

Can Online Data Anticipate Economic Behaviour?

Suzy Moat

Warwick Business School

Suzy.Moat@wbs.ac.uk

With Tobias Preis, Chester Curme,
Adam Avakian, Dror Kenett and Gene Stanley

Financial markets: “big data”





Google

MacBook Pro

The Internet: “big data”

Decision making

information
gathering



action

Google™



The Google logo is displayed on a laptop screen, with the letters in their characteristic multi-colored font. The screen is part of a MacBook Pro, as indicated by the text on the bezel.

Google

MacBook Pro

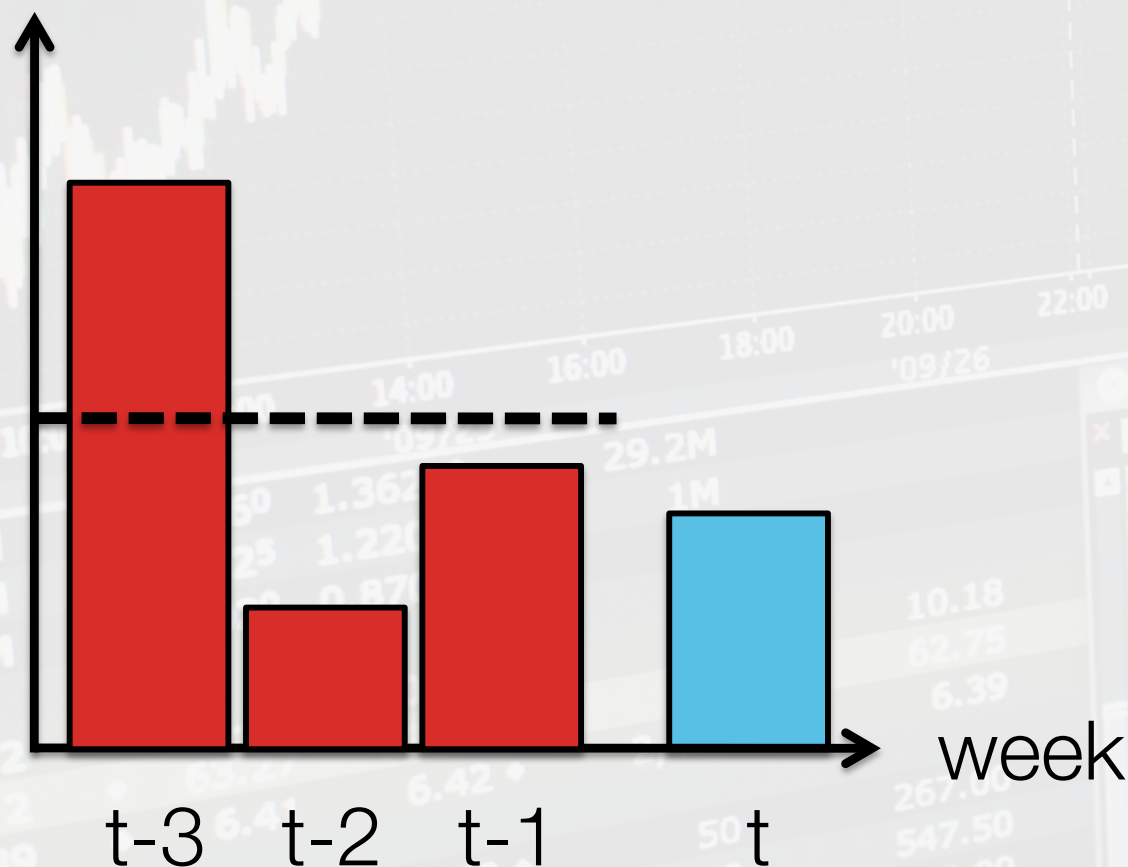
1

Does Google data anticipate
stock market moves?

