

[Home](#) > [Extreme Value Theory and Applications](#) > Chapter

Safety First Portfolio Selection, Extreme Value Theory and Long Run Asset Risks

| Chapter

| pp 471–487 | [Cite this chapter](#)



[Extreme Value Theory and Applications](#)

[Laurens de Haan](#), [Dennis W. Jansen](#), [Kees Koedijk](#) & [Casper G. de Vries](#)

👁 904 Accesses

❝ 60 Citations

Abstract

The paper motivates the use of the statistical extreme value theory for the problem of portfolio selection in economics, both theoretically and empirically. It is shown that the conventional safety first criterion developed by Roy can be successfully improved upon by exploiting the fat tail property of asset returns. Extreme value theory is seen to provide a better bound than the Chebyshev bound. In the empirical application we calculate minimum threshold return levels given very low exceedance probabilities for bond and equity investors. A proof of a new quantile estimator is obtained in the appendix. The data cover at least a half-century of returns and allow for evaluation of investment risks in the long run.

i This is a preview of subscription content, [log in via an institution](#)  to check access.

Access this chapter

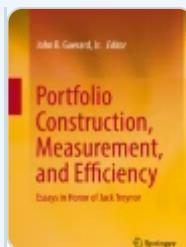
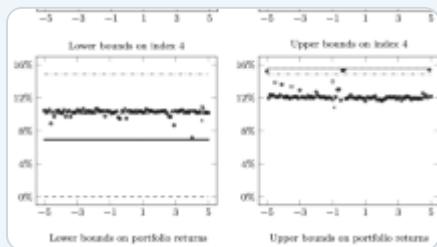
[Log in via an institution](#) 

[Institutional subscriptions](#) 

Preview

Unable to display preview. [Download preview PDF](#).

Similar content being viewed by others

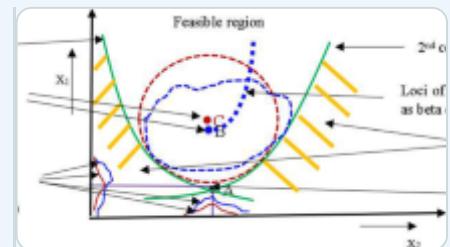


[Bounds on mean absolute deviation portfolios under interval-valued expected future asset returns](#)

Article | 15 March 2021

[The Theory of Risk, Return, and Performance Measurement](#)

Chapter | © 2017



[Bi-objective reliability based optimization: an application to investment analysis](#)

Article | 16 November 2023

Explore related subjects

Discover the latest articles, books and news in related subjects, suggested using machine learning.

[Applied Probability](#)

[Mathematical Finance](#)

[Probability Theory](#)

[Quantitative Finance](#)

[Risk Theory](#)

[Statistical Finance](#)

References

Baillie R. and McMahon P. (1989) *The Foreign Exchange Market, Theory and Econometric Evidence*, Cambridge University Press, Cambridge.

[Google Scholar](#)

Bernstein P. (1992) *Capital Ideas*, Free Press, New York, NY.

[Google Scholar](#)

Copeland T.E. and Weston J.F. (1983) *Financial Theory and Corporate Policy*, Addison-Wesley, Reading.

[Google Scholar](#)

Dekkers A.L.M., Einmahl J.H.J. and de Haan L. (1989) A moment estimator for the index of an extreme value distribution, *The Annals of Statistics*, 1833-1855.

[Google Scholar](#)

Einmahl J.H.J. (1992) The a. s. behaviour of the weighted empirical process and the LIL for the weighted tail empirical process, *Annals Probab.*, 20, 781-695.

[MathSciNet](#) [Google Scholar](#)

Friedman B.M. and Laibson D.I. (1989) Economic implications of extraordinary movements in stock returns, *Brookings Papers on Economic Activity*, 2, 137-172.

[Article](#) [Google Scholar](#)

Haan L., de (1990) Fighting the arch-enemy with mathematics, *Statistica Neerlandica*, 45-68.

[Google Scholar](#)

Hall P. (1990) Using the bootstrap to estimate mean squared error and select smoothing parameter in nonparametric problems, *Journal of Multivariate Analysis*, 177–203.

[Google Scholar](#)

Hill B.M. (1975) A simple general approach to inference about the tail of a distribution, *The Annals of Statistics*, 1163–1173.

