

WARWICK BUSINESS SCHOOL

# Can Google predict the stock market?



**Tobias Preis**  
<http://www.tobiaspreis.de>

# Financial markets: "big data"

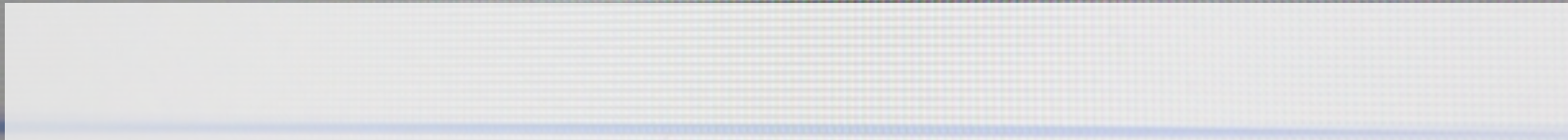


A close-up photograph of a MacBook Pro keyboard. The keys are black with white characters. The screen above the keyboard is visible, showing the Google logo in its multi-colored font. The text "MacBook Pro" is faintly visible on the bezel below the screen.

Google

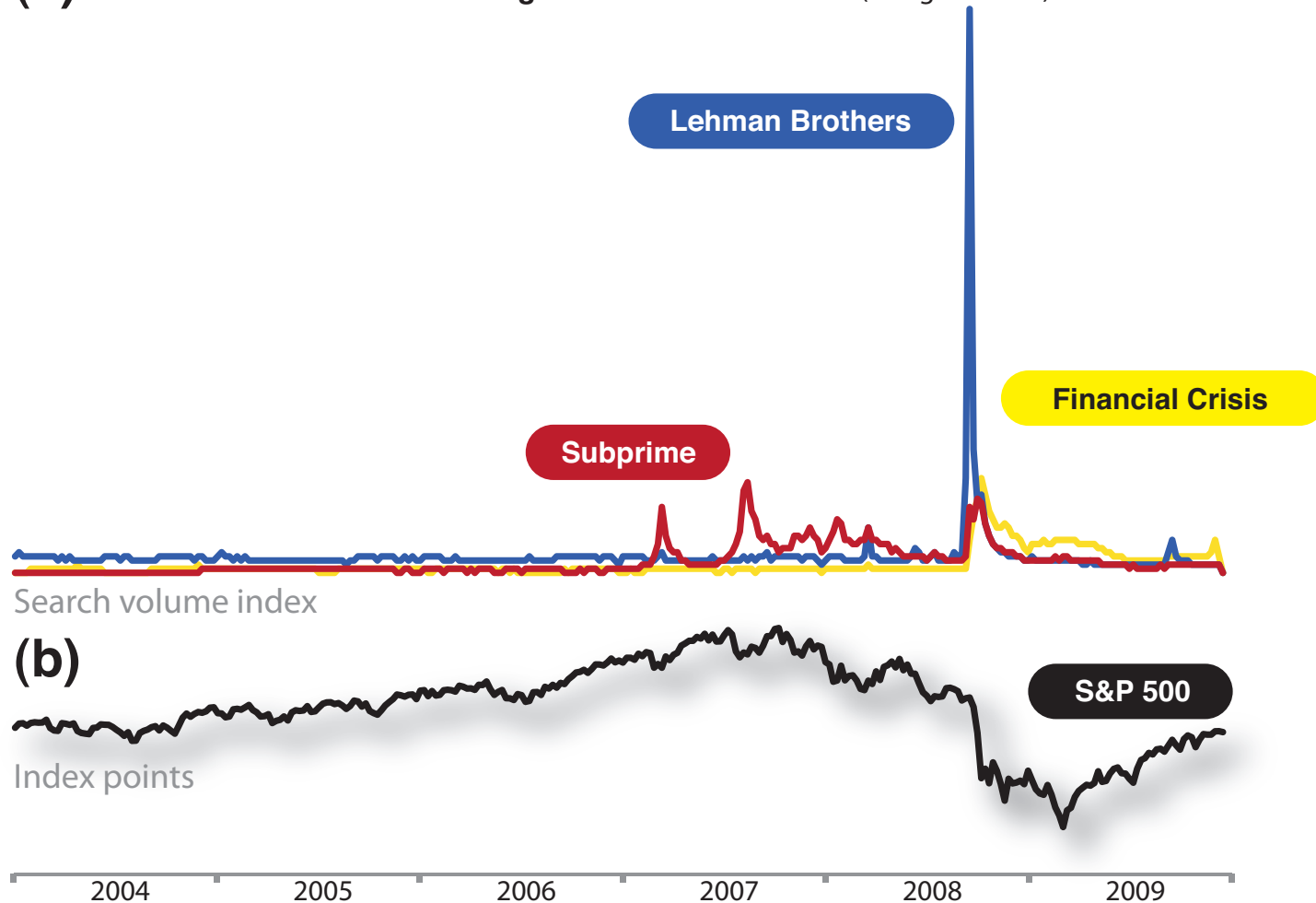
The internet: "big data"

# What *Google* knows about markets



# Google search volume data

(a) Public interest in stock exchange related search words (Google Trends)



Preis, Reith & Stanley, *Phil. Trans. R. Soc. A* 368, 5707 (2010)

