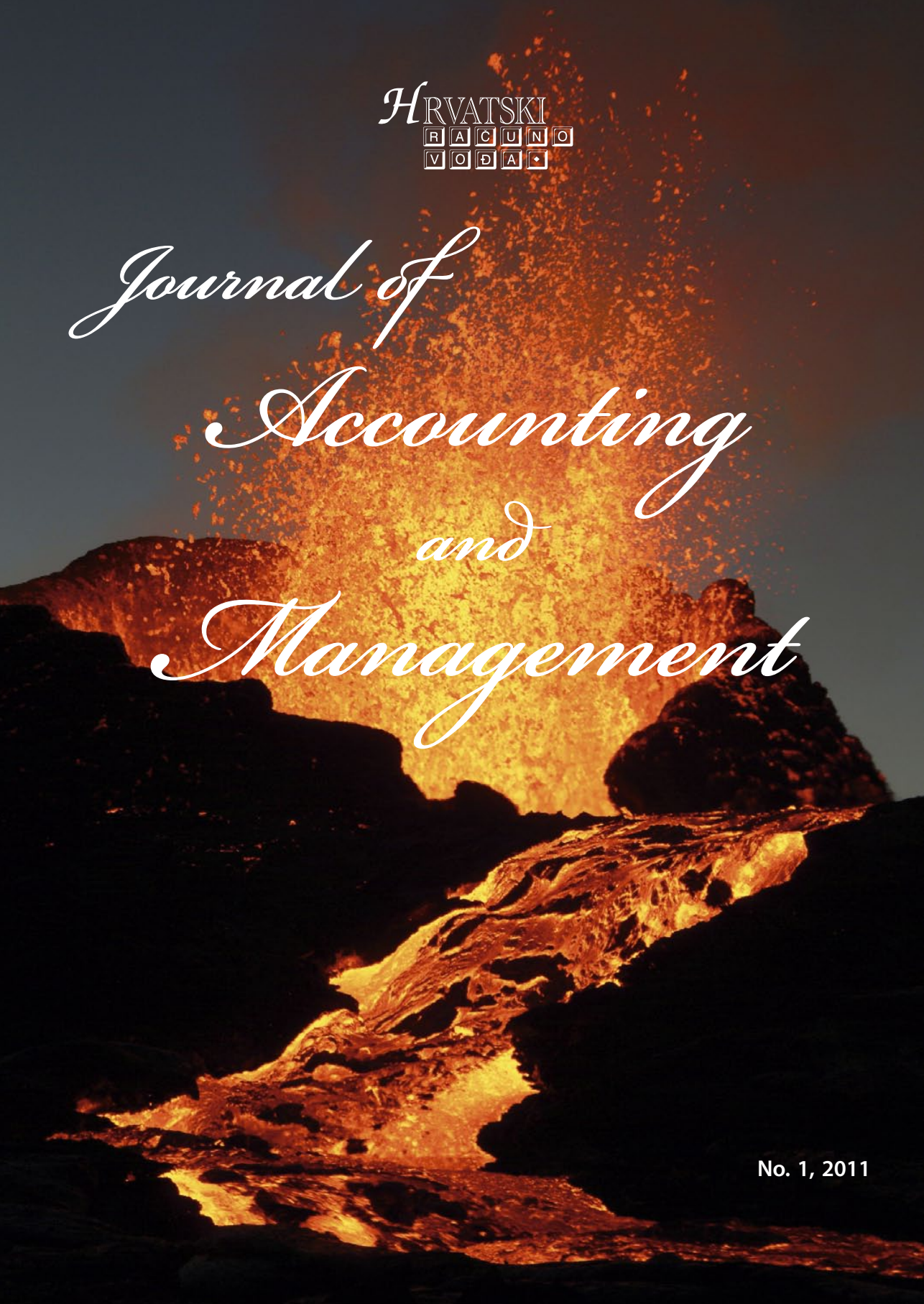
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PREFACE

The Journal of Accounting and Management has been conceptualized as a medium for publication of highly original theoretical and practical scientific research, dealing with various aspects of changes in accounting and management. It presents original, peer reviewed research findings that have local, national and international implications which are clearly applicable to professionals and academics.

The Journal contains selected papers presented at the International Scientific and Professional Conference organized by Association Croatian Accountant, but the submission of papers directly to the Journal is also welcomed. All papers are blindly peer- reviewed and should be accepted by two independent reviewers to be published in this journal.

The first number is presented to the professional and academic audience with the hope that it will pass the test and become a valued reference for all interested in topics of accounting and management.

Editors:
Vinko Belak, Editor in Chief
Željana Aljinović Barać, Associate Editor

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Preliminary Communication

THE SHAPE OF THE FREQUENCY DISTRIBUTIONS OF EARNINGS METRICS – EVIDENCE FROM CROATIA

Tina Vuko, Željana Aljinović Barać and Slavko Šodan,
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ABSTRACT:

The paper provides evidence on discontinuity around zero in the distribution function of reported earnings and earnings changes of companies listed on Croatian capital market. Namely, we document a significant frequency of companies reporting positive earnings while avoiding reporting losses, and unusually high frequencies of small increases in earnings. The contribution of this study can be found in the fact that it extends the existing evidence on the shapes of frequency distributions of earnings metrics around specific benchmark in alternative institutional setting.

Key words: *earnings management, earnings distribution, earnings thresholds*

1. INTRODUCTION

Earnings are considered to be one of the most important accounting figures, since they measure overall financial performance of the company for a given period. However, reported financial result is not only determined by real companies' performance, but it can also be subject of managers' discretionary adjustments in the accounting numbers. Prior research (Hayn 1995; Burgsthaler and Dichev 1997, DeGeorge et al. 1999; Peasnell et al. 2000; Daske et al. 2006) provides evidence that frequency distribution of earnings metrics have a kink around different earnings targets. In general, the literature is dominantly focused on three earnings targets (Daske et al., 2006:138): reporting profits or 'positive earnings'; reporting results that improve upon last years performance or 'positive earnings change' and meeting or beating consensus analysts' earn-

ings forecasts or 'positive earnings surprise'. Explicitly, systematic patterns in empirical distributions of earnings reveal unexpectedly high frequencies of observations above the earnings targets and unexpectedly low frequencies of observations below the earnings targets.

Burgsthaler and Dichev (1997) present two underlying theories that explain the motivation for earnings management to avoid earnings decreases and losses: (i) transaction costs theory and (ii) prospect theory. According to the transaction costs theory, companies with higher earnings face lower costs in transactions with stakeholders. Another assumption is also that stakeholders commonly use heuristics (for example cut-offs at zero earnings) to determine the terms of transactions with company, since it is less costly than detailed information processing and complex economic modelling. Prospect theory suggests that decision-makers derive value from gains and losses with respect to a reference point, rather than from absolute levels of wealth. Moreover, it argues that individuals' value functions are concave in gains and convex in losses. Consequently, the earnings game is to some extent binary. Either the company reports losses and thus belongs to one set or it makes a profit, which puts it into different valuation model.

Although there are many empirical studies that examine the shape of the frequency distributions of earnings, majority of them are carried out in institutional settings typical for common-law countries like the US, the UK and Australia, but only few of them are conducted in code-law legal system countries. However, the study that was conducted by Daske et al. (2006) shows that discontinuities around zero in EU sample are far more pronounced compared to prior US evidence. They analyzed over 60,000 company-year observations for the fiscal years 1986 to 2001 and documented that more companies than expected (i) report small positive earnings, (ii) report small positive earnings changes and (iii) have zero or small positive forecast errors.

In this paper we extend previously mentioned line of research by investigating the existence of discontinuity in the earnings distribution regarding the specificities of Croatian institutional setting, as a case of code-law country. We analyze 2,437 company-years observations for period between 2000 and 2008, in order to test whether the earnings are managed to small positive levels and to increase profits. Thus, the results of this study provide additional insight into international differences (or similarities) of financial reporting process and relative importance of earnings targets.

The reminder of the paper is organized as follows. In section 2 we provide relevant literature review, assessing both strength and weakness of applied distributional approach. Section 3 details the sampling process, variables used in the model and the applied methodology. The results of the research are

presented and discussed in section 4. Finally, the last section summarizes the main findings and offers some suggestions for future research.

2. LITERATURE REVIEW

Generally, prior earnings management studies can be divided into three types of research, i.e. three different approaches: (i) studies based on aggregate accruals, (ii) studies based on specific accruals and (iii) studies based on the distribution of earnings. The latest approach focuses on the behaviour of earnings around specific benchmarks, such as zero earnings, prior quarter's earnings or analysts forecast. This stream of research has some important advantages over its alternatives since it does not require an estimation of the proportion of discretionary (or abnormal) accruals and it allows authors to assess the number of companies that engage in this kind of behaviour. However, this method has some disadvantages too. Specifically, it does not capture the magnitude of earnings management and it does not identify the method that is used to manage earnings.

Hayn (1995) was the first researcher who documented a kink in the distribution function of earnings around zero. Her approach was further expanded by Burgsthaler and Dichev (1997) who provided graphical and statistical evidence of earnings discontinuity around zero. Namely, they found an abnormally low number of companies that miss the benchmark and abnormally high number of companies that beat the benchmark. This kink in the distribution function was interpreted as an evidence of earnings management behaviour. Furthermore, the Burgsthaler and Dichev (1997) research has had significant impact among accounting researchers and their methodology was used in many succeeding papers investigating earnings management after that. For example, DeGeorge et al. (1999) and Burgstahler and Emes (2006) provided evidence that companies manage earnings to meet or beat analysts' earnings forecasts. Other studies used discretionary accruals models to capture full effect of accruals management. Payne and Robb (2000) and Matsumoto (2002) found that discretionary or abnormal accruals are significantly associated with analysts' forecasts. Kang (2005) documented earnings management using data of companies suspected for managing earnings to avoid losses and applying both the Jones (1991) model and IV approach[1] of Kang and Sivaramakrishnan (1995). Marquardt and Wiedmann (2004) analyzed specific types of accruals that are expected to be associated with earnings management. However, Dechow et al. (2003) did not find statistically significant association between discretionary operating accruals and the kink in earnings distribution. They

[1] Instrumental variables approach

also raised the question whether a discontinuity in distribution may be caused by other reasons than earnings management. For example, Beaver et al. (2007) showed that the asymmetric effects of income taxes and special items for profit and loss companies contribute to a discontinuity at zero in the distribution of earnings. Durtschi and Easton (2005) examined the distribution of earnings per share and found no evidence of discontinuity at zero. They asserted that the shapes of frequency distributions of earnings could be due to scaling, sample selection criteria or differences between the characteristics of observations to the left of zero and observations to the right of zero. Jacob and Jorgensen (2006) found that discontinuity in earnings is not observed when net income is aggregated for annual periods other than the fiscal year. Their results generally validated the Burgsthaler and Dichev (1997) findings and indicated that their main results were not spuriously induced by scaling. Another discussable question is the ranking by importance of earnings benchmarks[2] (DeGeorge, 1999; Dechow et al., 2003; Brown and Caylor, 2005) as well as the independence between selected benchmarks[3] (Hansen, 2004; Beaver et al., 2007). Finally, it can be concluded that the mixed nature of prior evidence leaves open the debate over the causes and specificities of the discontinuity around earnings benchmarks and calls for further empirical investigations.

3. RESEARCH DESIGN

Based on theoretical background and the results of previous researches, the research hypotheses for this paper are (in alternative form):

H1: Earnings are managed to small positive levels.

H2: Earning are managed to increase profits.

3.1. DATA AND VARIABLES

Initial sample for the research is selected from the Croatian Financial Services Supervisory Agency database, available on www.hanfa.hr, and annual financial statements of all Croatian listed companies in succession from 2000 to 2008 are collected. Like in similar studies, financial institutions are excluded from the sample due to their regulatory specificities and balance sheet structure differences. Finally, depending on the data availability, initial sample is reduced to 2,437 company-year observations for earnings and 1,857 for earnings changes. The data is analysed using the Stata 11.0 software. Descriptive statis-

[2] Companies can use multiple benchmarks and their relative importance changes over time.

[3] For example, if earnings-changes benchmark is correlated with the level-of-earnings benchmark, this makes earnings changes noisy signals of earnings-level benchmark.

tics, Burgsthaler and Dichev (1997) statistical test and histograms are used to identify the existence of earnings management.

Our analysis is conducted both on earnings levels and earnings changes and the main focus is on net income (NI) variable. In order to remove the effect of different firm sizes (i.e. to homogenize the sample) earnings variables are deflated by opening total assets value for year *t*, while earnings changes variables are deflated by opening total assets value for year *t-1*.

Descriptive statistics for the earnings variables (i) deflated net income (i.e. scaled net income, NI) and (ii) deflated net income changes (i.e. scaled changes in net income, ΔNI) are presented in Table 1. Since we describe the frequency of the data distribution around zero only, with no attempt to analyze the magnitude of each variable at each positive or negative end, these statistics are calculated without eliminating extreme value observations.

Table 1: Descriptive statistics of scaled earnings and earning changes

Panel A: Scaled net income (NI)						
Year	N	**Mean**	**Std. dev.**	**25%**	**50%**	**75%**
2000	481	-0.0113	0.1021	-0.0493	0.0025	0.0267
2001	454	-0.0085	0.0823	-0.0384	0.0037	0.0312
2002	315	-0.0049	0.0861	-0.0165	0.0044	0.0268
2003	203	-0.0043	0.1075	-0.0295	0.0042	0.0250
2004	220	-0.0116	0.1320	-0.0430	0.0033	0.0359
2005	194	-0.0051	0.1206	-0.0418	0.0083	0.0372
2006	197	-0.0076	0.0892	-0.0275	0.0069	0.0328
2007	202	0.0176	0.1034	0.0007	0.0133	0.0491
2008	181	-0.0082	0.0867	-0.0382	0.0032	0.0237
Total	2447	-0.0060	0.1002	-0.0346	0.0045	0.0307
Panel B: Scaled changes in net income (ΔNI)						
Year	N	**Mean**	**Std. dev.**	**25%**	**50%**	**75%**
2001	415	0.0080	0.0951	-0.0186	0.0017	0.0293
2002	307	0.0133	0.0966	-0.0142	0.0019	0.0248
2003	179	0.0418	0.5865	-0.0171	0.0008	0.0199
2004	199	-0.0063	0.1258	-0.0179	0.0002	0.0155
2005	194	0.0119	0.1369	-0.0227	0.0026	0.0361
2006	193	0.0044	0.1027	-0.0134	0.0010	0.0255
2007	191	0.0218	0.1055	-0.0054	0.0042	0.0332
2008	179	-0.0228	0.0924	-0.410	-0.0095	0.0059
Total	1857	0.0091	0.2085	-0.0178	0.0011	0.0239

Source: estimated according to data from authors' data base (2010)

As it can be noticed from Table 1 (Panel A) the mean value of earnings are almost exclusively negative while all median values are positive through the sample period. This means that there are more companies in the sample that report profits (63%) than losses (37%), but the amounts of reported losses are higher than amounts of reported profits.

Regarding the scaled earnings changes (Table 1, Panel B) negative mean values are only reported in year 2004 and year 2008, while median values are positive through all years excluding the year 2008, when the global financial crisis emerged. The possible reason for negative earnings changes in year 2004 can be the abolition of income tax on income from capital in year 2005, so companies transferred their profits realized in year 2004 to the year 2005 or later, when this taxation was no longer effective.

3.2. METHODOLOGY

Distributional approach assumes that unmanaged earnings have a Gaussian distribution and that the evidence of earnings management is the deviation of observed earnings from this distribution. Histograms and statistical tests are used to detect discontinuities in the data. Potential bias when applying these methods is the choice of an interval width because the optimal interval width is controversial issue (Emerson and Hoaglin 1983, Scott 1992).

For the reasons of comparability with existing literature, we applied interval width of 0.5% of earnings deflated by opening total assets value for year t and 0.25% of earnings changes deflated by opening total assets value for year t-1. Companies with deflated earnings of exactly zero are included in the first interval immediately to the right of zero [0.000, +0.005).[4]

To test the statistical significance of the hypothesized avoidance of earnings decreases and losses, we used Burgsthaler and Dichev (1997) statistical test whose only assumption is that, under null hypothesis of no earnings management, the cross-sectional distributions of earnings levels and earnings changes are relatively smooth. Operationally, their definition of smoothness is that expected number of observation in any given interval of the distribution is average of the number of observations in two immediately adjacent intervals. The Burgsthaler and Dichev statistical test is ratio of the difference between the actual numbers of observations in interval over the estimated standard deviation of the difference. The latter is defined as follows:

[4] The issue of whether zero earnings should be included in the smallest profit or loss interval is one difficult to asses. Since in our sample zero earnings represent only small proportion of all observations (0.3%) their influence on the results are considered to be marginal.

$$std = \sqrt{Np_i(1-p_i) + \frac{N(p_{i-1}+p_{i+1})(1-p_{i-1}-p_{i+1})}{4}} \quad (1)$$

where:

std is estimated standard deviation of the difference,

N is the total number of observations in the sample,

p_i is the probability that an observation will fall into interval *i*.

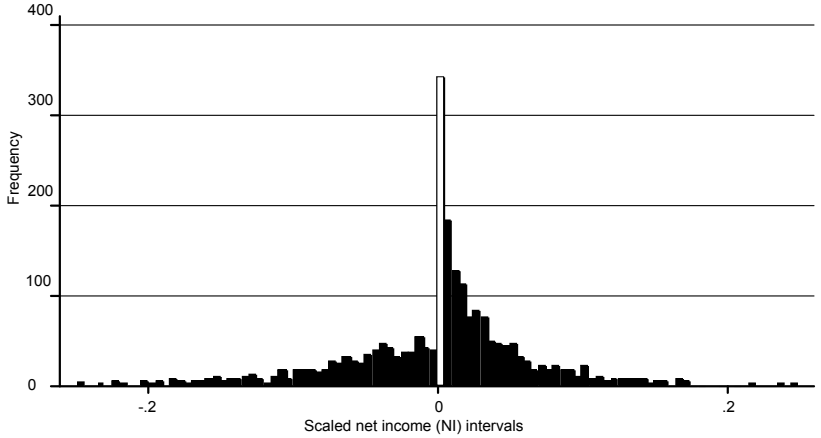
Under null hypothesis these standardized differences approximate normal distribution (zero mean and standard deviation of 1). Since the null hypothesis of smoothness might not hold at zero, the standardized differences for the interval immediately to the left and immediately to the right of zero are not independent. The test of discontinuity at zero is therefore based on one difference, either left or right.

4. RESULTS

As in the similar studies, first we present graphical evidence in the form of histograms of the pooled cross-sectional empirical distributions of scaled earnings and earnings changes. The existence of earnings management to avoid losses and earnings decreases is expected to take the form of unusually low frequencies of small losses (earnings decreases) and unusually high frequencies of small profits (earnings increases).

