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One Approach to Risk Management in SMEs Banking

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The purpose of this paper is to investigate the key determinants of relations between banks and small and medium-sized enterprise segment (SME) in the context of SME banking value chain and credit risk management. Due to a limited number of sources of financing, SMEs often opt for cooperation with the banking sector. On the other hand, most of the banks form separate departments for the cooperation with the SME segment, not only in the field of credit, but also in the field of various advisory services offered by banks. The paper draws on SME financing and banking management literature and discusses conceptual models of credit risk management. The research finds that the stability of the banking sector is greatly influenced by the condition and development of the entire financial system of a country, so it is essential that banks take into account the liquidity and adequate resource policy. Bank performance depends on the chosen way of generating revenue (amount of profit), the required quality of assets (risk level) and the defined level of efficiency in operations (operational expense). The findings of the paper highlight the importance of risk management and the complexity of the credit analysis function in banks, as well as provide an overview of quantitative methods for measuring credit risk.

Keywords: Small and medium-sized enterprises (SMEs), Risk management, Credit risk measurement, The SME value banking chain, Credit analysis

1. Introduction

SMEs create the market which is an important part of any economy. The most common criteria for the classification of companies include the number of employees, the volume of annual revenues, the value of assets on the balance sheet, as well as the ratio of borrowed and own funds. SMEs and entrepreneurs represent the most efficient economy segment of most economies worldwide and make the largest contribution to the increase in employment, gross added value and turnover. Their role is particularly important in countries in transition which are faced with problems of high unemployment, low level of economic activity, insufficient competition and lack of investment, and where large inefficient state-owned enterprises are still present. The social role in absorbing surplus labour generated in the processes of transition and ownership transformation of state-owned and socially-owned enterprises is also evident. Their characteristics, such as size, flexibility, propensity for innovative and risky ventures, and greater opportunity for specialization, enable these enterprises to adapt much easier than large business systems to continuous changes in consumer demand and business conditions in the global market. In this way, SMEs encourage the strengthening of competition, which results in the improvement of the quality of products and services as well as in lower prices, innovations and development of new technologies, and the growth of the national economy in general.

Survival, growth and development of small and medium-sized enterprises are primarily determined by funding opportunities from favourable sources. Limited access to the sources of finance, both on the money market and the capital market, especially in terms of prices and conditions of use, is perhaps the most important feature and issue for these companies. In an effort to provide the necessary funding, companies are facing the following dilemmas: should the investments and business development be financed from own resources or borrowed resources; how much capital should be obtained from loans; should the capital be provided by banks and other financial institutions, on the securities market, or by attracting formal or informal

investors; and what is the desired capital structure? Depending on the objectives of growth and development, the stage in the life cycle, the financial status, the nature of business activity and the investment structure, the stability of cash flows, the relationship to risk management and the availability of certain resources, companies decide to obtain capital from one or a combination of funding sources, while aiming for the optimal capital structure.

2. Theoretical background

In academia, it is a common opinion that large and foreign banks are generally not interested in investing in SMEs, while on the other hand, small banks which are focused on a specific niche are more motivated to overcome the problems which arise within SMEs. Torre et al. (2010) have shown that there are no sufficiently plausible arguments for this claim, and that banks find SMEs to be highly profitable clients. In addition, regardless of the size of the bank, the practice has shown that they are striving to maintain long-term relationships with the SME segment, especially in emerging markets. Financial experts argue that the constraints of SMEs in financial terms are very strong, representing the main potential of credit institutions.

Large banks, as well as foreign universal banks are leaders in the banking industry, as they are operating under the laws of economy of scale. In addition to having developed mechanisms for analysis and control of the clients, large banks are capable of developing products and services for the specific needs of SMEs. However, in recent years there has been an increase in the number of specialized banks which do business with only one market segment. The research of Torre et al. (2010) indicates that, despite the strengthening of relations between banks and companies, there are still limited opportunities in developing countries for key products, such as loans secured by adequate collaterals, and loans that have long-term fixed interest rates indexed in the local currency. Hanedar, Broccard and Bazzana (2013) investigated the characteristics of the collateral of SMEs in emerging markets. Regarding the type of collaterals, it was shown that the specific features of a loan applicant are significantly more important than the characteristics of the country of their origin. This research emphasized the importance of credit risk which a specific loan applicant brings, as well as the level of transaction costs compared with the characteristics of the underlying collateral. Menkhoff et al. (2012) state that companies in the developing countries are less interested in loans that they require collaterals, supporting the results of the research with the fact that they do not have enough high-quality collaterals, and that they have access to relatively expensive sources of funding and insufficiently attractive credit terms.

