Pre-Announcement Market Behavior: Evidence from Oil Trading Activity and Temporal Dislocation

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Abstract

Financial markets are generally viewed as information-driven systems in which trading activity and price adjustments follow the release of new information. Yet market behavior does not always conform neatly to this sequence. This study investigates a notable event in the oil futures market that occurred in March 2026, where unusually concentrated trading activity and price movements were observed approximately fifteen minutes before an official political announcement concerning Iran.

The event raises a fundamental question: can observable market behavior emerge before formal information enters the public domain? Existing explanations would typically point to information asymmetry, insider trading, or informed order flow. While such mechanisms remain relevant, they do not fully capture situations in which substantial market activity develops despite the absence of clearly identifiable public signals.

To explore this issue, the study draws on insights from behavioral economics, behavioral finance, market microstructure, and price discovery research [7–11,16,19]. It introduces the concept of Pre-Announcement Behavioral Dislocation (PABD), a framework that focuses on the temporal relationship between expectations, uncertainty, trading behavior, and formal information disclosure. The central argument is that market participants may react to evolving expectations, contextual developments, and perceived signals before information becomes formally confirmed, creating observable market effects ahead of official announcements.

Rather than treating such episodes solely as anomalies or evidence of information leakage, the paper examines whether they may reflect a broader behavioral pattern that appears across different contexts. The findings suggest that pre-announcement activity deserves greater attention within financial research because it challenges announcement-centered

assumptions about timing and market response. By emphasizing the role of expectation formation and behavioral dynamics under uncertainty, the study contributes to ongoing discussions regarding market efficiency, price formation, and the processes through which markets interpret emerging developments.

Keywords: Pre-Announcement Behavioral Dislocation (PABD); Behavioral Economics; Investor Sentiment; Anticipatory Behavior; Market Microstructure; Price Discovery; Information Asymmetry; Insider Trading; Market Efficiency; Oil Futures Market; Trading Volume; Event Studies; Financial Markets; Uncertainty; Behavioral Finance.

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1. Introduction

Financial markets are commonly viewed as information-processing systems in which new information enters the market, investors react, and prices adjust accordingly. The Efficient Market Hypothesis (EMH) formalizes this logic by proposing that asset prices rapidly incorporate available information, leaving little room for predictable price adjustments once information becomes public [2,3]. Related research in information asymmetry, market microstructure, and price discovery reaches a similar conclusion, although through different mechanisms: trading activity serves as the channel through which information is gradually reflected in prices [4,5,16].

Under these perspectives, the expected sequence is relatively clear. Information arrives first, market participants respond, and observable price effects follow. Formal announcements therefore occupy a central position in financial analysis because they are typically treated as the point at which new information becomes available to the market.

Yet market behavior does not always appear to follow this sequence. Financial markets occasionally exhibit episodes in which abnormal trading activity and price movements emerge shortly before important announcements are released. Such cases are usually explained through information leakage, insider trading, informed order flow, or rational interpretation of partial signals [18,19]. These explanations remain important and are supported by substantial evidence. Nevertheless, they do not fully account for situations in which substantial trading activity emerges within highly compressed time windows despite the absence of clearly identifiable public information.

The event examined in this study illustrates this challenge. In March 2026, the oil futures market experienced unusually concentrated trading activity shortly before a political announcement concerning Iran. The timing and scale of the activity attracted considerable attention because significant market participation appeared before the announcement itself. Whether this reflected informed trading, expectation formation, behavioral anticipation, or a combination of factors remains open to interpretation. However, the episode raises a broader question that extends beyond the event itself:

Does market behavior always follow information, or can observable market activity emerge before formal information disclosure in ways that challenge conventional assumptions about timing and market response?

This question matters because many widely used approaches in finance implicitly assume that announcements mark the beginning of market reaction. Event-study methodology, for example, typically defines the announcement date as the central reference point around which abnormal returns and trading activity are measured [6]. If meaningful market activity develops before announcements occur, then part of the adjustment process may already be underway before the designated event window begins.

