

# Automating Investing

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Alexandru Agachi  
[alex@empiriccapital.com](mailto:alex@empiriccapital.com)

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Hard wired for the short term

Hard wired to herd

Self control a limited resource

Hot cold empathy gaps

Anchoring

Endowment effect

Personal experience

Overoptimism

Overconfidence

Illusion of knowledge

Illusion of control

Groupthink

Conservatism



« Hundreds of studies have shown that wherever we have sufficient information to build a model, it will perform better than most people. »

Daniel Kahneman

« There is no controversy in social science which shows such a large body of qualitatively diverse studies coming out so uniformly in the same direction as this one... predicting everything from the outcomes of football games to the diagnosis of liver disease, and when you can hardly come up with a half a dozen studies showing even a weak tendency in favour of the clinician, it is time to draw a practical conclusion. »

Paul Meehl

« To my mind the lessons are clear. Financial analysis should really be a logical process. »

James Montier

Human brain - the **darkest** deepest box

Finding nonlinear patterns in large heterogeneous datasets

...**not** a **natural** human skill



Quantitative finance – our first attempt at

**formalizing** discipline of investing

“I don’t believe in quant investing. Markets are driven by psychology and quants don’t understand this.”

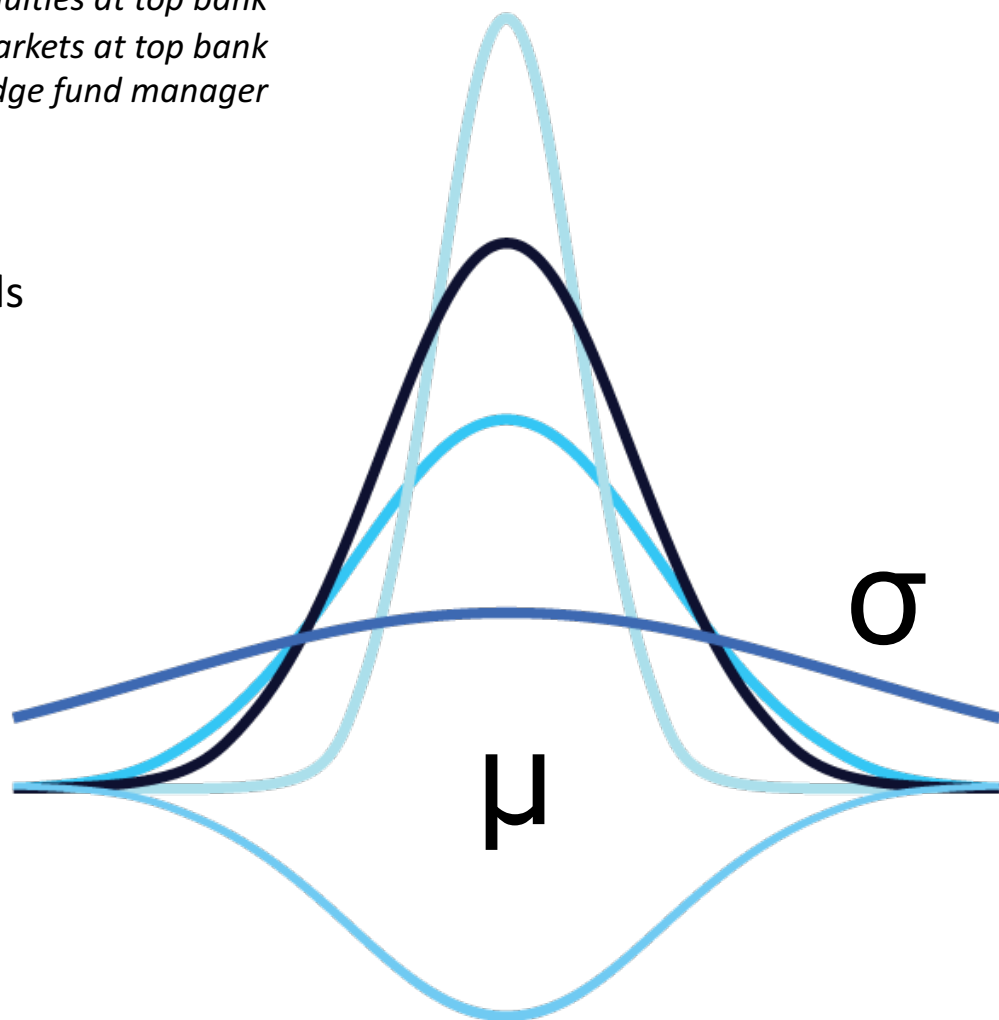
*Former global head of equities at top bank*

