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Factors Influencing the Formation of Autopoietic Economic Structures in the Baltic States

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Abstract

Research background: The concept of autopoiesis was initially developed in the field of biology and it was used to explain the behavior of biological systems. However it has been successfully applied in other fields of science, including economics and management. Although researches on economic entities using autopoietic systems' theory are performed in Western Europe and USA, this scientific approach still is not developed in Baltic countries. This paper addresses to this vacuum of scientific researches on autopoiesis of economic structures in small open markets.

Purpose of the article: The paper aims to identify and evaluate factors that turn on self-organization mechanisms of autopoietic economic structures in Baltic States, in particular in Latvia.

Methodology/methods: Expert survey was used to identify the most important factors affecting the formation of meso-economic entities in the Baltic States. Analytic Hierarchy Process (AHP) with fuzzy numbers was employed to process the data. Two different scales of evaluation (inverse linear and balanced) were used.

Findings & Value added: The factors influencing the process of formation of business groups were evaluated by experts. Research results allow making conclusions regarding the causes of the business integration, and impact of diversified integrated business structures on the country's business system in Central Europe.

Introduction

The concept of autopoiesis was initially developed by Humberto Maturana and Francisco Varela (1980) in the field of biology and it was used to explain the behavior of biological systems. However it has been successfully applied in other fields of science, including economics and management.

The goal of the given research is to identify and evaluate factors that turn on self-organization mechanisms of autopoietic economic structures in Baltic States. The pilot study, conducted by Morkunas in Lithuania (2017), has been prolonged, and the results are reflected in the current paper.

Based on the results from the pilot study, the following hypothesis was stated by the authors:

H1: The most important factor influencing formation of meso-economic entities in the Baltic States is the “big market entry barriers”.

To achieve the research goal and to test the stated hypothesis, experts – top-executives of international companies or their separate business units’ managers, as well as academicians with the expertise in management theories and international management – were surveyed. The authors used their own developed research instrument.

Respondents were offered to make a pairwise comparison of six factors, influencing the self-formation of large entities. Nine-point scale was suggested to the experts for completing individual comparison matrices. To identify the most important factors, procedures within AHP (Analytic Hierarchy Process) method were performed. AHP consensus index was estimated to evaluate the level of consistency between experts’ viewpoint.

Concept of Autopoiesis and factors influencing the formation of autopoietic structures

Now concept of autopoiesis is being frequently studied within the framework of management science (Alaa, 2009, pp. 19-34; Dittus & Vásquez, 2016, pp. 136-146; Vásquez & Benavente, 2015, pp. 269-274).

Autopoietic systems theory postulates, that autopoietic systems should have the following features: 1) ability to create the elements of which are composed by themselves, 2) be self-organizing, e.g. can independently define the boundaries of the system and generate an internal system architecture, 3) be self-sufficient, and 4) at least for a short period of time they can become closed. Such characteristics of the sophisticated autonomy were epistemologically discussed by Mirazo and Moreno (2004, pp. 235-259) and Bich (2012, pp. 215-232).

Investigation of factors affecting formation of integrated diversified business structures was made by Khanna & Riwkin (2001, pp. 45–74), Morck et al. (2005, pp. 655-720) and others.

For the research purposes, the authors selected six main factors, described further. The choice was substantiated by the results of the previous research made by Morkunas (2017), which yielded these factors as the most important ones in Lithuania.

Big market entry barriers (Mahmood & Lee, 2004, pp. 513-531). In some business sectors, economic activity can be characterized as requiring large scientific and / or economic resources, being of high dependence on economies of scale or specific commercial activity. If acting individually, for some companies such barriers can be insurmountable.

Risks related to production specialization (Knudsen, 2007, pp. 117-138). The opposite side of economies of scale in production is its increasing degree of specialization, dependence on specific skills. This leads to caution among companies regarding formation of specific competencies / deepening specialization or the adoption of liabilities of such kind, reducing the company's economic activity compared with the situation when risk sharing is of consolidative nature that is a characteristic of a business group owned enterprises.

The ability to more efficiently allocate resources (Khanna & Yafeh, 2007, pp. 331-372). This factor is being understood as the efficiency of internal business group's capital (loans to group's companies), production (purchases from group companies), human resources (rotation of the best managers / specialists) markets and maneuvering them within the business group, due to the high coordination level from one (or several) center.

