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LIQUIDITY RATIOS AS PREDICTORS OF ORGANIZATIONAL DECLINE: EVIDENCE OF THE EASTERN CROATIA

POKAZATELJI LIKVIDNOSTI KAO ČIMBENIK UPOZORENJA NA PROBLEME U POSLOVANJU: NA PRIMJERU ISTOČNE HRVATSKE

ABSTRACT

Problems in business are present long before bankruptcy procedure is initiated, whereas methods for bankruptcy prediction provide reliable results in a short term period – up to three years, which is most often too late for a company to be saved. Therefore company management boards and stakeholders strive to recognise latent business problems as early as they arise so that they could start business changes as soon as possible.
The aim of this research is to analyse liquidity ratios as the factor of influence on assessment of business decline, that is, problems in business operations.
Research methodology is based on descriptive and inferential statistical analysis of financial reports of the studied companies to warn about the influence.
Empirical research of financial reports of large companies in Slavonia and Baranja in the period from 1999 to 2008 and statistical analysis of results led to the conclusion that only some of the analysed liquidity ratios are of key importance in warning about business decline. A decrease of the current liquidity within one year does not indicate that the company is in crisis, but it warns about problems in business that need to be acknowledged and eliminated to maintain successful performance.

Key words: *Liquidity ratios, organizational decline, organizational change, Eastern Croatia*

SAŽETAK

Problemi u poslovanju postoje duže vrijeme prije odlaska u stečaj, dok metode predviđanja bankrota daju sigurne rezultate na kratki rok – do tri godine, što je najčešće prekasno za spašavanje poduzeća. Stoga uprave poduzeća i dionici teže što ranijem prepoznavanju latentnih problema u poslovanju kako bi što prije mogle započeti s promjenama u poslovanju.
Cilj istraživanja je analiza pokazatelja likvidnosti kao čimbenika utjecaja na ocjenu slabljenja poslovanja odnosno problema u poslovanju poduzeća
Metodologija istraživanja temeljena je na upotrebi deskriptivne I inferencijalne statističke analize financijskih izvještaja proučavanih poduzeća upozorilo se na utjecaj .
Empirijskim istraživanja financijskih izvještaja velikih poduzeća Slavonije i Baranje u razdoblju od 1999. do 2008. i statističkom analizom rezultata zaključilo da su samo neki od analiziranih pokazatelja likvidnosti ključni u upozoravaju na slabljenje poslovanja. Jednogodišnji pad pokazatelja tekuće likvidnosti ne ukazuje da je poduzeće u krizi, već upozorava na postojanje problema u poslovanju koje treba što prije uočiti i otkloniti kako bi se nastavilo uspješno poslovanje.

Ključne riječi: *Pokazatelji likvidnosti, slabljenje poslovanja, organizacijska promjena, Istočna Hrvatska*

1. Introduction

The issue of monitoring, exploring and evaluating problems in company performance, its influence on assessing problems in business operations, and through this its usage value in scientific and professional literature has so far mostly been covered from the management's point of view, i.e. problems were solved instead of being prevented. The aim of the research in this paper is to identify financial liquidity ratios that provide warning about decline (problems) in company performance. In the process of achieving the aim of this research the term **business problems** is defined as failure of a company to adapt to demands of the environment and to carry out the associated metamorphosis of its own resources.

The aim of the research is to analyse liquidity ratios as the factor of influence on the assessment of business decline, i.e. problems in business operations. Constraints that appear in the model development have been emphasized by applying statistical tools, i.e. specific qualities of financial reporting and characteristics of business operations of Croatian companies. Namely, the studied problems of business decline are primarily based on internal accounting reports that are monitored on a monthly basis. The aim of the research is to prove that liquidity ratios can indicate business decline before crisis is recognised in business based on annual reports.

2. Research Aim and Methodology

Studying the literature referring to business issues and changes within a company as well as timely adjustment of business operations and making of business decisions adjusted to business issues makes it possible to prevent crisis, i.e. possible bankruptcy. The aim of the research is to prove the following key research hypothesis:

H-1: Liquidity ratios influence assessment of business decline, i.e. issues in business operations.

The above hypothesis implies the following auxiliary hypotheses that are synthesized as follows:

1. Cash ratio (1) influences evaluation of business decline.
2. Quick ratio influences evaluation of business decline.
3. Current ratio influences evaluation of business decline.
4. Cash to current assets influences evaluation of business decline.
5. Cash and cash equivalents to current assets influence evaluation of business decline.
6. Working capital influences evaluation of business decline.
7. Working capital to total assets influences evaluation of business decline.
8. Financial stability indicator influences evaluation of business decline.

