

*Banking and financial
risks management*

THE EVOLVING, IMPLICATION AND IMPORTANCE OF CAD I, CAD II, CAD III

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Abstract

The capital adequacy concept leads off a risk measuring in the banks and investment firms, and subsequently from determination of an appropriate capital requirement of these institutions. The Banking Advisory Committee of European Union, which was established in 1979, is one of the most important authorities within European Union. It comprises the most significant authority of regulation and supervision in Europe with empowering to issue binding directives. The aim of this article is to show how the European Union responds Capital Accords Basel I, New Basel Accord and Basel II. The substance is on the Capital Adequacy Directives CAD I, CAD II and CAD III. The CAD I included market risk, risk of counterpart, foreign currency risk and risk of large exposures. The CAD II included commodity risk and internal models for calculating of capital requirements, it responds to New Basel Accord. CAD III responds to proposals included in Basel II.

Keywords: *capital adequacy, own funds, market risks, minimal level of capital to cover risks, investment companies.*

1. OFD and SRD Directives

Steps taken by European Union in the field of capital requirement have come from commands of Basel Committee for Banking Supervision.

European Union passed two directives in 1989 as reaction to Basel I:

- » Council Directive 89/299/EEC of 17th of April 1989 **on the own funds of credit institutions**, also called **OFD Directive**,
- » Council Directive 89/647/EEC of 18th of December 1989 **on a solvency ratio for credit institutions**, also called **SRD Directive**.

Overhead mentioned directives took a leaf from Basel I with an identical approach to credit risk.

The first directive (OFD Directive) defined own funds and the second directive (SRD Directive) specified risk weights for individual sorts of assets.

The conception of capital adequacy is named in EU Directives as solvency ratio and capital is named as own funds.

2. Capital Adequacy Directive I (CAD I)

In European Union has been born need to define minimal capital requirements for investment institutions (the same for both banks and investment firms).

Furthermore, Basel Committee for Banking Supervision has also recommended market risk to take under capital requirement. Thus, under the conditions the Council Directive 93/6/EEC of 15th March 1993 on Capital adequacy of investment firms and credit institutions has been passed. This directive is also named CAD I.

2.1 Reasons for passing CAD I Directive

The reasons for passing directive CAD I could be summarized to seven main points:

- » creation of common standards for capital requirement of banks and investment firms,
- » to give a definition of separate risks for different sorts of financial instruments and for different business positions,
- » the same capital requirements for the same market risks of banks and investment firms,
- » common standards of monitoring and managing credit engagement of banks and investment firms, particularly in banking book,
- » creation of the standards for own fund of credit institutions and investment corporations,

- » need of common rules of consolidation of financial institutions with regard to market risk,¹
- » the effort to remove barriers between investment banking and commercial banking in the interest of individual approach to them under the terms of regulation and supervision.

CAD I prescribed mainly conditions for capital requirement for investment firms. It also related to banks but only on those activities, which were integrated to business portfolio (trading book). Also the Directives OFD and SRD were linked with these activities.

2.2 The conception of trading book

The conception of trading book was significant for CAD I like that in the case of New Basle capital accord. The trading book includes financial operations (short-term operation on own account and providing financial services). Another items, mostly credit and deposit operations belong to banking book. Separation of classical banking operations and operations on the financial markets was related to growth of market risks, followed from the operations on the financial markets.

2.3 The CAD I followed market risks, position risk, settlement/delivery risk, risk of counterpart, foreign currency risk and risk of large exposures.

Credit and share risk were divided into general and specific ones.

Position risk was defined as preponderance of covered (uncovered) positions of institution over its uncovered (covered) positions within the same group of stock and debt instruments and identical time-limited contracts.

Risk of the marketable debt instruments is shown on the base of net currency position, in which the debt instruments are denominated. The general risk is appointed:

- » on the maturity-based of instruments,
- » on the based of modified duration if the institution uses this way, systematically.

Share risk is determined on the based of gross position, which is sum of all net covered and net uncovered positions. Capital requirement for general risk is 8%, for specific risk is 4% (in some precisely defined cases, it is possible to decrease capital requirement to 2%).

Settlement/delivery risk

¹ Council Directive 92/30/EEC of 6th April 1992 on the supervision of credit institutions on a consolidated basis is not related to cases, when a group contains more investment firms without bank.

Settlement/delivery risk arises from a price differences between agreed price and possibility of change in market price during the time to maturity of business. It depends on a number of working days till the date of settlement.

Counterpart risk follows from a situation, where counter-party is not able to fulfill its own liabilities from concluded contracts.

Foreign exchange risk can be sets out in two steps:

1. the net open position of institution is calculated in each currency,
2. the net uncovered and covered position are converted through spot exchange rate to reporting currency and such a sum of covered and uncovered positions will be created.

If an institution's overall net foreign-exchange position exceeds 2% of its total own funds, it shall multiply the excess by 8% in order to calculate its own funds requirement against foreign-exchange risk.

Other risks represent independent part, which includes for example low business turnover risk or risk from low revenue at the level which is not sufficient to cover overheads. Therefore, investment firms shall be required to hold own funds equivalent to one quarter of their preceding year's fixed overheads (when a firm has not completed a year's business, the requirement shall be a quarter of the fixed overheads figure projected in its business plan).

CAD I was not monitoring market risk at a level of credit and stock instruments of the banking book.

2.4 The investment companies

The investment company has an important position under the terms of CAD I, where is defined like corporate body with regular activities oriented to providing investment services for third-country investment firms on a professional bases.

The directive also enables to add subjects which are not corporate bodies between investment companies. Investment companies are not that subjects which only receive and transmit orders from investors without holding money or securities belonging to their clients and which for that reason may not at any time place themselves in debit with their clients.

Initial capital of investment firms had been appointed subsequently:

1. **ECU 125 000**, if institutions provided one of the following activities:
 - » the reception and transmission of investors' orders for financial instruments,
 - » the execution of investors' orders for financial instruments,

» the management of individual portfolios of investments, provided that they do not deal in any financial instruments for their own account or underwrite issues of financial instruments on a firm commitment basis.

2. **ECU 50 000**, if firm was not authorized to hold clients' money or securities, or to deal for its own account.
3. All other investment firms should had initial capital of **ECU 730 000**, mainly those of them which running activities beyond the terms of first point.

The member states of European Union could divide single items of own funds of the credit and financial institutions by that way their national supervision authorities decided within the scope of EU recommendations. Regardless of legally and accounting terminology the items of the own fund had to fulfill the following signs:

- » the credit institution had them at itself disposal for covering ordinary banking risks anytime,
- » there were keeping account of them,
- » the subordinated funds could not exceed 100% of core funds and also had to contain clause of inferiority and their maturity should not be less than 5 years.

CAD I should been implemented within the member states of European Union till the end of the year 1995. The most of them did not meet this date. Great Britain was the first country which implemented CAD I in practice. On the other hand, Germany was the last country implemented this directive.

3. Capital Adequacy Directive II (CAD II)

CAD II represents a revision of CAD I following New Basel Capital Accord – amendment of Basel I. Target was to avoid different regime of members and non-members of Basel committee on banking supervision within European union.

CAD II was adopted in 1998 and was focused on two main areas:

1. internal models of banks and
2. commodity risks.

3.1 Reasons for passing CAD II Directive

Reasons why to adopt CAD II may be summarized into several areas:

- necessity to incorporate commodity risks or commodity derivative risks designed for trading into trading book,
- to allow institutions to use their own risk management and risk measurement models to measure risks more accurate,
- to evaluate gold positions (and their derivatives) of the institutions similar to the foreign currency and foreign currency derivatives positions,
- a detailed modification of the non-balance items,
- improvement of the OTC derivative regulation, possibility to include risk mitigation effect,
- necessity of consistent regulation over the lending institutions and investment firms in OTC derivatives area,

3.2 Commodity risks

Investment firms with their main activity focused on commodity trading are not subjects to neither CAD II nor investment firms Directive .

Capital requirements connected to commodity risks are related to necessity to defend lending and investment institutions depositors and lenders. These institutions are not primarily focused on commodity operations. Capital requirement per commodity is 15% of the net covered/uncovered position multiplied by current commodity price and 3% of a gross position, covered plus uncovered, multiplied by current commodity price.

3.3 Internal models

To apply internal models by an institution must be approved by regulator.

According to CAD II possibility to exercise internal models is connected to several risks:

- position risks,
- foreign currency risks,
- commodity risks.

Regulator may allow institution to use internal models for the purpose to calculate capital requirements for **specific risks in debt and stock trading positions**, if internal models fulfill **additional (along with obligatory) conditions**, which are:

- model explains price volatility in portfolio,
- model evaluates concentration in portfolio structure,
- model is verified by reverse testing.

Regulator authorize institution to use risk management internal models only if these **obligatory conditions are reached**:

- institution has risk management unit, independent of trade units, and they report directly to the head management,
- risk management internal models is integrated into everyday process of risk management and cooperate with head management,
- head management actively participate in risk management process, executive officers responsible for checking reports should be authorized to lower positions of the relevant traders to help to decrease the risks,
- institution should have enough crew able to work with complex models,
- model accuracy control and model reliability control is needed,
- strict program for crisis situation testing and their evaluation by head management,
- internal audit concerning model reliability judging.

In reverse testing, VaR (Value at risk) calculated by internal model is compared every day (not including weekends). Daily change calculated for portfolio at the end of the day is taking into account. Reverse testing on theoretical changes of portfolio value is done by comparing the portfolio value at the end of a day and portfolio value at the end of a next day, while portfolio position remains unchanged.

Minimum value of the multiplier is 3 and it grows in dependence on number of overruns during the last 250 trading days. Overrun means daily change of the portfolio value that is greater than VaR calculated for the same day by internal model. Overruns are calculated either on real or theoretical changes of portfolio value.

4. Capital Adequacy Directive III (CAD III)

Goal is to provide unified application of the new concept for capital adequacy in banks and financial institutions within EU. CAD III respond to Basel committee on banking supervision and its ratification of the Basel II in 2004 (26.6.2004). This document established **operation risk** defined as a risk of operating system failure as well as some forms of human factor failures. There are three ways to calculate capital needs to cover this risk:

- simple, based on a gross profit percentage,
- advanced, dividing trade activities into 8 groups,
- developed, based on institution's own calculations.

CAD III represents union title for recodification of the SRD² directives and CAD II. The new projection of the directive was introduced to Council of the EU by European Commission in 2004 (19.7.2004).

This document increases the role of the regulation on consolidated basis over cross-border groups. There is also emphasis on regulators' cooperation. Newly found The Banking Advisory Committee of European Union will play important role in this context.

5. Conclusion

Main point of capital adequacy in CAD Directives is measuring of risks of credit institutions and investment firms and valuation minimal level of capital to cover them. The aim of capital regulation is health of financial system and protection of depositors and investors. Basel Committee on Banking Supervision has defined as first the capital adequacy. Basel accords respond to condition of banks. Principle "the same capital has to cover the same risk in banks and investment companies" is implemented to Capital Adequacy Directives. CAD Directives were prepared on conditions of investment companies and for operations of trading book in banks. In conditions of national banking and financial systems of many countries are implemented the same capital accords with different result. The reason is in different access to application of capital adequacy rules (Basel Accords or CAD Directives) in diverse territorial parts. Different access to application of capital adequacy rules shows next table:

	Bank	Financial institution
EU members and members of Basel committee on banking supervision: (Great Britain, Belgium, France, Germany, Luxembourg, Netherlands, Sweden, Italy)	New Basel Accord + CAD	CAD
EU members outside G10: (Austria, Denmark, Finland, Greece, Iceland, Ireland, Norway, Portugal, Spain)	CAD	CAD
Basel committee members outside EU: (USA, Canada, Japan, Switzerland)	New Basel Accord	No international agreements

² SRD directive was amended in 2000 and figures under the number 2000/12/ES

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RISK ATTITUDE PROFILES OF INVESTORS IN THE FINANCIAL SERVICES INDUSTRY: THE IMPACT OF BEHAVIOURAL BIASES

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Abstract

Risk attitude profiling is an essential step in the financial advising process. It provides an understanding of the investor's attitude and tolerance for investment risk. Data collection on risk attitudes is commonly collected from an investor's choice between uncertain outcomes of a risky investment. However, responses are conditioned by a well documented behavioural bias in decision making under uncertainty known as "framing". Individuals develop internal frames of reference as a simplifying behavioural heuristic when faced with decision making under uncertainty. The framing of attitudinal survey questions will condition an investor's response to risk attitudes. Alternative frames can reverse attitudinal responses to the same choice. This paper examines the significance of framing in the risk attitude profiling process. We argue the need for alignment between the external framing of questions and the investor's internal frames appropriate to a particular class of investment decision. Misalignment may bias attitudinal responses and lead to inappropriate investment advice. We analyse this within the context of providing advice for superannuation (pension) investment. A class of investment decisions with a common purpose, long time investment horizon, individual choice and large capital sums.

Keywords: *Personal Finance; Framing, Risk Attitude; Superannuation; Behavioural Finance.*

1. Introduction

The assessment of risk attitudes and tolerances of potential investors is now required of all financial advisors. But current practices are severely criticised for their lack of psychometric validity and omission of significant behavioural factors that characterise financial investment decision making under uncertainty [(Callan and Johnson, (2002), McCrae, (2004)]. A crucial omission that may invalidate the interpretation and application of risk attitude profiles as a basis for subsequent financial advice, is a behavioural factor known as ‘framing’.

The term framing refers to how choices are put to a decision maker. Framing first evolved from Kahneman and Tversky (1979) in prospect theory and then more formally in (Kahneman and Tversky, 1986). The main issue raised within prospect theory is the notion that the desirability of alternatives is altered by their framing, such that risk choices can be manipulated through alternative framing methods.

Two consistent findings emerge from behavioural finance studies regarding how individuals deal with outcome uncertainty or financial risk when making financial decisions. Kahneman and Tversky (1984) demonstrated that individual attitudes towards financial risk are conditioned by how the uncertain outcomes are expressed or ‘framed’ to the respondent – a characteristic known as external framing. Subsequent studies confirmed the phenomenon of risk attitude reversal associated with opposing frames. Risk tolerance (risk loving) observed when uncertain outcomes are expressed in terms of gains, wins or survival may reduce to risk aversion when equivalent outcomes are framed as losses, costs or failures.

A second group of studies demonstrates that individuals tend to adopt behavioural heuristics or ‘general behavioural rules’ to simplify the complexity of financial choices dominated by outcome uncertainty and information overload. One such heuristic is the grouping together of decision situations with common characteristics and the use of common attitudinal ‘internal frame’ of reference that may emphasise the loss or gain aspects of uncertain outcomes for all such decisions. Individuals simplify choice decisions in that class by using the same risk attitude or risk tolerance level considered appropriate to that frame of reference. The dominant risk attitude applied to particular sets of decisions may vary drastically between sets.

This paper suggests that the aforementioned behavioural principles have significant implications for the risk attitude assessment process (risk

profiling) now required of financial advisors when recommending a specific or well defined set of financial choices such as superannuation. Risk attitude profiling is essential as it provides the financial advisor with an understanding of an investor's attitude towards investment risk and establishes a 'reasonable basis' for subsequent investment advice.

A concern in the risk profiling process is a misalignment between external and internal framing. Misalignment can occur when the external 'frame' used to express a financial choice problem in a profiling instrument does not correspond to the respondent's normal internal frame for that category or class of financial decisions. Since external framing can cause risk attitude reversals for equivalent situations, misalignment may produce completely inappropriate risk attitude profiles for that decision context.

This exploratory study examines the significance of framing as a decision making heuristic in the risk attitude profiling process. Current legislation that governs the processes which financial advisors must adhere to, including risk attitude profiling omit behavioural factors. An example of this is framing. We argue the need for an alignment between the external framing of questions in the risk attitude profile and the investor's internal frames appropriate to a specific class of investment decisions. To highlight this we use superannuation or pension investing as a class of investment. We have selected this class of investment as it forms the majority of an investor's wealth, has a common purpose (to attain the highest retirement income), an approximately defined long term investment horizon and individual choice of investment strategy. Moreover, we believe that superannuation is an appropriate example, as financial advice and recommendations may be in conflict with attitudes that do not agree with economic objectives.

Our analysis is structured as follows. Section two defines the process of risk profiling and briefly reviews the financial risk attitude profiling requirements placed upon financial advisors by the legislation and the lack of guidance on process control. Section three defines heuristics, with the types of framing in decision making literature also identified. Section four analyses the unique investment aspects of superannuation, illustrating the need for alignment between internal and external frames. Section five concludes with a main summary of the paper and future research directions

2. The Financial Services Industry & Risk Attitude Profiling.

In 2001, the Australian Federal Government introduced sweeping reform of the financial services industry to combat rampant self-interest,

fraudulent practices, inadequate training, excessive fee structures and a pervasive lack of transparency, disclosure or accountability. Any individual or organisation providing financial advice of any nature is required to have minimum knowledge standards, with respect to the advice they are giving. The legislative foundation for this reform is the Financial Services Reform Act (FSR Act) of 2001 (Commonwealth of Australia, 2001).

In common with legislation in the UK, USA and many European countries, the foundation of the advisor-client fiduciary relationship laid down in the Act is an absolute requirement for an advisor to act in a client's 'best interests'. The burden of proof rests on the financial services provider. An advisor must make reasonable attempts to gather sufficient information from the client about their financial and other relevant circumstances to establish a 'reasonable basis' for subsequent financial advice and to show that the advisor has always acted in the client's 'best interests'. Penalties for contravention include large fines and deregistration depending on offence severity.

Under the Act, the terms 'best interest' and 'reasonable basis' expressly include notions of psychological and behavioural, as well as economic, well-being. Both the FSR Act and Section 851 of the Corporations Law require financial advisors to make 'reasonable attempts' to define and consider an investor's risk attitudes or 'tolerances' in relation to a specific financial objective before providing financial advice.(section References). Risk attitude profiles aim to provide financial advisors with a means to assess an investor's attitude and tolerance towards investment risk. Any subsequent advice, product recommendations or other services must then accord with those attitude profiles, as these risk attitude and tolerance profiles are shown to fundamentally condition client choice between alternative financial decision alternatives (Kahneman and Tversky, 1984).

The purpose of the risk attitude profiling process is to provide the financial advisor with an understanding of an investor's attitude towards investment risk. Unfortunately, the FSR Act gives no guidance on the risk profiling process other than a requirement for collection of information directly from the client. The vacancy is problematic since the majority of current risk profiling practices have been strongly criticised as ad hoc processes that lack internal consistency, remain psychometrically untested and characteristically ignore behavioural biases that characterise human financial decision making under uncertainty. Current profiling procedures often produce inaccurate, invalid attitudinal assessments that lead to gross mismatches between financial advice and a client's actual risk preferences.

2.1 Financial Risk Defined

Financial risk refers to uncertainty about investment outcomes. The outcome may be return on investment, capital growth or loss or failure to meet an expected target. The greater the uncertainty about the outcome the greater the financial risk. The most common measure of this concept is the volatility of investment returns around their expected value as given by their standard deviation. As return volatility or (loss probability) increases so does the financial risk associated with the outcome. Choices between investments depend upon the expected level of return and the volatility or uncertainty attached to that return. The summary measure is usually expressed as risk-adjusted returns.

Finance theory holds that higher absolute returns are preferred to lower returns and lower volatility preferred to higher volatility. However, individual choice of the optimum risk-return combination among alternative investments will be uniquely determined by each investor's attitude towards, or tolerance of financial risk.

2.2 Risk Attitude Profiling

The process of identification, measurement and categorization of a client's individual risk attitudes and tolerances is known as risk profiling. Legally, risk attitude profiling is a requirement and necessity of financial advice as deemed by the FSRA Act (2001) and the financial services hand book (ASIC, 2003). To identify attitudes towards uncertainty a financial advisor must identify preferences for risk through choices under uncertainty. However, each individual may approach or edit information differently to others when faced with choices, even given the same choices. Risk attitudes contribute to an understanding of the investor's psychological "comfort". This integration of attitudes or behavioural dimensions to rational models seems to be juxtaposed. Therefore, when developing an understanding of investor's attitudes and how they are formed, investment advisors need to be aware of behavioural biases involved in responses to the risk attitude profiling process. Consideration of behavioural biases such as framing addresses the issue of psychological comfort. In other words, considering the investor's level of comfort with investment decisions.

Unfortunately, neither PS 175 nor the FSRA Act provide any guidance as to how to conduct risk attitude profile assessments. Nor do they address the issue of incorporating behavioural aspects of decision making into the risk assessment process which can affect the validity (framing effects) and relevancy of risk profiles. To understand how the process is

threatened by framing effects, it is worthwhile to briefly examine what are risk attitudes and how they are measured.

2.3 Risk Attitudes

Investment risk profiling provides a measure of an individual's 'attitude' towards financial risk. But the concept is not easy to define. The Act refers to levels of 'tolerance' of investment risk rather than using the term 'risk attitude'. However, the two terms are often used inter-changeably in the sense that risk attitude profiling provides a means of measuring individual tolerances of different levels of financial risk. The terms 'risk averse', 'risk neutral' and 'risk loving' are used to refer to the spectrum of attitudes.

The concept relates to the psychological or behavioural 'comfort' or 'well being' of an individual in making investment decisions. Definitions of the concept are inherently context dependent. In neo-classical portfolio theory, an investor's risk profile is reflected in the shape and position of their utility indifference curves which then uniquely determines an optimal portfolio choice. The optimal portfolio is determined through a tangency solution with the risk-return frontier of efficient portfolios positions given by "the point on the efficient frontier at which the one of the investor's indifference curves just touches the frontier" Sharpe (1997).

In contrast to this rather mechanistic approach, behavioural researchers emphasise the 'psychic comfort' aspect of attitudinal measurement, as in the following definitions:

"The maximum amount of uncertainty that someone is willing to accept when making a financial decision" (Grable, 2000), and *"Risk tolerance is the degree to which an investor is willing to accept the possibility of an uncertain outcome to an economic decision"* (Harlow and Brown, 1990). More recently, Callan and Johnson (2002) define risk attitudes as, *"The degree to which a client is willing and able to accept the possibility of uncertain outcomes being associated with their financial decisions"*.

Implicit in all these definitions is the trade-off between risk, as measured by the uncertainty of a return and the level of expected return, which is commonly referred to as the risk premium. This aspect of risk attitudes is emphasised in the work of researchers such as [(Cordell, 2001), (Bodie, Kane and Marcus, 2003) and (Jahnke, 1999)]. Therefore, assessment and measurement of investor's risk preferences requires a risk attitude profiling process. Emphasised across all definitions of the concept is the notion that the risk attitude profiling process is an attitudinal measure.

Importantly, the quality of this measure can be threatened by the process of measurement or data collection. The process of data collection and the investor's heuristics used to make decisions under uncertainty also need to be addressed.

2.4 Attitude Reversion

Risk attitude profiling process is an attitudinal measure whose psychometric validity depends upon the process of data collection and measurement. The data collection process of risk attitude profiling involves responses to questions on uncertainty, aiming to measure attitudes towards uncertainty. Data collection always and unavoidably involves "framing" of questions. Framing refers to how choices are put to the decision maker. In their development of prospect theory Kahneman and Tversky (1979) showed that the manner in which choices are framed alters their desirability, such that risk choices can be manipulated through alternative framing methods. Questions may be framed in terms of gains or losses, positive or negative returns, and long versus short term (narrow framing). Consequently, the results of any risk attitude profiles are determined by the framing of questions used to collect data about risk preferences. Framing a problem under uncertainty in terms of a loss context may provide a complete reversal in response to an identical decision in a profit context. If risk attitudes are prone to preference reversals, then financial advice and recommendations based on responses may not truly reflect or cater for the investor's psychological and financial well being.

2.5 Legal Requirement of Risk Attitude Profiling

Under the FSR Act, the purpose of risk profiling in financial advice is two-fold. Primarily, risk attitude profiles are a means of ascertaining an investor's attitude towards uncertainty as an integral part of a client's psychological 'comfort level'. Under the FSRA Act's definition of a "client's best interests", consideration of behavioural and psychological well-being, as well as economic benefit must occur. Risk attitude profiling achieves this.

Secondly, risk attitude profiling satisfies the legislative requirement placed on investment advisors to establish a 'reasonable' basis for all subsequent advice (FSRA Act, 2001; ASIC PS 175). Risk attitude profiles form an integral part of that "reasonable basis" of advice. All subsequent financial advice on asset allocation and portfolio selection (investment products) must conform to that 'reasonable basis'. A "reasonable basis" of advice essentially draws on the investor's attitudes towards investment risk and their tolerance of it under the concept of 'relevant circumstances'. PS 175 defines an investor's relevant circumstances as:

- (a) tolerance to the risk of capital loss, especially where this is a significant possibility if the advice is followed; and
- (b) tolerance of the risk that the advice (if followed) will not produce expected future benefits (PS 175.104, ASIC, 2003).

One criticism of the above definitions, in particular (a) is the focus on capital loss. An investment perspective should also incorporate volatility of returns which some industry bodies such as the Financial Planning Association (FPA) adopt. Moreover, PS 175 and the FSRA Act do not provide any guidance as to how to conduct risk attitude profile assessments, nor do they address the issue of incorporating behavioural aspects of decision making into the risk assessment process. In order to understand how the current process is threatened by framing effects (behavioural biases), it is worthwhile to briefly examine some of the current forms of risk attitude profiling.

2.6 Current Risk Attitude Profiling Techniques

Current profiling processes produce only the broadest of attitudinal categories. Industry practice is to distinguish only four profile categories that range from a low end of “risk averse”, through “risk neutral” onto ‘risk tolerant’ and “risk seeking” at the high end. Anecdotal evidence suggests that industry interests rather than the client’s focus dominate such divisions. Financial advisors typically use these four categories as a basis for recommending portfolio products already pre-packaged as ‘conservative’, ‘balanced’ and ‘growth’ portfolios based on relative percentages of asset classes in each (see table one below).

Table 1- Investment Product Risk Profiles

<i>Assets</i>	Risk Profile		
	<i>Conservative</i>	Balanced	Growth
Domestic Equities	15%	30%	50%
Global Equities	10%	25%	50%
Fixed Interest	40%	35%	-
Property	5%	5%	-
Cash	30%	5%	-

This table illustrates an example of the risk profiles of investment products that are broadly categorised as; “conservative”, “Balanced” and “Growth”. The assets represent the percentage of a portfolio for each risk

profile. It should be noted that this table is a guide and not indicative of all risk profiles as labelled below.

The major use of these profiles by financial advisors is for recommending selection from available investment products. Once completed, financial advice on portfolio selection with respect to a specific financial objective must be consistent with the investor's risk attitude profile.

2.6.1 Criticisms of Current Practice of Risk Profiling

The forms of risk attitude profiling range from primitive qualitative interpretations of statements, to highly quantitative measures of attitudes to financial risk (Roskowski, 2003). Even during interviews, investment advisors are capable of framing questions by presenting them in one form (e.g. in terms of gains, separate investments, etc). This leads to biased responses which may not necessarily reflect the investor's true risk attitudes. Consequently, an advisors interpretation of responses are then placed against standardised portfolios e.g. table one, and portfolios with risk profiles similar to the investor are recommended. A criticism of such an approach, is that if questions on risk attitudes were framed so as to yield risk seeking responses, a totally different risk profile would be formed to a question framed in opposing terms. This in turn determines the type of portfolio an advisor recommends.

Portfolio Matching

There are two primary methods by which risk profiling data can be obtained to identify risk attitudes and preferences. One method is to examine a number of alternative efficient portfolios, and explain to the investor the investment risks associated with them and, then choose among this sample of portfolios (investment products). Sharpe (1997) asserts that this is universally done in institutional practice.

This form of risk attitude profiling is a simplistic one-step approach at combining the investor's risk attitudes, investment objectives and preferences into asset allocation and recommendations. Whilst it meets the requirements of the Act, it does not meet any of the principles of risk attitudinal measurement as Callan and Johnson (2002) alluded to.

The second method categorises risk profiling by the data gathering technique; either structured questionnaires or semi-structured interview/discussion. Advisors use either a combination or one of these types of methods as a starting point for identifying risk attitudes. The semi-structured interview method may be used by itself or as a method of "probing" and contextualising responses to the preceding structured questionnaire (Roskowski, 2003).

Even with interviews, investment advisors are capable of framing questions by presenting them in one form (e.g. in terms of gains, separate investments, etc). This would lead to biased responses which may not necessarily reflect the investor's true risk attitudes. Consequently, an advisors interpretation of responses would then be placed against standardised portfolios such as those in table one and, be recommended portfolios with risk profiles similar to the investor. A further criticism of an approach such as this is that if questions on risk attitudes were framed so as to yield risk seeking responses, a totally different risk profile would be formed. In turn, an advisor would recommend a "growth" type portfolio.

The above form of investment product selection or 'portfolio matching' faces strong criticism in the financial planning literature. There are several reports from industry bodies and government regulators. Most notable, however, is the *Quality of Advice Survey*, conducted by ASIC in 2003. This survey involved over 100 investors or participants that actually received financial advice from financial advisors. Each financial plan and consultation between advisors and investors were then rated by academics, legal and financial services professionals. More than 50% of reviewed plans were either classed as "borderline" to "very bad". A discerning result from the survey was that some financial plans and advisors provided reams of generic information and failed to show how the recommended strategy and action was appropriate for the client. Portfolio matching provides a recommended strategy for a set of generic set of risk attitude questions.

Interviews

Callan and Johnson (2002) report that client-centred interviews and conversations are often the primary data collection tool for risk profiling by financial advisors. This data then allows the financial advisor to gain an initial insight into the investor's attitudes towards certain types of risky investments. They provide a technique to probe the comfort levels of investors associated with investment choices between alternative types of investments or asset classes that are characterised by return uncertainty.

Once the advisor has more meaningful understanding of the investor's attitudes, more possible valid questions about specific investment products that match the investor's level of expected performance and optimism can be used to further confirm risk attitudes (Callan and Johnson, 2002).

This type of assessment provides the financial advisor with subjective and intuitive estimates of the investor's investment needs and objectives that are relevant to their financial decisions. One discerning outcome of this method is the subjective interpretations as well as questions that investment advisors have in the process. The questions on choice under uncertainty may

be framed in manner that necessarily does not represent the investor's true attitudes.

Advisor interpretations of Risk Profiling

Research into investment advisors interpretations of risk tolerance is limited. Pioneering work by Snelbecker et al (1990) found that given a hypothetical investor's statements, financial advisors make substantially different interpretations. This finding is concerning for investors who receive and act upon advice from one advisor, despite theoretical variability in the validity of advice. Thus, interviews and informal discussions with investors regarding their previous and current investments are not scientific or objective and do not provide any substance for investment advisors to provide recommendations on.

These conflicts highlight several substantive criticisms levelled at unstructured data gathering approaches for risk attitude profiling. The process results in an ad hoc, unsystematic, often undocumented data collection that is completely subjective and open to wide variations in qualitative assessment attitudinal results very dependent upon the individual advisor's perceptions of risk attitude responses.