Although extensive research has examined market efficiency, information diffusion, investor sentiment, behavioral finance, expectation formation, and price

discovery, relatively little attention has been devoted to the possibility that pre-announcement activity may represent a recurring behavioral pattern rather than a collection of isolated anomalies. Most studies interpret such episodes through the lens of information advantages, informed trading, or speculative reactions [10,11]. As a result, the temporal relationship between information disclosure, expectation formation, and observable market behavior remains insufficiently explored.

To address this issue, the present study introduces the concept of Pre-Announcement Behavioral Dislocation (PABD). PABD refers to situations in which observable trading activity and market effects emerge before formal information disclosure. The framework does not challenge the importance of information in financial markets. Rather, it recognizes that investors often operate under conditions of uncertainty, incomplete information, evolving narratives, sentiment dynamics, geopolitical developments, and subjective expectations [7–11,22,25,27,33]. Under such conditions, market participants may begin acting before formal confirmation becomes available.

From this perspective, trading activity is not viewed solely as a reaction to information. It may also represent a behavioral process through which expectations, uncertainty, and perceived signals are expressed in advance of official disclosure. By examining the sequence of signals, trading activity, price movements, and subsequent announcements, this study explores whether a recognizable temporal structure exists in which market behavior precedes formal informational confirmation.

The study addresses an underexplored gap in the literature by introducing PABD as a distinct analytical framework for examining the temporal relationship between market behavior and information disclosure. While existing explanations typically focus on information asymmetry, insider trading, or informed order flow [5,18,19], the proposed framework expands the analysis by incorporating behavioral and temporal dimensions of market activity.

The study makes three primary contributions. First, it draws attention to a temporal disconnect that may arise between formal announcements and observable market effects, suggesting that market adjustment processes may begin before official disclosure occurs. Second, it develops a behavioral interpretation in which trading activity can function as an anticipatory response under uncertainty, extending existing explanations beyond purely information-based mechanisms. Third, it proposes a structured framework that integrates signals, expectations, trading activity, price movements, and subsequent announcements into a coherent analytical sequence that can be examined across different contexts and event types.

More broadly, the analysis suggests that timing itself deserves greater attention within financial research. If the relationship between information and market behavior is not always synchronized, then understanding when market responses emerge may be as important as understanding why they emerge. This perspective opens a path for future studies aimed at identifying, measuring, and testing pre-announcement behavioral dynamics across financial markets.

2. Literature Review

2.1 Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis (EMH) provides one of the most influential theoretical foundations for understanding the relationship between information and market behavior. According to EMH, financial markets incorporate available information into asset prices, implying that price adjustments occur following the arrival of new information [2]. Subsequent refinements of the theory further emphasized the ability of markets to rapidly process publicly available information, particularly within the semi-strong form of market efficiency [3].

Within this framework, market behavior is fundamentally viewed as a response to information. As new information becomes available, investors update their expectations and prices adjust accordingly. Consequently, formal announcements are generally treated as the starting point of observable market reactions and price formation processes [2,3].

2.2 Information Diffusion and Price Discovery

Research on information diffusion and price discovery extends the traditional EMH perspective by recognizing that information may be incorporated into prices through a dynamic trading process rather than instantaneously. Grossman and Stiglitz argued that perfectly efficient markets are theoretically impossible because acquiring information is costly, creating incentives for informed trading and resulting in a continuous process through

which information becomes reflected in prices [4].

This process was further developed by Kyle, who demonstrated how informed traders strategically exploit private information through trading activity, gradually influencing market prices over time [5]. Similarly, Hasbrouck showed that individual trades themselves contain informational value and contribute directly to the price discovery process [16].

These contributions acknowledge that information may enter markets gradually and through different channels. Nevertheless, the underlying temporal assumption remains unchanged: information precedes trading activity, and market behavior reflects the incorporation of information that already exists, whether publicly available or privately held [4,5,16].