*Former global head of markets at top bank*

*Fixed income hedge fund manager*

To fly we built airplanes not synthetic birds

Quant investing:  
Diversification  
Statistical frameworks  
Futures made of overlapping  
distributions



# Data

2x/year

New types

New sources

# Modelling

Innovative  
approaches

Non parametric

Machine learning

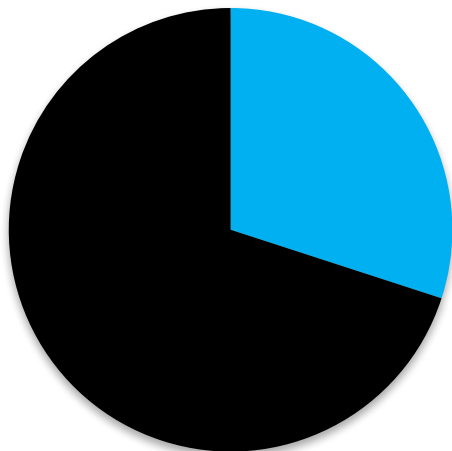
# Technology

Software

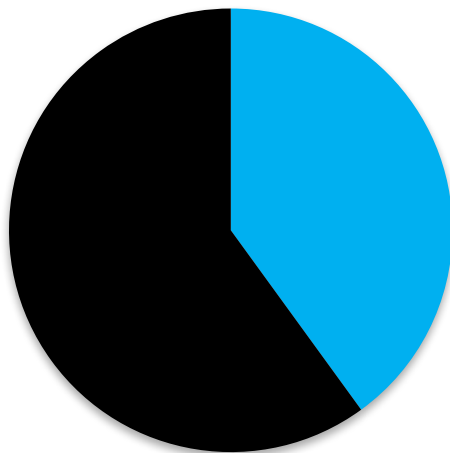
Computing

Storage

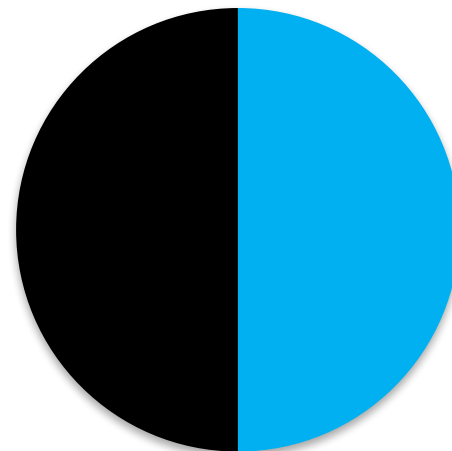
33%



40%



50%





- teams replacing key men/women
- constant improvement replacing large actions/reactions
- compliance and risk management built into the investment process
- new skillsets

caveats: Data

concentrated style of investing

« Investing should be **dull**. It shouldn't be exciting. Investing should be more like watching paint dry or watching grass grow. If you want excitement, take \$800 and go to Las Vegas. »