The World Bank has conducted a research on the business environment and the performance of SMEs in Eastern Europe and Central Asia. The results show that high demands for collateral are the third factor influencing the decision of the company not to apply for loan financing. The first two reasons are related to high interest rates and complicated procedures, which are also very time-consuming. The results of this study can be found in the Niinimäki (2009) paper. In addition, Berger et al. (2011) emphasize that, in emerging markets, it is very difficult to obtain relevant quality assessment of the collateral, and that a high risk occurs due to information asymmetry. According to Bartoli et al. (2013), the information that banks use can be described as "hard" and "soft". Hard information includes various quantitative data that banks obtain from the data in the financial reports or collateral offered by the loan applicant as security. Soft information is related to qualitative data, and their main source is the personalized relationship between banks and clients. It is evident that the soft information is more difficult to collect and there is a higher probability of errors, but the aforementioned group of authors believes that it is this information that presents a competitive advantage of the small banks relative to the large ones. They explain this attitude by the fact that small banks are more focused on their clients, that they meet specific requirements better, and that, in this process, they obtain valuable data of insufficiently transparent companies more easily.

3. The key determinants of relations between banks and SME sector

One of the main characteristics of small and medium-sized enterprises is a limited access to the necessary sources of finance for starting, surviving and developing the business. Throughout their lifecycles companies have different financial needs, which is why a stable banking sector is one of the basic conditions nec-

essary for the growth and development of the company. Developing countries are often accompanied by underdeveloped financial markets, which is why the only way of raising external funds is through bank loans.

In recent years, there has been an increase in the number of research papers dealing with the role of trust in relations between banks and SME segment. The econometric results have shown that the relationship between banks and small and medium-sized enterprises cannot be displayed in tabular form, as trust increases the number of soft and hard information available to managers. In addition, the company as well as bank managers, make decisions more effectively when a high level of confidence is achieved between them. The importance of trust is mostly reflected in situations when a bank approves a loan to micro enterprises even though they often do not have the documentation required by the bank. Furthermore, trust contributes to the proper behaviour of financial entities, and plays an important role in reducing agency problems, moral hazard, adverse selection and transaction costs (Nooteboom et al., 1997, Lewicki et al., 1998). The SME sector clients' loyalty to a certain bank facilitates business to both parties. A firm's performance and long-lasting relationships increase risk-adjusted profitability. Also, banks are not required to offer their products and services below cost in the fight for market share and have the ability to earn additional profit from the development of small and medium-sized enterprises. Small, local banks often contribute to better risk management in the SME sector, so their advisory function ensures economic stability (Fredriksson, A., Moreau, A., 2014). In the past, banks had an aversion to supporting small and medium-sized enterprises, and some of the reasons are high credit risk, lack of adequate collateral, high transaction costs, inadequate investment projects submitted for consideration, and unreliable financial statements.

Casey and O'Toole (2014) have conducted a research on the relationship between the SME segment and alternative ways of financing, caused by the rigorous rules and restrictions set by the banks. The authors came to the conclusion that small and medium-sized enterprises are turning to informal loans, loans from other companies, market funding and grants, if these methods of financing are available. The relationship between banks and the SME segment is particularly complicated in developing countries, given the lack of diversified financial institutions, undefined standards and procedures, and entrepreneurs' insufficient experience. Today, however, more attention is paid to small businesses, as is evidenced by the fact that certain banks have separate departments specializing in SME. It is also important to note that fiercer competition in the banking market has a positive effect on the availability of credits to small and medium-sized enterprises, as well as on the flexibility of the restrictions in contracts which banks offer (Chang et al. 2013). In addition, if the competitiveness of the banking sector is high, small and medium-sized enterprises will offer collaterals of lower quality, which automatically improves their bargaining position in relation to the banks (Voordeckers, Steijvers, 2006). Research has shown (Shen et al., 2009, Berger et al., 2002) that a banks' total assets are not the most important criterion when deciding whether or not to finance small and medium-sized enterprises. What affects the commercial banks' decision to lend their funds to the SME segment is: competition, detailed plans and appropriate legal action.

