Testing Dominant Theories in Finance Using the Trinidad and Tobago Stock Exchange

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Conference on the Economy

October 2011

Outline

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Mainstream Finance Assumptions

ALL	**•Rationality** **•perfect information** **•risk aversion**
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?

The Objectives

1) Are investors truly risk averse?

2) Are risk attitudes linear?

3) What really moves the market ?

Approach

1) Test benchmark index to determine the risk attitudes of investors

2) Test these risk attitudes over time and market direction

3) Test index's responsiveness to macroeconomic variables versus risk attitudes.

Trini Reality

- Domestic equity market not well understood scientifically
- Found to be underdeveloped; narrow, thin and inefficient (Singh 1995) as a limited number of entities are publicly traded (Bourne 1998)
- 70% of shares are held by institutional investors and are not actively traded (Nicholls, Leon and Sergeant 1996)
- Returns are highly non-normal, 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

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

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

- $V(x,y)=\max_i EU(X^T)$
- $i=-((u-r)V_x / \sigma^2 V_{xx})-(\rho V_{xy} / \sigma V_{xx})$

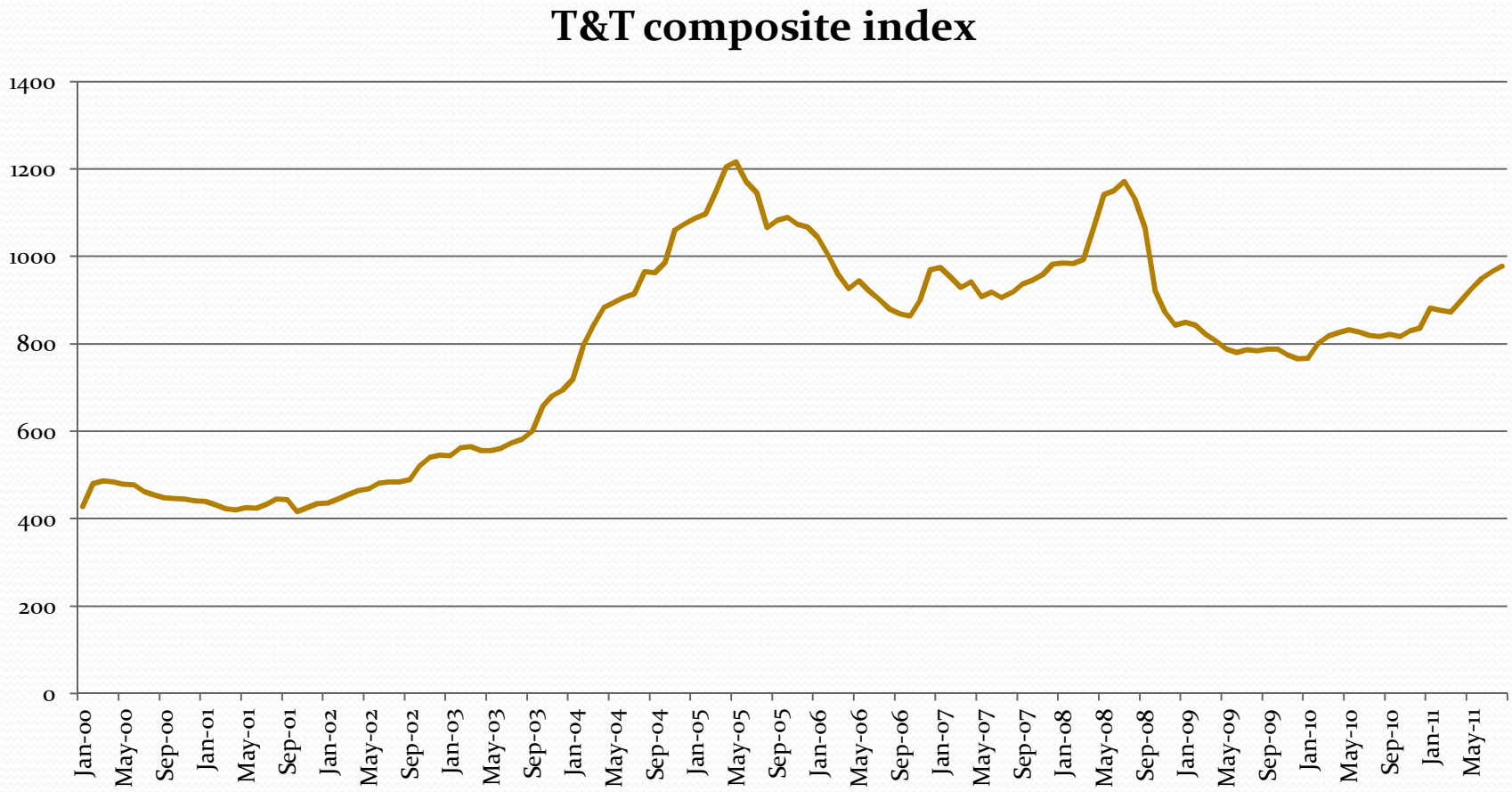
Where:

- 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

- 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

The TTCI


T&T composite index
1400
1200
1000
800
600
400
200
0
Jan-00
May-00
Sep-00
Jan-01
May-01
Sep-01
Jan-02
May-02
Sep-02
Jan-03
May-03
Sep-03
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Sep-10
Jan-11
May-11

The Method

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

The Empirical Results – Model 1

- TTCI investors are risk loving – whether gains / losses being realized
- 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 has a relatively weak influence on the TTCI index
- Risk appetite increases at a decreasing rate over the investment time horizon

Trinidad Survey Results

1	In general, you consider yourself to be	Risk Averse	48%
		Not risk averse	52%
2	On average, when faced with losses, you	Adopt a risk-loving attitude	19%
		Adopt a risk-averse attitude	23%
		Exit loss-making trades	52%
		Increase investment in loss-making trades	6%
3	Which one has the most influence on your investment decisions?	Macroeconomic and financial data	52%
		Overall market sentiment / risk attitude	27%
		Your own risk attitude	21%
4	Which ONE is generally more significant in influencing overall market movements?	Macroeconomic / financial data	27%
		Overall market sentiment / risk attitude	73%

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

Any questions?