Figure 1 shows empirical distribution of scaled earnings for companies on Croatian capital market. By the analysis of the figure it is apparent that there is a huge step between companies with small losses and companies with small positive earnings. Normally, it would be expected a smoother curve at this graph point and not such discontinuity. The visual notion from the frequency distribution histograms is supported by the ratio of small profits to small losses. This ratio is 7.17, which indicates that about seven times as many small profits as small losses were reported. For example, this ratio for EU sample ranges from 2.68 to 4.43 depending on the deflator used and for the US-sample ranges from 1.93 to 2.77 (Daske et al. 2006).

Figure 1: Empirical distribution of deflated earnings for Croatian companies

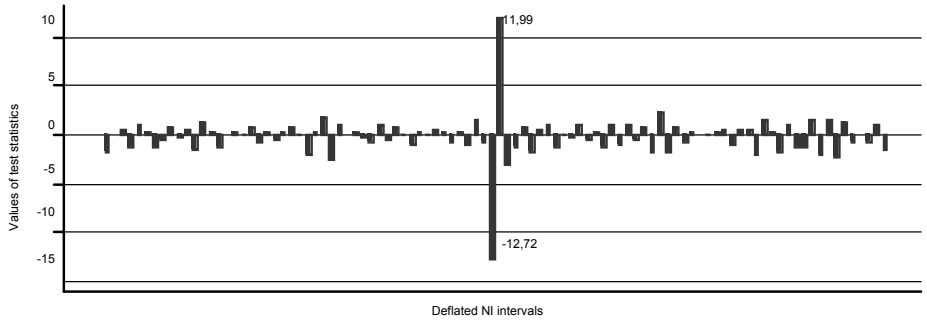


Source: estimated according to data from authors' data base (2010)

Note: Distribution of deflated annual net income for Croatian Companies (2000-2008). Histogram of the scaled net income (NI_t/A_{t-1}) is limited to the range from –0.25 to 0.25 for presentational parsimony. The distribution interval widths are 0.005 and "frequency" is the number of observations in a given earnings interval.

Moreover, using Burgsthaler and Dichev (1997) methodology we compute a test statistic to evaluate statistical significance of deviations from the expected frequency. The test statistics yield a standardized difference for the interval immediately to the left (right) of zero of -12.72, 11.99, respectively. Therefore, under the assumption that the standardized differences are approximately normal, the test statistics are strongly significant at conventional levels.

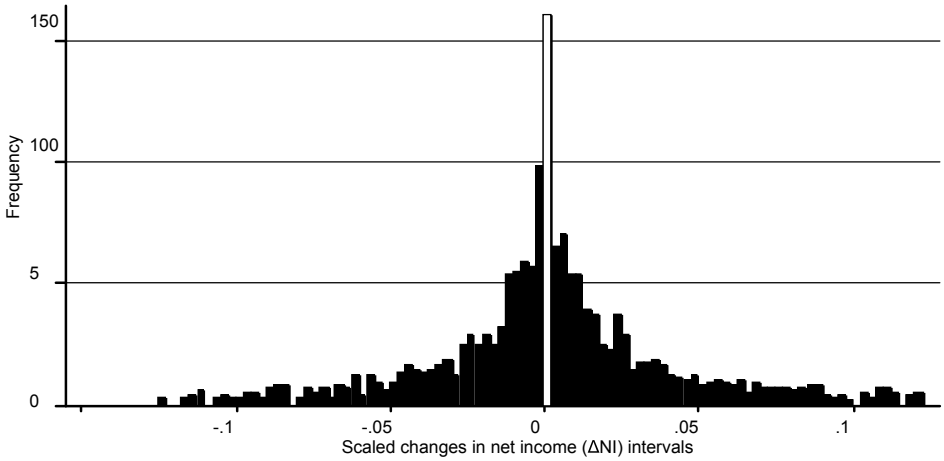
Figure 2: Values of BD statistics



Source: estimated according to data from authors' data base (2010)

The empirical distribution of scaled earnings changes for companies on Croatian capital market is presented in Figure 3. However, it provides only a preliminary evidence of the existence of earnings management practices caused by intention to avoid earnings decreases and to sustain recent performance. The evidence is based on the fact that there are higher than expected number of companies with slightly earnings increases, compared to number of companies with slightly negative earnings decrease.

Figure 3: Empirical distribution of deflated earnings changes for Croatian companies



Source: estimated according to data from authors' data base (2010)

Note: Distribution of deflated annual net income changes for Croatian Companies (2000-2008). Histogram of the scaled net income changes ($\Delta NI_t / A_{t-2}$) is limited to the range from –0.125 to 0.125 for presentational parsimony. The distribution interval widths are 0.0025 and "frequency" is the number of observations in a given earnings interval.

When testing for statistical significance, the frequency of the observations in the interval immediately right to the zero [0.0000, +0.0025) is significantly higher than expected under smoothness assumption (the test statistic is 5.49). However, the frequency of observations in the interval immediately left to the zero (-0.0025, 0.0000] is not significantly less than expected under smoothness assumption (the test statistic is -0.46). Therefore, assuming that the standardized differences are approximately normal, the test statistic for the interval immediately right to zero is statistically significant at conventional levels and there is a discontinuity at zero in the distribution.

5. CONCLUDING REMARKS

This paper provides exploratory examination on the existence of earnings management practice by companies listed on Croatian capital market. Conducted analysis of cross-sectional distributions of earnings and earnings changes indicate that more companies than expected report small positive profits and small increases in earnings. On the other hand, less companies than expected are found to report small losses. Our results are similar with prevalent studies showing that earnings game is widespread practice.

Summarizing the theoretical and empirical results, the following recommendations can be derived. First, future research on this issue in domestic institutional setting should aim to explore other possible reasons for discontinuity in earnings metrics, such as asymmetric accounting recognition of revenues and expenses (prudence principle), asymmetric tax treatment or different valuation of profitable and unprofitable companies. Furthermore, they should focus on the influence of alternative earnings targets on earnings management practice. In addition, effective tools for identification of earnings management actions in reported financial statements should be developed. Finally, standard setters and accounting regulatory bodies should aim to define and implement sanctions for earning management practices in order to prevent its frequency.

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Preliminary Communication

THE EFFECT OF FINANCIAL CRISIS ON COMPANY'S PERFORMANCE

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ABSTRACT

The global financial crisis has affected performance of the companies all over the world. The objective of this paper is to research the impact of the crisis on company's performance. Verification of empirical evidence will be provided through the sample of 25 Croatian listed companies whose stocks are included in official Zagreb Stock Exchange share index – CROBEX, and company's financial performance is measured by BEX index. In the research performance of selected companies before (i.e. in year 2007) and during the ongoing financial crisis (i.e. in year 2010) are considered. Different parametric and non-parametric statistical test for the paired sample were applied, and results indicate that financial crisis has no significant effects on companies' performance.

1. INTRODUCTION

The world's economy experienced several financial crises from the beginning of the 21st century. The ongoing global financial crisis put a number of countries into a recession, companies into liquidity and solvency problems and stock indexes into a downward spiral. According to recent authors researches (e.g. Hinton (2008), Taylor (2009), Johansson and Dimofte (2010)) it came to the forefront of the business world and world media in September 2008, with the failure of a number of American financial companies. In this paper, the aim was to determinate the significance of financial crisis effects on companies performance focusing on the business excellence of the largest national companies.

We examine how the company's financial performance differed in the conditions of global crisis and before it, trying to identify its impact on performance of the companies doing business in bank-oriented economies with undeveloped capital markets.

The remainder of the paper is organized as follows. In section 2, the theoretical background for the research is discussed. In section 3, applied methodology and sample selection are described. Section 4 presents verification of empirical evidence through the sample of Croatian listed companies. The paper ends with concluding remarks.

2. THEORETICAL BACKGROUND

A great number of studies have attempted to link effects of financial crisis on companies' performance and generally can be divided in two groups: (i) researches dealing with the impact of crisis on accounting performance, i.e. different financial ratios and (ii) researches dealing with the influence of financial crisis on stocks prices.

Jeon and Miller (2002a) explored performance of Korean nationwide banks in Asian financial crisis. They used return on assets and return on equity as performance measure and applied correlation tests with regard to number of profit and loss account items and macroeconomic variables. Generally, they found almost all of them significant for the 1991 to 1998 sample period. Later, they (Jeon and Miller, 2002b) expanded their research and include not only domestic, but also the foreign banks in Korea. Their results indicate that foreign banks did not experience the same negative effects of crisis on their performance and concluded that national banks were suffered more severally from the crisis than foreigners. Li and Zhu (2010) studied the impact of the crisis on performance of listed logistics companies (i.e. transportation & ware-housing companies) in China and found out that crisis affects its performance. In their study Park et al. (2009) research how export demand shocks associated with the Asian financial crisis affected Chinese exporters. They found that firms whose export destinations experience greater currency depreciation have slower export growth, and that export growth leads to increases firm productivity and other firm performance measures. Wang et al. (2010) have researched the impact of financial crisis on operating performance of listed firms in Chinese military industry. The results of their research has shown that operating performance has been negatively affected in deed and operating performance of more than half of listed firms of military industry has not been affected in current stability and rebound period by financial crisis any longer.

Also a wide number of studies have explored impact of financial crisis on stock market performance, i.e. on stock prices movement. Gonenc and Bulent Aybar (2006) examined the impact of concentrated ownership and business group affiliation on the performance of Turkish companies during the financial crisis by controlling balance sheet currency exposure, international involvement and firm size. Their findings showed that balance sheet exposure is the key determinant of the firm performance during the crisis periods. They have also included stock market performance in the analysis and found that companies with higher concentrated ownership experience lower stock market performance. Flouris and Walker (2009) examined accounting performance of three major airlines in the United States, one low-cost airline and two full-service airlines, in times of crisis. Their results indicate that low-cost airline performance was highly superior to full-service airlines primarily because of low operating costs. Furthermore, they investigated effects of crisis on company's stocks performance and proved that a number of factors, like consumer trust, product offering, corporate structure, workforce and work practices have contributed to company's relative success in the condition of global crisis. Last but not least, Žiković and Aktan (2009) investigate the relative performance of Value at Risk models in emerging markets in the conditions of global financial crisis on the case of Turkey and Croatia as EU candidate states.

In summary, most of previous researches are performed in developed, market oriented countries, but only few of them concentrate on the effects of financial crisis on companies' performance in emerging economies like Croatian. Emerging markets are fundamentally different than developed markets, as they are (according to Ži ković and Aktan, 2009:150) characterized by lower liquidity and frequent internal and external shocks, like inflation, depreciation of local currency, credit rating changes, etc. Thus, effects of financial crisis on company's performance in emerging economic differ from effects recorded at develop economies and should be explored independently.

Furthermore, performance measure is usually defined as dependent variable, while a list of macroeconomic indicators, approximating measures of financial crisis, such as growth, inflation, GDP, etc. are used as independent variables. Also, researches have mainly analyzed companies in one industry sector, e.g. financial institutions, public services, utilities, etc. Our research differs from above mentioned and offer a significant contribution in few areas: first, companies regardless of main activity are included in the sample; second, synthetic score as linear combination of four financial ratios weighted by coefficients is used as company's performance measure; and third, the fact of financial crisis existence is an *axiomatic truth*, i.e. it is taken for granted and not tested in the model.

3. RESEARCH DESIGN

The working hypothesis is that financial crisis has significant effects on company's financial performance. Different parametric and non-parametric statistical tests for the paired sample were applied to test the stated hypothesis on the sample of Croatian listed companies using the PASW v.18.0 software.

3.1. SAMPLE SELECTION

The verification of empirical evidence is provided through a sample of Croatian listed companies. Annual financial reports were collected from Croatian Agency for Supervision of Financial Services (HANFA) database available on http://www.hanfa.hr. In compliance with the Act of Format and Content of Financial and Business Reports for Joint Stock Companies (National Gazette 118/03), all joint stock companies and large and medium sized limited liability companies are required to submit the full set of their financial statements to the registrar in HANFA. The registrar is public and these statements are available to all interested parties, subject to a fee. Annual financial reports for the years 2007 and 2010 of 260 companies listed on Zagreb Stock Exchange are reviewed and companies whose stocks are included in official Zagreb Stock Exchange share index – CROBEX were selected in the sample. Additionally, financial institutions and insurance companies are excluded from the sample because of asset structure differences.

The final subset consists of 24 companies or 9.2% of total population. As it seems a small percentage of total population, we conducted more detail research about the characteristic of total population to find out can we consider the sample as representative. Our findings are shown in the table below:

Table 1: Sample description

COMPANY	Turnover	Pct of total mkt turnover (%)	Cumulative pct (%)
ADRIS	332,579,745	5.76%	5.76%
ATLANTIC GRUPA	2,252,251	0.04%	5.80%
ATLANTSKA PLOVIDBA	236,250,884	4.09%	9.89%
CAKOVECKI MLINOVI	34,608,736	0.60%	10.48%
DALEKOVOD	228,437,241	3.95%	14.44%
ERICSSON NIKOLA TESLA	168,818,278	2.92%	17.36%
HT – HRVATSKE TELEKOMUNIKACIJE	1,490,215,015	25.80%	43.16%
INSTITUT GRAĐEVINARSTVA HRVATSKE	172,957,785	2.99%	46.15%
INA	1,207,011,931	20.89%	67.04%

COMPANY	Turnover	Pct of total mkt turnover (%)	Cumulative pct (%)
INGRA	116,324,823	2.01%	69.06%
ISTRATURIST	14,045,909	0.24%	69.30%
JADROPLOV	42,877,233	0.74%	70.04%
JADRANSKI NAFTOVOD	36,686,204	0.64%	70.68%
KONZUM	21,780,160	0.38%	71.05%
KONČAR ELEKTROINDUSTRIJA	109,197,153	1.89%	72.94%
KRAS	33,108,334	0.57%	73.52%
LEDO	33,144,239	0.57%	74.09%
LUKA PLOČE	35,159,094	0.61%	74.70%
PODRAVKA	97,704,591	1.69%	76.39%
PETROKEMIJA	68,424,483	1.18%	77.58%
TEHNIKA	34,744,353	0.60%	78.18%
ULJANIK PLOVIDBA	66,945,361	1.16%	79.34%
VIRO	38,478,250	0.67%	80.00%
DOM HOLDING	22,989,213	0.40%	80.40%
TOTAL MKT	5,777,096,972	100.00%	

Source: estimated according to data from ZSE periodical report (2010)

In explanation, there is great number of companies listing on the stock exchange but without active trading in their shares. According to that, we take for better to consider number of companies in the sample with regard to stocks turnover (i.e. percentage of total market turnover). In that way, our sample includes companies that make 80% of total market turnover.

3.2. VARIABLES DESCRIPTION

Company's financial performance is measured by BEX index. BEX index is a predictive statistical ratio model for determining company's excellence. Belak and Aljinović Barać (2007) constructed this model based upon Altman's Z-score, taking into consideration characteristics of financial reporting in Croatia and specifics of Croatian capital market. Correspondingly, it is the most appropriate measure of companies' performance in given conditions. BEX model combines four different financial ratios to determine the likelihood of excellence amongst companies. The weighing system is based on data from 1,086 annual financial reports of joint stock companies listed on Croatian capital market (Zagreb Stock Exchange and Varaždin Stock Exchange) between 2000 and 2006. The score is calculated as follows:

$$BEX = 0.388*ex_1 + 0.579*ex_2 + 0.153* ex_3 + 0.316*ex_4, \quad (1)$$

where:

Ex_1 = EBIT/ Total assets. This ratio measures company's excellence as EBIT in relation to total capital. EBIT is a version of return on assets, indicating company's ability to extract profit from its assets, before interest and tax deductions. As some companies shrink their equity base in order to show high rates of return on shareholders' equity, review of this ratio can be instructive. Ex_1 also serves as a model tether, precluding extreme values of the score. The higher ratio indicates higher excellence of the company. Acceptable level in our case is 17%.

Ex_2 = Net operative income/(subscribed capital x 0.04). Ratio Ex_2 measures a company's economic profit as the surplus between revenue that investor has from investment and all costs associated with investment. The subscribed capital multiplied by value of 0.04 is the opportunity cost, the return that investor can obtain by putting his money into a relatively risk-free investment (e.g. bank saving, year-tied deposit). A standard value of economic profit in a healthy company is 1. The higher the ratio, the better the position of the company.

Ex_3 = Working capital /Total assets, where working capital is calculated as the difference between current assets and current liabilities. It can be positive or negative. This ratio measures company's liquidity as net current assets expressed as a percentage of its total assets. Low ratio indicates insufficient liquidity. Furthermore, a company with negative value will probably experience problems meeting its short-term obligations. The acceptable level in our case is 25%.

Ex_4 = (5 x (Net income + depreciation + amortization))/Total liabilities measures the company's financial strength as cash earnings in relation to total liabilities. This ratio indicates the time necessary to cover all liabilities with free cash – cash revenues less cash expenses, excluding the costs of depreciation and amortization. The shorter the cash coverage time, the higher the company's excellence. The standard value in a healthy company is 20%, and the maximum value of this ratio in BEX model is 10 because impact of ex_4 to business excellence is nonlinear. However, cash coverage time shorter than six months does not have significant impact on company's business excellence.

