

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

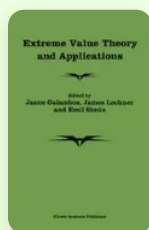
# Safety First Portfolio Selection, Extreme Value Theory and Long Run Asset Risks

| Chapter

| pp 471–487 | [Cite this chapter](#)

[Save chapter](#)

[View saved research](#) >



## [Extreme Value Theory and Applications](#)

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

 924 Accesses  62 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.



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

### Access this chapter

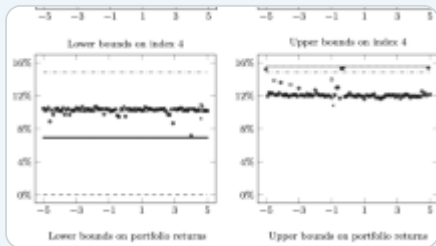
[Log in via an institution](#) →

[Institutional subscriptions](#) →

## Preview

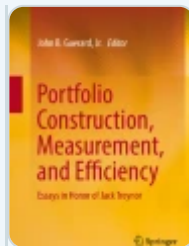
Unable to display preview. [Download preview PDF.](#)

### Similar content being viewed by others



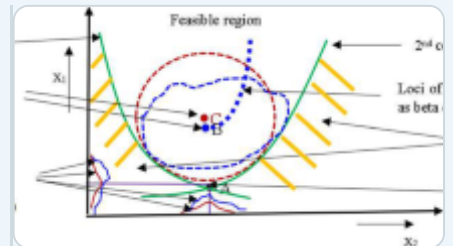
**Bounds on mean absolute deviation portfolios under interval-valued expected future asset returns**

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](#)

[Stochastic Volatility Modeling in Financial Markets](#)

# References

---

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

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

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

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.

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.

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

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

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

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

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.

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.

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.

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

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

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.

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

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.

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

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

Schwert W.G. (1989) Business cycles, financial crisis and stock volatility,

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

## Author information

---

### Authors and Affiliations

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

Laurens de Haan

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

Dennis W. Jansen

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

Kees Koedijk

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

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

---

© 1994 Kluwer Academic Publishers

## 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](https://doi.org/10.1007/978-1-4613-3638-9_29)

[.RIS↓](#) [.ENW↓](#) [.BIB↓](#)

DOI	Publisher Name	Print ISBN
<a href="https://doi.org/10.1007/978-1-4613-3638-9_29">https://doi.org/10.1007/978-1-4613-3638-9_29</a>	Springer, Boston, MA	978-1-4613-3640-2
Online ISBN	eBook Packages	
978-1-4613-3638-9	<a href="#">Springer Book Archive</a>	

## 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