ESSAYS ON INVESTOR ATTENTION

A THESIS
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ABSTRACT

The collective evidence from behavioral asset pricing literature alludes a negative (positive) effect of lagged (contemporaneous) investor sentiment on the cross-section of stock returns behavior (Baker and Wurgler, 2006; Baker et al., 2012; Schmeling, 2009). However, over the past decade, for investment decision-making, the debate shifted from quantifying the effect of investor sentiment on asset prices to identifying unobservable sentiment variables in the market with better accuracy. The FEARS (Financial and Economic Attitude Revealed by Search) index developed by Da et al. (2015) from the Google trends search queries find consistent performance for predicting stock market behavior (Chen, 2017; Gao et al., 2020). The search-based index offers several advantages over the other sentiment measures. First, the search-based sentiment measures are available at a higher frequency. Second, they reveal the attitudes of the households than inquire about them. Third, it reveals more personal information than survey-based measures. This dissertation studies several facets of internet search-based measures through three essays.

In the first essay, we measure the optimistic sentiment by constructing the Geographically Revealed Economic Expectations disclosed by Search (GREEDS) index for the first time along with pessimistic investor sentiment, i.e., FEARS index from households' search behavior on Google for a sample of 39 countries on a weekly basis from 2004 to 2019. We find that the GREEDS (FEARS) index has a positive (negative) relationship with global stock returns. We show the asymmetric effect of GREEDS (FEARS) and observe that this relation is stronger during the lower quantiles than the higher quantiles of the return distribution. Finally, we document the role of global sentiment and sentiment commonality in financial markets.

The second essay examines the relationship between online investor attention, measured by Google's search queries, and the network connectedness between the six-asset classes, i.e., stock, bonds, commodities, foreign currency, cryptocurrency, and volatility. We find that investor attention is a valid predictor for assessing spillover direction and the extent of attention connectedness. Using daily data for eight years, our results contribute to our understanding of asset classification based on attention shock receiver and attention shock transmitter. It also yields a practical understanding of better hedging effectiveness and optimal portfolio choices while minimizing the portfolio risk.

The third essay documents the effect of investor attention on commodities momentum. We construct a long-short factor mimicking portfolio based on investor attention. We demonstrate a strong positive cross-sectional relationship between investor attention and risk-adjusted returns derived from regressing multi-factor commodity pricing models on commodities momentum. We find that the behavioral proxy of 52-week high momentum is a superior predictor than 52-week low and price momentum. The findings suggest that equal-weighted and industrial production among economic factors and value factor among commodity-specific factors consistently explain the variation in all three momentum strategies.

Keywords: Investor attention, GREEDS, sentiment connectedness, commodities momentum

LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller test
ADS	Aruoba Diebold Scott
ASR	Attention Shock Receiver
AST	Attention Shock Transmitter
ASVI	Adjusted Search Volume Index
ATTN_FAC	Investor Attention factor
ATTN_INDEX	Attention Index
Bond	US Treasury Bond
CER	Country Exchange Rate
CFTC	Commodity Futures Trading Commission
CV	Coefficient of Variation
DCC-GARCH	Dynamic Conditional Correlation – Generalized AutoRegressive Conditional Heteroskedasticity
DCI	Directional Connectedness Index
DOLLAR_ER	US Dollar Exchange Rate
EPU	Economic Policy Uncertainty
EW	Equal Weighted commodities futures factor
FD	Financial Development Index
FEARS	Financial and Economic Attitude Revealed by Search
FI	Financial Institutions Index
FM	Financial Markets Index
GBP	Great Britain Pound
GLOBAL_FEARS	Global sentiment index for FEARS
GLOBAL_GREEDS	Global Sentiment index for GREEDS
GREEDS	Geographically Revealed Economic Expectations Disclosed by Search
GSCI	Goldman Sachs Commodity Index
HE	Hedging Effectiveness
HML	High Minus Low
HP_H	Hedgers' Hedging Pressure
HP_S	Speculators' Hedging Pressure
HR	Hedge Ratio
IMF	International Monetary Fund
IND_PROD	Unexpected change in the US Industrial Production
INFLATION	Unexpected Inflation
MATTEN	Market Attention
MSCI	Morgan Stanley Composite Index
NCI	Net Directional Connectedness Index
NPCI	Net-Pairwise Directional Connectedness Index
OI	Open Interest
RET	Stock Returns
RMRF	Excess Market Return over Risk Free return

S&P GSCI	Standard & Poor's Goldman Sachs Commodity Index
SENT	FEARS and GREEDS
SMB	Small Minus Big
SVI	Search Volume Index
TCI	Total Connectedness Index
TS	Term Spread
TS	Term Structure
USD	United States Dollar
VIX	Volatility Index

CONTENTS

LIST OF TABLES

LIST OF FIGURES

REFERENCES

Adekoya, O. B., & Oliyide, J. A. (2021). How COVID-19 drives connectedness among commodity and financial markets: Evidence from TVP-VAR and causality-in-quantiles techniques. *Resources Policy*, *70*, 101898.