Generally speaking, the greater the BEX index, the better the total excellence of the company. To be more precise, BEX distinguishes between first class companies, those showing signs of excellent growth, very good ones,

and borderline investment opportunities. Detail description is shown in the following table:

Table 2: Business excellence index (BEX)

BUSINESS EXCELLENCE INDEX (BEX)	BUSINESS EXCELLENCE RANK
Greater than 6.01 for 4 years in a row	World class
Greater than 6.01	World class candidate
4.01 - 6.00	Excellent
2.01 – 4.00	Very good
1.01 – 2.00	Good
0.00 – 1.00	Borderline
Negative	Company's existence threatened

Source: Belak and Aljinovic Barac (2008)

4. RESULTS

According to recent authors researches (e.g. Hinton (2008), Taylor (2009), Johansson and Dimofte (2010)) ongoing global financial crisis came to the forefront of the business world 2008 with the failure of a number of American financial companies. So, in the first part of the empirical research, performance of selected companies before (i.e. in year 2007) and during the ongoing financial crisis (i.e. in year 2010) are considered. Calculated values of BEX index and belonging BEX rank are presented in the table below:

Table 3: Business excellence index (BEX) of the companies included in CROBEX index

COMPANY	2007		2010	
	BEX INDEX	BEX RANK	BEX INDEX	BEX RANK
ADRIS	2.691	Very good	-0.121	Existence threatened
ATLANTIC GRUPA	2.577	Very good	2.846	Very good
ATLANTSKA PLOVIDBA	5.234	Excellent	0.222	Borderline
CAKOVECKI MLINOVI	2.995	Very good	1.351	Good
DALEKOVOD	2.967	Very good	1.655	Good
ERICSSON NIKOLA TESLA	2.816	Very good	0.515	Borderline
HT – HRVATSKE TELEKOMUNIKACIJE	4.658	Excellent	8.197	World class
INSTITUT GRAĐEVINARSTVA HRVATSKE	3.066	Very good	0.894	Borderline
INA	1.242	Good	-0.482	Existence threatened

COMPANY	2007		2010	
	BEX INDEX	BEX RANK	BEX INDEX	BEX RANK
INGRA	1.995	Good	-2.485	Existence threatened
ISTRATURIST	1.122	Good	3.184	Very good
JADROPLOV	3.801	Very good	-6.130	Existence threatened
JADRANSKI NAFTOVOD	1.517	Good	5.093	Excellent
KONZUM	7.482	World class	5.328	Excellent
KONČAR ELEKTROINDUSTRIJA	0.869	Borderline	0.779	Borderline
KRAS	1.060	Good	6.137	World class
LEDO	2.859	Very good	2.340	Very good
LUKA PLOČE	2.393	Very good	0.643	Borderline
PODRAVKA	0.766	Borderline	5.985	Excellent
PETROKEMIJA	1.651	Good	2.151	Very good
TEHNIKA	1.996	Good	4.395	Excellent
ULJANIK PLOVIDBA	9.600	World class	3.513	Very good
VIRO	3.063	Very good	2.841	Very good
DOM HOLDING	0.096	Borderline	-6.412	Existence threatened

Source: estimated according to data from authors' database (2011)

After that, univariate statistic analysis was conducted. Observations are paired because they are performed on the same sample in different conditions, so the parametric two sample paired t-test and non parametric Wilcoxon paired signed rank test were used to test the significance of mean differences of BEX index before financial crisis and during it. Also, correlations between samples are calculated. Results of correlation test and two sample paired t-test are presented in the tables below:

Table 4: Paired Samples Correlations

PAIR	N	Correlation	Sig.
BEX_2007 & BEX_2010	24	0.201	0.345

Source: estimated according to data from authors' database (2011)

Table 5: Paired Samples Test

PAIR	t	df	Sig. (2-tailed)
BEX_2007 - BEX_2010	1.434	23	0.165

Source: estimated according to data from authors' database (2011)

As it can be seen from the presented results, values of company's performance index before and during the financial crisis are found not statistically significant correlated (r=0.201; p=0.345). Furthermore, paired two-sample t-test are also found not statistically significant (t=1.434; p=0.165), so it can be concluded that that the average of the differences between a series of paired observations is zero. These findings suggest that financial crisis has no significant effect on company's financial performance.

However, since the paired differences come from a population whose distribution is not *a priori* normal, the t-test may not be the most powerful test available or may provide misleading results. For this reason, transformation of the data and nonparametric test are used. Transformation of the data involves changing the metric in which the data are analyzed, so BEX ranks are used instead of index values. The Wilcoxon paired signed rank test as the most common nonparametric alternative test to two sample paired t-test (Conover, 1980) is applied. Results of nonparametric test are presented in the following table:

Table 6: Wilcoxon Signed Ranks Test

	N	Mean Rank	Sum of Ranks
Negative Ranks (BEX_RANK_2010 < BEX_RANK_2007)	13	10.69	139.00
Positive Ranks (BEX_RANK_2010 > BEX_RANK_2007)	7	10.14	71.00
Ties (BEX_RANK_2010 = BEX_RANK_2007)	4		
Total	24		
Z			-1.286
Asymp. Sig. (2-tailed)			0.199

Source: estimated according to data from authors' database (2011)

According to the obtained results of Wilcoxon signed ranks test, 13 of 24 of companies (58%) achieved worse financial performance in the crisis than before it. At the same time, almost one third of the companies in the sample (29%, i.e. 7 of 24) achieved better financial performance rank in the crisis than before it. Four of companies did not change their financial performance rank category. Also, it is important to stress that in crisis five companies entered a category "existence threatened", while there is no companies in that category before the financial crisis began, which can be assigned to the effects of the crisis. However, despite obvious differences in company's performance data before and during ongoing financial crisis, these differences are not found statistically significant (Z=-1.286 and p=0.199).

5. CONCLUDING REMARKS

The ongoing global financial crisis is but one of several crisis that hits and will hit world's economy. Many empirical studies in this field have been conducted, but only a few have concentrated on bank-oriented economies with undeveloped capital market like Croatia. Therefore, this paper can play an important role in recognizing determinants and effects of financial crisis on companies' performance and providing certain contribution in the aforementioned areas.

From the theoretical point of view, this study questions whether a good financial performance is distressed, i.e. negatively affected by financial crisis. On the practical side, verification of empirical evidence is provided through the sample of 25 best Croatian listed companies whose stocks are included in official Zagreb Stock Exchange share index – CROBEX. Although presented data show differences in achieved financial results in the conditions of crisis and before it, the evidence of statistically significant effect of the crisis on company's financial performance are not found.

These results suggest that a number of additional analyses should be done, so *the following recommendations can be derived*. First, *standard setters should aim* to define a set of principles, actions and interventions that could prevent negative effects of crisis on economy and companies. Second, the recommendation for the future researches is to explore the effects of crisis within industrial sectors and in comparison to companies in similar economies.

Finally, it is important to stress that the research presented in this paper must be considered preliminary, because the crisis is still ongoing issue and more data need to be collected and more effect to be analyzed, especially when the crisis end.

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Preliminary Communication

Financial Market Perception of Systemic Risk and Financial Stability

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ABSTRACT

This paper argues that during periods of boom in asset prices, investors, creditors and regulators of financial markets have a decreased perception of systemic risk. Therefore, they increase their indebtedness. In this way, by making financial decisions at a microeconomic level, they can increase the probability of the occurrence of episodes of financial instability at the aggregate level. Therefore, in this study, we analyzed the influence of the perception of systemic risk on private sector credit in the United States from 1970 based on co-integration VAR during boom in stock and real estate prices. The co-integration test suggested that long-term development of private sector credit could be explained by the perception of systemic risk during asset price boom. Impulse response analysis based on Cholesky's standard decomposition revealed that there was significant dynamic interaction between the perception of systemic risk in credit markets during asset prices boom and the level of private credit in the United States.

INTRODUCTION

In recent decades in many developed countries, there have been connected cycles in credit, asset prices and economic activity. A considerable amount of scientific and professional literature deals with the afore-mentioned events *(Mishkin and White, 2002; Adalid and Detken, 2007; Mendoza, 2008; Assenmacher-Wesche and Gerlach, 2008; Borio and Drehmann, 2009; ECB, 2010; Tarashev, Borio, Tsatsaronis, 2010)*. However, only a small number of them try to model the movement of credit with asset prices (*Hofmann, 2004)*. With the model presented in this paper, we wanted to explore and explain these discrepancies, with particular emphasis on the analysis of perceptions of risk during the cred-

it cycle. This paper starts with the basic assumption that agents of credit and asset markets incorrectly perceived systemic risk at a time of continued growth in asset prices. Therefore, by making rational microeconomic decisions, they created the risk of financial instability at the aggregate level. Namely, with an increase in stock and real estate prices, at the same time, increasing indebtedness and investments in the asset markets of private sectors was also evident. This made them vulnerable to adverse financial and real shocks. With the increasing value of assets owned by potential debtors, financial institutions were more willing to approve loans based on pledged assets *(Bernanke and Gertler, 1989),* thereby further exposing themselves to the fall in asset prices *(Herring and Watcher, 1999).* At the same time, there was an obvious decrease in financial market perception of systemic risk *(Rimac Smiljanić, 2011a).* During the time of growing asset prices, investors and creditors considered investment in assets and debts with pledged assets to be low-risk activities and they reduced their perception of risk. This risk perception decrease was reflected in the reduction of the risk premium that they were looking for in their investment. This was obvious in the growth of asset ownership and in the ratio between debt and assets in their balance sheets. Due to the increase in asset prices and a stimulated economic environment, microeconomic agents ignored the growing systemic risk and they reduced the risk premium that they demanded in their investments. Before the crisis, in times of the highest prices of assets, risk premiums were at the lowest levels, although the systemic risk was at its highest. When the asset prices started to fall, the risks which were accumulated during the boom cycle in asset prices become overly manifest. Namely, during the boom phase in asset prices, the net worth of potential borrowers grew also because of the rising prices of stock and real estate in their possession. Therefore, the financial institutions were willing to grant them loans with lower interest rates due to a decrease in risk premium. It was also easier to borrow, so investors were encouraged with their "more valuable" asset, better financing terms and with expectations of retaining or a further increase in asset prices. The opposing events in the markets, i.e. the drop in asset prices, caused a withdrawal of lenders from the market due to increased problems of information asymmetry. In fact, the fall in asset prices caused a reduction in the net value of the debtor, and the creditor considered it to be more risky. This resulted in a rise in interest rates and the inability to gain new external financing. Quality investment projects were not undertaken because of the withdrawal of lenders from the financial markets. The problem of financial instability became visible. The financial system did not allocate savings surpluses to the most profitable projects, but directed them to the "safest" debtors. Starting from the basic theoretical hypotheses of this study, financial instability (stability) is defined as follows:

Financial instability is a phenomenon in the financial system, which is manifested by withdrawal of lenders from the financial markets due to increased distrust in the return of borrowed funds i.e. increased problems of information asymmetry among the participants in credit markets, which may be caused by internal or external events. It comes to disturbances in the functioning of the financial sector as an intermediary between savings-sufficed and savings-deficient subjects i.e. the financial sector allocates funds to the safest, not the most profitable borrowers. Financial stability is defined as the opposite phenomenon of financial instability.

By defining the financial stability (instability) in the above manner, we agree with the researchers that the causes of financial instability are seen in the phenomena of the strengthening problems of information asymmetry (*Mishkin, 1990; Mishkin and White, 2002*; *Borio and Drehmann, 2008*). The main difference between the proposed model in this paper compared to other previous studies is in the assumption that, during the boom phase in asset prices, macroeconomic subjects incorrectly perceived systemic risk and consequently their behavior created the threat of financial instability.

Based on the described model, we set out two basic hypotheses that we seek to prove in the empirical part of research:

H1: Reduction of perception of systemic risk during the boom phase in asset prices encourages growth of borrowing.

H2: With longer duration of the boom phase in asset prices, the microeconomic agents are more prone to borrow or lend.

One of the few researchers who empirically tested supply and demand for credit with economic activity and asset prices is Hofmann (2004). He created a model that explains both the supply and demand for credit in the private non-financial sector with real GDP, real interest rates and the real price index of commercial and residential real estate weighted with their share in the wealth of private sectors. With the acceptance of Hofman's idea, the model presented in this paper will be upgraded with the stock, residential and commercial real estate price index, the aggregate asset price index and the indicators of financial markets perception of systemic risk. The proposed model represents a "reduce form" credit model that includes the supply and demand for loans to private non-financial sectors in a country. With the proposed model, we wanted to test how the perception of systemic risk, during boom phases in asset prices, affect the movement of the share of credit to private sectors in gross domestic product. It was tested as follows: during the boom phase in the aggregate asset price index, but also during the phase of the boom in stock prices, commercial

and residential real estate prices. By testing the model with perception of systemic risk during the boom phases in indexes of each type of assets included in aggregate price index - stocks, commercial and residential real estate gave us an answer to which particular type of asset price movements create the most dangerous "threats" to financial stability. In this study, we followed up the theoretical and empirical results presented in previous pieces of research presented in papers by Rimac Smiljanić (2010, 2011a, 2011b) about the connection between asset prices, systemic risk perception and financial stability.

The paper is organized as follows: Section 2 contains the methodological approach and the data used in the analysis are described. In Section 3 the empirical results are presented and discussed. Section 4 concludes the paper with a summary and states the potential benefits and costs from using the asset prices in forecasting future economic developments.

METHODOLOGY AND DATA

We analyzed and empirically tested the theoretical model on samples of data from the United States from 1970 to the end of 2008 using the quarterly data. The following data variables have been taken into consideration:

- Systemic risk perception (SRP): Systemic risk perception on credit markets is visible in interest rate risk premiums. Namely, when credit market participants are expecting an increase in systemic risk, the lower quality borrowers will be considered to be more risky than the high quality borrowers and therefore will pay higher interest rates than low risk borrowers. Considering the fact that there are no indicators at the aggregate level of the difference between interests on loans between high and low risk borrowers, the spread between low versus high quality bonds is taken. Precisely, the spread on Moody's Seasoned AAA and BAA Corporate Bond Yield is taken.
- Boom in asset prices (BAP), boom in stock prices (BSP), boom in residential real estate (BRREP) and boom in commercial real estate prices (BCREP): Dates of boom and bust phases in stock prices, residential and commercial real estate prices and aggregate price index's are taken from Rimac Smiljanić (2011b)[1].
- Gross domestic product (GDP): Data for gross domestic product in the US are taken from OECD Main Economic Indicators data base. We took the real GDP as the broadest aggregate measure of the real activity. The nominal data were transformed to the index with 1985 as the base year. Nominal data are transformed to the real using the 2005 CPI index.

[1] More about methodology of determination boom and bust phases in asset prices in Rimac Smiljanić (2011b).

- Inflation (CPI): data were taken from the OECD Main Economic Indicators data base.
- Real interest rate (RIR): As a proxy of the real cost of financing, the real interest rate was calculated. The three month short-interest rate was taken from the OECD Main Economic Indicators data base. The real interest rate was calculated by reducing this rate with annual CPI inflation.[2]
- Credit to the private sector/gross domestic product (CPS/GDP): Data for nominal credit to the private sector were taken from the base International Financial Statistics (IFS) International Monetary Fund. The levels of bank credit and credit of other financial institutions were used (line 22d + line 42d). After calculating the ratio to the GDP, the data were transformed to the index with 1985 as the base year.
- Stock price (SP): Data were taken from the base of Bank of International Settlements (BIS) in real terms and in index form with 1985 as the base year.
- Residential real estate prices (RREP): Data were taken from the base of the Bank of International Settlements (BIS) in real terms and in index form with 1985 as the base year.
- Commercial real estate prices (CREP): Data were taken from the base of Bank of International Settlements (BIS) in real terms and in index form with 1985 as the base year.
- Aggregate asset price index (AAPI): Data were taken from the base of the Bank of International Settlements (BIS) in real terms and in index form with 1985 as the base year.[3]

The results of the Standard argument Dickey-Fuller *(Dickey and Fuller, 1981)* unit tests reported in Table 1 suggested that all variables were integrated into the first level over the whole sample. Additionally, the ADF test was performed by considering trends and constants, and results indicated the same conclusion (Appendix Table 1-2). In the next step of empirical testing, the model of the multivariate approach to co-integration analysis was used.

2 More about the way this calculation for getting real interest rate on credit market in Hofmann (2004).

3 The aggregate asset price index is calculated and published by the Bank for International Settlements (BIS). Its components are stock, and commercial and residential real estate prices. Their weighting in the index are determined by the proportion of each asset in the portfolios of private investors, based on data from national accounts. Accordingly, residential and commercial real estate prices have the highest proportion in the index – an average of 80%. The lowest proportion is made up of stocks, because they still constitute a small fraction of total assets held by private investors. More about this index is in Arthur (2001).

Table 1 Augmented Dickey-Fuller

Variable	H0: Variable has unit root			
	Level		Change	
	t-Statistic	Prob	t-Statistic	Prob
AAPI	-2.349	0.158	-6.746	0.000
SP	-1.361	0.599	-7.699	0.000
REEP	-4.753	0.000	-4.466	0.000
CREP	1.207	0.669	-2.278	0.186
CPS/GDP	0.279	0.976	-13.230	0.000
GDP	-0.036	0.952	-4.194	0.000
CPI	-2.653	0.084	-5.190	0.000
RIR	-2.740	0.069	-3.766	0.021
SRP	-2.266	0.184	-11.444	0.000
COUNTER	-2.794	0.061	-12.367	0.000
*MacKinnon (1996) one-sided p-values.				

Note: SRP - Systemic risk perception; GDP - Gross domestic product; CPI – Inflation; RIR - Real interest rate; CPS/GDP - Credit to the private sector/gross domestic product; SP - Stock price; RREP - Residential real estate prices; CREP - Commercial real estate prices; AAPI - Aggregate asset price index; COUNTER – duration of the boom phase in asset prices

In the next step, we designed the "interaction term" variable by using the movement of aggregate asset price index in the boom phase[4] and the financial markets perception of systemic risk. We believe that aggregate asset price index is the best indicator for the explanation of the movement ratio of credit/GDP. The index is formed based on the movement of stock, residential and commercial real estate prices weighted with shares of this type of asset in the wealth of private sectors. Perception of systemic risk in the times of this boom phase should be the best indicator of the willingness of households and businesses to borrow based on the pledge assets, as well as the indicator of preference for investing in certain types of assets of those sectors. Specifically, it is assumed to increase with the increase in asset prices. However, the proposed model was also tested with the "interaction term" variable formed on the basis of stock, commercial and residential real estate prices. The model was statistically significant and variables were marked with the expected sign for the "in-

[4] In this paper, we followed up methodology proposed in Rimac Smiljanić (2011a). Namely, we believe that this new methodology for ex post determination of the cycles in asset prices is more adequate than methodologies applied in previous studies (Borio and Lowe, 2002; Adalid and Detken, 2007; Mendoza and Terrones, 2008; Borio and Drehmann, 2009) in order to determine impact of asset prices on the level of credit in the country. Assuming that the level of indebtedness of the private sector is affected by their perception of systemic risk, which decreases with a longer continual growth in asset prices, we believe that it is necessary to determine the rising and falling phases in asset prices. In this paper we give strong arguments that the mentioned methodology can better determine the impact of asset prices on the occurrence of credit cycles in the country.

teraction term" variable formed on the basis of stock prices. The tested models with the "interaction term" variable formed on the basis of commercial and residential real estate prices were not statistically significant. The fact that the model is valid when we take the perception of systemic risk during the boom phase in the aggregate asset prices index, is not valid concerning the perception of systemic risk during the phase of the boom in real estate prices can be explained. Namely, in constructing the aggregate asset prices index, additionally the shares of these assets in the wealth of private sectors are taken into account. It is understandable that with greater or smaller share of ownership of a certain type of asset, its impact on the owners' willingness to borrow it increases or decreases as does their ability to obtain credit from commercial banks. Based on these results, we can conclude that the use of the aggregate asset price index for the formation of "interaction term" variable is justified because its value is affected by the share ownership of the certain type of asset and also with asset price movements. The afore-mentioned is in accordance with the assumptions of theoretical models. Following the model and research of *Hofmann (2004)*, we estimated an equation of the long-term relationship, because we cannot exclude the existence of a long-term relationship between variables, nor can the set of weakly exogenous variables be assumed.

