

THE FINANCIAL HEALTH OF HOSPITALS. V4 COUNTRIES CASE

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Abstract (AJ)

The paper aim is to investigate the financial health position of hospital operating in V4 countries. Our observation is studied by comparison both ROA with healthcare system's indicators. We have found that the financial situation if hospitals in V4 countries, measured with ROA, is strongly diversified and there is a statistically relevant relationship between ROA and the level of public and OOP spending on health. We also have found, that hospitals don't rely on nonpatient care activities.

INTRODUCTION

The health care system's functioning is one of key factors of society's health status - the socio-economic consequences of healthcare providers' activities are legion. Hospitals constitute an important part of healthcare system due to higher level of specialization, higher cost and, of course, society's expectations.

Generally, hospitals are responsible for generating of debts in healthcare systems. There are many indicators, that can be used measuring the economic situation of hospital. One of them is ROA – return on assets.

The purpose of this paper is to analyse the ROA ratio for hospitals in the countries of the Visegrad Group, hand in hand with the basic indicators for healthcare resources (finance, human and infrastructure).

We pose several hypotheses:

- 1) hospital's rentability is correlated with level of financing (both from public and private resources),
- 2) financial health of hospitals do not rely on nonpatient care in V4 countries,
- 3) systematic hospital risk management might reduce costs and make the negative influence on hospital financial health less destroying.

This hypotheses will be examined using data coming from hospitals and OECD covering years 2010-2012. The reserche's instrumentation comprises mainly descriptive statistic tools.

1 HEALTH CARE SYSTEM IN COUNTRIES OF VISEGRAD GROUP

Visegrad Group (V4) is an alliance of four Central European states – Czech Republic, Hungary, Poland and Slovakia. A common feature of Visegrad Group is not only a geography and history, but, above all, the processes of the socio-economic political transformation, launched in the 1990s. In the context of health systems, this process means the transition from a system based on the Semashko-style model, the model built on model Siemaszko to the system of universal social health insurance (SHI) (Bryndova, L. at all., 2009), (Gaál, P. at all., 2011), (Sagan, A. at all., 2011), (Szalay, T. at all., 2011).

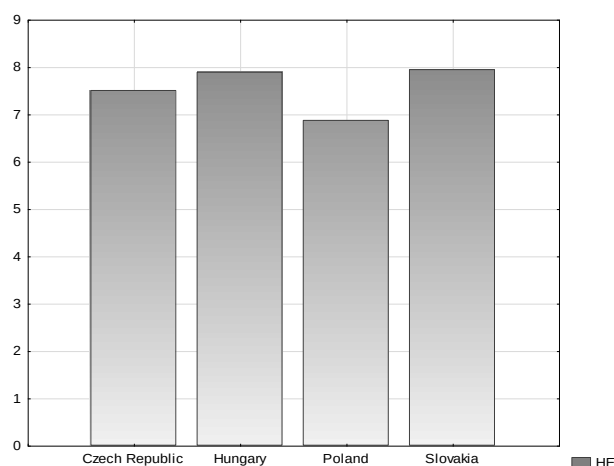


Figure 1. Health expenditures as %GDP, 2011

Source: own study on OECD data

Despite the economic transition and relatively rapid economic growth, healthcare spending (expressed as a% of GDP) is still relatively lower than in Western European countries and the OECD average (9,3 %GDP in 2011) and varies from 6.9 % GDP in Poland to 7.9% in Slovakia and Hungary with variation coefficient equal to 6,5% (Figure 1).

Another important indicator of health care spending level are expenditures per capita (PPP USD). The analysis of per capita spendings unclothes the real potencial of healthcare financing system. It varies from 1452 USD in Poland to 1966 USD in Czech Republic (2011) with variation coefficient equal to 13,4%. Even greater variation occurs in the case of out-of-pocket spendings p. c., that varies from 289 USD in Czech Republic to 439 in Hungary (2011) with variation coefficient equal to 20.6% (Figure 2).