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Appendix A: FEARS, Stock Returns and Government Policy Indices during COVID-19

Coefficients	(1)	(2)	(3)	(4)
$FEARS_t$	-5.445*** (-9.02)	-5.449*** (-9.03)	-5.388*** (-8.83)	-5.460*** (-9.10)
$Return_{t-1}$	-0.064* (-1.86)	-0.063* (-1.79)	-0.060* (-1.77)	-0.059* (-1.69)
TS_{t-1}	0.455* (1.97)	0.455** (2.03)	0.560** (2.32)	0.454* (2.00)
VOL_{t-1}	0.133*** (3.26)	0.113** (2.38)	0.239*** (6.33)	0.147*** (3.57)
SIR_{t-1}	0.012 (0.16)	0.004 (0.05)	-0.053 (-0.91)	0.020 (0.25)
CER_{t-1}	-0.039 (-0.45)	-0.044 (-0.52)	-0.007 (-0.09)	-0.051 (-0.60)
DCC_{t-1}	-0.140** (-2.54)	-0.120** (-2.33)	-0.074 (-1.69)	-0.084* (-1.76)
GRI_{t-1}	0.033*** (3.62)			
GSI_{t-1}		0.027*** (3.52)		
$GESI_{t-1}$			0.017*** (3.33)	
GHI_{t-1}				0.025*** (2.99)
$FEARS_t*DCC_{t-1}$	0.205** (2.58)	0.204** (2.56)	0.203** (2.55)	0.204** (2.57)
Constant	-1.069 (-1.09)	-0.865 (-0.89)	-1.064 (-1.11)	-1.010 (-1.04)
R-square	0.235	0.235	0.233	0.232
N	2450	2450	2450	2450
Wald test	48.030	48.411	48.186	49.738

Notes: This table reports the estimation results of regressing stock returns (RET) on FEARS. Control variables are lagged RET, TS, VOL, SIR, CER, DCC, GRI, GSI, GESI, and GHI. Models show the interaction between FEARS and DCC. The values in parenthesis are t-statistics. *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.

Appendix B: Quantile Regression: FEARS, Stock Returns, and Government Policy

τ	[0.20]	[0.40]	[0.60]	[0.80]	[0.95]
Panel (A): FEARS and GSI					
$FEARS_t$	-6.916*** (-9.92)	-5.614*** (-11.51)	-4.582*** (-9.94)	-3.492*** (-5.90)	-1.825* (-1.93)
$FEARS*GSI_{t-1}$	0.042*** (3.54)	0.028*** (3.41)	0.017** (2.21)	0.006 (0.57)	-0.012 (-0.74)
GSI_{t-1}	0.047*** (4.88)	0.036*** (5.39)	0.027*** (4.36)	0.019** (2.29)	0.005 (0.38)
DCC_{t-1}	-0.153** (-2.45)	-0.142*** (-3.28)	-0.134*** (-3.27)	-0.126** (-2.37)	-0.112 (-1.33)
Controls	Yes	Yes	Yes	Yes	Yes
Panel (B): FEARS and GRI					
$FEARS_t$	-6.379*** (-10.04)	-5.135*** (-11.66)	-4.189*** (-10.00)	-3.182*** (-5.92)	-1.628* (-1.89)
$FEARS*GRI_{t-1}$	0.029*** (2.85)	0.018** (2.52)	0.009 (1.37)	0.000 (0.01)	-0.014 (-1.01)
GRI_{t-1}	0.035*** (4.31)	0.029*** (5.08)	0.024*** (4.43)	0.019*** (2.68)	0.010 (0.95)
DCC_{t-1}	-0.105* (-1.80)	-0.116*** (-2.86)	-0.124*** (-3.22)	-0.133*** (-2.68)	-0.146* (-1.85)
Controls	Yes	Yes	Yes	Yes	Yes
Panel (C): FEARS and GESI					
$FEARS_t$	-5.768*** (-13.24)	-4.885*** (-16.33)	-4.185*** (-15.16)	-3.493*** (-10.08)	-2.408*** (-4.33)
$FEARS*GESI_{t-1}$	0.031*** (3.75)	0.022*** (3.92)	0.015*** (2.91)	0.008 (1.26)	-0.003 (-0.25)
$GESI_{t-1}$	0.024*** (4.70)	0.018*** (5.20)	0.014*** (4.21)	0.009** (2.21)	0.002 (0.28)
DCC_{t-1}	-0.066 (-1.37)	-0.072** (-2.19)	-0.077** (-2.53)	-0.082** (-2.12)	-0.089 (-1.44)
Controls	Yes	Yes	Yes	Yes	Yes
Panel (D): FEARS and GHI					
$FEARS_t$	-5.823*** (-13.53)	-4.908*** (-16.62)	-4.206*** (-15.35)	-3.480*** (-10.05)	-2.374*** (-4.31)
$FEARS*GHI_{t-1}$	0.031*** (3.65)	0.022*** (3.81)	0.015*** (2.85)	0.008 (1.23)	-0.002 (-0.21)
GHI_{t-1}	0.034*** (3.56)	0.026*** (4.06)	0.021*** (3.43)	0.015* (1.94)	0.006 (0.49)
DCC_{t-1}	-0.068 (-1.14)	-0.079* (-1.92)	-0.087** (-2.28)	-0.095** (-1.97)	-0.108 (-1.41)
Controls	Yes	Yes	Yes	Yes	Yes
N	2450	2450	2450	2450	2450

Notes: This table reports the estimation results of regressing stock returns (RET) on FEARS. Control variables are lagged RET, TS, VOL, SIR, CER, DCC, GRI, GSI, GESI, and GHI. The interaction between FEARS and government policy index is employed at five quantiles [0.20], [0.40], [0.60], [0.80], and [0.95]. The values in parenthesis are t-statistics. *, ** and *** indicate statistical significance at 10%, 5% and 1%, respectively.