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A3. MARKET EFFICIENCY & BEHAVIOURAL FINANCE

FINANCIAL MARKETS AND INSTITUTIONS

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TOPICS

- ARE MARKETS EFFICIENTS?
- ECONS VS HUMANS: DEVELOPMENTS IN BEHAVIOURAL FINANCE

EFFICIENT MARKET HYPOTHESIS

You live in a perfectly efficient market. You see on the sidewalk a 20€ banknote.
Do you pick it up?

Not 0% or 100%!

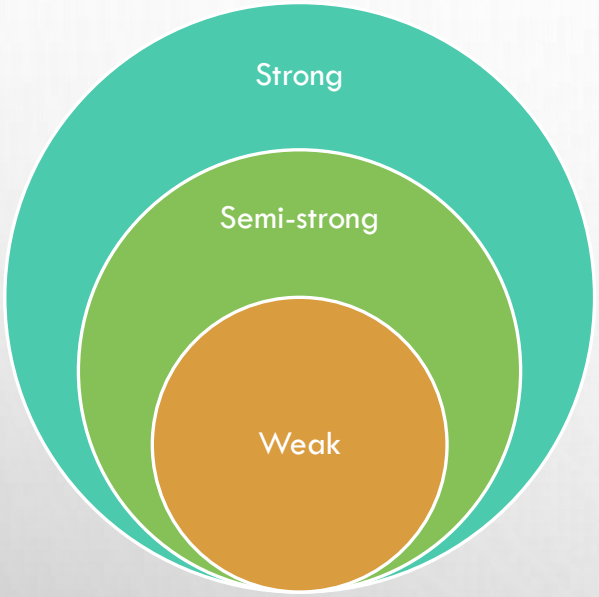
Assumptions:

- prices fully reflect all available information
- expectations are the best (combined) forecast, and provide efficiency through buying/selling decisions
- arbitrage is possible and quickly eliminates profit opportunities: few arbitrageurs seeking "easy" profits contribute to the overall efficiency

Different forms:

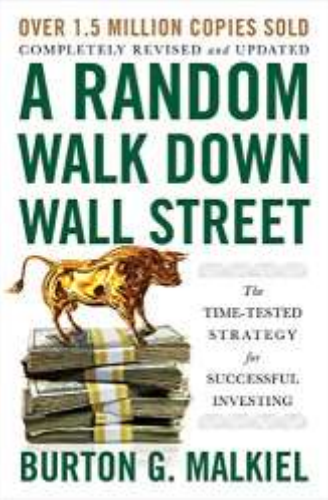
- **Allocative efficiency**: operators maximise their utility and grant funds to be transferred achieving the best total utility
- **Technical efficiency**: frictions, barriers, transaction costs
- **Pricing efficiency**: the value of assets reflects the best forecast based on current information
- **Informative efficiency**: the market, as the results of the joint efforts of operators, can not be "beaten"

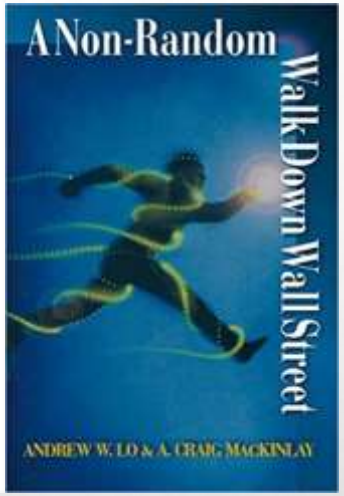
EFFICIENT MARKET HYPOTHESIS



Forms of informative efficiency:

- **Weak:**
  - Prices are a function of past prices
  - Outperformers only by chance
  - Paths are not foreseeable
- **Semi-strong:**
  - Prices incorporate public information
  - Only insiders can outperform (or by chance)
- **Strong:**
  - Prices reflect ALL information
  - Outperformance only by chance





Nobel 2013: **Fama** (efficiency tests and asset pricing), **Shiller** (efficiency and bubbles), **Hansen** (stochastic discounting in asset pricing)

ANY PROOF?

You have 5,000 £ and want to invest in UK stocks, who would you hire?

- Mark Goodson, expert financial advisor -2,6%

- Christeen Skiller, international astrologist -5,3%

- Tia Laverne Roberts, smart 4 years old +0,7%

Results after one week?
(Experiment of R. Wiseman, 2001)

Evidence **supporting** EMH:

- Investment analysts, technical analysts and mutual fund managers do not perform better than random assets
- Past good performances do not support good performances in the future
- Positive announcements on publicly available information do not influence assets' performance
- Extremely good performances across time are linked with insider trading, private information or market influence
- Future changes in stock prices are unpredictable and seem to follow a random walk

SETTLED THEN?