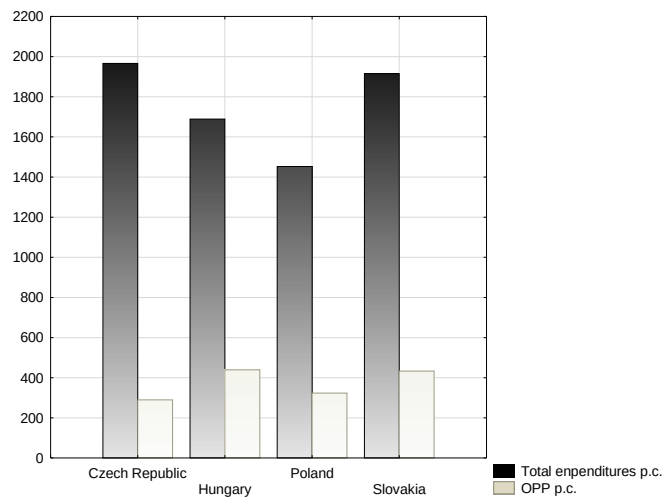


Figure 2. Expenditures on health per capita, 2011

Source: own study on OECD data [www.oecd.org]

Relatively lower spending do not reflect on health resources. Analysis shows that both in Czech Republic, Slovakia and Hungary, the number of beds (including curative beds), and the number of physicians per 1000 inhabitants is similar or even higher than the OECD average. The exception is Poland, where the number of physicians and doctor's consultations is significantly lower than in other countries of the Group. The average length of stay in hospital is the shortest in Slovakia - 7.2 days and the longest in the Czech Republic - 10.2 (Figure 3).

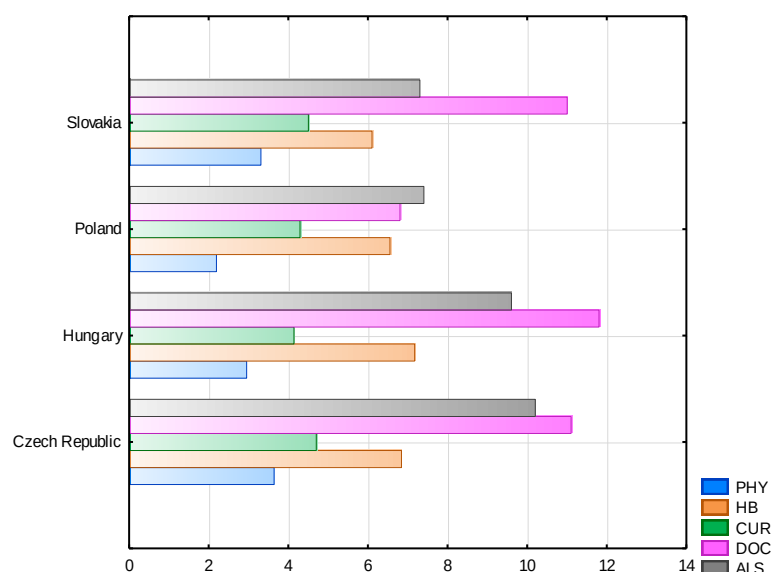


Figure 3. Healthcare system resources, 2011

Source: own calculation based on OECD data [www.OECD.org]

Figure 4 presents descriptive statistics for basic healthcare system indicators for V4's countries (average value, minimal and maximal value, standard deviation and variation coefficient). Data shows, that basic indicators for V4 healthcare system are not significantly differential – the variation coefficient is generally low (below 20%) for majority of variables. Only for 4 variables: out-of-pocket spending, spending per capita, number of physicians and number of doctors consultations – variation is medium.