Questionnaire Method

There is a plethora of psychological literature on the collection, measurement and interpretation of attitude scales. There are a number of well developed attitude scaling techniques now available as generalised instruments. But the development of similar instruments in the financial risk attitude profiling area is limited to a few studies exemplified by Grable and Lytton (1999, 2003) and Roskowski and Snelbecker (1990). However, there is an increase in the number of standardised computer based risk attitude profiling systems. This is a direct reflection of the current inadequate state of practices, which the industry has been left to do without any guidance from government regulators (albeit through the FSRA Act). Presently, there has been no comparison between the different risk attitude software profilers that examine their psychometric and construction validity. Although, the firm FinMetrica submitted their software for psychometric and validity tests, yielding positive results (ProQuest 1999).

The questionnaire process is similar to the interview method, but it provides a quantitative result. A questionnaire will have between 10-20 questions relating to financial experience and scenarios that describe possible outcomes of investments. Questions that involve choices between risky outcomes are spanned over a spectrum extending from risk averse to risk tolerant behaviour. Behaviours are based on hypothetical or experience based situations. Grable and Lytton (2003) empirically demonstrated the validity of

a 13 item risk assessment instrument (questionnaire). This study found that the responses to this instrument were correlated with portfolio ownership. That is there was a significant relationship between equity ownership (proxy for risk) and risk attitudes. An example by from Grable and Lytton (2003) is presented.

An experienced based question refers to attitudes towards certain investments. For example: In terms of experience, how comfortable are you in investing in stocks or stock mutual funds?

- a. Not at all comfortable
- b. Somewhat comfortable
- c. Very comfortable

With regard to attitudes toward “risk” a question may ask:

When you think of the word “risk” which of the following words come to mind first?

- a. Loss
- b. Opportunity
- c. Uncertainty
- d. Thrill

The above question is framed in terms of losses and highlights external framing, which is manipulation of presented choices. If asset allocation advice and recommendations is based on such questions, then the revealed risk attitude maybe biased in the manner which choices were given to them (e.g. positive or negative). As a consequence, the revealed risk attitude may be in conflict with the particular class of investment the investor is considering, and hence, provide the financial advisor with a misleading and inappropriate basis to provide advice from.

Responses are answered through likert scale type responses. Each question has a score allocated to its response, with a high score indicating that the investor is risk tolerant, and a low score meaning they are risk averse. The scores are then totalled and compared to benchmarks or “profiles”. The range that the investor falls within denotes their risk attitude profile. Model portfolios or portfolios of asset classes that display similar levels of risk are then recommended.

We have shown that current risk profiling methods are susceptible to interpretive bias that may lead to substantively different risk attitude assessments. This is due to the nature of data collection involved risk attitude profiling. Framing in data collection cannot be avoided. Therefore, to reduce

framing effects to establish more reliable and accurate measures of risk preferences we must examine framing and its implications on risk attitudes, in particular “internal” framing. This will be discussed now.

3. Framing Effects and Risk Attitude Profiling

The current risk attitude profiling methods used in both industry and research shown above, rely on a question and answer approach to measure individual investor’s uncertainty towards investment decisions. Kahneman and Tversky (1979) and much of the literature on decision making under uncertainty showed that risk preferences are influenced by how problems are presented. In terms of risk attitude profiling, framing is unavoidable. Current practices have illustrated that all forms of risk attitude profiling involve some form of question framing. By examining framing and in particular the effect of internal framing on decision making under uncertainty, emphasis needs to be placed on the need to recognise internal frames as part of the risk attitude profiling process. Doing so will provide a better means of understanding an investor’s risk preferences, as well as advice that is relevant to a class of investment.

3.1 Framing Formally Defined

Kuhberger (1998), defined framing as a subjective, internal process determined by the situation’s contextual and individual factors. Elliot and Hayward (1998) define framing as “any manipulation of factors causing a change in an individual’s frame such that a predictable behaviour is effected” (pg, 232). These two definitions are consistent with the original constructs of prospect theory. To illustrate this Kuhberger et al (2002) found that by manipulating a problem in order to describe the same situation in an opposite context, revealed attitudes were reversed. In terms of financial advising and risk attitude profiling this is a significant problem, particularly when considering long-term savings for investments such as superannuation or retirement income. Risk attitudes reveal that an investor may be “risk-averse” to a particular decision problem. Although this may just be their natural (internal framing) decision making response to choices with risky outcomes.

From the review of current risk attitude profiling methods, it is evident that in the data collection process, investors are faced with a choice. The two options are a certain outcome and a gamble with known probabilities. Options are expressed in monetary terms or that of total wealth. The investor’s selection of a certain outcome versus a gamble reflects their risk attitudes. When making decisions with alternative choices with given probabilities, the chosen path will reveal something about one’s attitude

toward risk (Kahneman and Tversky, 1984). Preference for the certain outcome would result in a risk “averse” attitude, whereas selection of the gamble would reflect a “risk seeking” attitude. This demonstrates the unavoidability of framing when seeking responses to risk attitudes.

3.1.1 Relevance of Framing in Financial Decision Making

Risk attitude profiles reveal an investor’s tolerance for investment risk. As mentioned in the previous section “framing” and its effects are unavoidable. Lebouf and Shafir (2003) define a framing effect as, “to occur whenever different descriptions of the same decision situation lead to different preferences” (p.78). Research has been plentiful and thorough, for reviews see (Kuhberger, 1998, Levin, Schneider and Gaeth, 1998) whom provide an excellent analysis of this issue. Framing effects are robust in numerous choice domains including medicine, project resource allocation, consumer choice, and gambling (Roskowsky and Snelbecker, 1990). But application to financial risk and risky decisions is an emerging discipline. Therefore, we need to look at more researched areas to assist in understanding how attitudes are formed.

Whilst the aforementioned areas may have life or death consequences in terms of the choices decision makers are faced with, economically the same is true for financial decisions. In terms of superannuation, if economically optimal investment decisions are not considered in an investment choice, the severity of that choice may be equivalent to a medical choice, between life and death. We will highlight this in our next section. There is a need for an understanding and incorporating framing in risk attitude profiling, as it is prominent in many choice domains.

This leads us to advocate and consider “internal” frames as part of the risk attitude profiling process. Kahneman and Riepe (1998) in their review of biases of judgement and decision making, acknowledge that individuals use their own heuristics in the coding and editing phase of analysing choices under uncertainty. Whilst these heuristics may not conform with rational decision making, to the individual they are correct. If these heuristics are used consistently, then individuals will continuously make errors in choice, or preference reversals. A further role of the financial advisor is to educate clients to make more optimal decisions and to be comfortable with them emphasising the importance to understanding and acknowledging internal

3.2 Internal Framing

Internal framing or “self-framing” refers to how decision makers (investors) “themselves spontaneously encode and frame a choice problem” (Wang, 2004). Internal framing is a behavioural heuristic to simplify complex decisions characterised by outcome uncertainty. The above analysis illustrated that framing is unavoidable in the risk attitude profiling process. However, as eluded by researchers [(Elliot and Archibald, 1989, Levin, Schneider and Gaeth, 1998, Thaler and Johnson, 1990)] when investigating the manner in which decision makers frame choice outcomes and risk preferences, findings show individuals prefer positive to negative frames.

Kuhberger (1998) asserts that the “loose” definition of framing as, “an internal event that can be induced not only by semantic manipulations but may result also from other contextual features of a situation and from individual factors, provided that problems are equivalent from the perspective of economic theory” (pg, 24). Internal framing may be adopted in any context. If a choice is presented in terms of either gains or losses, individuals may select the certain or risk averse option because their natural tendency is to be risk averse, even though it contradicts economic rationality.

For financial advisors and the current risk attitude profiling processes, internal framing has implications. The major issue for the financial advisor regarding internal framing is that the need to ensure an alignment between the external framing of questions and the investor’s typical internal frames when making decisions under uncertainty. Misalignment can result in inappropriate responses, attitude recognition and inappropriate advice for a particular class of investment.

3.2.1 Internal Framing as a Heuristic

Heuristics is a process whereby individuals use short-cuts to make complex decisions. Heuristics are problematic due to their inclination to introduce bias into decision making (Shefrin, 2000). This bias is encouraged by past events (representativeness) which are stereotypes of judgement. An example of this is investors focusing on short term volatility for long term investment (such as superannuation). The short term volatility may be viewed unfavourably, however, over the long term volatility could prove to be insignificant. Short term volatility for long term investment strategies such as investing predominately in equities is relatively, not of much consequence as the same decision would be over a short term (Bodie, 1995). Adopting heuristics means that when faced with a choice, individuals use their common heuristics (based upon past behaviour and experiences) to assist them in making decisions, even if doing so leads to a preference reversal. To

determine if a framing effect occurs, the choice must provide the same “acts, outcomes, and contingencies” associated with decision that lead to preference reversals (LeBoeuf and Shafir, 2003).

Thaler and Johnson (1990) examined systematic phenomena to determine how prior gains and losses can affect subsequent choices. When confronted with a choice asking individuals to consider the effect of previous investment outcomes, individuals do not always conform with prospect theory. Significantly, the authors found that a prior gain often induces individuals to accept gambles, the authors naming this behaviour as the “House-Money effect”. This is at odds with prospect theory which found people to be risk-averse in the domain of gains. Another finding was that when faced with losses, the gamble was less attractive. However, if there was an opportunity to break-even or recoup prior losses, this seemed attractive. A similar study by Fox and Dayan (2004) provided similar results. In terms of superannuation investment, investors need to consider the choice of their decision in terms of their total investments.

Mental accounting is another example of using of internal heuristics in decision making. Thaler (1999) found investors to segregate information about their investments. Doing this leads investors to value investments differently and, hence change their attitudes towards risk for various investments. For example an investor that is relatively young may not take as much risk for their long term investment strategy when in fact they are quite risk tolerant for short term investments. This is their natural internal frame. No matter how questions maybe framed in the risk attitude profiling process, investors may still elicit attitudes that are not rationally consistent with a particular class of investment they seek advice on.

There is literature that postulates individuals have internal frames. Individuals will work through a choice in the same manner irrespective of different problems facing them. Arguments of this type of nature are based assumption that “problem frames are an integral way people think about decisions” (LeBoeuf and Shafir, 2003). (Kuhberger, 1998) goes further by defining internal framing as an event that can be induced by both semantic manipulations as well as contextual features of a situation, provided the problems are equivalent from an economic perspective.

If choices to situations involving uncertainty reveal risk attitudes then the contextual features also play a role in determining choice. In the process of risk attitude profiling, the internal frames must be aligned with external frames or the context of decision making. The decision facing investors must be specific to a particular investment class. Or it will not provide an indication of their actual attitudes.

3.2.2 External Framing

External frames initially evolved from prospect theory, where Kahneman and Tversky (1979) manipulated the same problem to yield different responses and attitudes towards risk. Whilst probabilistically the chance of risky outcomes occurring is the same irrespective of the frame (gain or loss, certainty versus uncertainty, etc), the manner in how these choices are presented differ only in context. However, the difference in context leads individuals to interpret outcomes and utility associated with choices differently (Bazerman, 1998).

Conversely, internal frames are those that individuals adopt, irrespective of the decision they face. Individuals adopt heuristics to make decisions, as was shown by the House-Money effect and Mental Accounting. Using heuristics such as this may at times, not lead to optimal choices given the choices for a specific situation. The reason for this is that external frames used to describe a problem of choice under uncertainty do not correspond to the particular internal frame that an investor adopts. As a result there will be biased responses to decisions.

Current risk attitude profiling data collection methods involve framing, in particular that of external framing. Examples as seen in Grable and Lytton (2003) were given. These examples whilst not representative the types of questions asked in the data collection process, still highlight the issue of framing. Given some of these differences we will now examine some of the consequences of misalignment in financial advice recommendations.

3.3 Consequences of Misalignment

Under current risk attitude profiling techniques, the major consequence of misalignment is the false categorisation of investor profiles and hence, recommendations based on these risk profiles. However, the current prevalence of broad attitudinal scales with only four categories means misalignment in frames makes drastic mis-classification unlikely. Typically, variation would be only in terms of one class at most, and if risk adjusted returns between adjacent classes of portfolios are similar, the chance of misalignment is further mitigated.

Misalignment between external and internal frames arises from the current data collection procedures. Investor's internal frames determine the choices under uncertainty they select. Financial advisors then subjectively interpret these choices, with this interpretation at risk of being in opposition to the investor, causing misalignment. One possible way to overcome this

misalignment given current risk attitude profiling practices, is education of the investor by the financial advisor. In particular, education should include information regarding the existence of behavioural biases and the conflicts these biases may cause in choice and economic optimisation. This may be achieved through illumination of the behavioural biases investors display during the risk attitude profiling process. Alignment of investor's psychological and behavioural "comfort" with investment strategies for optimising economic objectives is thereby assured.

To illustrate our argument further we will briefly examine superannuation investment and the need for an alignment between internal and external framing of questions in the risk attitude profiling process.

4. Unique Characteristics of Superannuation Investment

To illustrate the need for alignment between the external framing of questions in the risk attitude profiling process and the investor's internal frame to a class of investment decision an example will be used. The class of investment we have selected as an example is superannuation or pension investment. In Australia, retirement investing is mandatory and termed superannuation. Superannuation is so termed because of the propensity for Australian investors to take retirement investments as a "lump-sum" rather than a stream of income. Superannuation investment is primarily a defined contribution retirement income vehicle. There are a few defined benefit schemes remaining, but most new superannuation investments are defined contribution based. Superannuation investment was selected as the example for a number of reasons. Primarily was been selected as it is the largest investment that individuals have (aside from the equity in their place of residence). Secondly a large proportion of the population is approaching retirement (the "baby boomers"¹) and finally with the onus of investment decision making placed on the individual investor². Characteristics that make this class of investment unique to other types of investments are; it has a common purpose (goal), long-term investment horizon, individual choice and involves large capital sums. These will be very briefly discussed to highlight how a misalignment of internal and external frames may affect the financial advice.

¹ "Baby Boomers" refers to people born within the years 1945-1950 (immediately after WWII).

² An example of this is Choice of Fund legislation. This legislation allows employees to select where their mandatory contributions are invested. This will come into full effect on July 1, 2005.

4.1 Purpose of Superannuation Investment

The objective of superannuation investment is to maximise the net accumulated wealth in the accumulation period (employment years), subject to the investor risk attitude profile. This enables the investor to achieve the highest possible retirement income. Currently, investor's superannuation is based on contributions paid into a defined contribution fund by their employer, which is managed by a financial institution. Investors also have the choice of voluntary contributions that supplement that of their employers. Investments can also be made outside of the superannuation domain for the same purpose of accumulating funds for retirement. However, superannuation provides investors with tax effective incentives such as lower capital gains taxes on investments and tax concessions on income tax, if contributions to superannuation are made from gross salary. Incentives such as those just described aid investors to maximise their net contributions. To achieve this though, investors must be comfortable with their investment strategies.

4.2 Long-Term Investment Horizon

Superannuation investing is definite long term investment. Investments can span over 40 years and begin at the individual's commencement of full-time employment³. At the conclusion of employed life, investors can receive superannuation benefits in terms of lump sums, annuities or pensions. During the accumulation period, investors are unable to access their funds or receive any associated cash flows from their investments. Thus, over time investor's could possibly make choices based on relatively large capital sums. Risk attitudes must be considered with respect to large capital sums that can not be accessed as well as time involved until they can be. If investors followed traditional economic models they would be able to plan and smooth consumption of wealth over their lifetime. This, however, does not largely occur, resulting in governments having to implement retirement income policies, such as superannuation investing. Such phenomenon has been named as *imperfect self-control*, and is been in the behavioural finance literature of (Fisher and Statman, 1997) and (Statman, 2002).

A long-term investment horizon highlights the need for an alignment between an investor's internal frames and external frames of risk attitude profile questions. For example a superannuation investor elicits a risk averse attitude in a risk attitude profile. This attitude is interpreted by a financial

³ Any individual earning over \$450 per month is entitled to a 9% superannuation contribution, on the behalf of their employer.

advisor as someone who would invest in relatively safe (low volatility) investments throughout their investment horizon, and is inappropriate considering the objective of superannuation and economic rationality. The risk attitude is inappropriate as investors need to maximise their terminal wealth. To achieve this they would need to invest passively in growth assets during their investment horizon, or accumulation period.

4.3 Investment Risk

In many defined contribution retirement systems throughout the world, investors are faced with the onus of investment risk, requiring them to select their own desired investment strategy and, accept the returns associated with the particular choice they have made. The onus of investment risk couples with investment choice gives the investor the ability to select investments and strategies that are consistent with their financial objectives. As mentioned previously another example of framing was “naïve diversification”. If an investor uses this as an internal frame to allocate assets evenly, then when presented with a choice between investments that have low volatility and return, they should do the same. Again, this highlights the issue of misalignment between internal and external frames. In terms of superannuation investment, presenting choices between investments that do not offer much growth for a compounded long term investment may not be suitable to eliciting risk attitudes. Furthermore, doing so may bias responses that are economically irrational. Responses are biased in the sense that they relate to choices that are financially contradicting. The alignment of a risk attitude profile for a class of investment such as superannuation would need to utilise a broad range of investment strategies, to identify the investor’s internal frame. Prudent advice (taking life style considerations into account) would be against naïve diversification.

4.4 Preservation of Superannuation Funds

Complementing compulsory contributions is *preservation* of accumulated funds. To stop investors from early withdrawals, taxes have been placed on accumulated funds to deter investors from accessing their future income sources. Conversely, investors are able to access and consume funds immediately outside the superannuation domain. If there were no accessing to superannuation funds then the objective of this specific type of investment is compromised. In their review of the behavioural finance literature, (Mullainathan and Thaler, 2000) found that given the wants and needs of most individuals over their lifetime, sacrificing current consumption for retirement is not a priority. Policies such as forced savings and preservation assist investors with self-control and planning for their

retirement needs. Superannuation investment envisages that investors remain focused on their goal of reaching the highest attainable retirement income stream. To achieve this, investors must be comfortable with an investment strategy that will enable them to achieve their objective and tolerate the risks of such a strategy over their investment horizon. Preservation of superannuation funds is a unique investment characteristic that makes this type of investment unique to other investment types that complements the forced superannuation savings thereby assisting investors to achieve the maximum attainable goals subject to their risk attitude profiles.

With respect to risk attitude profiling, internal frames found by may cause investors to be more risk seeking even in the gain domain (Thaler and Johnson, 1990). For financial advisors this is critical when reviewing investment strategies over an investor's life-cycle. If investments in superannuation have been performing considerably well, then a risk attitude profile, of the investor may change to a risk seeking attitude, when faced with choices under uncertainty. The new risk attitude profile may contradict previous assessments. Financial advisors should consider this change and consequently frame subsequent choices in terms of losses to see if this attitude is representative of all outcomes.

We have illustrated very briefly some of the unique investment characteristics of superannuation investing. By examining some of the issues surrounding risk attitude profiling we have highlighted the potential misalignment that risk attitude profiles may have when considering investment decisions for a specific class of investment. This misalignment will result in biased responses that do not characterise the investment decisions at hand. In particular, this analysis illustrates that specific investment purposes require specific risk attitude profiles reflecting the characteristics of the investment at hand.

5. Conclusions & Future Research

This paper examined the significance of framing as a decision making heuristic in the risk attitude profiling process. Current risk attitude profiling processes are fundamentally flawed behaviourally. We concentrated solely on data collection and framing influences. Through our example of superannuation investment we showed that framing may lead to adverse consequences both economically and behaviourally. Current data collection procedures are also used to manipulate investors to fit into pre determined portfolios.

We argued that there needs to be an alignment between the internal frames of investors and the external frames of questions in the risk attitude profiling process. To illustrate this we used superannuation investment as an example to highlight the critical aspect of misalignment between internal and external frames of a particular investment class. If investors make choices under uncertainty adopting internal frames, irrespective of the decision and outcomes available to them, bias will result in investment advice. Other notable behavioural biases including mental accounting and the House Money effect were shown to be examples of heuristics used in decision making when problems were presented in frames. Of note, behavioural biases that may influence risk attitudes are not limited to those aforementioned.

The analysis of internal frames being part of investment decision making for individual investors is restricted to superannuation portfolio construction advice and recommendations. We illustrated the unique aspects of superannuation investment and illustrated how the external framing of questions can result in biased results due to the internal frames individual investors adopt.

At present whilst there have been limited studies into the interaction of internal or self framing and the measurement of risk attitudes/tolerances, we believe the two complement each other. From the review of current practices it is apparent that framing of questions is unavoidable. This being the case, framing effects need to be recognised and considered in the interpretation of risk attitude results. Results of this process are critical in the financial advising process, as current and subsequent advice (asset allocation) is based on risk attitudes. Furthermore, the example of superannuation investing highlighted the need for a specific risk attitude profiling processes for individual classes of investment objectives. Generic risk attitude profiles may produce grossly biased responses that are economically contradicting.

This study is only the beginning of examining what constitutes internal frames and their impact on financial decision making. We believe that there should be some attempt to describe this empirically and on a more conceptual basis. This paper is will attempt to do so for the benefit of the financial services industry and investors.

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FINANCIAL CREDIT RISK PREDICTION WITH FUZZY SYSTEM

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Abstract

Credit risk is the possibility of loss incurred as a result of a borrower or counter party failing to meet its financial obligations. In the event of a default, a bank generally incurs a loss equal to the amount owed by the debtor, less any recovery amount resulting from foreclosure, liquidation of collateral or the restructuring of the debtor company. Credit risk prediction decisions are important for the financial institutions involved due to the high level of risk associated with wrong decisions. The process of making credit risk prediction decision is complex and unstructured. The existing models for prediction financial credit risk do not capture the learned knowledge well enough. In this study, we analyze the beneficial aspects of using fuzzy database for credit risk prediction decision.

Keywords: *Fuzzy system; Credit risk prediction; Fuzzy database.*

1. Introduction

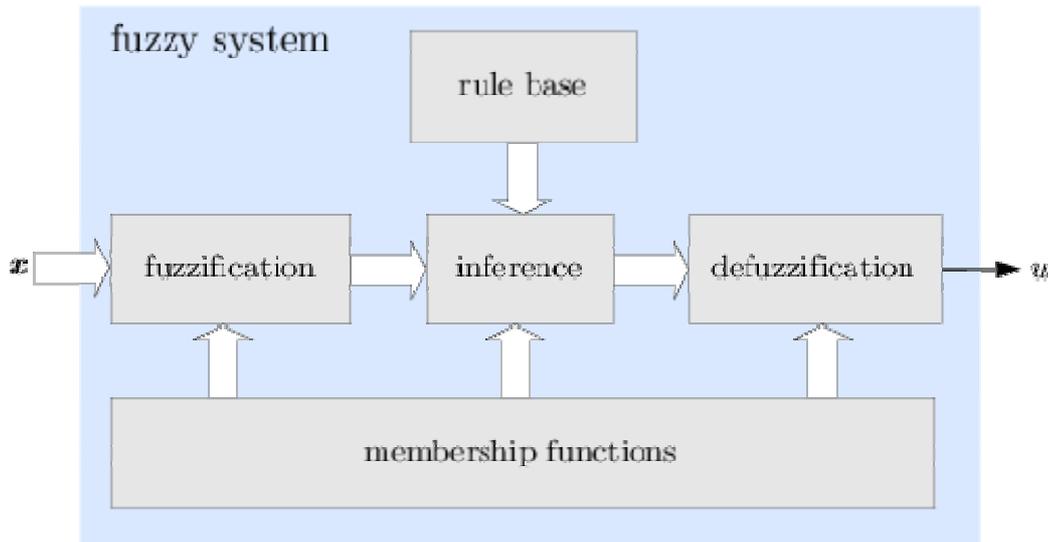
Credit risk is the risk of loss due to a counterparty defaulting on a contract, or more generally the risk of loss due to some "credit event". Credit risk is sometimes also called default risk. In business, almost all companies carry some credit risk, because most companies do not demand up-front cash payment for all products delivered and services rendered. Instead, most companies deliver the product or service, and then bill the customer, often specifying net 30 payment, in which payment is supposed to be complete on the 30th day after delivery. Credit risk is carried during that time. Managing credit risk is important for any company, and significant resources are devoted to the task by large companies with many customers (whether they be businesses or individuals). For large companies, there may even be a credit risk department whose job it is to assess the financial health of their customers, and extend credit (or not) accordingly [7].

In the process of analyzing credit-risk, the party involved in making the decision investigates factors that may lead to default in the repayment of loan. Credit-risk prediction decisions are inherently complex due to the various forms of risks involved. The existing models for prediction financial credit risk do not capture the learned knowledge well enough [1-3,5]. This paper analyzes the beneficial aspects of using fuzzy database system for credit risk prediction decision and organized as follows: Section 2 provides an overview of fuzzy system components and fuzzy database system for this problem. Section 3 includes a conclusion and future extensions of this study.

2. Fuzzy System

In this section, we briefly discuss the fuzzy database system as well as the components of this system and fuzzy search model. Fuzzy system is form a system that is easy to use, with good performance. Fuzzy system is drawn as a black box with some inputs and an output. Figure 1 shows the contents of a fuzzy system.

Figure 1: Components of a fuzzy system.



Now it is clear, what is in this black box. The input signals combined to the vector $\mathbf{x} = [x_1, x_2, \dots, x_q]^T$ are crisp values, which are transformed into fuzzy sets in the fuzzification block. The fuzzification comprises the process of transforming crisp values into grades of membership for linguistic terms of fuzzy sets. The membership function is used to associate a grade to each linguistic term.

The output u comes out directly from the defuzzification block, which transforms an output fuzzy set back to a crisp value. Using a fuzzy system as a controller, one wants to transform this fuzzy information into a single value u^* that will actually be applied. This transformation from a fuzzy set to a crisp number is called a defuzzification. The set of membership functions responsible for the transforming part and the rule base as the relational part contain as a whole the modeling information about the system, which is processed by the inference machine. The core section of a fuzzy system is that part, which combines the facts obtained from the fuzzification with the rule base and conducts the fuzzy reasoning process. This is called a fuzzy inference machine. This rule-based fuzzy system is the basis of a fuzzy controller [4,6]. As well as fuzzy database system contains a fuzzy search model for our study, which is described bellow.

2.1. Fuzzy search model

A practical realization of fuzzy query required the development of a model, method, and algorithm of fuzzy querying in MS Access on the basis of FQUERY. The suggested system allow processing fuzzy queries of kind and the linguistic quantifier e.g. “above”, “approximately”, “good”, “very good”, “good enough”, “around” etc.

The implementation of the fuzzy query is done by the following formular:

$$Poss(a_1/a_2) = \max_u \min(\mu_{a_1}(u), \mu_{a_2}(u)) \in [0,1] =$$

$$= \begin{cases} 1 - \frac{ml_1 - mr_2}{\alpha_1 + \beta_2}, & \text{if } 0 < ml_1 - mr_2 < \alpha_1 + \beta_2 \\ 1, & \text{if } \max(ml_1, ml_2) \leq \min(mr_1, mr_2) \\ 1 - \frac{ml_2 - mr_1}{\alpha_2 + \beta_1}, & \text{if } 0 < ml_2 - mr_1 < \alpha_2 + \beta_1 \\ 0, & \text{otherwise} \end{cases} \quad (1)$$

So by considering a_1, a_2 as flat fuzzy numbers which $a_1=(ml_1, mr_1, \alpha_1, \beta_1), a_2=(ml_2, mr_2, \alpha_2, \beta_2)$. Where ml_1, mr_1, ml_2, mr_2 are the mean values. α_1, β_1 and α_2, β_2 are the left and right spreads of the fuzzy numbers a_1 and a_2 respectively.

$\mu_{a_1}(u)$ and $\mu_{a_2}(u)$ are membership functions of the linguistic values a_1 and a_2 respectively. By using Visual Basic for Application of MS Access, the membership functions are calculated (formula (1)).

3. Conclusion

Fuzzy systems, including fuzzy logic and fuzzy set theory, provide a rich and meaningful addition to standard logic. Many systems may be modeled, simulated, and even replicated with the help of fuzzy systems, not the least of which is human reasoning itself. In this paper we have analyzed the beneficial aspects of using fuzzy database system for credit risk prediction decision. The kernel of the discussed system is Access DBMS and programming language Visual Basic. The purpose of the future work will be addition of neural network control system to our present study.

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BANKING RISKS MANAGEMENT – QUO VADIS?

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Abstract

The ever changing environment in which banks exist and function generates new opportunities, but also more complex and various risks as a challenge for traditional banking management. The present paper focuses on the importance of banking risks management as a key factor of success for Romanian banks, especially on the background of new risk facets in the contemporary economy. Monitoring is seen as an important share of the management process in banks and the monitoring of credit risk is particularly highlighted in the paper. Low quality credits have a high disturbing potential and this is the reason for which their causes and possible solutions are brought into analysis.

In order to value the opportunities and face the exigencies and risks that the European integration process and the globalization phenomenon induce in the banking sector, Romanian banks must develop efficient systems for reviewing and reporting the implementation of their credit policy, the quality and characteristics of their credit portfolios being one of the key success factors of a bank.

Keywords: *banking risks management; monitoring; credit risk.*

1. Introduction

The ever changing environment in which banks exist and function generates new business opportunities, but also more complex and various risks as a challenge for traditional banking management. These risks are to be managed by banks as adequately as possible in order to face competition and foster economic growth in the private sector.

Banking risk is a phenomenon present in the entire banking sphere and represents the uncertainty of achieving a certain level of profit or the probability to incur a loss. Banking risk can be generated by various operations and procedures and must be analyzed as a complex of factors, often interdependent, with common causes and chain effects. It is permanently changing and evolving in its complexity, adding to the traditional components new ones such as financial, operational, strategic, country, human and fraud risks.

2. New facets of banking risks management in the contemporary economy

The conditions that accompany the occurrence of banking risks are determined by a complex of factors which depend upon: the general economic trend, changes in the organizational structure of the bank, adopting financial decisions, political and economic circumstances. The occurrence of banking risks determines a decrease in profit and income for shareholders and, consequently, the bankruptcy of the bank or its acquisition by another bank.

The Basel Committee has identified eight categories of risks: credit risk, country risk, transfer risk, market risk, interest rate risk, liquidity risk, operational risk, legal risk and the reputation risk.

The contemporary era is dominated by the "risk management episode" in the banking system and risk management is a very important and difficult task for banks' management teams, covering a broad spectrum, from strategic planning of capital, asset and liabilities management to business management.

In order to generate profit, commercial banks must face risks that are specific to this process, while observing prudence requirements expressed by the national regulating authorities, justifying their exposure to risks and dimensioning risk in a way that the potential loss generated by its occurrence could be considered normal for the activity, for the internal and external

reputation of the bank. Banks must permanently monitor risks and balance sheet accounts. Their success in monitoring definitely depends on the organizational framework which should be likely to facilitate monitoring in particular and risk management in general.

We must point to the fact that banking literature does not draw a clear line between risk management instruments and monitoring instruments for the banking risks. We therefore consider it useful to distinguish between monitoring banking risks, i.e. identifying, assessing and controlling policies and practices regarding risk management in a bank, which allow for early detecting of potential problems and managing banking risks, i.e. the methods that are used for administrating banking risks with a view to eliminating, avoiding, dividing and financing them, as well as to decreasing exposure to risks. The demarcation line is even more important for banks management given the fact that high-quality monitoring of banking risks is likely to ensure the target area of risk management.