Covered by

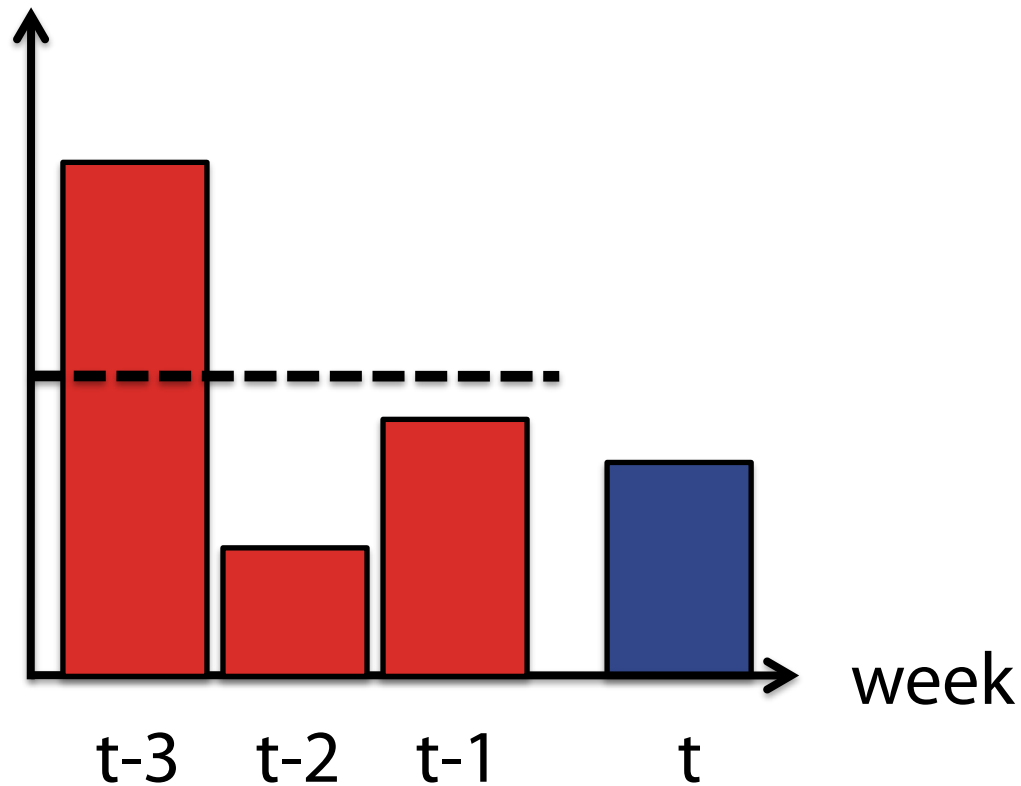
TIME

CNN

Science

# Google Trends based trading strategy

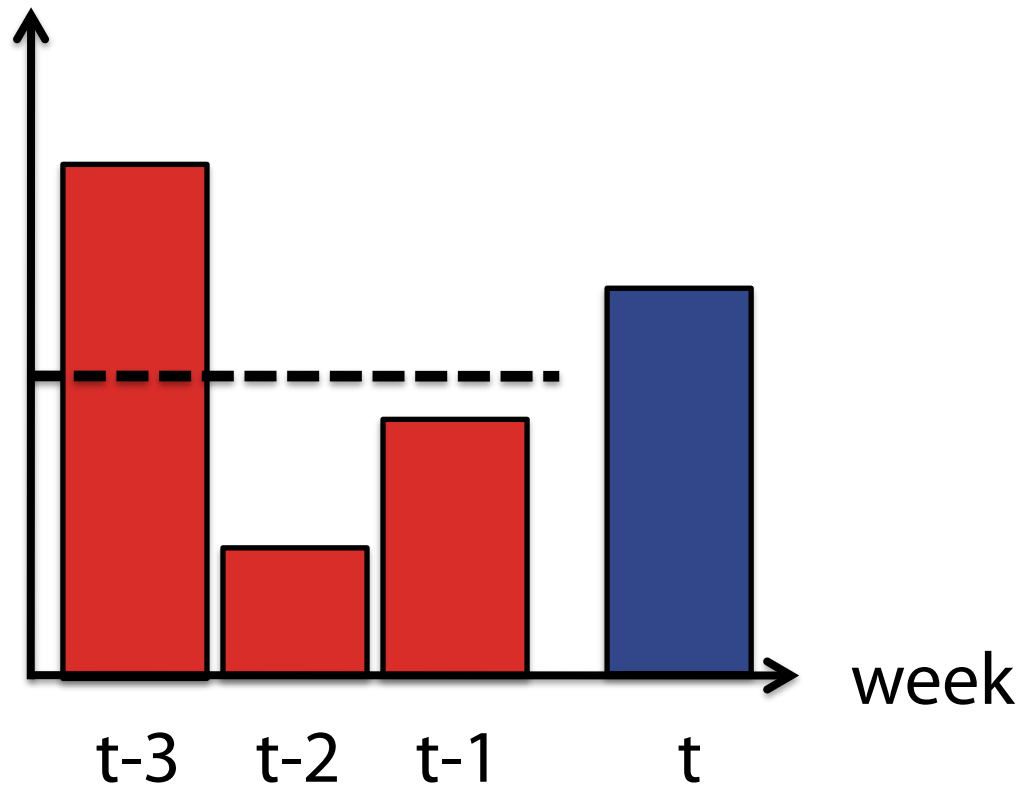
no of Google searches  
for keyword



Search volume  
decreased:  
**BUY** index  
in week t+1

# Google Trends based trading strategy

no of Google searches  
for keyword