Hypothetical trading strategy

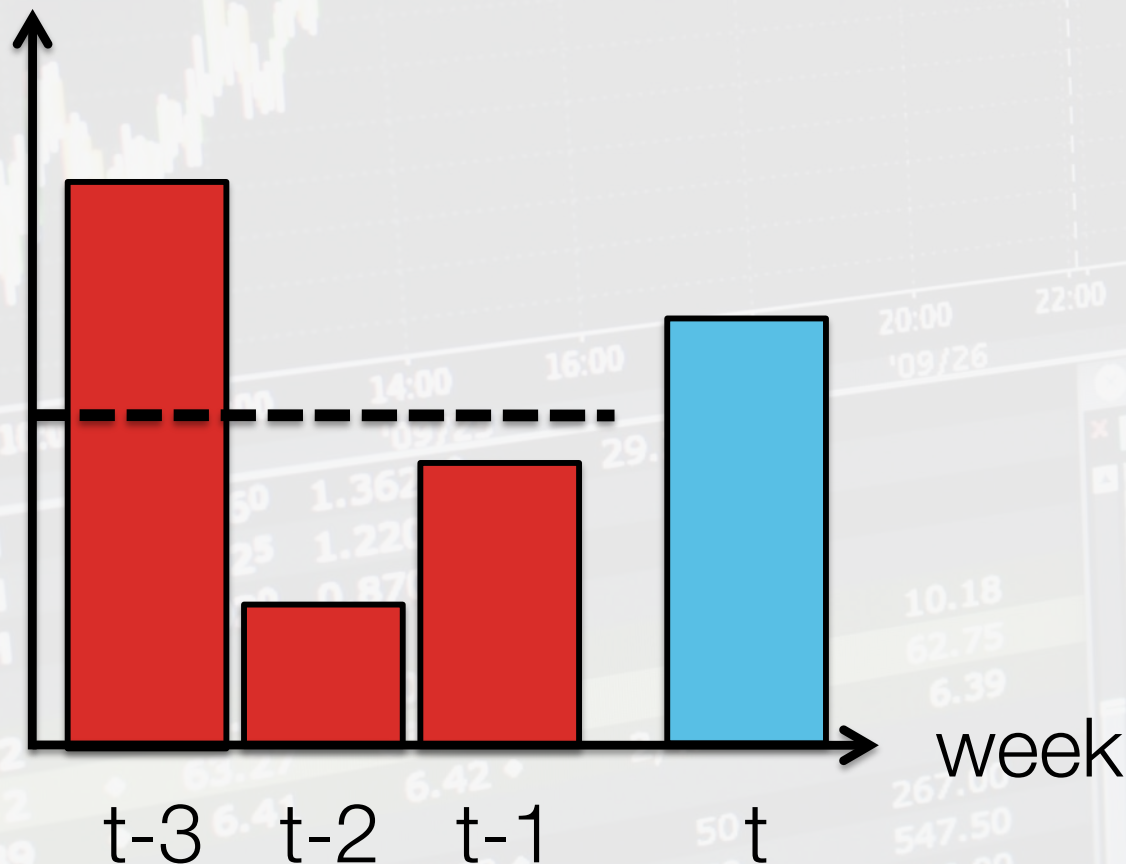
number of Google searches
for keyword

Search volume
decreased:
BUY stock
in week $t+1$



Hypothetical trading strategy

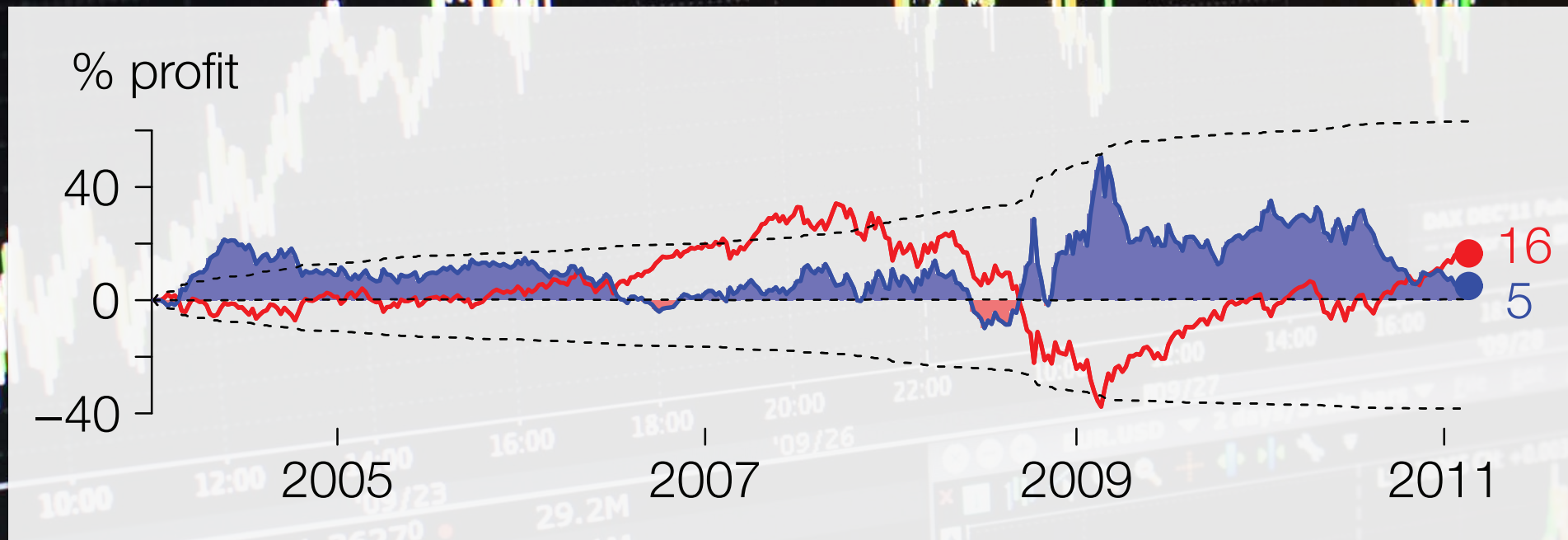
number of Google searches
for keyword



