ANALYSIS OF THE CORRELATION BETWEEN PROFITABILITY AND RISK IN THE SERVICES SECTOR IN DOLJ REGION

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Abstract: The research work consists of an analysis of the correlation between profitability indicators and the risk the company is facing. A range of profitability indicators, as well as risk indicators had to be determined in order to establish the correlation degree. The method used in correlation analysis is based on the Pearson index, used by means of the SPSS software. Profitability ratios and risk indicators were analysed for 300 business entities operating on the market of computer, financial and accounting services in Dolj region, during 2015-2016.

1. INTRODUCTION

The main purpose of the paper is to analyse the correlation between profitability indicators and risk indicators in the 300 services companies, along the 3 subsectors: computer services, financial services and accounting services.

The knowledge of several financial data, such as the gross profit, net profit, operating profit, turnover, total assets and equity, was needed in order to determine profitability and risk ratios.

Starting from these indicators, we aim at analysing the correlation between profitability and risk, as profitability is an internal factor of company profitability, and risk is an external influence factor.

In order to analyse this correlation, the research team performed a case study for the computer services, financial services and accounting services sectors in Dolj region. The data used for the analysis was taken from the website of the Romanian Ministry of Public Finance and then processed according to our own methodology.

Entities operating in the computer, financial and accounting services sectors were included in this study. All these are services a company needs in order to be able to operate and develop.

The highest share of companies in the total of entities providing such services, in terms of turnover, is held by computer services - 46%. Financial services occupy the 2nd position - 30%, and accounting services the 3rd position - 24%.

2. CONCEPTS AND TERMINOLOGY

The knowledge of research items, as well as their presence in an entity, is a primary requirement for the performance of economic and financial analysis.

Several indicators, some of which were already processed, such as the gross profit, net profit, operating profit, turnover, total assets and equity, had to be determined for this analysis of the profitability-risk correlation. The others resulted from calculations based on specific formulae: the economic rate of return, the financial rate of return, the profitability of revenues and the commercial re of return.

Rates of return are ratios reflecting a company's profitability and efficiency as a percentage, i.e. the ratio betewen the companies' effects and efforts.

We have used the following formulae[1]:

ERR = NP/TA*100 (1)

FRR = NP/Eq*100 (2)

CRR=OP/T*100 (3)

Where: ERR - Economic rate of return

FRR - Financial rate of return

CRR - Commercial rate of return

NP - Net profit

GP - Gross profit

OP - Operating profit

T - Turnover

TA - Total assets

Eq - Equity.

The research paper aims at analysing the operating risk expressing the "company's incapacity to adjust, in a timely manner and with costs as low as possible, to changes in the economic and social environment"[2], as well as the financial risk referring to "the variability of net profit, depending on the company's capital structure"[3]. This expresses the variability of the economic result compared to operating conditions.

The operating risk is calculated as follows[4]:

$$CLE = \frac{\Delta Re/Re_0}{\Delta CA/CA_0}$$

The financial leverage coefficient was used for financial risk.

$$CLF = \frac{\Delta Re/Re_0}{\Delta Pn/Pn_0}$$

A first indicator for analysing the profitability of a company is the economic rate of return, an indicator expressing the "usage efficiency of the company's total assets"[5]. This is highly important for the company's managers, who are constantly focused on achieving profitability and efficiency as high as possible.

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[1] Cârstina S., Gestiunea activelor și rentabilitatea întreprinderii, Ed. Universitaria, Craiova, 2015

[2] Siminică M., Diagnostic financiar, Ed. Universitaria, Craiova, 2010, p. 121

[3] Marcu N., Analiza economico-financiară, metode și aplicații, Ed. Expert, Bucharest, 2008, p. 168

[4] Cîrciumaru D., Analiza riscului firmei, Ed. Universitaria, Craiova, 2013, p. 90

[5] Buse L., Siminică M., Cîrciumaru D., Simion D., Ganea M., Analiză economico-financiară, Ed. Sitech, Craiova, 2012, p. 167

The financial rate of return is another efficiency indicator, important primarily for the company's shareholders. It expresses the usage efficiency of equity, where their investments are found.

The commercial rate of return is characteristic for the "efficiency of the sales of the business entity, and is determined as a ratio between the obtained result and net turnover"6.

Risk is one of the most vague and evasive concepts, hard to define by economists and even harder to define for investors.

Profitability is directly connected to risk. Thus, shareholders or other investors will invest in a certain asset, assuming the related risk, only because they claim a certain compensation; the higher the risk, the higher the compensation must be.

The performance of any business activity is subject to the action of many factors, which may be predictable or not. Their intensity determines the state of certainty or uncertainty regarding the obtained results. Even though the terms of risk and uncertainty are frequently used to express the same thing, there is a clear difference between them. Uncertainty is not knowing what is going to happen in the future.

Risk is how we characterize the amount of uncertainty existing. The more uncertainty, the higher the risk, and the other way around. Hence, risk is a characterization of the degree of uncertainty, being placed between the two states (certainty and uncertainty).