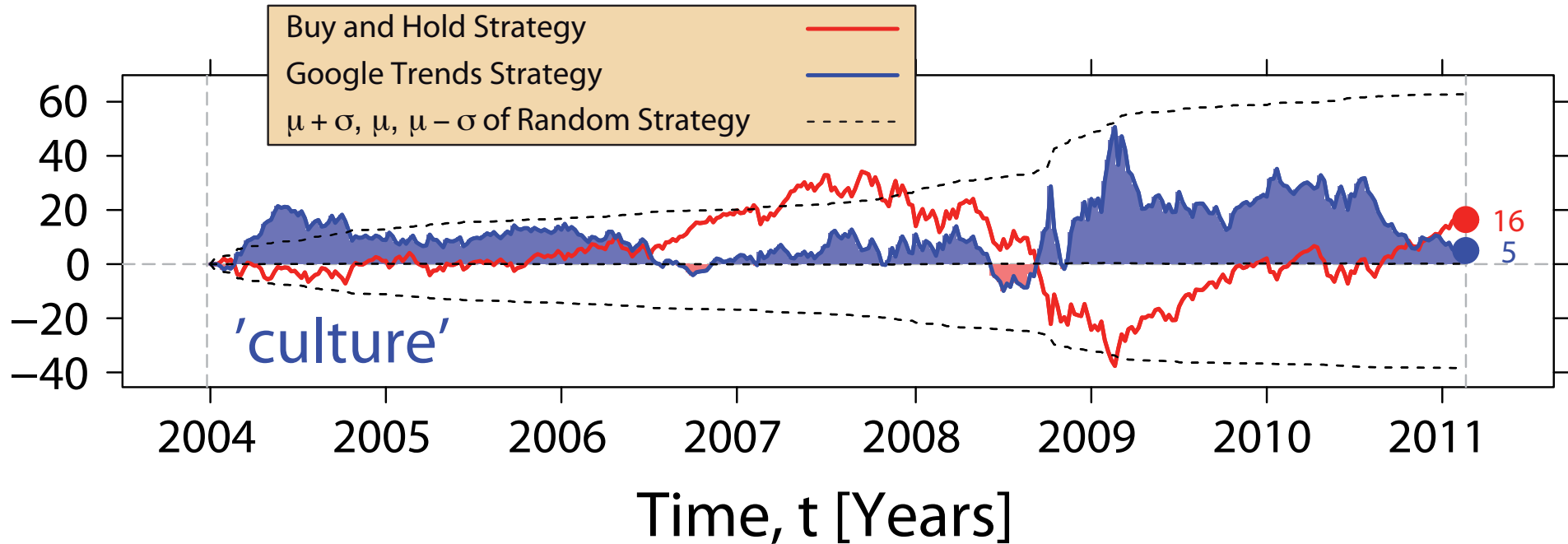


Search volume  
decreased:  
**BUY** index  
in week t+1

Search volume  
increased:  
**SELL** index  
in week t+1

# Google trading strategy for keyword "culture"

Profit and Loss [%]

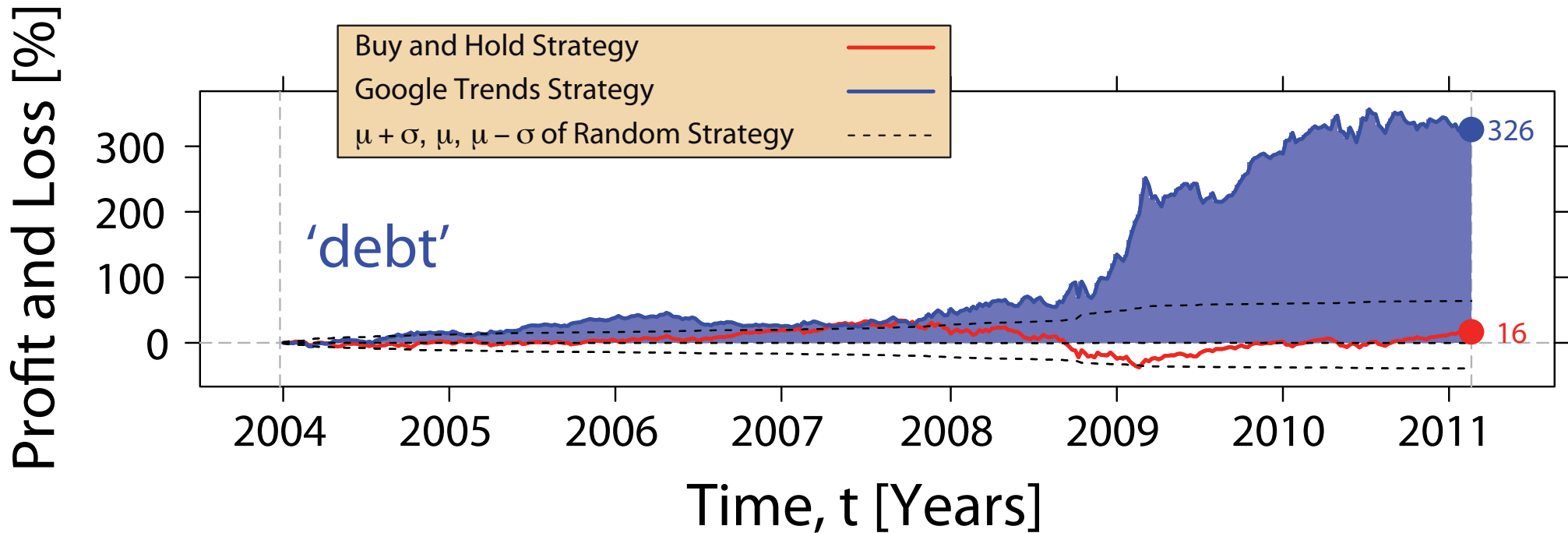


Preis, Moat & Stanley, *Scientific Reports* 3, 1684 (2013)