2.3 Insider Trading and Information Leakage

One of the most common explanations for pre-announcement market activity is the presence of insider trading or information leakage. Under this perspective, abnormal trading activity occurring before important announcements reflects the use of non-public information by individuals who possess an informational advantage over the broader market.

Empirical evidence provided by Meulbroek demonstrated that unusual trading activity frequently precedes major corporate announcements when material non-public information is available to certain market participants [18]. Easley and O'Hara further showed that order flow can reveal the presence of informed traders, allowing markets to partially adjust before information becomes publicly disclosed [19].

These explanations remain influential because they provide a direct mechanism through which market activity can emerge before announcements occur. However, they rely on a common assumption: pre-announcement trading behavior is driven primarily by informational advantage. Under this interpretation, early market activity reflects access to information rather than behavioral responses to uncertainty, expectation formation, or collective market dynamics [18,19].

2.4 Behavioral Finance

Behavioral finance challenges the assumption that market participants are fully rational by incorporating psychological, cognitive, and emotional factors into financial decision-making. Traditional behavioral-finance models suggest that investor beliefs, sentiment, and biases can influence market outcomes in ways that deviate from predictions based solely on fundamentals and information efficiency.

Barberis, Shleifer, and Vishny developed a theoretical framework demonstrating how investor sentiment and biased belief formation can generate predictable departures from fundamental values and contribute to market anomalies [10]. Similarly, Shiller emphasized the importance of psychological dynamics, narratives, and collective behavior in shaping financial-market outcomes, arguing that market movements are often influenced by factors extending beyond objective information and rational expectations [11].

Additional evidence indicates that investor behavior may become particularly sensitive to uncertainty, sentiment, and market conditions during periods of heightened instability. Recent research has highlighted how investor sentiment can influence market outcomes across different economic environments and contribute to observable deviations from conventional information-driven explanations of market behavior [1,24,31]. In the context of commodity markets, Akçay (2022) found evidence of a time-varying causal relationship between investor sentiment and oil prices in the United States, suggesting that sentiment-driven expectations can influence oil-market dynamics even when fundamental information remains incomplete or evolving [34].

Despite these contributions, behavioral-finance research generally continues to interpret market behavior as a response to perceived information, expectations, or sentiment. Consequently, the temporal assumption remains largely unchanged: behavioral reactions occur after market participants process signals or form expectations regarding future developments. Less attention has been devoted to situations in which observable market behavior itself emerges before formal informational clarity is established.

2.5 Event Study Methodology

Event study methodology is one of the most widely used approaches for evaluating the impact of specific events on financial markets. The methodology typically measures abnormal returns relative to a predefined event date, which is generally represented by the formal announcement or public disclosure of information [6].

This approach implicitly assumes that the announcement represents the starting point of market response. Under this framework, market reactions are evaluated relative

to the disclosure event, and abnormal returns are interpreted as evidence of how new information affects investor behavior and asset prices.

While event studies have proven highly effective in examining post-announcement effects, they may be less effective in capturing behavioral and trading dynamics that emerge before formal disclosure. When substantial trading activity and price movements occur within a narrow pre-announcement window, the assumption that the announcement marks the beginning of market adjustment may become more difficult to maintain [6].

2.6 Gap in the Literature

Although extensive research has examined market efficiency, information diffusion, insider trading, market microstructure, and behavioral finance, a significant gap remains in understanding systematic pre-announcement market behavior.

Existing explanations generally attribute early market movements to information leakage, insider trading, informed trading, or rational expectations based on available signals [18,19]. While these explanations account for many instances of pre-announcement activity, they do not fully address situations in which concentrated trading activity emerges before formal information disclosure without clearly identifiable public information triggers.

Moreover, existing theoretical frameworks largely preserve a common temporal assumption in which information, expectations, or signals precede observable market behavior. As a result, limited attention has been given to the possibility that market behavior itself may emerge as part of a broader process of expectation formation and uncertainty resolution before formal information becomes publicly available.

This limitation highlights the need for an alternative analytical perspective capable of examining the temporal relationship between information, uncertainty, expectations, and observable market behavior.