3. Research Methodology

The first studies of business decline go back to the 30-ies of the 20th century (Fitzpatrick, 1936). Research went in two directions: (1) bankruptcy prediction research (going concern assumption) in the 60-ies of the same century, such as research by Beaver, Altman, etc.; and (2) business decline preceding bankruptcy.

In most research studies decline is studied as the first of at least three phases of decline (FitzPatrick 1934 & 1936, Miller 1977, Hambrick & D'Aveni 1988 & 1989, Fopp 1989, Guy 1989, Weitzel & Jonsson 1989, Argenti 1977), studying the decline process itself and warning about the possibility of a turnaround. Research in the field of business decline is present in the literature of the 1970-ies, but also of the end of 1980-ies. Inability to develop a research of business decline beyond the

conceptual model is reflected in the first appearance of the so-called soft indicators that cannot be quantified in financial reports (especially annual reports). Therefore researchers make recommendations for company managements to apply the above conceptual models by monitoring changes within the company on a monthly basis during the minimum period of five years (Saloma, 1985) to prevent problem escalation, thus preventing the need for hiring crisis management.

3.1. Empirical Study

In the empirical part of the research, effort was made to point out the effects of business decline through liquidity ratios by analysing gathered annual financial reports. To achieve research goals, a research was conducted on the analysis of annual financial reports of companies in Slavonia and Baranja during a ten-year period (1999 to 2008). Statistical analysis of gathered data was carried out by means of a statistical software IBM SPSS ver. 19.0.

In addition to descriptive statistical analysis by means of which business performance of the observed companies was presented, multivariate statistical analysis methods were used to examine the latent connections among variables (factor analysis). Primary goal of descriptive research methods, i.e. normative research methods is to understand complex meaning of many different discreet events. Descriptive or normative approach was used to explore studied cases that require application of observation techniques as the main method of data gathering.

3.2. Sample Formation

Research was conducted in 2012, and it encompassed financial reports of 20 public joint stock companies in Slavonia and Baranja, in the period from 1999 to 2008. The sample was selected from the database of the Public information library of the Croatian Financial Services Supervisory Agency [17] and Fina's Public announcements – GFI (annual financial reports)[18].

The sample of 20 companies was formed by extracting, filtering and formatting data, satisfying the following criteria in the process:

1. Entrepreneur does not operate in the sector of financial institutions and insurance companies;
2. In the database of the Public information library of the Croatian Financial Services Supervisory Agency there are financial reports for the company for the studied period (ten years – from 1999 to 2008);
3. The seat of the entrepreneur is in Slavonia and Baranja (counties: Osijek-Baranja, Vukovar-Srijem, Požega-Slavonia, Virovitica-Podravina and Brod-Posavina county).

The first criterion was established because of the different nature of business of companies operating in the sector of financial institutions and significant differences in the structure of assets and ratio values that cannot be compared to ratios of companies in other sectors. The second criterion was established according to approach of relevant authors (Hambrick & D'Aveni, 1988, 1989) who used the observation period of ten years in their research. Further, the studied entrepreneurs have been operating for a long period of time (more than 30 years) so they can be described as Type 3 – mature entrepreneurs with problems according to Argenti (1976).

The next step divides entrepreneurs in two subsamples based on data published in financial reports for 2010 – Successful entrepreneurs and Unsuccessful entrepreneurs. Indicators chosen as selective indicators in this research are successful performance for successful entrepreneurs (realised profit and existence of retained earnings) in 2010, and growth of loss carried forward, including initiated bankruptcy procedure, for unsuccessful entrepreneurs.

[17] http://www.hanfa.hr
[18] http://www.fina.hr

SUCCESSFUL ENTREPRENEURS (USPJ 1)→ retained earnings > 0
UNSUCCESSFUL ENTREPRENEURS (USPJ 0)→ retained earnings < 0

In the process of model development, logistic regression was used with several prerequisites: (1) sample size, (2) multicollinearity and (3) non-typical points. Research was conducted on a sample of large entrepreneurs from Slavonia and Baranja from six successful and 14 unsuccessful entrepreneurs. Constraints that arose during model development can be divided into constraints arising from application of certain statistical tools and constraints arising from specific qualities of financial reporting in Croatia. Constraints in research that occurred due to application of certain statistical tools include:

1. Changes in the form, content and applied methodology of used data – content and form of financial and business reports is prescribed by the Bylaws on quarterly financial and business reports [19] amended in 2003[20], which was adopted by the Securities Commission and changes in the Accounting Act[21] and the Bylaws on the structure and content of annual financial reports (GFI)[22]. Namely, modifications of the Bylaws and the Act resulted in changes of report positions that entrepreneurs are required to publish.
1. Possible violation of normal distribution assumption;
2. Possible violation of homogeneity of covariance matrix assumption;
3. High disproportion between the share of successful and unsuccessful companies in the sample.

