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Economic Signaling via Social Media: Evidence from Trump's Tweets

1088855
1090893
MAY 2025

Tweet Classification Methodology

Tweet Collection

We downloaded the complete set of tweets authored by Donald Trump between Feb. 15th and May 15th, 2025 from Trump's Truth.org (A website setup by republican supporters of President Trump).

Total Tweets

- 1612 Tweets in total
- 267 economic related

Usable Tweets

- 987 Tweets coinciding with our data
- 187 economic tweets coinciding with our data

Preprocessing

Using the OpenAI API, we parsed the tweets and stored them in a structured format in Excel, with the following columns:

- Timestamp – the exact time the tweet was published.
- Tweet Text – the content of the tweet.
- Indicator Variable (Econ Tweet) – a binary flag denoting economic relevance.

Economic Relevance Filtering

A tweet was labelled as $\text{Econ Tweet} = 1$ if it contained at least one of the following economics-related keywords (case-insensitive). Otherwise, the value was set to 0:

- This classification enabled us to distinguish between tweets likely to affect markets through economic signalling versus those that were non-economic in nature.
- 75 key words

Key Words

Trade & Global Economy

- trade, china, foreign trade, china tariffs, trade war, NAFTA, USMCA, tariff, tariffs, tariff policy, trade deficit, trade balance, free trade, currency manipulation, currency devaluation, capital flight, balance of payments, global economy, US exports, US imports, foreign investment, economic sanctions, foreign

Taxes & Fiscal Policy

- taxes, tax cuts, tax reform, tax policy, corporate tax, corporate tax cuts, capital gains, repatriation, fiscal debt, national debt, debt ceiling, budget deficit, deficit reduction, spending cuts, spending plan

Labor Market & Income

- jobs, job creation, unemployment, labor force, wages, wage growth, minimum wage, income inequality

Key Words

Regulation & Government Role

- regulation, deregulation, social security, entitlements

Business & Corporate Issues

- corporate tax, corporate tax cuts, corporate profits, small business, manufacturing, economy, tax cuts, taxes, debt, debt ceiling, deficit

Monetary Policy & Financial System

- interest rates, rate hikes, fed, federal reserve, monetary policy, stock market, markets, powell

Economic Growth & Productivity

- GDP, economic growth, economic recovery, growth, stimulus, infrastructure, business investment, private sector, industrial policy, boom, economic reform, economic agenda

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Constructing a Tweet-Based Target Surprise Variable from ES Futures

Variable: E-Mini S&P 500 Futures (ES)

- Deep Liquidity Captures Market Reaction: Avg. daily trading volume over $100bn+
- Long Trading Hours capture Trump's Irregular Tweeting Times: ES contracts are Traded on Chicago Mercantile Exchange (CME) from 6pm EST Sunday to 5PM Friday

Formula: We construct the tweet-based Target Surprise (TS_{tweet}) to reflect the characteristics of our explanatory variable.

$$TS_{\text{tweet}} = \frac{P_{\text{after}} - P_{\text{before}}}{P_{\text{before}}}$$

Where:

- P_{before} is the price of ES futures just before the tweet (e.g., at t=−1).
- P_{after} is the price of ES futures after the tweet (e.g., at t= +5).

Adapting Target Surprise: Returns Not Price Changes

- While Fed Fund Futures trade in prices, those prices correspond, deterministically, to bps moves.
  - Fed Fund Future's Price = 100 – Implied Interest Rate → Implied Interest Rate = 100 – Fed. Funds Future Price
- Unlike the Fed Funds Futures, equity futures like the S&P E-mini are not quoted in a rate space as prices reflect index levels, not implied interest rates.
- Raw price changes in the S&P 500 do not carry constant economic meaning as the magnitude of price movements depends on initial levels.
  - A 10-point move in price is very different if the S&P is at 5000 vs. 2000
- Returns are scale-invariant and unit-consistent, which makes it easier to compare across time and tweet events
- Using returns also simplifies interpretation of regression coefficients: *How much does the return of asset I change in response to a 1% move in ES futures centered around a tweet?*

Adapting Target Surprise: No Scaling Factor

- This target surprise variable consists of the percentage change associated with the tweet $(P_{after} - P_{before})/ P_{before}$.
- Unlike the traditional setup, we do *not* need to incorporate a scaling factor (*e.g.* $\frac{D}{D-d}$) because S&P Futures contracts differ from Fed Fund's Futures in an important way.
  - Fed Fund's Futures are 1-month futures contracts that estimate the price of the Federal Fund's Rate at the end of the month. The Fed Funds Rate is itself the **historical average of realized rates** over the past month.
  - Therefore, a scaling factor is needed to weight the surprise (increase or decrease in rates set by the fed) to the portion of the month affected.
- However, S&P Futures are 3-month contracts about the future price of the S&P, which is *not* directly dependent on historical fluctuations or realizations.
- Therefore, no scaling factor is needed because price changes around tweets reflect the full revelation of information contained therein.