3. RESEARCH METHODOLOGY

This research paper is based on a range of financial data of companies in the Dolj region operating in the computer, financial and accounting services sector. The research team collected primary data for both years f study, 2015 and 2016, based on the official website of the Romanian Ministry of Public Finance www.mfinante.ro, section "Fields of activity".

The major criterion for the selection of companies for the study was the "turnover" indicator, with the first 100 entities being chosen for each services category. In our opinion, this indicator supports a conclusive analysis on the status of a company, sector or economic branch in terms of profitability and related risk. The total number of business entities providing such services in Dolj is significantly higher than 100, but the inclusion of all of them in this analysis could have generated faulty results at the level of activity sectors, due to a very low degree of significance. The selected 100 companies meet requirements of representativeness at a local level for the elaboration of the study.

After data was collected and sorted, profitability indicators were established. Economic and financial return and profitability of revenues were calculated for each services category and, within each category, for each identified NACE code. Then, all data was prepared for analysis and interpretation, so that relevant information could be obtained on the concerned topic.

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6 Robu V., Anghel I., Șerban E.C., Analiza economico-financiară a firmei, Ed. Economică, Bucharest, 2014, p. 349

The correlation between profitability and risk-specific elements was analysed and verified by means of the SPSS software and the Pearson index, for the period 2015-2016.

Pursuant to all these steps and the results of the study, the research team drew up a range of relevant verifiable conclusions regarding an analysis of the correlation between profitability and risk regarding the services sector, in particular for computer, financial and accounting services in the Dolj region.

4. CASE STUDY

Starting from the data taken from the website of the Romanian Ministry of Public Finance, we extracted and processed the elements required for determining the indicators present in the analysis of the correlation between profitability and risk. Thus, after processing data in Excel, we calculated the indicators for analysis, sorted along NACE codes, as reflected in the following table:

Table 1.1 - The level of profitability rates by NACE codes for the three types of services

ACTIVITY	Economic return		Financial return		Profitability of revenues	
	2015	2016	2015	2016	2015	2016
COMPUTER SERVICES, of which:	39.58%	27.04%	44.60%	46.69%	24.71%	23.41%
NACE 6201	31.02%	19.08%	35.02%	46.21%	17.80%	22.03%
NACE 6202	26.91%	-13.50%	65.32%	56.51%	23.00%	16.82%
NACE 6209	52.88%	-22.74%	62.02%	65.10%	30.29%	38.77%
NACE 6311	45.49%	39.47%	49.30%	45.42%	30.39%	23.95%
NACE 6312	9.33%	-55.70%	5.97%	36.04%	1.05%	5.63%
FINANCIAL SERVICES, of which:	11.55%	-19.65%	13.93%	16.50%	35.92%	47.90%
NACE 6492	8.85%	-40.34%	10.63%	15.83%	22.78%	42.75%
NACE 6499	32.62%	24.37%	31.56%	23.50%	76.88%	76.46%
NACE 6611	56.90%	-36.08%	100.02%	56.72%	81.81%	40.93%
NACE 6612	56.68%	30.31%	69.77%	51.49%	60.51%	50.62%
NACE 6619	30.44%	3.53%	35.90%	44.02%	32.20%	29.26%
NACE 6622	67.31%	-52.79%	68.21%	40.66%	51.09%	41.46%
NACE 6810	3.81%	-20.44%	12.02%	9.95%	41.90%	25.04%

NACE 6820	2.98%	-35.69%	3.10%	6.49%	15.56%	28.30%
NACE 6831	2.40%	1.66%	497.96%	161.91%	7.65%	-3.41%
NACE 6832	61.01%	44.84%	68.64%	46.53%	86.34%	86.41%
ACCOUNTING SERVICES, of which:	14.85%	-2.79%	37.88%	31.66%	29.24%	22.37%
NACE 6920	45.14%	-41.93%	54.62%	46.23%	45.00%	39.74%
NACE 7022	10.56%	2.25%	32.53%	31.10%	24.85%	22.69%
NACE 7111	-0.83%	-8.69%	-16.63%	-248.84%	5.72%	-21.63%
NACE 7112	33.19%	-10.26%	45.86%	33.58%	37.12%	28.63%
NACE 7120	26.72%	0.99%	38.17%	39.53%	25.85%	28.53%

Source: Excel table

The analysis of the correlation between profitability and risk was performed for each of the three services selected and presented in the introductory part of the paper. Thus, SPSS helped us determine the level of correlation for accounting services:

Table 1.2 - The correlation level for accounting services

		ERR	FRR	CRR
ERR	Pearson Correlation	1	.250**	.426**
	Sig. (2-tailed)		.002	.000
	N	100	100	100
FRR	Pearson Correlation	.250**	1	-.102
	Sig. (2-tailed)	.002		.214
	N	100	100	100
CRR	Pearson Correlation	.426**	-.102	1
	Sig. (2-tailed)	.000	.214	
	N	100	100	100
CLE	Pearson Correlation	.708**	-.625	.837**
	Sig. (2-tailed)	.000	.048	.000

	N	100	100	100
CLF	Pearson Correlation	.756	.688	.214**
	Sig. (2-tailed)	.010	.033	.003
	N	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Correlation analysis for companies in the accounting services sector indicates a strong direct correlation between the operating leverage coefficient, the economic rate of return of the asset and the profitability of revenues. In both cases, the sig significance threshold was lower than 0.05.

