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Genetic Algorithms In Economics and **Finance: Forecasting Stock Market Prices** And Foreign Exchange — A Review

Chapter

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Genetic Algorithms and Genetic Programming in Computational Finance

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Abstract

After a brief overview of the history of the development and application of genetic algorithms and related simulation techniques, this chapter describes alternative implementations of the genetic algorithm, their strengths and weaknesses. Then follows an overview of published applications in finance, with particular focus on the papers of Bauer, Pereira, and Colin in foreign exchange trading. Many other rumored applications remain unpublished.

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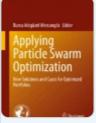
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References

Bäck, T. (1996). Evolutionary Algorithms in Theory and Practice, Evolutionary Strategies, Evolutionary Progarmming, Genetic Algorithms. New York and Oxford: Oxford University Press.

Google Scholar

Barnett, W. A., C. Chiarella, S. Keen, R. E. Marks, and H. Schnabl (eds.), (2000). Commerce, Complexity, and Evolution: Topics in Economics, Finance, Marketing, and Management: Proceedings of the Twelfth In-ternational Symposium in Economic Theory and Econometrics. Cambridge: Cambridge University Press.

Google Scholar

Bauer, R. J. Jr. (1994). *Genetic Algorithms and Investment Strategies*. New York: Wiley.

Google Scholar

Bauer, R. J. Jr. (1995). "Genetic Algorithms and the Management of Exchange Rate Risk," in J. Biethahn and V. Nissen (eds.), *Evolutionary Algorithms in Management Applications*, 253–263.

Bauer, R. J. Jr. and G. E. Liepins (1992). "Genetic Algorithms and Computerized Trading Strategies," in O'Leary and Watkins (eds.), *Expert Systems in Finance*,

89-100.

Google Scholar

Belew, R. K. and L. B. Booker (eds.), (1991). *Proceedings of the Fourth International Conference on Genetic Algorithms*. San Mateo: Morgan Kaufmann.

Google Scholar

Biethahn, J. and V. Nissen (eds.), (1995). *Evolutionary Algorithms in Management Applications*. Berlin, Heidelberg, New York: Springer-Verlag.

Google Scholar

Bodnovich, T. (1995). "Genetic Algorithms in Business and their Supportive Role in Decision Making," http://business.kent.edu/~tbodnovi/ga.html, November.

Google Scholar

Caldwell, C. and V. S. Johnston (1991). "Tracking Criminal Suspect Through 'Face-space' with a Genetic Algorithm," in Belew and Booker (eds.), *Proceedings of the Fourth International Conference on Genetic Algorithms*, 416–421.

Google Scholar

Colin, A. M. (1994). "Genetic Algorithms for Financial Modeling," in Deboeck (ed.), *Trading on the Edge: Neural, Genetic, and Fuzzy Systems for Chaotic Financial Markets*, 148–173.

Google Scholar

Colin, A. M. (2000). "A Genetic-programming-based Approach to the Generation

of Foreign-exchange Trading Models," in Barnett, Chiarella, Keen, Marks, and Schnabl (eds.), Commerce, Complexity, and Evolution: Topics in Economics, Finance, Marketing, and Management: Proceedings of the Twelfth International Symposium in Economic Theory and Econometrics, 173–189.

Google Scholar

Davis, L. (ed., 1991). *Handbook of Genetic Algorithms*. New York: Van Nostrand Reinhold.

Google Scholar

Davis, L. (1994). "Genetic Algorithms and Financial Applications," in Deboeck (ed.), *Trading on the Edge: Neural, Genetic, and Fuzzy Systems for Chaotic Financial Markets*, 133–147.

Google Scholar

Davis, L. and S. Coombs (1987). "Genetic Algorithms and Communication Link Speed Design: Theoretical Considerations," in Grefenstette (ed.), *Genetic Algorithms and their Applications: Proceedings of the Second International Conference on Genetic Algorithms*, 252–256.

Google Scholar

Deboeck, G. J. (ed.), (1994). Trading on the Edge: Neural, Genetic, and Fuzzy Systems for Chaotic Financial Markets. New York: Wiley.

Google Scholar

Eddelbüttel, D. (1996a). "A Genetic Algorithm for Passive Management: Creating Index Funds with Fewer Stocks,"

http://rosebud.sps.queensu.ca/~edd/papers.html 26 December.

Eddelbüttel, D. (1996b). "A Hybrid Genetic Algorithm for Passive Management,"

http://rosebud.sps.queensu.ca/~edd/papers.html 26 December.