2.7 Behavioral Economics Perspective

Traditional explanations of pre-announcement market activity largely emphasize information asymmetry, insider trading, and market microstructure mechanisms. While these perspectives provide important insights into how information may influence trading behavior, they do not fully explain why substantial market activity sometimes emerges before formal information disclosure. Behavioral economics offers an additional theoretical perspective by recognizing that investors frequently make decisions under conditions of cognitive limitations, uncertainty, and incomplete information rather than under assumptions of perfect rationality.

Consistent with this perspective, Rabin argued that psychological insights are essential for understanding economic behavior and that many economic decisions systematically deviate from the predictions of traditional rational-choice models [33]. This view suggests that investor behavior may be influenced by cognitive biases, subjective beliefs, and psychological processes, particularly when market participants operate under uncertainty and informational incompleteness.

More recently, Huynh highlighted the growing importance of investor sentiment as a central explanatory factor in financial decision-making and market dynamics [27]. Through a systematic review of the literature, the study demonstrated that sentiment-driven behavior can significantly influence market outcomes, particularly during periods characterized by uncertainty, incomplete information, and rapidly evolving expectations. The review further emphasized that behavioral factors increasingly complement traditional information-based explanations of market activity [27]. Consistent with this perspective, Nakhli, Hammami, and Shahbaz found evidence of a time-varying causal relationship between investor sentiment and oil prices, demonstrating that uncertainty significantly shapes the strength and direction of this relationship [35]. Similarly, Beckmann, Agyapong, and Williamson showed that media sentiment plays an important role in shaping oil price expectations, influencing how market participants interpret emerging developments and form anticipatory judgments under conditions of uncertainty [36]. Collectively, these findings suggest that market participants may adjust their behavior in response to evolving expectations, uncertainty, and sentiment dynamics before complete informational clarity emerges, reinforcing the relevance of behavioral mechanisms in explaining market activity and pre-announcement market responses [35,36].

Taken together, the contributions of Rabin and Huynh support the argument that investor behavior cannot be fully understood through information-based mechanisms alone [27,33]. Instead, psychological influences, subjective expectations, and sentiment formation may play an important role in shaping trading decisions, particularly in environments where information remains incomplete or ambiguous. This perspective provides an

important theoretical foundation for examining pre-announcement market activity as a behavioral phenomenon rather than solely as a consequence of informational advantages.

2.7.1 Bounded Rationality

The concept of bounded rationality was introduced by Simon, who challenged the traditional assumption that individuals possess unlimited cognitive capabilities and complete information when making decisions [7]. According to this perspective, decision-makers operate under constraints that limit their ability to process information, evaluate all available alternatives, and identify optimal outcomes. Rather than maximizing utility, individuals frequently rely on simplified decision rules and satisfactory solutions based on the information available to them at a particular point in time [7].

Within financial markets, investors rarely possess complete knowledge regarding future policy decisions, geopolitical developments, or market-moving events. As a result, investment decisions often occur under conditions of uncertainty and informational incompleteness. From a bounded-rationality perspective, market participants may interpret partial signals, contextual information, or indirect indicators as sufficient grounds for action. Consequently, pre-announcement trading activity may emerge not because investors possess complete information, but because available signals appear adequate to support decision-making before formal confirmation occurs.

2.7.2 Prospect Theory

Prospect Theory provides a further challenge to traditional rational-choice assumptions by demonstrating that individuals evaluate gains and losses asymmetrically [8]. Kahneman and Tversky showed that people tend to place greater psychological weight on potential losses than on equivalent gains and that economic decisions are frequently influenced by subjective perceptions of risk rather than by objective probability assessments [8].

These insights have important implications for financial-market behavior. When investors believe that delaying action may result in missed opportunities or increased downside exposure, they may choose to act before information is formally confirmed. Under conditions of uncertainty, the perceived cost of waiting may exceed the perceived cost of acting prematurely. Consequently, substantial trading activity may emerge before announcements as market participants attempt to avoid anticipated losses or secure expected gains. Prospect Theory therefore provides a behavioral explanation for why investors may respond to perceived future outcomes and expectations rather than waiting for complete informational certainty [8].