Search volume
decreased:
BUY stock
in week $t+1$

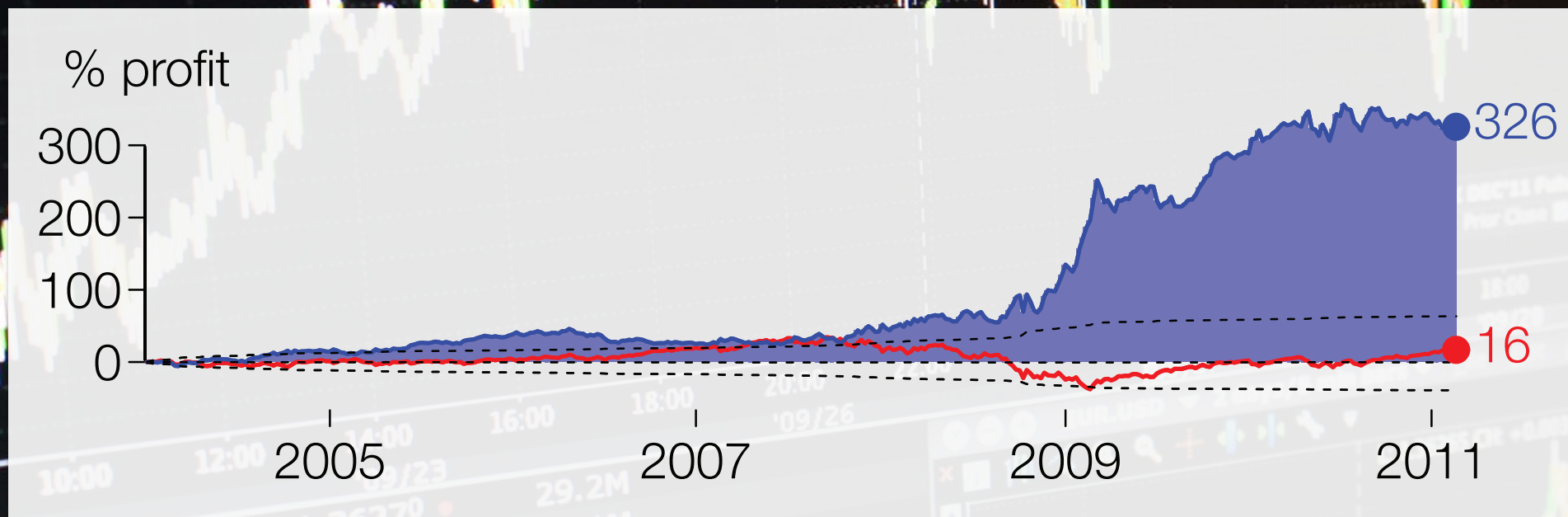
Search volume
increased:
SELL stock
in week $t+1$

Example: “culture”



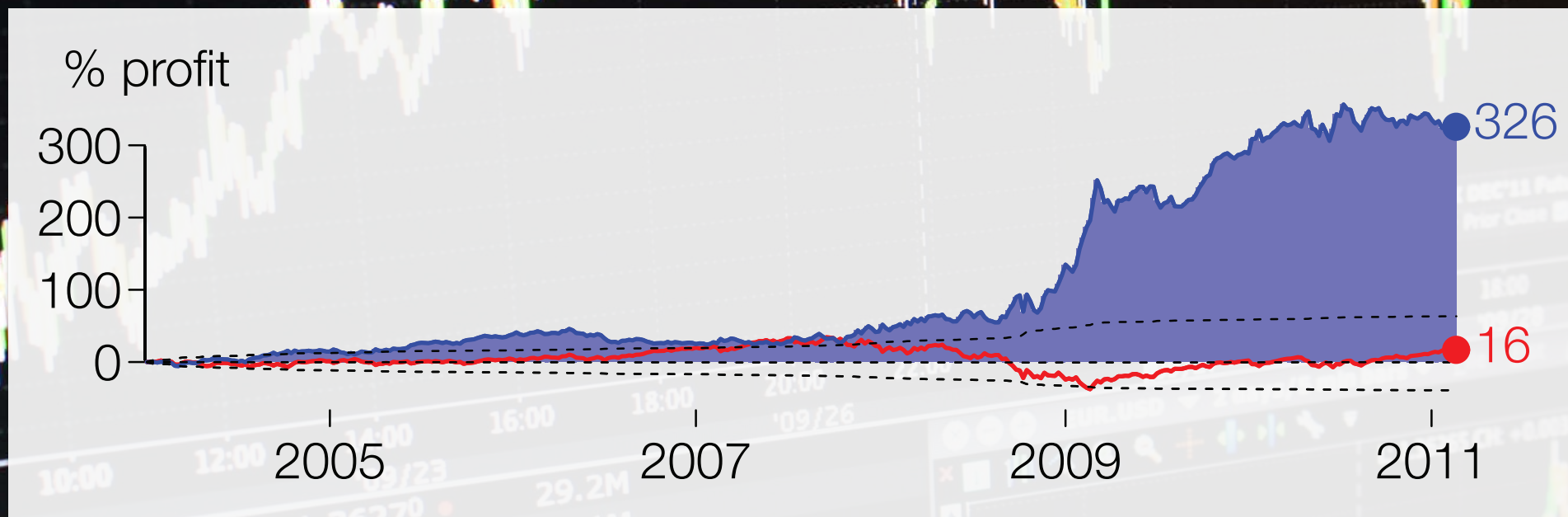
“culture” trading strategy
buy and hold strategy
mean \pm 1 sd of random strategies

