

# CLUSTER IMPACT ON COMPANY CREDITWORTHINESS: CASE OF LATVIA

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## Abstract

*One of the leading driving forces of every state economy is small and medium enterprises (SME). In Latvia, SME accounts for 99.7% of the national industrial system, creating 70% of the national value added. The lack of sufficient capital and credit is often a major problem for the development of SME, particularly in their early growth stages. The main criterion and quality indicator of credit risk assessment is the borrower's creditworthiness. Before issuing a loan, the checking of the borrower's credibility and solvency is carried out. The assessment of the borrowers' ability to pay, their creditworthiness at a definite moment must be connected with the ability to meet their liabilities in the future.*

*The objective of the paper is to provide analysis on the development of Latvian government supported SME clusters and test the author's hypothesis about the dependence of a company creditworthiness on its membership in a SME cluster.*

*Persistent market fragmentation, weak industry-research linkages and insufficient cooperation indicate that clusters in Latvia do not always have the necessary critical mass and innovation capacity to face global competition sustainably and to be world-class. The creditworthiness measurement methodology applied by these the authors did not prove any correlation between the membership of a firm in a cluster and its credit risk decrease, apparently other financial indicators (value of assets, capital etc.) are more significant. Improvement of these indicators will decrease the credit risk of a firm more considerably than membership in cluster organizations.*

**The type of the article:** Research report.

**Keywords:** cluster, creditworthiness, cluster support policies, small and medium enterprises.

**JEL Classification:** J58, L16, O41, R38, M19.

## 1. Introduction

One of the leading driving forces of every national economy is Small and Medium Enterprises. In Latvia, SMEs account for 99.7% of the national industrial system, creating 70% of the national value added (Central Statistical Bureau databases, Market Sector Economically Active Statistical Units by Size Group in Statistical Regions in Latvia in 2011). The recent crisis heavily affected SMEs and highlighted one of the modern economic imperatives for SMEs – the need for collaboration in order to survive and successfully compete. In the modern economic environment SMEs need to establish collaborative links with other SMEs, operating in the same industrial sector and region, thus forming business networks and clusters.

The objective of the paper is to provide analysis on the development of the SME clusters supported by the government of Latvia and test the author's hypothesis on the dependence of company creditworthiness on its membership in a SME cluster. The task of the paper is to present the case study of creditworthiness assessment of a company which belongs to the Latvian Electronics and Electrical Engineering Industry Cluster and a company which is outside the cluster.

Clusters, i.e. geographically co-located end-producers, suppliers, service providers, research laboratories, educational institutions and other institutions in the given economic field, are important drivers of dynamic regional economies. Recent trends in management, such as the focus on core activities/competencies and the move towards open innovation have increased companies'

reliance on partners in close proximity (Europe Innova, 2007). The above-mentioned findings suggest that cluster initiatives could be more efficient than traditional entrepreneurship support policies, as cluster policies not only support the creation of new companies, but also their growth and competitive advantages. The modern global economy is described as a knowledge-based economy with knowledge being the most important resource and learning being the most important process.

With cluster initiatives and other cluster-based economic policies being increasingly common across the EU Member States, there is a growing demand for a systematic assessment of their impact. Individual countries, for example, Austria, and groups of European regions, for example, Catalonia, Sweden and Yorkshire, have already initiated such efforts. However, there would be a huge advantage from designing and organizing such a monitoring effort from a central and neutral position (European Commission, 2007). Due to their fragmented nature, the existing cluster policies may be considered to be in their early stage of development. As various clustering activities and concentrations of firms have been identified across sectors, a thorough impact assessment is required to validate the best path forward.

Latvia regained independence in 1990 and implemented many structural economic reforms before joining the EU. However, there is still a big gap between Latvia and developed EU countries in terms of cluster development. One of the reasons is the previous planned economy regime heritage, when industries were located in accordance with the Moscow plan rather than the regional labor force concentration. In 1999-2002 the PHARE project investigated the potential for clusters in Latvia and identified four potential sectors two of which – IT and forestry – currently have functioning organizations, compared to Sweden, which has roughly 38 regional clusters with significant specialization levels and minimum levels of absolute size (Lindqvist *et al.*, 2003). According to the research findings, the following sectors of the Latvian economy were recognized as sectors having cluster development potential: IT, forests, machine building, and composite materials (Vanags, 2007). Thus, in comparison with Europe, Latvia has undeveloped clusters and needs to exploit cluster initiatives in order to support cluster development to achieve sustainable long-term development.

