Cybernetic approach to selecting models for simulation and management of investment portfolios (a general concept)

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The authors state that cybernetics present an unorthodox "new" way of studying the process of portfolio management. Being interdisciplinary by nature the science of cybernetics (along with its close counterparts – control theory and systems theory) makes it very suitable for solving problems that are complex and interdisciplinary by nature, such as investment portfolio management. Furthermore in the very fundament of cybernetics lies the notion of self-organization and adaptivity through evolution which exactly corresponds to the complex and ever-changing character of the free market.

Over the years a significant number of portfolio models, methods, procedures and strategies ("investors") have been proposed (for which the authors are suggesting a classification scheme) by theoreticians and practitioners in the field. Application of each of them should be considered as a systematic process consisting of several phases (i.e. goal setting, data collection, data structuring, statistical testing, enforcing limitations, forecasting, developing feasible solutions, selection of optimal solution, realizing the investment solution, feedbacking the significant outcomes, etc). Dissecting the "investors" opens new possibilities for heuristically combining various phases into new combined (and unstudied) approaches in portfolio management.

All of the above-mentioned portfolio "investors" (known and new) should be backtested on a unified competition data track. Such competition track consists of complete time series of all possible investment instruments. There is a significant challenge with the missing data for an emerging market such as Bulgarian Stock Exchange. The backtesting is done for every data-point (historical trading day) with all possibilities (all investment instruments available for trading on that day) using all state spaces (all possible values of all parameters). The direct result of such systematic approach would be a ranking list of the most successful portfolio "investors" (according to given criteria) which then could be selected by a given bias. So, from a general point of view, the whole concept is in fact a multi-stage selection procedure.