

Cross Sectional Analysis Of Securities within a Portfolio at a Point in Time

FMA Practitioner Demand Driven Academic Research Initiative (PDDARI)

PDDARI Supported by the CFA Society of Chicago

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Request for Academic Research

Definition

Consider a set of N stocks with total returns over a given period, from time 0 to time T. Let:

$R_i(0,T)$ = the total return of stock i over the period 0 to T

Hence, $R_1(0,T)$, $R_2(0,T)$, ..., $R_N(0,T)$ form a cross sectional population for study. The set of N stocks may represent a universe of stocks defined in some manner (e.g., all stocks that trade on U.S. exchanges) or a set of stocks that was formed by some particular process, such as the stocks which constitute an actively managed portfolio at a given point in time.

Questions to address empirically

1. Should a researcher characterize the actively managed portfolios cross section of returns using a parametric distribution such as the Normal distribution?
2. If yes to #1, proceed to #4.
3. If no to #1, which distributions fit best the various actively managed portfolio populations? Which distributions best fit large cap, mid cap, small cap, and micro cap? Which distributions best fit growth and value? Do distributions with infinite moments, such as Stable Paretian, fit better than those with finite moments, like Student-t, Weibolt, or an overlay of multiple Normal Distributions? If Distributions with infinite moments are a better fit, can a distribution with finite moments be used with reasonable approximately accurate results?
4. Do sets of stocks from actively managed portfolios possess significantly different cross sectional distributions from the universes from which they are drawn? One hypothesis suggests that unmanaged populations have fat left tails, but skilled active managers should eliminate these outliers a priori. Develop techniques to measure this effect.

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5. Do metrics exist to measure the desirability of a cross sectional return distribution which would, for example, quantify how well an active manager performed in modifying return distributions through stock selection?
6. Develop a frame work for analyzing cross sectional distribution returns over time to gain a deeper understanding of portfolio risk. Is there a set of statistical parameters which can use historical data to predict future risk in a portfolio? Determine the appropriate time frame of returns (Daily, Monthly, Annual, 5 years, 20 years, etc.) where predictive capability is maximized. Which time horizon best satisfies the risk or loss aversion preferences of different investor segments?
7. Is there a better measure of risk which uses the previous insights considering loss aversion, down side risk, portfolio recovery time, etc.?

Citations and Disclosures

1. Relevant Practitioner citations for academics to review prior to submitting their proposals.
 - a. Rawley Thomas³ (primary co-author of this Research Initiative Request for Proposal): Advanced DCF Valuation Measurement Methodology: Predictive Capability, Accuracy, and Robustness presented to the Midwest Finance Association, March 23, 2006 by Rawley Thomas, slides 29-44.
www.lcrt.com/Updates/MidwestFinance3-24-06.pps.
"A Stable Paretian risk analysis of Ironwood's Concentrated Small Cap Fund⁴ against a benchmark based on applying McCulloch's estimation procedure." www.lcrt.com/Updates/Ironwood.pdf.
"Risk: Applying a New Portfolio Risk/Return Measurement Methodology Based on Recent Advances in Quantifying Stable Paretian Fat Tailed Distributions and Investor Loss Aversion," August 5, 2006.
www.lcrt.com/Updates/RISK.doc.

Firms Willing to Donate Data

1. Morningstar – Morningstar will evaluate research proposals and may provide data on stocks, mutual funds, closed-end funds, ETFs, hedge funds, and broad market indexes. Academic proposals that are deemed by Morningstar to have particular value for practitioners may qualify for waived or reduced-fee research charges.
2. Ironwood – Portfolio performance data on the Concentrated Small CAP Fund.
3. LifeCycle Returns – Stock return data, % under (over) valuation, constant dollar gross investment, Cash Economic Return as intrinsic valuation drivers

³ Rawley Thomas serves as VP Practitioner Director of the Financial Management Association and heads the FMA's Practitioner Research Committee. Under the Committee's Policies and Procedures, Thomas must disclose his commercial interest as selling products, consulting services, and IT integration related to advanced DCF and risk measurement. LifeCycle may extend its market offerings with products to incorporate the new Risk Measurements arising from this Research Initiative. Based on the empirical work accomplished so far, Thomas has a bias toward Stable Paretian distributions with infinite variances as covering most distributions, especially regions of universes which approach Cauchy.

⁴ Warren Isabelle ran the Ironwood Concentrated Small CAP and contributed the data for LCRT to compare its performance against a benchmark with cross sectional Stable Paretian analysis each month.

Necessity of Automation?

Should the Society's FMA PDDARI members consider collaborating with academics and open source developers to automate the comparative risk / return measurement process, especially for distributions like Stable Paretian where commercial software may not be available? See John Nolan web site for library of routines currently available <http://academic2.american.edu/~jpnolan/stable/stable.html> .