3. Exigencies regarding the use of monitoring tools and techniques for credit risk in Romania

We consider that among the various risks that influence the activity of commercial banks in Romania, it is relevant to deepen the analysis of credit risk. Credit risk has been a factor with high destabilizing potential against the proper functioning of Romanian banks.

The environment in which Romanian banks function becomes more and more complex and intricate and leaves open way for tempting credit offers in terms of low exigencies regarding the quality of debtors and the required guarantees. This considerably increases the premises for credit risk to occur.

Credit risk can be defines as the probability of non-reimbursement or partial reimbursement for the interest, the principal or both of them. This type of risk is specific to banks whose main function is granting credits. No matter how high the level of assumed risks is, losses can be minimized if only credit operations are organized in a professional manner.

Credit risk must be assessed via comparison with the profit that the bank expects to gain by granting the credits; direct benefits consist of interests and fees charged against the principal, while indirect benefits consist of initiating or maintaining relationships with certain clients that are likely to open new deposit accounts or to require new and more diverse services.

The most important function of banking management is that aiming at the control and analysis of credit portfolio quality, given the fact that the low

quality of credits is one of the main causes of banks' bankruptcies and requires permanent informing of the managing boards on the results of the analysis process on credits quality. This allows for early detecting and correction of various problems.

The managing boards of Romanian banks should take care that the crediting function that they implement serves three fundamental objectives:

- credits are granted on a safe basis so that they will be reimbursed;
- the amounts are invested in a profitable manner to the benefit of shareholders and the protection of depositors with the bank;
- credit needs of the economic agents and natural persons are met.

It is also necessary to revise credit operations, given the fact that the integrity and the credibility of the crediting process depends on objective decisions that can ensure an acceptable risk level vis-à-vis the expected return. The revising must include a detailed credit analysis, the criteria on which granting credits is based, price policy, credit ceilings, guarantees for all types of credits, as well as methods for reassessing guarantees. Revising credit requests offers new clues on the quality of credit assessing systems.

We consider that the management teams of Romanian banks should pay attention to the important role that human resources play in this process, in order to better identify the personnel that is suitable for monitoring credit risk in terms of qualifications and skills.

There are also needed efficient systems for revising, reporting and informing the managing boards of banks on the way in which credit policies are implemented, on the quality and characteristics of banks' credit portfolios, which gives a picture of the market share, the demand for the products and services of a bank, its business and risk strategy, as well as its potential for granting credits.

In order to accomplish a correct analysis of the way in which the quality of credit portfolio evolves in time, and of the impact that it exerts on the profitability, capital adequacy of a bank and clients' trust, Romanian banks calculate the following categories of indicators for quantifying credit risk:

- $\text{non-reimbursed credits} / \text{total credits} \times 100$: it is expected to get as close as possible to 0;
- $\text{low-quality credits} / \text{total credits} \times 100$: the optimal value is the minimum one given the fact that low-quality credits negatively influence the activity and the financial results of banks and the economic system;

- reserves for credit losses/total credits x 100, this indicator shows the expectations of the managing board regarding the trend in the quality of credits portfolio;
- contingencies for credit losses/net losses x 100, this indicator reflects the level of prudence adopted by banks in performing their credit policy;
- gross profit/ contingencies for credit losses x 100, i.e. the cost incurred by a bank in order to cover the credit risk.

Romanian banks monitor the quality of their credits portfolio via periodical auditing depending on the credit rating depicted from the credit documentation. Monitoring allows for early detecting of potential problems generated by credits that do not generate income for the bank and that are considered as non-performing, when there are delays in the reimbursement of either principal and interests or both of them.

4. Non-performing credits in the Romanian banking system - causes and solutions

For a long period of time, the lack of performance in the crediting activity, as one of the main causes of the successive bankruptcies, has been present in the Romanian banking system.

There are certain reasons that can explain the worsening of the credits portfolio quality. The main explanations that have been identified for the Romanian banking system, especially for the period between 1990 and 1999 are:

- the "internal" crediting operations that consisted of granting numerous credits to banks' managers and shareholders, thus disobeying the sound crediting principles;
- disobeying sound crediting principles by consciously granting credits with high risks for hunting very high incomes in a competitive environment or because of personal conflict of interests;
- accepting and ignoring high risks in the idea that they will not come up anyway, which is a very frequent problem, especially that credits are the main source of income for banks;

- having incomplete and/or incorrect information regarding the solicitants and granting credits without a solid analysis of the client's financial situation;
- the lack of attention in supervising old, familiar clients, basing the credit granting on verbal information and not on financial evidence, by optimistic interpreting of weak points and the successful solving of problems in the past;
- ignoring alarm signals regarding the client, the economy, the region or the sector and refusing to apply the necessary laws and regulations at the appropriate time;
- inefficient supervision and incomplete knowledge of the client's activities and situation during the crediting interval, because it often happens that an apparently sound credit in the beginning turns into a problematic one and generates losses because of inadequate supervision;
- technical incompetence, consisting of the lack of capacity of credit officers to analyze financial documents, to collect and assess relevant data;
- weak credit selection process, consisting of: granting credits for which the amount offered by the bank out of the total investment cost exceeds clients' own capital; granting credits based on the assumption of successful finalization of a certain transaction and not on the quality of the client; granting credits to companies placed in problematic areas from an economic point of view; granting credits based on uncertain collaterals.

An important direction concerning the minimization of banking risks consists of maintaining a “granular” structure of the placement portfolio, which means drawing an optimal balance between assets, according to their potential degree of risk. From this perspective, one can suggest an optimal structure based on 30% of low risks credits and 30% medium risk credits. For high risk assets a level of 40% is usually calculated. On the other hand, banks must constantly aim at varying the attracted resources, especially in what deposits are concerned.

The capacity of Romanian banks' managing boards to correctly administrate banks' assets is a key factor for their success on the market. Given the fact that there are still low quality credits in the portfolios of Romanian commercial banks, it is obvious that they are preoccupied by identifying, monitoring and solving them along with minimizing their potential losses.

The portfolio of low-quality credits offers information on the quality of the total portfolio as well as on the crediting conditions of a certain bank. Its analysis points to the following aspects:

- the causes that have generated the worsening of the credit portfolio quality, which can contribute to identifying the possible corrective measures to be taken by the bank in the future;
- ranking low-quality credits according to their duration and types of clients, from the point of view of their sector of activity;
- assessing every low-quality credit in order to establish the actions necessary to improve the clients' capacity of reimbursing the credit and/or monitoring the schedule of reimbursement;
- assessing the impact of low-quality credits on the profit and loss account of the bank in order to anticipate the extent to which the bank could be affected by the worsening of its assets quality.

We must emphasize the fact that the main criterion for credit granting remains the client's capacity to generate positive cash-flows, as a primary source for reimbursement, thus placing on a second position the material guaranties.

In order to diminish risks, a periodical and strict analysis of the portfolio quality is necessary, as well as drawing up the necessary reserves. An immediate option could be the insurance of credits against the non-payment risk, made by specialized institutions (the Romanian Guarantee Fund for the private investors, the Rural Credit Guarantee Fund, Eximbank, insurance and re-insurance companies).

The credit risk dispersion can be achieved by unionizing the loans with other banks from Romania or abroad, as well as the diversification of clients and credit types. In order to avoid the danger of concentrating credits in a certain field of activity, it is necessary to establish some limits in exposure, on the basis of scoring type analysis models, according to the indices that are relevant for assessing various sectors' performance.

These indices could include, for example:

- non performing credits' share in total ongoing credits;
- the quality of the loans portfolio;
- the volume of risk-specific fare;
- the share of loans granted to the private sector in total credits.

5. Conclusions

The changing environment in which Romanian banks function generates new business opportunities, but also more complex and diverse risks, which are a challenge for the traditional approaches of banking management.

A competitive market economy can only function with profitable, well-consolidated banks and well prepared to face multiple risks. We have considered necessary to distinguish between the management methods and the monitoring tools of banking risks and we have focused in the present paper on the instruments and techniques that are used for identifying, assessing and controlling policies and practices regarding the management of credit risk by the Romanian banks.

Credit risk must be assessed as compared with the profit that banks expect to gain when granting credits. The most important function of banking management is that aiming at controlling and analyzing the quality of credits portfolio, especially that the latter has been one of the main causes of banks' bankruptcies in Romania.

In order to value the opportunities and face the exigencies and risks that the European integration process and the globalization phenomenon induce in the banking sector, Romanian banks must develop efficient systems for reviewing and reporting the implementation of their credit policy, the quality and characteristics of their credit portfolios being one of the key success factors of a bank.

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SOME ISSUES ABOUT RISK MANAGEMENT FOR E-BANKING

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Abstract

The e-banking or on-line banking is a service provided by many banks and credit unions that allow to conduct banking transactions over the Internet using the information and communication technology. Continuing technological innovation and competition among existing banking organisations and new entrants have allowed for a much wider array of banking products and services to become accessible and delivered to retail and wholesale customers through an electronic distribution channel collectively referred to as e-banking. However, the rapid development of e-banking capabilities carries risks as well as benefits. To minimize legal and reputation risk associated with e-banking activities conducted both domestically and cross-border, banks should make adequate disclosure of information on their web sites and take appropriate measures to ensure adherence to customer privacy requirements applicable in the jurisdictions to which the bank is providing e-banking services.

Keywords: *e-banking; risk; new banking products*

1. Introduction

Banking organisations have been delivering electronic services to consumers and businesses remotely for years. Electronic funds transfer, including small payments and corporate cash management systems, as well as publicly accessible automated machines for currency withdrawal and retail account management, are global fixtures. However, the increased world-wide acceptance of the Internet as a delivery channel for banking products and services provides new business opportunities for banks as well as service benefits for their customers.

But, can we appreciate that everything is ok in e-banking? *This study revealed that indeed ebanking could become the major form for payment systems in organizations as technologies will improve to create a fully secure environment.* In this moment, we believe that e-banking is only a supplement of traditional methods. This paper suggests, that not only is it probable to use e-banking but that networks (especially Internet) will promote the quick development of such a services.

Electronically-based payment systems have been in operation since the 1960s and have been expanding rapidly as well as growing in complexity. However, in most of the major industrialized countries, an inverse relationship exists between the volume and the number of transactions handled electronically. Typically, of business payments around 85-90% or more of monetary value will be processed electronically, while less than 5-10% of the total number of payment transactions will be handled in this way.

This has been due to four related factors: (1) proprietary closed networks were developed by banks to handle large and increasingly internationally based payments systems; (2) large value payments are increasingly associated with foreign exchange and global securities transactions, thereby becoming divorced from underlying world trade; (3) large value payment systems were not designed nor are they cost-effective for small value payments; and (4), paper-based non-automated payment systems remain an established part of accepted business practice for varying institutional reasons, thereby remaining ingrained in the economic system.

Electronic banking (e-banking) is the newest delivery channel of banking services. The definition of e-banking varies amongst researches partially because electronic banking refers to several types of services through which a bank's customers can request information and carry out most retail banking services via computer, television or mobile phone (Daniel, 1999; Mols, 1998; Sathye, 1999). Burr, 1996, for example, describes it as an electronic connection between the bank and customer in order to

prepare, manage and control financial transactions. Many authors appreciate that Internet banking (e-banking) is defined to include the provision of retail and small value banking products and services through electronic channels as well as large value electronic payments and other wholesale banking services delivered electronically.

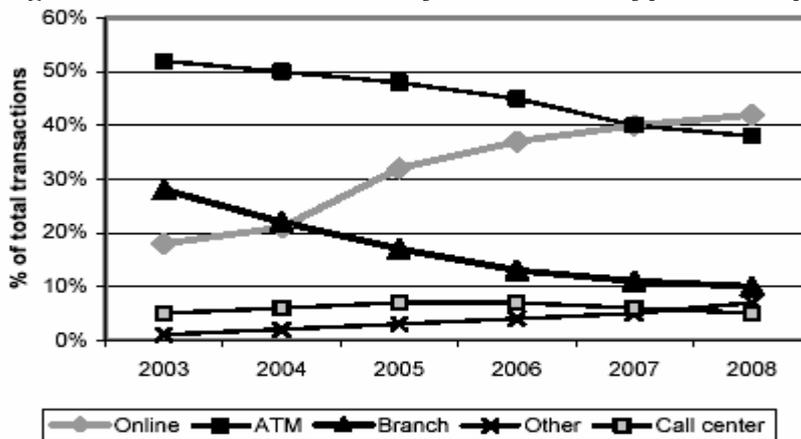
Electronic banking can also be defined as a variety of the following platforms: (a) Internet banking (or online banking), (b) telephone banking, (c) TV-based banking, (d) mobile phone banking, and (e) PC banking (or offline banking). In this paper, the ATM (Automated Teller Machine) channel is also added to the research.

2. Levels of e-banking business

According to researchers, in the late 2002, Internet bankers represented 37 percent of Internet users and online banking services now attract 18 percent of all European adults (Forrester, March 2003). Forrester projects that the number of Europeans using online banking will double to reach almost 130 million users in five years — a total of 21 percent. While online banking penetration in the Nordic countries and the Netherlands will climb to 60 percent of Net users in 2003, Italy and Greece, which had fewer than 5 percent of adults banking online a year before, struggled to achieve a situation with a third of Net users banking online in 2003.

According to Forrester, a typical European bank has the following perspective (Figure 1) — in six years the proportion of transactions made online will exceed 40% of all transactions, while the transactions in the traditional branches will be below 10% (Forrester, June 2003).

Figure 1 Transaction volume by channel in a typical European bank



Source: Forrester, June 2003

Despite their problems, some important steps are also in the developing countries where the average of e-banking penetration by the end of 1999 was close to 5% (World Bank Survey, 2001) and up to 15% in 2004. The Internet is experiencing rapid growth which is being largely driven by new commercial users of the network. Other commercial on-line services provided by companies such as CompuServe, America On-line and Prodigy are also expanding rapidly.

Continuing technological innovation and competition among existing banking organisations and new market entrants has allowed for a much wider array of electronic banking products and services for retail and wholesale banking customers. These include traditional activities such as accessing financial information, obtaining loans and opening deposit accounts, as well as relatively new products and services such as electronic bill payment services, personalised financial “portals,” account aggregation and business-to-business market places and exchanges. Notwithstanding the significant benefits of technological innovation, the rapid development of e-banking capabilities carries risks as well as benefits and it is important that these risks are recognised and managed by banking institutions in a prudent manner.

Generally we appreciate that there are three levels of e-banking business:

- ✚ **Basic information e-banking**/web sites that just disseminate information on banking products and services offered to bank customers and the general public;
- ✚ **Simple transactional e-banking**/web sites that allow bank customers to submit applications for different services, make queries on their account balances, and submit instructions to the bank, but do not permit any account transfers;
- ✚ **Advanced transactional e-banking**/web sites that allow bank customers to electronically transfer funds to/from their accounts pay bills, and conduct other banking transaction online.

In the past several years, many economists have considered the impact of the digital revolution on the money and banking system, and by extension the macroeconomy. Although many of the papers on e-money and e-banking have contained useful insights into these developments, they have also tended to paint an incomplete and even confusing picture. The application of information technology to money and banking raises many interesting questions. But to make further progress in understanding the economic effects, we need to advance in a very important area: what is the risk management for e-banking?

3. Categories of risk in e-banking

In many ways, e-banking is not unlike traditional payment, inquiry, and information processing systems, differing only in that it utilises a different delivery channel. Any decision to adopt e-banking is normally influenced by a number of factors. These include customer service enhancement and competitive costs, all of which motivate banks to assess their electronic commerce strategies. The benefits of e-banking are widely known and will only be summarised briefly in this document.

E-banking can improve a bank's efficiency and competitiveness, so that existing and potential customers can benefit from a greater degree of convenience in effecting transactions. This increased level of convenience offered by the bank, when combined with new services, can expand the bank's target customers beyond those in traditional markets. Consequently, financial institutions are therefore becoming more aggressive in adopting electronic banking capabilities that include sophisticated marketing systems, remote-banking capabilities, and stored value programs. Internationally, familiar examples include telephone banking, automated teller networks, and automated clearinghouse systems. Such technological advances have brought greater sophistication to all users, commercial and "the man in the street".

A bank may be faced with different levels of risks and expectations arising from electronic banking as opposed to traditional banking. Furthermore, customers who rely on e-banking services may have greater intolerance for a system that is unreliable or one that does not provide accurate and current information. Clearly, the longevity of e-banking depends on its accuracy, reliability and accountability. The challenge for many banks is to ensure that savings from the electronic banking technology more than offset the costs and risks involved in such changes to their systems.

While financial institutions have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers and counterparties, poor portfolio risk management or a lack of attention to changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's counterparties.

Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Banks should also consider the relationships between credit risk and other categories of risks. For any transaction on capital market, business or economic transaction in generally, there are seven categories of risk:

- Strategic;
- Credit;
- Market;
- Liquidity;
- Operational;
- Compliance/legal/regulatory;
- Reputation.

The most important category of risk management for e-banking services is operational risk. Operational risk is the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events. The main causes for operational risk can be:

- ✚ Inadequate Information Systems;
- ✚ Breaches in internal controls;
- ✚ Fraud;
- ✚ Unforeseen catastrophes.

The inadequate information system can result from general risks or from application oriented risks. The general risks can include physical access to the hardware, logical access to the information and communication technology systems, emergency management or from an insufficient backup recovery measures-mitigate the consequences of system failures.

Application oriented risk can be one result of one from following error situation:

- Data not correctly recorded due to system errors;
- Data not correctly stored during period of validity;
- Relevant data are not correctly included;
- Calculations which are basis for information are not correct;
- Due to systems failures the information processed by the application is not available in time.

For the risk result from fraud management, at e-banking level, we can meet one of the following categories:

- ✚ Check fraud;
- ✚ Debit card fraud;

- ✚ Electronic Payment fraud;
- ✚ ATM Deposit fraud;
- ✚ Account Take-over/Identity Theft.

For e-banking are many obstacles in detecting fraud, like financial or human resource shortage, high volumes of claims, transactions or other information to be analyzed, cookie-cutter detection methods that miss new or unusual instances or lack of in-house expertise or training. According to Office of Comptroller of the currency, the proportion of national banks in the world that provide e-banking services, was 21% in 1999, 32% in 2000, 41% in 2001, 47% in 2002 and more than 50% at the end of the year 2002.

The reliable customer authentication is imperative for e-banking. Effective authentication can help banks reduce fraud, reputation risk, and disclosure of customer information and promote the legal enforceability of their electronic agreements. There are many methods to authenticate customers, like:¹

- Passwords & PINS;
- Physical devices such as tokens;
- Biometric identifiers;
- Digital certificates & Public Key Infrastructures.

4. The principal risk management challenges identified by EBG2

The Electronic Banking Group of the Basel Committee on Banking Supervision (EBG) noted that the fundamental characteristics of e-banking (and e-commerce more generally) posed a number of risk management challenges:³

- The speed of change relating to technological and customer service innovation in ebanking is unprecedented. Historically, new banking applications were implemented over relatively long periods of time and only after in-depth testing. Today, however, banks are experiencing competitive pressure to roll out new business applications in very compressed time frames – often only

¹ Stoica, M., Risk management for E-banking, International Workshop IE&SI, Timisoara, 2003, p. 39

² EBG - The Electronic Banking Group of the Basel Committee on Banking Supervision

³ see - www.iwar.org.uk/pipermail/infocon/2003-July/000392.html

a few months from concept to production. This competition intensifies the management challenge to ensure that adequate strategic assessment, risk analysis and security reviews are conducted prior to implementing new e-banking applications;

- Transactional e-banking web sites and associated retail and wholesale business applications are typically integrated as much as possible with legacy computer systems to allow more straight-through processing of electronic transactions. Such straight-through automated processing reduces opportunities for human error and fraud inherent in manual processes, but it also increases dependence on sound systems design and architecture as well as system interoperability and operational scalability;
- E-banking increases banks' dependence on information technology, thereby increasing the technical complexity of many operational and security issues and furthering a trend towards more partnerships, alliances and outsourcing arrangements with third parties, many of whom are unregulated. This development has been leading to the creation of new business models involving banks and nonbank entities, such as Internet service providers, telecommunication companies and other technology firms;
- The Internet is ubiquitous and global by nature. It is an open network accessible from anywhere in the world by unknown parties, with routing of messages through unknown locations and via fast evolving wireless devices. Therefore, it significantly magnifies the importance of security controls, customer authentication techniques, data protection, audit trail procedures, and customer privacy standards.

The e-banking risk management principles identified in the Report of EBG, fall into three broad, and often overlapping, categories of issues. However, these principles are not weighted by order of preference or importance. If only because such weighting might change over time, it is preferable to remain neutral and avoid such prioritization.

A. Board and Management Oversight⁸ (Principles 1 to 3):

1. Effective management oversight of e-banking activities;
2. Establishment of a comprehensive security control process;
3. Comprehensive due diligence and management oversight process for outsourcing relationships and other third-party dependencies.

B. Security Controls (Principles 4 to 10):

4. Authentication of e-banking customers;
5. Non-repudiation and accountability for e-banking transactions;
6. Appropriate measures to ensure segregation of duties;
7. Proper authorisation controls within e-banking systems, databases and applications;
8. Data integrity of e-banking transactions, records, and information;
9. Establishment of clear audit trails for e-banking transactions;
10. Confidentiality of key bank information.

C. Legal and Reputational Risk Management (Principles 11 to 14):

11. Appropriate disclosures for e-banking services.
12. Privacy of customer information;
13. Capacity, business continuity and contingency planning to ensure availability of ebanking systems and services;
14. Incident response planning.

5. Security is of major importance to all online consumers, not only for ebanking transactions.

The main goal of any company is to maximize profits for its owners, and banks are no exception. Automated e-banking services offer a perfect opportunity for minimizing costs (see Table 3).⁴

⁴Olga Luštšik, Can e-banking services be profitable?, Tartu University Press, Tartu, 2004, p 26

Table 1 Unit costs for transactions in different distribution channels

Channel	Europe average (Forrester 2003)		US average (Booz 1996)		Nordea (Finland, Dynamo 2001)		Union Bank (Estonia, Toomla, 2003)
	Euro	%	US \$	%	US \$	%	%
Branch	2.00	100	1.07	100	1	100	100
Call Center	0.96	48	0.54	50			67
Mail	0.27	14					161
ATM	0.22	11	0.27	25			14
IVR	0.19	10					
Online	0.14	7	0.01	1	0.11	11	7
Direct Debit PC Bank	0.04	2	0.015	1			2

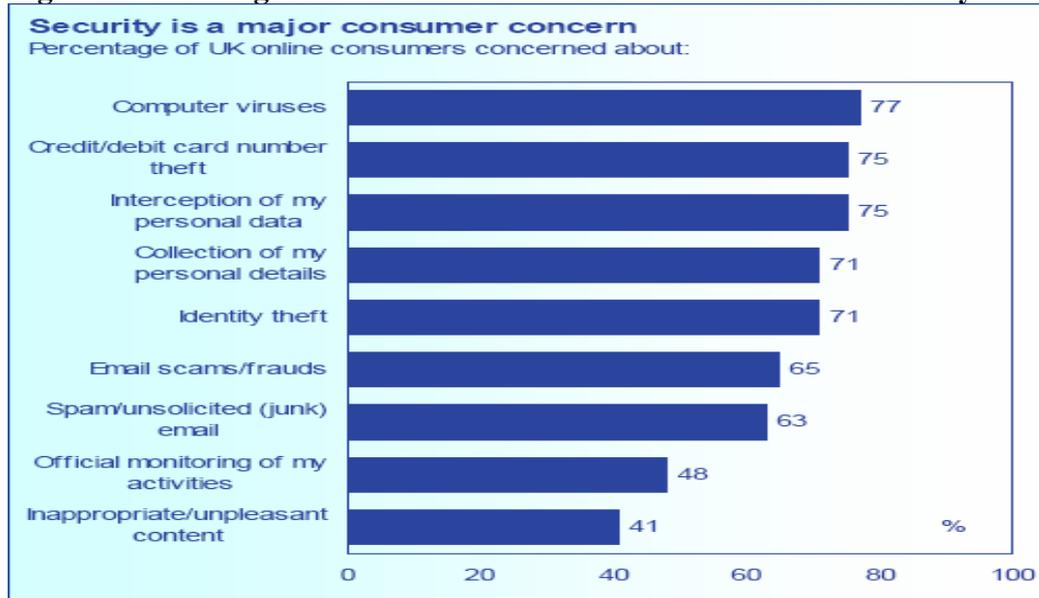
Source: Olga Luštšik, Can e-banking services be profitable?, Tartu University Press, Tartu, 2004, p 27

According to a survey by Booz, Allen and Hamilton (1996), an estimated cost providing the routine business of a full-service branch in the USA is \$1.07 per transaction, compared to 54 cents for telephone banking, 27 cents for ATM and 1.5 cents for Internet banking. In the Nordea Bank, Finland, one online transaction costs the bank an average of mere 11 cents, compared to \$1 per transaction in the branch (Dynamo..., 2001).

The difference in net cost between the US and Finnish banks can be explained by Finland's smaller population and the scale effect in case of the USA. Forrester research (June 2003) covered Europe's largest banks and found that on average online transactions cost 14 times less than those made by branch tellers'.

Security is of major importance to all online consumers, not only for ebanking transactions. Though they also worry about unpleasant content or spam, their foremost concerns relate to security. Viruses, credit card number theft, interception of data, collection of personal details and identity theft received most mentions in a survey in the UK. The attitude is similar in most European countries.

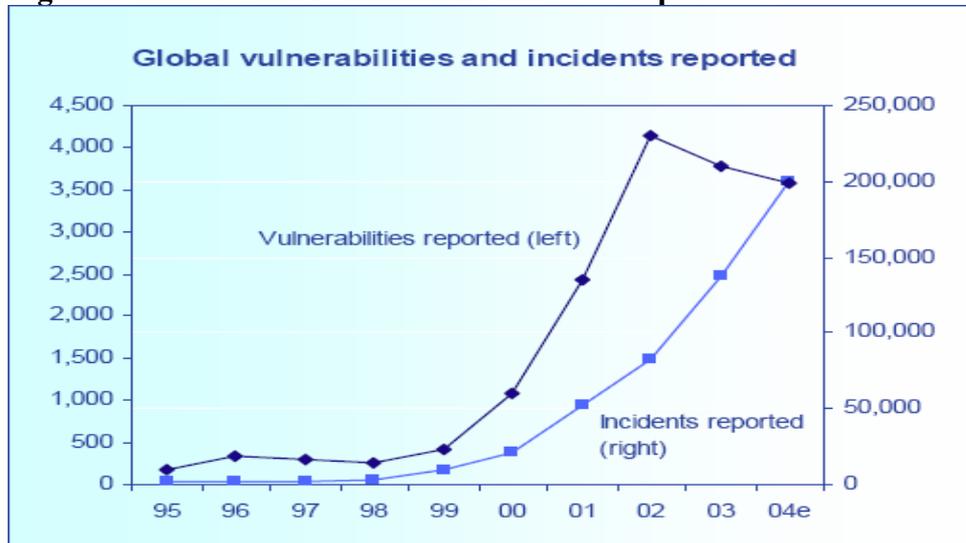
Figure 2 Percentage of UK online consumers concerned about security



Source: *www.forrester.com, 2004*

Security vulnerabilities are part of web reality, however. The success of the internet has attracted a rising number of hackers and other scallywags. Given the wide-spread use of automated attack tools against internet-connected systems, the overall damage is potentially much larger than the reported vulnerabilities and incidents indicate at first glance.

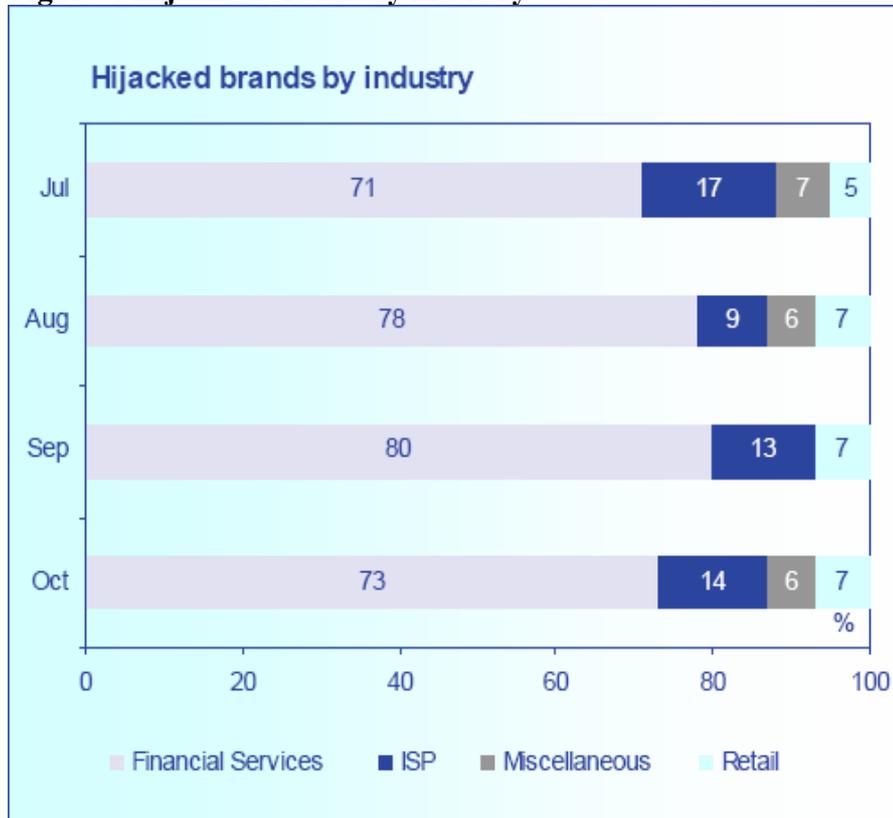
Figure 3 Global vulnerabilities and incidents reported



Source: *www.dbresearch.com, 2004*

The most targeted industry for phishing attacks is financial services. This holds from the perspective of total number of unique baiting sites as well as from the number of companies targeted. The financial services sector represents 73% of all brands hijacked in October 2004. Sites of internet service providers (ISP) rank second with 14% in October, followed by retail brands.⁵

Figure 4 Hijacked brands by industry



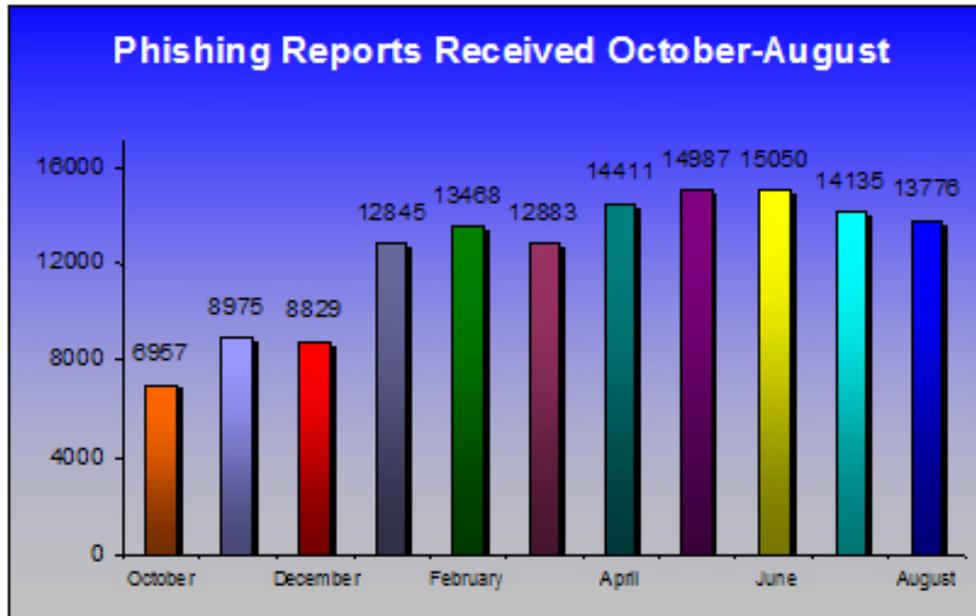
Source: *www.antiphishing.org*, 2004

Phishing attacks use both social engineering and technical subterfuge to steal consumers' personal identity data and financial account credentials. Social-engineering schemes use 'spoofed' e-mails to lead consumers to counterfeit websites designed to trick recipients into divulging financial data such as credit card numbers, account usernames, passwords and social security numbers.

