

THE EVALUATION OF THE IMPLEMENTATION EFFECTS OF THE CONCEPT EMAS TO THE PERFORMANCE OF ORGANIZATIONS IN THE PUBLIC AND THE PRIVATE SECTOR IN THE CZECH REPUBLIC

Vyhodnocení efektů implementace konceptu EMAS na výkonnost organizací ve veřejném a soukromém sektoru České republiky

Karel Kolman¹

¹ *Tomas Bata University in Zlín, Faculty of Management and Economics,
Mostní 5139, 760 01 Zlín
Email: kolman@fame.utb.cz*

Abstract: The article discusses the use of the Eco-Management and Audit Scheme (EMAS) in terms of entities in the Czech Republic. The use of this concept is analysed in the area of subjects of public administration and business entities. The results are based on the outputs from a questionnaire survey. Partially, the aim is to evaluate the administrative, personnel and financial requirements of implementation and compliance with the conditions of certification. There is also a simplified comparison of the financial performance of those entities with their surroundings. The main aim of the article is to describe the use of this metric in the Czech Republic and propose possible recommendations for other organizations thinking about implementation.

Abstrakt: Článek pojednává o využití nástroje Eco-Management and Audit Scheme (EMAS) v podmínkách subjektů České republiky. Analyzováno je použití tohoto konceptu u subjektů veřejné správy a podnikatelských entit. Výsledky jsou podloženy výstupy z provedeného dotazníkového šetření. Dílčím cílem článku je zhodnotit administrativní, personální a finanční náročnost implementace i udržení podmínek certifikace. Zjednodušeně je také komparována finanční výkonnost těchto subjektů s jejich okolím. Hlavním cílem článku je zmapovat využití této metriky v prostředí České republiky a navrhnout možná doporučení pro ostatní organizace uvažující o implementaci.

Keywords: EMAS, environmental management, implementation, performance

Klíčová slova: EMAS, environmentální management, implementace, výkonnost

JEL classification: G30, H83, Q56, R51

Introduction

Public service organizations and businesses are currently largely controlled financially. Dominant for their existence are financial metrics of management, level of profit, turnover or a percentage of the plan. The impact of production and the existence of these organizations on the environment is played down in favour of economic (financial) results for the entire production process. Many organizations perceive the orientation of the environmental aspect as redundant. Some of these organizations believe that there is no need to develop more activities beyond environmental legislation. A similar situation is not even close in public administration organizations. Reducing the impact of production on the environment is not the only way to behave properly. However, experience shows that it is appropriate to address this issue

at the stage of planning and managing the entire production process of production or provision of services. A suitable tool can also be EMAS.

1 Financial and environmental performance

The boom of monitoring, evaluation and performance management of business entities can be traced back to the 1980s, later Kaplan and Norton (1992), Neely (1995), etc. But it was soon adopted by public institutions as well. Such institutions are forced by the market environment to rationalize behaviour toward a more flexible, leaner and more efficient production. These institutions have a greater tendency to inefficiency, either due to their specific mission or connection to central or local budgets. The effort of these institutions is to take some of the methods and procedures from the business environment. Because of various layouts and sizes of the public administration of each country, it is also a scientific interest to identify different ways to improve performance. The performance measurement and management of healthcare and treatment facilities are currently coming to the fore (Pettersen, Nyland 2006, Yuen, Ng 2012). In such organizations, the concept of Balanced Scorecard is widely used (Behrouzi, Shaharoun et al. 2014). Another important area is the collection of taxes as the income for the central budget. For example, Klun (2004) states that there is no single definition of the effective functioning of the tax administration. A positive effect is also recognized by Park (2011) who in his empirical study indicates the clearly demonstrable effect of using performance measurement and the management of tax collection.

Performance is also discussed in the environmental field. Environmental behaviour is required from businesses or individuals but often downplayed by local authorities. Based on group interviews created by Lungberg (2009) a framework for linking the concept of MBO (Management by Objectives) and PSR (Pressure-state-response) together with the environmental goals of the organization was established, namely the Swedish Rail Administration. Attention is also given to the security forces of the state (Barlage, van den Born et al. 2014). Now we can observe efforts to control the performance of local governments. Their position in the public administration system is different, but they always more or less guarantee the provision of public goods and services, the organization of which was formerly managed autonomously.

