Applied Behavioural Finance: Insights into irrational minds and market

James Montier: Global Equity Strategy
“The brain is my second favourite organ”
Woody Allen

“The market can stay irrational, longer than you can stay solvent”
JMK

“There is nothing so dangerous as the pursuit of a rational investment policy in an irrational world”
JMK

“Economists are people who look at reality, and wonder whether it would work in theory”
Ronald Reagan
Taxonomy of biases

- Biases
  - Self Deception (Limits to learning)
    - Overoptimism
      - Illusion of control
      - Illusion of knowledge
    - Overconfidence
    - Self Attribution bias
    - Confirmation bias
    - Hindsight bias
    - Regret theory
    - Cognitive dissonance
  - Heuristic Simplification (Information processing errors)
    - Representativeness
    - Framing
    - Categorization
    - Anchoring/Salience
    - Availability bias
    - Cue Competition
    - Loss aversion/Prospect theory
  - Social Interaction
    - Emotion/Affect
      - Self control (Hyperbolic discounting)
      - Ambiguity aversion
    - Contagion
      - Casacades
    - Imitation
      - Herding

Global Strategy Unit
The bias blind spot: Everyone else, not me

- Self serving
- Self interest
- Reactive devaluation
- Error
- Fundamental attribution
- Halo effect
- Biased assimilation
- Cognitive dissonance

Average American vs Self
Dual processing theories of thought

<table>
<thead>
<tr>
<th></th>
<th>System One/ X-system</th>
<th>System Two C-system</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intuitive</td>
<td>Reflective</td>
</tr>
<tr>
<td><strong>Process Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic</td>
<td>Automatic</td>
<td>Controlled</td>
</tr>
<tr>
<td>Effortless</td>
<td>Effortless</td>
<td>Effortful</td>
</tr>
<tr>
<td>Associative</td>
<td>Associative</td>
<td>Deductive</td>
</tr>
<tr>
<td>Rapid, parallel</td>
<td>Rapid, parallel</td>
<td>Slow, serial</td>
</tr>
<tr>
<td>Process opaque</td>
<td>Process opaque</td>
<td>Self aware</td>
</tr>
<tr>
<td>Skilled action</td>
<td>Skilled action</td>
<td>Rule application</td>
</tr>
<tr>
<td><strong>Content on which processes act</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affective</td>
<td>Affective</td>
<td>Neutral</td>
</tr>
<tr>
<td>Causal propensities</td>
<td>Causal propensities</td>
<td>Statistics</td>
</tr>
<tr>
<td>Concrete, specific</td>
<td>Concrete, specific</td>
<td>Abstract</td>
</tr>
<tr>
<td>Prototypes</td>
<td>Prototypes</td>
<td>Sets</td>
</tr>
</tbody>
</table>
Neuropsychology of dual processing (Liberman)

- X-system
  - Amygdala
  - Basal ganglia
  - Lateral temporal cortex

- C-system
  - Anterior cingulate cortex
  - Prefrontal cortex
  - Medial temporal lobe
Klein’s factors for NDM (X-system)

- System X is more likely when:
  - The problem is ill-structured & complex
  - Information is incomplete, ambiguous and changing
  - Goals are ill defined, shifting and competing
  - Stress is high (time constraints and/or high stakes)
  - Decisions involve multiple participants
X-system can dominate

- Masters
- Class B players

Blitz (6 sec per move) vs Standard (2.25 mins per move)
Affect

The rational model

- Perceptions -> attitudes
- I like this person because I think she is smart and honest
- I like this company because it is low risk and high return

The affect model

- Attitude -> perceptions
- Because I like this person, I think she is smart and honest
- Because I like this company, it is low risk and high return
Biased assimilation: When attitudes drive perceptions

Studies supporting death penalty

Studies opposing death penalty

Participants pro death penalty

Participants anti death penalty
Panda and affect

![Graph showing the relationship between Pictures and Dots with respect to the number of Pandas.](image-url)
The dark side of emotion

The diagram shows the comparison of different groups under various conditions:

- **No invest**: Target patients vs. Normal players vs. Patient controls.
- **Invest and lost**: Target patients vs. Normal players vs. Patient controls.
- **Invest and won**: Target patients vs. Normal players vs. Patient controls.

The x-axis represents different conditions (No invest, Invest and lost, Invest and won), and the y-axis represents the percentage values.

