Proceedings of the
4th International Conference on Management, Leadership and Governance

Saint-Petersburg State University of Economics
Russia
14 - 15 April 2016

Edited by
Dr Dmitry Vasilenko & Natalia Khazieva
Saint-Petersburg State University of Economics
Russia

A conference managed by ACPI, UK

acpi

Influence of Legal Form and Non-Anonymous Ownership Structure on Corporate Financial Performance

Pavel Pudil[1], Petr Pirozek[2], Petr Somol[1] and Lenka Komarkova[1]

[1]Faculty of Management in Jindrichuv Hradec, University of Economics, Prague, Czech Republic
[2]Faculty of Economics and Administration, Masaryk University, Brno, Czech Republic

pudil@fm.vse.cz
pirozek@econ.muni.cz
somol@utia.cas.cz
komarkol@fm.vse.cz

Abstract

The paper represents a continuation of our previous results, which were closely linked to the topic of automated search for factors of corporate competitiveness and financial performance. As opposed to the results presented at ICMLG 2014 and ECMLG 2014, the current research deals with other characteristics of organizations not investigated before and related to Corporate Governance, like their legal form, the international diversity of top management (domestic only or also foreign) and particularly the non-anonymity of the ownership structure.The data were gathered in the period 2011 to 2013 from 222 companies with various legal forms.

The main purpose of our research was to investigate which of these characteristics have an impact on corporate financial performance that has been assessed by the Return on Assets (ROA) index. The paper attempts to answer the research question of whether the ownership structure, particularly the fact whether the organization or enterprise owners are or are not anonymous, has a major influence on corporate financial performance.

The methodology used in analysing and processing the data had to respect the fact that the characteristics (variables) of the companies which were individually investigated are not mutually independent, thus multidimensional methods have to be used. Therefore, we used here our non-linear kernel regression model which had already been successfully verified, having been developed in the field of statistical pattern recognition.

Prediction error of the proposed model is then used as a feature selection criterion in the process of identifying factors that affect Corporate Governance and the financial performance the most. The actual feature selection algorithm applied is the recent Dependency-Aware Feature Selection algorithm due to its good performance on low-sample high-dimensional data and its suitability for use with the regression model.

The results presented in the paper demonstrate that the type of ownership structure (anonymous or non-anonymous) has a dominant influence on the financial performance among the investigated characteristics. The target audience includes researchers in the fields of management and business science.

Keywords: anonymous ownership, legal form of companies, enterprises performance, machine learning approach, pattern recognition, feature selection

Introduction

After more than 20 years since the start of the transformation of planned economies into the market economies in the CEE (Central and Eastern Europe) countries, evaluating the success of this transformation of companies has become one of the key issues in academic discussions. One of the main areas of professional debate is finding answers to the appropriate ownership structure corresponding with the successful business activity and prosperity of the business. An integral part of this debate is the research on the relationship of ownership structure in relation to financial performance, which is of significance not only for the persons interested in ensuring effective and efficient Corporate governance, but also for the authorities executing public policy. In the context of monitoring the changes during the transition in management and associated impact on the financial performance of the companies, it is possible to evaluate the importance of selected variables that are actively reflected in Corporate Governance.

In academic debates worldwide, issues of concentration of ownership occur in conjunction with the effects on the financial performance of the company, or on firm value (Short, 1994). In particular, the performed division of the ownership structure (family, financial, corporate and government owners) and in relation with this, the examined relationship to the firm value of big companies quoted on stock markets in continental Europe (Pedersen and Thomsen, 2003) brings interesting findings. Other findings we can encounter are the findings on the influence of the dominant owner on business performance (Krivigorsky and Burton, 2012). Referred research covers primarily the issue of ownership concentration of companies in continental Europe. Unfortunately, more thorough research on ownership structures in relation to the effective and efficient Corporate Governance of companies that have undergone the transformation from a planned to a market economy is not available. The basic framework is provided by studies, which most often examine the link between their ownership structure or ownership concentration and corporate efficiency monitored by means of selected corporate indicators provided from public databases (Hanousek et al., 2012ab; Částek, 2013; Konečný, 2015). Research findings presented till now, however, point to the somewhat ambiguous results of the influence of composition of the supervisory and executive boards on the prosperity of businesses and do not correspond sufficiently to the questions arising from the anonymity of the owner.