For example, Folz (2009) addresses the issue of performance management in cities. He conducted his research on U.S. cities with a population between 25,000 and 250,000. A similar survey was conducted Streib and Poister (1999), also in cities with over 25,000 residents. And Nisio et al. (2014) conducted a similar study on Italian cities. As Pollanen (2005) noted, although such studies have "identified barriers to the development and sensible use of performance measures, performance measurement seems to be a useful management tool for municipalities and has considerable potential for the future."

Performance measurement and management of municipalities is often associated with the concept of New Public Management (Vienazindiene, Ciarniene 2007, Zarzycka, Michalak 2013), which combines a large number of tools, approaches, and concepts. As their applicability is different, so is the effects of implementation. Ochrana (2007) identifies general management methods and efficient decision-making practices in public management. As with healthcare, the most commonly used tool in New Public Management is the concept of a Balanced Scorecard (Dreveton 2013, Greatbanks, Tapp 2007, Duchon, Pavelková 2011). In municipal management are also applied systems taken from business practices, such as ISO Standards, TQM and others (Pun 2002). For public authorities are designed specific tools, among which is, e.g.,

the Common Assessment Framework – CAF (Cucu 2011, Matei, Balaceanu 2014). For the Czech environment, there are the concepts Zdravá města and Místní agenda 21.

Conventional performance measurement and management of public administrations and businesses is focused primarily on financial metrics. In an effort to find a comprehensive instrument are sought and other non-financial criteria that would reflect the actual development of these organizations. The environmental aspect is one of them.

Environmental management and audit scheme is in the world known by the acronym EMAS. Czech Environmental Inspectorate (CENIA) provides a definition of EMAS as "a voluntary environmental protection instrument that positively motivates the organizations to a responsible approach and to improving the environmental performance beyond legal requirements. The tool was set up by the European Union for the detection and monitoring of environmental impact of organizations and public disclosure through individual environmental statements." (CENIA 2016). The EMAS has been described in the Czech environment by Hyršlová (2003), then as a marginal part of the eco-controlling (Kolman, Pastuszková 2015).

Connections between the EMAS concept and changes in financial performance solve Iraldo Testa (2009), Rennings (2006) or Daddi and Iraldo (2016) That research team also dealt with the evaluation of the effects of the implementation of EMAS and ISO 14 001 by Italian companies (Testa, Rizzi et al. 2014). Their study shows that the implementation of these concepts provides benefits on short and long-term energy-intensive industries in the field of environmental performance.

The standard ISO 14001 is dedicated to of environmental management and belongs to a group of traditional ISO standards. EMAS and ISO 14 0001 have the same goal, namely to ensure a functioning of environmental management. These concepts are mutual competitors, but since 1996 (after approval by the European Commission) is an ISO standard springboard for the implementation of EMAS, as the EMAS system exceeds the requirements of this standard. Extension of an environmental management by the tool EMAS is not mandatory for the entities. This is an optional extension.

EMAS brings besides the main significance - a positive impact on the environment - at least 6 other benefits for organizations that decide to implement it and develop further. The advantage may be, for example, increase the success in obtaining public contracts, reduce operating costs, increase credibility among stakeholders, reduction of fees for the Ecolabel, and more. (Cenia.cz, 2012)

2 Aim and methodology

The aim of this article is to describe the Usage of EMAS in the Czech Republic, both for businesses and for public administration organizations. Additionally, this article aims to evaluate the financial, administrative and personnel demands of implementation and sustaining certification requirements for Czech entities. It is also compared the performance of these organizations in relation to their surroundings.

For an appraisal of involvement of entities in the Czech Republic was drawn from the database of the European Commission (European Commission 2016) and the database Czech Environment Inspection (CENIA 2016). It was carried out a questionnaire survey to evaluate the individual effects. Survey was sent electronically to all registered entities.

A simplified comparison of the financial performance is created by using data from a database Albertina and public outputs the Ministry of Industry and Trade of the Czech Republic. There is a comparison of the value of the return on equity of companies and entire sectors (by using arithmetic averages).

