Testing Dominant Theories in Finance

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Outline

- Mainstream Finance Assumptions

- What drives risk attitude?

- Objectives

- Approach

- Literature Review

- The Models

- The Data

- The Results

- Conclusion

Mainstream Finance Assumptions

ALL	•Rationality •perfect information •<u>risk aversion</u>
Expected utility theory	•Rationality •maximizing expected utility •risk aversion •constant risk preferences
Efficient-market hypothesis	•rational market •perfect information
Rational Expectations	•Rationality •perfect information •risk aversion

What Drives Risk Attitude?

Exogenous factors

Endogenous factors
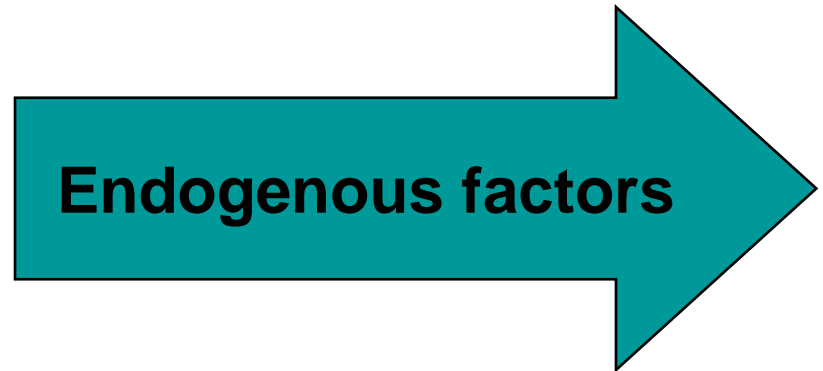
The Objectives

1) Are investors truly risk averse?

2) Are risk attitudes linear?

3) What really moves the market ?

The Approach

1) Test benchmark indices to <u>determine the risk attitudes</u> of investors

2) Test these <u>risk attitudes over time</u> and market direction

3) Test indices' <u>responsiveness</u> to macroeconomic variables versus risk attitudes.

Trini Reality

- Domestic equity market not well understood scientifically

- Found to be <u>underdeveloped</u>; narrow, thin and <u>inefficient</u> (Singh 1995) as a limited number of entities are publicly traded (Bourne 1998)

- 70% of shares are held by institutional investors and are <u>not actively traded</u> (Nicholls, Leon and Sergeant 1996)

- Returns are highly <u>non-normal</u>, and compared to the Jamaican and Barbados stock exchanges, presents the highest return and the lowest risk and, consequently, the largest Sharpe ratio (Watson 2008)

Behavioural Finance

- A marriage of finance and psychology, growing in acceptance

- Behavioural Finance – dominant finance's deficiencies are based on
  - The way our brains work
  - The way the market really works

  - Contradictions to assumptions of rationality, perfect information, risk aversion

(Im)perfect (mis)information

- All available information is assumed to be accurately reflected in prices (Samuelson 1965)

  – Available to whom?

  – How 'accurately' is information reflected? Let's see…

Cognitive Psychology

- Sources of irrationality -
  - cognitive biases and overall emotional reactivity
- We mentally overweight -
  - information confirming our expectations
  - more recent / memorable information
- Overconfidence -
  - We overestimate (underestimate) our role in our successes (failures)
  - We underestimate our information needs
  - We overestimate the precision of our estimates

Biases

- Biases make us blind to alternatives

- Biases and heuristics affect the majority of the population

- Biases are not static

- Psychology is silent on the magnitude and (in)consistency of these biases

Investor Behaviour

- Investors are risk loving

- Experts are equally prone to overconfidence

- Successful traders were found to be the most overconfident

- October 1987 stock market crash was precipitated by a decline in the market

- Herding - investors mimic other investors

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Prospect Theory - Assumptions

- Certainty effect
- Loss aversion
- Non-linear preferences
- House money effect
- Irrationality