Paul Samuelson

- Assness, C.S., Krail, R.J. and Liew, J.M. (2001) Do hedge funds hedge? *Journal of Portfolio Management*, 28(1), 6-19.
- Baumeister, R.F. (2003) The psychology of irrationality: Why people make foolish, self-defeating choices, in Brocas, I. and Carrillo, J. (eds) *The Psychology of Economic Decision Volume I: Rationality and Well-Being*. Oxford University Press, Oxford.
- Bechara, A., Damasio, H., Damasio, A.R., Loewenstein, G. and Shiv, B. (2005) Investment behaviour and the negative side of emotion, *Psychological Science*, 16(6), 435-439.
- Bechara, A., Damasio, H., Tranel, D. and Damasio, A.R. (1997) Deciding advantageously before knowing the advantageous strategy, *Science*, 275, 1293-1294.
- Beilock, S.L. and Carr, T.H. (2001) On the fragility of skilled performance: What governs choking under pressure? *Journal of Experimental Psychology: General*, 130, 701-725.
- Beilock, S.L. and Carr, T.H. (2005) When high-powered people fail, *Psychological Science*, 16, 101- 105.
- Beilock, S.L., Kulp, C.A., Holt, L.E. and Carr, T.H. (2004) More on the fragility of performance: Choking under pressure in mathematical problem solving, *Journal of Experimental Psychology: General*, 133, 584-600.
- Berkelaar, A. and Kouwenberg, R. (2000) From Boom 'til Bust: How Loss Aversion Affects Prices. *Econometric Institute working paper*. Available from [www.ssrn.com](http://www.ssrn.com).
- Blake, David, Tristan Caulfield, Christos Ioannidis, and Ian Tonks. *New Evidence on Mutual Fund Performance: A Comparison of Alternative Bootstrap Methods*. Rep. London: Pensions Institute, 2017.
- Camerer, C.F., Loewenstein, G.F. and Prelec, D. (2004) *Neuroeconomics: How neuroscience can inform economics*, *Economic Perspectives*.
- Camerer, C.F., Loewenstein, G.F. and Weber, M. (1989) The curse of knowledge in economic settings: An experimental analysis, *Journal of Political Economy*, 97(5), 1232-1254.
- Cremers, M. and Petajisto, A. (2006) How active is your fund manager? A new measure that predicts performance. Available from [www.ssrn.com](http://www.ssrn.com).
- Dasgupta, H., Prat, A. and Verardo, M. (2006) The price of conformism. Available from [www.ssrn.com](http://www.ssrn.com).
- DeVaul, R.A., Jervey, F., Chappell, P., Carver, P., Short, B. and O'Keefe, S. (1957) Medical school performance of initially rejected students, *Journal of American Medical Association*, 257, 47-51.
- Dohmen, T.J (2005) Do professionals choke under pressure? Working paper. Dreman, D. and Lufkin, E. (2000) Investor overreaction: evidence that its basis is psychological, *Journal of Psychology and Financial Markets*, 1(1), 61-75.
- Dunning, D., Johnson, K., Ehrlinger, J. and Kruger, J. (2003) Why people fail to recognize their own incompetence, *Current Directions in Psychological Science*, 12(3), 83-87. Edwards, W. (1968) Conservatism in human information processing. Reprinted in Kahneman, D., Slovic, P. and Tversky, A. (1982) *Judgement under Uncertainty: Heuristics and Biases*. Cambridge University Press: New York.

Englich, T. and Mussweiler, T. (2001) Sentencing under uncertainty: Anchoring effects in the courtroom, *Journal of Applied Social Psychology*, 31, 1535-1551.

Englich, T., Mussweiler, T. and Strack, F. (2005) Playing dice with criminal sentences: the influence of irrelevant anchors on experts' judicial decision making, *Personality and Social Psychology Bulletin*, 32, 188-200.

Glaser, M., Langer, T. and Weber, M. (2005) Overconfidence of professionals and lay men: Individual difference within and between tasks. University of Mannheim working paper. Available from [www.ssrn.com](http://www.ssrn.com).

Handzic, M. (2001) Does more information lead to better informing? *Informing Science, Challenges to Informing Clients: A Transdisciplinary Approach*, June, 251-256.

Heath, F. and Gonzalez, R. (1995) Interaction with others increases decision confidence but not decision quality, *Organisation Behaviour and Human Decision Processes*, 61, 305-326.

Henry, R.A. (1989) Accuracy and confidence in group judgement, *Organisational Behaviour and Human Decision Processes*, 43, 1-28.