Therefore, in the first step, we estimated the initial VAR to be able to choose the optimal lag-length that is needed to construct the VECM model. The initial VAR model was reformulated in vector error-correction form:

$$D(Yt) = \sum_{i=1}^{k-1} A * D(Y_{t-i}) + \alpha\beta' Y_{t-1} + \qquad (1)$$

Where:

- Y_t – is a n*1 vector of endogenous variables, i.e. Y_t =[CPS/GDP RIR PSR AAP*PSR]'
- CPS/GDP – ratio of credit to the private sector to the GDP in the US
- RIR – short term interest rate in the US
- PSR – credit markets perception of systemic risk in the US
- AAP – asset prices in US;
- AAP*PSR – interaction term - perception of systemic risk during the growth of asset prices in the US
- K – optimal number of lags
- A – matrix of parameters
- ε_t – n x 1 vector of stochastic disturbance

- α - matrix of speed of adjustments
- β - co-integration parameters matrix = [n*r] = [5*1]

EMPIRICAL RESULTS

In the first step of the estimation VECM model with the associated co-integration vector, it was necessary to select the optimal lag length of the initial VAR. Results of order selection criteria are given in Table 2.

Table 2 VAR lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1180.187	NA	104.691	16.002	16.083	16.035
1	-504.466	1305.783	0.014*	7.087*	7.492*	7.251*
2	-493.624	20.365	0.015	7.157	7.886	7.453
3	-477.392	29.612	0.015	7.153	8.207	7.581
4	-465.635	20.813	0.015	7.211	8.588	7.770
5	-455.970	16.587	0.017	7.296	8.998	7.988
6	-436.909	31.682	0.016	7.255	9.280	8.078
7	-413.178	38.162*	0.015	7.151	9.500	8.105
8	-406.798	9.914	0.017	7.281	9.954	8.367

*Note: * best lag order considering the criteria*
LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion

Taking into account the Final Prediction Error, the Akaike, Schwarz and Hannan-Quinn information criterion, the information criterion for the lag length of VAR k = 1 was chosen. Diagnostic tests of vector auto-regression model in order of seven, according to the sequential modified LR test statistic criteria, were not significant.

In the next step, the Johansen co-integration test was implemented. Taking into account the result given in Table 3, it can be concluded that the H0 hypothesis can be rejected at the 5% level, i.e. Trace test and Max – eigenvalue test indicate a one co-integration vector.

Table 3 Johansen co- integration test

Maximum rank[a]	Eigenvalue	Trace statistics	Eigenvalue	Max-Eigen statistic [b]
0*	0.230	63.371	47.856	0.000
1	0.112	24.255	29.797	0.189
2	0.042	6.500	15.494	0.636
3	0.000	0.042	3.841	0.837

a Trace test and Max – eigenvalue test indicates one co-integrating equation at the 5% level (*)

b MacKinnon-Haug-Michelis (1999) p-values

From the VECM (1) system, the estimated function of private sector credit to gross domestic product can be written in the following form:

$$CPS/GDP = - 42.784\ RIR + 147.535\ SRP - 205{,}033\ SP*SRP + 281.290 \qquad (2)$$

T-statistic tests of estimated coefficients are presented in Table 4. According to the co-integrating coefficients in Table 4 in the long-term, we can expect that rise of real interest rates (RIR) by one percentage point will result with a decrease in the share of loans to private sectors in gross domestic product (CPS/GDP) by 42.784%. Reducing perception of systemic risk of one percentage point during the time of boom in asset prices (AAP*SRP) results in increasing the share of loans to private sectors in gross domestic product (CPS/GDP) for 205.03%. On the other hand, for the reducing perception of systemic risk (SRP) at a time when there is not a boom in asset prices the opposite effect is visible, i.e. reducing perception of systemic risk by one percentage point have effect to reduce the share of loans to private sectors in gross domestic product (CPS/GDP) for 145.54%.

Table 4 Co-integration vector coefficients

VARIABLE	*COEFFICIENT*	*STANDARD ERROR*	*T-STATISTIC*
CPS/GDP	*1*		
RIR	*42.784*	*9.793*	*4.369*
SRP	*-147.535*	*70.349*	*-2.097*
*AAP*SRP*	*352.568*	*63.606*	*5.119*
C	*-281.290*		

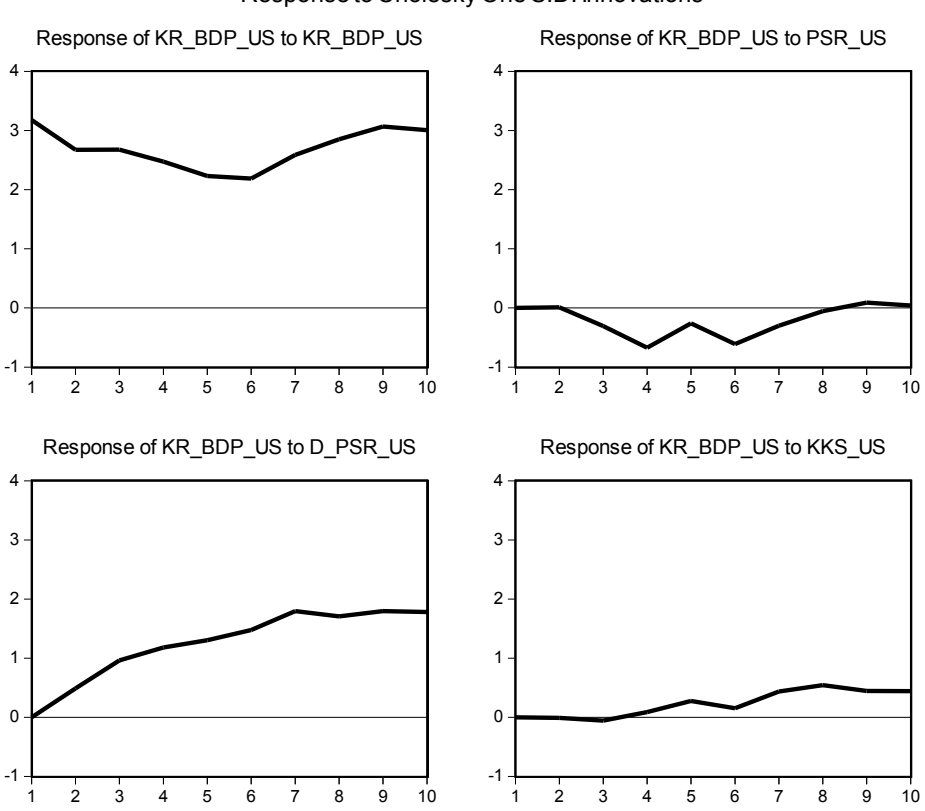
*Note: CPS/GDP - Credit to the private sector/gross domestic product; RIR - Real interest rate; SRP - Systemic risk perception; SP - Stock price; AAP*PSR – interaction term - perception of*

systemic risk during the growth of stock prices in the U.S.

The described model and its results confirm that we can accept hypothesis H1 i.e. that the reduced perception of systemic risk during boom phases in asset prices encouraged growth of indebtedness.

After evaluating the vector co-integration model of credit, an analysis of the dynamic interaction variables in the model follows. Cholesky's decomposition involves a recursive ordering of the variables *(Bahovec and Erjavec, 2009)*. The ordering adopted here is the following: share of credit to private sectors in gross domestic product, financial market perception of systemic risk during the boom phase in asset prices, perception of systemic risk when it is not the boom phase and the last real short-term interest rates on the interbank market. The real short-term interest rates are assumed to react first and their impact is transmitted to all other variables. Graph 1 shows how the ratio of credit in gross domestic product (CPS/GDP) reacts on the "shock" of one standard deviation in the values of other model variables. As can be seen in Graph 1, the share of loans to private sectors in gross domestic product responded with growth most strongly to the perception of systemic risk reduction during the phase of boom in asset prices. It is evident that the impact grows over time. In the first quarter, credit did not react to changes. In the next quarter, the "shock" of one standard deviation in the perception of systemic risk during the boom phase in asset prices led to the increase of ratio credit/GDP ratio by 48.55%. In the third quarter, after an initial increase in the perception of systemic risk during the boom phase in asset prices by one standard deviation, the credit/GDP remained a growth of 92.57% compared to the average level of movement of the ratio credit/GDP. In the following quarters, there was also visible growth of a shock effect on ratio credit/GDP relative to its average level. This trend went all the way to the eighth quarter, when it slightly fell, but was again restored in the ninth. In the tenth quarter, a small decline was visible, but the impact was still extremely strong. Namely, in the tenth quarter, after the "shock" of one standard deviation in the perception of systemic risk during the boom phase in asset prices, there remained a growth in ratio credit/GDP ratio by 177.6% compared to its average value. These facts support the theoretical thesis of the model that the impact of asset prices on the perception of systemic risk, and thus on financial stability is greater as time passes. Therefore, in the next step of the research, the model was upgraded with a variable COUNTER.

Graph 1 Standard Cholesky decomposition (+/- 95% bands)*



*Note: SRP (QSABUS) - Systemic risk perception at a time when there is no boom in asset prices; APP*SRP (QDCSAAPRUS) - Systemic risk perception at a time where there is a boom in asset prices; GDP (BDP_US) - Gross domestic product; RIR (QSTIRRUS)- Real interest rate; CPS/GDP (QCRUS_QGDPUS) - Credit to the private sector/gross domestic product; AAPI - Aggregate asset price index; *Full Standard Cholesky decomposition (+/- 95% bands) in Appendix*

In the next step, the model was upgraded with the variable COUNTER. We wanted to find the answer to the question of whether the duration of the boom phase in asset prices cycle affects the growth of private sector indebtedness in the country and thereby proves or disproves the second hypothesis. The new variable Counter was constructed. It counted how many successive quarters last boom phase in the asset prices cycle (ADF test results are in Table 1). We formed a new model by extending the existing with a new variable. The model was tested with VAR, because it was assumed that COUNTER influences in the short term. The variable COUNTER was introduced into the model as an exogenous variable. VAR results are presented in Table 5.[5]

[5] The selection criterions for optimal lag-length in the initial VAR are given in Appendix.

Table 5 Reduced results of VAR model variables counter effect on the ratio credit/GDP*

Vector Autoregression Estimates
Sample (adjusted): 8 156 Included observations: 149 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	D(QCRUS_QGDPRUS)	D(QDCSAAPRUS)	D(QSABUS)	D(QSTIRRUS)
	:	:	:	:
BROJAC	**0.227167**	0.001616	-0.00175	-0.000519
	(0.06114)	(0.00299)	(0.00396)	(0.01929)
	[3.71577]	[0.54034]	[-0.44361]	[-0.02689]

*Note: * Full result of VAR model with counter effect on the ratio credit/GDP can be found in appendix; BROJAC – is the symbol for the variable COUNTER*

According to the results from empirical testing, the growth of variable COUNTER statistically significantly affected the growth of ratio credit/GDP. Therefore, hypothesis H2 can be accepted. That is, it can be said that with longer growth in asset prices, microeconomic agents are more willing to borrow and/or lend. Also, the result of the estimated VAR indicates that the variable COUNTER affects the perception of systemic risk during the boom phase in asset prices. The specified result is consistent with the theoretical hypothesis of the model. The effect of variable COUNTER on the perception of systemic risk in asset prices when there is not a boom phase is not statistically significant.

CONCLUSION

This article offers an overview of financial market perception of systemic risk role in private non-financial sector credit. Strong theoretical assumptions support the importance of financial markets systemic risk perception as determinate of supply and demand for credit. As was shown in this paper, the perception of systemic risk during the boom phase in asset prices had a significant influence on the credit/GDP ratio in the United Sates in the period between 1970-2008. Due to the lack of indexes included in this analysis, together with the absence of more adequate data, these finding needs to be further explored by more research. Despite these limitations, the results in this paper provide evidence about the role of financial market perception of systemic risk on credit movements. Therefore, the results provide a significant contribution to better credit and investment decision making, but also shed new light on ways to achieve financial stability. Therefore, the results have important implications for monetary policy and regulatory management. The fact that that the leaders of the leading financial regulatory institutions believe *(Caruana, 2010;*

Greenspan 2007 cited in Felsenthal, 2007) that wrongly perceived systemic risk is a key cause of current financial crises certainly gives further significance to the results of this study.

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APPENDIX

Table 1 Augmented Dickey-Fuller test with the constant and linear trend

VARIABLE	*H0: VARIABLE HAS UNIT ROOT*			
	VARIABLE		*VARIABLE*	
	T-STATISTIC	*PROB**	*T-STATISTIC*	*PROB**
AAPI	*-3.083*	*0.114*	*-6.710*	*0.000*
SP	*-2.218*	*0.475*	*-7.693*	*0.000*
REEP	*-5.336*	*0.000*	*-4.467*	*0.002*
CREP	*-2.204*	*0.482*	*-2.281*	*0.440*
CPS/GDP	*-2.060*	*0.563*	*-13.269*	*0.000*
GDP	*-2.107*	*0.537*	*-5.568*	*0.000*
CPI	*-4.291*	*0.004*	*-5.214*	*0.000*
RIR	*-3.766*	*0.021*	*-12.379*	*0.000*
SRP	*-2.158*	*0.508*	*-11.434*	*0.000*
COUNTER	*-2.924*	*0.157*	*-12.336*	*0.000*
**MACKINNON (1996) ONE-SIDED P-VALUES.*				

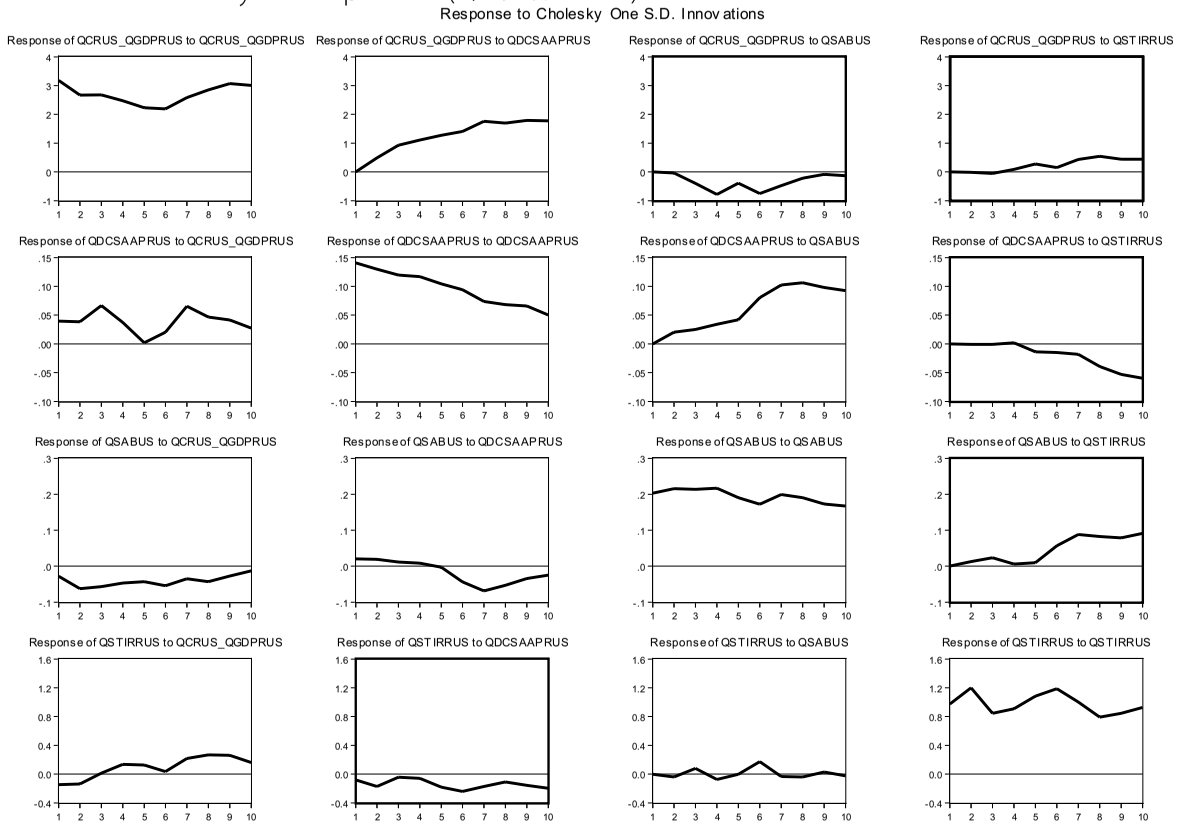
Note: SRP - Systemic risk perception; GDP - Gross domestic product; CPI – Inflation; RIR - Real interest rate; CPS/GDP - Credit to the private sector/gross domestic product; SP - Stock price; RREP - Residential real estate prices; CREP - Commercial real estate prices; AAPI - Aggregate asset price index; COUNTER

Table 2 Augmented Dickey-Fuller test without the constant and linear trend

VARIABLE	*H0: VARIABLE HAS UNIT ROOT*			
	VARIABLE		*VARIABLE*	
	T-STATISTIC	*PROB**	*T-STATISTIC*	*PROB**
AAPI	*-0.216*	*0.606*	*-6.768*	*0.000*
SP	*-0.436*	*0.523*	*-7.716*	*0.000*
REEP	*0.952*	*0.909*	*-4.394*	*0.000*
CREP	*-2.142*	*0.031*	*-1.879*	*0.057*
CPS/GDP	*2.487*	*0.997*	*-12.704*	*0.000*
GDP	*3.278*	*0.999*	*-4.194*	*0.000*
CPI	*-1.762*	*0.074*	*-5.195*	*0.000*
RIR	*-1.182*	*0.216*	*-12.427*	*0.000*
SRP	*-0.311*	*0.571*	*-11.458*	*0.000*
COUNTER	*-2.441*	*0.014*	*-12.407*	*0.000*
**MACKINNON (1996) ONE-SIDED P-VALUES.*				

Note: SRP - Systemic risk perception; GDP - Gross domestic product; CPI – Inflation; RIR - Real interest rate; CPS/GDP - Credit to the private sector/gross domestic product; SP - Stock price; RREP - Residential real estate prices; CREP - Commercial real estate prices; AAPI - Aggregate asset price index; COUNTER

Graph 1 Full Standard Cholesky decomposition (+/- 95% bands)



*Note: SRP (QSABUS) - Systemic risk perception in the time when is no boom in asset prices; APP*SRP (QDCSAAPRUS) - Systemic risk perception in the time when is boom in asset prices; GDP (BDP_US) - Gross domestic product; RIR (QSTIRRUS)- Real interest rate; CPS/GDP (QCRUS_QGDPUS) - Credit to the private sector/gross domestic product; AAPI - Aggregate asset price index*

Table 3 VAR lag order selection criteria's - Results of VAR model with variable counter