- Critique - Prospect theory does not suggest what the market's reaction to or interpretation of a specific economic event would be

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Model 1

- $V(x) = \max_i EU(X^T)$

- $i = -(u-r)V_x / \sigma^2 \ V_{xx}$

Where:

i=index

V=indirect utility function or value function

U=direct utility function

x=initial wealth

X^T=terminal wealth

σ^2 = volatility of the index

u=rate of return on the index

r=risk free rate of return

V_x = the marginal utility of wealth

V_{xx} = the second derivative of wealth

Model 2

- $V(x,y) = \max_i EU(X^T)$

- $i = -((u-r)V_x / \sigma^2\, V_{xx}) - (\rho\, V_{xy} / \sigma\, V_{xx})$

Where:

- y=macroeconomic factor
- ρ=instantaneous correlation factor between the index and the macroeconomic factor
- V_{xy}= cross derivative of the indirect utility function of wealth with respect to the macroeconomic factor, shows the significance of the macro factor in influencing the LHS

The Data

- US financial and macroeconomic statistics
  - S&P 500 daily closing levels
  - Risk free rate – US Treasury yields
  - Fed Funds Effective Rate and unemployment

- Trinidad and Tobago statistics
  - Trinidad and Tobago Composite Index (TTCI) Stock Exchange data – CBTT
  - Risk free rate - 90 day Treasury Bill rates – CBTT
  - Unemployment rate

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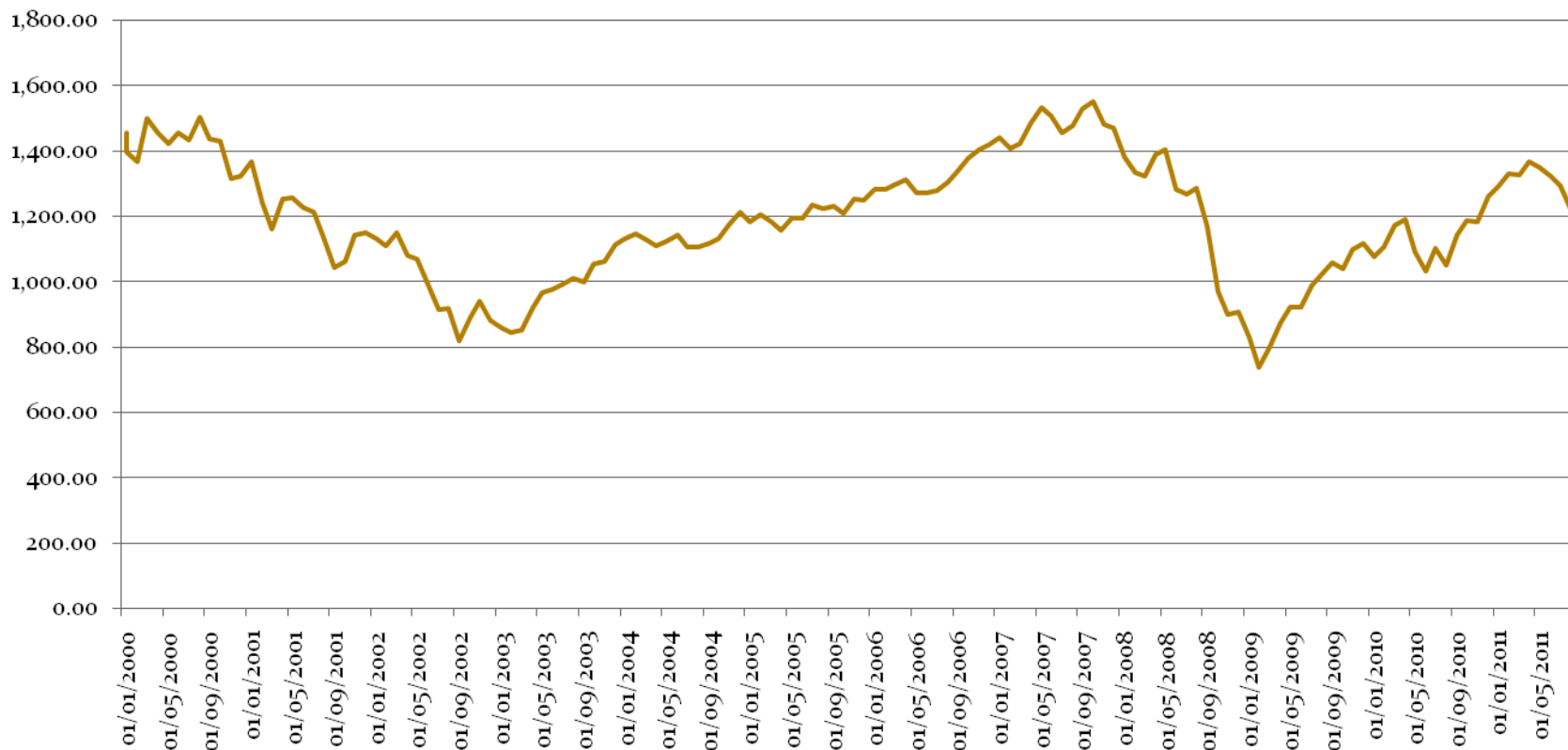# The Trinidad and Tobago Composite Index

