

Capital market reaction to the United States-China trade war: an event study of abnormal return, trading volume activity, and market capitalization in Indonesian coal sub-sector companies

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ABSTRACT

This study examines the capital market reaction to the United States-China trade war among coal sub-sector issuers listed on the Indonesia Stock Exchange (IDX), using an event study approach with Abnormal Return (AR), Trading Volume Activity (TVA), and Market Capitalization (MC) as reaction indicators. The final sample consists of 14 coal sub-sector companies selected through purposive sampling based on continuous listing, absence of confounding corporate actions, and complete price/volume data throughout the observation period. The event window spans 29 trading days ($t-14$ to $t+14$) surrounding the tariff escalation of April 16, 2025 ($t=0$), preceded by a 15-trading-day estimation window ($t-29$ to $t-15$) used to construct the expected return under the Mean-Adjusted Model. Because the AR, TVA, and MC data did not fully satisfy the normality assumption under the Shapiro-Wilk test, the non-parametric Wilcoxon Signed Rank Test was used for hypothesis testing. The results show no statistically significant difference in AR before and after the event ($Z = -0.408$, $p = 0.683$), whereas TVA ($Z = -2.480$, $p = 0.013$) and MC ($Z = -3.296$, $p = 0.001$) both differ significantly. These findings indicate that the trade war was not strong enough to alter abnormal profits captured through returns, but significantly affected trading activity and the market's valuation of coal issuers, suggesting that the reaction was channeled primarily through liquidity and valuation responses rather than price adjustments. Theoretically, this study extends the Efficient Market Hypothesis and geopolitical risk theory by showing that market efficiency can manifest asymmetrically across reaction channels; practically, it offers investors, portfolio managers, and issuers in China-exposed commodity sectors an evidence-based basis for monitoring liquidity and valuation signals, rather than price movements alone, during periods of trade-policy escalation.

Keywords: event study; abnormal return; trading volume activity; market capitalization; coal sector; United States-China trade war

JEL Classification: G14; G15

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1. Introduction

Entering the third decade of the twenty-first century, the global economy is characterized by an unprecedented level of interconnectivity. Globalization has liberalized the flow of goods and services and integrated world financial markets into a complex and interdependent system, so that a country's capital market can no longer be isolated from events occurring beyond its territorial borders. Domestic capital markets are becoming increasingly vulnerable to external shocks alongside the growing integration of global financial markets, as information and risks can rapidly propagate across markets. This situation leads to shifts in market risk that investors must consider when evaluating the risks and potential returns associated with their investment decisions (Long et al., 2021).

Among the various sources of global uncertainty, geopolitical risk has emerged as a significant determinant of financial market volatility. Prior evidence suggests that heightened geopolitical risk is associated with reduced corporate investment, as firms tend to scale back capital expenditure during periods of elevated geopolitical tension, and that it is also linked to substantially larger underpricing in initial public offerings, as issuers offer greater discounts to compensate investors for the additional risk they bear (Rumokoy et al., 2023; Rumokoy et al., 2025). More broadly,

geopolitical risk theory characterizes events such as trade disputes, military conflicts, and terrorism as systemic, non-diversifiable risk factors that disrupt investor expectations and global supply chains (Caldara et al., 2022). Geopolitical Risk Theory finds that the higher the geopolitical risk, the greater the tendency for stock market volatility in emerging markets. (Salisu, et al., 2022).

One of the most prominent manifestations of geopolitical risk in recent economic history is the trade war between the United States and China, which escalated further when the United States raised tariffs on Chinese imports to as much as 245% on April 16, 2025. Originating around 2018 and marked by successive rounds of retaliatory tariffs, this conflict extends beyond a bilateral trade dispute: it has reconfigured the international trade order and become a primary source of uncertainty for global economic growth.

For Indonesia, this impact is visible through the performance of its mainstay commodity exports. China is Indonesia's largest trading partner and its primary destination for non-oil and gas exports, and the coal sub-sector is among the most exposed given that China is the world's largest coal consumer. Statistics Indonesia (BPS) data reveal considerable volatility in the export value of Indonesian coal to China during and after the peak period of the trade war, as summarized in Table 1.