The EU PHARE support for cluster development activities has had several significant results, such as an increased understanding of the importance of clusters and their development, facilitating mutual co-operation among players of different sectors, and initiating the development of long-term activities and objectives of mutual co-operation. From the analysis of the cluster development processes in Latvia and the role of clusters in the economic development of Latvia, it is apparent that the role of clusters has not yet been fully recognized and understood. Today, with a changed government composition, this policy is regarded with scepticism, as the return from the idea was poor for such a big investment. One of the reasons for such scepticism is perhaps the misconception of what a cluster is and what it should be used for. The government (and society) today understands that a cluster is related to the creation of an institution/ association where members actively collaborate, especially to export (Orlovs, 2012).

By exploiting clustering initiatives SME may develop new products, educate employees and increase their competitiveness. However, every cluster initiative requires co-financing from the SME side. It is seldom that an SME has spare resources to finance a new R&D initiative therefore other kind of financing is necessary. One of the possible solutions is the bank loan or loan from a venture capitalists. In order to apply for a bank loan SME has to demonstrate proper creditworthiness.

The lack of sufficient capital and credit is often a major handicap to the development of SMEs, particularly in their early growth stages. One of the first steps to be made to gain additional capital from banks or some other financial lender, is the evaluation of the company's ability to repay the potential loan fully and in due time or the forecasting of the company's creditworthiness. The notion "creditworthiness" can be defined as a presumed ability to meet the agreed deadlines related to repaying the credit and the interest accrued without affecting the vitality of the borrower (Zelgalve, 2004). The repayment process should be based on the income received in the process of

the borrower's usual activity, without affecting its financial situation, financial results or other business entities.

The analysis of the creditworthiness involves the preliminary study of the factors and prerequisites, which can adversely affect the duly repayment of the credit.

Creditworthiness, by definition, is the willingness and ability to repay debt (c.f. Stiglitz & Weiss 1981; S&P 2006). At its most rudimentary level, creditworthiness is a probabilistic judgment of an entity's likelihood of default. Creditworthiness, therefore, is a useful tool to measure a firm's success. Social scientists frequently use creditworthiness to empirically measure both the firm strength and the relationship between the firm and the state (Borensztein *et al.*, 2009; Block & Vaaler, 2004; Balkan, 1992). From the perspective of political science, it is well established, that creditworthiness is as much a function of political risk as it is of economic and/or financial risk (Brewer & Rivoli, 1990).

It is believed that creditworthiness depends on several major factors: the borrower's efficiency, his reputation, his capacity for profit making, the value of his assets, the state of the economic situation, his profitability, etc. Firstly, the commercial bank determines the efficiency of its client. The client's reputation is of great importance when taking the decision for extending a credit. During the assessment process one can use information referring to the repayment of previous loans. It is widely accepted that if the client has been precise then there is a good reason to expect that he will be precise in this deal too. Profitability is also of importance when assessing creditworthiness. The profits made are the main source used to repay the extended loan. The assets, owned by the borrower, are an important factor in analysing creditworthiness. This property is seen as a possibility to secure the debt.

Latvian economist Zēgalve (2004) has interpreted the notion 'creditworthiness' from two positions – that of a bank and that of a customer. From the point of view of a bank, creditworthiness is the forecast of the customer's ability to repay the potential loan fully and in due time. From the customer's point of view, creditworthiness can be determined in two ways: as the ability to credit its debtors or "creditability" and as the ability to receive and repay a loan from outside or the "loan ability". Over the second part of 20<sup>th</sup> century several ways and methods have been developed for the evaluation of a company's creditworthiness.