When the President Tweets, the Market Listens

Donald J. Trump
@realDonaldTrump

Yesterday, China issued Retaliatory Tariffs of 34%, on top of their already record setting Tariffs, Non-Monetary Tariffs, Illegal Subsidization of companies, and massive long term Currency Manipulation, despite my warning that any country that Retaliates against the U.S. by issuing additional Tariffs, above and beyond their already existing long term Tariff abuse of our Nation, will be immediately met with new and substantially higher Tariffs, over and above those initially set. Therefore, if China does not withdraw its 34% increase above their already long term trading abuses by tomorrow, April 8th, 2025, the United States will impose ADDITIONAL Tariffs on China of 50%, effective April 9th. Additionally, all talks with China concerning their requested meetings with us will be terminated! Negotiations with other countries, which have also requested meetings, will begin taking place immediately. Thank you for your attention to this matter!

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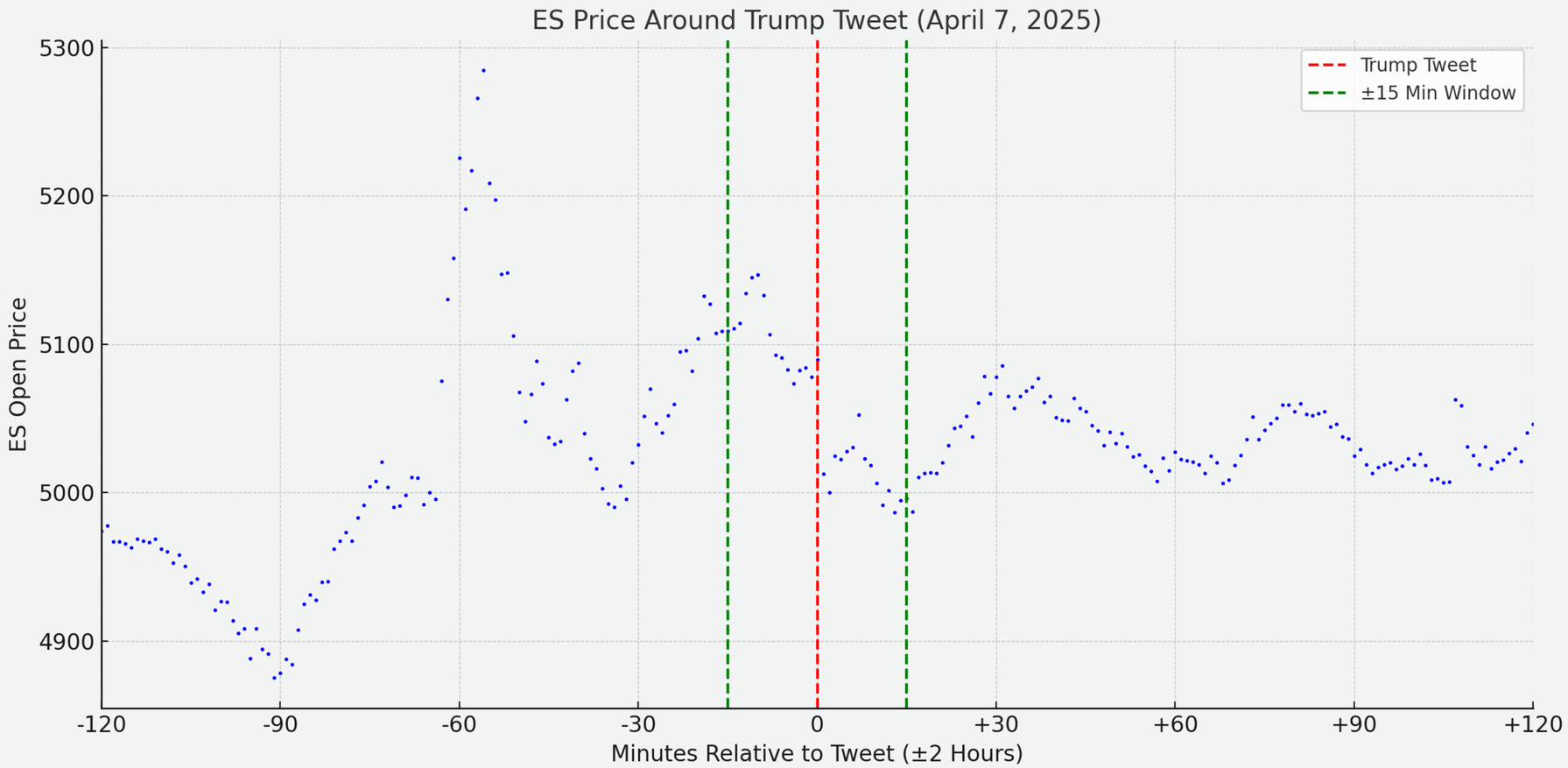
ES Price Around Trump Tweet (April 7, 2025)
Trump Tweet
±15 Min Window
ES Open Price
5300
5200
5100
5000
4900
-120
-90
-60
-30
0
+30
+60
+90
+120
Minutes Relative to Tweet (±2 Hours)