Example: “debt”



— “debt” trading strategy
— buy and hold strategy
--- mean ± 1 sd of random strategies

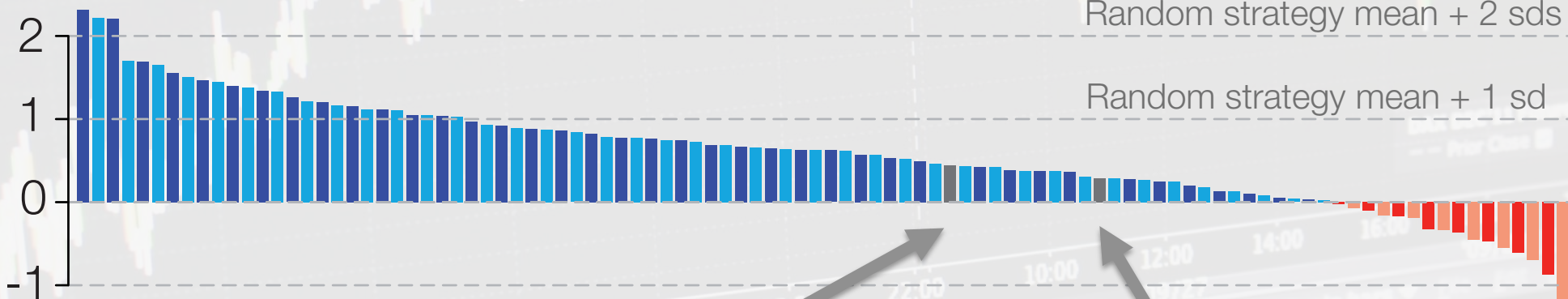
Example: “debt”



“debt” strategy: 326% profit

All strategies tested

return (random strategy sds)