Table 1. Value of Indonesian coal exports to China

Year	Export Value (USD million)	Growth (YoY)	Remarks
2019	4,890	–	Initial trade war escalation
2020	4,520	-7.75%	Peak of trade tensions
2021	4,950	+9.51%	Partial recovery and the COVID-19 pandemic
2022	15,840	+219.9%	Global energy crisis
2023	25,670	+62.0%	Impact of the Russia-Ukraine conflict
2024	20,150	-21.5%	Price normalization

Source: Statistics Indonesia (BPS, 2024) and Ministry of Trade projections.

Table 1 shows that coal export value fluctuated considerably following the peak of the trade war, compounded by subsequent disruptions such as the COVID-19 pandemic and the global energy crisis. This volatility illustrates how sensitive state revenue and corporate income in this sector are to global demand dynamics, which are partly driven by trade tensions.

Within the Indonesia Stock Exchange (IDX), the impact of the trade war has been felt heterogeneously across sectors, with the coal mining sub-sector among the most directly exposed, exhibiting sharp price fluctuations in response to international trade developments. Whenever new trade barriers or tariffs were imposed between the United States and China, the impact was rapidly reflected in export performance and in the stock prices of Indonesian coal companies. Major issuers such as PT Adaro Energy Indonesia Tbk (ADRO), PT Bukit Asam Tbk (PTBA), and PT Indo Tambangraya Megah Tbk (ITMG) derive a substantial share of their revenue from exports, with China as one of their primary markets; consequently, any news signaling an economic slowdown in China constitutes

material information for investors holding these shares.

This motivating observation is consistent with the semi-strong form of the Efficient Market Hypothesis (EMH), which posits that security prices fully and rapidly reflect all publicly available information, including macroeconomic and geopolitical announcements (Fama, 1970). Under this premise, an announcement of tariff escalation between the United States and China should be impounded into the prices, trading volume, and market valuation of firms with material exposure to Chinese demand, which is precisely the mechanism this study investigates through an event-study design.

Two closely related Indonesian event studies provide the nearest points of comparison for this research. Laluraa et al., (2022) examined the capital market reaction of mining-sector issuers to the Russia-Ukraine invasion and found no significant difference in abnormal return, while Tambunan et al., (2023) examined energy-sector issuers around the same event and found significant differences in trading volume activity and market capitalization. Both studies, however, concern a military-conflict event rather

than a trade-policy event, and neither jointly tests all three reaction channels, return, trading activity, and market valuation, for a single, trade-related geopolitical shock. To date, no study has examined how the coal sub-sector, one of the segments most directly exposed to Chinese demand, reacts to the US-China trade war specifically, nor has any study jointly evaluated AR, TVA, and MC as complementary indicators of market reaction to this event. This study addresses that gap.

Accordingly, this study aims to examine whether there is a statistically significant difference between the pre-event and post-event periods in (1) the abnormal return, (2) the trading volume activity, and (3) the market capitalization of coal sub-sector issuers listed on the IDX surrounding the escalation of the United States-China trade war on April 16, 2025.

By jointly testing these three complementary reaction channels within a single trade-policy event, this study contributes methodologically to the event-study literature and offers practical guidance for investors and portfolio managers assessing risk exposure in the coal sub-sector amid escalating geopolitical trade tensions.

2. Literature review

Efficient market hypothesis and geopolitical risk theory

The Efficient Market Hypothesis (EMH) holds that, in a semi-strong form efficient market, security prices adjust rapidly and fully to all publicly available information, so that no investor can consistently earn abnormal returns using publicly available information alone (Fama, 1970). Event-study methodology is built directly on this premise: if a market is efficient, the informational content of an event should be observable as a measurable, timely reaction in returns, trading activity, and/or valuation around the event date (MacKinlay, 1997).

Complementing this, geopolitical risk theory characterizes trade disputes and related geopolitical shocks as systemic, largely non-diversifiable risk factors that alter investor expectations, risk premia, and capital allocation decisions (Bouri et al., 2024). Together, these two theoretical strands motivate the expectation that the US-China trade war escalation constitutes value-relevant information that should be reflected in the market's reaction to coal sub-sector issuers.

Financial management and capital market

Financial management is broadly concerned with the efficient and effective use of capital, borrowed funds, and other business resources, and with decisions intended to maximize profitability and enhance firm value (Astuti et al., 2022). The capital market serves as a platform that connects parties with surplus funds namely investors with parties requiring funds or capital, known as issuers. It facilitates investment and financing activities through various long-term financial instruments, such as stocks, bonds, sukuk, and mutual funds. Beyond acting as a source of long-term financing for companies, the capital market serves as an investment avenue for the public and supports the mobilization of funds for productive economic activities (Financial Services Authority, 2023).

