FINANCIAL MARKETS AND INSTITUTIONS

EFFICIENCY OF FINANCIAL MARKETS AND BEHAVIOURAL FINANCE

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DEAMS
University
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AGENDA

- Are markets efficient?
- Econs or Humans?

THE EFFICIENT MARKET HYPOTHESIS

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

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:

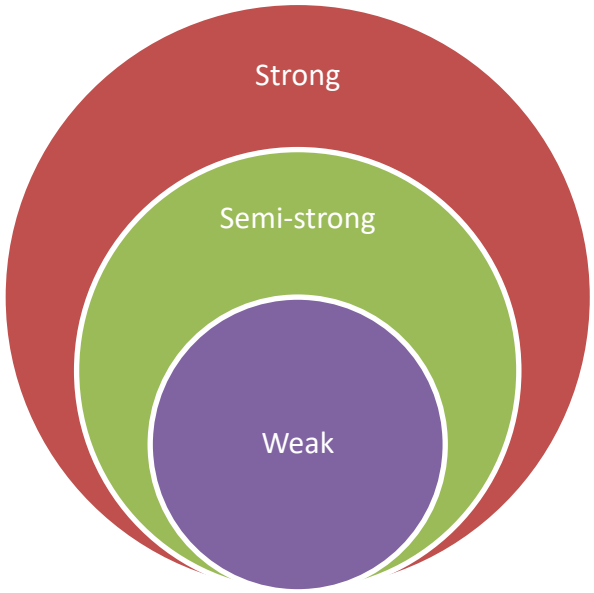
- **Allocative efficiency**: operators maximise their expected utility and grant that funds are transferred achieving the best total utility
- **Technical efficiency**: frictions, barriers, transaction costs
- **Pricing efficiency**: the value of assets reflects the best forecast based on current information
- **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
  - Paths are not foreseeable
- **Semi-strong**:
  - Prices incorporate public information
  - Only insiders can outperform (or by chance)
- **Strong**:
  - Prices reflect also private information
  - Only outperformance by chance



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 anti-EMH?

- Unexpected new information with impact on fundamentals not incremental:
  - accounting frauds or "scandals" (Enron, Parmalat, …)
  - catastrophes (f.i. 9/11, earthquakes, …)

- "Rational" bubbles:
  - expectation of others being ready to pay higher prices → self-fulfilling
  - expectations change (fear), adjustments are quick and sharp

- Some investors seem to overperform:
  - With private information…
  - With market influence/power…
  - With 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…

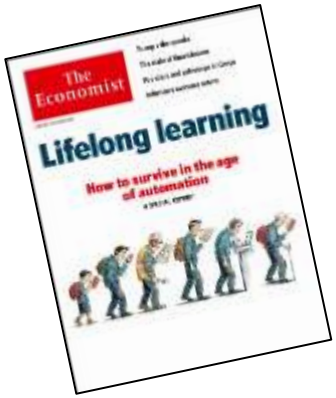
- A) you lose the ticket… do you buy it again?
- B) you lose 10€… do you buy the ticket?

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**

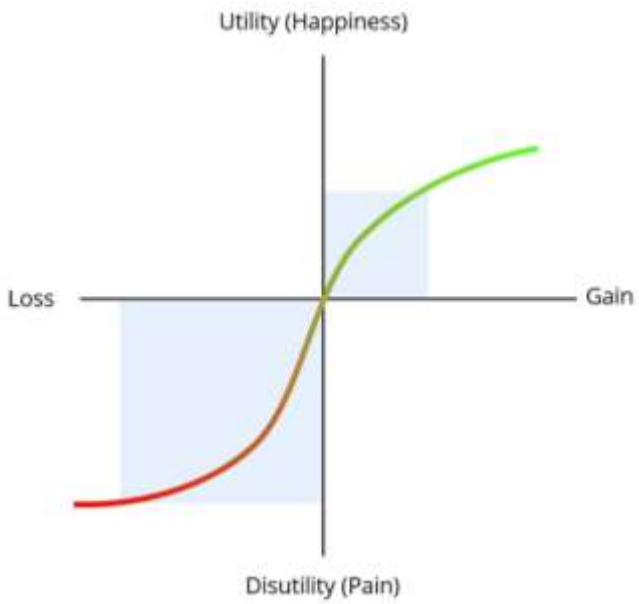
- only *online*: **59**$ — **16%**
- only print: **125**$ — **0%**
- *online* & print: **125**$ — **84%**

