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Preface

We are proud to present the *Book of Abstracts* of the contributions accepted for presentation at the *Colloque MAF - Mathematical and Statistical Methods for Actuarial Sciences and Finance.*

Since 2004, the International MAF Conferences have been held every two years in Salerno (2004, 2006, 2010, 2014) and Venice (2008, 2012). The current edition is held in Paris, from March 30 to April 1, 2016.

The conference has been organized by the MBA Centre des Hautes Etudes d'Assurances of the University Dauphine of Paris (France) and the Department of Economics of the Ca' Foscari University of Venice (Itay), with the collaboration of the Department of Economics and Statistical Sciences of the University of Salerno (Italy).

Its main aim is to promote the collaboration between mathematicians and statisticians, in order to provide new theoretical and methodological results, and significant applications in actuarial sciences and finance, by the capabilities of the interdisciplinary mathematical-and-statistical approach.

The conference covers a wide variety of subjects in actuarial science and financial fields, all treated in light of the interaction between the two quantitative approaches. It is open to both academicians and professionals, to encourage the cooperation between theoreticians and practitioners.

Venice, March 2016

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Evolutionary approach to combine statistical forecasting models and improve trading system *

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Abstract

The focus of this contribution is to propose an improvement of *technical analysis* now widely used by many traders. The point is that a huge number of indicators and oscillators has been proposed in the literature but they do not always provide the same signals on a market trend reversal. Furthermore, it is well known that each indicator or oscillator depends on some parameters that are often selected in a subjective way. We are interested to propose a less subjective trading strategy. In this framework two problems arise: on one hand we have to find the weighted combination of the different indicators in order to provide the best possible signal, on the other hand we have to select the best setting of indicators' and oscillators' parameters. In other words we have to tackle an optimization problem that implies the conjoint choice of the parameters characterizing indicators and oscillators and of the associated weights providing a single signal.

A peculiarity of technical analysis is that it neglects the use of the forecasts. So, the technical analysis is focused only on past and current values of time series that can be interpreted as a realization of a unknown data generating process (DGP) that show several recognizable and identifiable patterns. Nevertheless, the presence of pattern detected by the technical analysis implicitly involves the dependencies between the variables of the DGP and suggests the opportunity of using forecasting procedure to anticipate the future behaviour of the quantity considered as input in indicators and oscillators. In other terms, that suggests to use forecasting models. In Mathematics, Statistics and Econometrics literature a large number of papers are devoted to the previsional modelling. The identification of a model which is able to represent the DGP is a starting point to predict future values of the series. Linear models (ARIMA), models with different regimes (Threshold AR, Markov Switching Regimes), evolutionary models (Neural Network, Local Polynomial) are just a few examples. Roughly speaking each model can provide predictions with peculiarities making them complementary to the others for some feature and therefore the performance of the individual forecasts may be improved by using the techniques of the combination of forecasts.

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This contribution has two main aims. The former one is to improve the one-way prediction of the time series of the quantity to use as input in indicators and oscillators by combining statistical forecasting model. The later one is to propose a selection of the parameters characterizing such indicators and oscillators based on a optimization problem. Both the aims are pursued using an evolutionary approach that selects jointly the parameters and the weights.

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