Evidence against the EMH:

- Small firms have higher returns in the long run, even controlling for their risk; explanations vary widely (tax effects, liquidity effects, transaction costs)
- January effect, probably due to taxes (deduct losses by selling at years' end and repurchase later increasing assets' prices), and similar (Halloween, …)
- Overreactions to new bad unexpected information, slow adjustments to correct prices later or with new data
- Market volatility is higher than changes in fundamentals (f.i. dividends)
- Stocks with low historical returns seem to perform better in the future and those with good past performances will do worse (mean reversion)

OF COURSE! BUBBLES, FRAUDSTERS, … RIGHT?

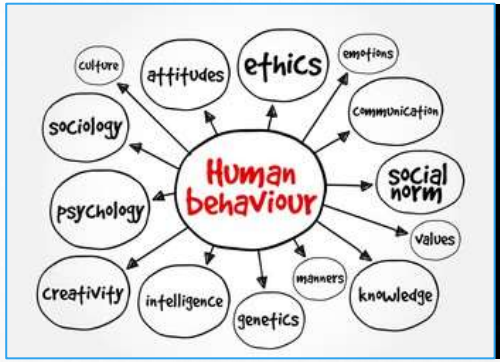
Assets' booms or crashes and investor's good tracks are anti-EMH?

- <u>Unexpected new information with impact on fundamentals not incremental:</u>
  - accounting frauds or "scandals" (Enron, Parmalat, …)
  - catastrophes (f.i. 9/11, earthquakes, …)
- <u>"Rational" bubbles</u>:
  - expectation of others being ready to pay higher prices → self-fulfilling
  - expectations change (fear), adjustments are quick and sharp
- <u>Some investors seem to overperform</u>:
  - With private information…
  - With market influence/power…
  - With criminal charges…

WE ARE ONLY HUMANS…

Many assumptions of economic theory require:

- rational, perfectly informed and optimally acting operators
- whose behavior is based on optimizing functions (utility, profit, …)



Behavioral finance investigates human behavior in economic and financial decisions, applying concepts of psychology, sociology, etc. in the case of imperfect markets and irrational operators that act on rules of thumb

Example: you are going to watch a 10€ movie and…

- A) you lose the ticket… do you buy it again?
- B) you lose 10€… do you buy the ticket?

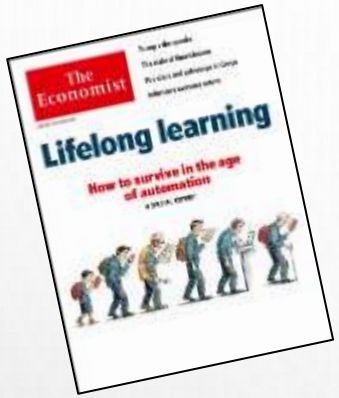
Y	N
46%	54%
88%	12%

shorturl.at/mBIKT

Nobel 2002: **Kahneman** (psychologist) and **Smith,** for studies on behavioural finance.

Nobel 2017: **Thaler,** for his contribution on behavioural economics

ANOTHER EXAMPLE



Example:
Paper subscription

OPTION **A**

- only *online*: **59**$ — **68%**
- *online* & print: **125**$ — **32%**

OPTION **B**

- only *online*: **59**$ — **16%**
- only print: **125**$ — **0%**
- *online* & print: **125**$ — **84%**

BEHAVIOURAL FINANCE IN A NUTSHELL

1. ***Prospect theory***:
   - People «filters» information to cope with complexity
   - People apply «heuristics» that lead to errors and distortions
   - Decisions are the result of both a «fast» (emotional, instinctive) and a «slow» (rational, analytical) cognitive system
   - The same problem, presented differently, leads to different answers (framing)
   - Valuations are based on value and not on expected utility, mostly gains/losses compared to a status quo
   - Gains and losses are perceived asymmetrically (typically 2:1)

BEHAVIOURAL FINANCE IN A NUTSHELL

2. Mental accounting:

- Investors weight differently their money depending on its origin and purpose, not altogether
- Income and wealth are divided in «mental accounts», each with a different propension to being consumed, saved, and a different risk aversion
- These propensions change depending on past results obtained from experience