<http://www.nature.com/srep/2013/130425/srep01684/full/srep01684.html>



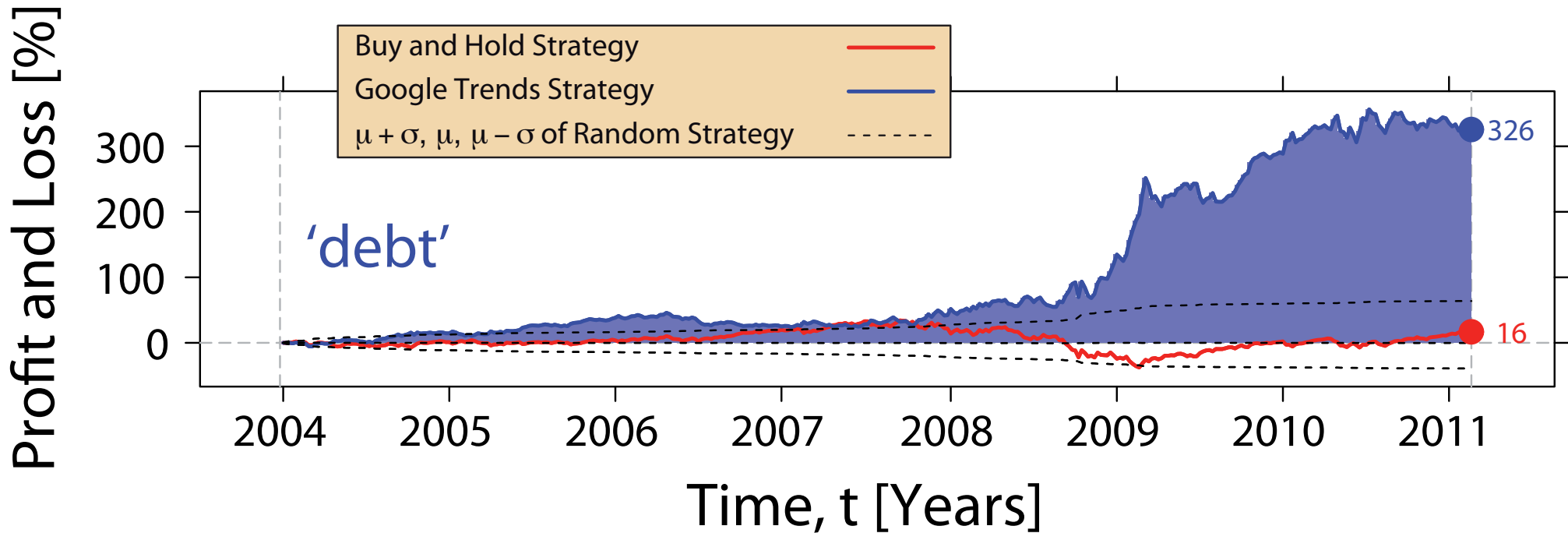
# Google trading strategy for keyword "debt"



Preis, Moat & Stanley, *Scientific Reports* 3, 1684 (2013)

<http://www.nature.com/srep/2013/130425/srep01684/full/srep01684.html>

# Google trading strategy for keyword "debt"



Preis, Moat & Stanley, *Scientific Reports* 3, 1684 (2013)

<http://www.nature.com/srep/2013/130425/srep01684/full/srep01684.html>

Covered by



# Google trading strategy



## Google search delivers new line in revealing stock market behaviour

By Richard Waters in London

Searches of financial terms on Google can be used to predict the direction of the stock market, according to an analysis of search engine behaviour stretching back nearly a decade. The research, by a group of UK and US academics, is the latest attempt to mine online behaviour patterns for clues about future movements in financial markets.

The findings appeared to show that people do more searches on terms such as "stocks", "portfolio" and "economics" when they are worried about the state of the markets, said Tobias Preis, associate professor of behavioural science and finance at Warwick Business School.

Rises in search volumes for such terms are generally followed by stock market declines, according to the research pub-

lished in the journal *Scientific Reports*. By contrast, a fall in financial searches often points to investor optimism, leading to a rising market. With hindsight, trading on the basis of Google search volumes would have led to significant gains, Mr Preis said. A short-term trading strategy constructed around searches for "debt", for instance, would have returned 326 per cent between 2004 and 2011.

Google releases data each week showing the volume of searches for specific keywords, providing the raw material for the analysis. The availability of large data sets has given rise to a rash of "big data" attempts to forecast financial markets, although there is little evidence of such efforts yielding profits.

Much of the experimentation has revolved around trying to deduce market sentiment from comments on social networks.

However, a hedge fund set up to trade on information about market sentiment revealed on Twitter closed after only a month.

