



Evolving Decision Models for Asset Selection in Equity Portfolio Management

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For my parents and brother

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Abstract

This thesis contributes an approach to equity portfolio management using computational intelligence methodologies. The focus is on generating an automated financial reasoning, with a basis in financial research, through searching a space of semantically meaningful propositions. The objective function to compare propositions is defined by a trading simulation.

In comparison with classical financial modeling, this approach allows continual adaptation to changing market conditions and a non-linear solution representation. Compared with other computational intelligence approaches, the focus is on a holistic design that integrates financial research with machine learning.

A major aim of the thesis is to develop methodologies for learning investment decision models for portfolio management that can adapt with market processes, the applications performance and the environment. It is toward this goal that we make use of a cross-disciplinary approach that combines an evolving fuzzy system with financial theory to perform key procedures at the conceptual level (as opposed to the execution of trades, storing information, etc.) We evaluate the methods developed in out of sample trading over historic data. The testing is designed to be realistic, for instance considering factors such as transaction costs, stock mergers and data snooping issues. We test scenarios for European and Australian stock markets in different economic conditions. It is found that the methodology is able to outperform the market in these cases.

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying, subject to the provisions of the Copyright Act 1968.

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