Constraints in the research related to specific qualities of financial reporting include:

1. Application of the historical cost principle in recording of business transactions;
2. Arbitration and application of the fair value principle in acknowledging and evaluating of assets;
3. *Noise* in financial reports that diminish reliability of contained information, and it occurs due to errors in accounting records or due to errors in criteria for evaluation or evaluation itself;
4. Manipulation.

Finally, certain constraints are also related to **specific qualities** of business operations in Croatia:

1. Reluctance of companies to publish information on their performance;
2. Shallow and non-liquid capital market.

4. Statistical Analysis of Gathered Data

Statistical analysis of gathered data was carried out by means of information tool IBM SPSS ver. 19.0. Statistical analysis of ratios based on financial reports about business decline implies application of a set of statistical methods:

- Descriptive statistical methods
- Inferential statistical method

Frequency distributions of liquidity ratios that are characterised by measuring the ability of a company to settle due short-term (current) liabilities, interests, total liabilities and dividends were studied by means of descriptive statistical analyses. All liquidity ratios are calculated based on data from the balance sheet.

[19] Bylaws on quarterly financial and business reports**, *Official gazette*, 38/2000**
[20] Bylaws on the structure and content of annual financial and business reports of public joint stock companies, ***Official gazette***. 118/2003
[21] Accounting Act, *Official Gazette,* 146/2005 and Accounting Act, *Official Gazette*, 109/2007
[22]Bylaws on the structure and content of annual financial reports, ***Official gazette***, 38/2008; Bylaws on amendments to the Bylaws on the structure and content of annual financial reports, ***Official gazette***, 12/2009; Bylaws on amendments to the Bylaws on the structure and content of annual financial reports, ***Official gazette***, 130/2010

- Cash ratio (1) – P01
- Quick ratio – P03
- Current ratio – P04
- Cash to current assets – P05
- Cash and cash equivalents to current assets – P06
- Working capital – P07
- Working capital to total assets – P08
- Financial stability indicator – P09

Table 1 Inferential statistical analysis – Variance analysis (ANOVA, F-test)

ANOVA

			Sum of Squares	df	Mean Square	F	Sig.
Cash ratio (1)	P01	Between Groups	.067	1	.067	1.854	.175
		Within Groups	7.169	198	.036		
		Total	7.236	199			
Quick ratio	P03	Between Groups	2.893	1	2.893	8.542	.004
		Within Groups	67.055	198	.339		
		Total	69.948	199			
Current ratio	P04	Between Groups	3.982	1	3.982	6.313	.013
		Within Groups	124.886	198	.631		
		Total	128.868	199			
Cash to current assets	P05	Between Groups	.010	1	.010	2.263	.134
		Within Groups	.903	198	.005		
		Total	.913	199			
Cash and cash equivalents to current assets	P06	Between Groups	.059	1	.059	4.104	.044
		Within Groups	2.825	198	.014		
		Total	2.883	199			
Working capital	P07	Between Groups	65747732232.292	1	65747732232.292	6.113	.014
		Within Groups	2129712399837.580	198	10756123231.503		
		Total	2195460132069.870	199			
Working capital to total assets	P08	Between Groups	.378	1	.378	8.876	.003
		Within Groups	8.428	198	.043		
		Total	8.806	199			
Financial stability indicator	P09	Between Groups	2.197	1	2.197	3.772	.054
		Within Groups	114.158	196	.582		
		Total	116.355	197			

Source: Author's calculation

Inferential statistical analysis, primarily F-test (ANOVA, i.e. variance analysis), was used to test assumptions about the existence of statistically significant difference among two or more categories of selected variables, i.e. business performance ratios based on financial reports. Comments were made on statistically significant differences of those test ratio whose significance (calculated p value) was below 0.05 (Horvat, 1995). Namely, variance analysis as parametric statistical procedure determines whether there is a statistically significant difference among several sets of results. Indicator test of ANOVA analysis is F-test (quotient of interpreted and total deviations) whose value directs at statistically significant difference at calculated p value less than 0.05. Mostly $p<0.05$ presents probability that the mean value of the observed variable will be found in the calculated interval of 95%.