3 Results

At the beginning of the investigation there was compared using the concept of EMAS in the Czech Republic and other European Union countries. The Czech Republic has now registered 25 subjects (2+ subjects with one registration). In conversion to million inhabitants, the Czech Republic occupies 10th place in the ranking. One of the best European country is Austria with 35 registrations per million inhabitants. The total number of registered organizations in the European Union is 9 271 (in May 2016)

As was mentioned previously, in the Czech Republic is now registered 25 subjects. A list of all organizations is shown in the following table.

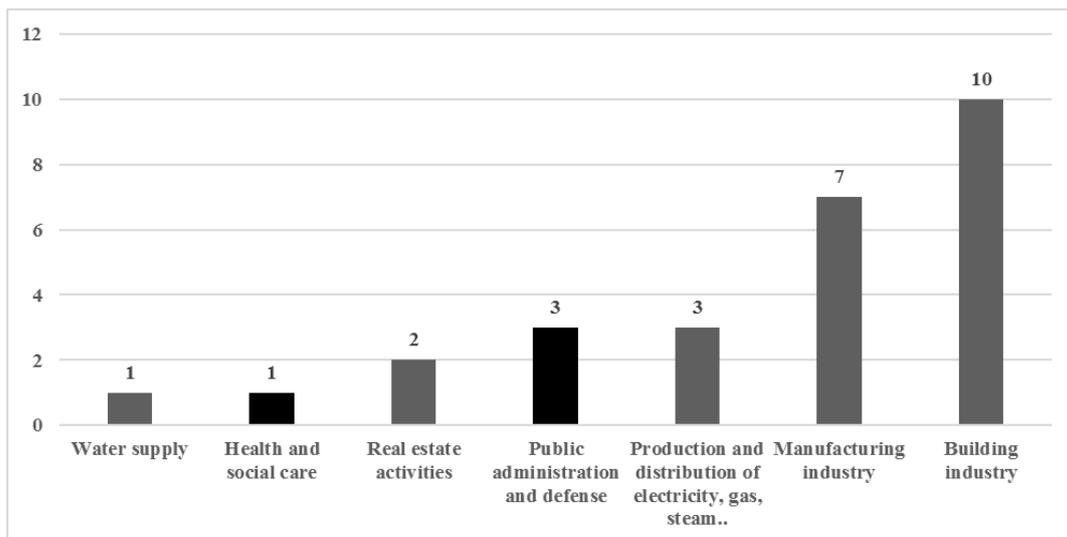
Table 1: List of registered entities in the Czech Republic

No.	Registration number	Company name	Registration date	Certificate validity
1	CZ-000014	OHL ŽS a. s.	24.6.2004	31.10.2018
2	CZ-000017	OEZ, s.r.o.	8.12.2004	14.6.2019
3	CZ-000021	IMOS Brno, a. s.	23.11.2005	31.8.2017
4	CZ-000022	Teplárna Strakonice, a. s.	24.11.2005	26.7.2017
5	CZ-000023	Alpiq Generation (CZ) s.r.o.	5.1.2006	10.5.2017
6	CZ-000025	AVARA, a. s.	13.3.2006	1.6.2017
7	CZ-000027	Subterra a. s.	4.5.2006	27.3.2018
8	CZ-000031	HOCHTIEF CZ a. s.	10.7.2006	28.5.2018
9	CZ-000032	Metrostav a. s.	8.9.2006	27.5.2018
10	CZ-000033	VCES a. s.	19.10.2006	2.7.2018
11	CZ-000037	STRABAG a.s.	16.8.2007	20.9.2016
12	CZ-000038	RELIMEX spol. s.r.o.	7.2.2008	17.9.2017
13	CZ-000040	UNISTAV CONSTRUCTION a. s.	19.5.2008	29.3.2017
14	CZ-000041	POHL cz, a. s.	29.5.2008	25.6.2017
15	CZ-000045	Město Chrudim	20.1.2010	10.12.2018
16	CZ-000046	EKOZIS spol. s r.o.	24.6.2010	24.6.2016
17	CZ-000048	Bombardier Transportation Czech Republic a.s.	2.5.2012	2.5.2018
18	CZ-000049	HYUNDAI MOTOR MANUFACTURING CZECH S.R.O.	6.6.2012	10.6.2018
19	CZ-000050	Městský úřad Jilemnice	13.7.2012	13.7.2018
20	CZ-000051	Krajský úřad Moravskoslezského kraje	12.9.2012	12.9.2018
21	CZ-000052	HETTICH k.s.	10.4.2013	10.4.2017
22	CZ-000053	Fakultní nemocnice u sv. Anny v Brně	20.5.2013	20.5.2016
23	CZ-000054	FERAMO METALLUM INTERNATIONAL s.r.o.	2.9.2013	2.9.2016
24	CZ-000056	OMNICON s.r.o.	15.7.2014	15.7.2017
25	CZ-000057	Unicont Opava s.r.o.	3.11.2014	3.11.2017

