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USING COMPUTATIONAL INTELLIGENCE IN STRUCTURAL FUNDS AND FINANCE DOMAIN

HABILITATION THESIS SUMMARY

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The habilitation thesis was structured in accordance with OMEC nr.3151/2014 in four chapters, in which were presented: the global context of this research, the results of research activity, the future directions for research and teaching, the conclusions and bibliography.

The first chapter was intended for presentation of the research stage. The chosen theme falls in the area of reasearch concerns and is entitled: „Using Computational Intelligence In Structural Funds and Finance Domain". Thus, the computational intelligence is found today in an impressive number of scientific papers, about 2337 articles indexed WoS, only 24 are in the economic field. This confirms that the use of computational intelligence in economics and finance is in its infancy, but with serious prospects for future development. Within this chapter were presented the main tools of computational intelligence: neural networks, fuzzy systems, genetic algorithms, agent-based modeling and grey system theory.

Also, in the first chapter weere presented the computational intelligence applicabilities in the economic field: solving optimization problems, basing financial decisions, making predictions in capital market area, identification and management of financial risks including credit risk, etc.

The second chapter targets the research results for four important areas of finance and structural funds, namely: public finances and budget, corporate governance, capital market and structural funds.

Regarding public finances and budget, the significant research achievements relates to diagnose the fiscal policies using three innovative indicators: the tax risk, the sensitivity and the volatility reported to taxpayer budget, the use of modern methods (method M MacBateh and Bayes-Nash balance) for sizing the public spending and development (using computational intelligence) of a hospital risk monitoring system, where risks are seen as a complex network.

Regarding corporate governance, the research results concern: developing a fuzzy logic system (SLF) for cash flow risk management in companies, using grey system theory for external risks incidence analysis on bank performance, errors measurement in the GM (1, N) model and adjusting these errors with the help of an adaptive fuzzy controller.

Regarding the capital market, are also presented the main achievements which include: using grey systems theory to study the influences of the macroeconomic variables on BET index, the influence of the capital structure on the company's performance and the future creation EU capital market.

Regarding the Structural Funds domain, the main achievements are the followings: developing a fuzzy logic system to detect financial risks of projects financed from structural funds, using modeling based agents for detection and risk management of cash flow in project implementation, using an information algorithm based on Lagrange function for the management of risks generated by projects financed from structural funds**.**

The third chapter is dedicated to the description of the teaching and research activities and also identifies the future directions for the development of teaching and research career. In this chapter were also described the courses held by the author: Treasury Budget and Public Finance of the Public Institutions and Corporate Governance. Also this chapter treats the development prospects of teaching, by including computational intelligence elements in these disciplines, for achieving basic skills in this area. Regarding the research activity, this chapter focuses on the description of the grant contracts won by the author together with the project teams, in the calls for structural funds projects. Research development perspective has been described in the context of this category of orientation activities, for accessing structural funds for projects that lead to the use of computational intelligence in the Structural Funds and finances.

The last chapter presents the conclusions, setting out the main computational intelligence innovative tools that were created by the author in finance and structural funds areas. The habilitation thesis concludes with a bibliography, which includes 217 papers.