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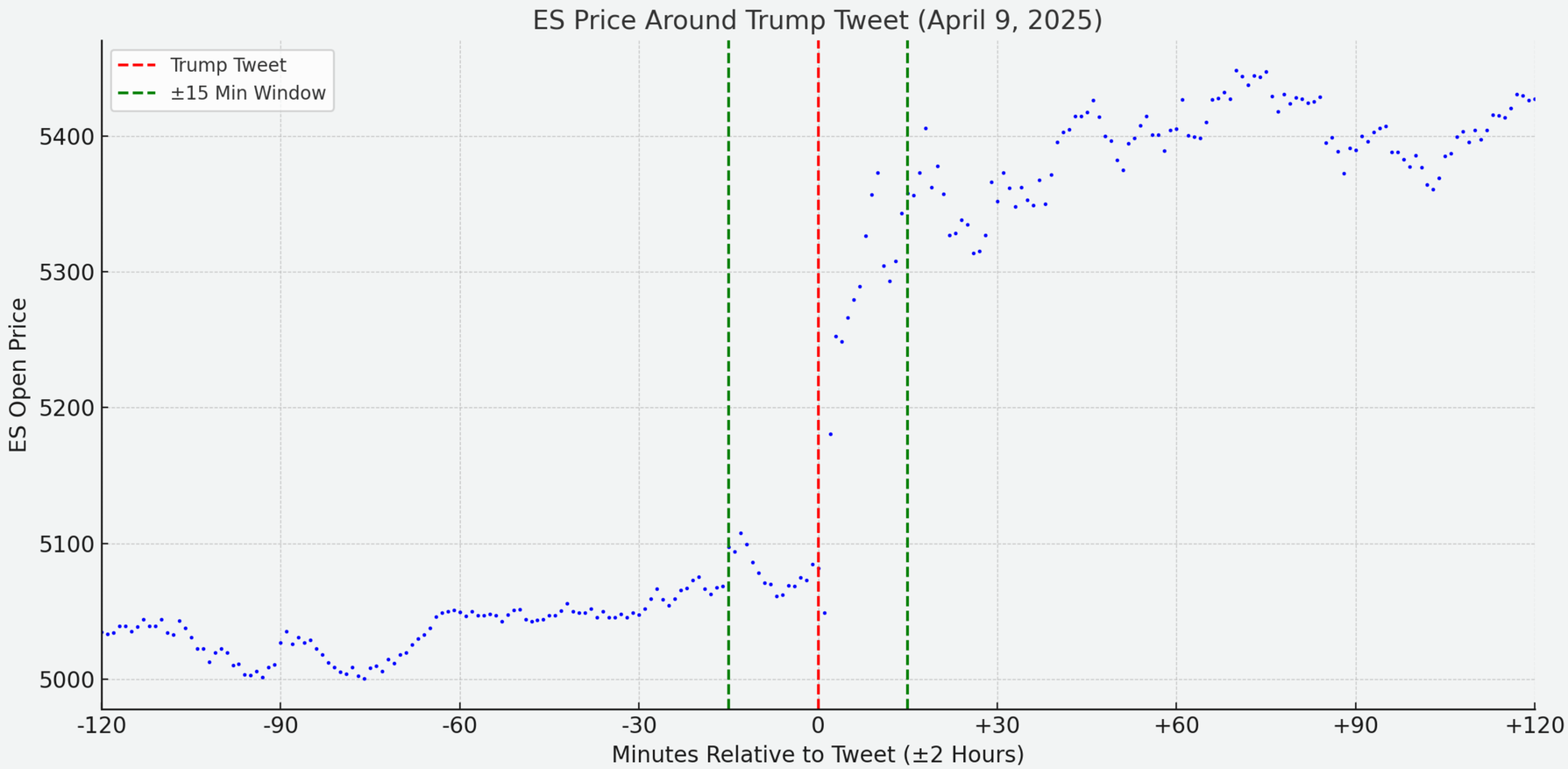
ES Price Around Trump Tweet (April 9, 2025)
Trump Tweet
±15 Min Window
ES Open Price
5400
5300
5200
5100
5000
-120
-90
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-30
0
+30
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Minutes Relative to Tweet (±2 Hours)

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“Too Late” Jerome Powell is a FOOL, who doesn’t have a clue. Other than that, I like him very much! Oil and Energy way down, almost all costs (groceries and “eggs”) down, virtually NO INFLATION, Tariff Money Pouring Into the U.S. — THE EXACT OPPOSITE OF “TOO LATE!” ENJOY!