Source: (CENIA, 2016), own processing

Registered entities are made up of 15% by public authorities. Specifically, they are represented by two local governments (municipalities), higher one local government unit (region) and one public hospital. Other subjects (85%) are business entities. According to CZ-NACE sections there are dominant construction companies (10 companies).

Figure 1: Distribution of subjects by activity



Source: (CENIA, 2016), own processing

The sectoral structure of registered organizations in the EU varies greatly. In services, the most represented are the Public Administration (399 organizations), followed by Education (240 subjects), Accommodation, and so forth. Within the industrial sector is dominant and Waste Disposal (466 subjects), followed by the Electricity and Gas (275 organizations), etc. The construction industry is not one of the key sectors in contrast to the Czech Republic.

It was subsequently conducted a questionnaire survey. To all registered parties were sent an electronic version of the questionnaire. The questionnaire was completed by 32% of respondents, of which 75% were representatives of business entities and the remaining 25% of public administration representatives. The questionnaire was distributed using the Google's form in date of September 2016. The aim of the questionnaire was to find satisfaction, benefits and mainly financial, personnel and administrative demands obtaining and maintaining certification of this concept.

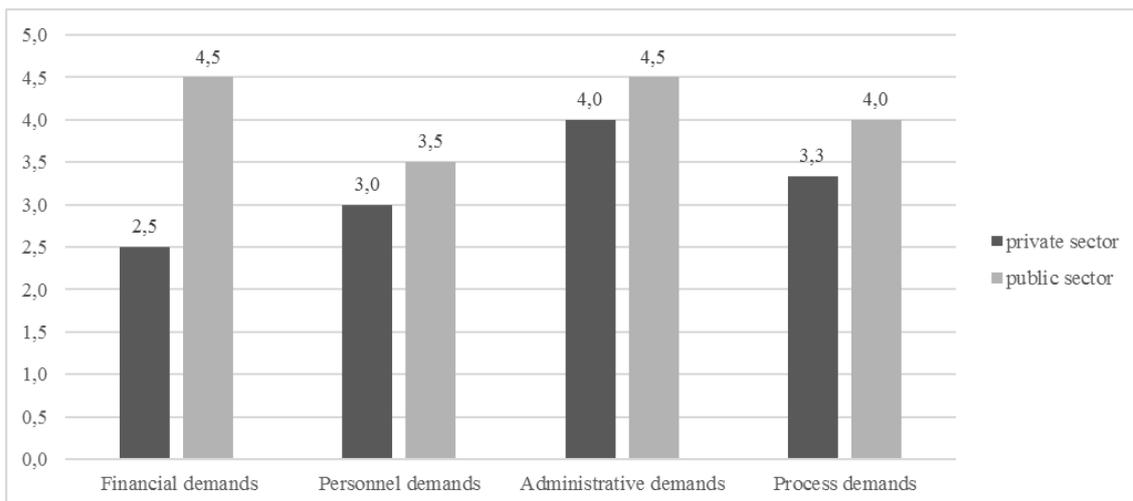
In the questionnaire survey was first analysed why entities decided to implement. Respondents most frequently targeted their reasons in improving the environment and public awareness. A frequent reason was also the only management decisions and fulfilment of conditions for public contracts.

There were also analysed the subjective demands of implementation of the concept EMAS. Respondents assigning points 1-5 for the 4 basic segment according to the degree of difficulty.

As the most important segment appears administrative and financial requirements for implementation. The public and private sector, however, is not perceived personnel demands on the EMAS concept. The financial demands are not the burdensome factor for the private sector as for the public sector.