Feldman, K. and P. Treleaven (1994). "Intelligent Systems in Finance," *Applied Mathematical Finance*, 1(2), December, 195–207.

Article Google Scholar

Fogel, D. B. (1995). Evolutionary Computation: Toward a New Philosophy of Machine Intelligence. New York: IEEE Press.

Google Scholar

Goldberg, D. E. (1989). *Genetic Algorithms in Search, Optimization, and Machine Learning*, Reading. Massachusetts: Addison-Wesley.

Google Scholar

Goldberg, D. E. (1994). "Genetic and Evolutionary Algorithms Come of Age," *Communications of the ACM*, 37(3), March, 113–119.

Article Google Scholar

Goldberg, D. E. and K. Deb (1991). "A Comparative Analysis of Selection Schemes Used in Genetic Algorithms," in Rawlins (ed.), *Foundations of Genetic Algorithms*, 69–93.

Google Scholar

Goldberg, D. E. and R. Lingle Jr. (1985). "Alleles, Loci, and the Traveling Salesman Problem," in Grefenstette (ed.), *Proceedings of an International Conference on Genetic Algorithms and their Applications*, 154–159.

Google Scholar

Grefenstette, J. J. (ed.), (1985). Proceedings of an International Conference on

Genetic Algorithms and their Applications. Hillsdale: Erlbaum.

Google Scholar

Grefenstette, J. J. (ed.), (1987). *Genetic Algorithms and their Applications: Proceedings of the Second International Conference on Genetic Algorithms*.

Hillsdale: Lawrence Erlbaum.

Google Scholar

Grefenstette, J. J., R. Gopal, B. Rosmaita, and D. V. Gucht (1985). "Genetic Algorithms for the Traveling Salesman Problem," in Grefenstette (ed.), *Proceedings of an International Conference on Genetic Algorithms and their Applications*, 160–168.

Google Scholar

Hetketter, J. and D. Beasley (1996). "Q1: What Are Evolutionary Algorithms (EAs)?" < http://www.cis.ohio-state.edu/hypertext/faq/usenet/ai-faq/genetic/part2/faq-doc-l.html

Holland, J. H. (1992a). "Genetic Algorithms," Scientific American, July, 44–50.

Google Scholar

Holland, J. H. (1992b). *Adaptation in Natural and Artificial Systems*, 2nd ed. Cambridge: MIT Press.

Google Scholar

Hughes, M. (1990). "Improving Products and Processes—Nature's Way," *Industrial Management & Data Systems*, 6, 22–25.

Article Google Scholar

Kennedy, S. (1996). "Introduction to Genetic Algorithms,"

< http://www.axcelis.com:80/articles.html>

Kingdon, J. and K. Feldman (1995). "Genetic Algorithms and Applications to Finance," *Applied Mathematical Finance*, 2(2), 89–116.

Article Google Scholar

Koza, J. R. (1992). "The Genetic Programming Paradigm: Genetically Breeding Populations of Computer Programs to Solve Problems," in Soucek and IRIS Group, *Dynamic, Genetic, and Chaotic Programming: The Sixth Generation*, 203–321.

Google Scholar

Koza, J. R. (1993). Genetic Programming. Cambridge: MIT Press.

Google Scholar

Leinweber, D. J. and R. D. Arnott (1995). "Quantitative and Computational Innovation in Investment Management," *The Journal of Portfolio Management*, 21(2), Winter, 8–15.

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Michalewicz, Z. (1994). *Genetic Algorithms* + *Data Structures* = *Evolution Programs*, 2nd ed. Berlin, Heidelberg, New York: Springer-Verlag.

Google Scholar

Mitchell, M. (1996). An Introduction to Genetic Algorithms. Cambridge: MIT Press.

Google Scholar

O'Leary, D. E. and P. R. Watkins (eds.), (1992). *Expert Systems in Finance*. Amsterdam and New York: North-Holland.

Google Scholar

Pereira, R. (1996). "Selecting Parameters for Technical Trading Rules Using Genetic Algorithms," *Journal of Applied Finance and Investment*, 1(3), July/August, 27–34.

Google Scholar

Rawlins, G. J. E. (ed.), (1991). Foundations of Genetic Algorithms. San Mateo: Morgan Kaufmann.

Google Scholar

Soucek, B. and IRIS Group (1992). *Dynamic, Genetic, and Chaotic Programming:* The Sixth Generation. New York: John Wiley.

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Syswerda, G. (1991). "Schedule Optimization Using Genetic Algorithms," in Davis (ed.), *Handbook of Genetic Algorithms*, 332–349.

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