The aim of this contribution is to present selected variables representing the Corporate Governance (Board structure) of companies in post-transformation in the environment of the Czech Republic and the associated impact of these variables on their financial performance.

State of the Art

Research in the area of the ownership structure in Corporate Governance is ongoing and still brings new findings from the business environment. The basic theoretical background of ownership structure in Corporate Governance issues is based on the classic work associated with agency problems (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). The subsequent elaboration in terms of size of represented owners, applied interest, and associated impacts is presented in different territorially focusing studies (Holderness, 2001; Fama and Jensen,1983; Morck et al.,1988).

Specifically, the studies are elaborated, which present the results of the carried out research focused on the relationship between performance and the board composition (Hermalin and Weibach, 1991) or the representation of the owners in the management of the organization and its impact on the financial performance (Himmelberg et al., 1999). Financial performance is examined for large companies from the viewpoint of corporate value (McConnel and Servaes, 1990) or selected performance indicators (Short, 1994). The specific focus of studies investigating the relationship of dependent and independent members of the board on the profitability of the company brings in the international study

(Krivogorsky, 2006) of the various countries of continental Europe. It shows the importance of the owner and relationship between ownership concentration and stakeholder value for financial and stock market listed companies, not for family businesses (family ownership) and companies in the hands of the Government (government ownership) (Pedersen and Thomsen, 2003). However, recent results from research carried out at companies in Continental Europe show that there is a positive relationship between financial performance and ownership of the company in the hands of a bank or a family/individual (Krivogorsky and Burton, 2012). In particular, companies owned by individuals represent the non-anonymized structure, which is not currently within the dominant ownership structure examined. For this reason, we focused on research into the ownership structure and the associated anonymity and its impact on financial performance.

The following research question, connected to the goal of our research, can be formulated:

RQ*: Does the fact of whether the owners of some organization are or are not anonymous have an impact on its financial performance?*

Research Sample

Our data set was already presented in previous articles (Pudil et al, 2014) in connection with the research on selected management components and their impact on financial performance. The research sample was made up of 260 companies, where due to the missing values of investigated variables (or their difficult determination) 38 companies were disregarded. The basic structure of companies in the sample included profit-oriented businesses of all sizes (small, medium and large) with domestic and foreign owners in the form of natural and juridical persons.

In our research sample, attention was focused on the variables: legal form (joint stock companies, limited liability companies or other), type of owner (domestic, foreign), the number of people represented in the Executive Board and the Supervisory Board, the number of foreign persons represented in the Executive Board and the Supervisory Board and the anonymity of the owner. The variable Anonymity of the owner was based on the identification of a particular physical person/persons (max 5), which is associated with decision making in the context of the exercise of ownership rights. This means that the ownership structure is anonymized in the event that we cannot specify a particular physical person/persons associated with decision-making in the exercise of property rights, and vice versa.

Table 1. Representation of companies according to the ownership anonymity and the legal form.

Ownership	**Legal Form**			
Anonymity	Limited Liability Companies	Joint Stock Companies	Other Companies	**Total**
No	59 (26.6%)	29 (13.1%)	5 (2.3%)	**93 (41.9%)**
Yes	61 (27.5%)	56 (25.2%)	12 (5.4%)	**129 (58.1%)**
Total	**120 (54.1%)**	**85 (38.3%)**	**17 (7.7%)**	**222(100.0%)**

After collecting all the necessary data, they were recoded to categorical or ordinal data. The financial performance of companies was assessed by the Return on Assets (ROA) index.

Methodology

In order to answer the research question specified above, we need to analyse the set of measured characteristics (variables) and its impact on the financial performance (in our study using ROA). Since the variables are generally not mutually independent, methods of multivariate analysis have to be

used. The authors showed that the methodology of feature selection in statistical pattern reduction and subsequent classification, recently used in this context (cf. Pudil and Pirozek, 2008; Blažek et al. 2011, Pudil et al. 2012, Pudil et al. 2014a), is a well-developed methodology fulfilling this task.