BEHAVIOURAL FINANCE IN A NUTSHELL

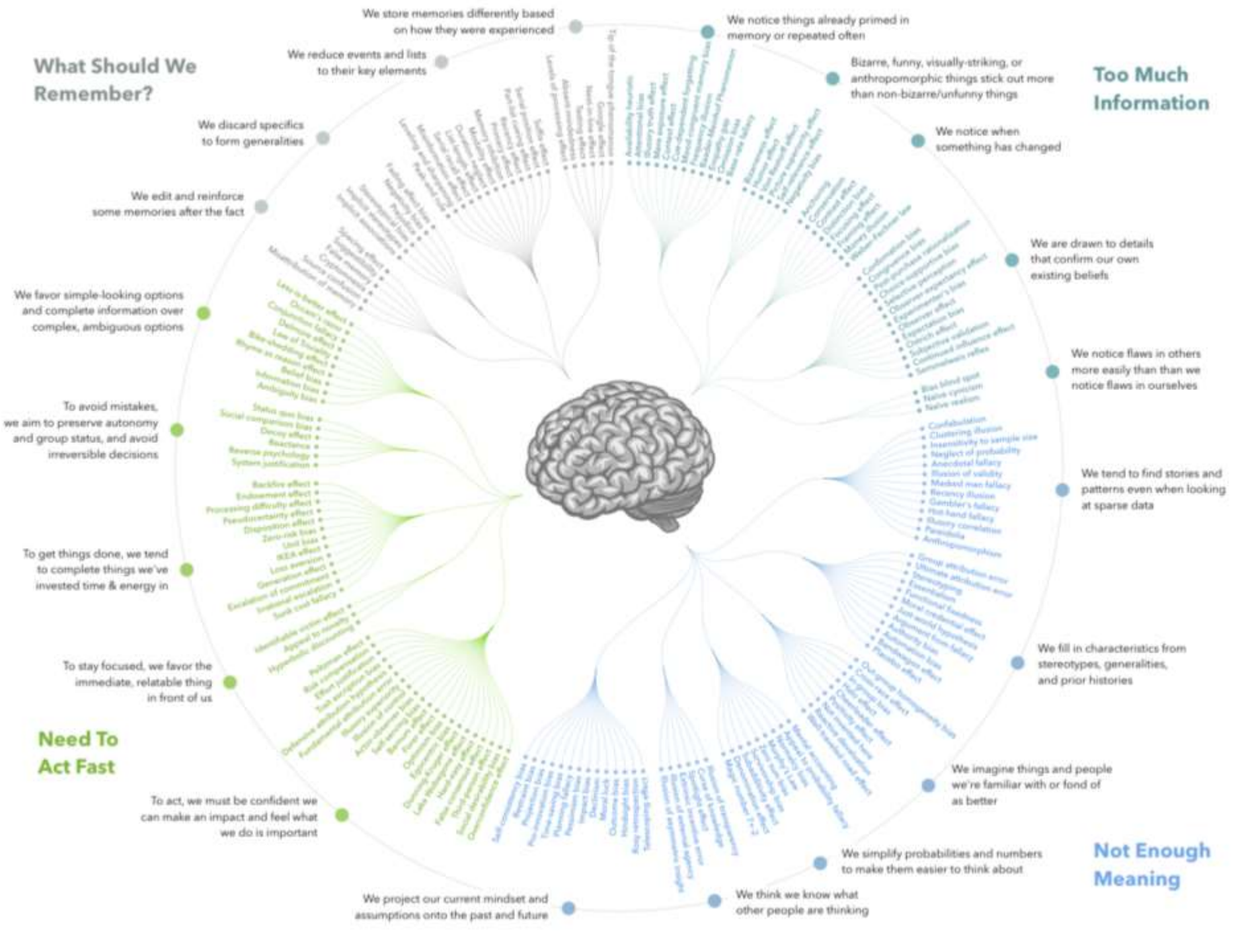
3. (main) Heuristics:

- **Availability:**
  - Likelihood of an event is influenced by how easy it is to recall it from memory
  - In building scenarios, more weight to more familiar experience
- **Representativeness:**
  - Likelihood of an event is influenced by prejudice and stereotypes, or how similar to other known events it is
- **Anchoring:**
  - Valuations are formed from an initial/starting value as deviations from it, even if the anchor is meaningless

BEHAVIOURAL FINANCE IN A NUTSHELL

4. (selection of) **Behavioural bias:**

- *Overconfidence, optimism on future scenarios*
- *Confirmation bias*: looking only for information supporting one's beliefs
- *Attribution bias*: successes are my doing, failures are not my fault
- *Herd behaviour:* «we can't be all wrong!»
- *Hindsight*: overvaluing ex-post one's ability to see cause-effect links
- *Endowment:* we overvalue things we own
- *Regret aversion*: avoiding being wrong is more important than trying, failing and learning (*status quo*)
- *Aversity for uncertainty*: unlikely becomes impossible, very likely becomes certainty


