

## Complex economic systems structural organization modelling.

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One of the well-known results of the theory of management is the fact, that multi-stage hierarchical organization of management is unstable. Hence, the ideas expressed in a number of works by Don Tapscott (see, for example, [1]) on advantages of network organization of businesses over vertically integrated ones is clear. While studying the basic tendencies of business organization in the conditions of globalization, computerization and internetization of the society and the results of the financial activities of the well-known companies, the authors arrive at the conclusion, that such companies, as IBM, Boeing, Mercedes-Benz and some others companies have not been engaged in their traditional business for a long time. Their partner networks performs this function instead of them. The companies themselves perform the function of system integrators.

The Tapscott's idea finds its confirmation within the framework of a new powerful direction of the development of the modern interdisciplinary science – the theory of the complex networks (CN) [2]. CN-s are multifractal objects, the loss of multifractality being the indicator of the system transition from more complex state into more simple state. We tested the multifractal properties of the data using the wavelet transform modulus maxima approach in order to analyze scaling properties of our company. Comparative analysis of the singularity spectrum  $f(\alpha)$ , namely, the difference between maximum and minimum values of  $\alpha$  ( $\Delta = \alpha_{\max} - \alpha_{\min}$ ) shows that IBM company is considerably more fractal in comparison with Apple Computer. Really, for it the value of  $\Delta$  is equal to 0.3, while for the vertically integrated company Apple it only makes 0.06 – 5 times less. The comparison of other companies shows that this dependence is of general character. Taking into consideration the fact that network organization of business has become dominant in the last 5-10 years, we carried out research for the selected companies in the earliest possible period of time which was determined by the availability of data in the Internet, or by historically later beginning of stock trade of computer companies. A singularity spectrum of the first group of companies turned out to be considerably narrower, or shifted toward the smaller values of  $\alpha$  in the pre-network period. The latter means that dynamic series were antipersistent. That is, these companies' management was rigidly controlled while the impact of market mechanisms was minimized. In the second group of companies if even the situation did change it did not change for the better. In addition, we discuss applications to the construction of portfolios of stock that have a stable ratio of risk to

return.

- [1] Tapscott D., Williams A., Digital Sight Inc **1** (2003), 2.
- [2] Newman M.E.J. SIAM Review, **45** (2003), 167.