However, this approach is based on the idea of classification and thus requires dividing the companies into two groups – in our previous research denoted as “Above average ROA” and “Under average ROA”. It is obvious that by replacing the values of ROA by this two-value variable we loose some essential information. At the same time, we cannot use classical linear regression analysis (as we also verified experimentally) owing to the very complicated and non-linear character of data. Therefore, a new method, presented already at ECMLG 2014 (Pudil et al. 2014b) combining feature selection from statistical pattern recognition and a special pseudo-kernel non-linear regression has been used here.

In order to keep this text self-contained, the main idea of this non-linear regression model is repeated here. We formulate the problem as a regression problem, where the financial performance (measured by financial success represented here by ROA) is considered to be the dependent variable, while each company is described by a vector of features (considered as the regressors) from which the dependent variable is to be predicted.

It should be taken into consideration that we cannot expect to have complete data, i.e., that all feature vector components are known. At the same time, not all features are necessarily of the same type. In fact, a significant amount of available data is not just numeric in real research tasks from economics and management, but also ordinal or categorical. These problem characteristics make it difficult or impossible to directly apply common tools like linear regression models.

For the purpose of evaluating the most important variables (key factors) among the set of the considered variables, i.e., evaluating the accuracy of model on a subset of factors under the given limitations, we consider a special pseudo-kernel regression model. The model does not put any assumptions on the space of feature vectors except that there must exist a distance measure, capable of evaluating the distance between any two feature vectors (companies). To enable handling of non-numeric and ordinal values we additionally assume that numeric features are normalized to [0,1]. For the purpose of key factors evaluation, we assume the model will be applied in leave-one-out fashion on the training data itself, i.e., for each company the model is used to predict its ROA, and the predicted value is compared to the known value. The average difference between predicted and known values over all companies is then used as feature selection criterion, i.e., combinations of factors (investigated variables) are then evaluated during feature selection procedure and compared by the model error (average difference between known and predicted value) on the given subspace.

Finally, to search for a subset of features (key factors) that yield the best results of the employed special regression model, Feature Selection methodology has been used. With respect to the expected limitations of our data (particularly a low sample size) we decided to apply the *Dependency-Aware Feature Ranking (DAF)* (cf. Somol et al. 2011) known to be very robust against over-fitting. As the DAF method provided a higher stability of results in this case, we chose it for the final processing.

To be able to understand the results, it is necessary to mention briefly the idea of DAF (cf. Somol et al. 2011). It is a very robust feature selection procedure based on the idea that any feature (in our case measured variable) importance should be investigated in the context of being or not being in various subsets of other features. This importance is then measured by a so-called DAF coefficient. The higher the DAF coefficient of a feature is, the more informative (thus more important) the feature is. In the regression approach, the DAF feature selection method is applied to minimize the regression error over possible feature subsets. The DAF method produced for each feature a weight, mirroring roughly the average feature ability to improve the criterion value on addition to a subset, evaluated over a large number and variety of contexts (various subsets).

Results

The Dependency-Aware Feature Ranking (DAF) procedure with the error of the pseudo-kernel regression model (Pudil et al. 2014b) has been used as a criterion function (by this error we understand actually the average error of prediction over all the companies). The result of the feature ranking according to their DAF coefficients (thus according to their "influence") is shown in Figure 1.

