Journal of Financial Economics 15 (1986) 373–394. North-Holland

PERFORMANCE MEASUREMENT WITH THE ARBITRAGE PRICING THEORY
A New Framework for Analysis*

Gregory CONNOR and Robert A. KORAJCZYK

Northwestern University, Evanston, IL 60201, USA

Received August 1984, final version received May 1985

This paper develops a theory and econometric method of portfolio performance measurement using a competitive equilibrium version of the Arbitrage Pricing Theory. We show that the Jensen coefficient and the appraisal ratio of Treynor and Black are theoretically compatible with the Arbitrage Pricing Theory. We construct estimators for the two performance measures using a new principal components technique, and describe their asymptotic distributions. The estimators are computationally feasible using a large number of securities. We also suggest a new approach to testing for the correct number of factors.

1. Introduction

The measurement of portfolio performance is an important practical application of asset pricing theory. Two popular measures of performance are the 'Jensen coefficient' and Treynor and Black's 'appraisal ratio'. Using the Capital Asset Pricing Model (CAPM), Jensen (1968) suggests that a positive deviation of a portfolio's average return from that predicted by the security market line (the Jensen coefficient) indicates superior performance. The appraisal ratio is a refinement of Jensen's measure and is equal to the ratio of the Jensen coefficient to the amount of non-market risk undertaken by the manager.

This paper develops analogous performance measures in an Arbitrage Pricing Theory (APT) framework by extending Connor's (1984) equilibrium version of the APT to include a small set of investors with superior information. Estimators of the performance measures are suggested and their asymptotic distributions are derived. The paper shows that:

(1) The Jensen coefficient is an appropriate indicator of superior performance in our equilibrium APT model. That is, an investor's portfolio expected

*We would like to thank Douglas Diamond, Robert Hodrick, Ravi Jagannathan, Larry Jones, Robert McDonald, Carol Mershon, Peter Rossi, Daniel Siegel, Sheridan Titman, and especially the referee, Jay Shanken, for helpful comments.

0304-405X/86/$3.50