⁵ Deutsche Bank Research, E-banking snapshot, in Digital economy, no 12, dec 2004, available at <http://www.dbresearch.com/servlet/reweb2>

Hijacking brand names of banks, e-retailers and credit card companies, phishers often convince recipients to respond. Technical subterfuge schemes plant crimeware onto PCs to steal credentials directly, often using Trojan keylogger spyware. Pharming crimeware misdirects users to fraudulent sites or proxy servers, typically through DNS hijacking or poisoning.⁶

Figure 5 New and Improved Phish Tracking 2005



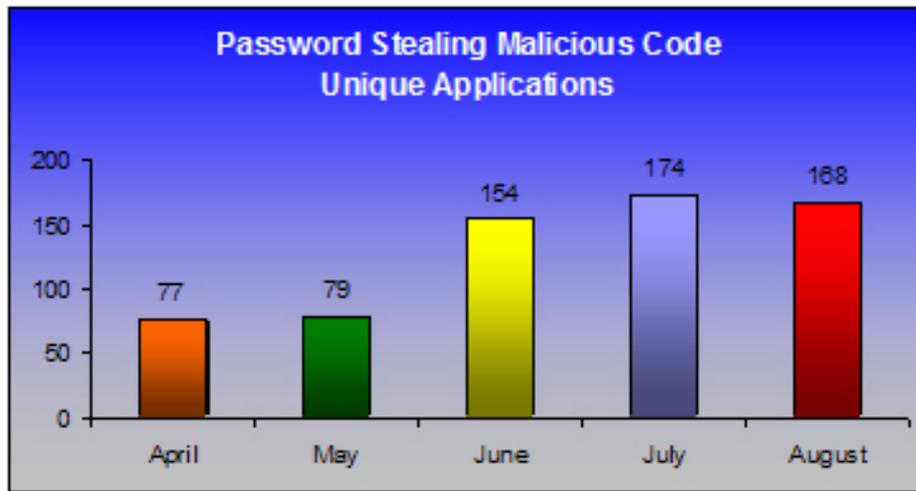
source: <http://www.antiphishing.org/>

Also, the figures offer an important information: the crimeware growth remains strong.⁷

⁶ see <http://www.antiphishing.org/>

⁷ see <http://www.antiphishing.org/>

Figure 6 The Crimeware growth remains strong



source: <http://www.antiphishing.org/>

A bouquet of measures is necessary to meet the threat. Banks must combine multiple instruments to keep – or regain – their online customers’ trust. Only best practices should be followed to minimise the hazards. Technology is an important weapon, business processes must be analysed and improved, and – most important – customers should be educated and reassured.

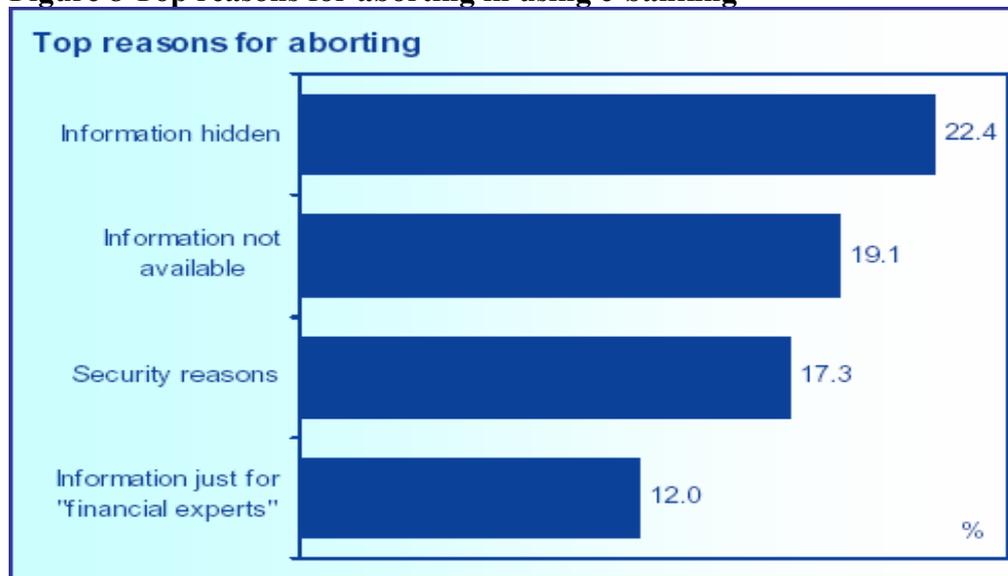
Figure 7 Instruments to meet the threat

Instruments to meet the threat	
Technology	<ul style="list-style-type: none"> Log analysis tools Alert services E-mail validation Web site verification
Screening of customer contacts	<ul style="list-style-type: none"> Check - Links in e-mails - 3rd party services for sending e-mails - Automated e-mail responses - E-mail campaigns
Customer education	<ul style="list-style-type: none"> Explain threats to customers Advise customers (technology and habits)

Source: DBR, Forrester, 2004

There is another important reason that could affect many potential users of e-banking. Complexity of online banking sites may turn customers away. A startling 92.6 percent of German internet users regularly abort their visits to bank websites according to an Emnid survey. The top reason for aborting is that they cannot find the information they are looking for because it is hidden or not available.

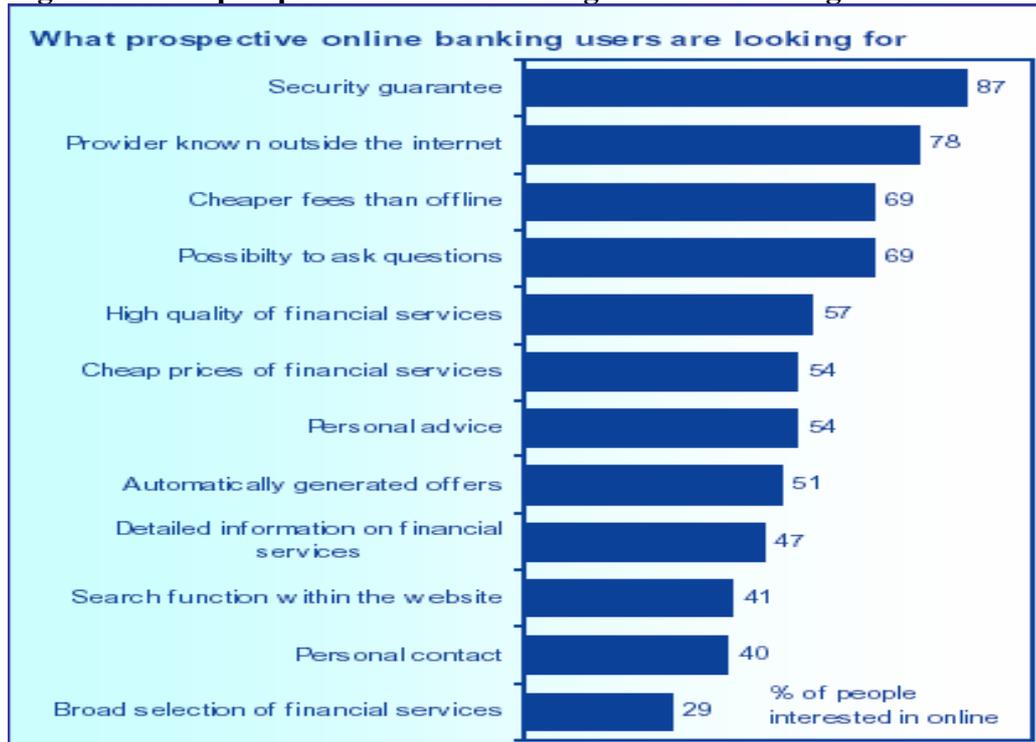
Figure 8 Top reasons for aborting in using e-banking



Source: <http://text.tns-global.com>

Banks should therefore convince more of their customers to go online. Of those offline customers who are interested in online banking, almost 90% find a security guarantee crucial. A well-known offline brand and relatively cheaper fees are also considered very important. Surprisingly enough, only 29% find a broad selection of financial services important in this context.

Figure 9 What prospective online banking users are looking for



Source: <http://text.tns-global.com>

6. Conclusion

The information technology (IT) revolution of the last 2 decades of the 20th century led to a proliferation of personal computers (PCs), servers, modems and other associated electronic data terminal equipment. The use of high bandwidth fiber optic cabling to provide integrated services coupled with modems and switching devices has improved speed of connection via the Internet and the growth in Internet Service Providers (ISPs) has increased accessibility.

This rapid growth and expansion of IT and telecommunication networks and interconnectivity encouraged the introduction of electronic services and non-more so than in the retail trade and in the provision of electronic banking.

Banks, like all other commercial organizations are in business, primarily, has to make a profit for their shareholders. Whilst banks have always offered the means of depositing and retrieving currency or currencies

for individuals, and usually within set opening hours, the fundamental business of banks is to make a profit from using monies on deposit within their system. They do this by buying or selling currencies at a mark-up, or mark-down depending on whether the customer is buying or selling and by loaning amounts of money at a predetermined or negotiated rate of interest. In addition, banks offer other services such as insurance cover, buying and selling securities, government bonds and stocks and shares.

All of these transactions have, until more recently, been conducted on the bank's premises and most transactions include a fee for financial services and advice. Now, through the advent of on-line services customers have greater choice and do not need to be tied to one financial institution or another. For example, customers can shop around, via the Internet, to find the best deal on home or car insurance, on interest rates on current and deposit accounts and, on buying and selling shares. Importantly, consumers can move banks if and when they do not receive the level of service they might reasonably expect from institutions that are handling their money. Indeed, it could be suggested that customer loyalty to one company or organization is dead and the idea of a 'one-stop-shop' for all financial services does not appear to make much sense unless that is the services on offer are highly competitive.

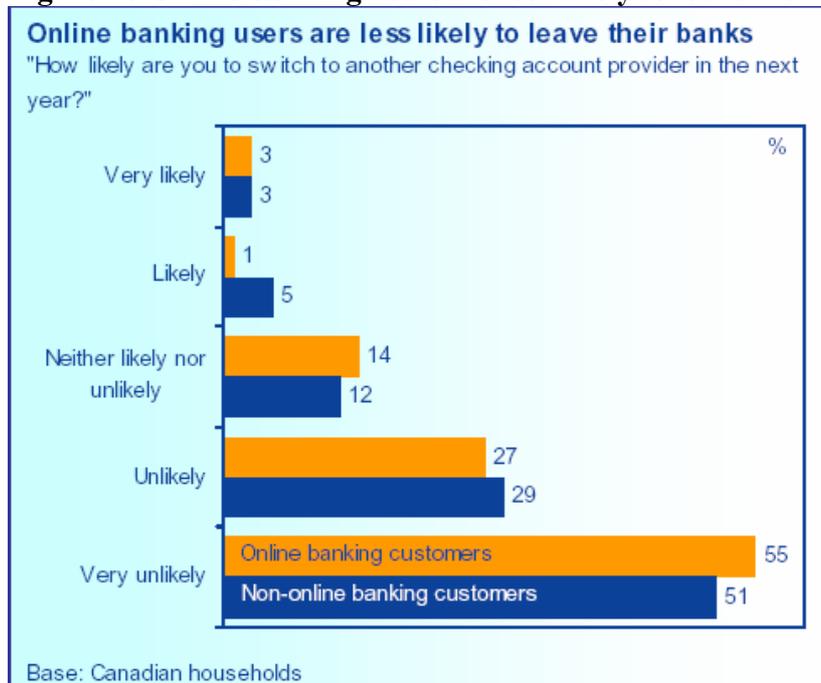
Over the last few years European banks have spent billions of euros on new electronic channels. However, after some years of excitement it was clear that the banks' long-awaited skyrocketing profits from this area would not be netted.

There are other drawbacks to the use of electronic systems. One of the biggest problem areas with Internet banking appears to be with the security and safeguarding of information exchanged between customer and bank. Indeed, the Federal Reserve Board of the US banking system expressed concern that the use of electronic banking could expose banks, their customers and their transactions to electronic interception and possibly interference leading to fraud. Therefore, banks need to conduct regular risk assessments, keep customers informed and, perhaps, be prepared to offer compensation if private information is made public.

With these entire problems one question is very important: online banking users are stimulated to develop or to leave their banks. Online banking users are less likely to leave their banks. Online banking appears to be the retail channel that is especially promising in cultivating customer loyalty: online banking users are less likely to switch their checking account provider than their offline counterparts. Only 4% of Canadian online households say they are likely or very likely to switch their provider. The corresponding figure for offline households is twice as high (8%). While

these results come from North American customers they are likely to also apply in the European context.

Figure 10 Online banking users are less likely to leave their banks



Source: www.antiphishing.org, 2004

It's important to follow some important policy implications/recommendations:

1. Establish a comprehensive security control process.
 - ✚ Authentication of e-banking customers;
 - ✚ Appropriate measures to ensure segregation of duties;
 - ✚ Establishment of clear audit trails for e-banking transactions;
 - ✚ Non-repudiation and accountability for e-banking transactions.

2. Centralized-back office to free staff time in sales and services areas and to consolidate process consistently across the organization.

3. Develop automated credit authorization system by developing appropriate credit scoring system and cash-flow scoring system to reduce operating costs, improve asset quality, and increase client profitability. One of the major benefits of credit scoring system is that lenders can make credit decisions without necessarily obtaining financial statement, credit reports, or other time-consuming and hard-to-get information. In particular, the financial statements of SMEs are often not complete and difficult to get. Banks can more closely align their specific credit policies and marketing strategies with the analytics, making the decision process more cost-efficient. (I.e., Fair,

Isaac has developed a credit scoring system specialized in SME finance—SBSS 5.0 (small business scoring services), which has been increasingly used by many banks as their SME credit decision making model.)

4. Comprehensive due diligence and management oversight process for outsourcing relationships and other third-party dependencies.

5. Integrate cross-border e-banking risks into the bank's overall risk management framework.

6. Legal and reputational risk management

[1] Appropriate disclosures for e-banking services;

[2] Privacy of customer information;

[3] Capacity, business continuity and contingency planning to ensure availability of e-banking systems and services;

[4] Incident response planning;

[5] Segregation of duties;

[6] Due diligence on risk assessment

Risk identification and analysis should direct the bank to adopt appropriate oversight and review guidelines, operating policies and procedures, audit requirements, and contingency plans. These risks can be mitigated by adopting a comprehensive risk management programme that incorporates a sound strategic plan. Importantly, the extent of a financial institution's risk management programme should be commensurate with the complexity and sophistication of the activities in which it engages. Essentially, a bank which offers a simple information-only site is generally not expected to have undertaken the same level of planning and risk management as institutions that engage in more complex activities. Many of these risk categories have been identified in the Basel Committee's Core Principles for Effective Banking Supervision, published in September 1997.

E-banking presents new administrative control requirements and potentially increases the importance of existing controls. Management must evaluate its administrative controls to maximize the availability and integrity of e-banking systems. E-banking information can support identity theft for either fraud at the subject institution or for creating fraudulent accounts at other institutions. Institutions should consider the adequacy of the following controls:

- Segregation of e-banking duties to minimize the opportunity for employee fraud;
- Dual-control procedures especially for sensitive functions like encryption key retrieval or large online transfers;
- Reconciliation of e-banking transactions;
- Suspicious activity reviews and fraud detection with targeted review of unusually large transaction amounts or volumes;

- Periodic monitoring to detect websites with similar names, possibly established for fraudulent purposes;
- Error checks and customer guidance to prevent unintentional errors;
- Alternate channel confirmations to ensure account activity or maintenance changes are properly authorized;
- Business disruption avoidance strategies and recovery plans.

To protect banks against business, legal and reputation risk, e-banking services must be delivered on a consistent and timely basis in accordance with high customer expectations for constant and rapid availability and potentially high transaction demand. The bank must have the ability to deliver e-banking services to all end-users and be able to maintain such availability in all circumstances. Effective incident response mechanisms are also critical to minimise operational, legal and reputational risks arising from unexpected events, including internal and external attacks that may affect the provision of e-banking systems and services. To meet customers' expectations, banks should therefore have effective capacity, business continuity and contingency planning. Banks should also develop appropriate incident response plans, including communication strategies that ensure business continuity, control reputation risk and limit liability associated with disruptions in their e-banking services.

At the end, we must not forget that E-banking can not only improve the access to finance, but also:

- allows access to finance with better and more competitive rates;
- use online banking as new delivery tools to improve access to finance and alleviate financial constraints;
- as a regulatory authority, focus on core principles and Basle capital accord.

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LIQUIDITY RISK MANAGEMENT

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Abstract

Liquidity risk management is a key banking function and an integral part of asset liability management process. The importance of liquidity transcends the individual institution, because a liquidity shortfall at a single institution can have system wide repercussions. Banks are particularly vulnerable to liquidity problems, on an institution –specific level and from a systemic-market viewpoint. Diversification of funding sources and maturities enables a bank to avoid the vulnerability associated with the concentration of funding from a single source. The framework for liquidity risk management has three aspects: measuring and managing net funding requirements , market access and contingency planning.

Keywords: *assets , liabilities, liquidity, banking legislation, , cash flow*

1. Introduction: The Need for Liquidity

Liquidity represents a bank's ability to obtain needed funds to efficiently accommodate the redemption of deposits and other liabilities. The price of liquidity is a function of market conditions and the market's perception of the inherent risk of borrowing institution. It is in the nature of a bank to transform the term of its liabilities to different maturities on the asset side of the balance sheet. The actual inflow and outflow of funds do not necessarily reflect contractual maturities. A bank may therefore experience liquidity mismatches, making its liquidity policies and liquidity risk management key factors in its business strategy. Liquidity risk management therefore addresses market liquidity rather than statutory liquidity. A bank's net funding includes its maturing assets, existing liabilities and stand by facilities with other institutions. Liquidity risks are normally managed by a bank's asset-liability management committee (ALCO), which must therefore have a thorough understanding of the interrelationship between liquidity and other market and credit risk exposures on the balance sheet. Understanding the context of liquidity risk management involves examining a bank's approach to funding and liquidity planning under alternative scenarios. As a result of increasing depth of inter bank (money) markets, a fundamental shift has taken place in the attitude that the authorities have toward prudent liquidity management. Supervisory authorities now tend to concentrate on the maturity structure of a bank's assets and liabilities rather than solely on its statutory liquid asset requirements. The level of liquidity deemed adequate for one bank may be insufficient for another. Thereby, the liquidity lack problem could be solved but the real problem is obtaining the price of these liquidities. The lack of liquidities, although apparently a conjuncture factor results from a serial of structural correlation of the resources and investment of the bank.

2. Optimizing the bank activities by correlating the asset and liability operations

In day-to-day operations the management of liquidity is typically achieved through the management of a bank's assets. In the medium term, liquidity is also addressed through management of the structure of a bank's liabilities.

Maturity mismatches are an intrinsic feature of banking, including the short-term liability financing of medium-term and long-term lending. The crucial question is not whether mismatching occurs-because it always does-

but to what extent, and whether this situation is reasonable or potentially unsound. Put another way, one can ask how long, given its current maturity structure, a bank could survive if it met with a funding crisis, and what amount of time would be available to take action before the bank became unable to meet its commitments. These questions should be asked by banks, regulators, and, ultimately policymakers. This aspect of liquidity risk management also implies that access to the central bank, as the lender of last resort, should be available only to solvent banks that have temporary liquidity problems. An increased mismatch could be due to problems in obtaining long-term funding for the bank or could reflect a deliberate decision based on the bank's view of future interest rate movements. For example, banks tend to increase their short-term mismatches if they expect interest rates to fall.

The focus of such an analysis is not only the size of the mismatch but also its trends over time, as these could indicate if the bank has a potential funding problem. If deposits are composed primarily of small stable accounts, a bank will need relatively low liquidity. A much higher liquidity position normally is required when a substantial portion of the loan portfolio consists of large long-term loans, when a bank has a somewhat high concentration of deposits, or when recent trends show reductions of large corporate or household deposit accounts. Also, bank should increase its liquidity position, when large commitments have been made on the asset side and the bank expects the client to start utilization. Liquidity needs usually are determined by the construction of a maturity ladder that comprises expected cash inflows and outflows over a series of specified time bands. The difference between the inflows and outflows in each period provides a starting point from which to measure a bank's future liquidity excess or shortfall at any given time. The success of the banking activities depends on the efficient binding between the assets and liabilities. The comparison and correlation can be realized considering:

- the resource mobilize and use
- the crediting price

The time of mobilization and use of the liquidities is strongly connected with the liquidity position of the bank being a way to work against the liquidity risk. To have liquidity conditions, the bank must assure the balance on every segment ($A_1=L_1$; $A_2=L_2$;; $A_n=L_n$), not just the whole balance on ensemble ($A=L$).

Table 1 presents a possible structure depending on the different time of use.

Table 1
The structure of the banking assets and liabilities on the different time of use.

Period	Effective liabilities	Assets		Net liabilities		
		accumulated	Effective	accumulated	Effective	accumulated
-1 week	4800	4800	4200	4200	600	600
8days-1 month	6400	11.200	5000	9200	1400	2000
1-3 months	8600	19.800	5400	14600	3200	5200
3-6months	5800	25.600	4200	18800	1600	6800
6months-1year	2000	27.600	2400	21200	-400	6400
1-3years	1000	28.600	3400	24600	-2400	4000
Over 3 years	1400	30.000	5400	30000	-4000	0
	30.000	30.000	30000	30000	0	0

There is a seeming balance.

To truly appreciate the situation we will calculate the liquidity index.

The liquidity index = Σ counterbalanced liabilities : Σ counterbalanced assets

Between the assets and the liabilities there is a satisfying correlation if the counterbalanced liquidity index is 1 or close to it. If the index is far from 1 it means that covering long term assets out of short term resources ultimately represents an deficient management.

$$K = \frac{(4800 \times 1) + (6400 \times 2) + \dots + (400 \times 7)}{(4200 \times 1) + (5000 \times 2) + \dots + (5400 \times 7)} = \frac{92400}{117400} = 0,787 \quad (1)$$

The presented index is an instrument of global analyse. It is required the analyse out of distinct sequences that appear from the different engaging time of assets and liabilities.

The liquidity position is a low but talking index obtained through the difference between the liquidities and the assets and the liquid liabilities like "Net effective liabilities" out of table 1.

Another challenge for liquidity management is contingent liabilities, such as letters of credit or financial guarantees. These represent potentially significant cash outflows that are not dependent on a bank's financial condition.

The existence of multiple currencies also increases the complexity of liquidity management, particularly when the domestic currency is not freely convertible. In principle, a bank should have a management (i.e.,

measurement, monitoring and control) system for its liquidity positions in all major currencies in which it is active.

The liquidity index shows the commitments of the bank on the crediting market, the way that immediate reimbursing loans must be paid d from new resources.

The crediting price, the level of the current interest is an important criteria on correlating the assets with liabilities.

Obviously, the bank is interested in its working and performance the difference between the sum of the cashed and paid interest

In the condition when the bank practice is used on a relatively big scale the flowing interest we have the sensitive assets, liabilities, interest influenced by the market interest change.

To analyse the correlation between the assets and liabilities we must calculate the rate of sensibility as a report between the sensitive assets and liabilities. The below 1 rate expresses the bank dependence on the sensitive liabilities which can act in the direction of growth with the interest expense. In another way, the sensitive interest impact determines a difference between the assets and liabilities, a gap for which' s covering you must draw in resources.

To example, we take the following situation:

	Interest rate	interest
Assets 9800	12,50%	1225
<i>Liabilities</i> 8600	10,90%	937,4
<i>Gap:</i>	1200	287,60

The coverage index of the lack of liabilities in sum of 1200 is calculated by operation:

The gap coverage rate:

$$\text{Interests: } \text{Gap} = 287,60 : 1200 \times 100 = 23,96\% \quad (2)$$

By some foreign authors opinion, the presented situation can be shown in the following way:

The bank is considered to have sensitive liabilities of 125.000 thousands m.u. with an 14% interest put in the situation of raising this interest at 16%.

It must be determined the minimal interest level in use the credits given this way in summarizing 110.000 thousands for which appliance in the beginning was an 17,5% interest. The bank has an 10.000 m.u. capital, unusable assets in sum of 45.000 m.u. out of 320.000 m.u.

The fixed interest is 10,5% on the liabilities and 15,5% on the assets. The bank estimated costs and bank profit of 7900 thousands m.u. By all this data the balance sheet equality is: :

$$45.000(\text{ unusable assets})+165.000(\text{fixed interest assets})+110.000(\text{sensitive interest assets})=320.000 \quad (3)$$

$$10.000(/\text{capital})+185.000(\text{fixed interest liabilities})+125.000(\text{sensitive interest liabilities})=320.000 \quad (4)$$

The income and expense equation is :

$$(A_{NS} \times D_{NS}) + (A_S \times D_S) = (P_{NS} \times D_{NS}) + (P_S \times D_S) + \text{CPB}, \text{ where:}$$

$A_S, P_S, D_S =$ assets, liabilities ,sensitive interests

$A_{NS}, P_{NS}, D_{NS} =$ assets, liabilities ,nonsensitive interests

$\text{CPB} =$ costs and bank profit

In the first place, we have:

$$(165.000 \times 15,5\%) + (110.000 \times 17,5\%) = (185.000 \times 10,5\%) + (110.000 \times 14\%) + 7900 = 44.825 \quad (5)$$

Because of the sensitive interest change, the equation becomes:

$$(165.000 \times 15,5\%) + (110.000 \times X\%) = (185.000 \times 10,5\%) + (110.000 \times 16\%) + 7900 = 44.825 \quad (6)$$

$$A_S \times D_S = 44925 - (165.000 \times 15,5\%) = 19.350 \quad (7)$$

$$D_S = (A_S \times D_S) : A_S \times 100 = 19.350 : 110.000 \times 100 = 17,59\% \quad (8)$$

It is observed that the engaging of the assets and liabilities do not change.

The interest level modifying goes to expense modifying, which determines a fit of the income based on the sensitive interest. Banking legislation normally contains specific liquidity requirements that banks must meet. These prudential requirements should not be viewed as the primary method for the management of liquidity risk; the opposite in fact is true.

Typical liquidity regulations are:

- a limit on the loan-to-deposit ratio;
- a limit on the loan-to-capital ratio;
- guidelines on sources and uses of funds;

-liquidity parameters; for example, the liquid assets should not fall below "x" percent or rise above "y" percent of total assets;

- a percentage limit on the relationship between anticipated funding needs and available resources to meet these needs; for example, that the ratio of primary sources over anticipated needs should not fall "x" percent.
- a percentage limit on reliance on a particular; for example, that negotiable certificates of deposit should not account for more than "x" percent of total liabilities.
- limits on the minimum/maximum overage of different categories of liabilities; for example, the average maturity of negotiable certificates of deposit should not be less than "x month"

3. Liquidity Risk Management Techniques

Banks should regularly estimate their expected cash flows instead of focusing only on the contractual periods during which cash may flow in or out.

An evaluation of whether or not a bank is sufficiently depends on the behavior of cash flows under different conditions.

Liquidity risk management must therefore involve various scenarios.

The "going-concern" scenario is ordinarily applied to the management of a bank's use of deposits.

A second scenario relates to a bank's liquidity in a crisis situation when a significant part of its liabilities cannot be rolled over or replaced.

A third scenario refers to general market crises, wherein liquidity is affected in the entire banking system, or at least in a significant part of it.

Table 3 provides a simple forecasting tool for liquidity needs under normal business conditions, under conditions of liquidity crisis and under conditions of general market crisis.

Diversified liabilities and funding sources usually indicate that a bank has well-developed liquidity management. The level of diversification can be judged according to instruments types, by type of fund provider and geographical markets

All banks are influenced by economic changes, but sound financial management can buffer the negative changes and accentuate the positive ones.

In practice, however, it may be difficult to obtain funding when a dire for it exists. Certain unusual situations also may have an impact on liquidity risk, including internal or external political upheavals, seasonal effects, increased market activity, sector problems and economic cycles.

Management must have contingency plans in case its projections prove to be wrong. Effective planning involves the identification of minimum

and maximum liquidity needs and the weighing of alternative courses of action to meet those needs.

Large banks normally expect to derive liquidity from both sides of the balance sheet and maintain an active presence in inter bank and other wholesale markets. They look to these markets as a source for the discretionary acquisition of short-term funds on the basis of interest rate competition, a process that can help them meet their liquidity needs. Conceptually, the availability of asset and liability options should result in a lower cost for liquidity maintenance. The costs of available discretionary liabilities can be compared to the opportunity cost of selling various assets, since banks also hold a range of short-term assets that can be sold if necessary. These assets also serve as reassurance to the potential suppliers of funds, thus enhancing a bank's ability to borrow.

The major difference between liquidity in larger and smaller banks is that, in addition to deliberately determining the asset side of the balance sheet, larger banks are better able to control the level and composition of their liabilities. They therefore have a wider variety of options from which to select the least costly method of generating required funds. Discretionary access to the money market also reduces the size of the liquid asset buffer that would be needed if banks were solely dependent upon asset management to obtain funds.

When large volumes of retail deposits and lending are at stake, outflows of funds should be assessed on the basis of probability, with past experience serving as a guide. Banks with large volumes of wholesale funds can also manage liquidity through maturity matching. This means that an appropriate degree of correspondence between asset and liability maturities must be sought, but not that an exact matching of all assets and liabilities is necessary.