T-test was used to compare mean values of variables of business performance indicators based on financial reports of successful and unsuccessful companies respectively, for a ten-year period (1999 to 2008). The aim of t-test is to show that change of the dependent variable does not take place by accident. Namely, experimental control disables other influences on the dependent variable (successful/unsuccessful business performance), so the change is attributed to influence of independent variable.

Table 2 Selection of predictors of warning about problems in business (T-test)

Independent Samples Test

			Levene's Test for Equality of Variances		t-test for Equality of Means						
										95% Confidence Interval of the Difference	
			F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Cash ratio (1)	P01	Equal variances assumed	2.449858	0.119132	-1.36173	198	0.17483	-0.03998	0.029362	-0.09788	0.017919
		Equal variances not assumed			-1.3376	107.332	0.183854	-0.03998	0.029891	-0.09924	0.019271
Quick ratio	P03	Equal variances assumed	0.028978	0.865004	-2.92269	198	0.003874	-0.26245	0.089796	-0.43953	-0.08537
		Equal variances not assumed			-2.84905	105.5583	0.005273	-0.26245	0.092117	-0.44509	-0.07981
Current ratio	P04	Equal variances assumed	0.759504	0.384539	-2.51263	198	0.012781	-0.30791	0.122546	-0.54958	-0.06625
		Equal variances not assumed			-2.67059	129.0599	0.008546	-0.30791	0.115298	-0.53603	-0.07979
Cash to current assets	P05	Equal variances assumed	5.752	0.017398	-1.50424	198	0.134112	-0.01567	0.01042	-0.03622	0.004874
		Equal variances not assumed			-1.38616	94.05653	0.168974	-0.01567	0.011307	-0.03813	0.006777
Cash and cash equivalents to current assets	P06	Equal variances assumed	1.949184	0.164238	-2.0259	198	0.044116	-0.03734	0.01843	-0.07368	-0.00099
		Equal variances not assumed			-1.93641	101.237	0.055605	-0.03734	0.019282	-0.07559	0.000911
Working capital	P07	Equal variances assumed	1.690101	0.195099	-2.47236	198	0.014265	-39565.4	16003.07	-71123.7	-8007.09
		Equal variances not assumed			-3.10745	189.106	0.002178	-39565.4	12732.43	-64681.2	-14449.6
Working capital to total assets	P08	Equal variances assumed	11.96525	0.000664	-2.97918	198	0.003252	-0.09484	0.031835	-0.15762	-0.03206
		Equal variances not assumed			-3.59233	175.2288	0.000426	-0.09484	0.026401	-0.14695	-0.04274
Financial stability indicator	P09	Equal variances assumed	5.382599	0021368	1.942288	196	0.053535	0.229222	0.118016	-0.00352	0.461967
		Equal variances not assumed			2.669054	190.5033	0.008263	0.229222	0.085881	0.059821	0.398622

Source: Author's calculation

5. Research findings

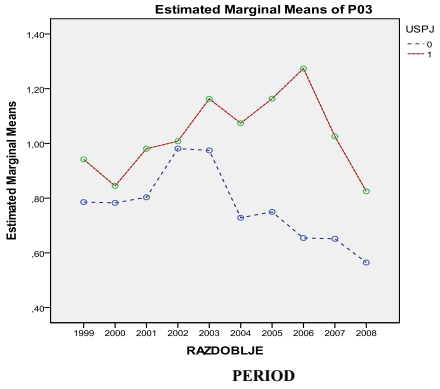
Research aimed at development of a model of business decline based on financial reports includes analysis of calculated ratios of business performance.
As the main goal of the research is to develop a warning model for business decline, selected statistical parameters were presented for each of the two sub-samples – successful and unsuccessful companies for each year. Separate presentation of statistical parameters by groups of stable and unstable companies provides insight into basic characteristics of both sub-samples during the observed period of business activities (1999 - 2008).

Based on T test, six (6) out of eight (8) tested liquidity ratios were selected with significant difference (sig. <0.05) between successful and unsuccessful companies.