2.7.3 Ambiguity and Uncertainty

The distinction between risk and ambiguity represents another important contribution of behavioral economics. Ellsberg demonstrated that individuals often display ambiguity aversion when confronted with situations in which outcome probabilities are unknown or difficult to estimate [9]. Unlike conventional risk, where probabilities can be quantified, ambiguity involves uncertainty regarding the probability distribution itself.

Financial markets frequently operate under ambiguous conditions, particularly during periods of geopolitical tension, policy uncertainty, and rapidly evolving economic developments. In such environments, investors must make decisions without complete knowledge of future outcomes. Rather than remaining inactive until uncertainty is resolved, market participants often rely on subjective interpretations, contextual signals, and evolving expectations. Consequently, uncertainty itself may become a driver of trading activity. Observable market behavior may therefore emerge before formal information disclosure as investors attempt to position themselves in anticipation of potential outcomes [9].

2.7.4 Anticipatory Behavior

Behavioral-finance research further suggests that investors continuously form expectations regarding future developments and frequently act before outcomes become certain. Barberis, Shleifer, and Vishny argued that investor sentiment and belief formation can influence market behavior independently of fundamental information [10]. Their work demonstrates that market participants may react to expectations, narratives, and perceived signals even when objective information remains incomplete.

Similarly, Shiller emphasized the importance of psychological dynamics and collective expectations in financial markets [11]. According to this perspective, market outcomes are influenced not only by information and fundamentals but also by investor sentiment, narratives, and social interactions. Expanding on this view, Akerlof and Shiller introduced the concept of “animal spirits,” arguing that economic and financial

decisions are often shaped by confidence, stories, emotions, and collective beliefs rather than by purely rational calculations [22]. They further argued that psychological forces can significantly influence market behavior, particularly during periods of uncertainty when investors must interpret incomplete or ambiguous information.

Recent evidence further supports the role of investor sentiment in shaping market expectations under conditions of uncertainty. Harasheh et al. found that sentiment spillovers during major geopolitical and economic disruptions can influence financial-market behavior across jurisdictions and amplify market reactions during periods of elevated uncertainty [25]. Similarly, the European Central Bank emphasized that geopolitical risk can significantly affect oil-price dynamics by altering market expectations, risk perceptions, and anticipatory behavior under conditions of uncertainty [38]. The International Energy Agency further reported that oil markets remain highly responsive to geopolitical developments, policy signals, and expectation-driven adjustments, with market participants frequently reacting to anticipated developments before formal confirmation becomes available [39]. In addition, Le, Pham, and Nguyen documented dynamic spillover effects between oil-price shocks, investor sentiment, and stock-market returns, demonstrating that sentiment-driven responses can propagate across interconnected financial and commodity markets under conditions of uncertainty [40]. Mohamad, Al-Yahyaee, Mensi, and Kang further highlighted the importance of price-discovery mechanisms and time-varying causal dynamics in energy and financial markets, showing that information transmission and market adjustment processes evolve over time and may generate heterogeneous responses across interconnected markets [37]. Consistent with these observations, Obi, Arene, and Nwafor found that major geopolitical events can trigger significant reactions across both commodity and equity markets, highlighting the sensitivity of market participants to emerging political developments and uncertainty shocks [41]. Aizenman, Qian, and Jinjarak further showed that geopolitical shocks can exert substantial effects on commodity-market dynamics through expectation channels, risk transmission mechanisms, and shifts in investor behavior, reinforcing the importance of geopolitical uncertainty in shaping market outcomes [42]. More recently, Basdekis, Christopoulos, and Katsampoxakis demonstrated that geopolitical shocks can significantly increase crude-oil market tail risk, indicating that uncertainty associated with major political events may heighten market sensitivity and amplify responses to emerging developments [43]. Collectively, these findings suggest that collective expectations, sentiment dynamics, geopolitical uncertainty, cross-market spillover effects, evolving price-discovery processes, and perceptions of tail risk may influence market behavior even before new information becomes formally incorporated into prices [25,37–43].

