Home ► All Journals ► Econometric Reviews ► List of Issues ► Volume 27, Issue 4-6 Generalized Safety First and a New Twist

Econometric Reviews > Volume 27, 2008 - Issue 4-6

155 21 Views CrossRef citations to date Altmetric

Original Articles

Generalized Safety First and a New Twist on Portfolio Performance

M. Ryan Haley & Charles H. Whiteman

Pages 457-483 | Received 14 Nov 2005, Accepted 08 Nov 2006, Published online: 22 May 2008

66 Cite this article ▲ https://doi.org/10.1080/07474930801960360

> Sample our Mathematics & Statistics >> Sign in here to start your access to the latest two volumes for 14 days

Full Article

Figures & data

References

66 Citations

Metrics

➡ Reprints & Permissions

Read this article

Abstract

We propose a Generalization of Roy's (1952) Safety First (SF) principle and relate it to the IID versions of Stutzer's (Stutzer's 2000, 2003) Portfolio Performance Index and underperformance probability Decay-Rate Maximization criteria. Like the original SF, the Generalized Safety First (GSF) rule seeks to minimize an upper bound on the probability of ruin (or shortfall, more generally) in a single drawing from a return unner hound coincides with wh distribution We

maximiz About Cookies On This Site

> We and our partners use cookies to enhance your website experience, learn how our site is used, offer personalised features, measure the effectiveness of our services, and tailor content and ads to your interests while you navigate on the web or interact with us across devices. You can choose to accept all of these cookies or only essential cookies. To learn more or manage your preferences, click "Settings". For further information about the data we collect from you, please see our Privacy Policy

ge return Accept All is simple Essential Onla Deviations ond to the Settings and the n which lead to the nus that the

shrinks enough theo

"closest

minimiz

same de

decay-rate maximizing strategy may require the investor to take positions that do not minimize the probability of shortfall in each successive period. It also makes clear that the relationship between the marginal distribution of the one-period portfolio return and the mean-shortfall distribution is the same as that between the source density and the target density in importance sampling. Thus Geweke's (1989) measure of Relative Numerical Efficiency can be used as a measure of the quality of the divergence measure. Our interpretation of the decay rate maximizing criterion in terms of a one-shot problem enables us to use the tools of importance sampling to develop a "performance index" (standard error) for the Portfolio Performance Index (PPI). It turns out that in a simple stock portfolio example, portfolios within one (divergence) standard error of one another can have very different weights on individual securities.

Q Keywords: Entropy Importance sampling Kullback-Leibler divergence Portfolio choice

Portfolio performance Safety first Shortfall

Q JEL Classification: G11 C4

ACKNOWLEDGMENTS

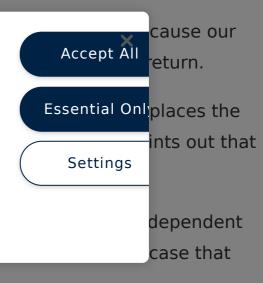
The article was prepared for the 2nd Conference on Information and Entropy in Econometrics, American University, September 23–25, 2005. We are grateful to Joel L. Horowitz, Narayana Kocherlakota, Michael J. Stutzer, and two anonymous referees for helpful comments and useful suggestions.

Notes

¹ R(w) ca analysis ²In relatindic indic similar ³Stutzer data. Th

About Cookies On This Site

We and our partners use cookies to enhance your website experience, learn how our site is used, offer personalised features, measure the effectiveness of our services, and tailor content and ads to your interests while you navigate on the web or interact with us across devices. You can choose to accept all of these cookies or only essential cookies. To learn more or manage your preferences, click "Settings". For further information about the data we collect from you, please see our Privacy Policy



the returns are IID, though a similar rate function characterizes the non-IID case. Since much of our analysis hinges on the precise form of I(d,w), it should be regarded as applying only to the IID case. We conjecture that something very similar to our analysis would apply in the non-IID case.

⁴In the log-optimal version in Stutzer (2003), $1 - \theta$ is interpreted as the coefficient of relative risk aversion.