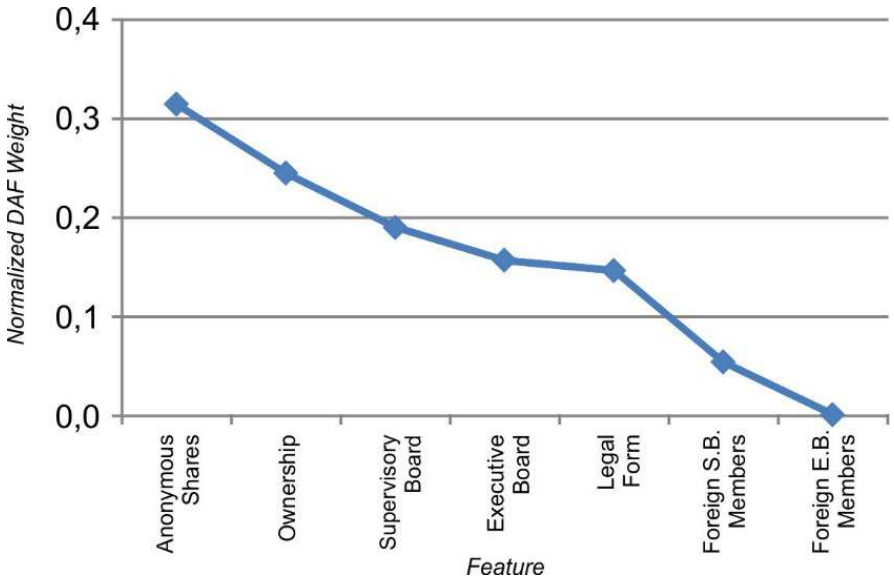

Figure 1. Features ordered according to DAF ranking.

Having obtained the feature ranking, we then evaluated the prediction error for feature subsets constructed consecutively by adding one feature at a time, given the DAF ordering.

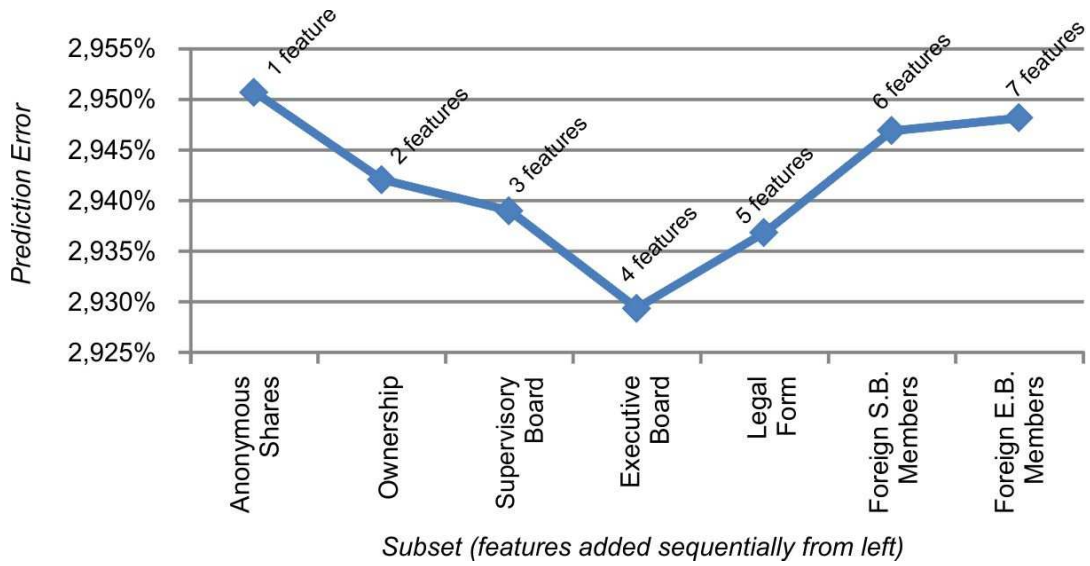

Figure 2. Prediction error for subsets of features ordered according to DAF ranking

The graph in Figure 1 summarizes the result. Note that the prediction error is decreasing with the number of features (dimensionality) until roughly four features (d=4), then it starts to increase. In other words, selecting the first four features (with respect to descending DAF coefficient ordering) gives the highest model accuracy; adding more features deteriorates the model accuracy. The overall best accuracy, i.e. the lowest prediction error 0.02930 achieved for the best subset of four features was with the subset consisting of the following features:

Table 2. Key factors with the highest influence on ROA

Factor name	DAF coefficient
Anonymous Shares	0.0001311
Ownership	0.0000963
Supervisory Board	0.0000690
Executive Board	0.0000523

Note that we performed a series of experiments with various settings of the tools in consideration. We tried the pseudo-kernel regression model classifiers both for constant and optimized width of kernel, and employed also various distance measures. To summarize, the model based on the selected subset of features is clearly capable of capturing information for a good predictive ability.