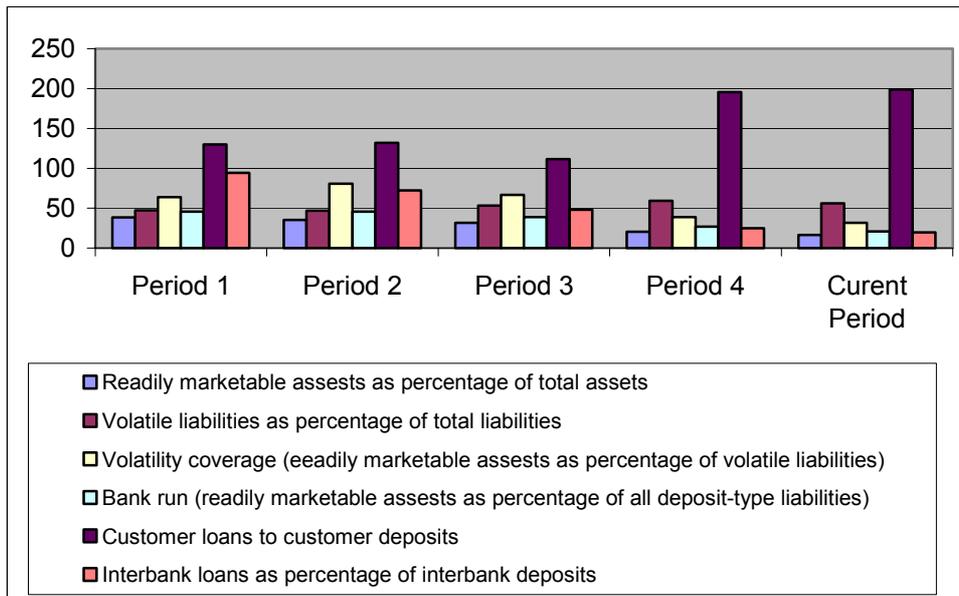
Figure 1 and Table 2 illustrate the liquidity management of a bank and the bank's liquidity position has deteriorated over time.

Table 2 Liquidity ratios-percent

<i>Liquidity</i>	<i>Period 1</i>	<i>Period 2</i>	<i>Period 3</i>	<i>Period 4</i>	<i>Current Period 4</i>
<i>Readily marketable assets as percentage of total assets</i>	38,5	35,40	231,79	20,53	16,31
<i>Volatility liabilities as percentage of total liabilities</i>	47,74	46.85	53,28	59,17	55,99
<i>Volatility coverage</i>	63,89	80,66	66,70	38,88	31,44
<i>Bank run</i>	45,77	45,68	38,67	26,62	20,94
<i>Customer loans to customer deposits</i>	130,06	132,05	111,62	195,68	198,82
<i>Inter-bank loans as percentage of inter-bank deposits</i>	94,24	72,54	78,20	24,64	19.60

The percentage of loans funded from the bank’s own sources has steadily decreased. In contrast, the percentage of volatile liabilities has increased and volatility coverage has become significantly worse.

Fig. 1 Liquidity position of a bank



In reality, a bank’s position and reputation within the financial community influence its liquidity options. This connection is based on many factors, the most crucial of which is the bank’s past and prospective

profitability. Properly understood, a maturity profile can be a useful indicator of a bank's position and may yield important information, for example when a sudden increase in maturity mismatches occurs. However, maturity profiles should be analyzed in conjunction with information about the bank's off-balance-sheet business, management objectives and systems of control.

Table 3 Maturity ladder under alternative scenarios

	<i>Normal Business conditions</i>	<i>Bank specific crises</i>	<i>General Market- Crisis</i>
<i>Maturing asset(contractual)</i>			
<i>Interest receivable</i>			
<i>Asset sales</i>			
<i>Draw downs</i>			
<i>Other(specify)</i>			
<i>Cash inflows</i>			
<i>Total inflows</i>			
<i>Maturing liabilities(contractual)</i>			
<i>Interest payable</i>			
<i>Disbursements on lending commitments</i>			
<i>Early deposit withdrawals</i>			
<i>Operating expenses</i>			
<i>Other(specify)</i>			
<i>Total outflows</i>			
<i>Liquidity excess(shortfall)</i>			

Although the acquisition of funds in a market at a competitive as profitable banks to meet the expanding customer demand for loans, the misuse or improper implementation of liability management can have severe consequences.

Preoccupation with obtaining funds at the lowest possible cost and with insufficient regard to maturity distribution can greatly intensify a bank's exposure to the risk of interest rate fluctuations.

Another critical aspect of liquidity risk management is dependence on a single source of funding, known as concentration risk. A bank has a few large depositors and one or more withdraw their funds, enormous problems will occur if alternative sources of funding cannot quickly be found. Most banks therefore monitor their funding mix and the concentration of depositors very closely, to prevent excessive dependence on any particular source. The sensitivity of banks to large withdrawals in an uncertain environment cannot be overemphasized. Regulators increasingly are focusing on mismatches in liquidity flows and on the ability of banks to fund such mismatches on an

ongoing , rather than on statutory liquid assets and traditional access to the central bank.

An appraisal of a bank therefore must give adequate attention to the mix between wholesale and retail funding and , in connection to this, to the exposure to large depositors and whether or not an undue reliance on individual sources of funds exists. By calculating the percentage of the short-term mismatch that large deposits represent an analyst can obtain a picture of the sensitivity of the bank or of the banking sector as a whole to withdrawals by large supplies of funds. The proportion of wholesale funding to retail funding is another means of measuring sensitivity to large depositors. Overall, the increasing volatility of funding is indicative of the changes in the structure and sources of funding that the banking sector is undergoing.

To assess the general volatility of funding, a bank usually classifies its liabilities as those that are likely to stay with the bank under any circumstances; for example, enterprise transaction accounts and those that can be expected to pull out if problems arise. The key issues to be determined for the latter are their price sensitivity, the rate at which they would pull out and which liabilities could be expected to pull out at the first sign of trouble.

5. Conclusions

The changes that appear necessary within the bank's culture and managerial practices, given the nature and relative complexity of liquidity risk management, , including as applicable:

- the need for full sponsorship by the board and executive management;
- the necessary enabling culture in which every manager is expected to consider risk, that is, to identify, measure and report on risk exposure;
- the changes that appear necessary after the assessment of evaluation, monitoring and reporting systems that cover critical risk functions.
- the convenience of adopting appropriate risk objectives for each function and for the bank as a whole;
- the need to institute a formal process for the general manager and the board to review and evaluate all expected and unexpected liquidity risks;
- the convenience of designating a member of senior executive management for overseeing the liquidity risk;

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DYNAMIC OF LOCAL FINANCIAL BEHAVIOUR

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Abstract

The last research on dynamic demand for local public goods depending on the median voter does not give value to the transformation of the capital structure and the nature of the local public goods. Those reports admit the static hypothesis of a median voter's model based on the total consumption of his own income in each period. However, that is not realistic because the median voter demand depends on the level of public goods available. As a result, this demand changes and becomes intertemporal. Indeed, the median voter does not totally consume his income in each period, but he saves a share which constitutes the intertemporal constraint of the decisive agent. On the other hand, the time introduction operates on the local public good nature of which use extends throughout many periods of time (durable local public goods). However, this capital accumulation involves the municipality to plan the recurrent charges in order to assure the continuity of the use of local public goods. The dynamic of cost operation is similar to a technical debt.

Keywords : *Budgetary dynamic, Financial gearing, Local public account, Durable local public, Median voter.*

1. Introduction

The modelization of the financial behaviour of the local communities lies on a basis model of the median voter. In that very static model, the expense in local public goods of the local community is immediately covered by the local tax that balances the budget each year. For that reason, the static modelisation of the expensive choice doesn't mark out the operation section of the budgets.

Nonetheless, time is a mechanism that doesn't make immediacy possible. Indeed, every choice made in the real world involves a postponement between the end of an action and the instant the decision was made. The consumption of the durable goods, like the local public good, takes a long time. From that point of view, taking into account the temporality needs to consider the investment line of the budgets. From that moment on the issues of investment and of its financing are raised. As an aftermath, the intertemporal local expensive choice of the median lies an optimal arbitrage of the means of financing which are, for instance, local tax (final ressource) and borrowing (temporary ressource).

However, the credit standard and the disappearing of the financial gearing from the mid 80's (Guengant, Josselin, 1999) led the local communities to focus to the recent times on fiscal levy to the detriment of public loan. Within the context of weak interest rates and of a financial environnement fueled by the competition of european financing sources, arbitrary in favor of public loan could help local communties to benefit a lever effect, in the sens of Modigliani-Miller (M-M, 1958). Furthermore, the use of public loan rather than tax has the advantage of postponing the burden between the current and future taxpayers (tax effect) or to pre finance a fiscal feed back on investment thanks to the increase of the future bases (basis effect). Choosing public loan cannot be considered as a will be to spare the current taxpayer or to postpone the consequences of investing : constructing a secondary school or residences will be useful to many generations of users/taxpayers.

This paper is about the choice of the funding structure concerning the investment request for local public goods. This investment request can be seen as the result of the preference of the median voters since Borcharding and Deacon (1972).

The investment decision requires from the local government a correct estimate of the demand for local public goods. In dynamics, the risk of inadequacy between demand and supply for local public goods is showed trough the increase of the local tax deduction on taxpayers. From this point of view, we can wonder about the budgetary impact of a misjudgement of the demand for local public goods. Indeed, the risk of overvaluation of current

and future demand can lead to a possibility of insolvency of the local public budgets.

The dynamic analysis for demand of local public goods the medium voter pattern is a very new theme in France. Most of the patterns made so far have been instant section (Rosa, 1984 ; Rocaboy, 1994 ; Baudry, Leprince and Moreau, 2001 ; Métais, 2001).

During the last decade many reports have been published in the United States, Sweden, Norway and Finland¹. The authors tried to verify on the empirical view the existence of the intertemporal decision at a local level. But all those searching studies have in common to keep on the theoretical level the hypothesis of the static model of the media

This paper is different from those searching studies in two main aspects: the introduction of the concept of stock required by the median in each period and the local budgetary dynamic. Indeed, in lack of public loan, the annual equality of outgoings and incomings is a condition of budget static balance. The opportunity to borrow changes the nature of the balance. The opportunity to borrow changes the nature of the balance, that must be analyse in a pluriannual perspective. The time introduction operates on the nature of the local public good whom use extends throughout many periods of time.

Thinking from a financial behavior conception in terms of flows to a conception in terms of stocks causes a change in the use of the local public good that's now extended throughout time. The durable goods will be analysed in the first part. Then, in a second part, we shall go root from the model of medium static demand to a general model of intertemporal demand general pattern.

2. Frame of theoretical analysis : theory of durable goods and dynamic budgetary

In definition, in the static model, only one period was mainly taken in account. From this moment, we tried to determine on the one hand, the level of the publics goods required, on the other hand the level of public goods which was offered. In the current case, we have to notice that the local public good inherently does services in a sequence of periods. Therefore, the local public good can be considered as a durable good. we considered one period and the we searched to find in the one hand the level of public demanded, and the other hand the level offered by the municipality. Here, we must to take in

¹ See Holtz-Eaking and Rosen (1989-1991,1993) ; Holtz-Eaking and al. (1994); Newey and Rosen (1989); Dahlberg-Johansson (1998-2000); Borgea and al.(1993, 1996); Borge-Tovmo (2001); Moisisio (2002).

account the nature of local public good which isn't short-lived but gives back some services on rest of period. So local public goods can be considered as durable goods.

Durable goods help a long, lasting use throughout time, contrary to non durable goods, subject of the median static model.

Furthermore, the imposition of the median electorate involves that they consume their whole income in each period. However, this is simplifying enough insofar as the median makes a request which depends on the level of the public goods available. The consequence is that the request of the median electorate changes and becomes intertemporal. The income of the median is not entirely consumed in each period. There is percentage saved which is going to allow to constitute the intertemporal imposition of the decisive agent.

So, it's interesting to notice how the median, who should represent the local community, makes his expense choice when the analysis period goes beyond the year. For the same reason that it's possible to adapt the consumer choice standard theory to the intertemporal choice study, it's also possible to extend the median model to a dynamic model of local expensive choices.

2.1. Dynamic pattern of the local financial behaviors

All along the local communities existence, theoretically never-ending, the median voter remain decisive. He has an intertemporal preference function, U , defined as such :

$$U_t = u(x_{m_t}, k_t) \tag{1}$$

With, $t = 1, 2, 3$ to write it simply; x_{m_t} is the median private consumer; k_t correspond to the local public facilities stock desired by the median during the period t . In order respect, in dynamic, the reasoning involves to consider local public facilities stock, K_t , more or less divisible. So, we get the following division function on the local communities :

$$k_t = \frac{K_t}{N_t} \tag{2}$$

Moreover, in the static pattern, the median income was totally divided in every expense without considering the possibility to delay or advance the purchase day. So, he spends a part of his income to spare that could be used to increase money ingoings or to purchase financial assets.

If s_t spare at t periods, y_{mt} the median private income, $T_t b_{mt}$ the tax paid by the median to finance public facilities of the period.

To explain the median intertemporal behaviour, it's easy to reason in the frame of a simplified pattern where the choices are taken back on 3 periods marked out by three dates $t = 1, 2$ and 3. The current period for future date. We put :

$$s_1 = y_{m1} - x_{m1} - T_1 b_{m1} \quad (3)$$

$$s_2 = (1 + r_1)s_1 + y_{m2} - x_{m2} - T_2 b_{m2} \quad (4)$$

$$s_3 = (1 + r_2)s_2 + y_{m3} - x_{m3} - T_3 b_{m3} \quad (5)$$

We get :

$$s_3 = (1 + r_2)(1 + r_1)[(y_{m1} - x_{m1} - T_1 b_{m1}) + (y_{m2} - x_{m2} - T_2 b_{m2})] + y_{m3} - x_{m3} - T_3 b_{m3} \quad (6)$$

Where r_t indicates the real interest rate, measuring the median net gain when he delays his consumer. The median voter wins because of the nominal interest rate that pays for saving later, but he may lose if the prices increase.

If the median is selfish, there'll be no heritage. The equation will then be written $s_3 = 0$. The intertemporal budgetary constraint of the median expressed in the present values will be:

$$x_{m1} + T_1 b_{m1} + \frac{x_{m2} + T_2 b_{m2}}{1 + r_1} + \frac{x_{m3} + T_3 b_{m3}}{(1 + r_1)(1 + r_2)} = y_{m1} + \frac{y_{m2}}{(1 + r_1)} + \frac{y_{m3}}{(1 + r_1)(1 + r_2)} \quad (7)$$

From that point of view, the present value of the median public and privates consumer expenses match the current value of the future incomes.

But, supplying local public utilities (LPU), to the users needs to produce them be for. Also, the median is confronted to a technical constraint by the production function.

2.1.1. Production function of the LPU

It's distinguished by a coefficient of capital v , and a coefficient u associated to the repeating costs of intermediary consumers (IC) and salaries (S). By hypothesis, the production is made at constant factor. Then, a combination of production is described by the input, postulating a wasteless production :

$$Z_t = K_t^\theta \quad (8)$$

θ indicates the production scale output that can be constant ($\theta=1$), decreasing ($\theta<1$) or increasing ($\theta>1$). Within simplified calculations, the outputs are constant.

2.1.2. Dynamic of development costs

The production of LPU creates an annual total cost that can be broken down into an annual variable cost (intermediary consumers and salaries) and an annual permanent cost (hiring gross price of fixed assets).

In the frame of an efficient production of collective utilities, the variable cost in volume correspond to a determined proportion of the capital (v_t):

$$CV_t = v_t K_t \quad (9)$$

As for the annual permanent cost, if we take into account the hiring gross price fixed assets is made of the economic profit and the depreciation provision on full year (K_t/m_t , m_t certain duration of use). If the asset evaluation by the local community by the flow (economic profit rate) he makes in one year, we get the recurrent permanent cost :

$$CF_t = \left(r_t^e + \frac{1}{m_t} \right) K_t \quad (10)$$

r_t^e indicates the profit rate of the local community total asset. Then, it comes from the permanent total cost :

$$CT_t = \left(v_t + r_t^e + \frac{1}{m_t} \right) K_t \quad (11)$$

From that point of view, in addition to the necessary financial debt to finance the local collective investments, the concept of permanent expense points out the obligation for the local community to provide future amounts to assure the continuity and the maintenance of the local public utilities. They can be analysed as a technical debt. So we have a double dynamic of development permanent charges and an induction dynamic of financial charges.

De facto, the local community budgetary constraint can be done by the accounting links coming from internal mechanisms of the budget operation : connection of the operation and investment sections.

2.1.3. Accounting balance of the operation section

First and foremost, the balance of the operation section is secured when the operation section is secured when the operation receipts match the operation expenses :

$$T_t B_t + G_t = CT_t \Leftrightarrow T_t B_t + G_t = \left(v_t + r_t^e + \frac{1}{m_t} \right) K_t \quad (12)$$

If the difference is positive, the local community redeems a gross saving (EB_t) which, on an accounting level, is made of the depreciation provision (DAP_t) and profit or loss for the financial year (RES_t) :

$$EB_t = DAP_t + RES_t \quad (13)$$

However, the equation doesn't help to overview the other dynamic described at the previous paragraph, i.e. the dynamic of financial debt. To put it right, an help to a decomposition of the economic profit rate is done. On the one hand, the interest rate of the debt and the other hand the financial profit rate. That difference of profit rate refers to the financial gearing by M-M (1959).

Indeed, the structure of the local community asset (K_t) written at the liabilities is made of debt stock, the public facilities subventions and the net saving or self financing.

Supposing that the long-term capital cover & employment stable” (gross values of capital assets), it’s now : $K_t = K_t^p + D_t$ (14)

With, K_t^p for Am stockholders’ equity.

Flow-stock induction of the permanent financial charges helps to link every part of financial sheet to a flow.

As it is, at the credit of the financial sheet, the local community asset is associated to the economic result that results from the profit or loss for the financial year and the financial costs. To the liabilities the debt stock is associated to financial charges flow (FF_t). We successively obtain :

- The median interest rate :

$$i_t = \frac{FF_t}{D_t} \quad (15)$$

- The financial profit rate :

$$r_t^f = \frac{RES_t}{K_t^p} \quad (16)$$

- The economic profit rate :

$$r_t^e = \frac{RES_t + FF_t}{K_t} \quad (17)$$

By the hypothesis of financial markets efficiency, we deduce the equation of financial gearing:

$$r_t^f = r_t^e + (r_t^e - i_t) \frac{D_t}{K_t^p} \quad (18)$$

From the equation (12), (14) and (18), the accounting balance constraint is as such :

$$T_t B_t + G_t = \left(v_t + r_t^f + \frac{1}{m_t} \right) K_t + (i_t - r_t^f) D_t \Leftrightarrow T_t B_t + G_t = v_t K_t + i_t D_t + \frac{K_t}{m_t} + r_t^f (K_t - D_t) \quad (19)$$

$$T_t B_t + G_t = v_t K_t + i_t D_t + \frac{K_t}{m_t} + r_t^f (K_t - D_t) \quad (20)$$

$$\Rightarrow EB_t = \frac{K_t}{m_t} + r_t^f (K_t - D_t) \quad (21)$$

2.1.4. Account balance of the investment section

Then, the balance of the investment section is made when :

$$EB_t + E_t + S_K K_t = RK_t + I_t \quad (22)$$

E_t corresponds to the debt flow of the current period; $S_K K_t$ corresponds to the public facilities subventions received from the Government RK_t corresponds to the financial amortization of the current period. The introduction of the investment (I_t) helps the precise expression of the balance constraint. But that specificity needs two more hypothesis. Indeed, the investment made along the period t (I_t) generates a modification of the local public utilities at the end of the period. So that investment decomposes of replacement investment (IR_t) and development investment (ID_t). The latter increases the equipment stock, so it's characterised by a variation of the local public utilities stock :

$$ID_t = \Delta K_t \quad (23)$$

The replacement investment permits to fill a local public utilities loss occurred during the previous period. By hypothesis, the investment covers exactly the capital assets fall in value:

$$IR_t = \frac{K_{t-1}}{m_{t-1}} \quad (24)$$

$$\text{i.e. } I_t = K_t - \left(1 - \frac{1}{m_{t-1}}\right) K_{t-1} \quad (25)$$

Moreover, the amortization of the financial debt is lineary made connected to the median residual duration (n_t) of borrowing portfolio :

$$RK_t = \frac{D_t}{n_t} \quad (26)$$

Rewriting the balance constraint of the investment section from the equations (21) and (26), it comes:

$$\left(r_t^f - \frac{\Delta K_t}{K_t}\right) K_t = \left(r_t^f - \frac{\Delta D_t}{D_t}\right) D_t + S_K K_t \quad (27)$$

With, $\Delta D_t = E_t - RK_t$, the debt annual instalment. Supposing that the financial profit rate of own assets is nil and neglecting the endowed facilities subventions, the variation of the debt balances exactly the development investment.

2.2. Budgetary balance

From accounting balance of operation and investment section, global balance of community obtained in the structural model form :

$$\begin{cases} T_t B_t + G_t = CV_t + FF_t + EB_t \\ EB_t + E_t + S_K K_t = I_t + R_t \end{cases} \Rightarrow \text{Structural model form} \quad (28)$$

The verification of the existence and the solution uniqueness is easy because the model is linear. The entry of a reduced form give the possibility to specify the global imposition of the municipal financial stability via the unstable gross saving which is shared by the two equation. Writing of a reduced form permit to specify the global constraint of accounting balance of community via the gross saving who is the common variable to aboth equation :

$$T_t B_t + G_t + E_t + S_K K_t = RK_t + I_t + CV_t + FF_t \quad (29)$$

However, this imposition goes against the golden rules of the real stability of the local budget which obliges the local government to affect mainly the loan by the single funding of the investment and the gross saving at the amortisation of capital. This obligation ($EB_t > RK_t$) involves a positive or null net saving ($EN_t : EB_t - RK_t \geq 0$). From this equation (21) and after the simplifying, we obtain:

$$EN_t : r_t^f K_t^p + \left(\frac{K_t}{m_t} - \frac{D_t}{n_t}\right) \geq 0 \quad (30)$$

If the hypothesis of a profit or loss for the financial year result is null

$$EN_t : \left(\frac{K_t}{m_t} - \frac{D_t}{n_t} \right) \geq 0 \quad (31)$$

In that case the depreciation provision is superior or equal to the funding amortization. However, this inequality in connection with the budgetary imposition does not enable to entry correctly the synthetical financial imposition of the municipality. In the case of a strict budgetary, the net saving is null. The consequence is that the specification of the indebtedness conduct is necessary. This specification is obtained from the relation between the debt stock and the public stock facilities after entering and simplifying the expression of the net saving: amortization allocation becomes greater or equal than financial amortization allocation. On the other hand, this disparity tied to budgetary constraint doesn't allow to write correctly the global constraint for the municipality. In this case of strict budgetary balance, net saving is equal to zero. As a result, characterization of behaviour debt is necessary. The latter obtained from the relation between the debt stock and public facilities after reducing net saving expression :

$$D_t = \left(\frac{r_t^f + \frac{1}{m_{t-1}}}{r_t^f + \frac{1}{n_t}} \right) K_{t-1} \quad (32)$$

If the profit or loss for the financial year is null, the indebtedness conduct with the imposition of the budgetary stability is written:

$$D_t = \left(\frac{n_t}{m_{t-1}} \right) K_{t-1} \quad (33)$$

Finally we obtain global balance with strict stability per addition of (19) and (32) :

$$T_t B_t + G_t + S_K K_t = \left[\left(v_t + \frac{1}{m_{t-1}} \right) + i_t \left(\frac{r_t^f + \frac{1}{m_{t-1}}}{r_t^f + \frac{1}{n_t}} \right) + r_t^f \left(\frac{\frac{1}{n_t} + \frac{1}{m_{t-1}}}{r_t^f + \frac{1}{n_t}} \right) \right] K_{t-1} \quad (34)$$

Finally the budgetary constraint obtained involving a financial profit rate null is:

$$T_t B_t + G_t = \left(v_t + \frac{1 + i_t n_t}{m_{t-1}} \right) K_{t-1} \quad (35)$$

$$\text{where: } T_t = \frac{v_t + \left(1 + \frac{i_t n_t}{m_{t-1}} \right) K_{t-1} - G_t}{B_t} \quad (36)$$

Here's what occurs to the median intertemporal global constraint:

$$\begin{aligned} & x_{m_1} + \frac{x_{m_2}}{1+r_1} + \frac{x_{m_3}}{(1+r_1)(1+r_2)} + \left[\left(v_1 + \frac{1+i_1 n_1}{m_0} \right) k_0 N_0^y \right] \frac{b_{m_1}}{b_1} + \left[\left(\frac{v_2 + \frac{1+i_2 n_2}{m_1}}{1+r_1} \right) k_1 N_1^y \right] \frac{b_{m_2}}{b_2} + \left[\left(\frac{v_3 + \frac{1+i_3 n_3}{m_2}}{(1+r_1)(1+r_2)} \right) k_2 N_2^y \right] \frac{b_{m_3}}{b_3} \\ & = y_{m_1} + G_1 + \frac{y_{m_2} + G_2}{1+r_1} + \frac{y_{m_3} + G_3}{(1+r_1)(1+r_2)} \end{aligned} \quad (37)$$

The current value of the public and private consolidated consumer covers the current value of the private and public resources.

From which the following intertemporal optimisation program:

$$\text{Max}_{x_{m_1}, x_{m_2}, x_{m_3}, k_0, k_1, k_2} U = u_m(x_{m_1}, x_{m_2}, x_{m_3}, k_0, k_1, k_2)$$

$$\begin{aligned}
& x_{m_1} + \frac{x_{m_2}}{1+r_1} + \frac{x_{m_3}}{(1+r_1)(1+r_2)} + \left[\left(v_1 + \frac{1+i_1 n_1}{m_0} \right) k_0 N_0^\gamma \right] \frac{b_{m_1}}{b_1} + \left[\left(v_2 + \frac{1+i_2 n_2}{m_1} \right) \frac{1}{1+r_1} \right] k_1 N_1^\gamma \frac{b_{m_2}}{b_2} + \left[\left(v_3 + \frac{1+i_3 n_3}{m_2} \right) \frac{1}{(1+r_1)(1+r_2)} \right] k_2 N_2^\gamma \frac{b_{m_3}}{b_3} \\
& = y_{m_1} + G_1 + \frac{y_{m_2} + G_2}{1+r_1} + \frac{y_{m_3} + G_3}{(1+r_1)(1+r_2)} \tag{38}
\end{aligned}$$

We make the hypothesis of a Cobb-Douglas utility function :

$$U(x_{m_t}, x_{m_{t+1}}, x_{m_{t+2}}, k_t, k_{t+1}, k_{t+2}) = \prod_{t=1}^3 \left(x_{m_t} \cdot k_{t-1} \right)^{\frac{1-a}{3}} \frac{1}{(1+\rho)^\gamma} \tag{39}$$

With ρ represents the subjectif interest rate, we obtain the demand functions for locals private and publics goods :

$$x_{m_1}^* = \frac{a(1+\rho)}{2+\rho} \cdot (y_{m_1} + G_1) \tag{40}$$

$$x_{m_2}^* = \frac{a(1+\rho)}{2+\rho} \cdot \frac{y_{m_2} + G_2}{1+r_1} \tag{41}$$

$$x_{m_3}^* = \frac{a(1+\rho)}{2+\rho} \cdot \frac{y_{m_3} + G_3}{(1+r_1)(1+r_2)} \tag{42}$$

$$k_0^* = \frac{(1-a)(1+\rho)}{2+\rho} \cdot \frac{y_{m_0} + G_0}{\left[\left(v_1 + \frac{1+i_1 n_1}{m_0} \right) N_0^\gamma \right] \frac{b_{m_1}}{b_1}} \tag{43}$$

$$k_1^* = \frac{(1-a)(1+\rho)}{2+\rho} \cdot \frac{y_{m_1} + G_1}{\left[\left(v_2 + \frac{1+i_2 n_2}{m_1} \right) N_1^\gamma \right] \frac{b_{m_2}}{b_2}} \tag{44}$$

$$k_2^* = \frac{(1-a)(1+\rho)}{2+\rho} \cdot \frac{y_{m_2} + G_2}{\left[\left(v_3 + \frac{1+i_3 n_3}{m_2} \right) N_2^\gamma \right] \frac{b_{m_3}}{b_3}} \quad (45)$$

The demand functions for local public goods depends effectively of recurrent cost, financial fees, depreciation rate and the fiscal ratios. The private revenue of median voter, is one variables that determines the local public demand for the municipality.

If private price is equal to zero, fiscal price of local public goods for median voter are :

$$p_{m_0} = \left[v_1 + \left(\frac{1+i_1 n_1}{m_0} \right) \right] \frac{b_{m_1}}{b_1} \quad (46)$$

$$p_{m_1} = \left[v_2 + \left(\frac{1+i_2 n_2}{m_1} \right) \frac{1}{(1+r_1)} \right] \frac{b_{m_2}}{b_2} \quad (47)$$

$$p_{m_2} = \left[v_3 + \left(\frac{1+i_3 n_3}{m_2} \right) \frac{1}{(1+r_1)(1+r_2)} \right] \frac{b_{m_3}}{b_3} \quad (48)$$

i.e :

$$p_{m_i} = \left[\frac{\left(v_{r+1} + \frac{1+i_{r+1} n_{r+1}}{m_r} \right) N_r^\gamma}{\prod_{i=1}^r (1+r_i)} \right] \frac{b_{m_i}}{b_i} \quad (49)$$

The fiscal price expression insert fiscal return on investment by tax base growth (base effect). In practical terms, this effect will be in favour of municipality if the economic profit rate expected from public development is

greater or equal than debt cost. The debt allow to make net saving by Euro invested greater than credit cost by Euro debt.

In other words, more debt weight compared with Am stockholder's equity is high, better will be financial profit. Conversely, if the economic yield rate expected become lower than credit cost, the growth of debt compared with Am stockholder's equity will damage the financial profit. So the municipality will be forced to diminish his debt.

In addition, the marginal cost use is :

$$p_t = \frac{C'(k_{t-1} N_{t-1}^\gamma) N_{t-1}^\gamma}{R_t} = \frac{N_t^\gamma \left(v_{t+1} + \frac{1 + i_{t+1} n_{t+1}}{m_t} \right)}{R_{t+1}} \quad (50)$$

The short term cost function is defined as minimum production cost when we adjust only the variables productions factor. The expression of variables cost was defined by equation (9). But, the production cost of local public goods in static was :

$$C(Z) = p \times Z \quad (51)$$

p is use cost for local public goods :

$$p = \frac{C_z N^\gamma}{R} \quad (52)$$

By identification :

$$C(Z) \equiv C(Z)_v \quad (53)$$

It results a function v defined by the usage cost of locals public goods :

$$v = \frac{C(k N^\gamma)}{R} \quad (54)$$

$$v'_k = \frac{\partial}{\partial k} \left[\frac{C(kN^\gamma)}{R} \right] = \frac{N^\gamma}{R} C'_k \quad (55)$$

The variables marginal recurrent cost expressed in term of stock per capita is similar to marginal use cost of local public goods in static.

