From Behavioural to Emotional Corporate Finance: A New Research Direction

Richard Fairchild, School of Management, University of Bath
December 6th 2010

Technical Analysts Conference, London
December 6th 2010
Presentation Structure

- Traditional Finance
- Behavioural Finance
- Behavioural Corporate Finance
- Emotional Finance
- Emotional Corporate Finance
- Implications for Technical Analysis/Hedge Fund Industry
Traditional Finance

• Traditionally, financial economics models have been based on ‘Homo Economicus’
• => Fully rational, emotionless, purely self-interested agents
• => unlimited calculating power!
• => Efficient Markets Hypothesis/CAPM => no role for Active asset allocation!!
But: Evidence that Agents/Markets are not fully rational!

- Market Anomalies observed in reality:
  - Over- and under-reaction to news
  - Long-run abnormal returns
  - Excessive volatility (beyond news volatility)

- $\Rightarrow$ Behavioural Finance/Behavioural Corporate Finance

- $\Rightarrow$ role for active asset allocation !!
Over/under-reaction and long-run abnormal returns

Firms begin to repurchase cheap/undervalued shares

But why this pattern?

1987 Crash

1990
The Path to Emotional Finance/ Emotional Corporate Finance
Starting Point 1: Traditional Corporate Finance

• Traditional approach: homo economicus: Fully rational, self-interested, maximisers of expected utility
• => Efficient capital markets
• Corporate Debt: aligns managers and investors:
Starting point 2: Behavioural Finance

• Behavioural Finance (1980’s): recognised that investors may not be fully rational:
• Human beings: imperfect, biased, flawed, emotional (conscious emotions)…
• => financial markets inefficient: over-reaction/under-reaction/mispricing/bubbles/excess volatility etc etc….
Focus of Behavioural Finance

• Taking findings from psychology:
• Scholars have focused on the following biases:
  • Overconfidence
  • Regret
  • Loss aversion (prospect theory).

• (Heuristics/rules of thumb/mental shortcuts/framing).
Starting Point 3: Behavioural Corporate Finance

- Late 1990’s –
- Scholars began to examine Behavioural Corporate Finance (Shefrin, Thaler, De Bondt…)
- Managers not fully rational, not fully-self interested.
- OC and investment decisions (negative NPV projects taken?)
- OC and capital structure (excessive debt?)
- OC and dividends (unclear)
- Market timing (rational managers exploiting irrational investors)….
Behavioural Challenge

• Effect of combining managerial and investor psychology?
• What if managers and investors are overconfident?
Exciting Paradigm shift!!


• Applied to the Financial markets:

• Analyzes the effect of *unconscious*, infantile emotions on investors’ decisions.

• *Freud*’s theory of phantastic objects => stock market bubbles and crashes?

• Hedge Funds: boom and bust.
Emotional Corporate Finance

• Brand new!
• As BCF developed from BF (psychologically biased markets/investors => biased mgrs)
• ECF adds to EF by considering unconscious, infantile emotions in corporate managers.
• Particularly: projects as phantastic objects? Initial “love” of the project, followed by sudden project “hatred”? Concorde…
• => volatility of performance (especially if we add in emotional investors too!!!)
EF: “Phantastic Object”

(see eg: Taffler and Tuckett (2003; 2008)

• Psychoanalytical approach
• => Unconscious emotions
• **Phantastic Object** => “mental representation of something which in an imagined scene fulfills the protagonist’s deepest desires to have exactly what she wants when she wants it.”
• Aladdin’s lamp.
• **Phantastic Investments**: Tulip-mania, South-sea bubble, 19th C Railroad stocks, internet dot.com bubble.
• Hedge funds as “phantastic objects” !!!
• Madoff….
EF: Anatomy of a bubble/crash

• Freud: Paranoid-schizoid and depressive states
• 1. PS phase:
  • New, mysterious, exciting ‘objects’ (eg dot.com stocks)
  • Everybody falls ‘in love’ with these stocks
  • Reality is suspended:
  • Pleasure and pain split out from each other
  • Perceived infallibility/ no risk!
  • Experts’ views are sacrosanct.
Anatomy of bubble/crash (continued)

• Critical point at which reality intrudes =>
• => Depressive state
• Understand risk!
• => love turns to hate!
• Revulsion
• Looking for scapegoats/blaming others.
• *(But what triggers the critical point?)*
BF versus EF

• BF focusses on cognitive biases and *conscious* emotions (overconfidence, pride, regret, anger….)

• EF focusses on unconscious emotions:

• Critics of BF => many biases to appeal to! Rather piecemeal!

• EF provides a unified framework?

• PS = overconfidence…..?

• DS = regret…..?
BF versus EF explanations

Herding/Overconfidence/greater fool theory

Pressure by buyers

Regret

Pressure by sellers

PD state: Love

D state: reality: Hate

Internet bubble Chinese Stock Market
Next steps for EF?

• Extend to ECF.
• Taffler’s work very descriptive and case-based (ex post)
• => scope for modelling
• Predictive ability?
Modelling of EF/ECF?