Conclusions

After evaluating the analysis of the influence of selected variables representing the Corporate Governance on the financial performance of the company, we have come to an interesting conclusion. The results are clearly show that the non-anonymous ownership structure is of great importance, associated with the company's financial performance to be measured. Other variables include the owner and the owner's representatives in the Supervisory Board and the representative of the Executive Board. However, it is necessary to add that, according to our findings, in particular, the variable Anonymity of the owner itself yields the highest information among all the investigated variables for the used pseudo-kernel regression model and also has a dominant influence on the associated financial performance

Furthermore, in accordance with our expectations, the variable Legal Form has no significant influence. As an interesting result we can indicate the remaining variable Representation of foreign persons in the Supervisory Board or the Executive Board. Although the results indicate the importance of the owner itself or the Executive Branch, the representation of expatriates does not seem to bring an effect on the measured financial performance (Pirožek and Komárková, 2015). With respect to so far not too explored area of the composition of Board and enforcement of property rights in companies in the CEE, our results confirm the previous studies pointing to the importance of the non-anonymized owner, who is represented most commonly in the form of family business (Krivogorsky and Burton, 2012). Our findings suggest a further direction of research, which should be directed not only to research on the concentration of ownership with the impact on performance (Pedersen and Thomsen, 2003), but also to revealing the identification of the owner itself.

As far as the methodological aspect of our research is concerned, the learning approach, particularly feature selection techniques in combination with pseudo-kernel regression model, has proven to be a

suitable tool for revealing the factors influencing the successfulness of companies. The used approach is quite robust and suitable even for small sample size problems and for multidimensional data with nonlinear character.

To conclude, the answer yielded by the presented results to the research question indicates that the non-anonymous, clearly identifiable ownership structure affects the performance of the enterprise, which is reflected in the indicators of the ROA. As opposed to research abroad our research sample does not contain the firms quoted on the stock exchange, but it consists of smaller companies operating on the market of the Czech Republic. We are aware of the fact that conducted research has some limitations with respect to the size of research sample and the character of the companies analysed. However, the achieved prediction error shows that the anonymity of the ownership structure may significantly distort the research ownership structure and its effect on performance (since it has a dominant influence). It has implications both as far as the methodological viewpoint is concerned (determination of anonymous ownership), and also with respect to the measurement of the performance with regard to the types of businesses. We expect that future research will be directed not only to the issue of concentration of ownership of a larger sample, representing the different types of business, but also to their anonymity.

References

Blažek, L., Pudil, P. and Špalek, J. (2011). "The factors affecting competitiveness of companies: contribution and limits of the statistical pattern recognition methods", *Acta Universitatis Agriculturae et Silviculturae Mendelianae Bruneensis*, Vol. LIX, No. 7, pp. 69–80.

Částek, O. (2013). "The Effect of Ownership Structure on Corporate Financial Performance in the Czech Republic", In Semmelrock-Picej, M. T., Novak, A. *Proceedings of the 9th European Conference on Management, Leadership and Governance*. 1st ed. Reading: Academic Publishing International Limited, pp. 7–15.

Fama, E.F. and Jensen, M.C. (1983). "Agency Problems and Residual Claims", *Journal of Law and Economics,* Vol. 26, No. 2., pp. 327–349.

Hanousek, J., Kočenda, E. and Mašika, M. (2012) "Firm efficiency: Domestic owners, coalitions, and FDI", *Economics of Transition*, Vol. 15, No. 1, pp. 1–34.

Hanousek, J., Kočenda, E. and Mašika, M. (2012). "Firemní efektivita: vliv vlastnických struktur a finančních ukazatelů" (in Czech), *Politická Ekonomie*, Vol. 2012, No. 4, pp. 459–483.

Hermalin, B. E. and Weibach, M. S. (1991). "The effect of board composition and direct incentives on firm performance", *Financial Management*, Vol. 20, No. 4, pp. 101–112.