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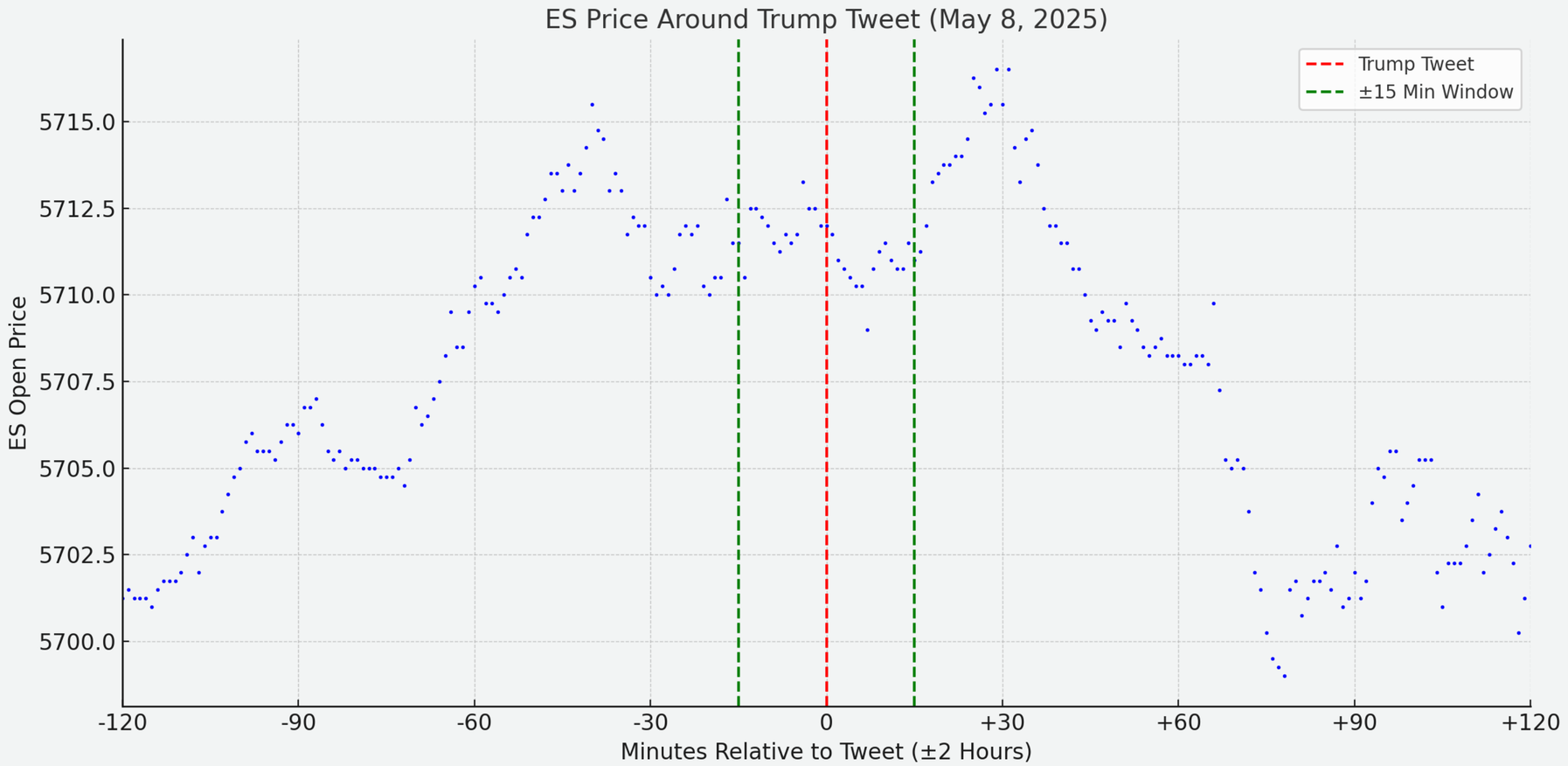
ES Price Around Trump Tweet (May 8, 2025)
Trump Tweet
±15 Min Window
ES Open Price
5715.0
5712.5
5710.0
5707.5
5705.0
5702.5
5700.0
-120
-90
-60
-30
0
+30
+60
+90
+120
Minutes Relative to Tweet (±2 Hours)

Regression Specification with Interaction Term

We estimate the impact of this target surprise on returns of other financial assets using the following regression model:

$$R_i = \alpha + \beta_1 TS_{\text{tweet}} + \beta_2 \left(TS_{\text{tweet}} \times \text{Econ\_Tweet}\right) + \varepsilon$$

Where:

- $R_{i,}$ is the return of asset i in a symmetric window around the tweet (e.g., from t=−15 to t= +15)
- TS_{tweet} is the target surprise from the E-mini S&P 500 3-month futures contract
- Econ-Tweet ∈ {0,1} is a dummy indicating whether the tweet was economically relevant
- TS_{tweet} ×Econ-Tweet is the interaction term capturing differential impact of economic tweets.
- ε_{tweet} is the residual error term

Interpretation

$$R_{i,\text{tweet}} = \alpha + \beta_1 TS_{\text{tweet}} + \beta_2 (TS_{\text{tweet}} \times \text{Econ-Tweet}_{\text{tweet}}) + \varepsilon_{\text{tweet}}$$

$$H_0: \ \beta_1 = 0 \text{ and } \beta_2 = 0$$

$$H_A: \ \beta_1 \neq 0 \text{ or } \beta_2 \neq 0$$

- α captures the avg. return of asset *i* during the tweet window when both TS and Econ variables are zero.
- β1 captures the baseline effect of the target surprise on asset returns around *non-economic* tweets.
  - Effect of a 1 bps change in ES future prices around the tweet (6 minutes) on the 30-minute return of asset *i*, for non-economic tweets[1].
- β2 captures the additional impact of the target surprise for *economic* tweets.
  - The incremental effect of that same ES future move when the tweet is economic.

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1 Independent and dependent variables were normalized according to the methodology specified in the Appendix. The resulting regression was then converted from standard deviation to bps for clearer interoperability.