Legend:
- **Blue**: Target patients
- **Green**: Normal players
- **Red**: Patient controls
No sign of learning

Global Strategy Unit
Self deception or perception is reality
Self deception

Over-optimism

- People tend to exaggerate their own abilities
- Illusion of control
- Illusion of knowledge

Over-confidence

- People are surprised more often than they expect. Not well calibrated.
- Confidence intervals around a forecast which should yield 2% error, actually get a 30-40% error
Overconfidence

Weather men

Doctors

Global Strategy Unit
Overconfidence and investment

- Lay people
- Professionals
Overconfidence driven by the illusion of knowledge

![Bar chart showing overconfidence in different domains: Previous month's results, Other knowledge, Intuition, and Guessing. The chart compares Laypeople (blue) and Professionals (red).]
Does more information improve your accuracy?

Figure 5

ACCURACY (%) vs. ITEMS OF INFORMATION

CONFIDENCE (%) vs. ITEMS OF INFORMATION

Correct first place selections
The walk down to beatable earnings:
average scale of forecast error at the earnings level – US (%, 1986-2000)

Source: DrKW Macro research and IBES
Trading is hazardous to your wealth

Low Turnover

High Turnover

Global Strategy Unit
Should traders be women?

![Bar chart showing comparison between men and women in different categories.](image)
Bubble echoes in the laboratory

Once experienced

Mixture of twice experienced and novice players (Ratio of 4/7)

Novices

Fundamental value

Source: Ackert and Church

Global Strategy Unit
Keynes’s beauty contest and investment professionals

Over 1000 players
Average number picked 26
2/3rds: 17
Average level of thinking 1.6 steps
Self deception
Self attribution bias

- Good outcomes are a testament to your skill, bad outcomes are sheer bad luck.
- How often do you say that's just a blip?
Hindsight bias

It is a common observation that events in the past appear simple, comprehensible, and predictable in comparison to events in the future. Everyone has had the experience of believing that they knew all along the outcome of a football game, a political election or a business investment. The hindsight bias is the tendency for people with outcome knowledge to believe falsely that they would have predicted the reported outcome of an event. After learning of the occurrence of an event, people tend to exaggerate the extent to which they had foreseen the likelihood of its occurrence.
Psychological Foundations

II. Heuristic Simplification

Or

There is no such thing as context free decision making
Heuristic Simplification

- Conservatism Bias
  - Hard to give up a view once it has formed. Leads to:

- Anchoring and slow adjustment
  - Depends upon saliency of the anchor
  - i.e. analysts will change their views from their forecasts slowly
Analysts lag reality

Earnings

Forecasts

Global Strategy Unit
The Fed model

Source: Thomson Financial Datastream
Equities vs. bonds in the US: the Fed model since the 1950s

Source: DrKW Macro research
Simple maths leads to anchoring

- $8*7*6*5*4*3*2*1 = \text{median answer } 2250$
- $1*2*3*4*5*6*7*8 = \text{median answer } 512$
- Actual answer = 40,320
Estate agents and anchoring

Given
Listing Price

Appraisal value
Lowest acceptable offer

Global Strategy Unit
Anchoring and valuation

- Cordless mouse
- Cordless keyboard
- Average Wine
- Rare Wine
- Design book
- Belgian Chocolates

Legend:
- Low SS No.
- High SS No.
- Ratio
Cheap? Surely some mistake - US

### Various valuation measures (x)

<table>
<thead>
<tr>
<th></th>
<th>Current level</th>
<th>1997-2004</th>
<th>Long run*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trailing reported PE</td>
<td>21.1</td>
<td>29.0</td>
<td>14.0</td>
</tr>
<tr>
<td>Operating PE</td>
<td>17.5</td>
<td>22.5</td>
<td>14.9</td>
</tr>
<tr>
<td>Forward operating PE</td>
<td>15.6</td>
<td>19.7</td>
<td>12.5</td>
</tr>
<tr>
<td>PB</td>
<td>3.0</td>
<td>4.0</td>
<td>2.4</td>
</tr>
<tr>
<td>PC</td>
<td>13.0</td>
<td>14.9</td>
<td>9.2</td>
</tr>
<tr>
<td>Graham and Dodd PE</td>
<td>27.5</td>
<td>37.0</td>
<td>16.4</td>
</tr>
<tr>
<td>Hussman PE</td>
<td>19.3</td>
<td>23.5</td>
<td>11.0</td>
</tr>
<tr>
<td>Trend PE</td>
<td>22.0</td>
<td>29.0</td>
<td>13.9</td>
</tr>
</tbody>
</table>

Source: DrKW Macro research

* the term long run refers to the longest run of data we have which varies from starting in the 1870s to starting in the mid 1980s. All long run measures end at the end of 1996, effectively stripping out the bubble years.
Psychological foundations

Linda is 31, single, outspoken and very bright. She majored in philosophy. As a student she was deeply concerned with issues surrounding equality and discrimination.