In order to write the expense function per capita, we deduce the dynamic marginal use of local public goods to $t+1$ order terms :

$$p_t = \frac{N_t^\gamma \left(C'_k + \frac{1+i_{t+1}n_{t+1}}{m_t} \right)}{R_{t+1}} \quad (56)$$

i.e. :

$$p_{m_t} = \left[\frac{\left(C'_{k_t} \frac{1+i_{t+1}n_{t+1}}{m_t} \right) N_t^\gamma}{\prod_{i=1}^t (1+r_i)} \right] \frac{b_{m_t}}{b_t} \quad (57)$$

The public facilities function is :

$$d_t = k_0 (p_{m_t} \times p_t)^\alpha \times y_{m_t} \beta_2 \times G_t \beta_1 \times E_t \beta_3 \quad (58)$$

With α price effect and β revenue effect. The intertemporal expense function per capita is :

$$\frac{1}{\prod_{i=1}^t (1+r_i)} \times \frac{d_t}{R_t} = \left[\frac{\left(C'_k + \frac{FF_{t+1}/RK_{t+1}}{m_t} \right) N_t^\gamma}{\prod_{i=1}^t (1+r_i) R_{t+1}} \right]^{\alpha+1} \left(\frac{b_{m_{t+1}}}{\prod_{i=1}^t (1+r_i) b_{t+1}} \right)^{\alpha+\beta_1} \left(\frac{y_{m_t}}{\prod_{i=1}^t (1+r_i)} \right)^{\beta_2} \left(\frac{G_t}{\prod_{i=1}^t (1+r_i)} \right)^{\beta_1} \left(\frac{E_t}{\prod_{i=1}^t (1+r_i)} \right)^{\beta_3} \quad (59)$$

The originality of this paper compared to median voter static model is the first term of right . That's say the synthetic measure of number of users.

Indeed, in front of durable public goods, the congestion increased according to traditional parameters (length of road, resident population) but also according four news induction parameters : financial fees, repayment amortization, depreciation and marginal cost use.

Indeed, as we are rigidity public facilities, diminution of users of local public goods don't signify the reduction of burden. Because of fixed cost higher and variables cost resulting from capital accumulation.

In this case, reducing of resident population doesn't lied a diminution of expenses but contrary an increase of expenses per capita.

In the case of durable public goods, fixed cost are so important that local adjustment period almost infinite.

3. Conclusion

This paper attempted to build a partial balance model of local financial behaviors, characterizing municipality financial choice as resulting of capital accumulation. This accumulation generates firstly internals risks tied either expenses (recurrent expenses operates et financial fie futur), or incomes (locals situation and tax bases mobility)

Now, it might be instructive to validate this theoretical model with an econometric approach.

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THE SPECIAL PURPOSE VEHICLES AND THEIR USES

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Abstract

As the name suggests, a Special-Purpose Vehicles is an entity created to engage in a specific transaction, most commonly for asset acquisition, leasing, securitization and insurance. SPVs or SPEs (Special Purpose Entity) have been used for several decades as a preferred form to raise financing for large international projects and other projects with well-defined cash flows and risk characteristics. This paper analyzes some aspects concerning SPV and analyzes the securitization. SPVs are carefully designed to avoid bankruptcy. Finally, the paper insists on juridical aspects on SPV in Romania and their impact in our economy.

Keywords: *special purpose vehicles, securitization, bankruptcy*

1. Introduction

The word "special purpose vehicle" or "special purpose entity" is a buzzword in structured finance and can be potentially confusing. Specially, after the Enron collapse, the word SPE has acquired an unpleasant connotation in public mind.

The word "vehicle" is a marketplace equivalent of "entity". Therefore SPV and SPE mean the same thing. As opposed to a general purpose vehicle or a trading corporation, a Special Purpose Vehicle, as the name suggests, is formed for a special purpose: therefore its powers are limited to what might be required to attain that purpose and its life is destined to end when the purpose is attained.

An SPE is either a Trust or a Company. SPEs can be either on shore or offshore. Special purpose corporations are used for a variety of legitimate purposes, including structured risk management solutions. In securitizations, the SPE houses the asset risk either through the purchase of the assets or in synthetic form.

When a corporation, call it the sponsor of the SPV, wants to achieve a particular purpose, for example, funding, by isolating an activity, asset or operation from the rest of the sponsor's business, it hives off such asset, activity or operation into the vehicle by forming it as a special purpose vehicle. This isolation is important for external investors whose interest is backed by such hived-off assets, etc., but who are not affected by the generic business risks of the entity of the originating entity. Thus SPVs are housing devices - they house the assets transferred by the originating entity in a legal outfit, which is legally distanced from the originator.

By its very nature, an SPV must be distanced from the sponsor both in terms of management and ownership, because if the SPV were to be owned or controlled by the sponsor, there is no difference between a subsidiary and an SPV.

Being an independent, an SPV is responsible for its own funding, risk capital and management decisions. Most SPVs, for example, securitization SPVs, run on a pre-punched program and do not have to take any management decision: they are almost "brain dead".

Apart from securitizations, SPVs are often used for many purposes. One common purpose is to use them for what is known as "synthetic leases" - a device by which assets are acquired under an off balance sheet lease from the vehicle that funds them with debt. After the Enron collapse, the public

has come to know for the first time the all kinds of obscure SPVs floated by US companies.

2. What are special Purpose Vehicles?

A SPV, or a special purpose entity (SPE), is a legal entity created by a firm (known as the sponsor or originator) by transferring assets to the SPV, to carry out some specific purpose, or circumscribed activity, or a series of such transactions. SPVs have no purpose other than the transaction(s) for which they were created, and they can make no substantive decisions; the rules governing them are set down in advance and carefully circumscribe their activities. Indeed, no one works at an SPV and it has no physical location.¹

Special purpose entities (SPE) are usually created for a single, well-defined and narrow purpose. An SPE does not have a single defining characteristic but is generally identified by the single purpose nature and a number of common features. The SPE may have any one of a number of legal forms: corporation, partnership, trust, unincorporated entity or a multi-user structure such as a protected cell company.

The common features that identify an SPE are:

1. Auto-pilot arrangements that restrict the decision-making capacity of the governing board or management;
2. Use of professional directors, trustees or partners;
3. Thin capitalization, the proportion of 'real' equity is too small to support the SPE's overall activities;
4. Absence of an apparent profit-making motive, such that the SPE is engineered to pay out all profits in the form of interest or fees;
5. Domiciled in 'offshore' capital havens;
6. Have a specified life;
7. Exist for financial engineering purposes;

¹ Gary Gorton, Nicholas S. Souleles, 2005, Special Purpose Vehicles and Securitization, National Bureau of Economic Research, Cambridge, March 2005, <http://www.nber.org/papers/w11190>

8. The creator or sponsor may transfer assets to the SPE, often as part of a derecognizing transaction involving financial assets.

An essential feature of an SPV is that it be “bankruptcy remote,” that is, that the SPV never be able to become legally bankrupt. The most straightforward way to achieve this would be for the SPV to waive its right to file a voluntary bankruptcy petition, but this is legally unenforceable².

The only way to completely eliminate the risk of either voluntary or involuntary bankruptcy is to create the SPV in a legal form that is ineligible to be a debtor under the U.S. Bankruptcy Code. The SPV can be structured to achieve this result. As described by Klee and Butler (2002): “The use of SPVs is simply a disguised form of bankruptcy waiver” (p. 34).

To make the SPV as bankruptcy remote as possible, its activities can be restricted, for instance it can be restricted from issuing debt beyond a stated limit. The SPV can also obtain agreements from its creditors that they will not file involuntary petitions for bankruptcy. Depending on the legal form of the SPV, it may require more structure to insure effective bankruptcy remoteness.

There is also the risk that if the sponsor of the SPV goes bankrupt that the bankruptcy judge will recharacterize the “true sale” of assets to the SPV as a secured financing, which would bring the assets back onto the bankrupt sponsor’s balance sheet. Or the court may consolidate the assets of the sponsor and the SPV. As a result of this risk, most structured financings have a two-tiered structure involving two SPVs. Often times the sponsor retains a residual interest in the SPV that provides a form of credit enhancement, but the residual interest may preclude a “true sale.” Consequently, the residual interest is held by another SPV, not the sponsor. The “true sale” occurs with respect to this second vehicle.

The presence of any of the features identified above does not automatically make an entity an SPE, nor does the absence of a feature or features mean that it is not an SPE. The decision about whether an entity is an SPE, and subsequently who controls it, is one of professional judgment requiring careful consideration of all relevant facts. Pension plans and equity compensation plans are not SPEs.

² Klee, Kenneth and Brendt Butler (2002), “Asset-Backed Securitization, Special Purpose Vehicles and Other Securitization Issues,” *Uniform Commercial Code Law Journal* 35, 23-67.

3. The legal form of SPV

A SPV can take the form of a *corporation, trust, partnership, or a limited liability company*. SPEs often are created with legal arrangements that impose strict and some times permanent limits on the decision-making powers of their governing board, trustee or management over the operations of the SPE. Frequently, these provisions specify that the policy guiding the ongoing activities of the SPE cannot be modified other than perhaps its creator or sponsor.

The sponsor (or entity on whose behalf the SPE was created) frequently transfers assets to the SPE, obtains the right to use assets held by the SPE or performs services for the SPE, while other parties (capital providers) may provide the founding to the SPE. An entity that engages in transactions with an SPE (frequently the creator or sponsor) may in substance control the SPE.

A beneficial interest in a SPE may take form for example of a debt instrument, an equity instrument, a participation right, a residual interest or a lease. Some beneficial interests may simply provide the holder with a fixed or stated rate of return, while others give the holder rights or access to other future economic benefits of the SPE's activities. In most cases, the creator retains a significant beneficial interest in SPE's activities, even though it may own little or none of the SPE's equity.

SPV may be a subsidiary of the sponsoring firm, or it may be an "orphan" SPV, one that is not consolidated with the sponsoring firm for tax, accounting, or legal purposes (or may be consolidated for some purposes but not others).³

Most commonly in securitization, the SPV takes the legal form of a **trust**. Traditionally, a **trust** is "*a fiduciary relationship with respect to property, arising as a result of a manifestation of an intention to create that relationship and subjecting the person who holds title to the property (the trustee) to duties with it for the benefit of third party beneficiaries*". Often the SPV is a charitable or purpose trust. Traditional gratuitous or charitable trusts have been transformed into a vehicle with a different economic substance than perhaps contemplated by the law.

³ Gary Gorton, Nicholas S. Souleles, 2005, Special Purpose Vehicles and Securitization, National Bureau of Economic Research, Cambridge, March 2005, <http://www.nber.org/papers/w11190>

A purpose trust (called a STAR trust in the Cayman Islands) is a trust set up to fulfill specific purposes rather than for beneficiaries. A charitable trust has charities as the beneficiaries. For many transactions there are benefits if the SPV is domiciled offshore, usually in Bermuda, the Cayman Islands, or the British Virgin Islands.

4. Taxation of the SPV

There are two tax issues. First, how is the SPV taxed? Second, what are the tax implications of the SPV's debt for the sponsoring firm?

The first question is easier to answer. SPVs are usually structured so as to be tax neutral, that is, so that their profits are not taxed. The failure to achieve tax neutrality would usually result in taxes being imposed once on the income of the sponsor and once again on the distributions from the SPV. This "double tax" would most likely make SPVs unprofitable for the sponsor. There are a number of ways to design the SPV to achieve tax neutrality. Many SPVs are incorporated in a *tax haven jurisdiction*, such as the Cayman Islands, where they are treated as "exempted companies."

An exempted company is not permitted to conduct business in, for example, the Cayman Islands, and in return is awarded a total tax holiday for twenty years, with the possibility of a ten year extension. Because such entities are not organized or created in the U.S., they are not subject to U.S. federal income tax, except to the extent that their income arises from doing business in the U.S.

An investment trust that issues pass-through certificates is tax neutral, that is, the trust is ignored for tax purposes – there is no taxation at the trust level – and the certificate owners are subject to tax. Pass-through certificates represent pro rata interests in the underlying pool. It is important for maintaining this tax neutral tax status that the SPV not be reclassified as a corporation. To avoid this it is necessary that the trustee have no power to vary the investments in the asset pool and activities must be limited to conserving and protecting the assets for the benefit of the beneficiaries of the trust.⁴

More common than pass-through structures are pay-through structures. Pay-through bonds are issued by SPVs that are corporations or owner trusts. In these structures the SPVs issue bonds, but this requires that there be a party that holds the residual risk, an equity holder. If the SPV is a corporation, then the pay-through bonds have minimal tax at the corporate

⁴ Kramer, Andrea (2003), *Financial Products: Taxation, Regulation and Design*, 3 volumes (Aspen Publishers; New York City).

level because the SPV's taxable income or loss is the difference between the yields on its assets and the coupons on its pay-through bonds. Typically these are matched as closely as possible.

The second question is more complicated. Some SPVs achieve off-balance sheet status for accounting purposes but not for tax purposes. Securitizations can fit into this category because they can be treated as secured financing for tax purposes.

There is no easy answer to the question: "Where is the best place to set up an SPE?" It depends on the structured finance application among other considerations. SPEs are currently set up in a variety of tax friendly venues including Delaware (in the United States), New York, Luxembourg, the Caymans, Ireland, Jersey, Guernsey, and Gibraltar.

While SPEs in the United States are often, but not always, set up as trusts for tax reasons, in non-U.S. venues, the special purpose corporation is a common structure. Venues can be chosen wherever an SPE structure is allowable, but as a rule, only tax friendly venues for the specific structured finance application are chosen.

While choice of venue usually revolves around tax issues, other considerations can be important. For example, many investors in Germany will buy notes issued by SPEs, but often require an OECD issuer. Therefore, the SPE must be set up in an OECD country. Among the OECD countries, the Netherlands, Luxembourg, and Ireland are currently the most commonly used tax-friendly venues.⁵

In tax terms, we want the SPE to pay zero tax on payments flowing in and flowing out. We want to avoid corporate income tax at the venue of the SPE and the bank sponsor.

There are two withholding tax issues: 1) withholding tax at the source, the venue of the incorporation of the SPE, on EMTNs issued by the SPEs; and 2) withholding tax imposed on the underlying assets purchased by the SPEs by the country in which the assets were originated. The goal is that neither interest nor dividends paid by the SPEs is subject to withholding tax, so an ideal venue does not impose this tax.

If we choose a venue such as the Cayman Islands that does not have tax treaties in place with most jurisdictions, there is no mechanism for reclaiming tax withheld (if any) on the underlying asset income from the

⁵ Janet M. Tavakoli, 2005, SPECIAL PURPOSE ENTITIES: USES AND ABUSES
Presentation to the International Monetary Fund

country of origination. The SPE will purchase assets that are not subject to withholding at the country of the assets' origination so that investors will not suffer a reduced return.

If instead we choose a venue with tax treaties in place, assets that suffer withholding tax may specifically be chosen so the withholding tax can be reclaimed. This is a legitimate use of an SPE. Tax evasion is illegal; tax avoidance is legal.

We do not want to suffer tax on the SPEs income. In Europe, we also want to avoid value added tax (VAT) and stamp duties. The goal is to have zero tax leakage, if possible. Venues such as the Caymans, Jersey, and Guernsey offer this advantage, but may not enjoy ready investor acceptability.

Other venues such as the Netherlands, Luxembourg, and Ireland, also offer several tax advantages. There is no withholding tax on note interest. There is no stamp duty. There may be a very small value added tax (VAT) on servicing and administration for the SPE. There is no withholding tax on deposits. Among these three venues, there are other considerations that may affect the final choice, however. The Netherlands seems to take several weeks longer to provide tax rulings for SPEs compared to Ireland and Luxembourg. In the Netherlands, there seems to be a turf war between Amsterdam versus Rotterdam, and most SPEs are set up in Amsterdam. For speed, one might choose Ireland or Luxembourg. In Ireland, the SPE must fit within the Irish tax securitization code. This may drive up the cost slightly relative to Luxembourg. U.K. based deal arrangers might find it more convenient to deal with Ireland, since Ireland uses an English law based system. Lately, Ireland has been the fastest of the three venues in actual set-up time; usually two to three weeks once the paperwork is in order.

5. SPV usage

SPEs have been used to legitimately move assets off of a balance sheet and monetize them through repackaging combined with sales to investors. SPEs have also been used for embezzlement, money laundering, to mischaracterize revenues and losses, to perpetrate fraud on unwitting fund investors, to move money offshore for tax evasion, to channel funds to terrorist operations, and to disguise the source of money for illegal arms sales.

All of the following are examples of SPEs: Special Purpose Corporations (SPCs) which may or may not be Special Purpose Subsidiaries or captives; Master Trusts; Owners Trusts; Grantor Trusts; Real Estate Mortgage

Investment Conduits (REMICs); Financial Asset Securitization Investment Trust (FASIT); Multiseller Conduits; Single Seller Conduits.⁶

The SPE is formed concurrently with or immediately prior to the subject transaction, that is unlikely to become insolvent as result of its own activities and that is adequately insulated from the consequences of any related party's insolvency. The SPE is generally utilized in one of three different types of transactions:⁷

- the property-specific or large loan transaction;
- the pool transaction;
- the credit lease transaction.

Property-specific or large loan transaction

Many property-specific transactions include, as part of their structure a deposit of one or more mortgage loans into a trust. As a result, in a property-specific transaction, multiple SPE's may be appropriate. In addition to each borrower being an SPE, the depositor and/or the holder of any securities or interests in mortgage loan received or retained in connection with a transfer of a loan or loans should be an SPE if the transfer of the loan or loans by the originator to the depositor, or by the depositor to a trust, could not otherwise be characterized properly as a "true sale".

Pool transaction

In a traditional pool transaction, one or more mortgage loan sellers will transfer a portfolio of mortgage loans to the depositors which, in turn, will transfer a such mortgage loans to a trust. The trust will issues the rated securities, which are backed by the mortgage loans, to investors in exchange for the proceeds from the sale of securities.

In situations where a transfer cannot be characterized properly as true sale, the transferor generally should be an SPE. In addition, any securities or interests in the transferred mortgage loans received or retained by a loan originator in connection with such transfer generally should be held in an SPE.

The purpose of creating a SPE in this situations is to create an entity that should not become subject to a bankruptcy proceeding. The use of an SPE entity is designed to reduce the risk of the transferor becoming

⁶ Janet M. Tavakoli, 2005, SPECIAL PURPOSE ENTITIES: USES AND ABUSES
Presentation to the International Monetary Fund

⁷ Special-Purpose Bankruptcy-Remote Entities, Standard & Poor's Ratings Services, May 2003, The McGraw-Hill Companies

insolvent, filing a bankruptcy petition, and claiming that the transfer of the mortgage loans and other collateral to the depositor or the securitization trust was not a true sale.

Credit lease transaction

In a credit lease transaction, the borrower, as landlord and owner of the fee interest in an income producing real property, obtains a loan that is secured by a “triple net” bondable lease to a rated tenant.

Special purpose entities are often classified as either ***passthrough*** or ***paythrough structures***.

Passthrough structures pass through all of the principal and interest payments of assets to the investors. Passthrough structures are therefore generally passive tax vehicles and do not attract tax at the entity level.

Paythrough structures allow for reinvestment of cash flows, restructuring of cash flows, and purchase of additional assets. For example, credit card receivable transactions use paythrough structures to allow reinvestment in new receivables so bonds of a longer average life can be issued.

For securitization of cash assets, the key focus is on non-recourse (non-recourse to the originator/seller) financing. The structures are bankruptcy remote so that the possible bankruptcy or insolvency of an originator does not affect the investors’ right to the cash flows of the vehicle’s assets. The originator is concerned about accounting issues, especially that the structure meets requirements for off-balance sheet treatment of the assets, and that the assets will not be consolidated on the originator/seller’s balance sheet for accounting purposes. For bankruptcy and accounting purposes, the structure should be considered a sale.

This is represented in the documentation as a true sale at law opinion. The structure should be a debt financing for tax purposes also known as a debt-for-tax structure. Tax treatment is independent of the accounting treatment and bankruptcy treatment. An originator selling assets to an SPE will want to ensure that the sale of assets does not constitute a taxable event for the originator. The securitization should be treated as a financing for tax purposes i.e., treated as debt of the originator for tax purposes. This is represented in the documentation in the form of a tax opinion.

The structured solution to the bankruptcy, true sale, and debt-for-tax issues varies by venue.

Synthetic securitizations do not get true sale treatment for accounting purposes, since no asset has been sold. This is true whether the vehicle is an

SPE or a credit-linked note. The motive behind these structures is to reduce regulatory capital according to regulatory accounting principles. Funding is a non-consideration or a minor consideration. These are usually balance sheet deals for bank regulatory capital relief. Partial funding is feasible with a hybrid structure. A corollary motive is to get credit risk relief.

Repackaging is another legitimate use of SPEs. U.S. banks often set up multi-issuance vehicles (MIEs) in the Cayman's or other tax friendly venues. These are Qualifying Special Purpose Entities (QSPEs) for Financial Accounting Standards Board (FASB) purposes. By definition, they are off balance sheet, bankruptcy remote entities. The assets are put presumptively beyond the reach of the bank transferor's creditors through a true sale. Furthermore, the bank is not obligated to repurchase the transferred assets. Setting up the SPE in this way insulates the customers from the bank's credit risk, and ensures the assets don't re-emerge on the bank's balance sheet, even though the SPE may often purchase assets from the bank sponsor's books.

The MIE issues notes that reference only the underlying collateral specific to each note (unlike the structure in which the collateral for all the EMTNs is a reference pool of assets). The noteholders do not have a claim to any other asset owned by the SPE. Each set of assets is funded separately with its own EMTN tranche combining the risk characteristics of the underlying assets and/or derivatives. The derivatives may be hedges or may actually be an underlying asset, such as a credit derivative.

In a typical vanilla repackaging, the SPE purchases assets. The assets are pre-funded from proceeds of an EMTN issued by the SPE and underwritten or sold by the bank arranger's (bank sponsor's) capital markets group. The SPE pays the asset cash flows to the bank arrangers swap desk as one leg of a swap payment. The bank arranger provides the structured coupons due to the investors under the EMTN issue.

The flexibility and privacy of offshore SPEs in particular makes them very powerful financial tools for legitimate securitizations, but also makes them attractive tools for illegal financial dealings. The key issue seems to be disclosure of the true ownership of the SPE. Legitimate businesses voluntarily disclose minority ownership interests in offshore SPEs as equity on their balance sheet. Offshore subsidiaries are also disclosed.

While SPEs are ideal for securitizing assets, they are also ideal for hiding assets. Many offshore venues do not divulge ownership of SPEs, and to complicate matters, the owner may be one or more SPEs in different venues. There is no easy answer to this dilemma, since any legitimate means can be exploited for illegitimate gain.

6. Juridical aspects concerning the SPV in Romania

In this year has been issued the law of securitization in Romania which provides the general framework for obtaining financing through securitization, and also the rights and obligations of the participants at the securitization transaction.

The object of securitization:

- ❖ credit contracts;
- ❖ lease contracts;
- ❖ commercial contracts with the payment price in term, as well as commercial contracts with the payment rate;
- ❖ financial instruments, issued according to the law.

According to this law the SPV is defined as an entity with or without juridical personality, which has the single objective to issue securitized financial instruments.

The transfer as it is defined by the present law is exempted by the value added tax. The SPV is an entity set up as securitization fund, based on contracts of limited company or corporation. The SPV must be approved by CNMV (National Committee of Securities).

7. Conclusion

The overall issue, however, is how do regulators wish to react to any illegal financial activity, including the abuse of SPEs. What is the best course of action for entities such as the International Monetary Fund that are in a position to distribute funds? One could suggest that each country must introduce rule of law and financial accountability before debt is forgiven or before new funds are lent. Even in strong financial venues like the United States, it is difficult to curtail abuse. In disadvantaged countries, especially venues in which corruption is suspected, it may be even more difficult to curtail financial abuse, and the issues are more difficult. There are broader humanitarian issues such as the effect of withholding funds on the general population and whether funds provided aren't diverted to special interests instead of employed as intended.

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A SHORT OVERVIEW ABOUT ESTIMATING THE BANKRUPTCY RISK: A CASE STUDY PERFORMED ON A SET OF ROMANIAN COMPANIES

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Abstract

Various empirical studies regarding the bankruptcy risk were conducted using financial analysis of companies, with or without financial difficulties. The variables (mainly accounting variables) which influence the risk were determined. In this article, we propose a short overview which emphasizes the efficiencies of different methods of classification used so far. We describe the available techniques, compare their performances and underline various modalities of empirical applications. We also perform an empirical study on a set of Romanian companies. We are using two alternative models: Binary Logit and Binary Probit. Their performance is evaluated based on econometric criteria as well as a criterion of accuracy of predictions: receiver Operating Characteristic Curve.

Keywords: *bankruptcy risk, logit, probit, ROC curve*

1. Introduction

The purpose of this paper is to present synthetically the evolution and the present state of research concerning the bankruptcy risk and to propose a modality of application on the Romanian market, where the chosen model is based on a prediction criterion, not on econometric criteria. The first part of the study displays the common methodology of the research concerned, as well as the various modalities of the empirical applications, the construction of the sample, the choice of the explanatory variables and the method to validate the results.

2. The construction of the sample

The elaboration of the sample is very important for the quality of the proposed prediction. The defining of the states of the endogenous variable and the choice of the prediction level play an essential part, because they determine the objective of the constructed indicator, and the selection of the units which form the given sample. The choice of the variables characterizing the selected units is also very important because these variables condition the homogeneousness and the representativeness of the sample, hence they influence the quality of the prediction.

The explanatory variables: the representativeness and the homogeneousness of the sample. For the binary models, the construction of two sub-samples raises the problem of how representative and homogeneous the two sub-samples are. For instance, in the case of a model of financial scoring related to the enterprise bankruptcy risk, the full sample must be representative for the economy: from the point of view of the sectors of activity, of the size of the enterprises, but also of the relation between the number of bankrupt enterprises and non-bankrupt enterprises. However, this representativeness creates a heterogeneousness which might generate a statistical displacement: explanatory factors could be rendered under the aspect of sectorial or size effects. In order to reconcile the two exigencies, several solutions have been found.

Recent studies have resorted to enlarged samples: over 1000 enterprises (Lennox,1999) and more than 40000 for the Bank of France score (Bardos,1998). If the number of the supervised enterprises (belonging to the given sample) is large enough, we have a good representativeness. However, the representativeness must be verified by comparing the characteristics of the sample with the characteristics of the global population. Another way of rendering a good representativeness is to limit the research to an economic

field or to a size interval (Trieschmann and Pinches, 1973; Calia and Ganuci, 1997). This particular method has the advantage of reconciling the representativeness and the homogeneousness.

3. Date analysis models and binary econometric models

These techniques were used mainly in the enterprise bankruptcy analysis and the bankruptcy risk estimation, starting from a series of book-keeping data characteristic for the given enterprise, namely economic and financial indicators. The studies that propose or make use of such models generally fall into three classes, according to the classifying methods which are being used. The most frequent classifying methods are the parametric statistical methods: the discriminant-linear models analysis (Altman, 1968) or the square analysis (Lachenbruch et al., 1973)- and the techniques of the qualitative variables econometric (Ohlson, 1980; Zmijewski, 1984). Other studies resort to non-parametric statistical methods, such as: the recursive partition (Frydman et al, 1985) and the nucleus estimators (Calia and Ganuci, 1997). At the same time, more recently, there have been performed analysis concerning the artificial intelligence, such as the neuronal networks (Altman et al, 1994; Bardos and Zhu, 1997) and the genetic algorithms (Varetto, 1998). In the following lines, we are going to explain briefly the techniques mentioned above, resorting to the founding studies, as well as to the various improvements later suggested.

The parametric methods of statistical classification

The parametric methods of statistical classification establish a functional relation between the explanatory variables (the law of variable distribution is supposed to be known in this case) and the variable explained, the form of this relation being given a priori. Three types of such methods have been identified:

The one-dimensional methodology founded by Beaver (1966)

The discriminant analysis (liniary and non-liniary)

The regressions with qualitative variables

a. Beaver's one-dimensional methodology (1966)

Beaver (1966) elaborated a one-dimensional dichotomic classification, namely a classification based on a single book-keeping indicator: the most discriminant (in relation to which the sample is more heterogeneous). In a first sub-sample, he groups the enterprises according to the value given by a specific indicator. Next, a critical limit is being chosen, and all the enterprises that have an installment inferior to this limit are considered bankrupt, while the enterprises that have an indicator value superior to the limit are non-

bankrupt. This critical limit is determined by maximizing the percentage of the well-classified enterprises belonging to the first sample. A second sub-sample is further elaborated, starting from the critical limit previously established, and the percentage of the well-classified enterprises is calculated once again. This percentage lies at the basis of the final selection of the most discriminant book-keeping instalment. Although the method proposed by Beaver could supply an easy and efficient indicator for the characterization of the financial health of various enterprises, the shortcomings of the method related to the unicity of the book-keeping instalment, as well as the advantages provided by the multidimensional methods applied to the description of the state of the enterprise, drastically restrict the area of application of Beaver's methodology.

b. Prediction models based on the discriminant analysis

In 1968, Altman pointed out that the one-dimensional analysis does not take into account the complexity of the bankruptcy process. He was the first one to use simultaneously in his research several book-keeping installments by means of a multidimensional linear analysis. In order to classify an enterprise as bankrupt or non-bankrupt, Altman (1968) uses the simple decision law, which refers to the inclusion of an enterprise in the group to which this particular enterprise is the closest. Accordingly, he resorts to the the discriminant analysis proposed by Fisher, based on a metrical criterion. Essentially, a function named **score** is being constructed, a linear combination of the explanatory variables given; the realization of this function suggests the risk level of the enterprise.

A number of k book-keeping indicators will be selected, the ones which are most likely to justify the bankruptcy. At the same time, the model maintains the indicators which limit the problem of the exogenous variables multicollinearity and provide the greatest power of discrimination between the enterprises. The sum of the enterprises could be represented in a \mathfrak{R}^k space. The purpose of the discriminant analysis is to divide this space into two sub-spaces: the bankrupt enterprises sub-space and the non-bankrupt enterprises space. This separation is made by determining the hyper plan H^* which separates most adequately the two groups of enterprises. H^* must be calculated so that on the one hand, the number of bankrupt enterprises related to the sub-space of the non-bankrupt enterprises should be minimum, while on the other hand, the number of the non-bankrupt enterprises included in the sub-space of the bankrupt enterprises should also be minimum. The enterprise whose bankruptcy risk will be estimated belongs to the group corresponding to the sub-space in which the enterprise is situated according to its coordinates. If A is an enterprise whose bankruptcy risk we intend to estimate, and x_A its coordinates, a value of the distance to a group will be

established. Thus, the distance to a group represents the distance to the middle point of the group, using a particular system of measure. If $S(x)=0$ is the equation of the hyperplan H^* in the \mathfrak{R}^k space, S is a linear combination of the two k book-keeping installments we have in view. The value taken by the function $S(\cdot)$ in the point x_A determines the classification of the enterprise A into one or another of the two sub-groups:

if $S(x_A)>0$, enterprise A belongs to the non-bankrupt enterprises

if $S(x_A)<0$, enterprise A belongs to the bankrupt enterprises

if $S(x_A)=0$, enterprise A cannot be classified.