Abnormal return

Abnormal return is the excess return an investor obtains beyond the expected return, computed as the difference between a stock's actual return on a given day and its expected return for that day (Nuritomo et al., 2023). Within event-study methodology, abnormal return is the primary indicator of whether an event carries information that the market prices into security values (MacKinlay, 1997; Bodie et al., 2021).

Trading volume activity

Trading Volume Activity (TVA) is essentially a measure indicating how actively a stock is traded over a specific period, generally calculated by comparing the volume of shares traded to the number of outstanding shares (Harimbawa and Sulindawati., 2022). Because changes in trading volume can reflect shifts in investor beliefs and behavior even when prices adjust only gradually, TVA is commonly used alongside abnormal return as a complementary event-study indicator (Ross et al., 2022).

Market capitalization

Roosmawarni et al (2022) explain that market capitalization is a key measure for assessing corporate performance, particularly for banking companies.

Hypothesis development

Building on the EMH and geopolitical risk theory outlined in Section 2.1, this study proposes that the escalation of the US-China trade war constitutes material information for coal sub-sector issuers, which should manifest as measurable differences in AR, TVA, and MC between

the pre-event and post-event periods. The hypotheses are stated as follows.

H1: There is a significant difference in Abnormal Return (AR) of coal sub-sector issuers before and after the escalation of the United States-China trade war.

H2: There is a significant difference in Trading Volume Activity (TVA) of coal sub-sector issuers before and after the escalation of the United States-China trade war.

H3: There is a significant difference in Market Capitalization (MC) of coal sub-sector issuers before and after the escalation of the United States-China trade war.

Conceptual framework

Figure 1 summarizes the event-study logic underlying this research: an estimation window is used to model each stock's expected return under the Mean-Adjusted Model; the event window brackets the trade-war escalation announcement of April 16, 2025; and the pre-event and post-event sub-periods within the event window are compared on AR, TVA, and MC to test H1-H3.

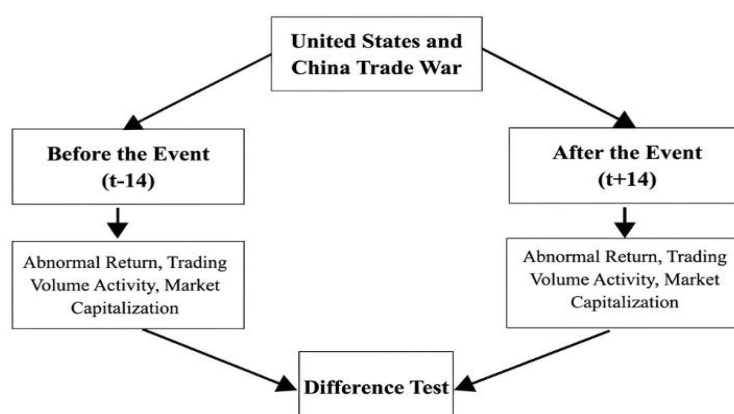


Figure 1. Research model

3. Research method

3.1 Research design and event window

This study applies a quantitative approach using an event-study method. The quantitative design enables statistical hypothesis testing on numerical data, stock price movements, trading volume, and market capitalization, to evaluate how the market responds to a specific event while isolating that event's effect from other, unrelated market factors (Damodaran, 2021; MacKinlay, 1997).

The event date ($t = 0$) is defined as April 16, 2025, the date on which the United States officially raised tariffs on Chinese imports to as much as 245%. To avoid the ambiguity present in the original design, a single, unambiguous timeline is adopted throughout this study: the estimation window spans 15 trading days prior to the event window ($t-29$ to $t-15$) and is used exclusively to construct each stock's expected return under the Mean-Adjusted Model; the event window spans 29 trading days ($t-14$ to $t+14$), comprising 14 trading days before the event, the event date itself, and 14 trading days after the event, and is used exclusively to measure AR, TVA, and MC reactions. The event period follows the Indonesia Stock Exchange (IDX) trading days, excluding Saturdays, Sundays, and exchange trading holidays from the observation period (Lukman et al., 2023).