Himmelberg, C. P., Hubbard, R. G. and Palia, D. (1999). "Understanding the determination of managerial ownership and the link between ownership and performance", *Journal of Financial Economics*, Vol. 53, No. 3, pp. 353–384.

Holderness, C. G. (2003). "A Survey of Blockholders and Corporate Control", *Economic Policy Review*, Vol. 9, No. 1, pp. 51–63.

Jensen, M. and Meckling, W. (1976). "Theory of the firm: Managerial behavior, agency costs, and ownership structure", *Journal of Financial Economics*, Vol. 3, No. 4, pp. 305–360.

Konečný l. (2015). The Effect of Ownership Structure on Corporate Financial Performance in the Czech Republic, Master Thesis, Masaryk University, Brno, Czech Republic.

Krivogorsky, V. (2006). "Ownership, board structure, and performance in continental Europe", *International Journal of Accounting*, Vol. 41, No. 2, pp. 176–197.

Krivogorsky, V. and Burton, F.G. (2012). "Dominant owners and performance of Continental European firms", *Journal of International Accounting Research*, Vol. 11, No. 1, pp. 191–221.

McConnel, J. and Servaes, H. (1990). "Additional evidence on equity ownership and corporate value", *Journal of Financial Economics*, Vol. 27, No. 2, 595–612.

Morck, R., Shleifer, A. and Vishny R.W. (1988). "Management Ownership and Firm Value: An Empirical Analysis", *Journal of Financial Economics*, Vol. 20, No. 1, pp. 293–315.

Pedersen, T. and Thomsen, S. (2003). "Ownership structure and value of the largest European firms: The importance of owner identity", *Journal of Management and Governance*, Vol. 7, No. 1, pp. 27–55.

Pirožek, P. and Komárková, L. (2015). "The representation of expatriates in the corporate governance of subsidiaries of multinational companies: A study from the Czech Republic", *Management: Journal of Contemporary Management Issues*, Vol. 20, No. 1, pp. 23–37.

Pudil, P., Blažek, L., Somol, P., Pokorná, J. and Pirožek, P. (2012). "Searching Factors of Corporate Competitiveness Using Statistical Pattern Recognition Techniques", In *Proceedings of the 8th European Conference on Management Leadership and Governance*. Pafos, 8.11.2012 – 9.11.2012. Reading: Academic Conferences and Publishing International Limited, pp. 556–559.

Pudil, P., Tripes, S., Somol, P. and Pirožek, P. (2014a). "Learning Approach for Selecting Key Organization Components Influencing Enterprises Performance", In *Proceedings of the 2nd International Conference on Management, Leadership and Governance* [CD]. Boston, 20.03.2014 – 21.03.2014. Reading: Academic Conferences and Publishing International Limited, pp. 222–227.

Pudil, P., Pirožek, P. (2008) "Učící se přístupy a jejich potenciál pro stanovení nejvýznamnějších faktorů konkurenceschopnosti" (in Czech), In *Konkurenceschopnost podniků*. Brno, 5.02.2008 – 6.02.2008, Brno: Masaryk University, pp. 573–584.

Pudil, P., Pirožek, P., Somol, P. and Komárková, L. (2014b). "Identification of Key Organization Components Influencing Enterprises Performance by Means of Non-linear Regression Model", In *Proceedings of the 10th European Conference on Management, Leadership and Governance ECMLG 2014*. [online] Zagreb, 13.11.2014 – 14.11.2014. Reading: Academic Conferences and Publishing International Limited, pp. 278–284.

Shleifer, A., Vishny, R. W. (1997). "A survey of corporate governance", *Journal of Finance,* Vol. 52, No. 2, pp. 737–783.

Short, H. (1994). "Ownership, Control, Financial Structure and the Performance of Firms", *Journal of Economic Surveys*, Vol. 8, No. 3, pp. 203–249.

Somol, P., Grim, J. and Pudil, P. (2011). "Fast Dependency-Aware Feature Selection in Very-High-Dimensional Pattern Recognition", In *Proceedings of the IEEE International Conference on Systems, Man and Cybernetics* [online]. Anchorage, 09.10.2011 – 12.10.2011. San Diego: IEEE Computer Society, pp. 502–509.