The following graphs represent the arithmetic mean of answers by the breakdown between public and private sector.

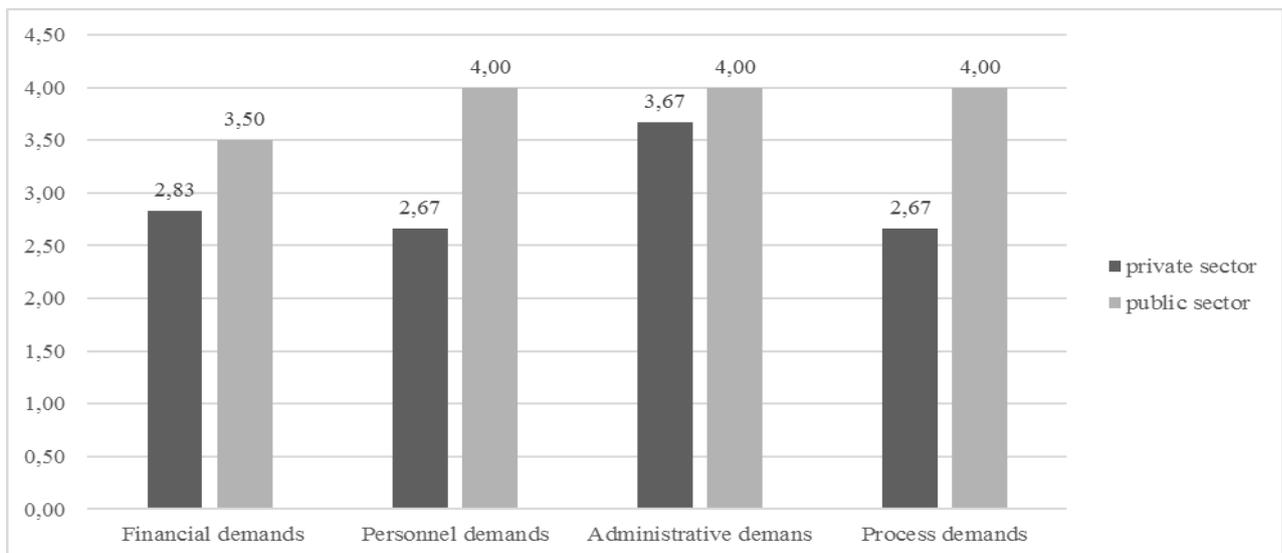
Figure 2: Implementation demands



Source: own processing

Similarly, representatives of organizations were asked about the difficulty of maintaining the conditions of certification and re-obtaining the certificate. In this area, representatives of organizations see the greatest demands of in terms of administrative and personnel, as it was in the initial phase.