Is it more likely that Linda is

- Works in a bank
- Works in a bank and is active in the feminist movement
Psychological Foundations

Representativeness Heuristic

▶ Aka law of small numbers – belief that random samples of a population will resemble each other and the population more closely than statistical sampling theory would predict.

▶ Which is more likely HTHTTH or HHHTTT?
Earnings growth as representativeness

Source: Montier, and Chan et al

Global Strategy Unit
Great stories ≠ Great investments
Under-reaction and Over-reaction

- Information is judged in two dimensions – strength and weight
- Letter of reference – judged by strength i.e. number of appealing traits
- Weight is neglected. i.e. who wrote it
Over-reaction and Under-reaction: Information analysis

<table>
<thead>
<tr>
<th>Strength</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>High</td>
</tr>
<tr>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>High</td>
</tr>
</tbody>
</table>
Analysis of over-reaction and under-reaction

Under-reaction
- Dividend omissions, initiations
- Earnings surprises
- Analyst recommendations
- Z-scores
- Buybacks on value stocks
- Goodwill write-offs
- Valuations

Over-reaction
- IPOs, SEOs
- High earnings growth
- Cap ex.
- Buybacks on growth stocks
- Quarterly earnings announcements
Bias of Judgement

 Availability Bias

 Which is a more likely cause of death in the US – being killed by a lightening strike or as a result of a shark attack?

 Shark attacks receive more publicity, they are easier to imagine (thanks to Jaws). However, the chance of dying from a lightening strike are 30x greater than chances of being killed by a shark.
Narrow Framing

- Context sensitivity. Aka frame dependence or mental accounting.
- We can’t see through how things are actually framed.
- Separate funds for separate purposes – holiday money, house keeping
When is a buyback not a buy back?
announced, actual and net share buy-backs in the US

Source: DrKW Macro research
Repurchases & their impact: dividend, repurchase & total yield for the S&P500 (%)
Prospect Theory

- People value changes not states. Rational man tries to maximise the utility of wealth.
- Real people worry far more about gains and losses than levels.
Stock broker Sample
Prospect theory

• Leads to
  • Endowment effect
  • Status quo bias
  • Disposition effect
Endowment effect/Status quo bias

Sellers
Choosers
Buyers

Global Strategy Unit

Source: Frazzini (2004)

Proportion of losses realized
Proportion of gains realized

Global Strategy Unit
Top tips for better decision making

- This applies to me, you and everyone else
- You know less than you think you do
- Be less certain in your views, aim for timid forecast and bold choices
- Don’t get hung up on one technique tool, approach or view – flexibility and pragmatism are the order of the day
- Listen to those who don’t agree with you
Top tips for better decisions

► You didn’t know it all along, you just think you did

► Forget relative valuation, forget market prices, work out what the stock is worth (Use reverse DCFs)

► Don’t take information at face value, think carefully about how it was presented to you

► Don’t confuse good firms with good investments, or good earnings growth with good returns
Top tips for better decisions

► Vivid, easy to recall events are less likely than you think they are, subtle causes are underestimated

► Try to focus on facts, not stories

► Sell your losers and ride your winners
Beating the biases

- Being aware of the biases is not enough. It is just an important first step.
- Need to create a framework that incorporates mental best practice. Easier said than done. Mental bad habits are persistent.
- The good news, we continue to create new brain cells throughout our lives.
Applied Behavioural Finance: Are two heads better than one? The psychology of group decisions

James Montier: Global Equity Strategy
“Madness is a rare thing in individuals – but in groups...it is the rule”
Friedrich Nietzsche

“To associate with other like-minded people in small, purposeful groups is for the great majority of men and women a source of profound psychological satisfaction.”
Aldous Huxley

“Deliver us from committees”
Robert Frost

“Committees are groups of people who keep minutes but waste hours”
Berle Milton

“A committee is an animal with four back legs”
John le Carre

“A committee is a group of the unwilling, chosen from the unfit, to do the unnecessary “
Unknown
Types of groups

- Statistical groups = large number of people asked for an answer, take the mean.
- Deliberative groups = discussion is necessary
- Evidence suggests that statistical groups outperform deliberative groups and individuals
- E.g. when judging the number of beans in a jar, the group average is almost always better than the vast majority of the individual members. In one such experiment, a group of 56 students was asked about a jar containing 850 beans; the group estimate was 871, a better guess than all but one of the students
Statistical groups

- Only work when:
  - People are unaffected by others’ decisions (errors are uncorrelated)
  - Probability of being correct must be independent of the probability of everyone else being correct
  - The participants must be unaffected by their own vote possibly being decisive
  - When participants have some idea of the answer.
  - Anchors are avoided
Deliberative groups

- Such groups seem to amplify:
  - Representativeness
  - Framing
  - Overconfidence (simple repetition of views leads to people having greater confidence)
  - Anchoring
  - Availability
The establishment of norms (Sherif 1936)
Conformity (Asch 1955)
On 12 of the 18 rounds, confederates unanimously agreed on a wrong answer.