Within this framework, anticipatory behavior reflects a forward-looking decision process in which market participants revise expectations and adjust positions before official announcements occur. Investors may interpret indirect signals, changing circumstances, and contextual developments as indicators of future outcomes, generating observable trading activity before formal disclosure takes place. As collective expectations strengthen, investors may increasingly act on anticipated developments rather than waiting for formal confirmation, contributing to the emergence of pre-announcement market activity.

Taken together, the contributions of bounded rationality, Prospect Theory, ambiguity aversion, investor sentiment, and anticipatory behavior provide a behavioral foundation for understanding pre-announcement market activity [7–10,22,25]. These perspectives suggest that investors may act under conditions of uncertainty using incomplete information, subjective expectations, collective narratives, sentiment spillovers, and behavioral heuristics. Consequently, observable trading activity may emerge before formal information disclosure, providing a theoretical basis for the phenomenon described in this study as Pre-Announcement Behavioral Dislocation (PABD).

3. Research Gap

A central assumption within financial economics is that information precedes market behavior. Under the Efficient Market Hypothesis (EMH), asset prices adjust in response to newly available information, implying a clear sequence in which information arrival leads to trading activity and subsequent price changes [2,3]. This assumption is also embedded within theories of information diffusion and price discovery, where trading behavior is viewed as the mechanism through which information—whether public or private—is incorporated into market prices [4,5,16].

When market movements occur before formal announcements, the prevailing literature generally attributes such activity to insider trading, information leakage, or informed trading based on non-public information. Empirical studies have demonstrated that informed traders may act before information becomes publicly available, generating observable pre-announcement trading activity and price adjustments [18,19]. Although these explanations differ in their specific mechanisms, they share a common assumption: information remains the primary driver of behavior, even when that information is not publicly observable.

However, this perspective becomes less satisfactory in situations characterized by three conditions:

- Significant trading activity emerges immediately before formal announcements;
- No verifiable public information or confirmed information leakage can be identified; and
- The timing and structure of market activity suggest that observable behavior emerges before any identifiable informational trigger becomes apparent.

Existing theories do not provide a comprehensive framework for interpreting such cases. Rather, they tend to classify them as anomalies or assume the existence of unobservable information that cannot be directly verified. Consequently, limited attention has been given to the possibility that the temporal relationship between information and behavior may not always conform to conventional assumptions.

This limitation reveals an important gap in the literature: the absence of a structured framework capable of explaining systematic pre-announcement market activity without relying exclusively on information-based causality. In particular, relatively little research has examined whether trading activity may emerge under conditions of uncertainty through behavioral processes that are not fully explained by known informational channels [10,11,27,33].

The present study addresses this gap by introducing a behavioral-temporal interpretation of pre-announcement market activity. Rather than assuming that observable market behavior must always follow information, the proposed framework explores whether market participants may respond to uncertainty, evolving expectations, sentiment formation, and contextual signals before formal information becomes available [7–11,22,25,27,33].

Accordingly, the study proposes that pre-announcement activity may reflect a broader process in which behavior, expectations, and uncertainty interact prior to formal informational confirmation. Under this interpretation, market behavior is not viewed solely as a consequence of information but also as a component of the process through which uncertainty is interpreted and future expectations are formed.

The identified gap therefore extends beyond the absence of observable information. It reflects a broader conceptual limitation regarding how timing is understood within financial analysis. Existing frameworks generally treat time as a passive dimension through which information flows into markets. In contrast, the present study argues that temporal structure itself may constitute an important analytical dimension capable of revealing how behavioral activity, expectation formation, and market responses emerge before formal information disclosure. Addressing this limitation requires a shift toward examining timing as an active component of market dynamics rather than merely a chronological reference point.