Interpreting Coefficient Signs

- A positive value for TS means the S&P 500 rose in the minutes following the tweet ($P_{after} > P_{before}$)
- A negative value for TS means the S&P 500 fell in the minutes following the tweet ($P_{before} > P_{after}$)
- Positive regression coefficients indicate that the returns on S&P move with returns on asset *i*
- Negative regression coefficients indicate that returns on the S&P move inversely with returns on asset *i*

Table 2: Interpretation of Regression Coefficient β and Target Surprise (TS)

TS Sign	**β Sign**	**Return Comovements**	**Interpretation**
$TS > 0$	$\beta > 0$	S&P ↑, Asset ↑	*Risk-on rotation out of safe-haven assets.* For bonds: yields rise, prices fall, indicating bond sell-off as investors shift into equities.
$TS > 0$	$\beta < 0$	**S&P ↑, Asset ↓**	***Safe-haven demand despite equity rally.*** For bonds: yields fall, prices rise, suggesting bond inflows even as equities rise.
$TS < 0$	$\beta > 0$	S&P ↓, Asset ↓	*Flight to safety.* For bonds: yields fall, prices rise, as investors exit equities and seek safety.
$TS < 0$	$\beta < 0$	**S&P ↓, Asset ↑**	***Risk-off; Broad Market Decline.*** For bonds: yields rise, prices fall, suggesting bond sell-off despite equity declines.

Return Assets (R_i)

- Short-Term Rates / Money Market Instruments
  - SOFR 3M Futures– SR3
  - SOFR 1M Futures – SR1
  - 30-Day Fed Funds Futures – ZQ
- Commodities
  - Gold Futures – GC
- Interest Rate Instruments / Treasury Securities
  - 2-Year Treasury Futures – ZT
  - 5-Year Treasury Futures – ZF
  - 10-Year Note Futures – ZN
  - 10-Year Ultra Treasury Futures – TN (9.5-10 yr remaining)

Results

$$R_i = \alpha + \beta_1 TS_{\text{tweet}} + \beta_2 \left(TS_{\text{tweet}} \times \text{Econ\_Tweet}\right) + \varepsilon$$

Table 1: Asset returns (in bps) on tweet-based target surprise (TS) and economic tweet interaction (Econ)

Asset	**TS Coeff.**	**t-stat**	**p-value**	**Econ Coeff.**	**t-stat**	**p-value**	R^2	**N Obs**
Gold Futures (GC)	0.24	0.781	0.435	3.35	0.338	0.735	0.0262	985
SOFR 1M (SR1)	-5.90*	-17.483	0.000	0.10	0.033	0.974	0.7641	99
SOFR 3M (SR3)	-7.18*	-9.249	0.000	-6.20*	-2.232	0.026	0.6640	476
2-Year Treasury (TN)	-28.91*	-3.521	0.000	-24.60	-0.471	0.638	0.1256	737
5-Year Treasury (ZF)	-30.15*	-7.492	0.000	-22.60	-0.901	0.368	0.3472	832
10-Year Note (ZN)	-33.47*	-6.052	0.000	-23.70	-0.618	0.537	0.2257	860
30-Day Fed Funds (ZQ)	-1.18*	-9.738	0.000	-0.10	-0.145	0.885	0.5019	35
10-Year Treasury (ZT)	-16.43*	-7.179	0.000	-13.60	-1.323	0.186	0.4868	691

Interpretation of Regression Results

Short-Term Rates and Cash-Like Instruments: 1M SOFR (SR1) , 3M SOFR (SR3), & 30-Day Fed Funds Rate (ZQ)

- **TS:** All three coefficients are **statistically significant** and **negative**
  - When S&P futures rise (fall), yields rise (fall) , prices fall (rise).
    - When tweets are positive, investors rebalance away from safe-haven assets into equities.
    - When tweets are negative, investors rebalance toward to short-term rate instruments.
- **Interaction Term: All coefficients are negative or close to zero** (directionally consistent with the TS).
- R^2 *are* high (SR1 = .76, SR3 = .66, ZQ =.50). This implies that short-term rate instruments are very sensitive to news about short-term changes in policy direction, of the kind that would be revealed and captured by tweets.

Interpreting Results: Treasury Futures

Treasury Futures: 2-yr Treasury (TN) , 5-yr Treasury (ZF), 10-year Treasury Note(ZN), 10-yr Treasury Bonds (ZT)

TS: All coefficients are **statistically significant** and **negative**, except for the coefficient for TN, which is slightly positive.

- When S&P futures rise (fall), yields rise (fall), and prices fall (rise).
  - Positive tweets lead investors to rebalance away from bonds
  - Negative tweets lead investors to expect treasury yields to rise

Interaction Term: All coefficients are **negative,** but **none** are **statistically significant**.

- Possible Explanation: Longer-dated bonds are less sensitive to policy news by tweet, which provides short-term clarification. Therefore, traders are likely to be less sensitive to nuances of tweets (economic vs. non-economic).

R^2 suggest low to moderate explanatory power (TN = .13, ZF = .35, ZN =.23, ZT = .49). While bond markets respond to news disclosed by tweet, they do not distinguish between non-economic and economic news.

Summary Insights

Putting it All Together: Insights

Broad Market Responsiveness:
Most assets exhibit statistically significant sensitivity to tweet-based target surprises, with short-term interest rates and Treasury futures showing the strongest effects.