3.2 Population, sample, and sampling technique

The population comprises all coal sub-sector companies listed on the Indonesia

Stock Exchange under the IDX Industrial Classification (IDX-IC) Energy Sector, Coal Sub-Sector during the observation period.

The sample was determined using purposive sampling, a non-probability technique in which sample members are selected based on criteria relevant to the research objectives. The criteria applied are:

1. Continuously listed on the coal sub-sector of the IDX throughout the entire estimation window and event window ($t-29$ to $t+14$ trading days), i.e., not newly listed through an IPO and not delisted during that period.
2. Did not undertake corporate actions with potentially confounding effects on price or trading volume during the observation window, such as stock splits, reverse stock splits, rights issues, or stock dividends.
3. Had complete and continuously available daily closing price, daily trading volume, and outstanding-shares data for the entire estimation window and event window, with no missing observations or halted trading days.
4. Was not placed under the IDX Special Monitoring Board or subject to trading suspension at any point during the observation window.

Table 2 summarizes the stepwise sample selection process.

Table 2. Sample selection procedure

Step	Sample Selection Criteria	Number of Firms
1	Coal sub-sector companies listed on the Indonesia Stock Exchange (IDX-IC Energy Sector, Coal Sub-Sector) as of the reference date	14
2	Less: companies newly listed (IPO) or delisted/suspended from the IDX at any point during the observation window (t-29 to t+14 trading days)	0
3	Less: companies undertaking corporate actions with confounding effects on price/volume during the window (e.g., stock split, reverse stock split, rights issue, or stock dividend)	0
4	Less: companies with incomplete or unavailable daily closing price, trading volume, or outstanding-shares data for the full estimation and event windows	0
5	Less: companies placed under the IDX Special Monitoring Board or subject to trading suspension during the observation window	0
Final sample used in the analysis (n)		14

Source: IDX Statistics database (2025), processed by the author.

Application of these criteria yields a final sample of 14 coal sub-sector issuers, consistent with the degrees of freedom (df

= 14) reported in the normality test (Table 5). Table 3 lists the sample firms and their ticker codes.

Table 3. List of sample firms

No.	Ticker	Company Name
1	AADI	PT Adaro Andalan Indonesia Tbk
2	ADRO	PT Adaro Energy Indonesia Tbk
3	ADMR	PT Adaro Minerals Indonesia Tbk
4	PTBA	PT Bukit Asam Tbk
5	ITMG	PT Indo Tambangraya Megah Tbk
6	BYAN	PT Bayan Resources Tbk
7	BUMI	PT Bumi Resources Tbk
8	GEMS	PT Golden Energy Minerals Tbk
9	HRUM	PT Harum Energy Tbk
10	BSSR	PT Baramulti Suksessarana Tbk
11	INDY	PT Indika Energy Tbk
12	CUAN	PT Petrindo Jaya Kreasi Tbk

13 MBAP

PT Mitrabara Adiperdana Tbk

14 SGER

PT Sumber Global Energy Tbk

Source: *IDX Statistics / Yahoo Finance (2025)*, processed by the author.

3.3 Data, sources, and collection technique

This study uses historical secondary data at daily frequency, comprising: (1) daily stock closing prices; (2) daily trading volume; (3) the Composite Stock Price Index (IHSG), used as a proxy for market return; (4) market capitalization data for each issuer; and (5) the key announcement date of the US-China trade war escalation. Research data can be obtained from corporate annual reports, the official website of the Indonesia Stock Exchange (IDX), company websites, and market information providers such as Yahoo Finance to acquire the stock price and trading activity data required for the study (Lukman et al., 2023).

Historical stock prices, trading volumes, IHSG values, and market capitalization figures were downloaded from the sources described above. The collected data were subsequently organized and entered into Microsoft Excel to facilitate tabulation and processing, and then further analyzed using the statistical software SPSS (Musdalifah et al., 2022).

3.4 Operational definition, measurement, and data analysis technique

Actual Return. The actual daily return of stock *i* on day *t* is calculated as:

$$R_{it} = (P_{it} - P_{i,t-1}) / P_{i,t-1}$$

where P_{it} is the closing price of stock *i* on day *t*

$P_{i,t-1}$ is the closing price of stock *i* on day *t*-1.