Based on T test, the **auxiliary hypothesis 1 is partially dismissed** due to lack of significant difference between successful and unsuccessful companies. Namely, significant difference between successful and unsuccessful companies on the selected sample was detected for the following ratios:

- *Quick ratio (P03),*
- *Current ratio (P04),*
- *Cash and cash equivalents to current assets (P06),*
- *Working capital (P07),*
- *Working capital to total assets (P08) and*
- *Financial stability indicator (P09).*

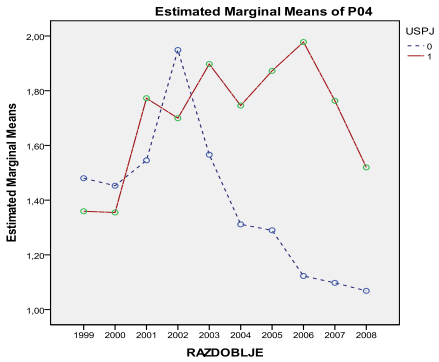
Chart 1 *Quick ratio (P03)* trends for successful (1) and unsuccessful (0) companies for the period 1999 – 2008



Source: Author's calculation

Quick ratio or acid test indicates the ability of a company to satisfy the urgent needs for money within a short period. Namely, quick ratio shows the ratio between cash, cash equivalents and marketable securities and short-term receivables and short-term liabilities. According to common criteria, it is not recommended that quick ratio is below 1 as it may lead to a delay in company's ability to pay liabilities within their due dates. Based on the above presented Chart (1) it can be concluded that successful entrepreneurs are better at managing cash and cash equivalents compared to unsuccessful entrepreneurs whose quick ratio was not above 1 for the entire observed period. Successful companies have recorded increase of this ratio since 2001 i.e. after restructuring of one of the observed companies. Poor economic situation in Croatia ad global economic crisis showed their impact on business performance of successful companies already in 2007.

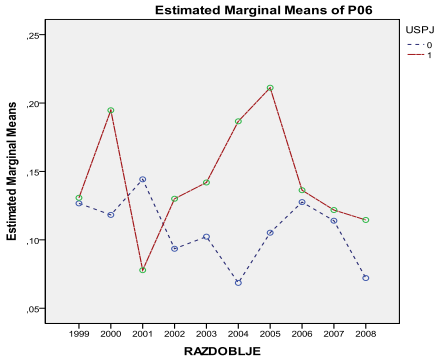
Chart 2 *Current ratio (P04)* trends for successful (1) and unsuccessful (0) companies for the period 1999 – 2008



Source: Author's calculation

Current ratio is the most frequently used liquidity ratio, showing the coverage of current liabilities by current assets. This ratio warns about the limit up to which an entrepreneur can go with its current assets without having problems. It is recommended that current ratio is minimum 1.3, that is, 2 in case of companies with large inventories that are typical for specific production. High current ratio is also not recommended because it indicates poor liquidity management of a company. Entrepreneurs with current ratio being around 1 have continuous liquidity issues, which can be observed here in unsuccessful entrepreneurs. Influence of the global economic crisis is visible in the years 2007 and 2008, which is also reflected in a sudden fall of current liquidity of successful companies (from almost 2 to 1.5 within two years). Also, restructuring of one of the successful companies in 2001 is visible through growth of current liquidity.

Chart 3 Cash to current assets ratio (P06) trend for successful (1) and unsuccessful (0) companies for the period 1999 – 2008.

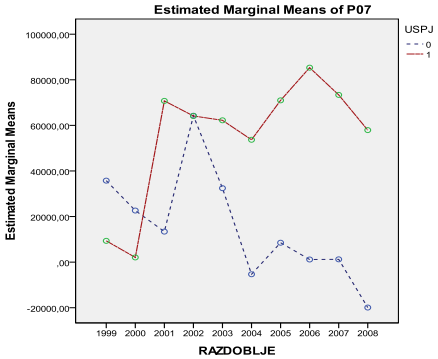


Source: Author's calculation

Cash to current assets ratio is useful when determining the share of current assets and financial assets easily convertible into cash. This ratio is considered the most conservative way of assessing company's liquidity as it ignores liquidation value of receivables and inventory. During the observed period it can be seen that unsuccessful entrepreneurs were not good at managing cash, cash equivalents and current financial assets with the falling tendency of the share. Among successful companies restructuring of one of them is visible in 2001, so that a significant growth of the share of cash, cash equivalents and current financial assets can be observed in the period from

2001 to 2006, when the share was reduced, which can be explained with the onset of the global economic crisis.