Economic Tweets Amplify Market Response:
The interaction term shows that market reactions are larger when tweet content is economic in nature—especially for short-term rate instruments like 3M SOFR.

Consistent Directionality:
TS and interaction coefficients are generally **negative**, indicating that when equities rise (positive TS), yields tend to rise (bond prices fall), consistent with a risk-on interpretation.

Variation Across Maturities:
Short-term instruments (SOFR, ZQ) are more responsive and more explanatory (**higher R^2**), whereas longer-term Treasuries (ZF, ZT, ZN) are less sensitive, suggesting they respond more to broad sentiment than to tweet content.

Magnitude Matters:
A 1 bps move in ES Futures leads to asset price movements of up to 7.2 bps (e.g., SOFR), indicating meaningful real-time repricing within a 30-minute window.

Implication:
Trump's tweets—especially those of economic relevance—move markets in systematic, directional, and interpretable ways. Market participants rapidly reallocate across asset classes in response to perceived policy signals.

When the President Tweets, the SR3 Market Listens

Putting it All Together: Empirical Insights

3M SOFR

Table 3: Implied SOFR 3M Effects across Target Surprise (TS) Quantiles

Quantile	TS (bps)	Implied TS Effect (bps)	Implied Econ Effect (bps)	Total Effect (bps)
1%	-38.2	+273.0	+237.9	510.9
5%	-19.5	+139.6	+121.6	261.2
25%	-4.6	+33.2	+29.1	62.3
50%	0.00	0.0	0.0	0.0
75%	+3.9	-28.3	-24.9	-53.2
95%	+19.06	-135.9	-119.0	-254.9
99%	+37.45	-266.9	-233.8	-500.7

- The model provides plausible estimates for the interquartile range but extreme dislocations for outlier events
- Nonetheless, the model shows that trump tweets can have non-negligible effects on specified return assets such as the 3M SOFR rate

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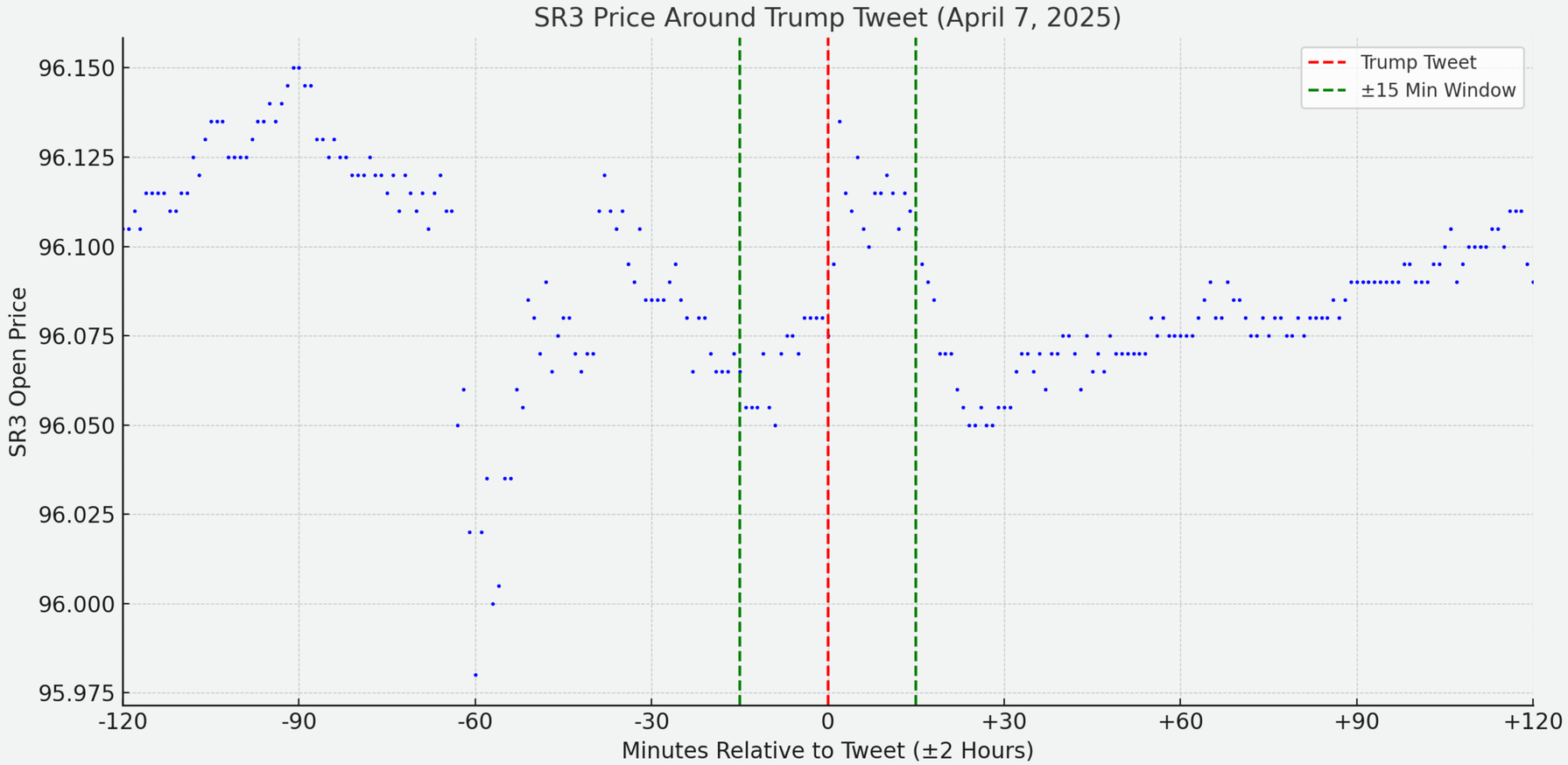
SR3 Price Around Trump Tweet (April 7, 2025)
Trump Tweet
±15 Min Window
SR3 Open Price
96.150
96.125
96.100
96.075
96.050
96.025
96.000
95.975
-120
-90
-60
-30
0
+30
+60
+90
+120
Minutes Relative to Tweet (±2 Hours)