In the accounting based credit-scoring systems, the creditworthiness is analysed by comparing various key accounting ratios of potential borrowers with the industry or group norms. When using multivariate models, the key accounting variables are combined and weighted to produce either a credit risk score or a probability of default measure. If the credit risk score, or probability, attains a value above a critical benchmark, a loan applicant is either rejected or subjected to increased scrutiny.

While in many cases multivariate accounting based credit-scoring models have been shown to perform quite well over many different time periods and across many different countries, they have been subject to at least three criticisms. First, these models may fail to pick up more subtle and fast-moving changes in borrower conditions, i.e., those that would be rejected in capital market data and values. Second, the world is inherently non-linear, consequently, the linear discriminant analysis and linear probability models may fail to forecast as accurately as those that relax the underlying assumption of linearity among explanatory variables. Third, the credit-scoring bankruptcy prediction models, are often only tenuously linked to an underlying theoretical model. As a result, there have been a number of new approaches – most of an exploratory nature, that have been proposed as alternatives to the traditional credit-scoring and bankruptcy prediction models.

A class of bankruptcy models with a strong theoretical underpinning are the "risk of ruin" models. At its simplest level, a firm goes bankrupt when the market (liquidation) value of its assets (A) falls below its debt obligations to outside creditors (B). Models of this type can be found in (Wilcox, 1973; Scott, 1981; Santomero & Vinso, 1977).

The second, newer class of models, with strong theoretical underpinnings, are those that seek to impute implied probabilities of default from the term structure of yield spreads between the

default-free and risky corporate securities. An early version of this approach can be found in Jonkhart (1979) with a more elaborate version being presented by Iben and Litterman (1989).

The third, capital market based, model is the mortality rate model of Altman (1988, 1989) and the aging approach of Asquith *et al.* (1989). These mortality default rate models seek to derive actuarial-type probabilities of default from past data on bond defaults by credit grade and years to maturity.

The fourth, newer approach, is the application of the neural network analysis to the credit risk classification problem. Essentially, the neural network analysis is similar to the non-linear discriminant analysis, in that it drops the assumption that variables entering into the bankruptcy prediction function are linearly and independently related.

## 2. Method

In order to test the authors' hypothesis the creditworthiness of two above-mentioned companies was calculated based on the five "Cs" method. One of the most generic methods is American economist Saunders and Allen's (2002) defined expert method - the five "Cs" of credit, which yields sufficient understanding of creditworthiness. Within the method the expert analyses these five key factors, subjectively weights them, and reaches a credit decision:

1. *Character*. A measure of the reputation of the firm, its willingness to repay, and its repayment history. In particular, it has been established empirically that the age of a firm is a good proxy for its repayment reputation.
2. *Capital*. The equity contribution of owners and its ratio to debt (leverage). These are viewed as good predictors of the bankruptcy probability. High leverage suggests a greater probability of bankruptcy.
3. *Capacity*. The ability to repay, which reflects the volatility of the borrower's earnings. If repayments on debt contracts follow a constant stream over time, but earnings are volatile (or have a high standard deviation), there may be periods when the firm's capacity to repay debt claims is constrained.
4. *Collateral*. In the event of default, a banker has claims on the collateral pledged by the borrower. The greater the priority of this claim and the greater the market value of the underlying collateral, the lower the exposure risk of the loan.
5. *Cycle (or Economic) Conditions*. The state of the business cycle; an important element in determining credit risk exposure, especially for cycle-dependent industries. For example, durable goods sectors tend to be more cycle-dependent than nondurable goods sectors. Similarly, industries that have exposure to international competitive conditions tend to be cycle-sensitive.

In addition to these five "Cs," an expert might take into account the level of interest rates. As it is well known from the economic theory, the relationship between the level of interest rates and the expected return on a loan is highly nonlinear (Stiglitz & Weiss, 1981). When interest rates are at "low" levels, the expected return could increase if rates are raised. However, when interest rates are at "high" levels, an increase in rates may lower the return on a loan. This negative relationship between high loan rates and expected loan returns occurs because of adverse selection and risk shifting. When loan rates rise beyond some point, good borrowers drop out of the loan market and prefer to self-finance their investment projects (adverse selection). The remaining borrowers, who have limited liability and limited equity at stake, have the incentive to shift into riskier projects (risk shifting). In good times, they will be able to repay the bank. If times turn bad and they default, they will have a limited downside loss.