	AVERAGE	MIN	MAX	STANDARD DEVIATION	VARIATION COEFFICIENT
HE	7,55	6,87	7,94	0,494	6,53763
TE	1755,48	1452,36	1965,96	235,276	13,40243
PE	72,61	65,04	84,18	8,156	11,23254
OOP	21,43	14,74	26,03	4,765	22,24040
OPP PC	371,67	289,79	439,56	76,305	20,53014
PHY	3,02	2,19	3,64	0,622	20,59337
HB	6,66	6,06	7,17	0,471	7,07194
CUR	4,41	4,14	4,70	0,243	5,52506
DOC	10,18	6,80	11,80	2,278	22,38795
ALS	8,63	7,30	10,20	1,493	17,31060
HD	18817,03	16149,30	20554,30	2019,796	10,73387

Figure 4. Healthcare system – basic information, 2011

Source: own calculation based on OECD data [www.oecd.org]

This analysis has entitled us to adopt an assumption, that healthcare systems in V4 countries are generally similar. Possible differences in rentability indicator's level might have other origins, then healthcare system's financing and organization (on macroeconomic level).

2 RESEARCH

Hospital's rentability has a great impact on the quality of healthcare services – deep financial problems prompts lower quality (Bazzoli, Chen, Zhao i Lindrooth, 2008). It can also influence the access to health services for the population.

Epirical study shows, that the there are some factors, which are significant determinants of hospital's profitability: location, ownership (private or public), teaching status, number of employees, lenght of stay, bad capacity and occupancy rate (Younis, Rice i Barkoulas, 2001). The correlation coefficients between some of this factor and rentability will be evaluated in this paper.

Hospital behaviour generally depends on the ownership – public or private, and type – for-profit and non-profit. Public hospitals constite the majority of inpatient providers in V4 countries – that's way there are no incentives to generate high profits. On the other hand public hospitals are often forced to provide unprofitable services, which are demanded by patients (Horwitz, 2005).

During last decade hospital costs have grown significantly but, simultaneously, revenue growth has been constrained. Hospitals are losing billions of dollars per year caring for patients (Schuhmann, 2010). That's way empirical studies have proven, that nonpatient activities should be considered as profit centres (McKay i Gapenski, 2009).

ROA (the return on assets) is one one of rentability's rate. It's the percentage that shows how profitable a company's assets are in generating revenue of the firm, in this case hospitals. ROA is calculated as the ratio of net income to average total assets. Assets are generally defined as a certain economic resource, that can generate some economic value - this category covers both current and fixed assets.

The level of assets, in case of hospital, should be perceived as relatively stable, as a result of low level of financing activities. That's way the ratio's contruction implicates the direct, strong relantionship between the level of income and ROA.

	ROA_Slovakia	ROA_Poland	ROA_Hungary	ROA_Czech Republic
NUMBER OF OBSERVATIONS	31	631	24	163
AVERAGE	-5,30609	-1,54012	11,97153	1,99919
MIN	-54,080	-277,778	-26,253	-288,930
MAX	14,8614	139,2735	138,1793	84,3690
25% QUARTILE	-12,0594	-6,0277	-5,7543	-2,1584
75% QUARTILE	6,155464	3,139973	9,335184	7,839909
STANDARD DEVIATION	15,88293	20,84334	39,87935	28,33239
VARIATION COEFFICIENT	-299,33	-1353,35	333,12	1417,19
SKEWNESS	-1,36381	-4,45005	2,54723	-6,65103
KURTOSIS	1,84085	61,32520	6,28757	70,06814

Figure 5. Descriptive statistic for ROA, 2010

Source: Own study based on Database Amadeus product of Bureau van Dijk, [date of release: 2013 NOV 14]

ROA is an part of financial analysis as an important rentability's indicator. High return on assets creates a stable base for future development and investments.

We calculated ROA using data from years 2010-2012. Study group varies in years and countries, but generally covers both public and private hospital. Detailed information concerning the number of observation are presented in Figures 5-7.