“Dow Jones”
strategy

buy and hold
strategy



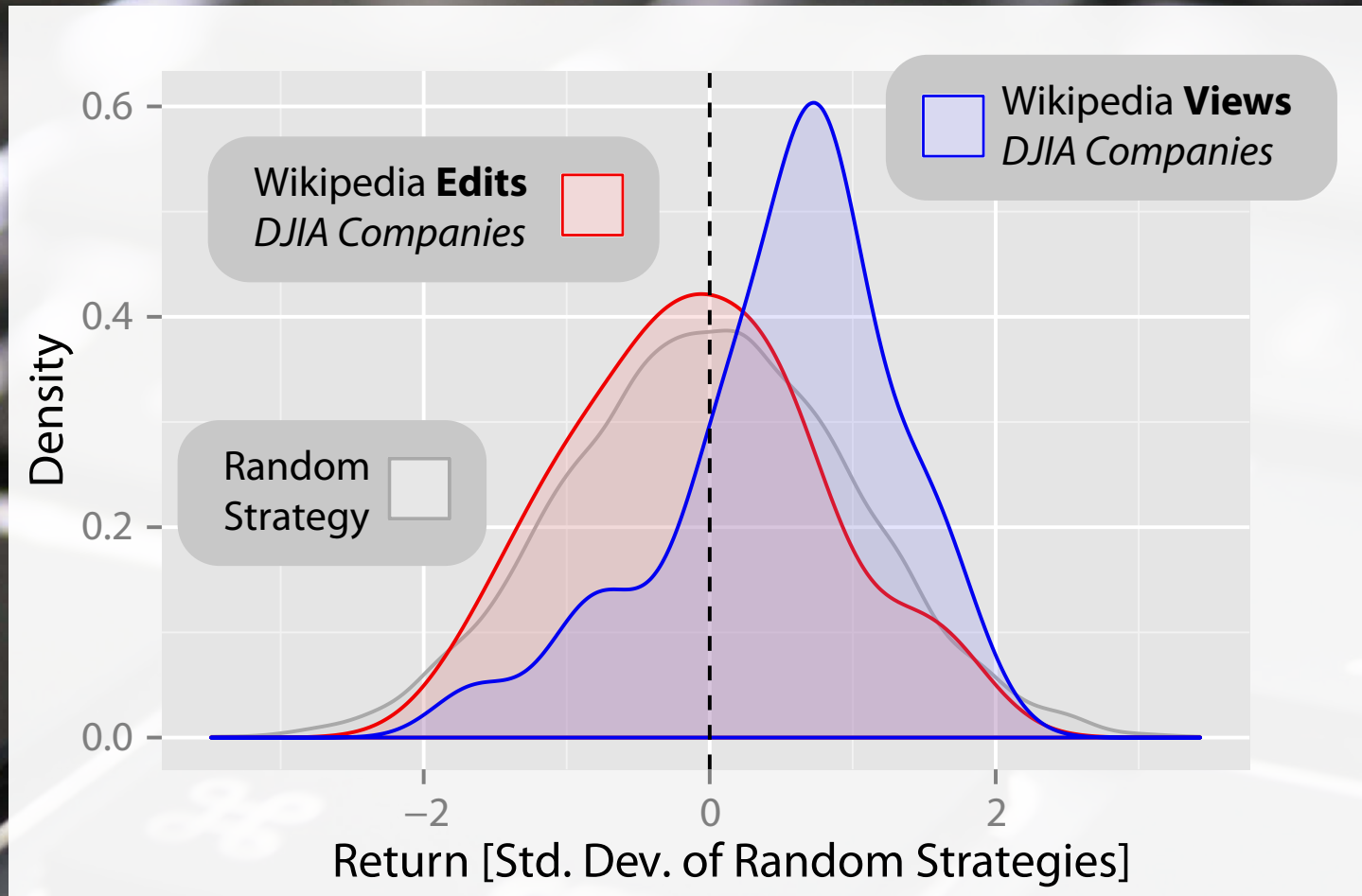
Google

MacBook Pro

2

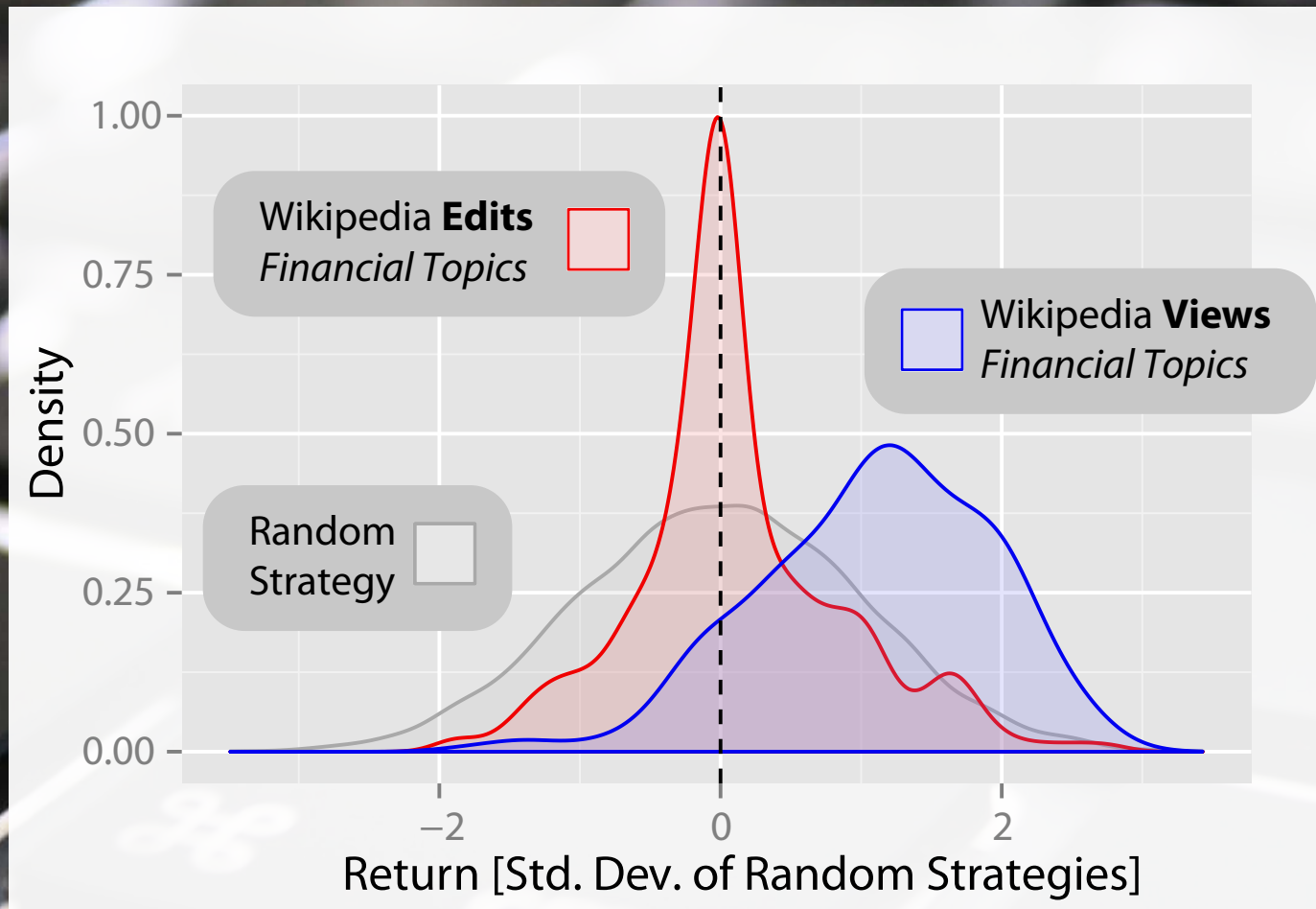
Does Wikipedia data anticipate
stock market moves?