Mr Preis warned that the findings might not hold for future stock market movements. Revealing the predictive value of search data could change people's behaviour, neutralising the effect shown by the analysis.

A large amount of "noise" in the data made it hard to isolate individual words that would have predictive value. For instance, the volume of searches for "colour" and "restaurant" appeared to be better guides to future stock movements than terms such as "Dow Jones" and "markets". But the researchers said they honed their sample by checking the daily frequency of a set of financial terms in the *Financial Times*.

Preis, Moat & Stanley, *Scientific Reports* 3, 1684 (2013)

<http://www.nature.com/srep/2013/130425/srep01684/full/srep01684.html>

Covered by

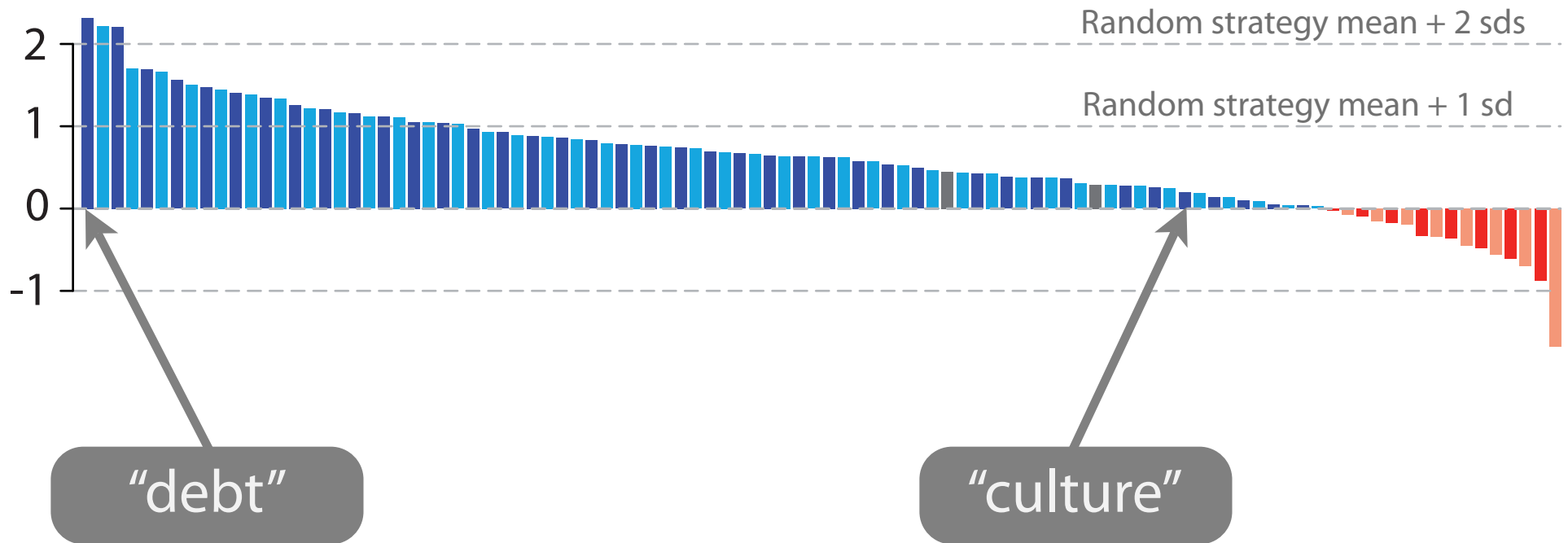


# What makes a keyword successful?



# What makes a keyword successful?

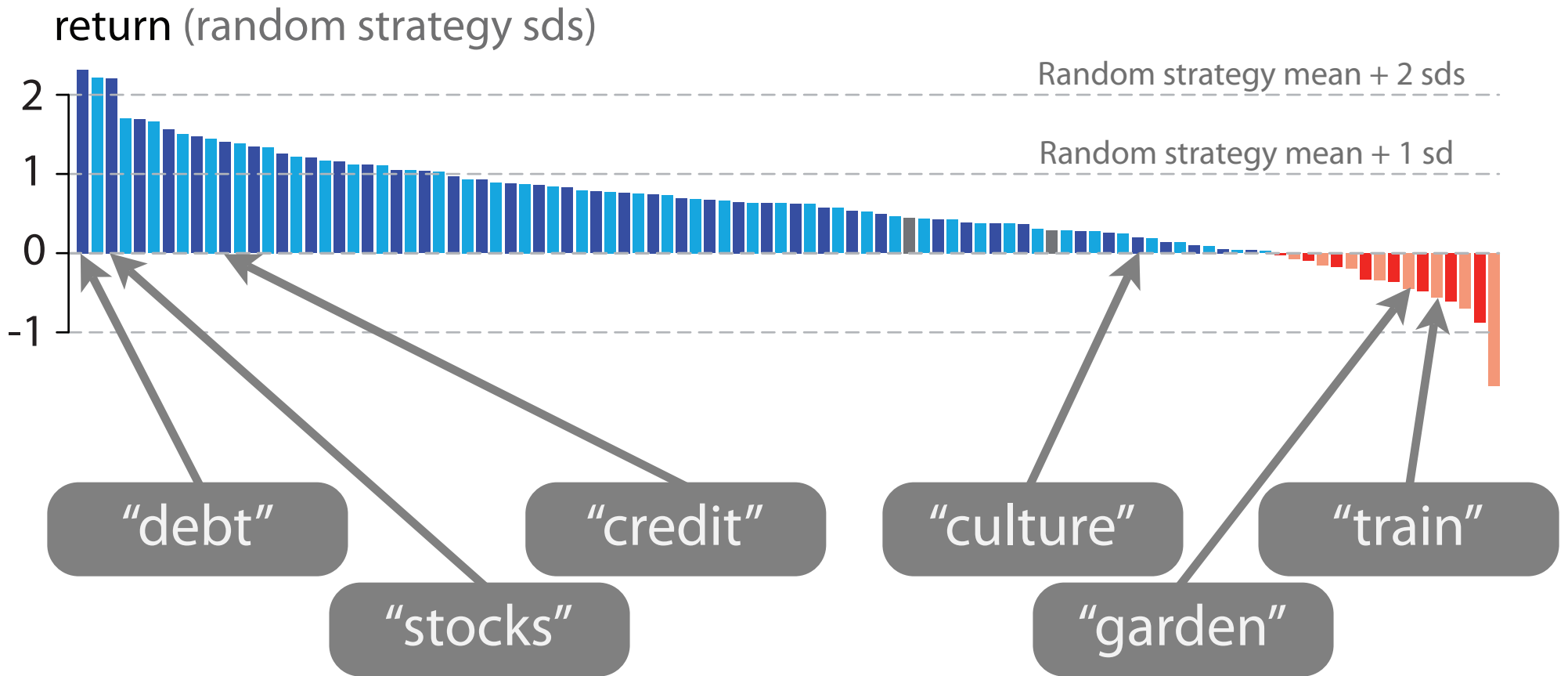
return (random strategy sds)