	ROA_Slovakia	ROA_Poland	ROA_Hungary	ROA_Czech Republic
NUMBER OF OBSERVATIONS	25	605	24	153
AVERAGE	-10,9786	-2,4765	-2,2863	5,0785
MIN	-144,340	-155,487	-256,090	-90,835
MAX	14,2005	145,6537	62,8510	54,6467
25% QUARTILE	-14,5481	-7,4608	-2,5904	-0,4304
75% QUARTILE	3,32504	2,33250	14,15769	8,86045
STANDARD DEVIATION	30,97221	15,41447	56,94965	15,28060
VARIATION COEFFICIENT	-282,11	-622,42	-2490,90	300,89
SKEWNESS	-3,56848	-0,55945	-4,07766	-0,66124
KURTOSIS	15,11269	33,72188	18,97878	11,21920

Figure 6. Descriptive statistics for ROA, 2011

Source: Own study based on Database Amadeus product of Bureau van Dijk, [date of release: 2013 NOV 14]

The analysis of prested data has shown, that in each country ROA is extremely diversified in every year, but it is difficult, on this stage of research, to find a common pattern of observed changes.

	ROA_Slovakia	ROA_Poland	ROA_Hungary	ROA_Czech Republic
NUMBER OF OBSERVATIONS	13	82	24	99
AVERAGE	-4,14501	5,39786	-5,69545	2,12302
MIN	-108,163	-24,597	-83,002	-35,616
MAX	27,50799	43,97003	28,55134	36,84845
25% QUARTILE	-1,1159	0,6203	-12,0311	-2,1679
75% QUARTILE	5,174761	8,859190	9,748356	7,388452
STANDARD DEVIATION	32,44212	11,73040	26,46133	10,77886
VARIATION COEFFICIENT	-782,679	217,316	-464,604	507,714
SKEWNESS	-3,12487	0,95573	-2,04146	-0,55065
KURTOSIS	10,78855	2,62953	4,54851	3,43572

Figure 7. Descriptive statistics for ROA, 2012

Source: Own study based on Database Amadeus product of Bureau van Dijk, [date of release: 2013 NOV 14]

Average ROA was positive (above zero) in Czech Republic and negative (below zero) in Slovakia in every analysed year. In Poland ROA was positive only in 2012, and in Hungary only in 2010.

Detailed analysis of ROA distribution (Figure 8-11) has testified, that, regardless very serious spread of ROA, significant part of observation is centred and the spread between 1st and 3th quartiles is relatively low. It suggest the need of outlier's removal.

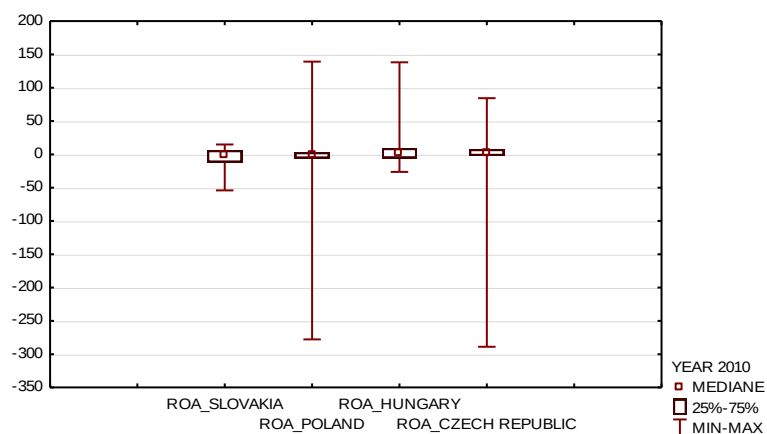


Figure 8. ROA distribution, 2010

Source: own study based on Database Amadeus product of Bureau van Dijk, [date of release: 2013 NOV 14]

