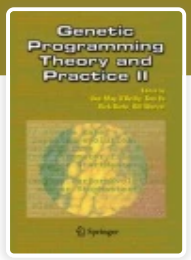

Genetic Programming Theory and Practice II pp 11–30

Discovering Financial Technical Trading Rules Using Genetic Programming with Lambda Abstraction

Tina Yu, Shu-Heng Chen & Tzu-Wen Kuo

Chapter

Part of the Genetic Programming book series (GPEM,volume 8)

Abstract

We applied genetic programming with a lambda abstraction module mechanism to learn technical trading rules based on S&P 500 index from 1982 to 2002. The results show strong evidence of excess returns over buy-and-hold after transaction cost. The discovered trading rules can be interpreted easily; each rule uses a combination of one to four widely used technical indicators to make trading decisions. The consensus among these trading rules is high. For the majority of the testing period, 80% of the trading rules give the

same decision. These rules also give high transaction frequency. Regardless of the stock market climate, they are able to identify opportunities to make profitable trades and out-perform buy-and-hold.

Keywords

modular genetic programming

lambda abstraction modules

higher-order functions

financial trading rules **buy-and-hold**

S&P 500 index

automatically defined functions

PolyGP system **stock market**

technical analysis

constrained syntactic structure

strongly typed genetic programming

financial time series

lambda abstraction GP

- Own it forever

Buy Chapter

eBook **EUR 117.69**

Price includes VAT (Poland)

- Available as PDF
- Read on any device
- Instant download
- Own it forever

Buy eBook

Softcover Book **EUR 160.49**

Price includes VAT (Poland)

- Compact, lightweight edition
- Dispatched in 3 to 5 business days
- Free shipping worldwide - see info

Buy Softcover Book

Hardcover Book **EUR 160.49**

Price includes VAT (Poland)

- Durable hardcover edition
- Dispatched in 3 to 5 business days
- Free shipping worldwide - see info

Buy Hardcover Book

Tax calculation will be finalised at checkout

Purchases are for personal use only

Learn about institutional subscriptions

Preview

Unable to display preview. Download preview PDF.

References

Allen, Franklin and Karjalainen, Risto (1999).

Using genetic algorithms to find technical trading rules. *Journal of Financial Economics*, 51(2):245–271.

Bhattacharyya, Siddhartha, Pictet, Olivier V., and Zumbach, Gilles (2002). Knowledge-intensive genetic discovery in foreign exchange markets. *IEEE Transactions on Evolutionary Computation*, 6(2):169–181.

Brock, William, Lakonishok, Josef, and LeBaron, Blake (1992). Simple technical trading rules and the stochastic properties of stock returns. *Journal of Finance*, 47(5): 1731–1764.

Church, Alonzo (1941). *The Calculi of Lambda Conversion*. Princeton University Press.

Cooper, Michael (1999). Filter rules based on price and volume in individual security overreaction. *The Review of Financial Studies*, 12(4): 901–935.

Kaboudan, Mak (2002). Gp forecasts of stock prices for profitable trading. In *Evolutionary Computation in Economics and Finance*, pages 359–382. Physica-Verlag.

Koza, John R. (1992). *Genetic Programming: On the Programming of Computers by Means of*

Natural Selection. MIT Press, Cambridge, MA, USA.

Koza, John R. (1994). *Genetic Programming II: Automatic Discovery of Reusable Programs*. MIT Press, Cambridge Massachusetts.

Neely, Christopher J., Weller, Paul A., and Dittmar, Rob (1997). Is technical analysis in the foreign exchange market profitable? A genetic programming approach. *The Journal of Financial and Quantitative Analysis*, 32(4):405–426.

O'Neill, Michael, Brabazon, Anthony, and Ryan, Conor (2002). Forecasting market indices using evolutionary automatic programming. In *Genetic Algoritms and Genetic Programming in Computational Finance*, pages 175–195. Kluwer Academic Publishers.

Pereira, Robert (2002). Forecasting ability but no profitability: An empirical evaluation of genetic algorithm-optimised technical trading rules. In *Evolutionary Computation in Economics and Finance*, pages 275–295. Physica-Verlag.

Pesaran, M. Hashem and Timmermann, Allan (1995). Predictability of stock returns: Robustness and economic significance. *Journal of Finance*, 50:1201–1228.

Pring, Martin J. (1991). *Technical Analysis Explained*. McGraw-Hill Trade.

Wang, Jun (2000). Trading and hedging in s&p 500 spot and futures markets using genetic programming. *The Journal of Futures Markets*, 20(10):911–942.

Yu, Gwoing Tina (1999). *An Analysis of the Impact of Functional Programming Techniques on Genetic Programming*. PhD thesis, University College, London, Gower Street, London, WC1E 6BT.

Yu, Tina (2001). Hierachical processing for evolving recursive and modular programs using higher order functions and lambda abstractions. *Genetic Programming and Evolvable Machines*, 2(4): 345–380.

Yu, Tina, Chen, Shu-Heng, and Kuo, Tzu-Wen (2004). A genetic programming approach to model international short-term capital flow. *To appear in a special issue of Advances in Econometrics*.

Author information

Authors and Affiliations

Chevron Texaco Information Technology Company, USA

Tina Yu

National Chengchi University, Taiwan
Shu-Heng Chen & Tzu-Wen Kuo

Editor information

Editors and Affiliations

Massachusetts Institute of Technology, USA
Una-May O'Reilly

Chevron Texaco Information Technology Group, Chevron
Tina Yu

University of Michigan, Michigan
Rick Riolo

Genetics Squared, Inc., Genetics
Bill Worzel

Rights and permissions

Copyright information

About this chapter

Cite this chapter

Yu, T., Chen, SH., Kuo, TW. (2005). Discovering Financial Technical Trading Rules Using Genetic Programming with Lambda Abstraction. In: O'Reilly, UM., Yu, T., Riolo, R., Worzel, B. (eds) Genetic Programming Theory and Practice II. Genetic Programming, vol 8. Springer, Boston, MA. https://doi.org/10.1007/0-387-23254-0_2

DOI
https://doi.org/10.1007/0-387-23254-0_2

Publisher Name
Springer, Boston, MA

Print ISBN
978-0-387-23253-9

Online ISBN
978-0-387-23254-6

eBook Packages
Computer Science
Computer Science (R0)