4. Event Description (Case Study)

4.1 Main Case: Oil Futures Market Activity Prior to the Iran Announcement

This study examines a market event that occurred on 23 March 2026 involving unusually concentrated trading activity in the oil futures market shortly before a political announcement concerning Iran. The event is analyzed as a case study to explore the temporal relationship between trading behavior, expectation formation, and formal information disclosure within financial markets.

According to reports published by multiple international news organizations covering the event, the market recorded exceptionally high trading activity during a brief pre-announcement interval. Estimated trading volume ranged between approximately USD 500 million and USD 580 million and involved more than 6,000 futures contracts. This level of activity substantially exceeded typical short-term trading patterns observed during comparable periods, indicating an unusual concentration of market participation.

The timing of the activity is particularly significant. The transactions occurred approximately fifteen minutes

before the public announcement concerning ongoing political discussions involving Iran. Reports consistently indicated that both heightened trading intensity and initial price reactions emerged within a narrowly defined time window preceding the announcement. As a result, the event presents a clear temporal sequence in which observable market behavior emerged before formal information disclosure.

An important characteristic of the case is the apparent absence of identifiable public information during the pre-announcement interval. No official statements, scheduled economic releases, or widely reported geopolitical developments were identified that could reasonably explain the magnitude, timing, and concentration of the observed market activity. This absence of observable public signals constitutes a central feature of the event and contributes directly to its analytical relevance.

Existing literature often interprets such patterns as evidence of information asymmetry, informed trading, or information leakage. Previous studies have demonstrated that abnormal trading activity may occur before important announcements when certain market participants possess informational advantages [18,19]. In addition, research in market microstructure has shown that trading activity itself can convey information and contribute to the price discovery process before information becomes publicly available [5,16].

Recent research further suggests that market participants increasingly respond to evolving information environments, news flows, and emerging narratives when forming expectations. Hashamia and Maldonado argued that news-based analytical approaches can contribute to forecasting oil-price volatility by capturing market responses to developing information signals and changing narratives [26]. Their findings highlight the growing role of expectation formation and information interpretation within commodity markets, particularly during periods of elevated uncertainty.

Nevertheless, the combination of unusually large trading volume, extreme temporal concentration, and the apparent absence of identifiable public information distinguishes this event from conventional cases of market response. The observed pattern provides a suitable setting for examining whether existing information-based explanations are sufficient to account for pre-announcement market behavior. More broadly, the event creates an opportunity to investigate whether market participants may respond not only to identifiable information but also to uncertainty, evolving expectations, sentiment dynamics, and perceived signals that emerge before formal disclosure occurs.

Table 1. Pre-Announcement Activity Snapshot

Event	Time Before Announcement	Trading Volume	Contracts	Abnormality Indicator
Oil Market (23 March 2026)	~15 minutes	USD 500–580 million	>6,000	Significant deviation from typical intraday volume

Note: A later, separate event on 8 April 2026 involved approximately USD 950 million in trades; the present analysis refers only to the 23 March 2026 episode.

To provide a preliminary empirical perspective, the observed pre-announcement activity can be framed within a simple event-based context. The clustering of trading volume within a ~15-minute window prior to the announcement, combined with the absence of identifiable public information, indicates an abnormal concentration of market activity relative to typical intraday behavior. While this study does not employ formal econometric testing, the scale and timing of the observed activity suggest a deviation from standard market dynamics that warrants further systematic investigation.

As summarized in Table 1, this pattern reinforces the presence of a temporally dislocated market response.

4.2 Exploratory Multi-Event Evidence

4.2.1 Case 2: Compute Sovereignty and Pre-Announcement Infrastructure Positioning

A second exploratory case concerns the announcement of a major artificial intelligence infrastructure agreement between Google and CoreWeave on 6 June 2026. According to publicly reported information, the

agreement involved a multi-year commitment designed to secure large-scale AI computing capacity extending into future years. The reported arrangement included long-term infrastructure commitments and capacity reservation agreements intended to support the growing computational requirements of advanced artificial intelligence systems.

