

## Dominance among financial markets

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*Abstract:* - In this paper, we deal and evaluate the comparison problem among different financial markets using risk/variability measures consistent with investors' preferences. First, we recall a recent classification of multivariate stochastic orderings consistent with preferences and we properly define the selection problem among different financial markets. Secondly, we propose an empirical financial application where multivariate stochastic orderings consistent with the non-satiable and risk averse investors' preferences are applied to compare and evaluate the possible dominance among the most developed market in the world (the US stock market) and two European markets (the German stock market and the UK stock market). In this context, we propose an ex-ante and an ex-post evaluation of the dominance among country stock markets. Moreover, in both cases we evaluate the dominance, considering the "oldest" and "youngest" firms of selected countries over previous decade.

*Key-Words:* - Multivariate preferences, Stochastic Dominance, Financial Market comparison.

### 1 Introduction

At financial markets, we can identify many distinct problems, solution of which requires application of various mathematical methods. In this paper, we focus on the problem of portfolio selection and related issues.

In this framework, we introduce multivariate orderings consistent with investors' preferences and we show how they can be used in order to determine dominant sectors and markets in different financial contexts. Therefore, we define the dominance among financial markets and we propose a comparison methodology that uses probability functionals to optimize choices consistent with the investors' preferences. Then, we propose an ex-ante and an ex-post empirical application of multivariate orderings, in this context.

Thus, we first generalize the concept of univariate FORS orderings, risk and reward measures in the multivariate framework (see Ortobelli et al. in [6], [7] and [8]; FORS is an acronym derived from the name of the authors). FORS probability functionals and orderings generalize those found in the literature (see Shaked and Shanthikumar in [14], and Muller and Stoyan in [5]) and are strictly related to the theory of choice under uncertainty and to the theory of probability functionals and metrics (see Rachev in [11],

Stoyanov et al. in [15] and Tversky, and Kahneman [17]). While the new orderings serve to further characterize and specify the investors' choices and preferences, the new risk measures should be used either to minimize the risk or to minimize its distance from a given benchmark. In particular, in the paper we suggest to use multivariate ordering consistent with investors' preferences to define the dominance among different financial markets/sectors.

Secondly, we propose an empirical comparison to evaluate the possible dominance among three different stock markets (US stock market, the German stock market and the UK stock market). In this framework, we preliminarily test the return distributions of each market, to understand which distributional assumption is suitable for a mean-risk comparison among stock markets. Then, we examine ex ante when one market dominates the others. Finally, we forecast and compare the ex-post dominance among markets. In this ex-post analysis we evaluate the future market evolution either using a myopic portfolio selection approach or forecasting the returns evolution with proper Markov Chains as suggested by Ortobelli et al. in [9] and Angelelli et al. in [2] and [3].

The paper is organized as follows. In Section 2 we introduce multivariate FORS orderings and the



