Jung, Nadine, Christina Wranke, Kai Hamburger, and Markus Knauff. "How Emotions Affect Logical Reasoning: Evidence from Experiments with Mood-manipulated Participants, Spider Phobics, and People with Exam Anxiety." *Frontiers in Psychology* 5 (2014): n. pag. Web.

Keen, S. (2001) *Debunking economics: The Naked Emperor of the Social Sciences*. Zeb Books.

Koehler, D.J. and Poon, S.K. (2006) Self-predictions overweight strength of current intentions, *Journal of Experimental Social Psychology*, 42, 517-524.

Kruger, J. and Dunning, D. (1999) Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments, *Journal of Personality and Social Psychology*, 77, 1121-1134.

Langer, E.J. (1975) The illusion of control, *Journal of Personality and Social Psychology*, 32(2), 311-328.

Langer, E.J. and Roth, J. (1975) Heads I win, tails it's chance: The illusion of control as a function of the sequence of outcomes in a purely chance task. *Journal of Personality and Social Psychology*, 32(6), 951-955.

Lo, A.W., Repin, D.V. and Steenbarger, B.N. (2004) Fear and greed in financial markets: A clinical study of day-traders. MIT Sloan working paper no. 4534-05. Available from [www.ssrn.com](http://www.ssrn.com).

Loewenstein, G. and Adler, D. (1995) A bias in the prediction of tastes, *Economic Journal*, 105(431) 929-37.

Marriage, Madison. "86% of Active Equity Funds Underperform." *Financial Times* [London] 20 Mar. 2016: n. pag. Print.

Montier, James. *Behavioural Investing: A Practitioners Guide to Applying Behavioural Finance*. Chichester, UK: John Wiley & Sons, 2007. Print.

Ono, K. (1987) Superstitious behaviour in humans, *Journal of Experimental Analysis of Behaviour*, 47, 261-271.

Oskamp, K. (1965) Overconfidence in case-study judgements, *Journal of Consulting Psychology*, 29, 261-265.

Shefrin, H. and Statman, M. (1985) The disposition to sell winners too early and ride losers too long: Theory and evidence, *Journal of Finance*, 40(3), 777-790.

- Shiller, R.J. (1987) Investor behavior in the October 1987 Stock Market Crash: Survey evidence. Reprinted in Shiller, R.J. (1989) Market Volatility. MIT Press.
- Shiv, B., Loewenstein, G. and Bechara, A. (2005) The dark side of emotion in decision-making: when individuals with decreased emotional reactions make more advantageous decisions, *Cognitive Brain Research*, 23, 85-92.
- Simons, D.J. and Chabris, C.F. (1999). Gorillas in our midst: Sustained inattention blindness for dynamic events, *Perception*, 28(9), 1059-1074.
- Simonsohn, U., Karlsson, N., Loewenstein, G. and Ariely, D. (2004) The tree of experience in the forest of information. Available from [www.ssrn.com](http://www.ssrn.com).
- Skinner, B.F. (1947) Superstition in the pigeon, *Journal of Experimental Psychology*, 38.
- Torngren, G. and Montgomery, H. (2004) Worse than chance? Performance and confidence among professionals and laypeople in the stock market, *Behavioural Finance*, 5(3).
- Tversky, D.W. and Griffin, A. (1992) The weighing of evidence and the determinants of confidence, *Cognitive Psychology* 24, 411-435.
- Tversky, A. and Kahneman, D. (1974) Judgement under uncertainty: Heuristics and biases, *Science*, 185, 1124-1131.
- Tversky, A. and Kahneman, D. (1983) Extension versus intuitive reasoning: the conjunction fallacy in probability judgement, *Psychological Review*, 90, 293-315.
- Tyska, T. and Zielonka, P. (2002) Expert judgements: Financial analysts versus weather forecasters, *Psychology and Financial Markets*, 3(3), 152-160.
- Ung, Daniel, Rodney Fernandes, and Bryan Hahn. Spiva Europe Scorecard. Rep. N.p.: S&P Dow Jones Indices, 2015.