The necessity of adapting to weak market regulatory institutions by reducing transaction costs (Meyer et al. 2009, pp. 61-80). With market institutes being under development a relatively high level of transaction costs is due to low level of trust between the parties, frequent breaking of agreements or even disregard to property rights. This results that making supply contracts with the unfamiliar or firms that are in distrust is quite expensive, but in some cases it is necessary, for what the company believes that it makes sense to include suppliers into their structure and by such mean at least partially control them.

Bargaining power in the development of relations with the state for state orders. When merged into large economic entities, companies become more attractive partner not only for other companies, but also to public authorities in its economic policy. Often the governance structures initiates and /or promotes such integration with the hope that such an integrated structure will help to achieve the objectives of the state for countries eco-

nomy. This factor has much more significance in emerging markets (Classens, 2008, pp. 554-580; Cooper et al., 2010, pp. 687-724).

Bargaining power in the development of relations with the state for more favorable legislation (Guriev & Rachinsky, 2005, pp. 131-150). Indirect impact on inter-enterprise integration makes public institution's policy, when influential politicians tend not to interact with many, but only with some of the strongest / most influential businessmen. As a result of these heads' of state actions, is the desire of companies to have direct contact with the decisive for determining state's policy politicians, what makes to bond into large economic entities in order to gain more power and access to decision-makers, which is converted into even greater economic benefits and market power.

Research Methodology

For research purposes the authors developed an original research instrument that was offered to experts in the field - representatives of the academic environment (professors with the background or research interest in finance, economics, management and / or business administration) and representatives of business environment (top-executives of national business units of large diversified business groups).

Selected factors (see Table 1) were inserted into the evaluation matrix, combined in pairs.

Table 1. Labels of factors

No.	Factor	Factor's label
F1	Big market entry barriers	Entry barriers
F2	Risks related to production specialization	Risks
F3	The ability to more efficiently allocate resources	Resource allocation
F4	The necessity of adaptation to weak market regulatory institutions by reducing transaction costs	Cost reduction
F5	Bargaining power in the development of relations with the state for state orders	Bargaining power I
F6	Bargaining power in the development of relations with the state for more favourable legislation	Bargaining power II

Source: designed by the authors

According to AHP (Analytic Hierarchy Process) method experts compare alternatives with each other by filling pairwise comparison matrices.

For completing individual comparison matrices experts were suggested to use nine-point scale, where “1” means that factors are equally important and “9” means that one factor is extremely important over another. Every expert had to evaluate $(n(n - 1) / 2)$ pairs (n – number of alternatives). For the purpose of data processing balanced scale (Salo, Hämäläinen, 1997, pp. 309-319) and inverse linear scale (Ma, Zheng, 1991, pp. 197-202) were used.

Scales, which characteristics are presented in Table 2, were chosen as they provide higher consistency level of the pairwise comparison matrices (Franek and Kresta, 2014, pp. 164-173).

After experts complete pairwise comparison of the factors, all the assessments have to be written in standardised matrix form and arithmetic mean of each line is calculated. In this way, the main factor is identified. However, if the level of inconsistency is higher than the set limit, the matrix has to be modified into consistent one or should be eliminated from the further calculations as consistency of the matrices shows whether experts’ factors evaluations were logical and reliable.

In order to determine consistency index, eigenvalue λ_{max} of pairwise comparison matrix ought to be calculated. After the value of λ_{max} is computed, consistency ratio CR could be calculated (Zhang et al. 2017, pp. 1-13). For experts’ pairwise comparison matrices that fulfil the consistency condition ($CR < 0,2$), the aggregated experts’ assessment was calculated. Aggregated experts’ assessment was calculated using geometric mean.

Besides, consensus index introduced by Goepel (2013, pp. 1-10) was calculated. AHP consensus index compares experts’ numerical estimations of criteria. The results vary from 0 to 100 percent and show the level of agreement between the experts.

Research Results

Experts’ individual comparison matrices were analyzed to rank the factors according to the are presented in the Appendix. Analysing experts’ individual comparison matrices it was found that the matrix constructed by expert Nr. 5 appeared to be inconsistent; hence, it was eliminated from further analysis. The results of the factors’ assessments are presented in the Table 2.

Table 2. Factors’ assessment

Normalized eigenvector, w_j	Rank
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	Balanced	Inverse Linear	Balanced	Inverse Linear
F1	0.146	0.152	2	2
F2	0.135	0.139	5	5
F3	0.307	0.282	1	1
F4	0.137	0.142	4	4
F5	0.129	0.136	6	6
F6	0.145	0.149	3	3

Source: authors' estimation

Testing for consistency yielded values of the consistency ratio (CR = 0.015 and 0.009 for balanced scale and inverse linear scale, respectively), lambda ($\lambda = 6.093$ and 6.054 for balanced scale and inverse linear scale, respectively) and consensus index ($S^* = 77.1\%$ and 81.5% for balanced scale and inverse linear scale, respectively), which met the stated requirements. Consequently, experts' aggregated assessments could be used for obtaining general results.