T&T composite index
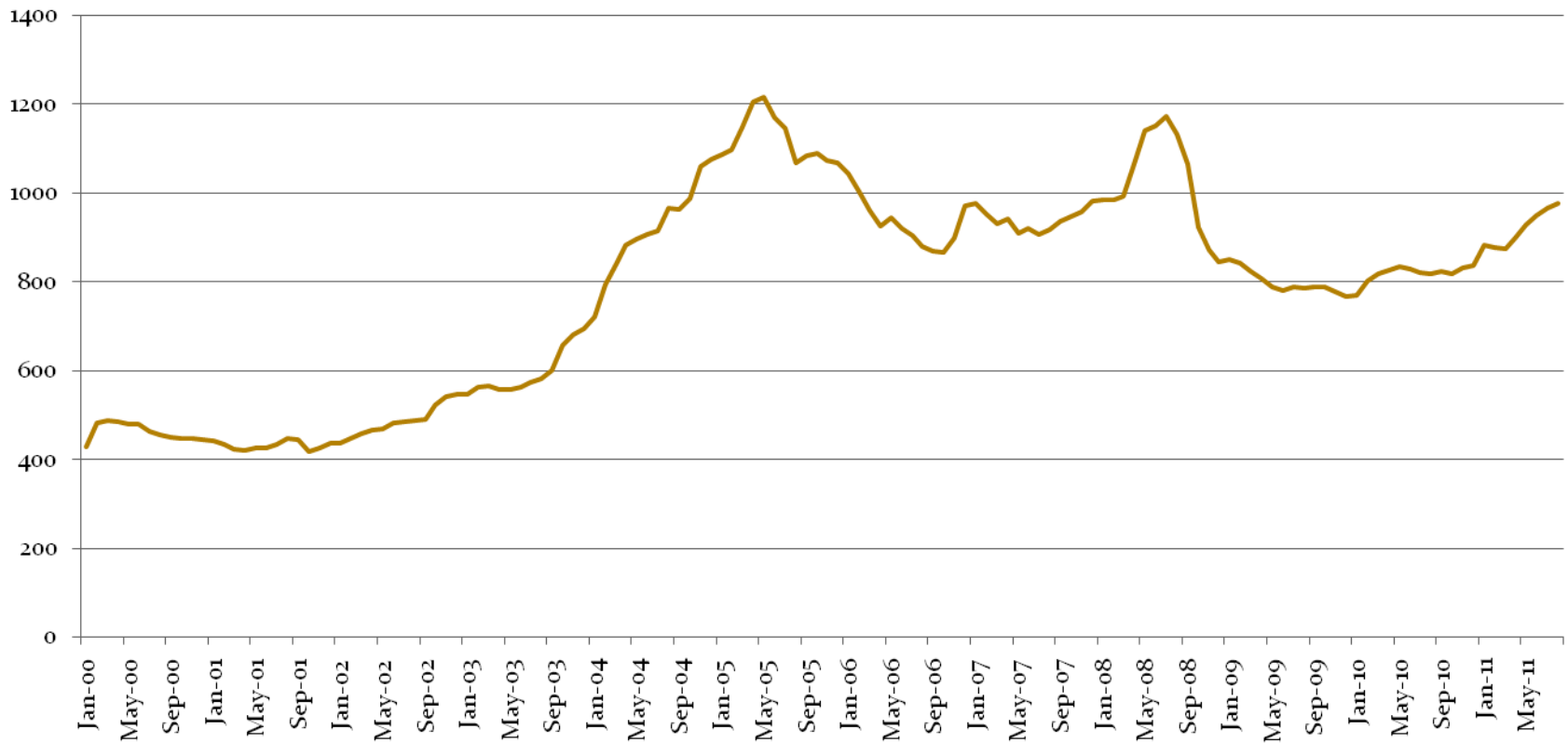
The S&P 500 Index

S&P 500 Index

The Method

- We conduct non-linear least squares regressions on e-views, using the models and data discussed

- We test the S&P 500 index and the TTCI for risk attitude, the effect of macroeconomic statistics, and the effect of investment time horizons

- Survey data – responses from local and overseas investors, portfolio managers, traders etc., to a short survey. Not used in empirical testing.

The Empirical Results – Model 1

- S&P 500 and TTCI investors are risk loving – whether gains / losses being realized

- S&P 500 and TTCI investor preferences are dependent on the value of the index, but the converse is not true

- Risk appetite increases at a decreasing rate over the investment time horizon

The Empirical Results – Model 2

- Investors are consistently risk loving

- Unemployment (TTCI) and interest rates (S&P 500) have a weak influence on the index

- Risk appetite increases at a decreasing rate over the investment time horizon

The Survey - Characteristics

- Executed twice – early 2011 and August-September 2011

- Initially did one survey instrument in excel, and the second one on www.surveymonkey.com

- Sent to TnT investors, professional traders and fund managers, finance professionals etc.

- Initially got 35 responses, then an additional 30

- Relatively low response rate based on the nature of the questions – not relevant to many persons

The Survey - Questions

1. Are you responding in a personal or professional capacity?

2. Are you mainly invested in TnT or otherwise?