What Should We Remember?
We store memories differently based on how they were experienced
We reduce events and lists to their key elements
We discard specifics to form generalities
We edit and reinforce some memories after the fact
We favor simple-looking options and complete information over complex, ambiguous options
To avoid mistakes, we aim to preserve autonomy and group status, and avoid irreversible decisions
To get things done, we tend to complete things we've invested time & energy in
To stay focused, we favor the immediate, relatable thing in front of us
Need To Act Fast
To act, we must be confident we can make an impact and feel what we do is important
We project our current mindset and assumptions onto the past and future
We think we know what other people are thinking
We simplify probabilities and numbers to make them easier to think about
Not Enough Meaning
We imagine things and people we're familiar with or fond of as better
We fill in characteristics from stereotypes, generalities, and prior histories
We tend to find stories and patterns even when looking at sparse data
We notice flaws in others more easily than than we notice flaws in ourselves
We are drawn to details that confirm our own existing beliefs
We notice when something has changed
Bizarre, funny, visually-striking, or anthropomorphic things stick out more than non-bizarre/unfunny things
We notice things already primed in memory or repeated often
Too Much Information

EXAMPLE: FACEBOOK'S IPO

- Before going public in 2012, the company received a number of very different estimations, from 10-15 bln $ in 2007-09, to 59 bln $ in 2011
- The closer to 18th May, the higher the expectation: from the original offer of 5 bln $ stocks, n. of shares sold was raised and the final amount echieved16 bln $
- Markets euphoric on fixing pricing targets: from 26$/s to 28-38$/s, to 34-38$/s (company), to 40$7s up to 46$/s (some expected day1 growth up to 80$/s)
- Day 1 of trading with technical problems: initial trading soaring to 45$/s, soon falling back to slightly more than the target price (38$/s).
- In less than one month, price was 30$/s, in two months 20$/s, setting the lowest price in September at 18,80$/s (now around 170 $/s, after peaking >320)
- Losses impacted FB's growth expectations, its employees, investment firms, retail investors, other IT companies
- Lawsuits started…
- Market for IT IPOs seemed to cool off, lessons were learnt (again?), until …

EXAMPLE: TWITTER'S IPO

- Twitter announced IPO on 3rd September 2013 after some delay
- The battle of target prices started already: from 17$/s in early 2013, to 20-21$/s, to current 28-30$/s or even higher
- Still, the company reports no profits to date…
- Growing excitement makes a case for another bubble
- On 4th October 2013, after the "code" for Twitter's IPO was set ('TWTR'), a stunning flow of funds and orders went to company Tweeter Home Entertainment ('TWTRQ'):
  - Failed (in 2007!) retailer of electronics worth <0,01$/s
  - 1 day top performance of +1.000%, closing at +669%
  - Went from trading less than 1,000 shares per day to almost 15 million
- TWTR around 54 $/s before delisting, peaked around 80

EXAMPLE: LET'S BEAT THE MARKET!

Exhibit 1: Performance Persistence Over Three Consecutive 12-Month Periods

Mutual Fund Category	Fund Count at Start	Funds Remaining (%)	
	March 2012	March 2013	March 2014
Top Quartile			
All Domestic Funds	687	18.78	3.78
Large-Cap Funds	263.00	15.97	1.90
Mid-Cap Funds	95.00	9.47	3.16
Small-Cap Funds	146.00	23.97	4.11
Multi-Cap Funds	183.00	23.50	6.56
Top Half			
All Domestic Funds	1,372	41.55	18.66
Large-Cap Funds	525	37.52	14.10
Mid-Cap Funds	190	37.37	16.32
Small-Cap Funds	292	51.03	25.00
Multi-Cap Funds	365	41.92	21.37

Source: S&P Dow Jones Indices LLC. Data as of March. 31, 2014. Charts and graphs are provided for illustrative purposes. Past performance is not a guarantee of future results.

The New York Times

STRATEGIES

Mutual Funds That Consistently Beat the Market? Not One of 2,132.

No actively managed stock or bond funds outperformed the market convincingly and regularly over the last five years. Index funds have generally been better.

By Jeff Sommer

Jeff Sommer is the author of Strategies, a weekly column on markets, finance and the economy.

Dec. 2, 2022

LET'S PLAY THE DICATOR'S GAME

LET'S PLAY THE DICATOR'S GAME