Figure 3: Certification demands

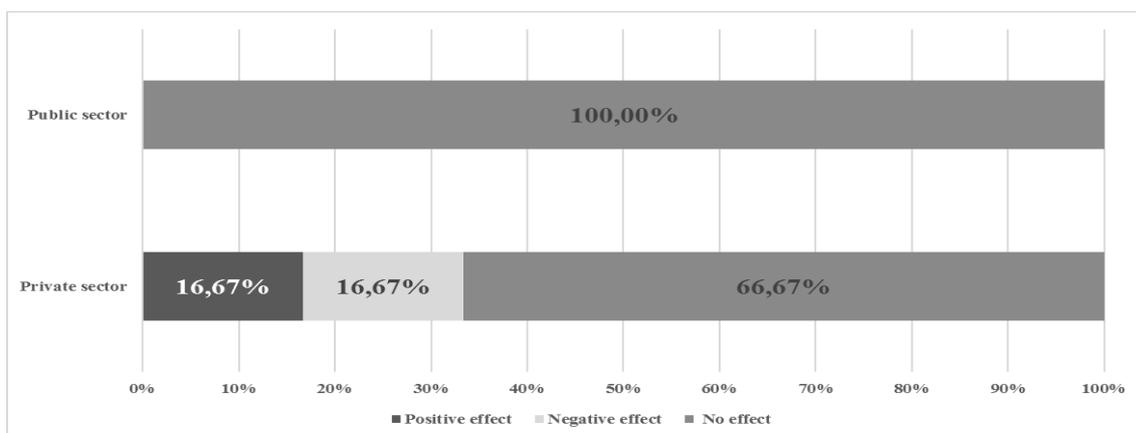


Source: own processing

The use of a tool EMAS is intended to improve the environmental position of organizations. In addition to improving environmental performance, however, it is necessary to evaluate the financial performance. The aim of this article is to also answer the question whether the implementation of the concept EMAS has an impact on the financial performance of these organizations. Respondents answered the question of whether the implementation EMAS had an impact on their financial management. Within the public sector, all subjects perceive no impact on financial performance. In the private sector, almost 67% of the subjects also does not see any impact on financial performance. The only item affecting the financial position can be the implementation costs (organizations estimate an average of 211 thousand CZK) and

maintenance costs (134 thousand CZK). The organization also reject the creation of another financially valuable income (benefits) of the implementation.

Figure 4: The assessment impacts on financial performance



Source: own processing

Subjective effects on the financial performance were compared with the objective. For this purpose, it was compared to return on equity (ROE) by private sector entities, for which there are relevant data and are dominant in the use of EMAS. These are the categories according to NACE - Building Industry, Production and distribution of electricity, gas, steam and air conditioning and Manufacturing industry. By these groups, there were created the average value of ROE (as the arithmetic mean) for the period 2011 to 2013.

To calculate the companies ROE has been used database Albertina. Values were compared with the sectoral results which are published by the Ministry of Industry and Trade of the Czech Republic.

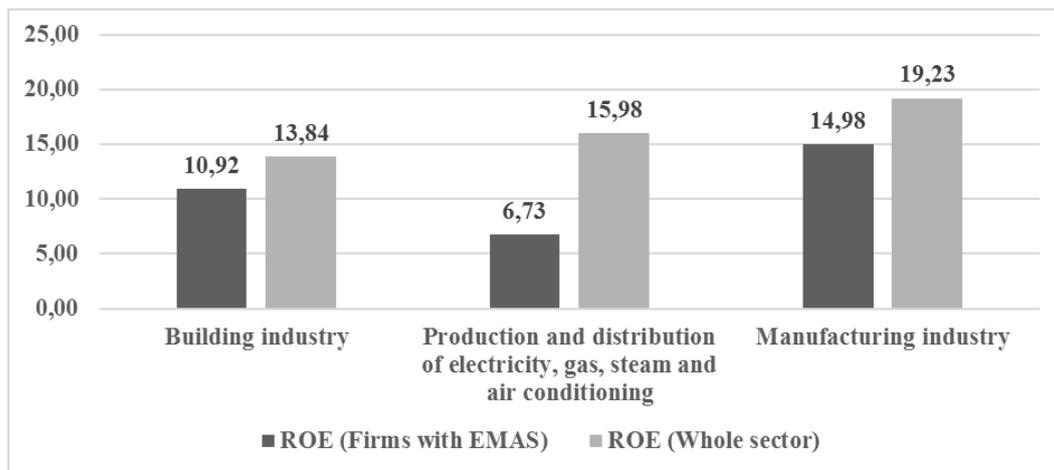
Table 2: ROE comparison

NACE	INDICATOR	2011	2012	2013
Building industry	ROE (Firms with EMAS)	14,56	10,54	7,65
	ROE (Whole sector)	19,84	15,68	6,01
Production and distribution of electricity, gas, steam and air conditioning	ROE (Firms with EMAS)	7,62	6,56	6,01
	ROE (Whole sector)	17,14	23,13	7,67
Manufacturing industry	ROE (Firms with EMAS)	-1,43	27,73	18,63
	ROE (Whole sector)	22,27	29,09	6,32

Source: own processing

The results which are published in table and graph demonstrate that it is impossible to expect it also to improve financial performance. Businesses with EMAS have on average worse results than their surroundings.

Figure 5: Comparison of the average ROE



Source: own processing

Despite the financial benefits, they are not clearly evident, more than 88% of representatives sees implementation EMAS for their organization as beneficial. Results of the survey showed that is appropriate to have the established norm ISO 14000 to simplify of EMAS implementation. The hardest stages are regular (annual) updating and regaining the certificate. At the beginning of the process, it is necessary to convince management about the suitability of tools and effects arising from implementation. The next step is to convince all employees to the extent that they are willing to voluntarily change their habits and adapt to the new environmental management system.

