Portfolio Selection with Estimation Risk: 
a Test Based Approach*

Bertille Antoine†

Abstract

An important challenge of portfolio allocation arises when the (true) characteristics of returns distribution are replaced by some estimates. This introduces estimation risk, which is crucial for portfolio management just like traditional financial risk. This paper contrasts with existing literature by focusing on a different measure of performance. We borrow from practitioners and evaluate different funds allocations through their likelihood of beating a benchmark. Then, the optimal portfolio which accounts for estimation risk is known in closed-form and does not depend on any nuisance parameter. This investment rule corresponds to a mean-variance investor with a corrected, sample-dependent risk aversion parameter.

JEL Classification: C4, D8, G0.

Key words: Portfolio theory; Estimation risk; Benchmark performance; Mean-variance efficiency; Test.

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†Simon Fraser University. Email: bertille_antoine@sfu.ca.