Wikipedia: Dow Jones companies



Strategies profitable

Wikipedia: Financial topics



Strategies profitable

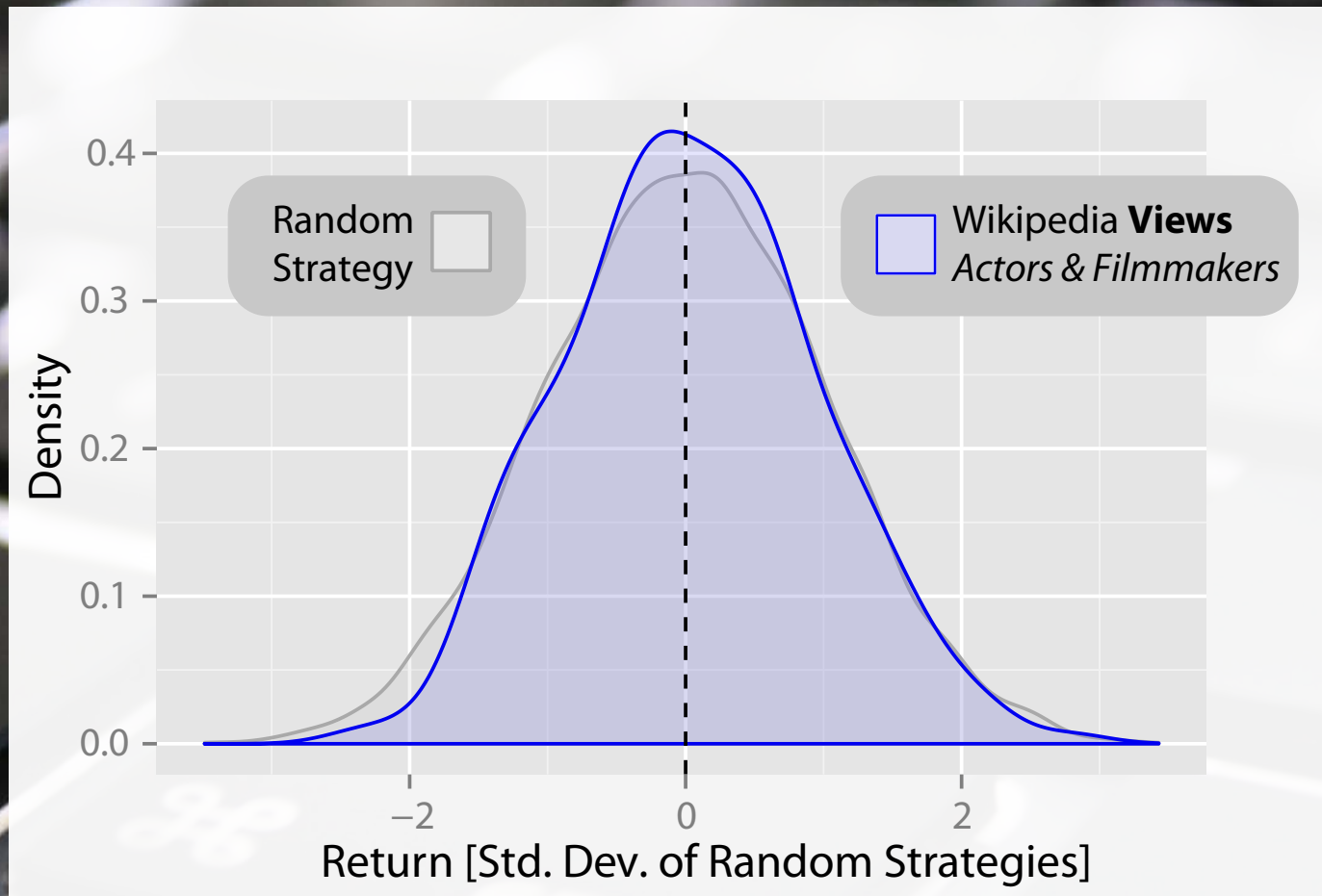
A close-up, slightly blurred photograph of a MacBook Pro. The screen displays the Google logo in its multi-colored font. The laptop's keyboard is visible in the foreground, and the 'MacBook Pro' text is faintly visible on the bezel below the screen.