¾ of participants agreed with the confederates in at least one round. Half agreed in 6 or more rounds. Only 25% resisted in all rounds!
Does group size matter? (% conforming to wrong answers)
Herding when uncertain – Baron et al

- Unimportant
  - Low uncertainty: 2.5
  - High uncertainty: 3.5

- Important
  - Low uncertainty: 1.0
  - High uncertainty: 4.0
Sharing information (Stasser et al 1989)
Why are we so bad at sharing information?

- Shared information is more likely to be discussed and repeated and this will influence the individuals in the group, and hence influence the group’s eventual outcome.
- Social pressure
- Cascades
Social pressure: Those who conform are rewarded (Wittenbaum et al. 1999)
Cascades

Cascade creation: Actual pot used B

<table>
<thead>
<tr>
<th>Player</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private signal</td>
<td>a</td>
<td>a</td>
<td>b</td>
<td>b</td>
<td>b</td>
<td>b</td>
</tr>
</tbody>
</table>

| Decision | A | A | A | A | A | A |

Source: Anderson and Holt (2004)
Group polarisation

- Group polarization is the tendency for members of a group to end up in a more extreme position in line with their original beliefs after talking to one another. The increased confidence in view mentioned earlier, begins to create feedback into the extremity of view, generally creating a loop of increased confidence in more and more extreme views.
Groupthink

- A tendency to examine too few alternatives
- A lack of critical assessment on each other’s ideas
- A lack of contingency plans
- Poor decisions are often rationalized
- Illusion of group invulnerability and shared morality
- True feelings and beliefs are suppressed
- Illusion of unanimity is maintained
- Mind guards are appointed to protect the group from negative information
Solutions

- Secret ballots
- Devil’s advocates
- Authentic dissent
- Respect for other group members
Figure 2. Obedience Rates, Basic Milgram Experiment
Fraction of ordinary Connecticut residents who directed high voltage electric shocks through the bodies of perfect strangers when ordered to do so by a psychologist.
Bandura’s driving forces – turning good people bad

- Moral justification
- Euphemistic labelling
- Advantageous comparison
- Displacement of responsibility
- Diffusion of responsibility
- Disregard or distortion of consequences
- Dehumanisation
In respect of any compendium presentation covering six or more listed companies, please refer to the following website for all relevant Italian disclosures: http://www.drkwresearch.com/disclosures.

The relevant research analyst(s), as named on the front cover of this presentation, certify that (a) the views expressed in this research presentation accurately reflect the views of the research analyst(s) concerning the securities and companies mentioned in this presentation; and (b) no part of their compensation was, is, or will be directly or indirectly related to the specific recommendation(s) or views contained in this presentation.

**European Economic Area:** Where this presentation has been produced by a legal entity outside of the EEA, the presentation has been re-issued by Dresdner Kleinwort Wasserstein Securities Limited for distribution into the EEA.

**United Kingdom:** This presentation is a communication made, or approved for communication in the UK, by Dresdner Kleinwort Wasserstein Securities Limited (regulated by the Financial Services Authority and a Member Firm of the London Stock Exchange). It is directed exclusively to market counterparty and institutional customers. It is not directed at private customers and any investment or services to which this presentation may relate are not available to private customers. No persons other than a market counterparty or an intermediate customer should read or rely on any information in this presentation. Dresdner Kleinwort Wasserstein Securities Limited does not deal for, or advise or otherwise offer any investment services to private customers.

**United States:** Where this presentation has been approved for distribution in the US, such distribution is by either: (i) Dresdner Kleinwort Wasserstein Securities LLC (DKW S LLC) or (ii) other Dresdner Kleinwort Wasserstein companies to US Institutional Investors and Major US Institutional Investors only; or (iii) if the presentation relates to non-US exchange traded futures, Dresdner Kleinwort Wasserstein Limited (DKKWLL), DKW S LLC, or in case (ii) DKW S, accept responsibility for this presentation in the US. Any US persons wishing to effect a transaction through Dresdner Kleinwort Wasserstein (a) in any security mentioned in this presentation may only do so through DKW S LLC, telephone: (+1 212) 429 2000; or (b) in a non-US exchange traded future may only do so through DKKWLL, telephone: (+1 11 44) 20 7623 8300.