There are, however, some disadvantages in the use of the linear discriminant analysis. Such disadvantages refer to a series of difficulties concerning the linearity of the the score-function constructed by Fisher's discriminant analysis, as well as to the necessity to satisfy some strict statistical conditions (the exogenous variables of the model must submit to a normal law, while their variation/co-variation matrix must be the same for the sub-sample of the bankrupt enterprises and for the sample of the non-bankrupt enterprises). The method was thus modified to some extent, although it had represented for 30 years the main technique used in predicting bankruptcy in several countries. A series of studies from the 80's and the 90's which confront the linear discriminant analysis with other techniques of classification (Collins, 1980; Rose and Giroux, 1984; Altman et al, 1994; Calia and Ganuci, 1997; Kira et al, 1997; Bardos and Zhu, 1997; Varetto, 1998) generally proves the superiority of the linear discriminant analysis.

c. Models based on regressions upon the qualitative variables

These methods imply the estimation of some qualitative variable regressions (at least the endogenous variable), based either on a logistical distribution of the errors (Logit), or on a normal distribution of the errors (Probit). The Logit regression was applied in predicting the bankruptcy risk by Ohlson (1980), Mensah (1984), Aziz et al (1988), Bardos (1989), Burgstahler et al (1989), Flagg et al (1991), Platt and Platt (1991), Weiss (1996), Bardos and Zhu (1997), Mossman et al (1998). The Probit model was used to a smaller extent (Zmijewski, 1984; Gentry et al, 1985; Lennox, 1999). According to the two models, the endogenous variable y is a qualitative variable, dichotomic, in the given case: y takes the values 0 or 1 if the enterprise is bankrupt, respectively- non-bankrupt. The x vector of exogenous variables includes a series of k economic and financial indicators, used in the operation according to their discriminant quality and their weak interdependence. The model requires that between the chosen indicators and

the bankruptcy risk there be a linear relation. The estimated model is expressed as follows:

$$y_i = 1 \text{ if } \beta x_i + \varepsilon_i > 0 \quad (1)$$

$$y_i = 0 \text{ if, } \beta x_i + \varepsilon_i \leq 0 \quad (2)$$

where ε is the error associated to enterprise I , while β is the coefficient vector. The a posteriori likelihood for the enterprise to be bankrupt is expressed as follows:

$$P\{y_i = 0\} = P\{\beta x_i + \varepsilon_i \leq 0\} = P\{\varepsilon_i \leq -\beta x_i\} = F(-\beta x_i) \quad (3)$$

where F is the function of ε error repartition. The a posteriori likelihood for enterprise I to be non-bankrupt is expressed as follows:

$$P\{y_i = 1\} = P\{\beta x_i + \varepsilon_i > 0\} = P\{\varepsilon_i > -\beta x_i\} = 1 - P\{\varepsilon_i \leq -\beta x_i\} = F(\beta x_i) \quad (4)$$

$$\text{See : } P\{y_i = 1\} = F(\beta x_i) \quad (5)$$

$$P\{y_i = 0\} = 1 - F(\beta x_i) = F(-\beta x_i) \quad (6)$$

The Logit model requires that the errors submit to a logistical law which has the following repartition function:

$$F(x) = (1 + e^{-x})^{-1} \quad (7)$$

In this case, the a posteriori likelihood for enterprise I to be bankrupt is expressed as follows:

$$P\{y_i = 0\} = (1 + e^{\beta x_i})^{-1} \quad (8)$$

According to the Probit model, the errors submit to a normal law, which has the following repartition function:

$$F(x) = \int_{-\infty}^x \frac{1}{\sqrt{2\pi}} e^{-\frac{t^2}{2}} dt \quad (9)$$

As a consequence, the a posteriori likelihood for enterprise I to be bankrupt is expressed as follows:

$$P\{y_i = 0\} = \int_{-\infty}^{-\beta x_i} \frac{1}{\sqrt{2\pi}} e^{-\frac{t^2}{2}} dt \quad (10)$$

Similarly to the previous case, the a posteriori likelihoods are of great help in taking the decision: they allow us to construct a series of risk classes. If we intend to classify a specific enterprise, A , into one of the two groups of enterprises (bankrupt or non-bankrupt) starting from the bankruptcy likelihood, we could determine a critical limit according to which we may take a decision. We note this critical likelihood with P . The judgment that

brings us to the decision is the following: if the bankruptcy likelihood estimated for enterprise A is higher than in the case of P , then enterprise A is considered bankrupt; in the opposite case, A is considered non-bankrupt. The P likelihood is chosen in such a manner as to maximize the quality of the classification operation. The predictions performed by several researchers on the basis of Probit and Logit models are of a very good quality (Platt and Platt, 1991; Mossman et al, 1998) and they are generally superior to the discriminant analysis (Kira et al, 1997; Lennox, 1999).

4. Application

We start from a sample consisting of 25 commercial enterprises competing on the Romanian market. In order to form the sample, we have used a simple aleatory test. By observing the sample units, we came to the conclusion that 13 of the supervised enterprises were bankrupt, while the other 12 remained in the competitive economy. Consequently, we associate to the observation of the event $y_i = 0$ in the case of the bankrupt enterprises, respectively $y_i = 1$ in the case of the surviving enterprises, where y_i is the endogenous variable standing for the bankruptcy risk. The variables x_i are associated to the observation of the event y_i , where x_i with the value of $i = \overline{1,5}$ represents the variables expressing accurately the economic and financial situation of the enterprises, as follows (Altman, 1968):

$X_1 = \text{Working capital/Total assets}$

$X_2 = \text{Retained Earnings/Total assets}$

$X_3 = \text{Earnings before interest and taxes/Total assets}$

$X_4 = \text{Market value equity/Book value of total debt}$

$X_5 = \text{Sales/Total assets}$

We have calculated these variables with the help of the data from the Balance-Sheet and the Profit and Loss Account for each enterprise. We have processed the data on the basis of the econometry soft LIMDEP 7.0.

d. The Probit binary estimation model

Table 1. The estimation of the Probit binary model parameters

Binomial Probit Model

Maximum Likelihood Estimates

Log likelihood function -11.22305

<i>Variable</i>	<i>Coefficien t</i>	<i>Standard Dev.of b</i>	<i>t=b/st.dev.</i>	<i>P[Z >z]</i>
<i>Constant</i>	-1.372	0.861	-1.594	0.111
<i>X1</i>	8.894	6.319	1.408	0.153
<i>X2</i>	1.008	8.194	0.123	0.902
<i>X3</i>	1.835	5.409	0.339	0.733
<i>X4</i>	0.288	0.274	1.053	0.292
<i>X5</i>	0.433	0.413	1.048	0.294

e. The Logit binary estimation model

Table 2 The estimation of the Logit binary model parameters

Binomial Logit Model

Maximum Likelihood Estimates

Log likelihood function -11.29708

<i>Variable</i>	<i>Coefficien t</i>	<i>Standard Dev.of b</i>	<i>t=b/st.dev.</i>	<i>P[Z >z]</i>
<i>Constant</i>	-2.292	1.431	-1.603	0.109
<i>X1</i>	14.92	10.32	1.447	0.148
<i>X2</i>	1.605	14.13	0.114	0.909
<i>X3</i>	3.144	8.849	0.355	0.722
<i>X4</i>	0.483	0.458	1.056	0.291
<i>X5</i>	0.721	0.673	1.070	0.284

Although the parameter estimators are very different for each of the two models, their representativeness is practically the same. We estimate for each enterprise the bankruptcy likelihood by using both models.

Table 3 The estimation of the bankruptcy likelihood, Probit and Logit 1 models

<i>Observ.</i>	<i>Observed Y</i>	<i>Predicted Y</i>	<i>Prob[Y=1] (probit)</i>	<i>Prob[Y=1] (logit)</i>
1	.000	.000	.3289	.3244
2	.000	.000	.0002	.0025
3	.000	.000	.0000	.0004
4	.000	.000	.0008	.0051
5	.000	.000	.2780	.2756
6	.000	1.00	.6702	.6772
.....				
20	1.00	1.00	.7203	.7244
21	1.00	1.00	.5264	.5256
22	1.00	1.00	.5797	.5864
23	1.00	1.00	.9957	.9880
24	1.00	.000	.3235	.3184
25	1.00	.000	.2699	.2661

The likelihoods are very similar and, as a consequence, the two models are equivalent, from an econometric point of view (the parameter representativeness), as well as from the point of view of the likelihood. The parameters of the models with all the explanatory variables might be however less representative due to the correlations between the X1-X5 variables. We might even think about obtaining superior results by eliminating some variables. We make the estimation for models from which we gradually eliminate one variable or another (Logit 2- Logit 6).

Table 4. The estimation of the reduced models parameters : Logit 2- Logit 6

	<i>Logit 2</i>		<i>Logit 3</i>		<i>Logit 4</i>		<i>Logit 5</i>		<i>Logit 6</i>	
	<i>Coe f.</i>	<i>Pro b.¹</i>								
<i>Constant</i>	- 2.23	0.05	-2.28	0.11	- 2.15	0.10	- 1.47	0.19	- 1.47	0.15
<i>X 1</i>	-	-	15.2	0.13	13.6	0.12	17.0	0.08	13.2	0.12
<i>X 2</i>	6.15	0.61	-	-	5.71	0.48	- 7.09	0.54	4.65	0.73
<i>X 3</i>	0.054	0.99	3.97	0.42	-	-	6.73	0.37	1.03	0.89
<i>X 4</i>	0.83	0.42	0.46	0.28	0.51	0.24	-	-	0.33	0.34
<i>X 5</i>	0.85	0.18	0.73	0.66	0.67	0.30	0.52	0.39	-	-

⁽¹⁾Prob=P[|Z|>z]

Here we notice that none of the models has a good parameter representativeness. According to this criterion it is difficult to choose between the models. We will thus focus on each one's prediction capacity.

Table 6 The bankruptcy likelihood estimation, models : Logit 2- Logit 6

<i>Observation</i>	<i>Logit 2 Prob[Y= 1]</i>	<i>Logit 3 Prob[Y= 1]</i>	<i>Logit 4 Prob[Y= 1]</i>	<i>Logit 5 Prob[Y= 1]</i>	<i>Logit 6 Prob[Y= 1]</i>
<i>1</i>	0.1378	0.3302	0.3336	0.5104	0.4651
<i>2</i>	0.1640	0.0023	0.0042	0.0023	0.0071
<i>3</i>	0.1677	0.0003	0.0007	0.0003	0.0013
<i>4</i>	0.3255	0.0044	0.0086	0.0029	0.0127
.....
<i>22</i>	0.4269	0.5936	0.5771	0.5928	0.6422
<i>23</i>	0.7992	0.9884	0.9832	0.9836	0.9763
<i>24</i>	0.3696	0.2961	0.3546	0.2763	0.4784
<i>25</i>	0.1807	0.2826	0.2253	0.4709	0.3326

The likelihoods vary in a significantly in the case of each model. Therefore, in order to be able to choose the best model, we need an efficient criterion to evaluate the prediction capacity of each model. Such a criterion is the Receiver Operating Characteristics Curve.

f. Receiver Operating Characteristic Curve

We use the following symbols:

y_i is the noticed value of the endogenous variable

$y_i = 1$ if enterprise I survives

$y_i = 0$ if enterprise I does not survive

$$\hat{y}_i = \begin{cases} 1 & \text{si } \text{Prob}(y_i = 1) \geq c \\ 0 & \text{sinon} \end{cases}$$

$c \in [0;1]$ is a cut-off

In most of the applications, cut-off c can be chosen by the user. For each value of c we may draw a cross-figure:

\hat{y}_i	I	0	$Total$
y_i			
I	N_{11}	N_{10}	N_{1T}
0	N_{01}	N_{00}	N_{0T}
$Total$	N_{T1}	N_{T0}	N

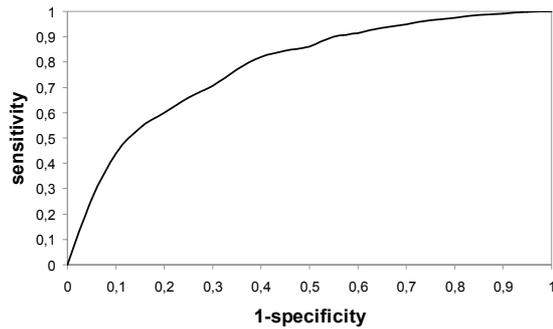
We note the relations as:

$\frac{N_{11}}{N_{1T}} = \textit{sensitivity}$ = the relative frequency of the correct predictions for the individuals for whom $y_i = 1$

$\frac{N_{00}}{N_{0T}} = \textit{specificity}$ = the relative frequency of the correct predictions for the individuals for whom $y_i = 0$

By changing the value of c , we obtain different values for *sensitivity* and *specificity*, which allows us to trace the R.O.C. *curve*.

Figure 1 R.O.C. curve



If $c=1$, $\hat{y}_i = 0 \quad \forall i = \overline{1, N}$ (for all enterprises) \Rightarrow *specificity* = 1 et *sensitivity* = 0 and the curve reaches the coordinates (0 ;0). If $c=0$, $\hat{y}_i = 1 \quad \forall i = \overline{1, N}$ (for all the individuals) \Rightarrow *specificity* = 0 and *sensitivity* = 1 and the curve is situated at the (1;1) coordinates. The ideal model curve traverses the abscissa and ordinate axis, passing trough the (0;1) coordinates, where *specificity*=1 and *sensitivity*=1, so there are 100% correct predictions for enterprises with $y_i = 0$, and 100% correct predictions for enterprises with $y_i = 1$. Consequently, the closer is the curve to (0;1) coordinates, the more efficient is the model in terms of likelihood. The value indicating the competitiveness of a particular model is the surface of the sub-diagram determined by the R.O.C. curve.

5. Conclusions

The academic research concerning the methods of bankruptcy prediction is still up-to-date, while they become more widely used. The linear discriminant analysis, after its probing phase from the 70's, is the most widely used operational method, providing trustworthy predictions. The score function provides many useful applications to the practitioners, and makes possible the calculation of *a posteriori* likelihoods or the construction of risk classes. Other methods, such as the square discriminant analysis, the regressions upon qualitative variables or the non-parametric techniques were also developed, with the view of avoiding the statistical compulsions imposed by the linear discrimination. Recent techniques borrowed from the artificial intelligence, such as the neuronal networks or the genetic algorithms are more and more popular in the academic medium. They allow us to obtain good predictions and, in addition to that, they have the advantage of not imposing statistical limitations.

As for the application, it proves that it is difficult to choose between the different possible models, even if they belong to the same class. We may

get to several competing models, which could be compared from the point of view of their quality, on econometric criteria. We could make the choice using a criterion of prediction efficiency (for instance: R.O.C. Curve), which is however preferred by the practitioners, a fact which stimulates the applications.

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BANK RISK MANAGEMENT STRUCTURES IN ROMANIA¹

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Abstract

The Romanian banking system comprises private banks mainly and has the following bank risk management structures:

- 1. The Bank Risk Bureau - (BRB) is a structure specialized in collecting, storing and centralising information on the exposure of each crediting institution in the Romanian banking system to those debtors who were granted loans and/or have commitments that totalize more than the reporting threshold or the payments overdue more than 30 days, regardless the amount, of the natural persons against whom crediting institutions exposures are of approximately 5.700 Euro, as well as information on card frauds committed by the card holders;*
- 2. The Payment Incidents Bureau (PIB) is an intermediation centre that manages information specific to payment incidents both from the bank's point of view (overdraft), as well as from a social point of view (stolen). Information is sent to the PIB through the Interbank Communication Network which links the head office of the National Bank of Romania to the head offices of all banks;*
- 3. The Bank Deposit Guarantee Fund has the purpose of repaying natural persons' deposits according to the terms and conditions imposed by law..*

Keywords: *structure; risk; deposits; credit; debtors.*

¹ The data presented in this paper are taken from the National Bank of Romania site.

1. Introduction

Romania prepares to adhere to the EU, the countdown to January 1st 2007 having begun. Although the negotiations closed, the economic reform is still in development. The banking system, essential in developing the Romanian economy, improved, important progress in privatisation and aligning to the EU surveillance standards being made. The investments in infrastructure and in improving the financial indicators made by banks led to creating a banking system able to face the international standards after the adherence to the EU. On the whole, the banking system has improved from the point of view of monitoring the credit risk, very important being the regulations of the National Bank of Romania as well as of the risk management structures created by the banking authority.

2. Bank Risk Management Structures

2.1 *The Bank Risk Bureau (CIB)*

This is a structure specialized in collecting, storing and centralising information on the exposure of each crediting institution in the Romanian banking system to those debtors who were granted loans and/or have commitments that totalize more than the reporting threshold or the payments overdue more than 30 days, regardless the amount, of the natural persons against whom crediting institutions exposures are of approximately 5.700Euro, as well as information on card frauds committed by the card holders.

The database of the Bank Risk Bureau is organized into:

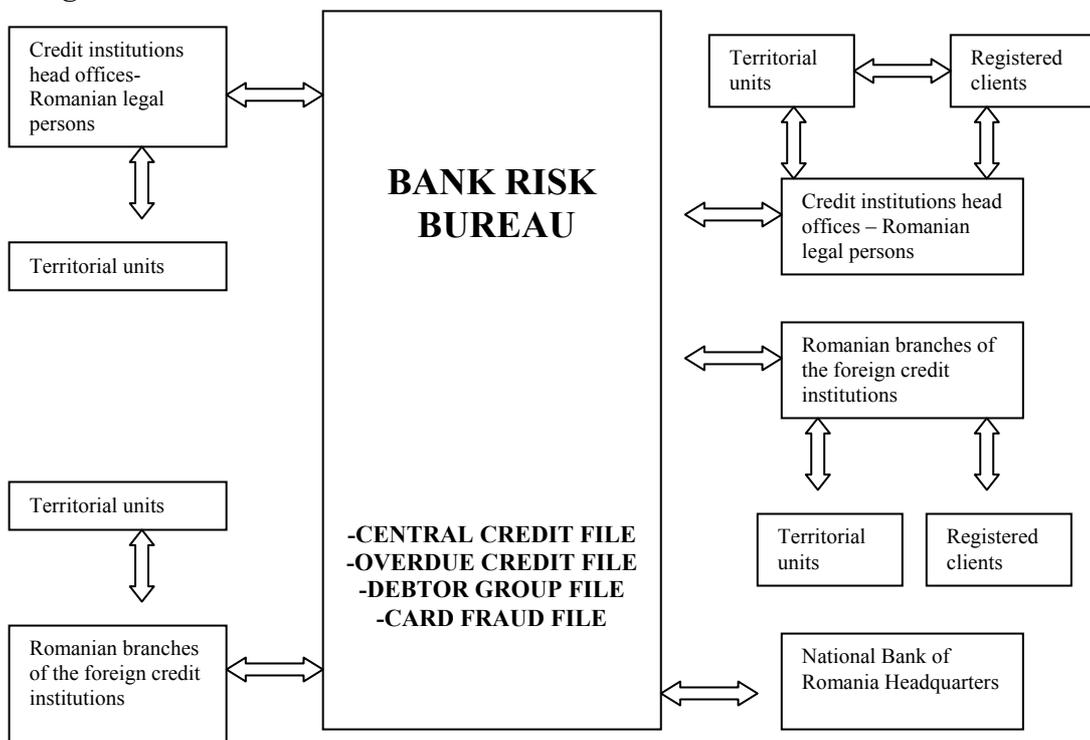
- ▶ The Central Credit File (CCF) which contains information on the bank risk reported by credit institutions and is updated monthly.
- ▶ Overdue Debt File (ODF) which contains credit risk information on delays at the repayment schedules over the past seven years at most and is updated monthly from the Central Credit File.
- ▶ The Debtor Group File (DGF) which contains information on groups of natural persons or/and legal persons representing one debtor and is updated monthly from the Central Credit File.
- ▶ The Card Fraud File (CFF) which contains information on card frauds made by the card holders as reported by the credit institutions and is updated on-line.

The users of the information from the data base of the Bank Risk Bureau are the reporting entities and the National Bank of Romania. The reporting entities are the credit institutions and the companies that deal with loans on mortgage and which are organised according to existing law.

The exchange of information on bank risk is done electronically through the Interbank Communication Network. The reports contain the following information:

- The identification data of the debtors against whom the credit institution has an exposure equal to or higher than the reporting threshold;
- Information on all loans and commitments of the debtor: the type of the loan, maturity, type of warranty, debt service, granting date and maturity date, amount granted, used and unused amounts, overdue loans;
- Information on the natural persons who do not fulfill the conditions imposed by the reporting threshold and are overdue more than 30;
- Information on the groups of natural or/and legal persons representing one debtor: the name of the group, the code of the group, the members of the group.
- Information on card frauds committed by the cardholders: the identification data of the cardholder, type of card, the currency, the date when the fraud was noticed, the amount of fraud.

Figure 1 Bank Risk Bureau Information Flow



Source: www.bnro.ro/legislatie

The information is disseminated by the Bank Risk Bureau in two ways:

1. Monthly reports containing information on all the debtors reported that month, all the information available at the Bank Risk Bureau, regarding the loans and commitments of the debtor from all the credit institutions, without mentioning the identity of those institutions (the overall risk situation).

2. In reply to the on-line queries in which the reporting entities may request two types of information: the overall risk situation and the overdue loan situation (on a 7 year period).

It must be underlined that the information is given unconditionally for the reported debtors, while for clients as possible debtors, the access of the reporting entities to the information is conditioned by having that client's approval

Similar credit information management systems are successful in EU countries with a high degree of financial intermediation such as: Austria, Belgium, France, Germany, Italy, Portugal, Spain, etc.

2.2 The Payment Incidents Bureau (PIB)

Is an intermediation centre that manages information specific to payment incidents both from the bank's point of view(overdraft), as well as from a social point of view(stolen).

Information is sent to the PIB through the Interbank Communication Network which links the head office of the National Bank of Romania to the head offices of all banks.

The database of the PIB is organised in two files:

1. The Payment Incidents National File (PINF) having the following structure:
 - Cheques National File (CNF);
 - Bills of Exchange National File (BNF);
 - Promissory Notes File (PNF)
2. Risky Persons National File (RPNF), which is automatically fed from PINF.

Risky Persons National File is a permanent database. Information on major payment incidents (overdrafts, cheques issued without the approval of the drawee, cheques bearing a false date or lacking a compulsory specification, circular ceques and traveller cheques issued as bearer cheques, cheques issued by a drawer under ban on banking operations, bills of exchange discounted without a claim being assigned upon transfer) registered in the name of a natural/legal person can not be erased from the database unless they are cancelled by the same reporting persons who has previously submitted them to the PIB, on their own initiative, or following a court order.

Ban on banking operations is imposed by a bank on an account holder who is not allowed to issue cheques for a period of one year since the recording to the PIB of a major payment incident, in order to prevent the occurrence of further payment incidents as well as to sanction the account holders who generate them in the banking system.

On the basis of the information received by PIB from the reporting persons, it must:

- send a *Report on the ban* to issue cheques to all bank head offices that will disseminate this information in their own interbank system;

- send a *Report on the loss/theft/destruction/cancellation* of payment instruments to the remitting bank in order to prevent settlement of such cheques, bills of exchange or promissory notes, in case they are presented for settlement by a malevolent person.

The bank head office or the territorial branch, the account of the natural or the legal person is opened with, must recoup not filled-in or faulty filled-in cheques, except those used for cash withdrawal. In case they fail to recoup all the not filled-in or faulty filled-in cheques, they must cancel them and notify it to the PIB within 15 days from the PIB's Report on imposing the ban.

The information stored in the PINF and RPNF will be used:

- a) compulsorily by banks and the National Bank of Romania, when remitting chequebooks to account holders

- b) on its own initiative by the PIB, in order to defend public interest, by sending the information to the Prosecutor's Office attached to the Supreme Court and to the Ministry of Interior with their territorial units, from its own evidence or by publishing the information in the mass-media.

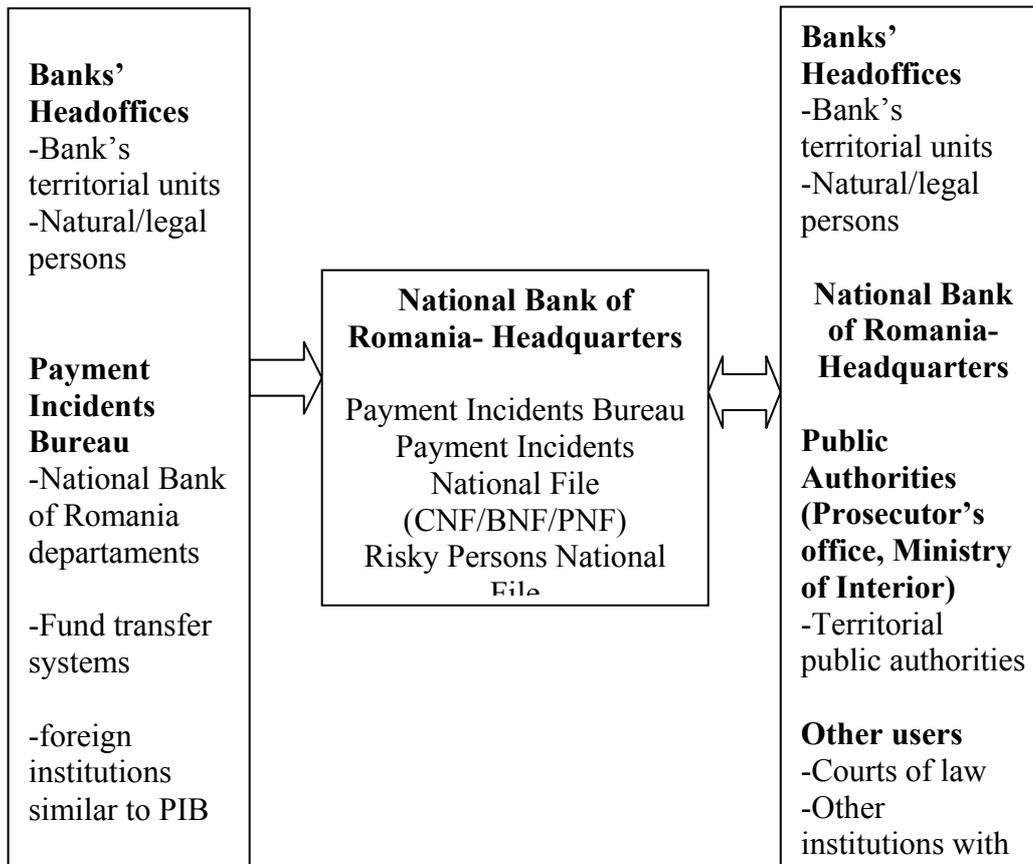
- c) by court, the institutions under letter b), other supervision and control institutions of the state, as well as mass-media based on the data required from the PIB;

- d) by natural or legal persons, other than those under letters a) – c), through banks;

- e) by foreign institutions similar to PIB, on the ground of data concerning payment incidents supplied by the PIB on its own initiative or at the request of these institutions.

Before signing a contract with a partner, a company may consult, through a bank, the PIB's database to verify if the partner is registered as having payment incidents with cheques, bills of exchange or promissory notes. According to the information received from the PIB, the company will be in the position to decide on continuing or ceasing the collaboration with that partner.

Figure 2 Payment Incidents Information Flow



Source: www.bnro.ro/legislatie

The database may be accessed by a trader, through a bank, before receiving a cheque from a partner, in exchange for the sold goods. In this case, the trader is able to find out whether the series and number of the cheque, he is going to receive, is part of the payment instruments approved by the NBR, or the cheque was previously declared to the PIB as lost/stolen/damaged or withdrawn.

When issuing a bill of exchange, the beneficiary may access the PIB's database, in order to get information on the drawee. The beneficiary may grant a commercial loan to the drawer if by the issue date of the bill of exchange the drawee (the person indicated to pay for the drawer) hasn't had any payment incidents with other credit incidents. The same prudent

behaviour may be shown by the beneficiary of a promissory note towards the underwriter as the beneficiary of a cheque towards the drawer.

The information stored in the RPNF on a natural or legal person and the specific analysis done by banks may contribute to making the decision of granting a loan or opening an account for a new client.

2.3 The Bank Deposit Guarantee Fund

The Bank Deposit Guarantee Fund, legal entity subject to public law, has the purpose of repaying natural persons' deposits according to the terms and conditions imposed by law. The Fund guarantees deposits held both by residents and non-residents in domestic or foreign currency.

In case of a bank insolvency, the Fund guarantees the payment in Lei of deposits, irrespective of the currency or the number and size of deposits, within the guarantee ceiling, updated half-yearly with the consumer price index. The guarantee ceiling includes interest on the respective deposits until the date they became unavailable.

The total amount of financial obligation of a bank towards a depositor is established by totalizing all the deposits held by the depositor, including due but not paid interest at the date the deposits became unavailable and by deducting the financial obligations of the depositor to the respective bank.

The Fund pays the compensation within 3 months from issuing the court order for commencement of bankruptcy proceedings, but not later than 3 years from beginning of compensation payments.

2.4. The Credit Information Bureau

In 2004 granting of loans for natural entities increased. Although they do not have money people buy more and more goods, especially household items. Loans can be obtained easily, sometimes an ID being enough, and within a short period of time, in two hours, without an endorser. An instalment could be under 10 Euro making the loan accessible to almost anyone. Due to the granting conditions crediting has increased alarmingly, as the whole banking system and mainly the National Bank of Romania noticed. A lot of Romanian citizens got loans from more than one bank, being unable afterwards to repay. It is eloquent the case of a person who had loans at no less than 10 banks, the total amount of granted money being of 168,000 USD. Creating an institution specialised in managing bank risk was necessary. This

was the point when the Credit Information Bureau, an institution that manages credit risk information, was set up.

Created at the initiative of the Romanian banking system, the Credit Information Bureau has the role to support the credit institutions, forwarding reliable, actualised and consistent information on natural entities who were granted loans by banks or other financial institutions, bought something through leasing, were insured against payment risk or are subscribed users of the mobile or national telecommunication companies.

The Credit Information Bureau began its existence on August 16th 2004 and at present manages positive and negative data received from banks or non-banking institutions.

The activity of the CIB refers to:

- Collecting/processing data regarding the clients- natural entities portfolio of the participants;
- Information/analyses offered to the participants so that they can:
 - Identify and estimate the credit risk;
 - Increase the credits quality;
 - Diminishing the fraud risk and protecting the granters;
- Establishing the scoring criteria;
- Financial and banking counselling;
- Confidentiality;
- Impartiality and correctness;
- Efficiency.

The CIB system develops in three phases:

In the first phase, begun in 16th 2004, the participants submit, daily, in electronic format, information on:

- ✓ Debtors whose payments are overdue more than 30 days
- ✓ Fraudsters – persons who committed a banking fraud
- ✓ Inaccurate or incomplete application forms

During *the second phase* of the system development, the so called “positive phase”, operational from July 11th 2005, the information received from the institutions mentioned above, on all crediting and insurance instruments for natural persons will be processed.