Google

3

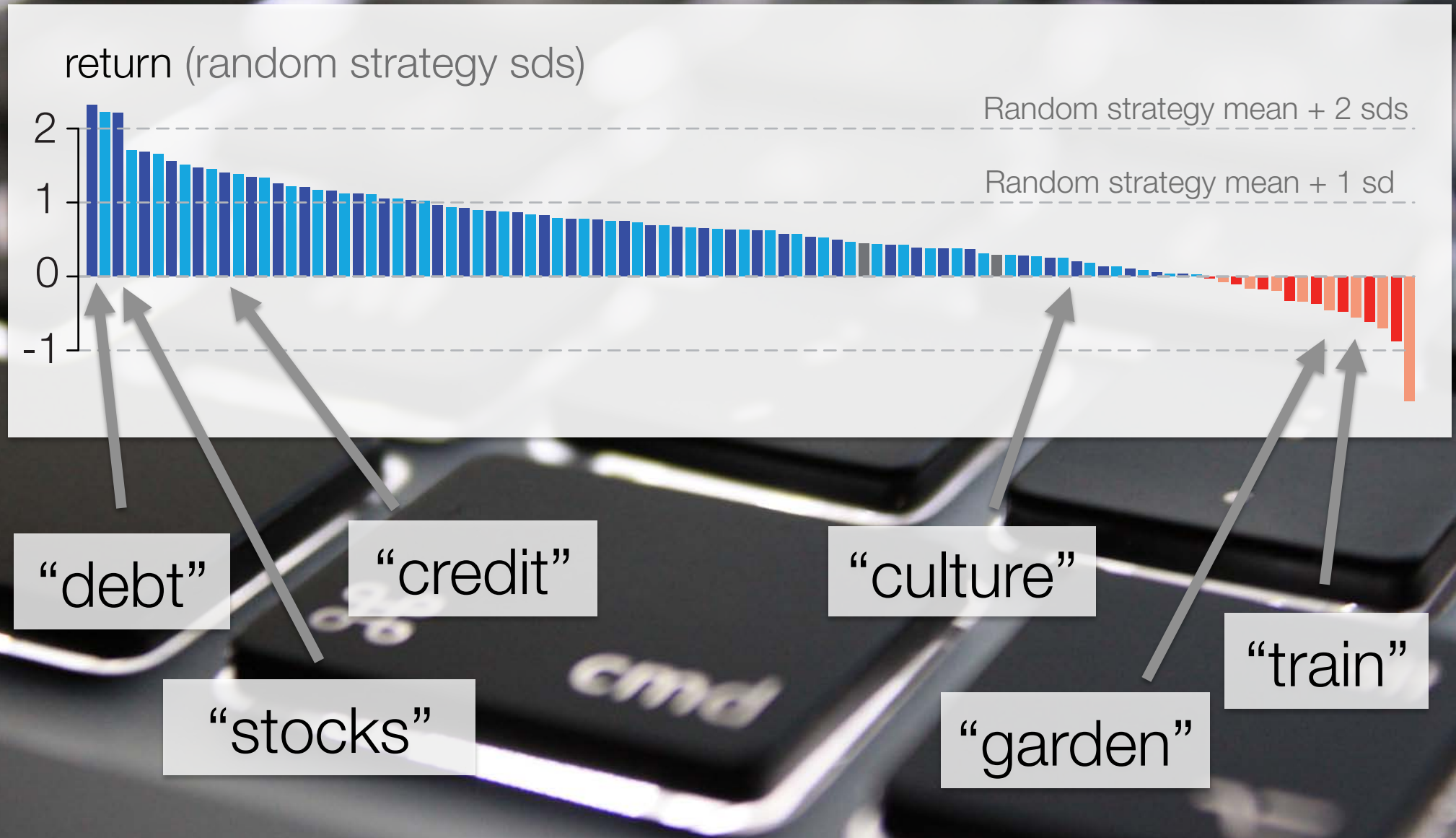
Which topics are searched for before market falls?

Wikipedia: Actors and filmmakers?

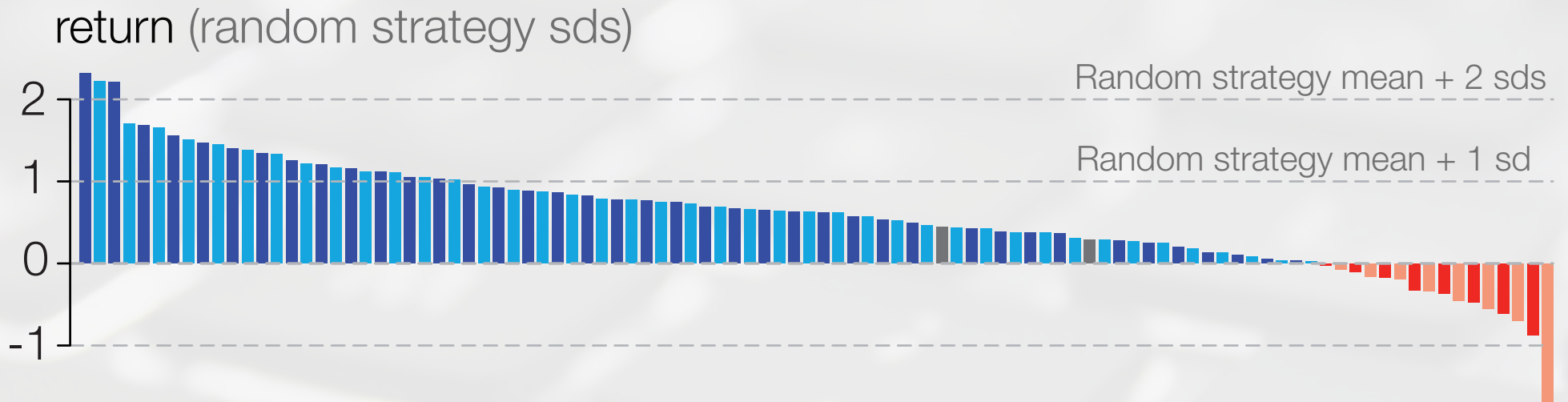


Strategies NOT profitable

What is searched for before falls?