⁵An additional interpretation of θ as a Lagrange multiplier will be offered in the next subsection.

⁶Technically, there is an important distinction between a divergence and a distance; the former is not a proper metric and may violate properties such as symmetry or the triangularity rule.

⁷For a general proof of Kullback's lemma see, for example, Bucklew (<u>1990</u>, p. 30).

⁸Note that the probabilities, $\pi_t(\cdot)$, are concentrated in terms of the to-be-determined multiplier θ ; this reduces the dimensionality of the optimization problem from (T+N+1) to (N+1). For a more thorough discussion about the relationship between the $\pi_t(\cdot)$ s, I(d,w), GSF, and the KL divergence, see Haley (2003).

⁹To match the conditions in Stutzer (2003), the mean of X should be strictly greater than d to ensure that the probability of shortfall goes to zero asymptotically. Our argument is clearer with E(X) = d; continuity ensures that it will go through with a slightly larger mean.

¹⁰Strictly speaking, the "infinitely-repeated" terminology applies only in the case that returns are IID. In the general non-IID case treated in Stutzer (2003), the term "dynamic game" is more appropriate.

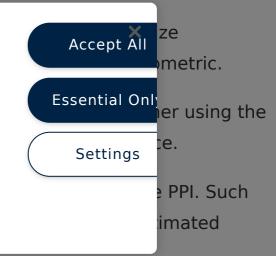
¹¹Horizo discount

12In r

¹³That is measure

About Cookies On This Site

We and our partners use cookies to enhance your website experience, learn how our site is used, offer personalised features, measure the effectiveness of our services, and tailor content and ads to your interests while you navigate on the web or interact with us across devices. You can choose to accept all of these cookies or only essential cookies. To learn more or manage your preferences, click "Settings". For further information about the data we collect from you, please see our Privacy Policy



moments or parameters, as sampling error will affect the performance of each such procedure.

¹⁴This notation generally follows that of Geweke (<u>1989</u>). For simplicity, we take $\mathfrak{I}(\psi)$ and $p(\psi)$ to be proper normalized densities; Geweke works with the more general unnormalized (kernel) density.

¹⁵The adjective "numerical" is used to emphasize that even in a fully Bayesian context, frequentist procedures may be appropriate for assessing the sampling properties of a posterior sample generated randomly using Monte Carlo procedures. We will apply the same reasoning to the data sample, so the standard terminology applies.

- *Sample size equals 240.
- ¹⁶Two stocks Stutzer (2000) used have dropped out of the CRSP data set.
- *Sample size equals 240.
- *Sample size equals 240.

¹⁷The classic example is the "height with shoes on vs. height with shoes off" example: the population variation in heights is irrelevant, as everyone is taller with shoes on.





We and our partners use cookies to enhance your website experience, learn how our site is used, offer personalised features, measure the effectiveness of our services, and tailor content and ads to your interests while you navigate on the web or interact with us across devices. You can choose to accept all of these cookies or only essential cookies. To learn more or manage your preferences, click "Settings". For further information about the data we collect from you, please see our Privacy Policy

Accept All

Essential Only

Settings

Information for

Authors

R&D professionals

Editors

Librarians

Societies

Opportunities

Reprints and e-prints

Advertising solutions

Accelerated publication

Corporate access solutions

Open access

Overview

Open journals

Open Select

Dove Medical Press

F1000Research

Help and information

Help and contact

Newsroom

All journals

Books

Keep up to date

Register to receive personalised research and resources by email



Sign me up











Copyright © 2024 Informa UK Limited Privacy policy Cookies Terms & conditions



Registered in England & Wales No. 3099067





We and our partners use cookies to enhance your website experience, learn how our site is used, offer personalised features, measure the effectiveness of our services, and tailor content and ads to your interests while you navigate on the web or interact with us across devices. You can choose to accept all of these cookies or only essential cookies. To learn more or manage your preferences, click "Settings". For further information about the data we collect from you, please see our Privacy Policy



Essential Onl

Settings