Expected Return. Expected return is estimated using the Mean-Adjusted Model, which assumes the expected return of a stock is constant and equal to its average

actual return during the estimation window:

$$E(R_{it}) = \sum R_{ij} / T, \text{ for } j = t-29 \text{ to } t-15$$

where *T* is the number of trading days in the 15-day estimation window (*t*-29 to *t*-15).

Abnormal Return. Abnormal return is the deviation of the actual return from the expected return:

$$AR_{it} = R_{it} - E(R_{it})$$

A positive AR indicates a return above expectation for stock *i* on day *t*; a negative AR indicates a return below expectation.

Trading Volume Activity. TVA is calculated as the ratio of shares traded to shares outstanding:

$$TVA_{it} = (\text{number of shares of stock } i \text{ traded on day } t) / (\text{number of shares of stock } i \text{ outstanding on day } t)$$

Market Capitalization. Market capitalization is calculated as:

$$MC_{it} = \text{closing price of stock } i \text{ on day } t \times \text{number of shares of stock } i \text{ outstanding on day } t$$

Data were processed using IBM SPSS Statistics 27. The Shapiro-Wilk test was first applied to each variable (AR, TVA, MC) to assess normality at $\alpha = 0.05$. Where both the pre-event and post-event data of a variable were normally distributed ($p > 0.05$), the Paired-Sample *t*-test would be used; where at least one sub-period failed the normality assumption ($p \leq 0.05$), the non-parametric Wilcoxon Signed Rank Test was used instead. To complement the significance tests, a standardized effect size ($r = Z / \sqrt{n}$) was additionally computed for each Wilcoxon test to indicate the practical magnitude of the observed differences.

4. Result and discussion

4.1 Descriptive Statistics

Table 4 presents the descriptive statistics of AR, TVA, and MC for the pre-

event and post-event periods (n = 14 firms each).

Table 4. Descriptive statistics of AR, TVA, and MC

Variable	n	Mean	Median	SD	Min	Max
AR – Before	14	0,0073695	0,0104192	0,02937276	-0,06490	04392
AR – After	14	0,0134779	0,0112010	0,01703929	-0,00315	0,06304
TVA Before	14	0,0009348486	0,0008431950	0,0002943448	0,00055301	0,00139081
TVA – After	14	0,0014311236	0,0012680900	0,0005967576	0,00081414	0,00256563
MC – Before	14	8,60026E+13	8,48862E+13	1,93362E+12	8,08104E+13	8,79831E+13
MC – After	14	9,04251E+13	9,02137E+13	1,94757E+12	8,70918E+13	9,40221E+13

4.2 Normality test

Table 5 reports the Shapiro-Wilk normality test for AR, TVA, and MC. For AR, the pre-event significance value was 0.252 ($p > 0.05$, normal), whereas the post-event value was 0.006 ($p < 0.05$, non-

normal). For TVA, the pre-event value was 0.167 (normal), while the post-event value was 0.014 (non-normal). For MC, the pre-event value was 0.014 (non-normal), while the post-event value was 0.223 (normal).

Table 5. Normality test for AR, TVA, and MC

Variable	Statistic	df	Sig.
AR_Before	0.924	14	0.252
AR_After	0.804	14	0.006
TVA_Before	0.912	14	0.167
TVA_After	0.834	14	0.014
MC_Before	0.836	14	0.014
MC_After	0.920	14	0.223

Because at least one sub-period failed the normality assumption for every variable, the non-parametric Wilcoxon Signed Rank Test was used for all three

hypothesis tests (n = 14 firms in each test, identical sample across AR, TVA, and MC).

4.3 Hypothesis testing

Table 6. Wilcoxon signed rank test for AR, TVA, and MC

	Z	Asymp. Sig. (2-tailed)
AR After (Combination) – AR Before (Combination)	-0.408	0.683
TVA After (Combination) – TVA Before (Combination)	-2.480	0.013
MC After (Combination) – MC Before (Combination)	-3.296	0.001

H1 – Abnormal Return. The Asymp. Sig. (2-tailed) value of 0.683 exceeds the 0.05 threshold; H1 is therefore not supported. There is no statistically significant difference in AR before and after the trade-war escalation ($Z = -0.408$, effect size $r = Z/\sqrt{14} \approx -0.11$, indicating a negligible-to-small effect).

H2 – Trading Volume Activity. The Asymp. Sig. (2-tailed) value of 0.013 is below the 0.05 threshold; H2 is supported. TVA differs significantly before and after the event ($Z = -2.480$, effect size $r \approx -0.66$, a large effect), with the negative Z-statistic indicating a significant decline in trading volume activity after the event.