**Singapore:** This presentation is being distributed for DKW in Singapore by Dresdner Bank AG, Singapore Branch to clients who fall within the description of persons in Regulation 49 of the Securities and Futures (Licensing and Conduct of Business) Regulations 2002.

**Hong Kong:** This presentation is being distributed in Hong Kong by Dresdner Bank AG, Hong Kong Branch to persons whose business involves the acquisition, disposal or holding of securities.

**Japan:** Where this presentation is being distributed in Japan, such distribution is by either (i) Dresdner Kleinwort Wasserstein (Japan) Limited, Tokyo Branch (DKWJ) to Japanese investors excluding private customers or (ii) other Dresdner Kleinwort Wasserstein companies, to entities falling within Article 2, Paragraph 1 of the Cabinet Ordinance for Enforcement of the Foreign Securities Firms Act. Any Japanese persons not falling within (i) wishing to effect a transaction through Dresdner Kleinwort Wasserstein in any security mentioned in this presentation may only do so through DKW J, telephone: (+81 3) 5403 9500.

The information and opinions in this presentation constitute judgment as at the date of this presentation and are subject to change without notice. Dresdner Kleinwort Wasserstein and/or any of its clients may undertake or have undertaken transactions for their own account in the securities mentioned in this presentation or any related investments prior to your receipt of it. Dresdner Kleinwort Wasserstein may provide investment banking services (including without limitation corporate finance services), or solicit such business, for the issuers of the securities mentioned in this presentation and may from time to time participate or invest in commercial banking transactions (including without limitation loans) with the issuers of the securities mentioned in this presentation. Accordingly, information may be available to Dresdner Kleinwort Wasserstein, which is not reflected in this presentation. Dresdner Kleinwort Wasserstein and its directors, officers, representatives and employees may have positions in or options on the securities mentioned in this presentation or any related investments or may buy, sell or offer to buy or sell such securities as principal or agent on the open market or otherwise. This presentation does not constitute or form part of, and should not be construed as, any offer for sale or subscription of, or any invitation to offer to buy or subscribe for, any securities, nor should it or any part of it form the basis of, or be relied on in any connection with, any contract or commitment whatsoever. The information and opinions contained in this presentation have been compiled or arrived at from sources believed to be reliable and in good faith, but no representation or warranty, express or implied, is made as to their accuracy, completeness or correctness. Any price targets shown for companies discussed in this presentation may not be achieved due to multiple risk factors including without limitation market volatility, sector volatility, corporate actions, the unreliability of complete and accurate information and/or the subsequent transpiration that underlying assumptions made by DKW or by other sources relied upon in the presentation were inapposite. Dresdner Kleinwort Wasserstein accepts no liability whatsoever for any direct or consequential loss or damage arising from any use of this presentation or its contents. Whilst Dresdner Kleinwort Wasserstein may provide hyperlinks to web-sites of entities mentioned in this presentation, the inclusion of a link does not imply that Dresdner Kleinwort Wasserstein endorses, recommends or approves any material on the linked page or accessible from it. Dresdner Kleinwort Wasserstein accepts no responsibility whatsoever for any such material, nor for any consequences of its use. This presentation is for the use of the addressee only, but is not to be relied upon as authoritative or taken in substitution for the exercise of judgment by any recipient. This presentation is being supplied to you solely in your capacity as a professional, institutional investor for your information and may not be reproduced, redistributed or passed on to any other person or published, in whole or in part, for any purpose, without the prior, written consent of Dresdner Kleinwort Wasserstein. Dresdner Kleinwort Wasserstein may distribute presentations such as this in hard copy, electronically or by Voiceblast. In this notice “Dresdner Kleinwort Wasserstein” means Dresdner Bank AG and/or Dresdner Kleinwort Wasserstein Securities Limited and any of their affiliated or associated companies and their directors, officers, representatives or employees and/or any persons connected with them.

Additional information on the contents of this presentation is available on request.

**Global Strategy Unit**

---

### Distribution of DKW equity recommendations as of 1 Apr 2004

<table>
<thead>
<tr>
<th>Recommendation Definition</th>
<th>All covered companies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buy/Add</strong></td>
<td>307</td>
</tr>
<tr>
<td><strong>Hold</strong></td>
<td>168</td>
</tr>
<tr>
<td><strong>Sell/Reduce</strong></td>
<td>108</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>583</td>
</tr>
</tbody>
</table>

Source: DKW