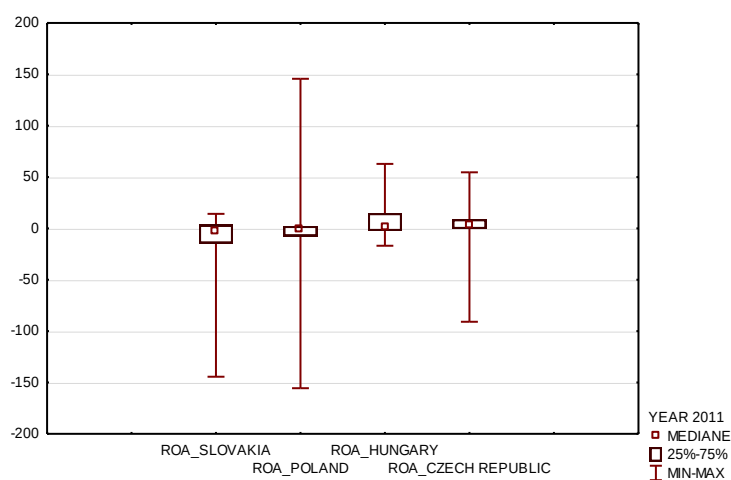


Figure 9. ROA distribution, 2011

Source: Own study based on Database Amadeus product of Bureau van Dijk, [date of release: 2013 NOV 14]

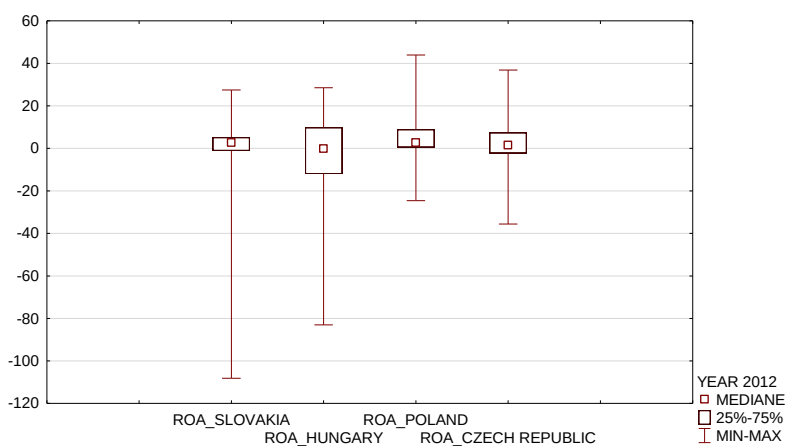


Figure 10. ROA distribution, 2012

Source: Own study based on Database Amadeus product of Bureau van Dijk, [date of release: 2013 NOV 14]

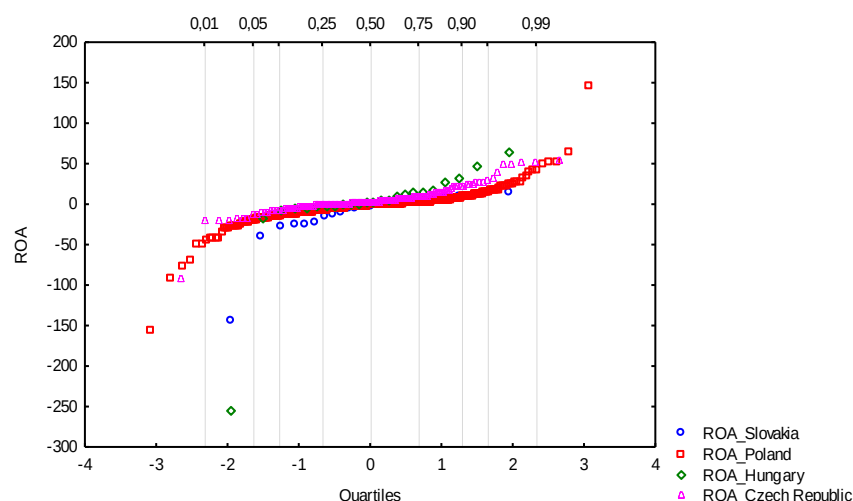


Figure 11. ROA quantiles, 2011

Source: Own study based on Database Amadeus product of Bureau van Dijk, [date of release: 2013 NOV 14]

Another issue is the analysis of relationships between ROA and health system's indicators. Analysis of correlation coefficients indicates, that for the V4' countries, the strongest positive correlation occurs between ROA and the number of curative beds (0,9600) and the level of public expenditure (as % of GDP) (0,9582). A significant negative correlation has been shown between the ROA and the level of out-of-pocket expenditure (-0,9381). The other relationships we consider statistically insignificant (Figure 12).

