



# Visual Explorations in Finance

## with Self-Organizing Maps

Springer Finance

by Guido J. Deboeck , Tuevo K. Kohonen (Editors)

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## Synopsis

SOMs (Self-Organizing Maps) have proven to be an effective methodology for analyzing problems in finance and economics--including applications such as market analysis, financial statement analysis, prediction of bankruptcies, interest rates, and stock indices. This book covers real-world financial applications of neural networks, using the SOM approach, as well as introducing SOM methodology, software tools, and tips for processing. 106 illus.

# Table of Contents of Visual Explorations in Finance

Introduction

## PART I: APPLICATIONS

1. Let Financial Data Speak for Themselves
2. Projection of Long term Interest Rates with Maps
3. [Picking Mutual Funds with Self-Organizing Maps](#)
4. Maps for Analyzing Failures of Small and Medium-sized Enterprises
5. Self-Organizing Atlas of Russian Banks
6. [Investment Maps of Emerging Markets](#)
7. A Hybrid Network System for Trading Financial Markets
8. Real Estate Investment Appraisal of Land Properties using SOM
9. Real Estate Investment Appraisal of Buildings using SOM
10. [.Differential Patterns in Consumer Purchase Preferences using Self-Oganizing Maps: A Case Study of China.](#)

## PART II: METHODOLOGY

11. The SOM Methodology

12. Self-Organizing Maps of Large Document Collections

[13. Software Tools for Self-Organizing Maps](#)

14. Tips for Processing and Color-coding of Self-Organizing Maps

[15. Best Practices in Data Mining using Self-Organizing Maps](#)

Glossary

Bibliography

## Review by the author

(prepared April 27, 1998)

The massive amount of information available on the worldwide web as well as that provided by many information providers creates new demands for novel, more effective methods for knowledge capturing and visualization of massive amounts of information.

The focus in this book is on automated ways to extract, synthesize, and visualize massive amounts of information to discover new structures and patterns, to extract new knowledge from existing data or human experiences.

The method used for this is unsupervised neural networks, an approach that has been used with success in many technical fields.

Starting from exploratory data analysis and data mining this book provides first an overview of traditional methods for clustering and

visualizing data, and then describes self-organizing maps(SOM), their advantages for financial, and economic and marketing analyses.

This book contains practical examples of how SOM is used to

- .. analyze the financial statements of companies with maps,
- .. analyze investment opportunities;
- .. predict long term interest rates and bankruptcies;
- .. select investments in mutual funds and stocks;
- .. appraise real estate properties;
- .. analyze markets based consumer preferences and attitudes;
- .. segment markets and customers or clients;
- .. support strategic marketing using market analysis and customer segmentation.

This book also shows how structures can be discovered in economic data; how to improve on risk and portfolio management; how SOM can be used for improving the organization of large document collections and knowledge management.

This book concentrates on methods for detecting new knowledge and information from data; it shows the way towards automate knowledge discovery by the translation of tacit into explicit knowledge.

It contains several maps and provides suggestions for creating knowledge maps.

This book breaks new ground in

- .. finance
- .. economics, and
- .. marketing applications.

It brings together the experience gained by many researchers, professionals, and business executives in applying advanced analytical tools for more effective knowledge and information management.

# Review from the Publisher

This volume, edited by Guido Deboeck, a leading exponent of the use of computational intelligence methods in finance, and by Teuvo Kohonen, the originator of self-organizing maps (SOM), provides a leading edge look at improved methods for data visualization and data mining. Aimed at business, financial and marketing professionals, this book is essential reading for all practitioners of knowledge discovery, data mining or the use of SOM for finding novel structures or patterns in data. Many issues in finance, economics and marketing require dealing with multi-dimensional data. The use of SOM is a neural network technique, invented by Teuvo Kohonen, that creates reduced visual displays of multi-dimensions. SOM have been applied with great success in engineering and many other technical fields. This book is the first in demonstrating the use of this unsupervised neural network technique in finance. The volume contains fifteen applications of SOM including: - analysis of financial statements, - prediction of bankruptcies, - forecasting and long term interest rates, - selection of mutual fund managers, - evaluation of investment opportunities, - trading stock indices. Also included are applications on market analysis and customer segmentation. Five chapters are devoted to methodology, software tools, and tips for processing maps.

## Review by readers

8 of 8 people found the following review helpful:

**Fascinating but the price isn't right...**, March 22, 2001

B

y **Louis Charbonneau** (Montreal, Quebec Canada) - [See all my reviews](#)

SOM are a kind of neural networks that are totally different from the feedforward multi-layered networks that everybody has heard about. The ideas behind SOM are remarkable intellectual stuff, first intellectual class stuff, and would certainly deserve to be more widely known. I found myself wondering how comes I rarely heard of Prof. Kohonen, and when is he going to win the Nobel prize... Prof. Kohonen and the development of SOM would make a good subject for the James Gleicks out there.

This book is in fact a collection of short articles about how SOM can be applied to financial visualisation and classification problems. Compilations of articles are a awkward genre, ranging from either the totally unintelligible or the totally trivial, and if you

have graduate education in finance, you will find that most of the articles are pretty lame, if not downright amateurish, compared to standard academic finance literature; if you don't have grad education, I'm not sure whether you would want to buy this book in the first place, but there's nothing particularly hard about it. Art buffs may be attracted by the richly colored SOM maps (Vasarely-like) that come inside the book, and I could imagine somebody exposing these in an art gallery...

Anyway, after going through this book, one gets a decent idea of what can be done with SOM, so I would definitely say IT IS worth reading. I have to say I found it utterly fascinating, although I was disappointed with most of the articles.

Another thing I don't like about the book is the price (I mean, OUCH!)... The other thing is the fact that even after reading the theory article by Professor Kohonen in this book, I still couldn't understand intuitively how the basic SOM convergence algorithm worked. It is only after reading the first few pages of his masterpiece "Self-Organizing Maps", published at Springer in 1992 that I had the "haha!" experience and that I decided to put Professor Kohonen on the pedestal of my personal heroes of science...