Starting from the standard methodology of specialized institutions, theoretical assumptions and their own practice, a bank should develop its own analytical base (matrix) for the credit analysis of companies that will help them to:

- form the documentary basis for credit analysis,
- execute the analysis of the existing placement and
- avoid the risk of non-performing loans (credit risk) in credit activities.

4. SME banking value chain

To frame the discussion of how banks approach the challenge of serving SMEs, a standard banking value chain framework will be used. This framework consists of five discrete stages and one cross-cutting task. The five stages of this banking value chain are (1) understanding the market, (2) developing products and services, (3) acquiring and screening clients, (4) serving clients, and (5) managing information and knowledge. Cutting across each of these five stages is the permanent and critical task of risk management. At each stage of the value chain, there are actions and considerations particularly relevant to the SME sector.

Table 1: SME banking value chain (World Bank Group, 2010)

Risk management				
Understand the SME market	Develop products & services	Acquire & screen SME clients	Serve SME clients	Manage Information & knowledge
<ul style="list-style-type: none"> • Define the SME sector • Research SME needs & preferences • Sub-segment the market 	<ul style="list-style-type: none"> • Design & bundle lending and non lending products • Ensure profitability of product offering • Develop SME-specific lending technologies 	<ul style="list-style-type: none"> • Market product & service offering to clients • Build a growing & diversified portfolio • Distinguish profitable from unprofitable prospective clients 	<ul style="list-style-type: none"> • Meet the needs of existing clients • Cultivate new business through cross-selling • Use teams organized for front & back-end servicing • Monitor loans 	<ul style="list-style-type: none"> • Model & manage risks using portfolio data • Use current customer data to adapt service approaches • Analyze & respond to profitability data at segment, product & client levels

The World Bank group (2010) suggests the following observations from the five value chain stages: understanding the market is critical and serves as a foundation to being able to address the unique needs of SMEs, non lending products should not be overlooked, as they may generate more revenues than SME loans, a bank’s current portfolio is a critical potential source of new business, segmenting service approaches can help banks balance customer service and operating cost concerns, and effective information management means knowing how to maximize the use of IT systems.

5. Challenges along the SME banking value chain – credit risk management approach

Risk management represents one of the most difficult tasks in the banking industry, especially when taking into consideration informational asymmetries which characterize the SME banking sector. Besides the importance of credit, market, strategic and operation risks, special attention in this paper will be paid to the credit risk and the risk of high costs for providing services. The credit risk is related to the bank’s inability to collect the debt and the interest within the agreed time frame. Limited information sources are forcing banks to require additional insurance such as different collaterals whose value depends on the assessed risk and the amount of the wanted resources. (Beck et al., 2008) claim that more than 80% of the loans for the SMEs in emerging markets are insured.

Regarding the banking sector, despite the vigorous expansion of innovation in the financial services sector at the turn of this century, credit risk is still the main reason of the insolvency of banks. The explanation for this should be sought in the fact that in contemporary conditions over 80% of a bank’s balance sheet, in general, refers to this aspect of risk management in banking (Greuning van H., S. Brajovic – Bratanovic, 2003). At the same time, the share of certain types of credit risk varies from bank to bank – natural person risk, company risk and country risk. From the point of view of a bank’s potential losses, credit risk is perhaps the most important of all risks as it directly affects the fundamental banking activity. It is understood that the relative importance assigned to the risk of certain financial operations depends on the scope and development of a country’s financial market, as well as the fragmentary structure of financial intermediaries. Better developed markets provide a more complete risk analysis methods as well as broader insurance possibilities due to a larger number of entities in the financial market, the possibility of speculative transactions, and specific forms of regulating credit operations of banks, other financial intermediaries and businesses (Dabić et al., 2013). Credit risk requires a managing mechanism that is ready for the worst case scenario, even in the conditions of economic stability. The Basel standards and central banks promote the importance of risk management and thus contribute to a higher quality of the investment environment, especially when it comes to developing countries.

Implementation of these steps depend on several factors, such as the informational system the bank is using, as well as recognizing the first indicators of credit risk appearance. The following basic indicators of the credit risk must be taken into consideration: irregular payments, frequent changes of the loan terms, unusually high interest rates, incomplete documentation collected by a client, poor quality collaterals, lack of reports and cash flow forecasts, as well as the client's reliance on non-renewable sources.