4 Discussion and conclusion

The EMAS is a "set of rules" above the legal framework that organizations are complying voluntarily to improve their environmental performance. The essential property of EMAS is the existence of external benefits, such as increased credibility or a better position in the public procurement system. The EMAS has not really designed only for business subjects. It is suitable even for non-profit entities.

The article showed a representation of the instrument in the Czech Republic. It has also been demonstrated in a numerical utilization in the public and private sectors. There is highly simplified a comparison of the financial performance of organizations with EMAS and their surroundings.

Finding the causes of the negative impact on the implementation of the ROE is not easy. It would also be necessary to analyze other metrics, indicators and management systems, which may affect on the final ROE as a top indicator. A lower financial performance is also described by Bracke Verbeke (2008).

Acknowledgement

The author is thankful to the project IGA/FaME/2015/027 "The Identification of Impacts of Selected Methods and Techniques for Performance Management in the Frame of Financing Municipalities in the Czech Republic" for financial support to carry out this research.

References

- [1] BARLAGE, M., VAN DEN BORN, A., VAN WITTELOOSTUIJN, A. and GRAHAM, L., 2014. Estimating public performance bias through an MTMM model: the case of police performance in 26 European countries. *Policy Studies*, **35**(4), pp. 377-396.
- [2] BEHROUZI, F., SHAHAROUN, A.M. and MA'ARAM, A., 2014. Applications of the balanced scorecard for strategic management and performance measurement in the health sector. *Australian Health Review*, **38**(2), pp. 208-217.
- [3] BRACKE, R., VERBEKE, T. and DEJONCKHEERE, V., 2008. What Determines the Decision to Implement EMAS? A European Firm Level Study. *Environmental & Resource Economics*, **41**(4), pp. 499-518.
- [4] CENIA, 2016-last update, EMAS Database. Available: <http://www1.cenia.cz/www/node/376> [Sep 30, 2016].
- [5] CUCU, A.A., 2011. *Enhancing Public Organizations Performance Using the New Public Management Tools: The European Model of Common Assessment Framework*. CHENGDU; UESTC PRESS, CHENGDU, 610054, PEOPLES R CHINA: UNIV ELECTRONIC SCIENCE & TECHNOLOGY CHINA PRESS.
- [6] DADDI, T. and IRALDO, F., 2016. The effectiveness of cluster approach to improve environmental corporate performance in an industrial district of SMEs: a case study. *International Journal of Sustainable Development and World Ecology*, **23**(2), pp. 163-173.
- [7] DREVETON, B., 2013. The advantages of the balanced scorecard in the public sector: beyond performance measurement. *Public Money & Management*, **33**(2), pp. 131-136.
- [8] DUCHOŇ, J. and PAVELKOVÁ, D., 2011. *Měření a řízení Výkonnosti Organizací Státní Správy*. Žilina: Georg.
- [9] EUROPEAN COMMISSION, 2016-last update, ENVIRONMENT(Eco-Management and Audit Scheme). Available: http://ec.europa.eu/environment/emas/index_en.htm.
- [10] FOLZ, D.H., ABDELRAZEK, R. and CHUNG, Y., 2009. THE ADOPTION, USE, AND IMPACTS OF PERFORMANCE MEASURES IN MEDIUM-SIZE CITIES Progress Toward Performance Management. *Public Performance & Management Review*, **33**(1), pp. 63-87.
- [11] GREATBANKS, R. and TAPP, D., 2007. The Impact of Balanced Scorecards in a Public Sector Environment. *International Journal of Operations & Production Management*, **27**(8), pp. 846-873.
- [12] HYRŠLOVÁ, J. and BROŽKOVÁ, A., 2003-last update, Eko-controlling jako nástroj environmentálního řízení v podniku. Available: <http://www-1.sysnet.cz/projects/env.web/zamest.nsf/defc72941c223d62c12564b30064fdcc/ccf95034112b70bcc1256ac3002f21fc!OpenDocument> [3/27/, 2015].
- [13] IRALDO, F., TESTA, F. and FREY, M., 2009. Is an Environmental Management System Able to Influence Environmental And competitive Performance? the Case of the Eco-management and Audit Scheme (EMAS) in the European Union. *Journal of Cleaner Production*, **17**(16), pp. 1444-1452.
- [14] KAPLAN, R.S. and NORTON, D.P., 1992. The Balanced Scorecard - Measures that Drive Performance. *Harvard business review*, **70**(1), pp. 71-79.
- [15] KLUN, M., 2004. Performance measurement for tax administrations: the case of Slovenia. *International Review of Administrative Sciences*, **70**(3), pp. 567-574.