VAR LAG ORDER SELECTION CRITERIA
ENDOGENOUS VARIABLES: QCRUS_QGDPRUS QSTIRRUS QDCSAAPRUS_ QSABUS
EXOGENOUS VARIABLES: BROJAC
DATE: 05/12/10 TIME: 12:52
SAMPLE: 1 158
INCLUDED OBSERVATIONS: 148

LAG	*LOGL*	*LR*	*FPE*	*AIC*	*SC*	*HQ*
0	*-1350.392*	*NA*	*1044.284*	*18.30259*	*18.38360*	*18.33551*
1	*-497.4173*	*1648.316*	*0.012788*	*6.992125*	*7.397154**	*7.156687**
2	*-484.3033*	*24.63302*	*0.013303*	*7.031125*	*7.760177*	*7.327337*
3	*-468.8191*	*28.24812*	*0.013412*	*7.038096*	*8.091171*	*7.465958*
4	*-452.6266*	*28.66512*	*0.013408*	*7.035495*	*8.412592*	*7.595006*
5	*-442.2860*	*17.74668*	*0.014526*	*7.111973*	*8.813094*	*7.803135*
6	*-421.1745*	*35.09081*	*0.013629*	*7.042899*	*9.068042*	*7.865710*
7	*-398.9348*	*35.76387**	*0.012621**	*6.958578**	*9.307744*	*7.913039*
8	*-393.1642*	*8.967825*	*0.014637*	*7.096813*	*9.770002*	*8.182924*

** INDICATES LAG ORDER SELECTED BY THE CRITERION*
LR: SEQUENTIAL MODIFIED LR TEST STATISTIC (EACH TEST AT 5% LEVEL)
FPE: FINAL PREDICTION ERROR
AIC: AKAIKE INFORMATION CRITERION
SC: SCHWARZ INFORMATION CRITERION
HQ: HANNAN-QUINN INFORMATION CRITERION

*Note: BROJAC is a symbol for the variable COUNTER; SRP (QSABUS) - Systemic risk perception in the time when is no boom in asset prices; APP*SRP (QDCSAAPRUS) - Systemic risk perception in the time when is boom in asset prices; GDP (BDP_US) - Gross domestic product; RIR (QSTIRRUS)- Real interest rate; CPS/GDP (QCRUS_QGDPUS) - Credit to the private sector/gross domestic product; AAPI - Aggregate asset price index*

Table 4 Results of VAR model with variable counter

VECTOR AUTOREGRESSION ESTIMATES
DATE: 05/10/10 TIME: 21:00
SAMPLE (ADJUSTED): 8 156
INCLUDED OBSERVATIONS: 149 AFTER ADJUSTMENTS
STANDARD ERRORS IN ( ) & T-STATISTICS IN [ ]

	D(QCRUS_QGDPRUS)	D(QDCSAAPRUS)	D(QSABUS)	D(QSTIRRUS)
D(QCRUS_QGDPRUS(-1))	-0.191030	-0.005535	-0.006918	-0.003598
	(0.09388)	(0.00459)	(0.00608)	(0.02963)
	[-2.03476]	[-1.20551]	[-1.13850]	[-0.12146]
D(QCRUS_QGDPRUS(-2))	-0.122852	0.003588	0.004482	0.001768
	(0.09934)	(0.00486)	(0.00643)	(0.03135)
	[-1.23663]	[0.73850]	[0.69697]	[0.05640]
D(QCRUS_QGDPRUS(-3))	-0.174753	-0.012827	0.004755	0.028668
	(0.09575)	(0.00468)	(0.00620)	(0.03022)
	[-1.82508]	[-2.73912]	[0.76726]	[0.94878]
D(QCRUS_QGDPRUS(-4))	-0.137252	-0.016214	0.002565	-0.008944
	(0.09566)	(0.00468)	(0.00619)	(0.03019)
	[-1.43481]	[-3.46571]	[0.41434]	[-0.29630]
D(QCRUS_QGDPRUS(-5))	-0.088970	0.001450	0.001594	0.000906
	(0.10240)	(0.00501)	(0.00663)	(0.03231)
	[-0.86883]	[0.28960]	[0.24051]	[0.02804]
D(QCRUS_QGDPRUS(-6))	0.029733	0.016395	0.013284	0.048931
	(0.09949)	(0.00487)	(0.00644)	(0.03140)
	[0.29884]	[3.36938]	[2.06281]	[1.55850]
D(QDCSAAPRUS(-1))	1.102936	0.011705	-0.027978	-0.153878
	(1.79411)	(0.08775)	(0.11613)	(0.56616)
	[0.61475]	[0.13340]	[-0.24093]	[-0.27179]
D(QDCSAAPRUS(-2))	2.123857	0.022016	-0.025035	0.988506
	(1.78170)	(0.08714)	(0.11532)	(0.56224)
	[1.19204]	[0.25266]	[-0.21708]	[1.75815]
D(QDCSAAPRUS(-3))	0.884924	0.086869	-0.051094	0.077775
	(1.73050)	(0.08463)	(0.11201)	(0.54608)
	[0.51137]	[1.02640]	[-0.45616]	[0.14242]
D(QDCSAAPRUS(-4))	1.015494	-0.009235	-0.099173	-0.333617
	(1.39416)	(0.06819)	(0.09024)	(0.43995)
	[0.72839]	[-0.13544]	[-1.09902]	[-0.75831]

D(QDCSAAPRUS(-5))	1.248056	0.041964	-0.262821	-0.456877
	(1.39724)	(0.06834)	(0.09044)	(0.44092)
	[0.89323]	[0.61407]	[-2.90608]	[-1.03619]
D(QDCSAAPRUS(-6))	2.281010	-0.030833	-0.191120	0.470729
	(1.49763)	(0.07325)	(0.09694)	(0.47260)
	[1.52308]	[-0.42096]	[-1.97162]	[0.99604]
D(QSABUS(-1))	0.282329	0.048610	0.076061	-0.340007
	(1.62070)	(0.07927)	(0.10490)	(0.51144)
	[0.17420]	[0.61326]	[0.72507]	[-0.66481]
D(QSABUS(-2))	-1.505410	-0.013928	-0.004361	0.573334
	(1.58183)	(0.07736)	(0.10239)	(0.49917)
	[-0.95169]	[-0.18003]	[-0.04259]	[1.14857]
D(QSABUS(-3))	-1.946625	-0.001427	0.011198	-1.230059
	(1.54345)	(0.07549)	(0.09990)	(0.48706)
	[-1.26122]	[-0.01890]	[0.11209]	[-2.52548]
D(QSABUS(-4))	1.576303	-0.007232	-0.120134	0.821318
	(1.60358)	(0.07843)	(0.10379)	(0.50603)
	[0.98299]	[-0.09221]	[-1.15743]	[1.62305]
D(QSABUS(-5))	-2.010338	0.142403	-0.007870	0.142807
	(1.60085)	(0.07829)	(0.10362)	(0.50517)
	[-1.25579]	[1.81881]	[-0.07595]	[0.28269]
D(QSABUS(-6))	0.190103	0.002095	0.149841	-0.763685
	(1.59599)	(0.07806)	(0.10330)	(0.50364)
	[0.11911]	[0.02684]	[1.45051]	[-1.51633]
D(QSTIRRUS(-1))	-0.176378	0.002010	0.012784	0.243660
	(0.29395)	(0.01438)	(0.01903)	(0.09276)
	[-0.60002]	[0.13982]	[0.67190]	[2.62673]
D(QSTIRRUS(-2))	-0.176037	0.001586	0.006991	-0.407276
	(0.28841)	(0.01411)	(0.01867)	(0.09101)
	[-0.61037]	[0.11241]	[0.37449]	[-4.47497]
D(QSTIRRUS(-3))	-0.026117	0.002646	-0.014941	0.251869
	(0.31302)	(0.01531)	(0.02026)	(0.09878)
	[-0.08344]	[0.17281]	[-0.73747]	[2.54987]
D(QSTIRRUS(-4))	0.144222	-0.015072	0.012338	-0.042191
	(0.30132)	(0.01474)	(0.01950)	(0.09509)
	[0.47864]	[-1.02277]	[0.63261]	[-0.44372]
D(QSTIRRUS(-5))	-0.204582	0.002807	0.039010	0.206598
	(0.29212)	(0.01429)	(0.01891)	(0.09218)
	[-0.70033]	[0.19647]	[2.06317]	[2.24116]
D(QSTIRRUS(-6))	0.319519	-0.012489	0.021392	-0.223512
	(0.29048)	(0.01421)	(0.01880)	(0.09166)
	[1.09999]	[-0.87907]	[1.13780]	[-2.43839]

BROJAC	**0.227167**	0.001616	-0.001755	-0.000519
	(0.06114)	(0.00299)	(0.00396)	(0.01929)
	[3.71577]	[0.54034]	[-0.44361]	[-0.02689]
R-SQUARED	0.185522	0.250910	0.247652	0.342402
ADJ. R-SQUARED	0.027881	0.105925	0.102036	0.215125
SUM SQ. RESIDS	1246.548	2.981725	5.222364	124.1327
S.E. EQUATION	3.170616	0.155068	0.205221	1.000535
F-STATISTIC	1.176867	1.730594	1.700721	2.690208
LOG LIKELIHOOD	-369.6738	79.98077	38.22737	-197.8185
AKAIKE AIC	5.297634	-0.737997	-0.177549	2.990852
SCHWARZ SC	5.801652	-0.233979	0.326469	3.494870
MEAN DEPENDENT	0.670744	-0.007696	0.012595	0.006798
S.D. DEPENDENT	3.215763	0.163997	0.216567	1.129359

DETERMINANT RESID COVARIANCE (DOF ADJ.)	0.009422
DETERMINANT RESID COVARIANCE	0.004519
LOG LIKELIHOOD	-443.4334
AKAIKE INFORMATION CRITERION	7.294408
SCHWARZ CRITERION	9.310479

*Note: BROJAC is a symbol for the variable COUNTER; SRP (QSABUS) - Systemic risk perception in the time when is no boom in asset prices; APP*SRP (QDCSAAPRUS) - Systemic risk perception in the time when is boom in asset prices; GDP (BDP_US) - Gross domestic product; RIR (QSTIRRUS)- Real interest rate; CPS/GDP (QCRUS_QGDPUS) - Credit to the private sector/gross domestic product; AAPI - Aggregate asset price index*

Review

Effects of Leasing on the Financial Statements of Companies In FB&H

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ABSTRACT

Leasing, as a form of financing, is known for a long time in the world and in last two decades has became part of financial services in Federation of Bosnia and Herzegovina. Users of leasing as well as investors and users of financial statements agreed that there is impact of the lease on the final results expressed in the financial statements of companies measured by traditional performance indicators. The problem lies in the fact that the effects of this impact are not completely understood and it is important to differentiate between problems with the current methods in accounting of leasing and its impact on the financial statements. In order to solve these existing problems International Accounting Standards Board (IAS Board) is prepared a new amended International Accounting Standard 17, which should be completed during the current year. However, the application of the standard into practice will require a few more years, which suggests the need for clarifying the impact of leasing on financial statements. The aim of this paper is to clarify this influence of leasing on financial statements and to single out group of traditional performance indicators that can be classified as an impartial, regardless of the leasing arrangement of the company. Since the majority of papers in domestic and foreign literature on the subject of leasing deals with the practical problems of its application, accounting issues, or with comparison of the advantages and disadvantages towards loan, contribution of this paper is to address the problem of comparison of the company with leasing in its balance sheet or its off-balance sheet records and those that do not have the leasing and offer solutions in this regard.

Key words: *leasing, operational leasing, financial leasing, financial statements, traditional performance indicators.*

INTRODUCTION

Leasing, as a form of financing, is known for a long time in the world. In the Federation of Bosnia and Herzegovina leasing is a relatively new financial service. However, every new financial service and practices associated with it raises numerous questions. One of the important issues in the use of leasing is related to financial reporting of companies. Leasing is a rather new phenomenon in our region and his advantages in financing the company are still not fully recognized.The practice in developed countries has shown some advantages, but also problems that arise with the use of leasing. It is logical to expect that we in the Federation of Bosnia and Herzegovina will also meet with the same or similar problems.

Already, there is unmistakable impact of the lease on the final results expressed in the financial statements of companies measured by traditional performance indicators. In fact, leasing appears as important part of the financial statements of companies and as such it has significant impact on the results of business performance. The problem lies in the fact that the effects of this impact are not completely understood and it is important to differentiate between problems with the current methods in accounting of leasing and its impact on the financial statements.

1. THEORETICAL BACKGROUND

1.1. LITERATURE REVIEW

In the countries of former Yugoslavia about leasing is written mostly in professional journals (Financial Regulations and Practice, RIF, RRIF, Insurance: Journal of theory and practice in insurance, Contemporary Business, Law in the economy, etc.) where is discussed about various problems with financing by leasing (Brkanić, 2000.; Rajkovič - Burić, 2004.; Turčić, 2005.), about problems with leasing accounting (Gulin, 2000.; Briški, 2002.; Dagelić, 2004.; Belak, Pehar, 2006.; Horvat - Jurjec, 2007.), also about the tax treatment of leasing (Felker, Jerčinović, Šaric - Perinić, 2002.), comparison of leasing and loan (Šober, 2003.; Dokonal, 2006.) and about the legal issues of a lease agreement (Miklaušić, 2000.; Amon, 2002)..

When it comes to research papers, it can be found several scientific theses on this topics like: comparative analysis of financial leasing (Potnik Galić, 2004.), or the financing of imports and exports by leasing (Vukadin, 1997).This type of research is mainly based on secondary data obtained from leasing companies or the available literature. Books on the subject of leasing are rare and mostly, as well as professional and scientific papers, dealing with the practicalities of

leasing contracts such as the use of leasing in practice (Cinotti... et.al, 2005.), role of leasing in foreign trade of the Republic of Croatia (Konjihodžić, 2005.) as well as taxation, accounting and legal side of the leasing contracts (Urukalović. et.al, 2003).

It can be concluded that the domestic literature about leasing mostly deals with issues of leasing use in practice, which may be explained by the fact that the leasing in this region appeared in the early 90-ies of the last century.

Unlike local authors, foreign authors are dealing with wider leasing issues, which includes topics such as the impact of financing assets by leasing in emerging markets (Boobyer, 2003.; Fletcher. et.al, 2005.), also issues like misconceptions in the existing literature related to structures of companies that use leasing and the impact of the leasing on their credit ability (Eisfeldt, Rampini, 2005.; Brage, Eckerstöm, 2007.).

Leasing, especially if seen in the light of the upcoming changes of IAS 17, can provide interesting questions for research, but it is necessary to look further than the basic issues of the leasing practice.

1.2. ACCOUNTING TREATMENT OF LEASING – IAS 17

International Accounting Standard 17 separates leasing on the financial and operational, with only the assets and liabilities arising from finance lease recognized in the financial statements. The direct consequence of this kind of treatment by IAS 17 is that a large portion of the total leasing transactions is not reflected in financial statements of companies. This treatment caused a number of leasing issues. A large number of users of financial statements and information's that are based on them, believes that all assets and liabilities arising from operating lease should be recognized in financial statements, so they trying to adjust the financial statements in an attempt to show the effects of operating lease.This difference in treatment of the financial and operational leasing has for a result that very similar transactions are shown differently, reducing the comparability for the users of financial statements. The difference in accounting treatment of financial and operational leasing provides the opportunity for adjustment of transactions to achieve desired classification of leasing, which opens the field for various manipulations of the financial statements.

In order to comply with the requirements of the profession and users, the International Accounting Standards Board (IAS Board) in March 2009. offered document for discussion called *Leasing: Preliminary perspectives*. In September 2009. Committee has confirmed that goes forward with the *right of use model* for the lessees, while model specialized for the lessor has yet to be developed.

The final version of the revised future standard, International Financial Reporting Standard (IFRS) that will replace the existing IAS 17, should be completed in the second quarter of 2011. If we take into account that the committee typically leaves a period of 12-18 months to national economies to adapt and prepare for the use of new and revised standard, in FB&H application of the same should be expected at the beginning of 2013. The basic idea of the accounti ng model *right of use* is the same treatment of financial and operational leasing in the balance sheet of the lessee. The new model is actually an attempt to display all the assets used by the lessee in its balance sheets. Thus, for example, an airline company according to current regulations is not required to display the aircraft on its balance sheet if it is treated by operating lease. Showing such an aircraft in the airline's balance sheet would provide a more realistic picture of the company.

At a meeting of the International Accounting Standards Board held on 10th February 2010 it was decided that the definition of the leased asset is not limited only to property, plant and equipment, although a proposed amendment to the standard definition of the lease does not refer to anything other than property, plant and equipment. On this meeting, leasing is defined as a type of contract which transfers the right of use, and the right to control the use of certain assets at a specific time for a certain fee.

2. METHODOLOGY

The basic scientific objective of this study was to understand the impact of leasing on the financial statements of companies, while the main operational goal was to determine what are the performance indicators by which the operating results of various commercial companies can be compared regardless of the use of some form of leasing in the financing of its business, and extract those indicators that are defective in this respect.

Objectives of empirical research, conducted at 139 companies, were:

1. To find out in what extent leasing is used to finance the operations of enterprises in the FB&H,
2. To detect type of leasing which is mostly used in companies of Federation,
3. To detect what type of assets is most often financed by leasing in Federation,
4. To detect conditions of financing by leasing in the FB&H.

2.1. RESEARCH HYPOTHESES

In accordance with objectives and subject of the research, hypotheses to be explored are the following:

H1: For companies that use finance leasing, accounting methods of the same has no impact on traditional performance indicators. That is, the companies that use operating lease, accounting methods of the same will have the effect on the results of the financial reports measured through the traditional performance indicators.

H2: It is possible to single out a group of traditional performance indicators that will treat equally and give unbiased results for both the companies that use leasing and for those companies who on its balance sheet have only the classic form of ownership.

2.2. CASE STUDY

Information about the companies operations are contained in its basic financial statements. Basic financial statements are the balance sheet, profit and loss account or income statement, cash flow statement, statement of changes in equity and accounting notes. These reports represent an important source of data for understanding company's financial state.

However, it should be noted that all relevant information's relating to an operating lease transaction can not be seen from the basic financial statements. There is need for the data carried in the off-balance sheet records. This means that users of financial reports can not obtain a complete picture about the company based only on data from the basic financial statements.

The impact of leasing on the balance sheet and income statement of the lessee is considered through the study of a fictional company "X".

It is necessary to recall the following accounting rules related to accounting of financial leasing:

1. The object of lease is recorded in the balance sheet of the lessee in the total value of the arrangement with the simultaneous recording of liabilities under lease.
2. Depreciation of the leased asset is in lessee's reports, and the amount of depreciation goes on operating expenses.

Repayments of lease annuities are reducing the sum of total obligations by lease.

2.3. SAMPLE AND QUESTIONNAIRE DESIGN

Total number of registered enterprises in FB&H for 2009. year was 41.722,00. From total population is taken 0,5% enterprises from each category of registered activity to get sample basis, and then this number of 139 companies distributed through 10 cantons of FB&H according to number of registered enterprises for each canton[1].