This method was chosen as the most generic and proper solution for the case study needs – all comparisons are executed just between two companies and evaluations do not require any complicated mathematical models.

Other methods used are systematic, logical and comparative analysis of scientific literature, analysis of statistical data, case study and expert method by interviewing Cluster Managers.

### 3. Research

In order to test the authors' hypothesis on the dependence of a company creditworthiness on its membership in a SME cluster, the authors conducted a case study of creditworthiness assessment of a company which belongs to the Latvian Electronics and Electrical Engineering Industry Cluster and a company which is outside the cluster.

The authors studied the Top 500 Latvian company list for year 2010 (TOP 500 – Latvijas lielākie uzņēmumi 2012) and chose the top 10 electronic manufacture companies in order to select 2 companies for the case study, see Table 1.

**Table 1.** TOP 10 Latvian electronic manufacturing companies, by turnover, 2012, th. LVL

| Rank | Company                           | Activity  | Turnover |
|------|-----------------------------------|---|----------|
| 1    | Mikrotikls SIA                    | Wireless equipment                                    | 37.15    |
| 2    | Lexel fabrika SIA                 | Electro installation connectors                       | 18.17    |
| 3    | SAF Tehnika AS                    | Voice and data radio link                             | 10.90    |
| 4    | Axon Cable SIA                    | Electronic cables                                     | 10.41    |
| 5    | Z-Light SIA                       | Optical cables  | 4.22     |
| 6    | Hanzas elektronika SIA            | Electronic PC boards                                  | 3.74     |
| 7    | Sidrabe AS                        | Vacuum deposition equipment                           | 2.40     |
| 8    | Regula Baltija SIA                | Equipment for authenticity control of security papers | 2.29     |
| 9    | Alfa RPAR AS                      | Microelectronic components                            | 2.00     |
| 10   | Baltic Scientific Instruments SIA | Analytical equipment                                  | 1.53     |

Source: Journal TOP 500 – Latvijas lielākie uzņēmumi, Laikraksta dienas bizness pielikums, SIA Poligrāfijas grupa Mūkusalā, 2012, pp. 83.

From the list above 3 potential pairs of companies were chosen, based on a comparable turnover:

- a) SAF Tehnika AS - Axon Cable SIA;
- b) Z-Light SIA – Hanzas Elektronika SIA;
- c) Sidrabe AS – Regula Baltija SIA.

The next step was to test the companies' membership in any of the Latvian clusters, thus discovering the unique pair, which responds to the authors' criteria. The Latvian Electronics and Electrical Engineering Industry Cluster was contacted and its member list was obtained (LETERA unpublicised data), showing that SAF Tehnika, Hanzas Elektronika and Regula Baltija are the cluster members. Due to the fact that SAF Tehnika AS is a public company, but Axon Cable SIA is a daughter company of a large international concern, the authors excluded this pair of companies from the case study. Z-Light SIA is the member of the NanoTechEnergy cluster; therefore it is not possible to compare it to Hanzas Elektronika SIA. The only pair that fully met the authors' criteria was Sidrabe AS and Regula Baltija SIA, on which authors conducted the case study.

Sidrabe AS designs and manufactures vacuum deposition equipment. Regula Baltija Ltd core activity is the production of devices for the authenticity control of security papers, IDs, passports, banknotes and driving licences. The key financial figures of both companies are stated in a Table 2.