Preis, Moat & Stanley, *Scientific Reports* 3, 1684 (2013)

<http://www.nature.com/srep/2013/130425/srep01684/full/srep01684.html>

# What makes a keyword successful?

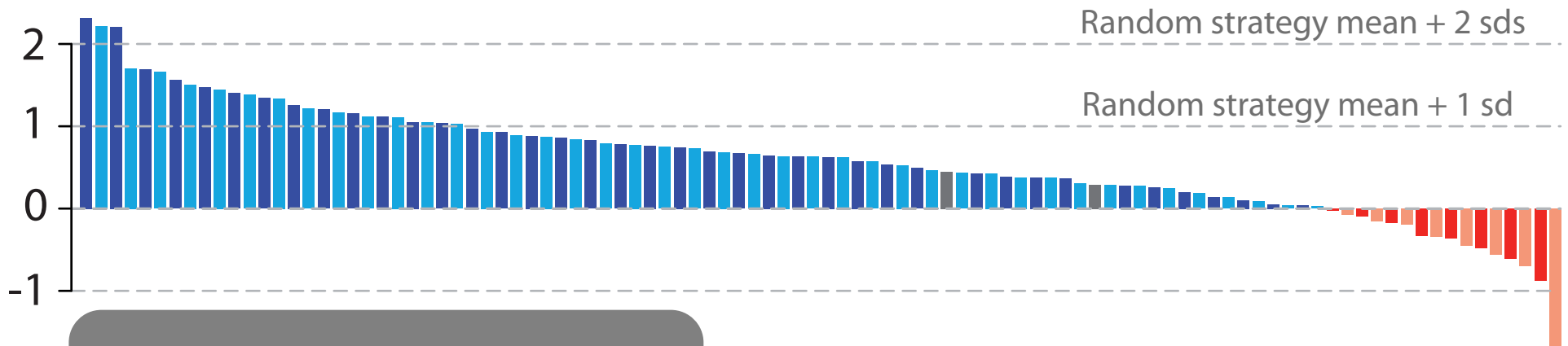


Preis, Moat & Stanley, *Scientific Reports* 3, 1684 (2013)

<http://www.nature.com/srep/2013/130425/srep01684/full/srep01684.html>

# What makes a keyword successful?

return (random strategy sds)