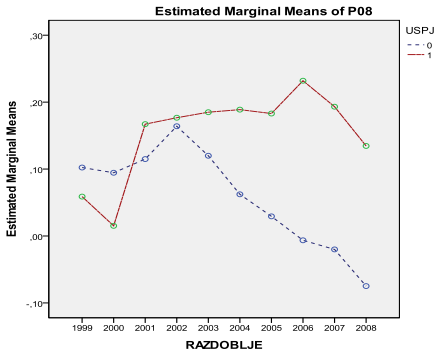
Chart 4 *Working capital (P07)* trend for successful (1) and unsuccessful (0) companies for the period 1999 – 2008



Source: Author's calculation

Working capital is the difference between current assets and current liabilities, which is a prerequisite for liquidity and financial stability of a company. Higher working capital reduces market pressure on business performance of entrepreneur and enables independent financing of growth. Taking into account specific qualities of a company, there is no ideal level of working capital that would be universally applicable to all entrepreneurs. Poor efficiency of business operations of unsuccessful companies lacking assets that are stuck in inventory, ongoing production and at buyers' place in relation to current liabilities can be seen in the Chart 4. On the other hand, importance of good management of working capital can be seen in the influence of the restructured company in 2001 which improved business performance.

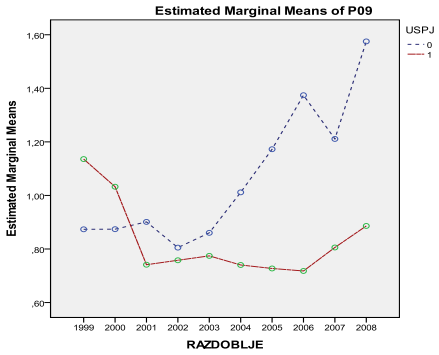
Chart 5 *Working capital to total assets (P08)* for successful (1) and unsuccessful (0) companies for the period 1999 – 2008



Source: Author's calculation

Working capital to total assets shows efficiency of working capital in relation to total assets. Higher level of working capital in total assets provides better long term business performance in terms of the ability to expand, improve or make changes in business. Higher level of working capital in total assets makes it possible for entrepreneurs to finance business growth independently, thus reducing market pressure. During the observed period low and negative share of working capital can be observed in unsuccessful companies. Low level of working capital before restructuring of one of the successful companies had influence until 2001. Continuous monitoring of the working capital level is necessary to be able to make timely changes in trends in order to prevent business decline.

Chart 6 *Financial stability indicator (P09)* trend for successful (1) and unsuccessful (0) companies for the period 1999 – 2008



Source: Author's calculation

Financial stability indicator shows the ratio between fixed assets and long term sources of assets (capital and long term liabilities). Financial stability indicator should not exceed 1. Decrease of a financial stability indicator is considered a positive tendency because that means that increasingly growing portion of current assets is financed from long term sources of financing, thus creating prerequisites for financial stability of the observed company. During the observed period, restructuring of entrepreneurs in 2001 had a positive impact on business performance of successful entrepreneurs, whereas unsuccessful entrepreneurs had negative tendency since 2004, with small improvement during 2007.

Results of this research should be taken with a grain of salt. Business decline of a company is an extremely complex process. As emphasized in earlier research of company performance (Adizes, 2006), each phase of company's life cycle is characterised by specific problems, which has different influence on business decline indicators. Further, research was conducted on a small sample of large companies in Slavonia and Baranja and the sample was uneven (six successful and 14 unsuccessful companies). Use of longitudinal data (10 years) reduced the influence of small sample, but larger sample would provide higher authenticity, thus strengthening internal value of the study.

Regardless of limitations of the model development, results of this research should be considered with due attention. Namely, future research could also include small and medium-sized entrepreneurs, especially those in different growth phases, due to their vulnerability and lack of experience of management/owners in business monitoring.

6. Conclusion

This research included analysis of liquidity ratios as factors of influence on assessment of business decline, i.e. problems in business. On the grounds of empirical research based on *ex post* data, i.e. financial reports of companies in the period from 1999 to 2008, the aim is to assume future, i.e. *ex ante* company performance.

Here *ex ante* refers to future performance, that is, suggestions and some solutions that could be applied by company managements and stakeholders based on this research. Recommendation to the management boards of large companies that were the object of this research is to introduce internal audits or controls to improve the continuity of business monitoring. The reason is objective understanding of company performance, especially regarding problems within particular industries.

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