**Table 2.** Key financial figures for Sidrabe AS and Regula Baltija SIA, 2009-2011, th. LVL

|                     | Sidrabe AS |       |       |       | Regula Baltija SIA |       |       |       |
|---------------------|------------|-------|-------|-------|--------------------|-------|-------|-------|
|                     | 2008       | 2009  | 2010  | 2011  | 2008               | 2009  | 2010  | 2011  |
| <b>Turnover</b>     | 4 504      | 2 241 | 2 397 | 3 925 | 1 657              | 1 600 | 2 294 | 4 173 |
| <b>Net Profit</b>   | 44         | 9     | 16    | 217   | 128                | 109   | 90    | 239   |
| <b>Capital</b>      | 1 122      | 1 130 | 1 452 | 1 669 | 230                | 339   | 428   | 567   |
| <b>Cash</b>         | 70         | 451   | 2 665 | 1 035 | 40                 | 114   | 98    | 290   |
| <b>Fixed assets</b> | 563        | 566   | 528   | 507   | 703                | 686   | 640   | 522   |
| <b>Debt</b>         | 1 642      | 71    | 40    | 51    | 652                | 653   | 1 027 | 963   |

Source: Lursoft data, Authors compilation.

In order to test the authors' hypothesis the creditworthiness of the two above-mentioned companies was calculated based on the methodology described in the METHOD chapter of the paper – the five “Cs”. This method was chosen as the most generic and proper solution for the case study needs – all comparisons are executed just between two companies and evaluations do not require any complicated mathematical models.

1. Character or reputation of the firm. From the reputation standpoint, company Sidrabe can be rated better than Regula Baltija. Sidrabe was registered in the register of Latvian enterprises in 1991 and has been running its business already for 22 years. Regula Baltija was established in 2005 and this year will celebrate only 8 years since the start. Sidrabe owns 4 patents for different inventions and products and is mentioned in more than 20 scientific papers. Starting from year 2007, Sidrabe together with the University of Latvia has been offering a sponsorship program, providing scholarships for successful students in the field of physics.

Regula Baltija is not involved in any kind of scientific activities, the company does not own any patents and has not been mentioned in scientific periodicals.

Both companies have certified their activities in accordance with ISO standards and are mentioned in the country's TOP of the largest electronics manufacturers. As in the TOP list the companies are ranked by the amount of their turnover, Regula Baltija holds the 6<sup>th</sup> position, but Sidrabe 8<sup>th</sup> position.

2. Capital. In terms of capital Sidrabe is definitely better capitalized than Regula Baltija, both in terms of absolute figures (Sidrabe capital is twice larger than Regula Baltija) and in terms of leverage, Sidrabe has almost no debt, but Regula Baltija is exposed to rather high leverage. This might be explained by the different approaches towards the leverage from the companies' shareholders. As it seen from the key figures on 2008, the companies were leveraged, but as the main shareholder of Sidrabe is the venture capital fund New Century Holding with over 3 billion USD of capital under management, the strategy decision towards the deleverage was made.

3. Capacity. Both companies operate in business-to-business segments with long term contracts and partners, thus insuring themselves against the volatility in earnings. As all the other economies, the Latvian economy was hit by the crises and the companies' turnover decreased in 2009, however, the successfully chosen business model and niche allowed to increase their turnover in the period from 2009 to 2011, all years in a row. The companies had chosen different growth strategies – Sidrabe developed a spin-off - GroGlass - a producer of anti-reflective coatings on glass that are designed specifically for the Architectural, Photovoltaic, Horticultural, Art Framing, and Technical markets. Regula Baltija established a daughter company in Russia, which positively influenced Regula Baltija revenues in 2011. In terms of the payment discipline, Sidrabe took a more conservative approach by mostly relying on customer prepayments for the manufactured products. Both companies were profitable all years in a row in the analyzed period, but as Sidrabe has larger capital (1 669 thousand LVL versus 567 thousand LVL), more cash (1 035 thousand LVL versus 290 thousand LVL) and almost no debt (51 thousand LVL versus 963 thousand LVL), the capacity of Sidrabe to repay a possible loan might be evaluated higher. 4. Collateral. The authors were not able to access trustful information about the companies' collateral, therefore assumptions were

made that in case of credit liability companies would use their fixed assets and future cash flow as a collateral. From this perspective the value of fixed assets of both companies are quite the same, Sidrabe holds long term investments amounting to 530 thousand LVL and Regula Baltija investments amount to 514 thousand LVL. From the fixed assets perspective a better situation is in Sidrabe, the value of their fixed assets accounts for 507 thousand LVL, while in Regula Baltija it is only 368 thousand LVL. From the future cash flow perspective company Sidrabe holds a better position as well as at the end of 201 their cash balance was 1.03 million LVL, while in Regula Baltija it was only 332 thousand LVL. Taking into account this evaluation, from the collateral perspective Sidrabe has a better capacity, than Regula Baltija.