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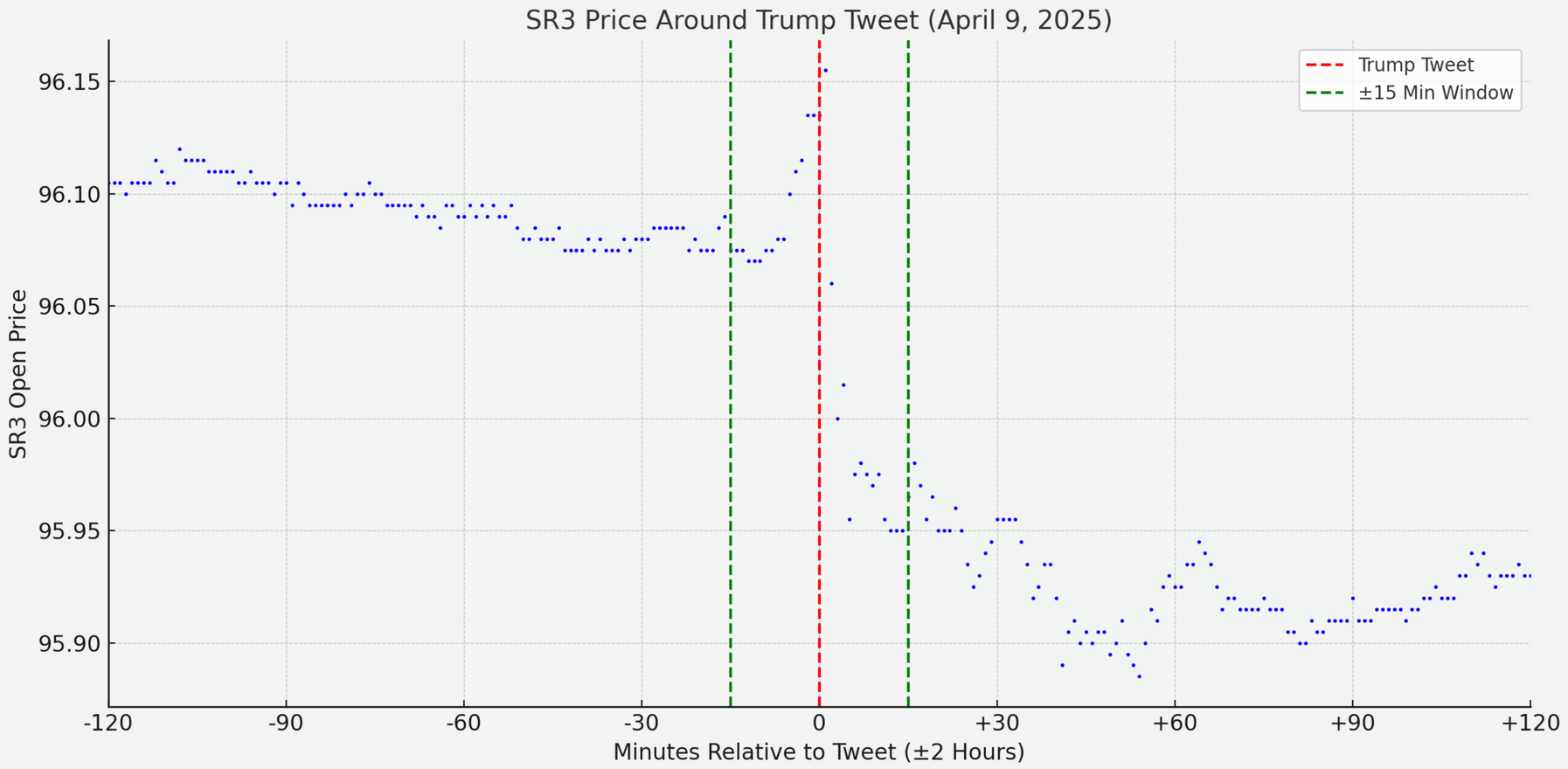
SR3 Price Around Trump Tweet (April 9, 2025)
Trump Tweet
±15 Min Window
SR3 Open Price
96.15
96.10
96.05
96.00
95.95
95.90
-120
-90
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-30
0
+30
+60
+90
+120
Minutes Relative to Tweet (±2 Hours)