[Google Scholar](#)

Hols M., de Vries C.A.B. and C.G. (1991) The limiting distribution of extremal exchange rate returns, *Journal of Applied Econometrics*, 287–302.

[Google Scholar](#)

Jansen D. and de Vries C.G. (1991) On the frequency of large stock returns: putting booms and busts into perspective, *The Review of Econ. and Stat.*, 18–24.

[Google Scholar](#)

Koedijk K.G., Schafgans M.M.A. and de Vries C.G. (1990) The tail index of exchange rate returns, *Journal of International Economics*, 93–108.

[Google Scholar](#)

Leadbetter M.R., Lindgren G. and Rootzen H. (1983) *Extremes and Related Properties of Random Sequences and Processes*, Springer-Verlag, Berlin.

[Book](#) [MATH](#) [Google Scholar](#)

Levy H. and Sarnat M. (1972) Safety first-an expected utility principle, *Journal of Financial and Quantitative Analysis*, 1829–1834.

[Google Scholar](#)

Loretan M. and Phillips P.C.B. (1992) Testing the covariance stationarity of heavy-tailed time series: an overview of the theory with applications to several financial datasets, SSRI Working Paper 9208, University of Wisconsin-Madison.

[Google Scholar](#)

Markowitz H.M. (1959) Portfolio Selection, Wiley, New York.

[Google Scholar](#)

McCulloch J.H. (1981) Interest rate risk and capital adequacy for traditional bank and financial intermediaries, in S.Y. Maisel (ed.), Risk and Capital Adequacy in Commercial Banks, University of Chicago Press, Chicago, 223-248.

[Google Scholar](#)

Pagan A.R. and Schwert G.W. (1990) Alternative models for conditional stock volatility, Journal of Econometrics, 267-290.

[Google Scholar](#)

Roy A.D. (1952) Safety first and the holding of assets, Econometrica, 431-449.

[Google Scholar](#)

Schwert W.G. (1989) Business cycles, financial crisis and stock volatility, Carnegie- Rochester Conference Series on Public Policy, 83-126.

[Google Scholar](#)

Schwert W.G. (1990) Indexes of U.S. stock prices from 1802 to 1987, Journal of Business, 399-427.

[Google Scholar](#)

Author information

Authors and Affiliations

Erasmus University Rotterdam, 300 DR Rotterdam, PB 1738, The Netherlands

Professor Laurens de Haan

Department of Economics, Texas A&M University, College Station, TX, 77845, USA

Professor Dennis W. Jansen

University of Limburg, P.O. Box 616, Maastricht, 6200 MD, The Netherlands

Professor Kees Koedijk

Tinbergen Institute Rotterdam, Oostmaaslaan 950, 3063 DM, Rotterdam, The Netherlands

Professor Casper G. de Vries

Editor information

Editors and Affiliations

Department of Mathematics, Temple University, Philadelphia, Pennsylvania, USA

Janos Galambos

National Institute of Standards and Technology, Gaithersburg, Maryland, USA

James Lechner & Emil Simiu &

Rights and permissions

[Reprints and permissions](#)

Copyright information

About this chapter

Cite this chapter

de Haan, L., Jansen, D.W., Koedijk, K., de Vries, C.G. (1994). Safety First Portfolio Selection, Extreme Value Theory and Long Run Asset Risks. In: Galambos, J., Lechner, J., Simiu, E. (eds) Extreme Value Theory and Applications. Springer, Boston, MA. https://doi.org/10.1007/978-1-4613-3638-9_29

[.RIS](#) [.ENW](#) [.BIB](#)

DOI

https://doi.org/10.1007/978-1-4613-3638-9_29

Publisher Name

Springer, Boston, MA

Print ISBN

978-1-4613-3640-2

Online ISBN

978-1-4613-3638-9

eBook Packages

[Springer Book Archive](#)

Keywords

[Mutual Fund](#) [Portfolio Selection](#) [Investment Opportunity](#) [Asset Return](#) [Stock Index](#)

These keywords were added by machine and not by the authors. This process is experimental and the keywords may be updated as the learning algorithm improves.

Publish with us

[Policies and ethics](#) 

Search

Search by keyword or author



Navigation

[Find a journal](#)

[Publish with us](#)

[Track your research](#)