3. Are you risk averse, risk loving or risk neutral?

4. On average, when faced with losses (gains), you
   a) Adopt a risk loving attitude
   b) Adopt a risk averse attitude
   c) Exit loss-making (profitable) trades
   d) Increase investment in loss-making (profitable) trades

The Survey – Questions Cont'd

5. Which one has the greatest influence on your risk attitude:

   a) Your existing stock of wealth / portfolio size

   b) Your current profit / loss

   c) Overall market sentiment / risk attitude

   d) The opinions / sentiment of your friends, colleagues

   e) Macroeconomic and financial data

6. Which one has the most influence on your investment decisions?

   a) Macroeconomic and financial data

   b) Overall market sentiment / risk attitude

   c) Your own risk attitude

The Survey – Questions Cont'd

7. Which one is generally more significant in influencing overall market movements?

   a) Macroeconomic and financial data

   b) Overall market sentiment / risk attitude

8. In general you believe that

   a) The real value of the portfolio / return depends on the risk attitude of the investor

   b) The attitude of the investor depends on the real value of the portfolio

Conclusion

- Investors are risk loving across market trends and trading results

- We refute finance theories and Prospect theory

- Preferences of investors depend on the value of the index, but the converse is not true

- Unemployment and interest rates less significant than risk attitudes

- Risk appetite increases over the investment time horizon, at a decreasing rate

Thank You