Financial relevance

$$\frac{\# \text{ occurrences in FT}}{\# \text{ hits on Google}}$$

Significantly correlated with returns

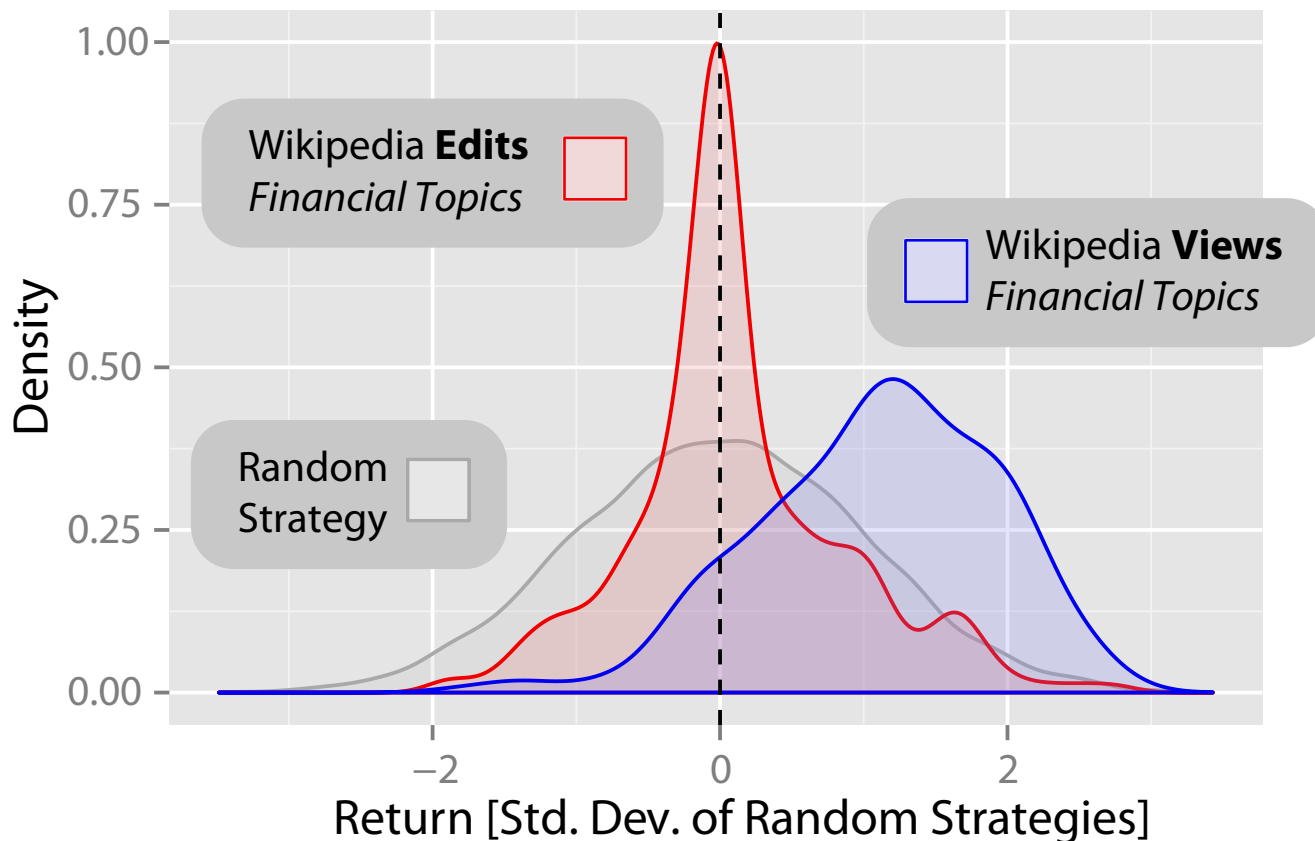
Preis, Moat & Stanley, *Scientific Reports* 3, 1684 (2013)

# What *Wikipedia* knows about markets





# Wikipedia: Financial topics



Views strategies  
profitable

Moat, Curme, Avakian, Kenett, Stanley & Preis, Scientific Reports 3, 1801 (2013)