Micro companies are excluded because they have less then 10 employees and revenues less then 200.000,00 EUR per year which classified them as most unlikely to have leasing contract (conclusion is based on interview with leasing companies mangers)[2].

Response rate was 139 companies from 139 companies planned for sample but there were 2199 interviews to get 139 full data interviews. Research was carried out in February and March of 2009 in cooperation with IPSOS Market Research Agency. Questionnaire had 24 elements divided in 4 logical parts.

3. RESEARCH RESULTS AND DISCUSSION

3.1. THE IMPACT OF LEASING ON COMPANIES FINANCIAL STATEMENTS

Case study of leasing impact on financial statements in the case of Company «X»

Early 2008. the leasing company and lessee entered into an irrevocable contract of financial leasing. The object of lease agreement was computer equipment that has a fair value of 50,000 EUR. The lifetime of the leased asset is 5 years with no residual value at the end of the fifth year. Leasing period is equal to the lifetime of the equipment. If the lessee borrowed funds to purchase such equipment, the interest rate would be 10% per annum. Leasing company determines the rate commission of 10% which is included in the amount of annual payment per lease. Company applies the straight-line method of depreciation.

Before it is approached to recording of leasing transactions in the l business's books of lessee, it is necessary to carry out some preparations:

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1 according to data from Statistički godišnjak/Ljetopis Federacije Bosne i Hercegovine (2009), Federalni zavod za statistiku, Sarajevo

2 according to distribution of companies data from Projekt Razvoj srednjeg i malog poduzetništva u Federaciji Bosne i Hercegovine (2008), Federalno ministarstvo razvoja, poduzetništva i obrta i Inžinjerski biro d.d. Zagreb, Sarajevo

1. ***Payments by lease*** on an annual basis are calculated as the ratio of the value of the leased asset and the present value of periodic annuity of 1 EUR per period with a rate of 10% and a period of 5 years (P5/10)

Payments by lease = 50,000 / 3.790787 = 13.189,88

2. ***Plan of lease payments***

Table 1. Plan of lease payments

Number of payments	The rest of debt	Principal repayment	Commission fee/ Interest of Leasing company	Leasing payment rate
1	2	3	4	5
0	50.000,00	-	-	-
1	41.810,13	8.189,88	5.000,00	13.189,88
2	32.801,27	9.008,86	4.181,02	13.189,88
3	22.891,52	9.909,75	3.280,13	13.189,88
4	11.990,80	10.900,72	2.289,16	13.189,88
5	0,00	11.990,80	1.199,08	13.189,88
Total:	0	50.000,00	15.949,38	65.949,38

3. ***Plan of depreciation of the leased asset***

Table 2. Plan of amortization of the leased asset

Year	1	2	3	4	5
Depreciation	10.000	10.000	10.000	10.000	10.000

Since straight-line method of depreciation is applied, depreciation of the leased asset in each year will be the same and will amount to 10,000 EUR. The amount of annual depreciation is obtained by dividing the total value of asset with a number of years of its lifetime (50,000/5 = 20,000). For the purpose of simplification VAT will not be taken into account. With financial leasing VAT is calculated on total value of the asset in the moment of conclusion of leasing contract, but also VAT is calculated on the amount of interest.

Effect of leasing arrangements on the balance sheet is evident in positions of long-term and short-term assets and long-term liabilities. Effect of finance lease on the balance sheet reflects through the positions shown in following table 3 (according to John A. T, 1997, p.8 - 20).

Table 3. The impact of leasing on certain balance sheet positions

	BALANCE SHEET OF LEASING ARRANGMENTS				
Year	**2008**	**2009**	**2010**	**2011**	**2012**
ASSETS					
Cash assets[3]	183.777	168.777	154.596	141.316	129.027
Long-term assets	50.000				
Value adjustments in assets	-10.000	-10.000	-10.000	-10.000	-10.000
TOTAL ASSETS	223.777	158.777	144.596	131.316	119.027
LIABILITIES					
Long-term liabilities	41.810	-9.009	-9.910	-10.901	-11.991
Tax liabilities	18.197	16.779	15.451	14.222	13.102
Profit brought forward	177.270	163.770	151.007	139.055	127.995
Profit of the financial year	-13.500	-12.763	-11.952	-11.060	-10.079
EQUITY AND LIABILITIES	223.777	158.777	144.596	131.316	119.027

The table shows the impact of leasing arrangements on the increase and decrease of certain balance sheet positions. Payments by lease arrangement will have an impact on the reduction of current assets. Equipment acquired through finance lease will increase the balance of fixed assets that will have linear decrease for accumulated depreciation through the years of leasing arrangement and at the end of lease period will have a value of zero. Long-term liabilities in a particular year will be reduced for the amount of paid principal. Paid interest amount will result in an increase of expenses in income statement which will lead to decrease in profits, which will affect a smaller amount of income tax.

Table 4. Effect of leasing arrangements on company's profit

Year	**2008**	**2009**	**2010**	**2011**	**2012**
Depreciation	10.000,00	10.000,00	10.000,00	10.000,00	10.000,00
Interest expense	5.000,00	4.181,02	3.280,13	2.289,16	1.199,08
Effect on profit before tax	-15.000,00	-14.181,02	-13.280,13	-12.289,16	-11.199,08
Income tax	1.500,00	1.418,10	1.328,01	1.228,92	1.119,91
Effect on profit after tax	-13.500,00	-12.762,91	-11.952,11	-11.060,24	-10.079,17

Suppose that the company "X" in the example, has a balance sheet for 2006. and 2007. year as stated in the second and third column of the table shown below. The next 6 columns of the table show the effect of financial leasing on the balance sheet of company "X".

[3] Cash assets = (Cash funds from the last year - Increase in the amount of liabilities for income tax + retained earnings) - (Amount of annual lease payments + Decrease in liabilities for income tax from the previous year)

It should be noted that while composing the balance sheet from the year of 2008. till the 2012. (lease arrangement period), all other effects of business operations are eliminated, in order to separate the direct impact of leasing on the balance sheet. In other words, it was assumed that the company retains the same absolute level of business as in 2007 (according to Potnik Galić, 2004, pp. 72).

Table 5. Planed balance sheet of company X from 2008. – 2012. year with Leasing

			BALANCE SHEET WITH LEASING				
POSITION	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
1	2	3	4	5	6	7	8
ASSETS							
Cash assets	151.287	222.479	407.756	577.952	733.876	876.421	1.006.567
Debtors	241.175	289.377	289.377	289.377	289.377	289.377	289.377
Supplies	413.807	489.047	489.047	489.047	489.047	489.047	489.047
Prepayments and accrued income	46.418	58.588	58.588	58.588	58.588	58.588	58.588
Total current assets	852.686	1.059.491	1.244.768	1.414.964	1.570.888	1.713.433	1.843.579
Long-term assets	798.525	993.225	1.043.225	1.043.225	1.043.225	1.043.225	1.043.225
Value adjustments in assets	169.674	226.070	236.070	246.070	256.070	266.070	276.070
Total long-term assets	628.851	767.155	807.155	797.155	787.155	777.155	767.155
TOTAL ASSETS	1.481.537	1.826.646	2.051.923	2.212.119	2.358.043	2.490.588	2.610.734
LIABILITIES							
Creditors	165.258	194.417	194.417	194.417	194.417	194.417	194.417
Short-term loans	187.500	212.500	212.500	212.500	212.500	212.500	212.500
Income tax liabilities	5.837	6.697	26.394	44.590	61.369	76.820	91.041
Other liabilities	68.950	94.270	94.270	94.270	94.270	94.270	94.270
Short-term (current) liabilities	427.545	507.884	527.580	545.777	562.556	578.006	592.228
Long-term liabilities	237.500	275.000	316.810	307.802	297.892	286.991	275.000
Subscribed capital	312.500	362.500	362.500	362.500	362.500	362.500	362.500
Profit brought forward	503.992	503.992	681.262	845.033	996.040	1.135.095	1.263.090
Profit of the financial year		177.270	163.770	151.007	139.055	127.995	117.916
Total equity	816.492	1.043.762	1.207.533	1.358.540	1.497.595	1.625.590	1.743.506
TOTAL EQUITY AND LIABILITIES	1.481.537	1.826.646	2.051.923	2.212.118	2.358.042	2.490.587	2.610.734

In table 5 balance sheet of "X" company for 2006. year is presented to enable a calculation of performance indicators for company. The third column shows the balance sheet for the year preceding the year of leasing transaction. Columns from 4th till 8th show effects of leasing on company balance sheet.

Effect of leasing can be noticed through increase of short-term assets for leasing arrangement period, which is direct result of increase in income tax liabilities and in retained earnings. Changes in long-term assets are caused by recording of the leased asset in balance sheet. It is assumed that the company overall profit is transferred to retained earnings for all years of the leasing arrangement.

The following table, under the aforementioned assumptions, shows the planned income statement (profit and loss account) for company "X" with the added impact of leasing (by Potnik Galić, 2004, pp. 73).

Table 6. Planned income statement 2008. – 2012. with leasing

		INCOME STATEMENT WITH LEASING				
POSITION	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Sales revenues	3.009.520	3.009.520	3.009.520	3.009.520	3.009.520	3.009.520
Costs of good sold	1.956.188	1.956.188	1.956.188	1.956.188	1.956.188	1.956.188
Gross profit	1.053.332	1.053.332	1.053.332	1.053.332	1.053.332	1.053.332
Operating expenses	761.644	761.644	761.644	761.644	761.644	761.644
Operating profit before depreciation and amortization	291.688	291.688	291.688	291.688	291.688	291.688
Depreciation and amortization	56.396	66.396	76.396	86.396	96.396	106.396
Operating profit	235.292	225.292	215.292	205.292	195.292	185.292
Interests	38.325	43.325	47.506	50.786	53.076	54.275
Profit before tax	196.967	181.967	167.786	154.506	142.217	131.018
Income tax	19.697	18.197	16.779	15.451	14.222	13.102
Profit after tax	177.270	163.770	151.007	139.055	127.995	117.916

The object of leasing in the previous example was computer equipment for whose purchase is assumed that it will not result in increased business revenue. However, it would be logical that such equipment increases the revenues of company or, on the other hand, decreases expenditures. In this case, a comprehensive study should be made on the investment profitability, which in this example is ignored. For this reason, purchase of equipment in the company "X" through leasing has resulted only in increase of the interest expense and depreciation and on this way company profits were reduced.

In compliance with example above where impact of the financial leasing on the financial statements of the fictitious company "X" was analyzed, impact of operating lease can also be analyzed under other same conditions, with respect to the following limitations:

- the total amount of monthly rent for a year, according to the operational leasing arrangement, would be equal to the annual lease amount (principal plus interest) under a financial lease arrangement;
- the annual rental under operating lease arrangement would be recognized as a cost of operations with co-entry of current liabilities, so the balance sheet would have no changes on the positions of fixed assets, value corrections, and long-term liabilities. Income statement would show increased operating costs but no changes in the positions of interest and amortization, which will remain at the level of business in 2007 year. Outcome of this will be the same result of income statement for period 2008 - 2012 year.

Therefore, the equipment acquired through an operating lease shall not affect the balance of fixed assets since such equipment is not recorded in balance sheet of the lessee, so there will be no depreciation on the basis of equipment acquired through an operating lease. There will be no impact on long-term liabilities, and long-term liabilities will not be decreased for the amount of principal, because operating lease obligates company to pay only the monthly rent.

Operating lease will reflect on the total expenditures through increased costs arising from lease payments for service of operating leasing, thus reducing company profits.

However, the actual impact of operating lease, because company uses object of lease for business and for making revenues, can not be fully perceived without additional information kept out of the basic financial statements.

3.2. THE IMPACT OF LEASING ON COMPANIES' FINANCIAL PERFORMANCE

To be able to see the difference between the impact of leasing on the traditional performance indicators in relation to traditional ownership (*traditional* in terms of acquisition of ownership by purchasing directly rather than through lending), we should consider effects of purchasing the equipment with companies own money in the same amount, under other same conditions, on indicators of "X" company. It is stated *with companies own money* because purchase via credit would be acted in similar way as financial leasing

– even with different interest rates and repayment terms, the ultimate effects in terms of depreciation, interest and principal repayment would be the same.

It should be noted that the company decision between the loan and lease will be based on the advantages and disadvantages of both options and the offered terms, and that, if one is already thinking about the lease or loan, usually does not have the cash for such a purchase.

- If company "X" buys equipment from the example with their own money there would be:
- increase in fixed assets, and depreciation would amount as in the case of finance lease related to the amount of purchased equipment;
- there will be no increase in long-term liabilities, also there will be no decrease on the basis of principal payment since equipment is paid immediately in the year of purchase;
- there will be no expenses on the basis of lease interest.

Problems with impact of leasing occur with traditional performance indicators also, and there is a need to distinguish usable from the unusable traditional performance indicators on this basis. In making its decision on the lease the lessee should determine the impact of such arrangements on the results of performance indicators. Examining the impact of leasing on the liquidity and profitability is of particular importance for the company. Through this analysis company can evaluate its capabilities for settlement of current liabilities in due time, also it can determine the success in earnings as well as profitability of assets and capital. Influence on turnover of assets is particularly important from the point of distinction between operating and finance lease because they reflect the state of company assets differently.

For these reasons, effect of leasing was observed on the following groups of traditional performance indicators, and on, within each group, selected indicators (according to Belak, 1995, pp. 63 - 85):

1. Profitability ratios/ Indicators,
2. Ratios/ Indicators of assets turnover,
3. Solvency Ratios/ Indicators,
4. Liquidity Ratios/ Indicators.

Following conclusions were made about the impact of financial leasing on companies performance indicators:

- Financial leasing negatively affects the profitability indicators of enterprises, throughout the duration of the lease it is gradually reduced because of the effect of repayments by leasing arrangement;
- Leasing will reduce indicators of activity in the initial year due to the recording of leasing arrangements and through next years it will induce their growth;
- Financial leasing has a positive effect on indicators of corporate liquidity; and
- With the solvency ratio there is a noticeable positive impact, except for indicators of interest coverage ratio and for the factor of indebtedness, number of years.

Following conclusions were made about impact of the operational leasing on performance indicators in comparison with the influence of financial leasing:

- Profitability indicators – operating lease had no impact on profit margins indicators. Return on assets (ROA) and return on total equity (ROE) are higher than in the case of financial leasing;
- Indicator of asset turnover is slightly higher in the case of operating lease, which derives from the fact that the lessee does not record the assets in balance sheet so the denominator of the indicator is less;
- Liquidity is higher in case of operating lease than financial;
- Operating lease affects the favourable results of solvency indicators as a result of not recording the object of the operating lease in balance sheet, but did not affect the interest coverage ratio indicator because operating lease has no impact on the amount of interest.

When we compare the obtained values for financial leasing, operating leasing and ownership in terms of purchasing equipment with companies own money, is seen that indicators give the best results when it comes to operating lease, then ownership, and at the end financial leasing, which leads to the conclusion that the manipulation of indicators and reports is easiest when it comes to operating lease because of the way its recorded, or better say not recorded in financial accounting. In order to select business performance indicators that could be classified as a relatively independent and resistant to both financial and operational leasing impact, deviations for each group of indicators are calculated under the influence of financial and operational leasing and compared to the same for classical ownership for "X "company.

Table 7. Deviations of profitability indicators for financial leasing for «X» company 2008. - 2012.

	EFFECT OF LEASING				
DESCRIPTION	2008.	2009.	2010.	2011.	2012.
OPERATING PROFIT MARGIN	0,00%	0,00%	0,00%	0,00%	0,00%
GROSS PROFIT MARGIN	0,00%	0,00%	0,00%	0,00%	0,00%
PROFIT MARGIN BEFORE TAXES	-2,67%	-5,19%	-7,46%	-9,40%	-10,85%
NET PROFIT MARGIN	-2,67%	-5,19%	-7,46%	-9,40%	-10,85%
RETORN ON ASSETS (ROA)	-3,04%	-2,01%	-0,95%	0,12%	1,18%
RETURN ON TOTAL EQUITY (ROE)	-2,31%	-4,30%	-5,98%	-7,32%	-8,21%

Table 8. Deviations of profitability indicators for operational leasing for «X» company 2008. - 2012.

	EFFECT OF LEASING				
DESCRIPTION	2008.	2009.	2010.	2011.	2012.
OPERATING PROFIT MARGIN	-1,42%	3,16%	8,19%	13,73%	19,87%
GROSS PROFIT MARGIN	0,00%	0,00%	0,00%	0,00%	0,00%
PROFIT MARGIN BEFORE TAXES	-1,71%	3,85%	10,07%	17,08%	25,05%
NET PROFIT MARGIN	-1,71%	3,85%	10,07%	17,08%	25,05%
RETORN ON ASSETS (ROA)	-2,51%	2,48%	8,07%	14,32%	21,28%
RETURN ON TOTAL EQUITY (ROE)	-1,47%	3,60%	8,75%	14,16%	19,99%

Table 9. Deviations of activity indicators for financial leasing for «X» company 2008. - 2012.

	EFFECT OF LEASING				
DESCRIPTION	2008.	2009.	2010.	2011.	2012.
TOTAL ASSET TURNOVER COEFFICIENT	-3,04%	-2,01%	-0,95%	0,12%	1,18%
CURRENT ASSET TURNOVER COEFFICIENT	-5,01%	-3,15%	-1,43%	0,17%	1,67%
LONG-TERM ASSET TURNOVER COEFFICIENT	0,00%	0,00%	0,00%	0,00%	0,00%
SUPPLIES TURNOVER COEFFICIENT	0,00%	0,00%	0,00%	0,00%	0,00%
DEBTORS TURNOVER COEFFICIENT	0,00%	0,00%	0,00%	0,00%	0,00%

Table 10. Deviations of activity indicators for operational leasing for «X» company 2008. - 2012.

	EFFECT OF LEASING				
DESCRIPTION	2008.	2009.	2010.	2011.	2012.
TOTAL ASSET TURNOVER COEFFICIENT	-1,11%	-0,67%	-0,11%	0,52%	1,18%
CURRENT ASSET TURNOVER COEFFICIENT	-5,01%	-3,15%	-1,43%	0,17%	1,67%
LONG-TERM ASSET TURNOVER COEFFICIENT	5,21%	3,91%	2,61%	1,30%	0,00%
SUPPLIES TURNOVER COEFFICIENT	0,00%	0,00%	0,00%	0,00%	0,00%
DEBTORS TURNOVER COEFFICIENT	0,00%	0,00%	0,00%	0,00%	0,00%

Table 11. Deviations of liquidity indicators for financial leasing for «X» company 2008. - 2012.