	TE	PE	OOP	OPP PC	PHY	HOS	CUR	DOC	ALS	HD	ROA
HE	0,5770	-0,1302	0,1931	0,6385	0,6357	0,9848	-0,1239	0,9673	0,8303	0,9514	0,1589
TE		0,7347	-0,6900	-0,2602	0,9973	0,4263	0,7389	0,7653	0,9342	0,8004	0,8980
PE			-0,9980	-0,8462	0,6826	-0,3005	1,0000	0,1256	0,4444	0,1814	0,9582
OOP				0,8784	-0,6347	0,3607	-0,9975	-0,0622	-0,3864	-0,1183	-0,9381
OPP PC					-0,1882	0,7625	-0,8428	0,4224	0,1013	0,3706	-0,6584
PHY						0,4919	0,6872	0,8107	0,9580	0,8425	0,8631
HOS							-0,2945	0,9085	0,7209	0,8835	-0,0151
CUR								0,1319	0,4501	0,1875	0,9600
DOC									0,9446	0,9984	0,4041
ALS										0,9616	0,6821
HD											0,4551
ROA											

Figure 12. Correlation matrix, variables 2011

Source: Own study based on Database Amadeus product of Bureau van Dijk, [date of release: 2013 NOV 14]

3 LIMITATIONS

The research' sample was relatively small, especially from Slovakia and Hungary. That's way the outliers hasn't been removed, but it limits the possibility of drawing conclusions. In further studies some form of weighting, should be introduced. We also calculated the Pearson's correlation coefficient – low correlation doesn't exclude the nonlinear's relationship between variables.

4 DISCUSSION

Gloede et al (2013) basing on resource-based theory analyze the interorganizational relationships between hospitals and hospital financial health. That relationship is a source for hospitals that effects in better financial health. In Gloede et al (2013) study, similar with our findings, the results document that having effective interorganizational relationships is positively associated with the hospital financial health. We do not continue but agree with claim that investment in interorganizational relationship helps in building long term financial health. Mc Kay and Gapenski (2009), and Singh and Song (2013) also, in their studies present hypothesis that traditionally hospitals rely on nonpatient care activities. That activity is for complementation of too small revenues from patient care. Such strategy can help in strengthening financial health of hospital. That finding is in opposite to situation in Visegrad Group's (V4) countries. That is documented in the Table 7. We have shown that ROA is strongly correlated with curative beds, so financial health of hospitals do not rely on nonpatient care in V4 countries. Banduhn and Schluhtermann (2013) have presented facts that medical treatment is entailed with non homogenous risk. That is also our observation that the negative impact of that non homogenous risk on patients health is in correspondence with costs of hospital insurance and as effect with hospital financial health. It is fundamental financial truth that higher risk and great risk sensitivity should be seen in financial effects with destruction of financial health of the hospital. We agree with Banduhn and Schluhtermann (2013) that systematic hospital risk management for sure reduce costs and make the negative influence on hospital financial health less destroying. Paper presents in Table 7 that OOP - Out-of-pocket payments (% total expenditure) are strongly correlated with ROA in negative way in V4 countries. It is corresponding with Banduhn and Schluhtermann (2013) who demonstrate the financial health effects of implementing a hospital risk management.

List of variables

HE	Health expenditures (% PKB)
TE	Total expenditures (PPP USD, per capita)
PE	Public expenditures (% total expenditures)
OOP	Out-of-pocket payments (% total expenditure)
PHY	Physicians (per 1,000 population)
HOS	Hospital beds (per 1,000 population)
CUR	Curative beds (per 1,000 population)
DOC	Doctors consultations (per capita)
ALS	Average length of stay (days)
HD	Hospital discharges (per 100,000 population)

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