A strong direct correlation was obtained between the economic rate of return and the financial rate of return for the financial leverage coefficient.

A similar analysis was performed for financial services and the results obtained with SPSS are presented in the table below:

Table 1.3 - The correlation level for financial services

		ERR	FRR	CRR
ERR	Pearson Correlation	1	.355**	.502**
	Sig. (2-tailed)		.014	.000
	N	100	100	100
FRR	Pearson Correlation	.355**	1	-.188
	Sig. (2-tailed)	.014		.214
	N	100	100	100
CRR	Pearson Correlation	.502**	-.188	1
	Sig. (2-tailed)	.000	.214	
	N	100	100	100
CLE	Pearson Correlation	.824**	-.425	.867**
	Sig. (2-tailed)	.000	.057	.000
	N	100	100	100
CLF	Pearson Correlation	.634	.842	.367**

	Sig. (2-tailed)	.026	.041	.647
	N	100	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

A strong correlation was seen between the operating leverage coefficient and the economic rate of return, as well as the profitability of revenues. The correlation was significant, but inverse, for the financial rate of return, with a Pearson index of -0.425.

A strong direct correlation was obtained between the economic rate of return and the financial rate of return for the financial coefficient. In terms of profitability of revenues, the correlation coefficient is 0.367, with a sig error of 0.647.

The last sector analysed in terms of correlation between profitability and risks is the computer services sector. In this sector we used the Pearson index calculated with the SPSS software, and the correlation level is reflected in the following table:

Table 1.4 - The correlation level for computer services

		ERR	FRR	CRR
ERR	Pearson Correlation	1	.412**	.468**
	Sig. (2-tailed)		.021	.011
	N	100	100	100
FRR	Pearson Correlation	.412**	1	-.274
	Sig. (2-tailed)	.021		.214
	N	100	100	100
CRR	Pearson Correlation	.468**	-.274	1
	Sig. (2-tailed)	.011	.214	
	N	100	100	100
CLE	Pearson Correlation	.784**	-.342	.846**
	Sig. (2-tailed)	.000	.064	.000
	N	100	100	100
CLF	Pearson Correlation	.688	.891	.432**
	Sig. (2-tailed)	.014	.001	.048

| | N | 100 | 100 | 100 |

**. Correlation is significant at the 0.01 level (2-tailed).

A strong correlation coefficient was seen between the economic rate of return, the profitability of revenues and the operating leverage coefficient. An inverse correlation was seen between the financial rate of return and the operating leverage coefficient.

We obtained strong direct correlations for the financial leverage coefficient in the economic rate of return and the financial rate of return, and the Pearson index for the profitability of revenues is 0.432, reflecting a significant direct correlation, but with a lower intensity than the first two.

5. CONCLUSIONS

Of course, the research culminates with the proposal of conclusions of the study. The calculation of indicators and the analysis of the profitability-risk correlation for a significant number of companies in the computer, financial and accounting services sectors in Dolj region led to the following verifiable opinions:

- The economic rate of return decreased in 2016 compared to 2015, for all three types of activities. This growth is due to the higher value of the total assets of companies in the three sectors, as well as the increase of net profit, but to a lower extent than total assets;
- The financial rate of return, whose structure is similar to the economic return, increased for computer and financial activities, showing an efficient use of the involved equity. At the same time, for accounting services, this ratio is lower in 2016 compared to 2015;
- The profitability of revenues is lower for computer and accounting services during the two years subject to analysis. For financial services, this increased due to the decrease in turnover and the increase of net profit at a sector level;
- The three profitability ratios, along with the two indicators expressing both operating risk and financial risk, define the following correlations: accounting services witness a strong direct correlation between the operating leverage coefficient, the economic rate of return and the profitability of revenues; the financial leverage coefficient has the same status regarding the economic rate of return and the financial rate of return; the branch of financial services experiences a strong correlation between the operating leverage coefficient and economic return, as well as profitability of revenues; the financial rate of return has a significant inverse correlation; the financial leverage coefficient shows strong direct correlation for the economic rate of return and the financial rate of return, while this is close, but with a slight error, for the profitability of revenues; computer services have a strong correlation between the economic rate of return, the profitability of revenues and the operating leverage coefficient; the financial rate of return is inversely correlated to the operating leverage

coefficient; strong direct correlations are also seen for the economic rate of return and the financial rate of return regarding the financial leverage coefficient, while the profitability of revenues has a significant direct coefficient, but with a lower intensity than the first two.

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