

# FINANCIAL MARKETS AND INSTITUTIONS

## EFFICIENCY OF FINANCIAL MARKETS

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# AGENDA



- Are markets efficient?
- What if humans are... humans?

# THE EFFICIENT MARKET HYPOTHESIS

## Assumptions:

- prices in an efficient market fully reflect all available information
- expectations are the best forecast, providing efficiency through consistent buying/selling decisions
- arbitrage is possible and quickly eliminates profit opportunities in prices away from forecast: few arbitrageurs seeking “easy” profits can contribute to the overall market efficiency



## *Example:*

*You are walking inside a perfectly efficient market and you see a 50€ banknote on the sidewalk. What can you say about it?*

# THE EFFICIENT MARKET HYPOTHESIS

## Different forms of efficiency:

- **Allocative efficiency:** operators maximise their expected utility and grant that funds are 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”

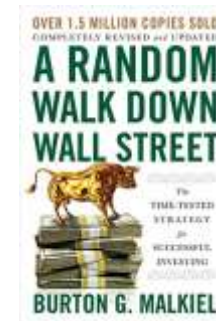
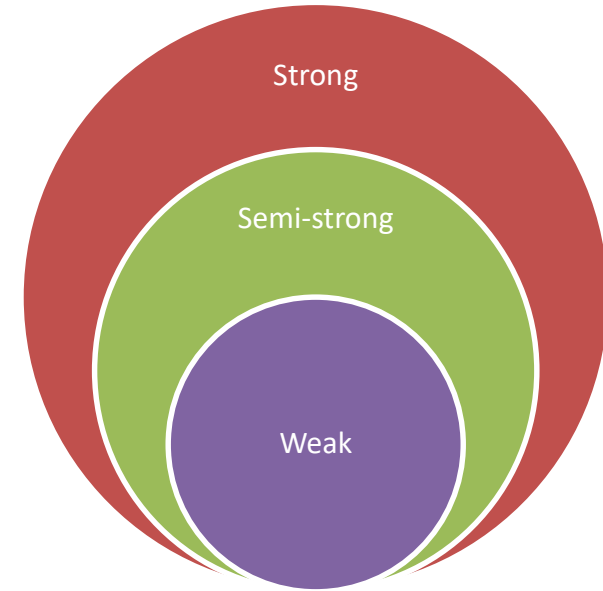
... unlikely a 100% or 0% efficiency!



# THE EFFICIENT MARKET HYPOTHESIS

## Forms of informative efficiency:

- **Weak:**
  - Prices are a function of past prices
  - Outperformers only in the short term or by chance
  - Prices are random walks, independent, without paths
- **Semi-strong:**
  - Prices incorporate new public information
  - Insiders can outperform and increase efficiency
- **Strong:**
  - Prices reflect also private information
  - No outperformers



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

# THE EFFICIENT MARKET HYPOTHESIS

## Evidence **supporting** EMH:

- Investment analysts, technical analysts and mutual fund managers do not perform better than randomly selected 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 since they seem to follow a random walk



# THE EFFICIENT MARKET HYPOTHESIS

## Example

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)

# THE EFFICIENT MARKET HYPOTHESIS

## 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)





# THE EFFICIENT MARKET HYPOTHESIS

Assets' booms or crashes and investor's good tracks are not necessarily anti-EMH:

- Unexpected new information with impact on fundamentals not incremental:
  - accounting frauds or “scandals” (Enron, Parmalat, ...)
  - unprecedented catastrophes (f.i. 9/11, earthquakes, hurricanes)
- “Rational” bubbles:
  - as long as the expectation of others being ready to pay higher prices in the future holds, investors will not sell it to adjust the market
  - when expectations change, adjustments are quick and sharp
- Some investors seem to overperform:
  - ruling out private information is not always possible
  - usually linked with huge corporations, exerting influence
  - past cases often anticipated criminal charges...



# BEHAVIOURAL HYPOTHESIS

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%



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

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

# BEHAVIOURAL HYPOTHESIS



Example:  
Paper subscription



## OPTION A

- only *online*: 59\$
- only *print*: 125\$
- *online* & *print*: 125\$

16%

0%

84%

## OPTION B

- only *online*: 59\$
- *online* & *print*: 125\$

68%

32%

# BEHAVIOURAL HYPOTHESIS

Selected findings:

- Short selling happens in the area of losses, and people are loss averse: losses are regretted more than gains are welcomed, hence little short selling is present and assets tend to be overvalued
- Overconfidence of people, in particular of being able to beat the market, “Those losers... I can’t be wrong!”
- Herd behavior, “others are doing it, it must be right”
- Irrational optimism, “BTC are the future! Buy!”
- Confirmation/attribution bias: “I am earning on this investment, I am good at choosing!”, “I am losing on this investment, let’s buy more since I can’t be that wrong!”
- ...