For each of the abovementioned phases, the methodology developed by the World Bank (2010) suggests adequate approaches to managing credit risk. The first stage of the banking value chain is an adequate understanding of the market needs. In order to diversify their portfolios, banks need to permanently analyze the market and client's preferences, where the following techniques can be implemented: surveys, a direct insight into the company's business transactions and the interaction with the employees of the particular firm. In this phase, quantification of risk in target market by leveraging existing bank data is of great importance. Efficient credit risk management also demands segmentation of the SME market by risk profile and improvement of predictive capabilities by collecting information on local SME success factors.

In order to expand its market share and strengthen its position on the SME market, a bank has to update its offer and attract new clients, where a loyal and long-standing relationship is of major importance. Common approaches to risk management related to development of new products and services include loan pricing models tailored for a particular client risk profile, innovative forms of collateral and prioritization of non lending products in order to establish a closer relationship with customers.

A broad body of evidence has shown that some banks would take high risks when financing SMEs without having an adequate collateral. If such contracts are made with several clients, it can be stated that diversification is achieved, but in the case of disproportional increase in the number of unsecured loans during the expansion period, the bank is losing control. A long-term cooperation with clients from the SME sector provides a stable income with the tendency to increase and is an excellent source of desired information. The suggested approaches to credit risk management related to the third phase of SME banking value chain include lending to current clients first, implementation of internal scoring methods for loan assessment and more rigorous underwriting by separation of sales from credit approval.

Banks serving SMEs have found ways to cost-effectively meet and even capitalize on the unique demands of SMEs. This task can be done by using direct delivery channels, segmenting and redefining relationship management, and turning demands into opportunities through cross selling. Dedicated staff and provision of advisory services related to cash flow management for clients are most common credit risk management approaches.

Information and knowledge management in banks represents the fifth stage of the banking value chain. This process is facing two main challenges: developing the infrastructure (tools and systems) to collect and analyze information, and developing the capacity (skills and processes) to turn information into knowledge and adjust operations accordingly. In order to use the knowledge potential, a bank should have a portfolio check and risk analysis. Client relations management and profitability analyses are crucial steps in running a good business. In order to manage credit risk more efficiently, it is necessary to establish centralized teams that will be responsible for monitoring the loan data for risks, for the implementation of early warning systems and for the integration of data into credit policies. Credit risk management process in this phase can be also improved by the usage of portfolio data in order to customize credit risk scoring models.

5.1. Overview of quantitative methods for measuring credit risk

Credit risk is very difficult to measure with certainty, and the situation is easier for the banks operating in the most developed financial markets due to the fact that with the emergence of a secondary market for bank loans it has become easier to read the price of loans. Internal and external rating schemes are still very common but are prone to subjectivity and inaccuracy, as are all qualitative methods for ranking credit risks.

Table 2: Comparative Structure of the Main Models (Servigny and Renault, 2004)

	Credit Metrics	Credit Portfolio View	Portfolio Risk Tracker	Portfolio Manager	CreditRisk +
Definition of risk	Change in market value	Change in market value or default losses only	Change in market value	Default losses	Default losses
Credit events	Downgrade/ Default	Downgrade/ Default	Downgrade/ Default and spread changes	Default	Default
Includes interest rate risk	No	No	Yes	No	No
Risk drivers	Country and industry factors	Macro factors	Country and industry factors	Factors through asset values	Default rates
Transition probabilities	Constant	Driven by macro factors	Constant	Constant	N/A
Numerical approach	Simulation	Simulation	Simulation	Simulation	Analytic

Generally speaking, portfolio models can be split into two categories: analytical models and simulation-based models. Analytical models provide precise solutions to the loss distribution of credit assets by giving some simplifying assumptions. The main advantage of analytical models is that we can receive results very quickly, although those results usually come at the cost of many strict theories about the drivers of default. On the other hand, the main idea underlying simulation-based models is to approximate the true distribution by a large number of scenarios. These models are flexible and valuable, but also very complex and dependent on computers. In a survey of 41 large international banks, Brannan, Mengle, Smithson and Zmiewski (2002) report that more than 80% of banks use one of the models listed above in their estimation of credit risk.

The five most popular models used within the international banks, which measure credit risk at the level of financial instruments and total portfolio, are: CreditMetrics, Credit portfolio view – CPV, Portfolio Risk Tracker, KMV Portfolio Manager and Credit Risk +. All five models are used to predict the occurrence of uncollectable receivables and to determine the correlation of the cases of debtors' defaults.