H3 – Market Capitalization. The Asymp. Sig. (2-tailed) value of 0.001 is below the 0.05 threshold; H3 is supported. MC differs significantly before and after the event ($Z = -3.296$, effect size $r \approx -0.88$, a large effect), with the negative Z-statistic indicating a significant decrease in market capitalization after the event.

Discussion

Abnormal return (H1)

The finding of no significant difference in AR is consistent with Laluraa et al. (2022), who similarly found no significant difference in abnormal return among mining-sector issuers around the Russia-Ukraine invasion. Under the semi-strong form EMH established in Section 2.1, this result suggests that investors had likely anticipated the escalation of US-China trade tensions well before the observation window, tariff rhetoric and negotiations

had been building for months, such that the specific tariff announcement of April 16, 2025 carried comparatively little new information for price formation, and prices had already substantially adjusted (i.e., the risk was priced in) ahead of the event date.

Trading volume activity (H2)

In contrast to AR, TVA shows a significant decline following the event, consistent with Tambunan et al. (2023), who found that the Russia-Ukraine invasion produced significant differences in trading volume activity among energy-sector issuers. A significant change in trading volume, even without a significant change in returns, is consistent with investors revising their beliefs and rebalancing portfolios in response to new uncertainty, without those portfolio adjustments necessarily generating a net directional price movement large enough to register as abnormal return.

Market capitalization (H3)

MC also shows a significant, and the largest-magnitude, decline following the event, again aligned with Tambunan et al. (2023). Because MC is a function of both price and shares outstanding, and reflects the market's cumulative valuation of the firm rather than a single day's return, its significant decline indicates a broader erosion of investor confidence in the long-term value of coal issuers, plausibly driven by anticipated slower Chinese industrial demand rather than by the tariff

announcement's immediate, single-day price effect.

Synthesis: Why the three indicators diverge

Taken together, these results reveal an asymmetric market reaction: price-based information efficiency (AR) appears largely unaffected, while liquidity-based (TVA) and valuation-based (MC) channels react significantly. This pattern is plausible under semi-strong form EMH combined with geopolitical risk theory: if the directional price implication of the trade war was already anticipated and priced in, daily returns need not show a statistically significant shift even as investors actively reposition their portfolios (elevating trading volume) and as the market's cumulative valuation of coal issuers is revised downward over the event window (reducing market capitalization). In other words, the market's reaction to this geopolitical shock was channeled primarily through liquidity and valuation adjustments rather than through abnormal price movements.

5. Conclusion

Based on an event study of 14 coal sub-sector issuers listed on the Indonesia Stock Exchange, observed over a 29-trading-day window surrounding the escalation of the United States-China trade war on April 16, 2025, this study finds that Abnormal Return did not differ significantly between the pre-event and post-event periods (H1 not supported), while Trading Volume Activity and Market Capitalization both differed significantly (H2 and H3 supported). These results suggest that the trade-war escalation was largely anticipated and already priced in, leaving price-based reaction (AR) statistically muted while still producing significant shifts in liquidity (TVA) and cumulative valuation (MC). For the semi-strong form Efficient Market Hypothesis and geopolitical risk theory,

this indicates that market efficiency in response to well-telegraphed geopolitical events should be assessed jointly across return, activity, and valuation channels, since the informational content of such events may be impounded asymmetrically across these channels rather than through abnormal return alone.

Practically, these findings suggest that investors and portfolio managers holding coal sub-sector positions may find earlier or more sensitive signals of market reassessment in trading volume and market capitalization movements than in price movements alone, since the latter may already reflect anticipated risk; issuers and their investor relations functions, meanwhile, should proactively and transparently communicate their exposure to Chinese demand and their diversification strategies to help manage investor sentiment during periods of elevated trade-policy uncertainty. The study is nonetheless limited by its single-sector, single-event scope, a relatively short 29-trading-day event window, its use of the Mean-Adjusted Model (which does not account for systematic market risk), and the absence of a control sector unaffected by the trade war; future research could extend the analysis to other China-exposed commodity sub-sectors (e.g., palm oil, nickel), adopt a multi-event or difference-in-differences design, test longer event windows, and compare results using the market or market-adjusted model as alternative expected-return benchmarks to assess the robustness of these findings.

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