	EFFECT OF LEASING				
DESCRIPTION	2008.	2009.	2010.	2011.	2012.
CURRENT RATIO	0,28%	-1,38%	-2,80%	-4,03%	-5,11%
QUICK CURRENT RATIO	3,82%	0,34%	-2,16%	-4,09%	-5,66%
WORKING CAPITAL	5,49%	2,36%	-0,11%	-2,18%	-3,96%

Table 12. Deviations of liquidity indicators for operational leasing for «X» company 2008.-2012.

	EFFECT OF LEASING				
DESCRIPTION	2008.	2009.	2010.	2011.	2012.
CURRENT RATIO	0,25%	1,06%	4,54%	10,89%	20,87%
QUICK CURRENT RATIO	3,79%	2,83%	5,23%	10,82%	20,15%
WORKING CAPITAL	5,46%	3,92%	3,80%	4,52%	5,81%

Table 13. Deviations of solvency indicators for financial leasing for «X» company 2008. - 2012.

	EFFECT OF LEASING				
DESCRIPTION	2008.	2009.	2010.	2011.	2012.
GEARING RATIO	12,38%	10,58%	8,39%	5,74%	2,56%
DEBT RATIO (NON-EQUITY CLAIMS TO ASSET RATIO)	5,29%	5,04%	4,70%	4,25%	3,67%
DEBT/EQUITY RATIO	9,00%	8,20%	7,40%	6,52%	5,50%
INTEREST COVERAGE RATIO	-11,54%	-19,33%	-24,54%	-27,79%	-29,39%
FACTOR INDEBTEDNESS, NUMBER OF YEARS	10,72%	11,09%	10,97%	10,29%	9,02%
FINANCIAL STABILITY COEFFICIENT	2,51%	1,22%	-0,06%	-1,30%	-2,49%

Table 14. Deviations of solvency indicators for operational leasing for «X» company 2008. - 2012.

	EFFECT OF LEASING				
DESCRIPTION	2008.	2009.	2010.	2011.	2012.
GEARING RATIO	0,19%	-0,20%	-1,01%	-2,15%	-3,53%
DEBT RATIO (NON-EQUITY CLAIMS TO ASSET RATIO)	2,09%	0,74%	-2,06%	-6,19%	-11,54%
DEBT/EQUITY RATIO	3,48%	1,18%	-3,12%	-9,00%	-16,11%
INTEREST COVERAGE RATIO	-1,42%	3,16%	8,19%	13,73%	19,87%
FACTOR INDEBTEDNESS, NUMBER OF YEARS	9,23%	7,76%	4,62%	0,00%	-5,92%
FINANCIAL STABILITY COEFFICIENT	2,98%	2,59%	2,63%	3,01%	3,65%

Indicators that show no differences (0% deviation), and can be classified as an impartial, regardless of the leasing arrangement of the company, are as follows:

1. Operating profit margin[4],
2. Gross profit margin,
3. Long-term asset turnover coefficient[5],
4. Supplies turnover coefficient,
5. Debtors turnover coefficient,

[4] applies to financial leasing, but not for operational leasing.

[5] applies to financial leasing, but not for operational leasing.

3.3. THE RESULTS OF EMPIRICAL RESEARCH ON COMPANIES IN FB&H ABOUT LEASING USE

After analyzing the data obtained (the questionnaire was conducted on 139 enterprises in the Federation there were following findings:

- 47.5% of surveyed companies use or used a finance lease;
- 52.5% of companies surveyed had never used a finance lease, and the most common reasons for not using financial leasing listed are: lack of knowledge about funding opportunities for leasing and disadvantages stance on interest rates and lease terms compared to traditional credit;
- 87.8% of enterprises in the FB&H, which are used or are using leasing finance, were established after 1990. year;
- Every fourth company in the Federation is engaged in wholesale and retail, while 30.3% of companies that use or had used a finance lease are in wholesale and retail trade;
- Over three quarters enterprises in the FB&H is organized as a limited liability company, the percentage was 85% in the case of companies that are using or have used finance leasing;
- Almost 90% of enterprises in the FB&H is privately owned;
- Surveyed companies that are using or have used the financing lease are privately owned;
- According the data about the number of full time employees, nearly three quarters of companies that use or had used a finance lease in Federation has over 50 employees, and this sets them into the category of micro and small enterprises;
- Over half of surveyed companies that are using or have used the finance lease with annual turnover between 500.000,00 EUR and 5.000.000,00 EUR;
- Companies that are using or have used finance leasing expressed satisfaction with cooperation with leasing company with whom they have or have had a contract with regard to the readiness to re-finance again with leasing contracts;
- 68.2% of contracts on the lease are contracts on financial leasing, which leads to the conclusion of the non-recognition capabilities and advantages of operating lease by the Company in the Federation;
- With finance lease agreements companies are mostly financing: Trucks and vans (50%), buildings (21.9%) and manufacturing plant and machinery (17.2%);

- With operating lease companies usually finance: passenger cars (29.2%), lorries (25%) and vans (20.8%) and manufacturing plant and machinery (12.5%);
- The largest number of financial leasing contracts is concluded for a period of 5 years, at an interest rate of 8% to 10% of the contract value to 125.000,00 EUR;
- The largest number of operating lease agreements is concluded for a period of 5 years, although the percentage of contracts awarded over the period of 5 years is higher than that of financial leasing (31.5% compared to 9.8%), with an interest rate of 8% 10% of the contract value to 125.000,00 EUR.

4. CONCLUSION

Based on insights from theoretical material and case study of company "X", it was concluded that the hypothesis H1 is not confirmed entirely, because it shows that financial leasing has an impact on traditional performance indicators of company success since it affects the position of the balance sheet and income statement in comparison to traditional ownership.

The second part of the hypothesis H1 is confirmed by theoretical insights and case study, because accounting of operating lease has an impact on performance indicators due to not recording assets and goods that are in lease through the balance sheet and income statement, which affects the favourable results of performance indicators in comparison with the traditional ownership.

Hypothesis H2 is, based on the obtained results, confirmed in a way that it was first pointed to discrepancies in the measurement of the same indicators for operational leasing in comparison with the traditional ownership, then the discrepancies in the measurement of financial leasing in comparison with the traditional ownership and then singled out a group of impartial indicators that lease, regardless of whether it is financial or operational, has no impact:

1. Operating profit margin[6],
2. Gross profit margin,
3. Long-term asset turnover coefficient[7],
4. Supplies turnover coefficient,
5. Debtors turnover coefficient,

[6] applies to financial leasing, but not for operational leasing.

[7] applies to financial leasing, but not for operational leasing.

Ultimately, after considering the theoretical and empirical part of research and case study, it can be concluded that leasing affects the financial statements of companies, it is possible to single out a group of impartial traditional performance indicators which can give relatively reliable insight into the company, and that the Federation of Bosnia and Herzegovina has room to expand the application of finance leasing, operating leasing especially if one bears in mind that over half of registered companies never used finance leasing, and those companies that are using or have used the finance leasing expressed satisfaction with this type of financing and a willingness to re-finance again in same way.

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Preliminary Communication

OUTSOURCING IN FUNCTION OF CROATIAN COMPANIES' PROFITABILITY

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ABSTRACT

The company value system includes the totallity of interdependent activities, from the suppliers of raw materials to end - users of products and services. In order to achieve competitive advantage, companies must realize costs and benefits in managing activities. Values associated with the product should be examined from the standpoint of the final customer. To achieve product competitiveness, it's necessary to find the path to the customer, and that assumed effective control of the activities throughout the entire company value system. During managing the activities, the company must take into account the shortening of some links / activities or revocation of certain links / activities. One of the strategies is based on externalisation of activities. Present paper starts from the assumption how the externalisation of activities affects expenditures as a function of the company profitability.

INTRODUCTION

In the past, the majority of companies have tried to own and control all sources of supply and distribution. On this way, they had direct managerial control and therefore reduced its own dependence on potentially unreliable suppliers.It was felt that was financialy more profitable. This procedure has impoverished resources of the companies. To manage such large, inefficient systems of complex companies was often very difficult. Large stocks were retained along the entire companies' value chains, in order to alleviate uncertainty and poor managerial practice. By mutual cooperation, companies along with their suppliers are trying to improve the effectiveness of the activities and therefore business profitability. The features of cooperation between suppliers and manufacturers are, from the very beginnings based on cooperation when designing the

components that as inputs enters the company. In this way, suppliers are given full rensponsibility for the one whole subsytem that is related to the production stage.

Management of the activities includes strategic role of supplier as an instrument for the achievement of the effectiveness of certain decisions and impact it has on its profitability. Suppliers, procurements of imputs and services have a key role in the process activities and delivery of final products to the customers. The long – term cooperation with the suppliers establishes and it doesn't want to have a large number of multiple sources for each purchased input. The main idea is based on cooperation in the approach to management of materials / raw materials and services from the supplier and information flow throughout the manufacturing process. The reason for that is simple: in many companies procured materials and parts represents a growing percentage of production costs items whose costs of raw materials and other components accounted for 60 % - 70 % of the product total costs. It's also important to emphasise growing logistical costs. All these are sufficient reasons why the company management focused its attention on procurement activities and its suppliers.

The traditional procurement concept, where the company is focused solely on the cheap suppliers, had been replaced by a strategy which is based on quality, joint development of the necessary inputs with their suppliers, flexibility of the demand and inputs reducing costs with the outsourcers. By cooperation with their suppliers, they take over added activities that are essential in the part of the transaction costs, as well as part of the so – called dependent costs of inputs procurement such as: transportation costs, workers wages in the management of inputs inventories, extension of warranty periods, etc. Companies that outsourced part of its activities, diminish or reduce the investments in the fixed assets. As a result, costs are reduced from the depreciation of fixed assets. If it's known that raw materials and other inputs components make two thirds of the total costs of manufactured products, than is obvious that the management should recognize the strategic role of connecting with suppliers and their suppliers in contributing to long – term success and profitability of company.

THEORETICAL REVIEW

Outsourcing can be defined as a binding contract between the buyer and one or more suppliers who provide services or processes which the buyer is currently internally manufactured (Efling & Baven, 1994:42). This allows the company to focus on the activities through which they can acquire unique

competencies. The process can be tracked back to the stage of competition between supply chains (Christopher, 1998, Handfield & Nichols, 1999). On this way, upward and downward integration with suppliers and buyers has emerged as an important part of the manufacturing and supply chain strategy (Frolich & Westbrook, 2001:185).

Modern trends in outsorcing allow companies with greater flexibility and resources to focus on the major capabilities, while partnerships with their suppliers enable them control. Various phenomena occurs in the strategic company ''desintegration". A studies that have been conducted in five cases from the German chemical industry, consider the separation of two types of companies. Manufacturers concentrate their business on specific products and technologies, while outsourced units (*facility operators)* that can also be regarded as service production, are formed to manage the infrastructure of the production site. The link between product manufacturers and outsourced unit offers challenges for the management of the companies' activities.

In deciding on exemption of the activities outside the company, there are two basic categories:

- **Sourcing:** supplier's selection
- **Outsourcing:** procurement of goods and services from the external supplier.

Supplier's selection is called **sourcing** (from the origin of internal selection); suppliers are literally ''a source" of supply. **Outsourcing** is the act of supplying goods and services that were originally produced in the industrial process by external suppliers. Through decades, this procedure has been implemented by companies as a short – term solution of the problem, such as an unexpected increase in demand, failures of factory plants and equipment, product testing or temporary lack of production capacity. Deciding to proceede with outsourcing has become a long – term tactic, rather then a simple and short procedure. Especially large multinational companies transfer more production processes, services and stocks in the supplier – outsourcer area. Most companies proceede with outsorcing as a strategic move by focusing more on its ***core competencies***, i.e. on that what they do best. Jobs that company doesn't perform among its best, are left to supplier - outsourcers, for which they are best qualified.

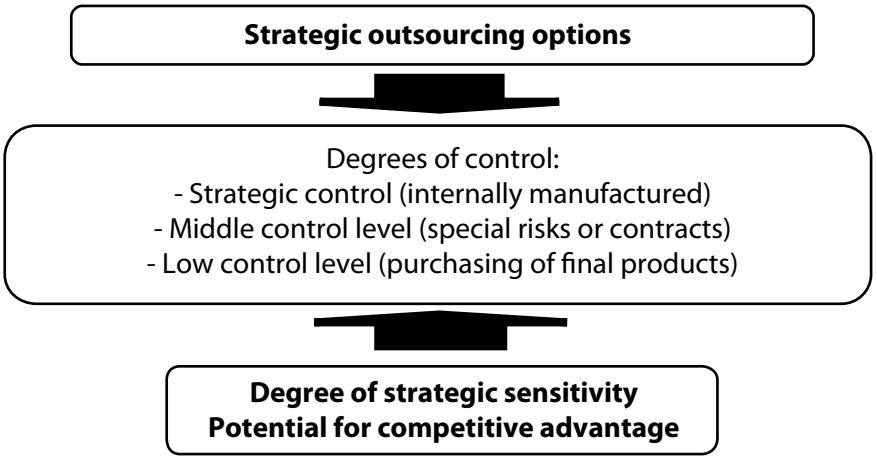
The core question that every company is facing is, in which processes creates its main capabilities and which parts and services will be procured from their suppliers. Quinn & Hilmer (1994) proposed three key factors in terms of activity considered for outsourcing.

- ✓ The first factor is described as a potential for the competitive advantage
- ✓ The second factor involves analyzing of the degree of strategic vulnerability in outsourcing.

These two dimensions form a matrix where each activity is set in accordance with both of the dimensions on the low, middle and high chart position, identifying three ideal strategies shown in Fig. 1.

- ✓ Third, the deciding factor includes the assessment of control measures necessary to reduce sensitivity: enabling agreements with suppliers, taking into account the functionals goals of the company.

Fig.1. Strategic outsourcing options



Source: Adopted from Quinn and Hilmer (1994:48)

Venkatesan (1992:98) proposes that the company focuses on the components which are well - recognised produced, while other activities are outsourced where suppliers have a clear comparative advantage. Furthermore, he proposed a simplified model for the strategic outsourcing process (Venkatesan, 1992:103). Such research has led to the development of detailed process for the models of outsourcing or for the decision – making about constructing, i.e. buying. McIvor (2000:29) has proposed the **four stages of decision – making on outsourcing**:

1. Defining the main business activities
2. Evaluation of relevant activities of the value chain
3. Performance analysis of the total costs of the main activities, and
4. Relationship analysis.

Based on this framework, a company can decide which activities will outsource and which of them will implement internally. Canez et al. (2000) have begun working on its own framework in the external environment of the company, which often drives decisions on production or buying within the company. They evaluated in various fields of company activities using functionality measurement, such as those traditionally used in operative management, for example, cost, quality or flexibility.

All the working frameworks perceived decisions on outsourcing as a free decision that takes place within one company. Consideration of the decision should be set as the focus of the discussion about integrated and extended company. Different authors mentions how outsourcing is often performed for peripheral activities, especially for services such as security, catering and cleaning (McIvor, 2000), units management (Van Weele, 2002) and logistics (Rabinovich et al., 1999). These activities are usually carried out by service companies. Limiting the outsourcing debate to such minor activities enables relatively limited view that doesn't cover the main phenomena of outsourcing, such as for instance, the formation of manufactured services from outsourced units[1].

GOALS AND HYPOTHESES OF THE RESEARCH

The goal of this paper is to determine whether exists the effects of outsourcing parameters from the Croatian companies to profitability. The research includes a new perspective on outsourcing by giving him different features from those already known in the literature. The paper deals with the effectiveness of outsourcing in Croatian companies. Outsourcing of the activities has resulted in cheaper inputs, and it has the impact on reducing depreciations costs of fixed assets. This means the influence on stock positions and positions of long – term resources which carries reduction of necessary funds for their investment.

The effectiveness of outsourcing is defined by a particular set of features. Named attributes of outsourcing effectiveness should affect one of the key positions in determining profitability: expenses. The group of parameters by which effectiveness of outsourcing in the value chain, with the impact on expenditures and profitability is marked, are shown in Table 1.

1 Seuring, S. A., remark cited, p.3

Table 1. Tested characteristics

Symbol	*Described characteristics of outsourcing*
RHDOUS04	Long – term cooperation with outsourcers
RHSTRO05	Cheaper inputs arising from outsourcing
RHDTRA06	Reduction in depreciation expenses arising from outsourcing

How the research goals and set of working hypotheses are defined are as follows:

H_1 - The influence of parameters of the efectiveness on the profitability of the outsourcing are present

H1-$_1$: There is a statistically significiant difference between co-operation with the outsourcersand profitabillity

H1-$_2$: There is a statistically significiant difference between the cheaper inputs arising from outsourcing and profitability

H1-$_3$: There is a statistically significiant difference between the reduction in depreciation expenses arising from outsourcing and profitability

The significance, i.e. the intensity of parameters of outsourcing effectiveness has on profitability is visible through a position of company's financial statements: the total expenditures. Acceptance or rejection of the previously stated hypotheses would provide an answer to the question: whether the influence of parameters of the effectiveness of outsourcing on expenditures, i.e. which of the parameters of the effectiveness of outsourcing determines the profitability. Profitability is observed through a set of four features: return on assets, increase return on assets, return on principal and increase return on principal, as it is shown in Table 2.

Table 2. Tested characteristics

Symbol	*Description characteristics on profitability*
PROF07	Return on Asset - ROA
PROF08	Increase return on assets
PROF09	Return on Equity - ROE
PROF10	Increase return on Equity

The return on asset (ROA) shows how profitabile a company' assets are in generating revenue. It's a useful number for comparing competing companies in the same industry. The number will vary widely across different industries. Return on equity (ROE) measures the rate of return on the owenership interest (shareholders' equity) of the common stock owners. Shareholders' equity is also known as net assets or assets minus liabilities (Belak, 1995:70).

DEFINING THE SAMPLES AND RESEARCH METHODOLOGY

The methodology of scientific research gives settings and provides guidelines that show how scientific research should be conducted. Methodology standardised procedures, methods and procedures in the understanding of research results and ways how to find them. For research purposes, the primary data obtained through field surveys are used.

The basic observation unit in this study is a company. For the basic set, which is also called the population group, were selected large and medium – sized companies from manufacturing industry in Croatia. For the need of collecting all necessary informations, data from Financial Agency (FINA) and from the website of the public announcement of the Croatian Chamber of Economy (HGK) were used[2]. The general characteristics of the sample are shown in Table 3.

Table 3. Characteristics of the research sample

Legal form	***F***	***%***	***Σ %***	***Size of the company***	***F***	***%***	***Σ %***
Joint – stock company	39	63,9	63,9	Large	16	26,2	26,2
Ltd.	22	36,1	100,0	Medium	45	73,8	100,0
Total N	61	100		Total N	61	100	

Source: Research results

**Code explanations: F- Frequency; %-Percent; Σ%-Cumulative Percent; N- number of respondents*

It should be noted that from the research were excluded companies that are running some form of the insolvency procedures, and also companies without employees. Furthermore, from the basic set were excluded companies whose losses from business operations exceeded the amount of capital. By applying these criteria, a basic set of empirical research has included 522 companies in Croatia[3]. On this way, the statistical set is defined conceptually, spatially and temporally. Conceptual definition of set is the subject of research by company. **Time frame** of the basic set comprises the companies for the year 2010, and empirical study was conducted in April of 2010.