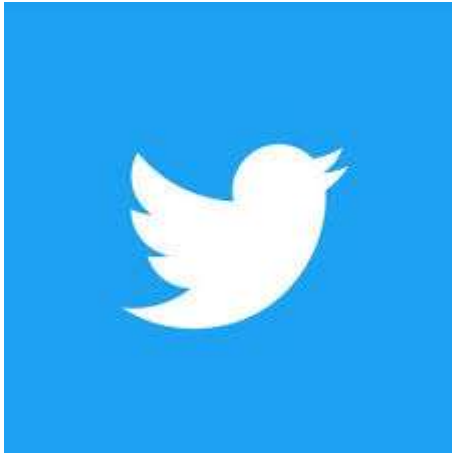
# EXAMPLES

## Facebook's IPO in short:



- 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 18<sup>th</sup> May, the higher the expectation: from the original offer of 5 bln \$ stocks, n. of shares sold was raised and the final amount achieved 16 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
- 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 ...

# EXAMPLES



## Twitter's expected IPO:

- Twitter announced IPO on 3<sup>rd</sup> 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 4<sup>th</sup> 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

# EXAMPLES

Aye Corona! <https://www.sciencedirect.com/science/article/pii/S1544612320305134>

**Constellation Brands, Inc. (STZ)**

NYSE - NYSE Delayed Price. Currency in USD

☆ Add to watchlist

Quote Lookup



**222.38** -0.11 (-0.05%)

At close: February 23 4:04PM EST

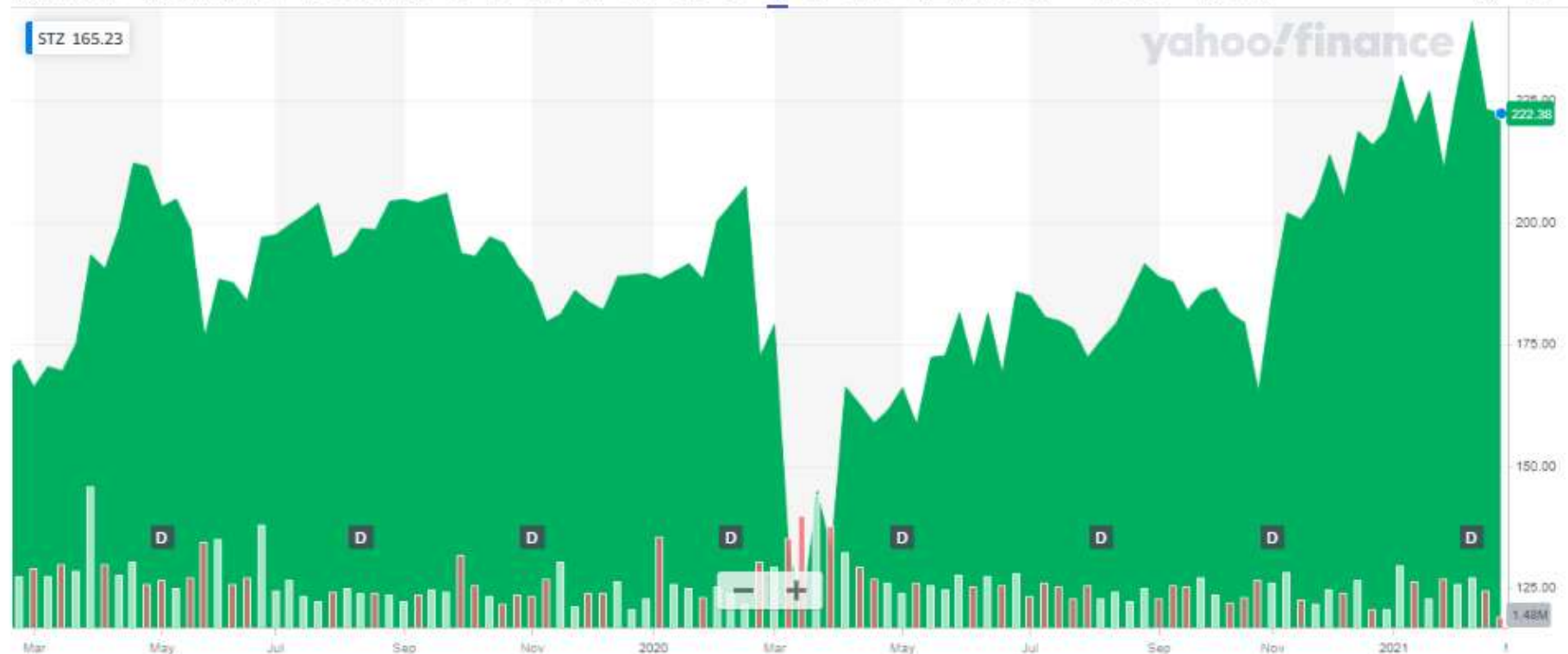
Summary **Chart** Conversations Statistics Historical Data Profile Financials Analysis Options Holders Sustainability

Full screen

Indicators Comparison Date Range 1D 5D 1M 3M 6M YTD 1Y **2Y** 5Y Max Interval 1W Area Draw

STZ 165.23

yahoo!finance





# EXAMPLES

## 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
<b>Top Quartile</b>			
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
<b>Top Half</b>			
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.