What is searched for before falls?



Financial relevance

occurrences in FT

hits on Google

Returns significantly correlated with indicator of financial relevance but more explanation needed

What is searched for before falls?

debt

housing

crisis

apple

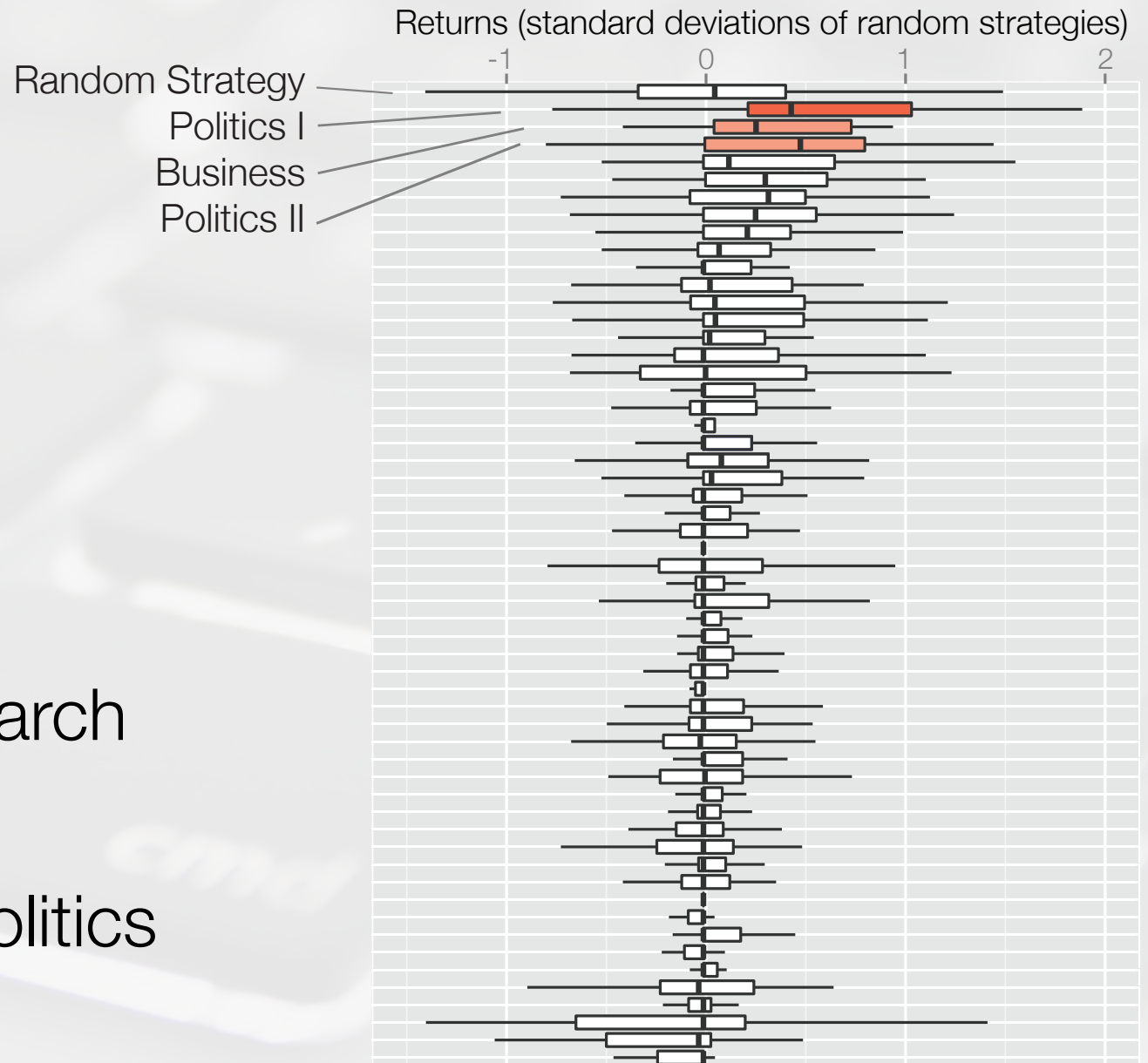
orange

tree

housing

debt

What is searched for before falls?



55 groups of search
terms

Business and politics
most related

Summary

- What we look for online may anticipate what we decide to do later in the real world

- Curme, C., Preis, T., Stanley, H. E., & Moat, H. S. (submitted) Quantifying the semantics of search behavior before stock market moves.
- Moat, H. S., Curme, C., Avakian, A., Kenett, D.Y., Stanley, H. E., & Preis, T. (2013). Quantifying Wikipedia usage patterns before stock market moves. *Scientific Reports*, 3, 1801.
- Moat, H. S., Preis, T., Olivola, C.Y., Liu, C. & Chater, N. (in press). Using big data to predict collective behavior in the real world. *Behavioral and Brain Sciences*.
- Preis, T., Moat, H. S., & Stanley, H. E. (2013). Quantifying trading behavior in financial markets using Google Trends. *Scientific Reports*, 3, 1684.