- [16] KOLMAN, K. and PASTUSZKOVA, E., 2015. The Proposal of using Eco-Controlling Tools at the Municipal Level in the Czech Republic. *Finance and Performance of Firms in Science, Education, and Practice*, , pp. 653-664.
- [17] LUNDBERG, K., BALFORS, B. and FOLKESON, L., 2009. Framework for environmental performance measurement in a Swedish public sector organization. *Journal of Cleaner Production*, **17**(11), pp. 1017-1024.
- [18] MATEI, A. and BALACEANU, E., 2014. Performance through the Common Assessment Framework. A critical review for Romania. *3rd Cyprus International Conference on Educational Research (Cy-Icer 2014)*, **143**, pp. 862-866.
- [19] NEELY, A., GREGORY, M. and PLATTS, K., 1995. Performance measurement system design: a literature review and research agenda. *International journal of operations & production management*, **15**(4), pp. 80-116.
- [20] NISIO, A., DE CAROLIS, R. and LOSURDO, S., 2014. Use of performance information in Italian municipalities: Some empirical evidences. *Administratie si Management Public*, (22), pp. 6-25.
- [21] OCHRANA, F., 2007. *Manažerské Metody Ve Veřejném Sektoru: Teorie, Praxe a Metodika Uplatnění*. Praha: Ekopress.
- [22] PARK, K., 2011. The Use of Performance Measurement Systems to Improve Performance in the Public Sector - Focused on Tax Offices -. *Korean Journal of Business Administration*, **24**(5), pp. 2963-2985.
- [23] PETTERSEN, I.J. and NYLAND, K., 2006. Management and control of public hospitals - the use of performance measures in Norwegian hospitals. A case-study. *International Journal of Health Planning and Management*, **21**(2), pp. 133-149.
- [24] POLLANEN, R.M., 2005. Performance Measurement in Municipalities. *International Journal of Public Sector Management*, **18**(1), pp. 4-24.
- [25] PUN, K.F., 2002. Development of an integrated total quality management and performance measurement system for self-assessment: A method. *Total Quality Management*, **13**(6), pp. 759-777.
- [26] RENNINGS, K., ZIEGLER, A., ANKELE, K. and HOFFMANN, E., 2006. The influence of different characteristics of the EU environmental management and auditing scheme on technical environmental innovations and economic performance. *Ecological Economics*, **57**(1), pp. 45-59.
- [27] STREIB, G.D. and POISTER, T.H., 1999. Assessing the validity, legitimacy, and functionality of performance measurement systems in municipal governments. *American Review of Public Administration*, **29**(2), pp. 107-123.
- [28] TESTA, F., RIZZI, F., DADDI, T., GUSMEROTTI, N.M., FREY, M. and IRALDO, F., 2014. EMAS and ISO 14001: the differences in effectively improving environmental performance. *Journal of Cleaner Production*, **68**, pp. 165-173.
- [29] VIENAZINDIENE, M. and CIARNIENE, R., 2007. New Public Management: Theoretical and Practical Aspects. *Inzinerine Ekonomika-Engineering Economics*, (5), pp. 44-50.
- [30] YUEN, P.P. and NG, A.W., 2012. Towards a balanced performance measurement system in a public health care organization. *International journal of health care quality assurance*, **25**(5), pp. 421-430.

- [31] ZARZYCKA, E. and MICHALAK, M., 2013. Measuring the Performance of Local Government Entities and Analysis of Their Managers' and Personnel's Information Needs in the Context of New Public Management. *Comparative Economic Research*, **16**(2), pp. 123-147.