The CIB, through CREDIT – IT system, forwards the information to the participants, on-line, when the information is required. The information is sent within seconds in form of the Credit Report. Also, the CIB forwards at

request, once a year, the registered entities, information that comprises the name of the participant(s) where the registered entities have payment that are overdue.

The third phase is dedicated to developing the scoring, a product that will offer a synthetical image of the debtor, making the crediting decision easier. The calendar of this phase hasn't been established yet. The CIB is an efficient and secure source of information for the participants. This information adds to that the participants have from own sources or other external ones in order to decide whether to start or not a financial relationship with the person.

Similar institutions have proved their efficiency in many countries all over the world. Statistics prove that credit bureaus facilitate access to loans and also helps to reducing payment overdue in the financial and banking system.

3. Conclusion

As a result of the activity of those structures, the expanding crediting process in the Romanian economy hasn't affected the quality of the loans portfolio, the insecure and overdue loans remaining constant.

Although the measures taken by the National Bank of Romania may be considered as 'drastical', they led to cleaning the loans portfolio, to granting performant loans and, the most important, to forming a banking culture.

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EXIMBANK WITHIN THE SLOVAK EXPORT-PROMOTING SYSTEM

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Abstract

To expand foreign-trade relations and exports in particular states developed integrated national systems of export promotion. States – either in co-operation or without co-operation with the private sector – create organizations focused on the functional support to exporting companies (incl. information, advertising and education) and separately organizations for the financial promotion of exports, so called Export Credit Agencies. The Export-Import Bank of the Slovak Republic (Eximbank), representing the latter type of these specialized institutions, offers to the Slovak exporters a wide range of export-financing and insurance products. The article deals with the place of the Eximbank within the Slovak export-promoting system and provides an overview of offered products and the bank's activities in 2004.

Keywords: *export promotion, financial instruments*

1. Introduction

While executing foreign-trade operations, exporting companies have to face a wide range of political, commercial and other risks. In response, a large number of states have established a national export-promoting system in order to eliminate or at least minimize these risks. Financial and informational promotion is a key element of these systems.

The establishment of first export-promoting policies is usually dated to the beginning of the 20th century.^[1] This was closely connected with the creation of Export Credit Agencies (ECAs) that constitute up to this day the basis of the national systems of export promotion. At the end of the 19th century was the international exchange of goods realized through cash payments or through bills of exchange. Taking into account the political and commercial risks, the only considerable risk was that one of the purchaser's failure to pay. The political stability of the contemporary international environment resulting from the balance of powers significantly contributed to the development of the international trade at the end of the 19th century. The World War I represented – as any other military conflict – an enormous source of risks for exporting companies and for economic stability in general. The Great War led to the increase of disbelief among commercial partners, which together with the abolishment of the gold standard resulted in a breakdown of the international exchange of goods.

The economic development after the World War I directly supported the ideas of increasing state interventionism in the area of economic policy.^[2] In relation to export-promoting policies this led to the establishment of ECAs with the objective to cover the risks resulting from the international exchange of goods and services. The need for such institutions appeared for the first time in states whose economies were characterized by a high dependence on international trade. One of the most important moments was the rising awareness of the linkage between exports (or foreign trade) and the domestic economy.

^[1] *Engelhard, J. E.*, Exportförderung: Exportentscheidungsprozesse und Exporterfolg, Gabler Verlag, Wiesbaden, 1992, p.20

^[2] *Kubišta, V., Dvořák, P.*, Postavení a formy proexportní politiky ve světě a v České republice, *Acta oeconomica pragensia*, 1999, No. 1, pp. 99-132

Box 1: Main Establishment Waves of ECAs

Phase	Term	Description
1 st wave	1918 – end of the 1920s	Establishment of first ECAs in developed industrial countries, which were prevalingly dependent on foreign trade, (e.g. Great Britain – 1919, Belgium – 1921, Germany – 1926, etc.) as a direct consequence of the World War I.
2 nd wave	The 1930s	In the aftermath of the 1930s Depression were ECAs founded in other developed economies (e.g., Japan – 1930, Sweden – 1933, USA and Switzerland – 1934, etc.). Export promotion philosophy of this period can be perceived as a result of the prevailing tendency towards state interventionism and protectionism.
3 rd wave	After 1945	This period after the end of the World War II is characterized by a dramatic expansion of ECAs. Their establishment was motivated by the necessity to promote the overall reconstruction of by war-destroyed Europe inter alia through mutual trade exchange. The economies of the increasingly liberalizing world started to benefit again from international trade as a source of economic growth.
4 th wave	From the beginning of the 1990s	Establishment of specialized institutions for export promotion in the countries of Central and Eastern Europe as a consequence of economic transformation. The main incentive behind was the effort to enable the exporting companies to act in at least comparable conditions as enjoy competing businesses abroad.

Source: author

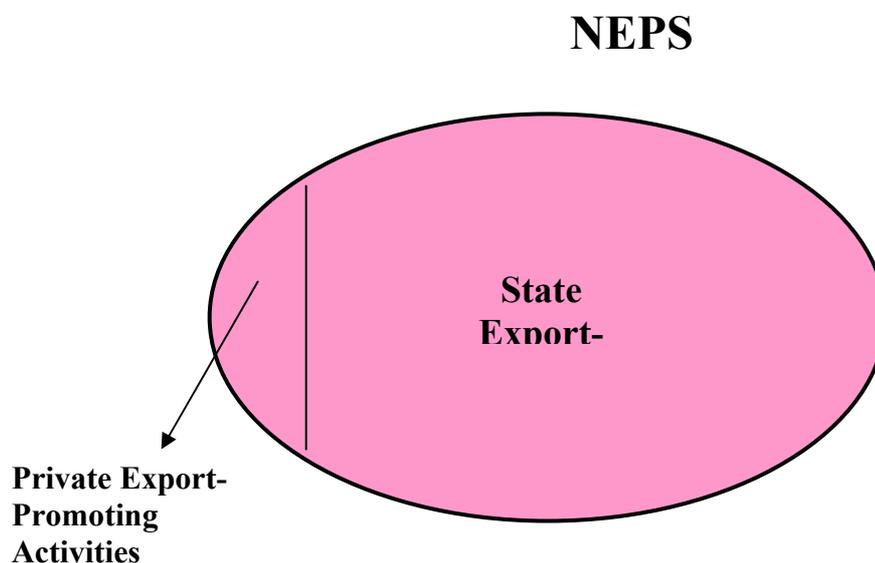
A positive impact on economic performance and employment provided theoretical and practical arguments that allowed the creation of national systems of export promotion. Britain's Export Credit Guarantee Department founded in 1919 in order to provide the companies exporting to risky East-European markets with short-term cash advance was the first in the long line of ECAs in public, private or combined ownership that were established almost in all states in the course of the 20th century. The whole history of national systems of export promotion could be characterized

through four major stages in the context of the 20th century's main political and economic events as it is described in *Box 1*.

2. National System of Export Promotion and Export-Promoting Policy

As we have already indicated, the above-mentioned development lead to the establishment of specialized institutional structures focused on the promotion of exports. State and private activities export-promoting activities together form in every state the national export-promoting system (see Figure 1). Thus it can be defined as a complex of institutions, activities, instruments and measures established and applied with the aim to increase exports.

Figure 1: National Export-Promoting System (NEPS)



Source: author

State activities are within the NEPS defined through the Export-Promoting Policy. It is possible to state in this regard, that every NEPS is a highly unique complex with particular parameters in every country. This special combination of its characteristics is a reflection of a unique economic

and political development in the particular state, its general economic development, economic structure and level of participation in the international division of labour. A distinctive impact has the development level of the private banking and insurance sector, which provides exporting companies with necessary financial services. Its strength usually defines its share within the NEPS. In a country with a weak or underdeveloped financial system it is the state that has to overtake the responsibility for providing these services to the exporting companies. Thus in many countries, including those in Central Europe, the export-promoting policy constitutes the dominant part of the NESP.

But the critical question always is, what actually the export-promoting policy is and how should it be defined. To give an answer we have to begin from a different point. From the viewpoint of the economic theory, all foreign trade theories are consistent in declaring the impacts of the international exchange of goods and services for contributing to the economic growth and welfare. Concerning the active participation of an economy in the international division of labour, certain differences could be observed. While the clear liberal theory is based on the strict application of the laissez-faire principle, other theories accept or even enforce state interventions. Meant are the first of all Keynesian or neo-Keynesian theories and also some neo-liberal theories (e.g., the Theory of the Social Market Economy) that were developed in the 1930s and after 1945. Efforts to succeed on foreign markets request co-ordination of many areas of the economic life. Economic policy is then called to create such strategies and economic conditions that would allow the achievement of a sufficient competitive advantage of the domestic production and its persistent or at least long-term tenability.

The level of economic development and differences in comparative advantages between economies determine the initial position of the national economy in the process of participation in the international division of labour. Modern (export oriented) economic policy is aimed at creating a competitive advantage by means of structural changes in favour of the most promising sectors. The nature of the process of creation of a competitive advantage allows the execution of such development strategies that do not need to be derived from areas in which the economy enjoys, or enjoyed, internal comparative advantages. The promotion of economic development and creation of an optimal economic environment with emphasis on its long-term tenability and competitiveness are also subsequently projected to the areas of the foreign trade policy and of the results in foreign trade.^[3] Furthermore, the state has the opportunity to affect the success of its

^[3] *Baláž, P. et al., Medzinárodné podnikanie, Sprint, Bratislava, 1997, p. 261*

domestic legal entities in the competition with foreign rivals. Additional support can in particular emanate from measures implemented within the fiscal, monetary and financial, social or foreign policies.

Foreign-trade policy, as a part of the economic policy, represents a complex of principles and appropriate means through which the state centrally, directly, wittingly affects the stimulation or weakening of certain development tendencies in the foreign trade.^[4] The application of the foreign-trade policy means and measures leads essentially to the regulation of import or to an increase of the volume of exported goods and services. If the result of the application of such means leads to a growth of export performance or to creation of more favourable conditions for realization of the domestic production on foreign markets, we speak about the export-promoting policy. The policy means that are used for this purpose are called active means of the foreign-trade policy.

Concerning the mutual relation of the export-promoting policy and the foreign-trade policy it is necessary to notice that while the foreign-trade policy affects both the development of the export and import sides of the foreign trade, the export-promoting policy is focused only on positive affection of export. However, by achieving this objective, the export-promoting policy uses not only the instruments of the trade policy but also a number of political instruments, means and measures that wittingly, directly and also indirectly lead to an increase of the volume of exported goods and services.

If all the measures that directly or potentially lead to a growth of the volume of exported goods (and services) should be understood as instruments of the export-promoting policy, it is clear that the traditional approach to the policy is widely exceeded. Export performance could be stimulated through a wide scale of policies, from which, for example, monetary policy, industrial policy, structural policy, regional policy, educational policy, state policy on the field of research and development, etc. can be considered as the most important. Traditional export policy realized by means of fiscal (subsidies), financial, informational and promotional instruments could be then understood as a consequent and necessary form of export promotion.

From the number of possibilities how to categorize the means and instruments of the export-promoting policy we can mention the most usual one – the division of all relevant instrument into:

- Financial
- Functional

^[4] *Lipková, L.*, Medzinárodné hospodárske vzťahy, Sprint, Bratislava, 2000, p. 95

Financial instruments usually include export financing instruments (export credits incl. refinancing credits) and insurance instruments (export credit insurance against risks in foreign trade, reinsurance and sometimes also state guarantees). States (when speaking about the official export promotion) establish either one or two (or even more) specialized financial institutions to offer these services. i.e. we can find one institution covering both financing and insurance services within the NEPS or two different institutions covering these two types of financial instruments separately.

Due to the relatively strong regulation of export promotion in form of financial instruments through international agreements (e.g., GATT, Consensus OECD, etc.), informational and promotional support – or the functional services – to exporters enjoys an increasing degree of importance. At the same time an increasing involvement of the state – through a network of official commercial representations – could be observed, too. Economic diplomacy (sometimes also called commercial or trade diplomacy, diplomacy in the marketplace, etc.^[5]) represents, as an organic and inseparable element of the whole diplomatic activity of the state, a specific performance of relevant national institutions for international commercial relations and their representatives in relation to foreign subjects and is aimed at the realization of objectives and tasks of the official foreign-trade policy.^[6] Since export promotion belongs to traditional objectives of the foreign-trade policy, economic diplomacy is according to the above-mentioned definition an important instrument of the export-promoting policy.^[7]

3. Slovak National System of Export-Promotion

The system of export promotion in the Slovak Republic is a direct successor of the former federal system of export promotion that was established at the beginning of the 1990s in Czechoslovakia. The process of economic transformation towards a market economy was accompanied by the establishment of an institutional framework with the objective to execute the tasks of the state export-promoting policy. In charge of the issues related to foreign trade was the Federal Ministry of Foreign Trade that co-ordinated activities falling under economic diplomacy. In order to provide exporting companies with advanced financing possibilities, the Export Guarantee and

^[5] *Knapik, P.*, Hospodárska diplomacia alebo ekonomický rozmer diplomacie, Ekonomický časopis 48, 2000, No. 2, pp. 228-242

^[6] *Tóth, L.*, Protokol a etiketa v diplomacii a obchode, THB, Bratislava, 1994, p. 9

^[7] For more on Economic Diplomacy see e.g. *Rusiňák, P.*, Klasická verzus hospodárska diplomacia. In. Hospodárska diplomacia v 21. storočí. Bratislava: Ekonóm 2005, pp. 124-130

Insurance Company was founded. This institution was focused on export credit insurance against territorial and commercial risks. After the establishment of two independent successors in 1993 this company remained in the ownership of the Czech Republic and a new company was immediately founded in Slovakia – the Slovak Export Credit Insurance Company (SPE).

Great attention was given to foreign trade issues during the following years. Foreign trade policy of the newly independent state counted from beginning with a developed institutional framework for the promotion of the expansion to foreign markets. Ministry of Economy that was and still is in charge of foreign trade affairs in the Slovak Republic established a network of Trade and Economic Departments at diplomatic missions. In 1996 was the Foreign Trade Promotion Fund (FPZO) established with the objective to make the export promotion more effective with its linkage to business circles. The Fund was funded both from the state budget and from contributions of exporting companies. A parallel network of official commercial representations was created under its guidance. The idea behind was the application of solidarity principle among exporting companies when big exporters helped to promote internationalisation of small companies. Fund's sources were used mainly for activities that required higher costs at once.

In 1997 started its activities the Export-Import Bank of the Slovak Republic replacing the former SPE. It seemed then that the export-promoting policy as a part of the state's foreign-trade policy has the appropriate institutional framework for the realization of its extensive objectives. Although limited through the shortage of resources that characterizes all economies in transition, the export-promoting policy enjoyed the free space without any significant regulation, e.g. from Brussels. Unfortunately, it has come again to some systemic changes. From 1999 to 2002 were priorities in the area of export promotion set by the "Complex Programme of Export Promotion" adopted by the government in 1999.^[8] Main activities were divided into three areas of financial, monetary and price policies, regional policy and of institutional organization with annual actualisation with reference to the development of foreign trade.

The Programme counted with the establishment of a new agency that would cover both areas of export and investment promotion. In consequence, the Slovak Investment and Trade Development Agency (SARIO) was founded and the activities of the Fund were damped at the same time starting

^[8] Government of the Slovak Republic, Government Decree No. 499/1999

with the dissolution of its representation network abroad.^[9] This represented a serious weakening of the existing informational and promotional system, as economic departments at diplomatic missions consisted in the majority of cases of one diplomat and the new agency was established without any institutional network abroad. This problem was formally eliminated in the following years after the heads of Trade and Economic Departments were appointed as representatives of SARIO, but the network of official commercial representations remained understaffed. The lack of budgetary resources became the strongest argument against any major personal consolidation of the official representation network and the few cases were in general compensated by the termination of diplomatic missions in some territories. In comparison with extensive plans of the Complex Programme 1999-2002 it might seem to be an at least contradictory decision.

The Complex Programme of Export Promotion was in the time of its implementation more than a simple export promotion “action plan”. As implies the above-mentioned scope of main activities, its expected impact was considerably wider. It also included activities in the areas of foreign investment promotion and tourism, which naturally exceed the export-promoting policy. Despite their indisputable impact on balance of payments, their inclusion into one partial economic policy makes this harder to manage and thereby less effective. The need to coordinate the development of all economic sectors related to international exchange of goods and services prevailed over the necessity to define the export-promoting policy in a way that would allow its effective management. The development after parliamentary elections in 2002 led to a less extensive definition of the export-promoting policy, but the previous merger of export- and investment-promoting systems resulted in favour of the latter with the decision to put a higher priority on the attraction of foreign direct investments.

4. Eximbank within the Slovak NEPS

The Export-Import Bank of the Slovak Republic (Eximbank) is a part of the state system of pro-export policy. Pursuant to Act No 80/1977 Coll. on the Export-Import Bank of the Slovak Republic it is charged with supporting the export and import activities of domestic importers and exporters by financing export credit, insurance of export credit with the aim of supporting the growth of foreign trade and increasing the competitiveness of domestic

[9] For more on SARIO see e.g. *Grešš, M.*, SARIO. In: Almanach 2002. Bratislava: Ekonóm 2003, pp. 18-25

products. It means that Eximbank is a type of specialized institution that covers both main areas of financial export promotion – export financing (or banking) and insurance services – under one roof. Performance of the Slovak export support function means that as regards the activity of Eximbank the primary criterion is not profit maximization, but the maximum volume of supported export with the concurrent ensuring of a return of funds by minimizing risks resulting from credit, financial and insurance activities.

Eximbank in its activity fully respects rules of the OECD Consensus, concerning state-supported export credits, and complies with the principles of the World Trade Organization. It complies with the rules ensuing to Slovakia from its membership in the EU and participates in the preparation of regulatory rules. It also respects regulations focused on evaluating the impact of the supported export on the environment in the importer's country, as well as directives related to the fight against corruption.

The role of the Eximbank includes as follows:

A. Banking Activities

- Refinancing Loans

- current interest rate 5.0% p.a. (+max. 3% p.a. margin from a commercial bank)
- maximum 1 year repayment schedule

- Direct Loans

- Bill of exchange and promissory note-based loans
- Discounting of exporters short-term accounts receivable
- Guarantees and bonds

- contract bonds
- counter guarantees
- payment guarantees

- **Support of Small and Medium Enterprises (SME's)**

- Bill of Exchange and promissory note based loans for the support of SME's
- lower interest rates (5.0% +max. 3% a commercial bank margin)
- bill of exchange based loans up to 1 mil. USD for a period not exceeding 12 months
- for a short term loan of 3-6 months it is possible to finance a specific contract up to the limit on the receivable for that contract

- Discounting of exporters short-term accounts receivable
 - minimum value of the discounted receivables is 10 000 USD
 - repayment period is 30 to 180 days

B. Insurance products

- Insurance of short term export credits
 - against commercial risk
 - against political risk
 - against combined risk
 - insurance of production risk
- Insurance of export guarantees
- Insurance of a confirmed irrevocable export documentary letter of credit
- Insurance of medium and long term export credits
 - insurance of suppliers credit against political and commercial risk
 - insurance of buyers credit against political and commercial risk
 - insurance of production risk
- Insurance of the foreign investments of Slovak legal entities abroad

5. Eximbank in 2004

Eximbank in 2004, through its banking and insurance activities, supported exports worth 66.9 billion SKK, where this figure exceeded budgeted expectations (60.5 billion SKK) by 10.62%.^[10] Banking activities contributed to this volume in the amount of SKK 48.2 billion, where the figure for insurance activities was 18.7 billion SKK. In comparison with 2003, export support for Slovak businesses by Eximbank grew by 12.3 billion SKK (22.51%). According to preliminary data from the Statistics Office of the SR, Eximbank supported 7.5% of the total export of the Slovak Republic. Eximbank's priority in 2004 was again to endeavor to provide a maximum volume of export support, with a concurrent improvement in the efficiency of its own operation.

^[10] Annual Report 2004. Bratislava: Eximbanka SR 2005.

Direct financing of clients of Eximbank accounted, as at 31.12.2004, for SKK 454 776 thousand, and comprised discount loans to clients. Besides credit activities, Eximbank supported exports also by means of guarantees issued, achieving at the end of 2004 the level of SKK 2 106 227 thousand. Against the preceding year this figure represents an increase of SKK 1 081 838 thousand (105.61%), which was connected with the replacement of a part of discount loans by guarantees issued.

In 2004 Eximbank operated primarily on its own funds, which according to the Act on Eximbank comprise registered capital, funds and retained profit, totaling 4 588 275 SKK thousand, and entrusted funds in the amount of 1 694 236 000 SKK. Compared to 2003 the volume of own funds grew by 2 106 000 SKK, the balance of entrusted funds did not change. Likewise as in 2003, in 2004 Eximbank again succeeded in acquiring external funds on the money market, the balance of which at the end of the year reached 268 901 000 SKK. These resources were used exclusively for financing export-supporting loans.

Table 1: Overview of Eximbank's Selected Indicators

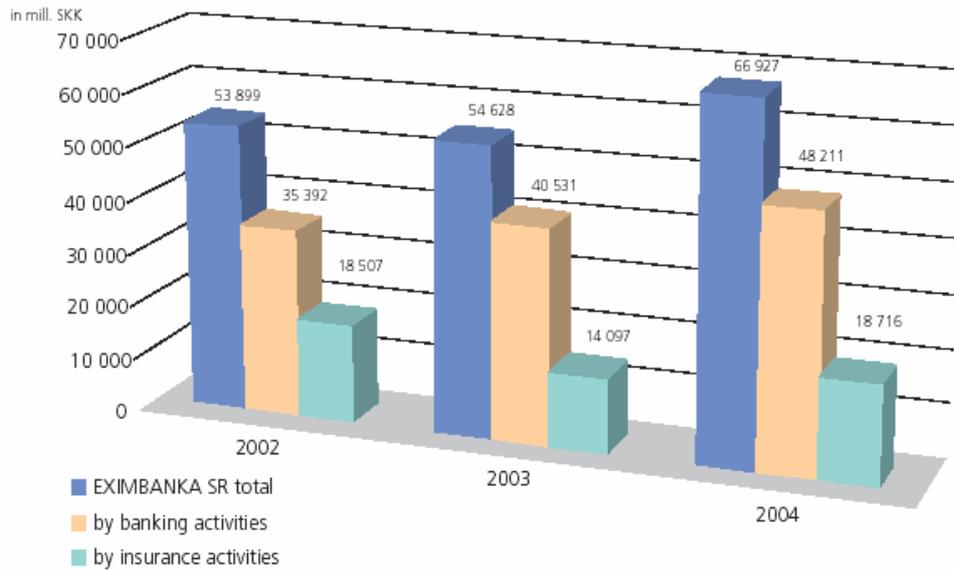
	2002	2003	2004	Index 2003/2002	Index 2004/2003
Export supported by EXIMBANKA SR (in mill. SKK)	53 899	54 628	66 881	101,3	122,4
of which: – by banking activities	35 392	40 531	48 211	114,5	118,9
– by insurance activities	18 507	14 097	18 716	76,2	132,8
Registered capital (in mill. SKK)	3 000	3 000	3 000	100,0	100,0
Balance value (in mill. SKK)	7 920	7 187	7 368	90,7	102,5
Total volume of credit in nominal value * (in mill. SKK)	4 470	5 735	5 402	128,3	94,2
Total volume of guarantees issued (in mill. SKK)	1 612	1 024	2 106	63,5	205,7
Level of insurance risk underwritten by EXIMBANKA SR (in mill. SKK)	11 290	11 664	13 906	103,3	119,9
Number of employees	104	88	80	84,6	90,9
General operating costs (in mill. SKK)	142	124	115	87,3	92,7
Profit after taxation (in mill. SKK)	138	96	50	69,6	52,1
Capital adequacy (in %)	97,78	167,65	124,97	171,5	74,5

Source: Eximbank's Annual Report 2004

In 2004 Eximbank supported exports worth 67 billion SKK, representing a 22.51% increase on 2003 through its banking and insurance activities. This value comprised export support via banking operations in the volume of 48 billion SKK (an increase of 18.95%) and insurance activities in the volume of 19 billion SKK (an increase of 32.77%).

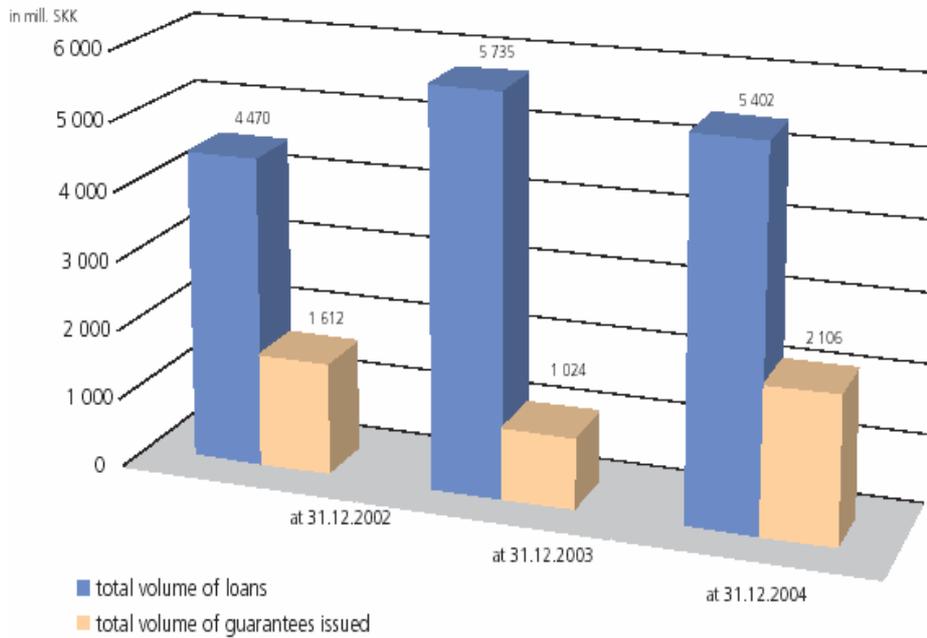
The total volume of credit activities as at the end of 2004 reached 5 402 million SKK, which represents a decrease of 333 million SKK on 2003, i.e. 5.8%. A fall in the total volume of loans was connected mainly with a decline in the balance of discount credit to clients, when a part of discount credit was replaced by guarantees issued. The total volume of guarantees issued to clients as at 31.12.2004 was 2 106 million SKK, representing a year-on-year increase of 1 082 000 SKK, i.e. of 105.61%.

Figure 2: Export Supported by the Eximbank in 2002-2004 (in mil. SKK)



Source: Eximbank's Annual Report 2004

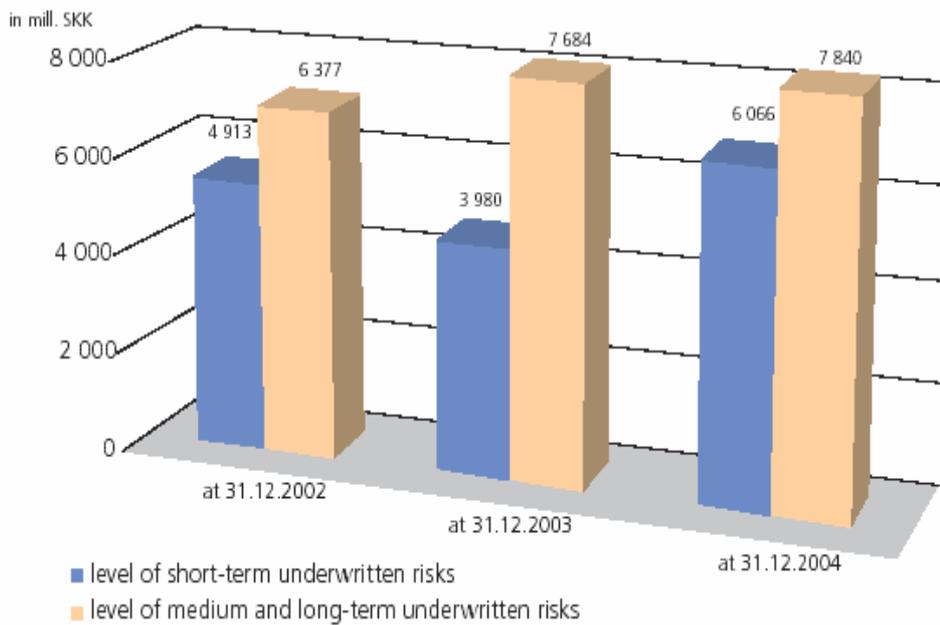
Figure 3: Total value of credits and guarantees granted in 2002-2004



Source: Eximbank's Annual Report 2004

The total amount of short-term underwritten risks at the end of 2004 totaled 6 066 million SKK. This is a 2 086 million SKK growth on 2003, i.e. an increase of 52.41%. The share of underwritten risks in the insurance of medium and long-term risks represented 7 840 million SKK, which is a year-on-year increase of 156 million SKK, i.e. an increase of 2.03%.

Figure 4: Underwritten risks 2002-2004



Source: Eximbank's Annual Report 2004

In looking at the results for the past year it may be said that the year 2004 saw further development in the field of banking products supporting Slovak exports. The amendment to the Act on Eximbank allowed a more flexible adaptation of the Bank's products to market conditions, in particular where this concerns the especially price of financing made more advantageous and the regulation of credit and guarantee conditions. The SR's membership in world economic groupings created opportunity for cooperation with foreign credit and insurance agencies (ECAs), as well as the acceptance of the institution on some foreign financial and capital markets.

The main product, with a continually growing trend in 2004, continued to be refinancing loans. Favorable development was recorded not only in the case of corporate clients, but also in the SME segment, in the provision of discount loans, in the field of approved and provided guarantees, where guarantees are from the long-term aspect becoming a core product of Eximbank. As regards loan products, Eximbank focused mostly on refinancing loans, i.e. short-term refinancing of operating capital of up to one year, transacted via commercial banks by means of a tripartite contractual credit agreement between the client, the commercial bank and Eximbank. By means of discount loans we supported exports worth 2 572 million SKK of which approx. 400 million was formed by the SME segment by way of

repurchasing receivables. Export support by insurance activities of Eximbank in 2004 amounted to 18.7 billion SKK, of which 93% represents export support from insuring marketable risk and 7% from insuring non-marketable risk. In 2004 the Eximbank insured export credits to 52 countries.

6. Conclusion

The Eximbank showed in 2004 the ability to adapt to new circumstances related to the accession of the Slovak Republic to the EU and also to the trends and requirements of the business sector. For the closest future, further capital strengthening is necessary. This can enable the Eximbank to reach the desired level of supported exports, what is in our opinion necessary especially with regard to the small and middle enterprises sector. Another proposal for the future activities of the Slovak Eximbank might be the establishment of consulting services as one of the major activities alongside the banking and insurance services to exporters. Unfortunately, this kind of services are suppressed in the competent institution – SARIO – as this is focusing almost completely on investment promotion and attracting foreign direct investments and thus there is no complex package of services for exporting companies. Eximbank, with its competence in financial services and having the analytical basis anyway, might then cross over to the functional export promotion.

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