Based on the results provided in Table 2, the highest rank was assigned to the ability to more efficiently allocate resources. In fact, this factor's weight is more significant than the other factors' weights and exceeds 28 percent limit according to balanced and inverse linear scales. This, in turn, corresponds to the statements of the common theory on large business entities for developed markets. It is also an evidence of maturity of the Baltic market.

The experts ranked big market entry barriers at the second position. The weight of the factor is 0.146 according to balanced scale and 0.152 according to inverse linear scale. Such a high ranking of this factor points to the globalization effect onto small open markets, such as Baltic States market.

Bargaining power in the development of relations with the state for more favourable legislation was ranked at the third position by the experts. Hence, high ranking of this factor, when determining the formation of large autopoietic economic entities in Baltic countries, shows a clear contradiction to a factor that was positioned at the first place. The reason is that in mature developed markets there are almost no possibilities to affect politicians in order to get a more favourable legislation, which is being converted to economic benefits at the expense of other market players. Therefore, the results indicated some weaknesses in market regulation institutes, especially those, which are ensuring equal rights to all market players, or lack of transparency of State's decision markets.

Experts ranked the necessity of adaptation to weak market regulatory

institutions by reducing transaction costs at the fourth position. In developed markets this factor should not be so important. However, some business groups in the Baltic States were formed in 1990s or at the beginning of the 2000s. At that time a market regulation was relatively weak.

Risks related to production specialization is the factor that was ranked to the fifth position. Such a low position can be explained by the fact, that Baltic States economies are dominated by a service sector, so there are very few large scale mass production companies, which would require some specific parts for its production.

Based on the experts' evaluation, bargaining power in the development of relations with the state for state orders was at the last place. The weight of this factor is 0.129 according to balanced scale and 0.136 according to inverse linear scale.

Conclusions

The current paper reflects the results of the authors' conducted survey on investigation of the factors influencing the formation of large diversified economic systems in the Baltic States.

The results of the experts' survey allowed identifying the most important factor influencing the formation of meso-economic entities in the Baltic States - the ability to more efficiently allocate resources within the business group. In the pilot study this factor was also highly ranked – it took the third place. Thus, the research hypothesis is partially rejected, since the factor regarding market entry barriers was evaluated as the second most important by the experts.

The ranking of other factors, mainly, corresponds to the theory and the results of the previously conducted pilot study in Lithuania. The only contradiction with the previous results is related to the last positioned factor “bargaining power in the development of relations with the state for state orders”. In a pilot study, conducted only in Lithuania, this factor was placed at a much higher place than the “bargaining power in the development of relations with the state for more favourable legislation”. It can be explained by the fact, that in this survey the participants from all three Baltic countries, and as Estonian market is being considered more mature, transparent and developed than Lithuanian, so there are almost no possibilities for companies in Estonia to achieve its' economic goals of winning government contracts by infringing other market players. This finding also offers a new ground for researches aimed at finding differences in factors

influencing the formation of large autopoietic economic structures in Estonian and Lithuanian markets.