- Emotional Trajectory/path: but...
- Currently, EF lacks formal modelling (Dow 2008)
- Modelling could help explain nature and timing of events that cause the switch between euphoric phantasy and onset of panic.
- Paper presents first rudimentary attempts at a model...
Model: Phantasy, investment appraisal, and project performance

- Self-interested corporate manager (risk-neutral/zero discount rate):
- New investment opportunity
- Initial required investment $I > 0$.
- Mgr decides a) whether to take the project, and b) then exerts effort in developing the project towards success.
- Moral Hazard: effort-shirking.
ECF

• Manager initially (unconsciously) views the project as a phantastic object:
• Characteristics over and above its financial performance (excitement/euphoria).
• Mgr continues in this phantasy, unless the project has a failure at a point in its life…
• => euphoria is destroyed: mgr switches to project hatred…
Timeline and details of model

- **Date 0**: Investment opportunity: required investment $I > 0$.
- If mgr takes project, issues a proportion equity to outsiders $1 - \alpha \in (0,1)$
- Mgr retains a stake $\alpha$.
- Mgr views as project as “phantastic” object, with phantasy parameter $\theta \geq 0$.
- At date 0, mgr views project as infallible: certain to succeed over both periods.
- This phantasy remains as long as project succeeds.
- Investors share mgr’s phantasy: mkt value > Fundamental value.
Timeline (continued)

- **Date 0.25**: mkt becomes rational, and understands mgr’s motivations.
- Investors switch from project phantasy to hatred, parameter $- \Delta$.
- **Date 0.5**: mkt’s hatred disappears => MV= FV
- The manager ignores mkt, and continues in his project phantasy.
- **Date 1**: Managerial effort level (stage 1) $e_1$
- Cost of effort
  \[
  c(e) = \beta e^2
  \]
Effect of effort

- Project succeeds or fails with equal probability
- Success income: $R(1 + \gamma e_1)$
- Failure income = zero
- Mgr’s phantasy: $(1 + \theta)R(1 + \gamma e_1)$.

**Date 2:** first stage outcome: if success, phantasy parameter continues: mgr still thinks project is infallible. $(1 + \theta)R(1 + \gamma e_2)$.
- If fails, mgr switches to project hatred: $\phi \leq 0$.
- $\Rightarrow (1 - \phi)R(1 + \gamma e_2)$. 
Solving game

• Backward Induction:
• Mgr’s expected date 2 payoff (following date 1 success):

\[ \Pi_2 = \alpha(1 + \theta)(R + \gamma e_2 R) - \beta e_2^2 \]

• Following date 1 failure

\[ \Pi_2 = \frac{1}{2} \alpha(1 - \phi)(R + \gamma e_2 R) - \beta e_2^2 \]
Manager’s optimal effort levels

\[ e_1^* = e_2^S^* = \frac{\alpha(1+\theta)\gamma R}{2\beta} \]

\[ e_2^F^* = \frac{\alpha(1-\phi)\gamma R}{4\beta} \]

**Proposition 1:** If the project succeeds at the end of date 1, the manager’s project phantasy is maintained throughout \( \Rightarrow \) same effort in date 1 and date 2.

If the project fails at the end of date 1, mgr switches from project-phantasy to project-hatred \( \Rightarrow \) effort falling from date 1 to date 2.
Date 0: investment decision

- Manager invests iff

\[ \Pi_1 + \Pi_2 = 2(1 + \theta)R + (2\alpha - \alpha^2) \frac{(1 + \theta)^2 \gamma^2 R^2}{2\beta} - I \geq 0. \]

- Bounded rationality/phantasy: At date 0, mgr thinks project succeeds for sure.

- Phantasy may be value-reducing (negative NPV as mgr overvalues project) or value-adding (overvalues project, but works harder due to phantasy).
Effect of mgr/investor phantasy on time-series of project values

Values

Phantasy causes volatility !!!

2 period Binomial model

=> Extend to multi-period/ continuous distribution model: BS
Implications for Technical analysis/Hedge Funds 1

- EF suggests an emotional trajectory (roller-coaster!) affecting stock price trends, returns and volatility.
- In boom times, people ‘love’ their magical investments and under-estimate risk.
- In down times, reality intrudes, and people fully understand risk.
- My Model: EF => emotions amplify volatility
Implications for Technical analysis/Hedge Funds 2

• Can we use EF framework to predict emotional trajectory => predict stock market?
• When does love turn to hate?
• Do all investors turn at the same time?
• Is the timeframe the same across all bubbles and crashes?
EF, modelling and predictability?
EF, modelling and predictability?

- Coppock Indicator (Bereavement time 14 months \(\Leftrightarrow\) remarkable predictive power in stock markets
- Leading and Lagging (behavioural) indicators
- **Chaos Theory** (Mandelbrot: Bernice Cohen: “Edge of Chaos”)
- Cohen describes Jeckell and Hyde Investors
- \(=>\) not all rational at once
- Nobody is fully rational at any time!
Chaos Rules (Bernice Cohen book)

- Chaotic patterns can be explained by simple mathematical rules (iterations)

\[ X^2 - 1 \]

\[ 2X^2 - 1 \]

But pattern sensitive to starting point!!
Summary and future research

• EF is a natural development from BF.
• BF: cognitive biases/emotions: piecemeal approach
• EF: Unconscious emotions: emotional trajectory/bubbles + crashes/volatility
• EF provides a framework for understanding bubbles and crashes
• But no formal models yet ⇔ predictive ability?