OPTION **B**

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

BEHAVIOURAL THEORIES/HYPOTHESIS

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 THEORIES/HYPOTHESIS

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 THEORIES/HYPOTHESIS

Main heuristics:

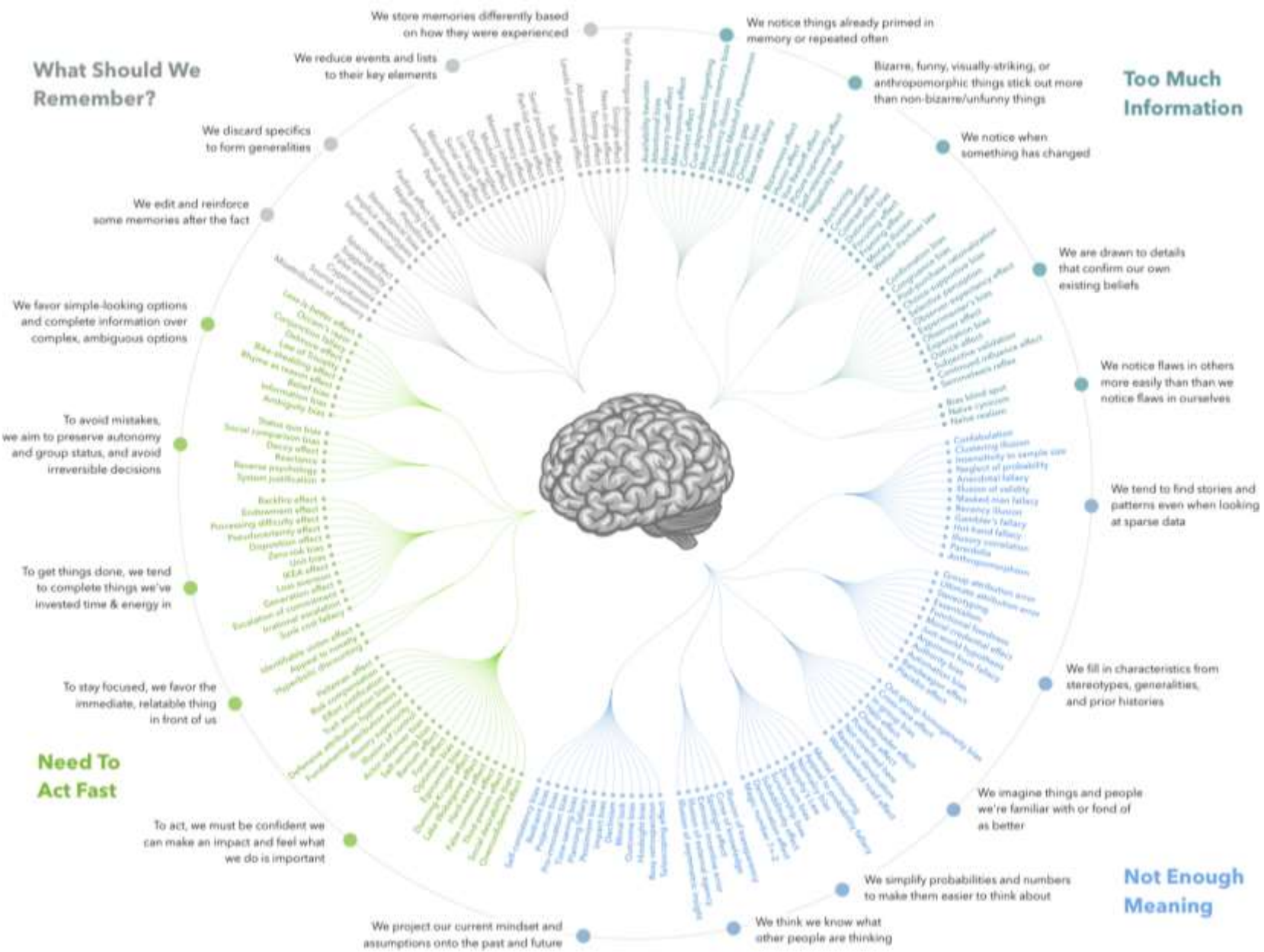
- **Availability:**
  - Likelihood of an event is influenced by how easy it is to recall it from memory
  - In building scenarios, more weight to more familiar experience
- **Representativeness:**
  - Likelihood of an event is influenced by prejudice and stereotypes, or how similar to other known events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