References

- Alaa, G. (2009). Derivation of Factors Facilitating Organizational Emergence Based On Complex Adaptive Systems and Social Autopoiesis Theories. *Complexity and Organization*, 11(1).
- Bich, L. (2012). Complex Emergence and the Living Organization: An Epistemological Framework For Biology. *Synthese*, 185(2). DOI: <http://dx.doi.org/10.1007/s11229-010-9722-6>
- Claessens, S., Feijend, E., & Laevena, L. (2008). Political Connections and Preferential Access to Finance: The Role of Campaign Contributions. *Journal of Financial Economics*, 88(3). DOI: <http://dx.doi.org/10.1016/j.jfineco.2006.11.003>
- Cooper, M.J., Gulen, H., & Ovtchinnikov, A.V. (2010) Corporate Political Contributions and Stock Returns. *The Journal of Finance*, 65(2). DOI: <http://dx.doi.org/10.1111/j.1540-6261.2009.01548.x>
- Dittus, R., & Vásquez, C. (2016). Opening autopoiesis: implications for the study of organizational communication. *CINTA DE MOEBIO*, 52. WoS: 000385308400002. DOI: <http://dx.doi.org/10.4067/S0717-554X2016000200002>
- Franek, J., & Kresta, A. (2014). Judgment Scales and Consistency Measure in AHP. *Procedia Economics and Finance*, 12(March). DOI: [http://doi.org/10.1016/S2212-5671\(14\)00332-3](http://doi.org/10.1016/S2212-5671(14)00332-3)
- Goepel, K. D. (2013). Implementing the Analytic Hierarchy Process as a Standard Method for Multi-Criteria Decision Making In Corporate Enterprises – A New AHP Excel Template with Multiple Inputs. *Proceedings of the International Symposium on the Analytic Hierarchy Process*. Retrieved from http://bpmmsg.com/wp-content/uploads/2013/06/ISAHP_2013-13.03.13.Goepel.pdf
- Guriev, S., & Rachinsky, A. (2005). The Role of Oligarchs in Russian Capitalism. *Journal of Economic Perspectives*, 19. DOI: <http://dx.doi.org/10.1257/0895330053147994>
- Khanna, T., & Yafeh, Y. (2007) Business groups in emerging markets: Paragons or parasites? *Journal of Economic Literature*, 45(2). WOS:000248824300001 DOI: 10.1257/jel.45.2.331
- Khanna, T., & Rivkin, J. W. (2001). Estimating the performance effects of business groups in emerging markets. *Strategic management journal*, 22(1). WOS:000166097000004 DOI: 10.1002/1097-0266(200101)22:1<45::AID-SMJ147>3.3.CO;2-6
- Knudsen, M. P. (2007). The Relative Importance of Interfirm Relationships and Knowledge Transfer for New Product Development Success. *Journal of Product Innovation Management*, 24(2). WOS:000244244600003 DOI: 10.1111/j.1540-5885.2007.00238.x

- Ma, D., & Zheng, X. (1991). 9/9-9/1 Scale Method of AHP. In *2nd Int. Symposium on AHP* (pp. 197–202).
- Mahmood, I.P., & Lee, Ch-Y. (2004). Business groups: entry barrier–innovation debate revisited. *Journal of Economic Behavior & Organization*, 54(4). DOI: <http://dx.doi.org/10.1016/j.jebo.2002.12.003>
- Maturana, H. R., & Varela, F. J. (1980). *Autopoiesis and cognition: The Realization of the Living*. Boston studies in the philosophy of science. Springer Netherlands. DOI: <http://dx.doi.org/10.1007/978-94-009-8947-4>
- Meyer, K.E., Estrin, S., Bhaumik, S.K., & Peng, M.W. (2009). Institutions, resources, and entry strategies in emerging economies. *Strategic Management Journal*, 30(1). WOS:000261646200004 DOI: 10.1002/smj.720
- Mirazo, K., & Moreno, A. (2004). Basic autonomy as a fundamental step in the synthesis of life. *Artificial life*, 10(3). WOS:000222533800002 DOI: 10.1162/1064546041255584
- Morck, R., Wolfenzon, D., & Yeung, B. (2005). Corporate governance, economic entrenchment, and growth. *Journal of economic literature*, 43(3). WOS:000232607500001 DOI: 10.1257/002205105774431252
- Morkunas, M. (2017). Lietuvos verslo grupių formavimosi veiksmų vertinimas. Submitted to Mykolas Romeris university In partial fulfillment of the Requirement for the degree of Doctor of Philosophy in Management. Retrieved from <http://talpykla.elaba.lt/elaba-fedora/objects/elaba:20079025/datastreams/MAIN/content>
- Salo, A. A., & Hämäläinen, R. P. (1997). On the measurement of preferences in the analytic hierarchy process. *Journal of Multi-Criteria Decision Analysis*, 6, 309–319. DOI: [http://doi.org/10.1002/\(SICI\)1099-1360\(199711\)6:6<309::AID-MCDA163>3.0.CO;2-2](http://doi.org/10.1002/(SICI)1099-1360(199711)6:6<309::AID-MCDA163>3.0.CO;2-2)
- Vásquez, C., & Benavente, R. D. (2015). Revisiting Autopoiesis Studying the Constitutive Dynamics of Organization as a System of Narratives. *Management Communication Quarterly*, 30(2). WoS: 000373229200009. DOI: 10.1177/0893318915620492
- Zhang, N., Zhou, K., & Du, X. (2017). Application of fuzzy logic and fuzzy AHP to mineral prospectivity mapping of porphyry and hydrothermal vein copper deposits in the Dananhu-Tousuquan island arc, Xinjiang, NW China. *Journal of African Earth Sciences*, 1–13. DOI: <http://doi.org/10.1016/j.jafrearsci.2016.12.011>