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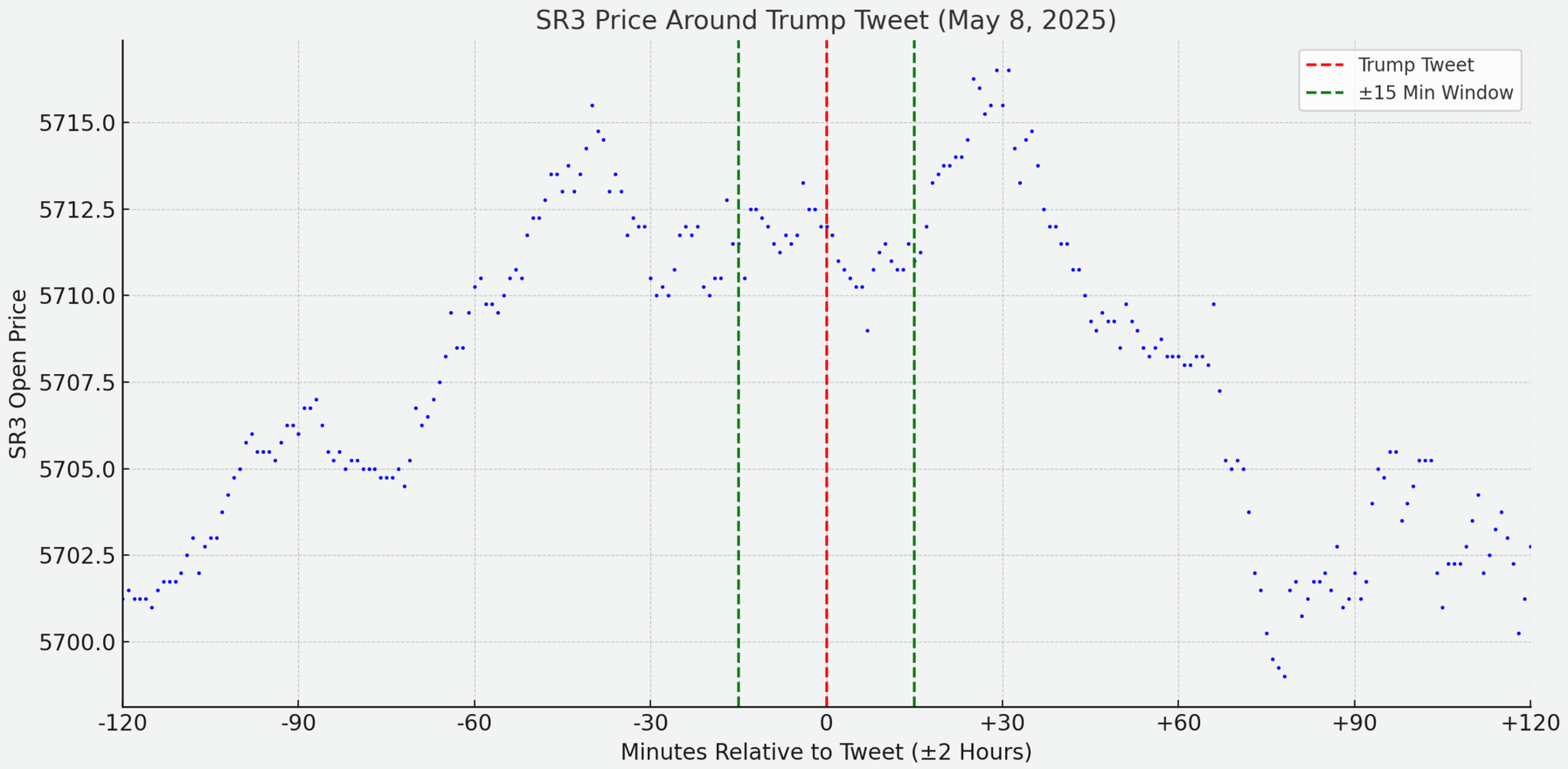
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Trump Tweet
±15 Min Window
SR3 Open Price
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5712.5
5710.0
5707.5
5705.0
5702.5
5700.0
-120
-90
-60
-30
0
+30
+60
+90
+120
Minutes Relative to Tweet (±2 Hours)

Appendix: Scaling Target Surprise

Standardization (Scaling)

Standardization transforms a variable to have mean zero and standard deviation one:

$$x^{\text{scaled}} = \frac{x - \mu}{\sigma}$$

We scale both the Target Surprise (TS) and the asset returns:

$$\text{TS}_{\text{scaled}} = \frac{\text{TS} - \overline{\text{TS}}}{\text{SD}_{\text{TS}}}, \quad \text{Return}_{\text{scaled}} = \frac{\text{Return} - \overline{\text{Return}}}{\text{SD}_{\text{Return}}}$$

Interpretation: The coefficient β_1 represents the number of *standard deviations* the asset return moves in response to a *1 standard deviation increase* in the Target Surprise. We scale by the actual SD values for each variable to get coefficents in terms of bps.

Reference

Trump, D. J. (2025). Series of Truth Social posts between March 5 and May 15, 2025. *Truth Social*. Retrieved May 16, 2025, from https://truthsocial.com/@realDonaldTrump

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