By use of statistical analysis we will try to find answers to the questions that have been set for the research. In order to realise empirical research, the following statistical methods and techniques are used: descriptive and interferential statistic. **Descriptive statistics** and its techniques allow the research of general statistics set – sample. It includes ''actions'' for calculating of descrip-

[2] HGK, Internetska stranica javne objave http//www1. biznet.hr/Hgk web, od 07.04.2010. CCE (HGK) public announcement website at http://www1.biznet.hr/Hgk web, dated April 7, 2010.

[3] According to data from Financial Agency, at the manufacturing industry level for the year 2009 in accordance with the criteria of the basic set of research

tive statistical indicators and tabular data display.

Interferential statistics and its techiques are based on a part (sample) of units selected from a comprehensive set of statistics, through which the application of appropriate statistical methods and techniques are used for making conclusions about the entire statistical set. The survey is used in the paper as a method of collecting data. With the help of prepared questionnary, respondents give their informations about the observed characteristics of the statistical set. A questionnary that was used as the main instrument in this research is structured in three parts. The first part covers general information about companies from the sample. The second part deals with issues through which the effectiveness of the outsourcing parameters of the company are analysed. The answers given to the third part of the questionnary completed the picture of companie's profitability construction, in accordance to the defined parameters.

The fundamental role belongs to **the statistical method**. In order to accept or reject a hypothesis, various statistical analysis and procedures are used. The whole variety of statistical operations will be made using the software package *SPSS v17 (SPSS.Inc.USA)*.

In determining the effectiveness of outsourcing and desribing the general characteristics of used sample, descriptive statistical analysis was used for within that particular parameters were set: F – frequencies; % - percentages; N – number of respondents, the minimum – minimum value, the maximum – maximum value; AS – arithmetical mean; SD – standard deviation and r – coefficients of linear correlation. In determining the difference between actual levels of profitability, Chi – square test was used in which were calculated the following parameters: χ^2 – value of chi – square test; Df – degrees of freedom and P – significance level of χ^2 test.

RESEARCH RESULTS

In accordance with established goals and working hypotheses, in the paper are presented the research results. Distribution of the effectiveness parameters of the outsourcing are presented in Table 4 (a, b and c), in accordance with the achieved results.

Table 4. Distribution of companies in the sample according to the parameters of the effectiveness of outsourcing

Parameter RHDOUS04 (a)	***F***	***%***	***Σ %***	***Parameter RHSTRO05 (b)***	***F***	***%***	***Σ %***	***Parameter RHDTRA06 (c)***	***F***	***%***	***Σ %***
0 percent	8	13,1	13,1	0 percent	11	18,0	18,0	O percent	18	29,5	29,5
1 to 5 %	22	36,1	49,2	1 -5 %	17	27,9	45,9	1 to 5%	16	26,2	55,7
6 to 10 %	19	31,1	80,3	6 -10 %	27	44,3	90,2	6 to 10%	17	27,9	83,6
11 to 20 %	6	9,8	90,2	11 -20 %	6	9,8		11 to 20%	8	13,1	96,7
21 to 30 %	3	4,9	95,1					21 to 30%	1	1,6	98,4
Above 31 %	3	4,9	100				100	Above 31%	1	1,6	100
Total	61	100		Total	61	100		Total	61	100	

Source: Research results

Research results from Table 4 present distribution of companies in the sample according to percentage parameter of total procurement which accounts for the outsourcers **(RHDOUSO4).** Specifically**,** 36,10% of companies from the sample realised their inputs through outsourcing, in the range of 1 – 5 %. Follows a group of companies of 31,10% whose procurements belongs to the outsourcers in range from 6 to 10 %. Distribution of 9,8 % comprise two groups of companies from the sample that have 21 % to 30 % and over 31 % of input supplies by the outsourcers. Furthermore, 13,10 % of companies in the sample didn't buy their inputs through outsorcers.

Analysis of the parameters of the effectiveness of the outsourcing results which marks the assesment of benefits to reduce costs of inputs covered by contracts for the outsourcing is shown in Table 4.b under the label **RHSTRO05.** Dominates the distribution of 44,30 % of companies in the sample which generates cheaper inputs from 6 % to 10 % of the purchase of inputs based on outsourcing. In the distribution follows companies in the sample, which occupies 27,9 %. Listed companies reduce the costs of its inputs based on such activities through the management of the activities from 1 to 5 %. Cheaper inputs from 11 % to 20 % have 9,8 % of companies in the sample. It should be noted that 18,00 % of companies don't realise cheaper inputs. If from distribution are off 13,10 % of companies that don't use outsourcing as a form for the procurement of inputs (Table 4.a) than it leads to the conclusion that 5 % of them, beside existing outsourcing procurement don't realise its benefits for cheaper inputs. None of the companies in our sample has reported quantification of the above parameter in the ranges from 21 to 30 % and above 30 %, although such quantification was possible through the answers.

Survey results for the parameter of depreciation cost reduction due to the reduction of fixed assets arising from outsourcing are shown in Table 4.c, under the label **RHDTRA06.** The analysis suggests that dominate distribution of companies from the 29,50 % that don't achieve reduction of costs on this basis. If we eliminate 13,10 % of companies that don't have outsorcing as a procurement form, then even 16,40 % of companies who have this form of procurement don't realise reduction of depreciation costs arising from outsourcing. In distribution follows companies in the sample with 26,20 and 27,90 % 0 % which reduce depreciation costs in the range of 1 to 10 %. The range of decrease of depereciations expenses realised 13,10 % of companies with the benefit from costs in the range of 11 to 20 %. Decrease in depreciation costs over 31 % have only 1,9 % of companies in the sample. As a result, companies with quantifications of costs reductions in the range of 1 to 10 % dominates in such a way that besides for reducing the costs and impact on expenditures and profitability also affects the amount of total assets.

Table 5 Characteristics of the effectiveness of outsourcing companies in the sample (n=61)

Parameters of the value chain expenditures	***Quantification***	***Distribution***
Share of procurement by outsourcing of the total procurement	1-5%	(22)
Decrease of input expenses covered by outsourcing	6-10%	(27)
Decrease of depreciation expenses due to reduction of fixed assets arising from outsourcing	0%	(18)*

Source: Research results

Table 5 shows dominant distributions and quantitative characteristics of each parameter. The 36 % of companies from the sample outsource procurement in the range from 1 to 5 %. Parameters of effectiveness of outsourcing dominate features of conveniences which are brought by contracts with outsourcers, here defined as parameter **RHSTRO04.** The benefits of such contracts resulted in reduction in input costs in the range of 6 - 10 %. It's important to stress that outsourcing of activities didn't result in reduced costs and depreciation, which would be a consequence of decrease in fixed assets. The above information has an important place in defining the outsourcing parameters of companies, i.e. its effectiveness which will result in its role on the achieved levels of profitability.

Further work will analyse the data by use of de scriptive statistics and variability of parameters of effectiveness of outsourcing and profitability parameters. The processing will be carried out using parametric tests (parametric description) for all parameters. Using descriptive statistics and standard deviations, the results of particular parameters in their range, dominance and variability will be analysed. Furthermore, paper will present results of the research on the interdependence of outsourcing parameters and profitability parameters.

Table 6. Descriptive statistics and parameters variability of the effectiveness of outsourcing - expenditures

Parameters	N	Minimum	Maximum	Mean	Std. Deviation
RHDOUS04	61	1	6	2,72	1,253
RHSTRO05	61	1	4	2,46	,905
RHDTRA06	61	1	6	2,36	1,184
Valid N (listwise)	61				

Source: Research results

The research results of the parameters of outsourcing – expenditures presented in Table 6 suggest the conclusion that the range of most parameters varies from 1 to 6. This is true for the parameters of volume of outsourcing procurement and reducement of depreciation costs as its consequences. The lowest range is marked by the parameter of the inputs reduction costs on the basis of outsourcing, moving in range from 1 to 4. Dominant value of 2,72 belongs to the participation of long – term contracts on the basis of outsourcing. Parameter that has in the quantitative expression in effectiveness of oustsourcing a dominant position over the value of reducing the overall expenditure on the financial report, amounts to 2,46 and it belongs to the parameter of reduction of input costs, in the range from 6 to 10 %.

Table 7. Desriptive statistics and variability of profitability parameters

Parametres	N	Minimum	Maximum	Mean	Std. Deviation
PROF07	61	1	2	1,20	,401
PROF08	61	1	5	2,39	1,173
PROF09	61	1	2	1,20	,401
PROF10	61	1	5	2,69	1,336
Valid N (listwise)	61				

Source: Research results

Analysis of parameters of profitabilty is discussed by the use of measure which represents their prevalence and variability, as shown in Table 7. The four elements are being analysed: return on assets, incresing of ROA, return on principal, and ROE increase. The range of parameters from return on assets and return on principal amounted from 1 to 2. Dominant values are the same. Observed parameters of profitability achieved range from 1 to 5. The dominant values are almost the same: 2,39 for increase in ROA and 2,69 for increase in ROE. Thus, the minimal difference of 0,30 will not let the parameter of increasing ROE to fall into quite another major feature, from this aspect of the research. The consequence of this dominant values, the increase in ROA and ROE are marked as ''good" increase (no increase, sufficient, **good**, very good and excellent).

Further work will analyse the distribution of companies from the sample by indicators of profitability. The goal is to explore how the complex distribution of listed companies is in accordance to positive and negative return on assets and return on principal.

Table 8. Distribution of companies in the simple according to the characteristics of ROA and ROE

Obilježje ROA	***F***	***%***	***Σ %***	***Obilježje ROE***	***F***	***%***	***Σ %***
Positive ROA	49	80,3	80,3	Positive ROE	49	80,3	80,3
Negative ROA	12	19,7	100,0	Negative ROE	12	19,7	100,0
Total	61	100,0		Total	61	100,0	

Source: Research results

Research results presented in Table 8 indicate that 80,3 % of companies have achieved a positive ROA, while 19,70 % of them had a negative return on total assets. Distribution is equal for both indicators of profitability.

Research results on the existence of **correlation** (interdependence) and statistical significance of difference between parameters of outsourcing and parameters of profitability are shown in Tables 9, 10 and 11.

Table 9. Correlation and chi-square test of parameters of procurement by outsourcing and profitabillity

Parameters of effectiveness of outsourcing Procurement by outsourcing	PROF07	PROF08	PROF09	PROF10	**Statistical parameters**
RHDOUS04	-,387**	,359**	-,387**	,395**	**Correlation**
Parameter of outsorcing effectiveness	χ^2	**df**	**p**		
RHDOUS04	19,528	5	,002		**χ^2-ROA; ROE**
Parameter of outsorcing effectiveness	χ^2	**df**	**p**		
RHDOUS04	33,405	20	,030		**χ^2-increase of ROA**
Parameter of outsorcing effectiveness	χ^2	**df**	**p**		
RHDOUS04	30,770	20	,058		**χ^2-increase of ROE**

Source: Research results

*** Statistically significant correlation coefficient at p<0,01*

** Statistically significant correlation coefficient at p<0,05*

Research results from Table 9 suggest the conclusion on existence of interdependence of parameters of procurement by outsourcing and return on assets, but also on return on principal. Correlations are negative and they are all statistically significant at p < 0,01 level. Statistically the most significance occupies a larger volume of inputs as a result of Return on Equity, with a correlation coefficient of r=-,395**. The companies in the sample, which tend to a higher level of procurement outsourcing shows a positive ROA and ROE.

Using chi – square test[4], the statistical diffreneces between the parameters of procurement outsourcing and profitability indicators were determined. Previous research results have shown the same distribution of companies in relation to positive and negative ROA and ROE indicators.

Analysis of research results of RHDOUS04 parameter shows a statistically significant difference between the outsourcing of procurement, return on as-

[4] Chi – square test is one of the tests that are based on the distribution of frequencies within a contingency table, according to Rozga, A. Statistika za ekonomiste (Statistics for economists), Faculty of Economics, Split, 2003, p.143.

sets and return on principal. The result shows the same number of degrees of freedom (df) and the same threshold of significance (p). Complete correlation, i.e. largest statistical differences is related to parameters of outsourced procurement, ROA and ROE. Increased participation of inputs procurement by outsourcing is in interdependence with the companies that generate positive returns on assets and principal. Other results from the point of chi – square test for the research of the characteristics of outsourcing of procurement and increase of ROA and ROE, shows statistically significant differences with p=,030 i p=,058. This suggests that the achievement of a positive ROA and ROE and their increase is a result of certain management decisions, at least in terms of management of outsourcing activities.

The research results suggest the confirmation of proof of hypotheses ***H1$_{-1}$*** *of the existence of significant differences between the outsourcing of procurement and profitabillity.*

Research results from Table 10 show chi – square test and correlation between parameters of reduced input costs and profitability.

Table 10. Correlation and chi-square test of reducing input costs by procurement done by outsourcing and profitability

Parameter of effectiveness of outsourcing Reducing of input costs by outsourcing	PROF07	PROF08	PROF09	PROF10	**Statistical parameters**
RHDOUS05	-,437**	,298*	-,437**	,313*	**Correlation**
Parameter of outsorcing effectiveness	**χ^2**	**df**	**p**		
RHDOUS05	16,849	3	,001		χ2ROA and ROE
Parameter of outsorcing effectiveness	**χ^2**	**df**	**p**		
RHDOUS05	27,983	12	,006		**χ^2-increase of ROA**
Parameter of outsorcing effectiveness	**χ^2**	**df**	**p**		
RHDOUS05	27,375	12	,007		**χ^2-increase of ROE**

Source: Research results

*** Statistically significant correlation coefficient at p<0,01*

** Statistically significant correlation coefficient at p<0,05*

Research results from Table 10 suggest on the existence of correlation parameters of inputs cost reduction of outsourcing of procurement and return to: assets and return on principal. Correlations are negative. Statistically significance at the p < 0,01 level record positive ROA and ROE with correlation coefficient of r =-,437**. The companies in the sample, which tends to the even larger level of input costs reduction by outsourcing (expenditures) show positive ROA and ROE.

The interdependence of outsourcing parameters RHDOUS05 and increase of return of assets and principal, shows a positive correlation of r=,298** and r=,313. The research results on identified differences of achieved levels of profitability and RHDOUS05 parameter are also presented in Table 10. Using chi – square test[5], statistical differences of RHSTR005 parameter were determined that captures the full interdependence of this parameter and the increase of ROA and ROE; all that at the threshold of level of significance of p<0,01, and they are as follows: p=,001, p=,006 i p=,007.

*The research results show the confirmation of proof of hypotheses **H1-2** of the existence of a statistically significant difference between the reduction in input costs of outsourcing and profitability.*

Table 11. Correlation and chi-square test of reducing depreciation and profitability costs

Parameter of effectiveness of outsourcing Reducing of depreciation expenses	PROF07	PROF08	PROF09	PROF10	**Statistical parameters**
RHDOUS06	-,328**	,220	-,328**	,272*	**Correlation**
Parameter of outsorcing effectiveness	χ^2	**df**	**p**		
RHDOUS06	10,307	5	,067		**χ^2-ROA and ROE**
Parameter of outsorcing effectiveness	χ^2	**df**	**p**		
RHDOUS06	30,453	20	,063		**χ^2-increase of ROA**
Parameter of outsorcing effectiveness	χ^2	**df**	**p**		
RHDOUS06	27,348	20	,126		**χ^2-increase of ROE**

Source: Research results

** *Statistically significant correlation coefficient at p<0,01*

* *Statistically significant correlation coefficient at p<0,05*

5 Chi – square test is one of the tests that are based on the distribution of frequencies within a contingency table, according to Rozga, A. Statistics for economists, Faculty of Economics, Split, 2003, p. 143.

Research results from Table 11 suggest on the existence of interdependent RHDOUS06 parameter, return on assets (ROA) and return on principal (ROE). Statistical significance of parameters is at p < 0,01 level. Correlations coefficients are negative, r=-,328**. However, correlation results of the observed parameter – depreciation reducing expenses as a consequence of outsourcing, was not statistically significant when compared to the increase in ROA, and statistically was significant at p<0,05 level when compared to the increase in ROE.

Analysis of the results of RHDOUS06 parametre doesn't show a statistically significant difference between the reductions of depreciation expenses as a consequence of outsourcing and the positive ROA and ROE. The observed parameter in relation to positive return achieved the threshold of p=,067 and p=,063. The parameter of reducing depreciation costs don't record statistical significance as a result of outsourcing jobs and increase in ROE, because the threshold of significance of p=,126 is achieved.

The above said suggests that the increase in ROA is a result of a certain management decisions in terms of management of outsourcing activities. A possibility of a different management of long – term assets are not fully considered. Although the companies have made the cession of businesses to the outsourcers, they retain the funds of fixed assets (properties) as their fixed assets. Furthermore, the practise of calculating depreciation based on the life of the funds (assets) in previous years, in the financial statements means the amount of depreciation that has been allowed by tax regulations (Bubić, 2010:202). All of this has enabled higher depreciation expenses from the real expenses, i.e. varying of depreciation expenses in its sole discretion.

*In accordance with the hypotheses **H1-$_3$**, based on the research results it can be argued that there was no statistically significant difference between parameters of reduction of depreciation of fixed assets that was a result of outsourcing and profitability.*

CONCLUSIONS

Companies by mutual cooperation with their suppliers try to improve the effectiveness of their activities and processes in their businesses, and thus profitability. The feature of cooperation between suppliers and producers is based on cooperation from the very beginnings, when designing components that as an input enters the company. Managing of activities related to inputs and their costs, but also with the underlying processes, involves the strategic role of supplier as an instrument of achievement in the management of companie's expenditures and assets, with an impact on its profitability.

The research results lead to the conclusion that the establishment of long – term contracts with the outsourcers and reducing the costs of such inputs has an impact on expenditures and positive returns on investments in resources and equity, and increase of profitability.

The critical parameter in outsorcing activities in Croatian companies refers to reducing the depreciation costs of fixed assets that are no longer in function of the main processes, because such processes were outsourced. Forementioned expenditures load profitability of Croatian companies. All this affects the amount of commited resources of fixed assets, the amount of equity and a negative business result.

There is a problem in the position of its own equity, which varies widely by companies, especially those who reported business losses. Equity in Croatian companies has not shown a stable relationship. In the future periods should be expected that management will recognise other ways of managing fixed assets that is no longer a function of the main processes that were outsourced. That would mean findings of other forms of its effective use as so it would not be a load for the achievement of positive results of Croatian companies.

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