The CreditMetrics was published in 1997 by JP Morgan Bank, and is based on the analysis of historical data on the average frequency of credit transitions from one credit rating group to another within the matrix of ratings. As it is very difficult to assess the value of the debtor's assets, the debtor's share prices are used for the purpose of simplification which can significantly affect the accuracy of the results. CreditMetrics consists of two processes which determine the risk values for each financial instrument and the values at portfolio level. In this way the effects of portfolio diversification are explained, as well as the changes in portfolio value which lead to a reduction in the number of uncollectable receivables.

The consulting firm McKinsey & Co. defined a model based on the evaluation of the portfolio, which leads to evaluating the effect of macroeconomic factors on the rate of defaults in a given sector. Variables that are commonly used are the growth of gross domestic product or industrial production, interest rates, exchange rates, and unemployment rates. The condition for the application of the approach based on Credit portfolio view (CPV) is a properly updated database. Although this information is relatively easy to obtain, the developing countries which have underdeveloped financial markets often have problems in securing the data to the rating agencies, which represents a major drawback of this model. In addition, the weakness of the CPV approach is related to the fact that it only defines the aggregate probability of default, neglecting the probability of default at the level of individual borrowers.

The Portfolio Risk Tracker is Standard & Poor's rating-based model. The main characteristics of this model are that it is a dynamic model and that it includes stochastic spreads which gives the possibility to capture the three sources of credit risk: defaults, transitions and changes in spread. This allows Portfolio Risk Tracker to analyze products such as credit derivatives and CDOs and calculate credit value at risk linked with those securities.

The KMV Portfolio Manager model was introduced by the KMV Corporation, which specializes in credit risk analysis. The expected frequency, i.e. probability of default, is a function of a company's capital structure, the level of volatility of return on assets and the current value of the company's assets. The process of default is seen as a result of the deterioration of the debtor's assets value. The first step is the assessment of the market value and volatility of the company's assets, followed by the calculation of the time distance to the moment of default. In the third phase, the time distance to default is balanced against the actual probabilities of default, using their own database of default (Srvigny, 2004).

CreditRisk + was introduced into practice in 1997 by the Credit Suisse First Boston (CSFB) and is based on actuarial approach. This means that when measuring credit risk, historical rates of default which are recorded by the statistics for different classes of loans are used, while the assumptions about causes of default are not used in this model. In addition, CreditRisk + does not associate the risk of default with the structure of the company's capital, ignoring changes in the prices of securities, as well as the movement of borrowers from one credit rating category to another. The essence of this model is defining the percentage number of debtors in a given sector who will be in a position to default and whether it will lead to a default at the level of the overall portfolio. The first phase measures the frequency of cases of default, while the second phase analyzes the distribution of losses during a default.

Table 3: Strengths and Weaknesses of Main Models (Servingy and Renault, 2004)

	Credit Metrics	Credit Portfolio View	Portfolio Risk Tracker	Portfolio Manager	CreditRisk +
Type of credit risk covered	Defaults and transitions	Defaults and transitions	Defaults and transitions	Defaults	Defaults
Interaction of market and credit risk	None	None	Included via interest and exchange rates and equity prices	None	None
Correlation of default events	Explicit via risk factors and idiosyncratic term Has to rely on accuracy of mapping between factor and default correlations				Not explicit

Conclusion

In recent years, financing of SMEs has attracted a lot of attention and has become one of the main topics for economists and regulators who are working on economic and financial development strategies. One of the reasons for the great interest in this segment is the fact that most businesses are small and medium-sized, and they employ a significant number of people. In addition, practice has shown that it often happens that small employers eventually become large. The majority of banks have organized a special department for cooperation with the SME segment, not only in the field of credit, but in the light of the various advisory roles which banks can offer as one of their services.

Considering all the aforementioned, and for the purpose of achieving adequate profits with cost efficiency and minimizing credit risk, a bank first needs to define a strategy that corresponds to its capacity and the chosen market segment. Successful banks are focusing on the structure of operations, human resources and software support, whereas risk management is an area where, due to its importance and complexity, constant improvement is required. In favor of further research on this subject, this paper frequently mentions that in spite of vigorous expansion of innovations in the financial services sector, credit risk is still the main reason for the insolvency of banks.

The Basel standards and central banks promote the importance of risk management and thus contribute to a higher quality of the investment environment, especially when it comes to developing countries. This is also corroborated by the models used to measure credit risk at the levels of financial instruments and total portfolio. However, the appropriate strategy, constant risk control, with an emphasis on credit risk, and business continuity are the backbone of the success of each bank.

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