<http://www.nature.com/srep/2013/130508/srep01801/full/srep01801.html>

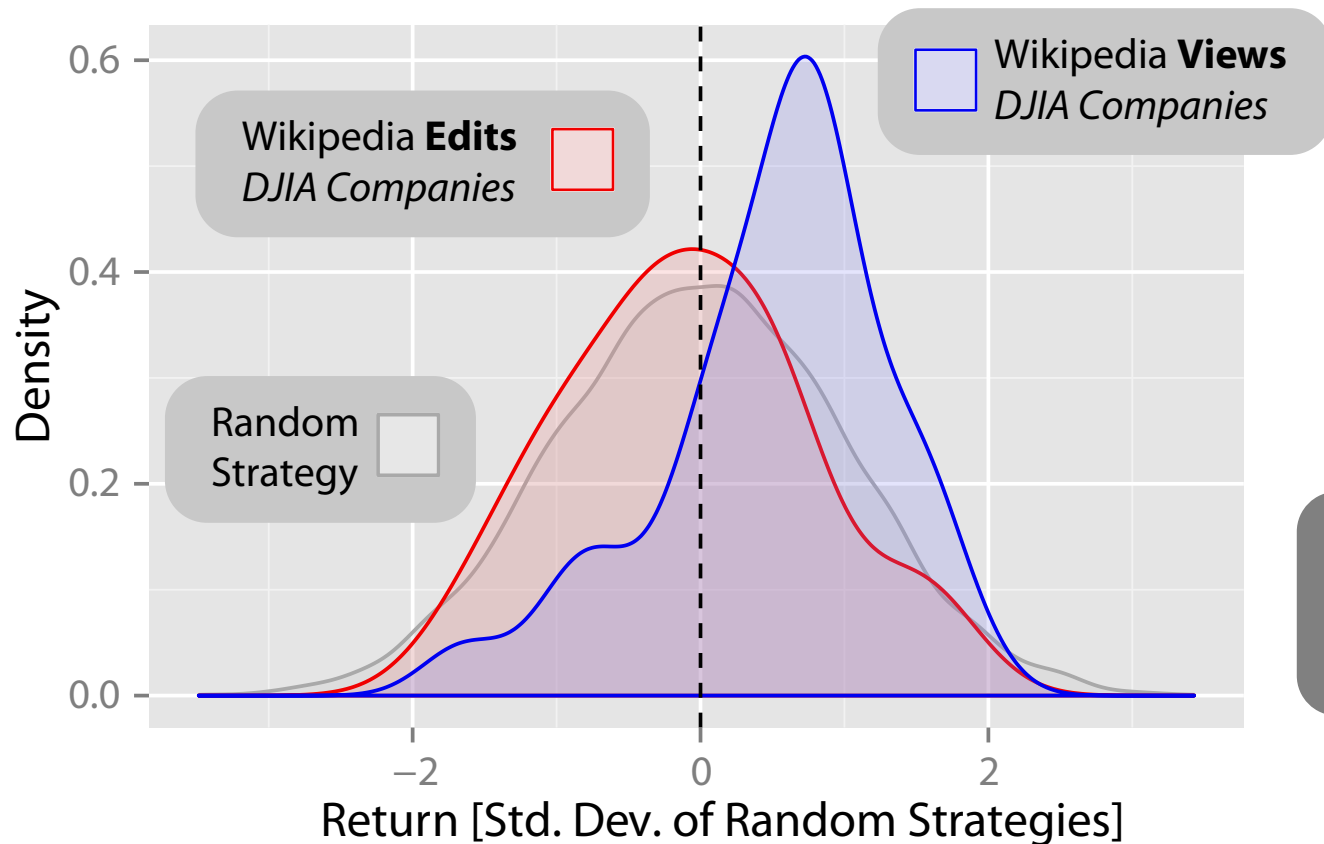
Covered by

WIRED

FT

The Washington Post

# Wikipedia: Dow Jones companies



Views strategies  
profitable

Moat, Curme, Avakian, Kenett, Stanley & Preis, Scientific Reports 3, 1801 (2013)

<http://www.nature.com/srep/2013/130508/srep01801/full/srep01801.html>

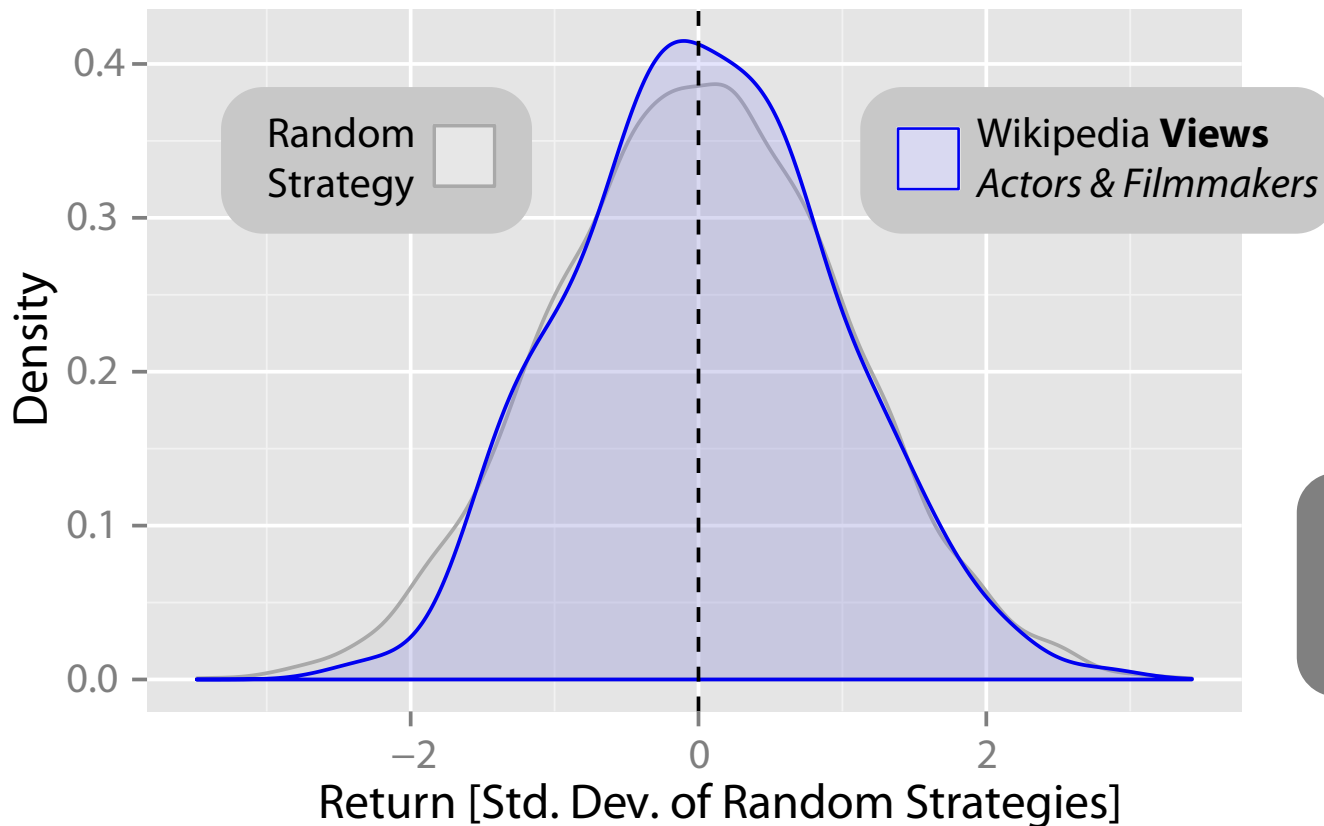
Covered by

WIRED

FT

The Washington Post

# Wikipedia: Actors and filmmakers?



Strategies NOT profitable

Moat, Curme, Avakian, Kenett, Stanley & Preis, Scientific Reports 3, 1801 (2013)

<http://www.nature.com/srep/2013/130508/srep01801/full/srep01801.html>

Covered by

WIRED

FT

The Washington Post

Google

<http://www.tobiaspreis.de>