5. Cycle (or Economic) Conditions. Both companies operate in the same country and in the same sector of the national economy, so the authors presume that this indicator for Sidrabe and Regula Baltija is identical.

Taking into account the analysis made above the authors have assigned weights to every of the five “Cs” elements in order to compare the creditworthiness of both organizations. The results are summarized in Table 3. The creditworthiness was evaluated in the scale where 0 - weak impact, and 5 - strong impact.

**Table 3.** Evaluation of five “Cs” in companies Regula Baltija and Sidrabe

|                                     | <b>Sidrabe AS</b> | <b>Regula Baltija SIA</b> |
|-------------------------------------|-------------------|---------------------------|
| Character or reputation of the firm | 4                 | 3                         |
| Capital                             | 4                 | 3                         |
| Capacity                            | 4                 | 3                         |
| Collateral                          | 4                 | 3                         |
| Cycle (or Economic) Conditions      | 4                 | 4                         |
| <b>Total score:</b>                 | <b>20</b>         | <b>16</b>                 |

From what was stated above the authors conclude that Sidrabe has better creditworthiness than Regula Baltija and the fact that Regula Baltija is a member of the Latvian Electronics and Electrical Engineering Industry Cluster does not have an impact on the creditworthiness Regula Baltija.

#### 4. Discussion

The development of SME clusters supported by the government of Latvia is an important imperative in establishing the competitive advantage of Latvia as a country and in increasing its export. The lack of sufficient capital and credit is often a major handicap in the development of SME, particularly in their early growth stages. The main criterion and quality indicator of credit risk assessment is the borrower’s creditworthiness. The authors tested the hypothesis about the dependence of a company creditworthiness on its membership in a SME cluster.

From the conducted research the authors concluded that clusters and cluster organizations indeed add value in terms of technology and knowledge transfer and foster collaborative relationships between suppliers and clients. They do establish a close link among SMEs, large companies and R&D institutions and can thus help to overcome the lack of knowledge sharing and persisting information asymmetries in the innovation sector.

Persistent market fragmentation, weak industry-research linkages and insufficient cooperation indicates that clusters in Latvia do not always have the necessary critical mass and innovation capacity to sustainably face the global competition and be world-class.

The fact that many new cluster initiatives have appeared in Latvia over the last few years indicates that enterprises have acknowledged their importance and the co-operation opportunities they provide.

Creditworthiness measurement methods have developed dramatically over the last 20 years in response to a number of secular forces that have made its measurement more important than ever before. Among these forces there has been the worldwide structural increase in the number of

bankruptcies, more competitive margins on loans and dramatic growth of off-balance sheet instruments with inherent default risk exposure, including credit risk derivatives.

Academics and practitioners alike have responded to these forces by developing new and more sophisticated credit-scoring/early-warning systems, new models for pricing credit risk (such as the risk adjusted return on capital models) and models for better measurement of the credit risk of off-balance sheet instruments.

The creditworthiness measurement methodology applied by the authors did not prove any correlation between the membership of a firm in a cluster and its credit risk decrease, apparently other financial indicators (value of assets, capital etc.) are more significant. The improvement of these indicators will decrease the credit risk of a firm more considerably, than its membership in cluster organizations.

One of the possible solutions for addressing the creditworthiness issue of SME is to create mutual guarantee associations within clusters – solidarity groups formed by small enterprises without access to credit. These associations have the potential to overcome adverse selection and moral hazard in lending and to act as driving forces behind entrepreneurial development. Well-implemented credit guarantee schemes can improve small enterprises' access to credit and assist the integration of small enterprises in the formal financial market.

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