BEHAVIOURAL THEORIES/HYPOTHESIS

Selected sources of bias:

- Overconfidence (and hindsight)
- Irrational optimism
- Confirmation bias
- Attribution bias
- Herd behaviour
- Endowment
- Regret aversion
- Preference for certainty
- …

BEHAVIOURAL THEORIES/HYPOTHESIS



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 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 300 $/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 …

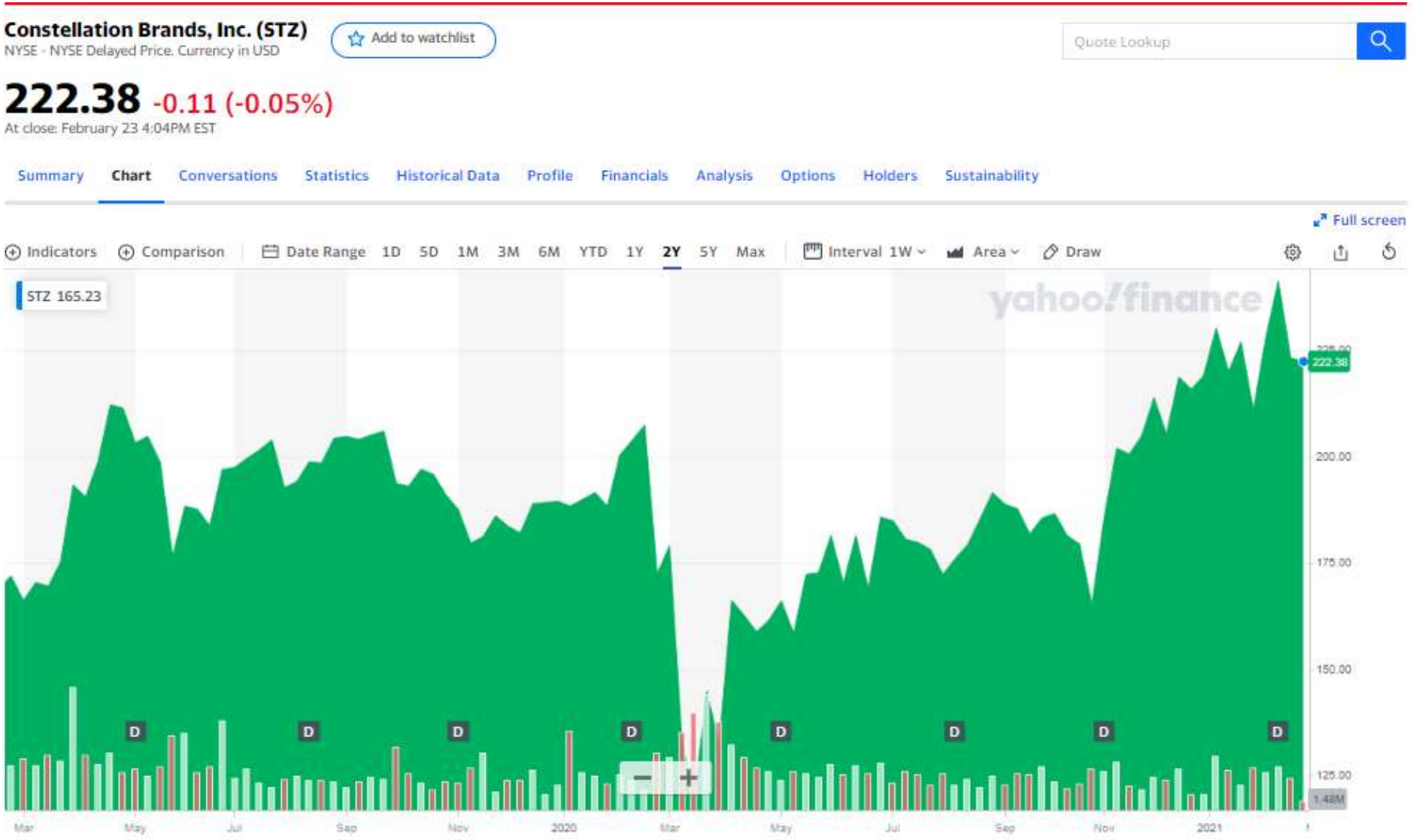
EXAMPLES

Twitter's expected IPO:

- Twitter announced IPO on 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
- Now TWTR around 35 $/s

EXAMPLES

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



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
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.