The significance of the event extends beyond the commercial value of the agreement itself. Industry reporting surrounding the announcement highlighted the increasing strategic importance of computing infrastructure, data-center capacity, cloud resources, and long-term access to processing power. As demand for AI computing resources accelerated, market participants increasingly focused on infrastructure availability as a critical determinant of future competitive positioning.

From a Pre-Announcement Behavioral Dislocation (PABD) perspective, the case is relevant because the strategic importance of compute capacity had become increasingly visible prior to the formal announcement. Market narratives, infrastructure investment activity, data-center expansion, and growing concerns regarding AI compute scarcity had already influenced expectations across technology and capital markets before the agreement was officially disclosed. Consequently, market participants may have adjusted expectations and positioning in anticipation of developments related to AI infrastructure expansion.

Unlike traditional event interpretations that focus exclusively on the announcement itself, the PABD framework emphasizes the possibility that behavioral and expectation-driven dynamics may emerge before formal disclosure. In this case, growing awareness of infrastructure constraints, increasing competition for compute resources, and expectations regarding future AI capacity requirements may have contributed to behavioral positioning prior to the official announcement.

The case therefore provides an additional example in which evolving expectations concerning a strategically important resource preceded formal confirmation. Similar to the primary Iran-related case, the observed sequence suggests that market participants may respond to emerging expectations and perceived future developments before information is formally consolidated through official announcements. While the underlying drivers differ substantially from the geopolitical context of the primary case, both events exhibit a temporal structure in which expectations and behavioral positioning may emerge before formal disclosure occurs.

Date: 6 June 2026

Sources: Reuters; Google; CoreWeave; Al Jazeera Economy; U.S. AI infrastructure market reports.

4.2.2 Case 3: Tariff-Driven Capital Reallocation and Pre-Announcement Investment Positioning

A third exploratory case concerns the large-scale investment commitments announced by Swiss companies in the United States on 7 June 2026. Public reports indicated that Swiss firms invested approximately USD 27 billion within a four-month period as part of broader investment commitments exceeding USD 200 billion through 2028. The developments were accompanied by tariff adjustments, expanded industrial investment plans, and continued trade negotiations between the two countries.

The event attracted significant attention because it linked trade-policy developments with large-scale capital allocation decisions. Reports indicated that reductions in U.S. tariffs on Swiss goods were accompanied by expanded investment commitments across pharmaceuticals, medical technology, manufacturing, logistics, and other industrial sectors. These developments highlighted the growing interaction between trade policy, investment decisions, and long-term industrial positioning.

From a PABD perspective, the relevance of the case lies in the possibility that market participants and corporations adjusted expectations before the formal announcement of investment commitments. Discussions regarding tariffs, market-access conditions, industrial policy, and investment incentives had been developing prior to the public disclosure. Consequently, firms and investors may have engaged in strategic positioning based on evolving expectations regarding future trade arrangements and investment opportunities.

Rather than focusing exclusively on the announcement itself, the PABD framework emphasizes the behavioral and expectation-driven processes that may emerge before formal confirmation. In this case, expectations concerning tariff reductions, improved market access, and industrial expansion opportunities may have influenced investment planning and market positioning before the investment commitments became publicly

consolidated.

The case therefore illustrates how anticipation of policy developments may contribute to observable economic and financial behavior prior to formal disclosure. Similar to the primary Iran-related case and the AI infrastructure case, the event suggests that expectations and strategic positioning may emerge before official announcements, creating a temporal sequence in which behavior precedes formal confirmation.

Date: 7 June 2026

Sources: Reuters; CNBC Arabia; Swiss-American Chamber of Commerce; corporate investment announcements and U.S.–Swiss trade-related reporting.

4.2.3 Case 4: Expectation Compression and Pre-Announcement Market Repositioning

A fourth exploratory case concerns the sharp market reaction observed across the semiconductor sector following Broadcom's earnings announcement on 6 June 2026. Reports indicated that AI-related semiconductor companies experienced substantial valuation declines, with more than USD 1 trillion in market value erased across the sector within two trading sessions. Major firms affected included Nvidia, AMD, Micron, and other companies closely associated with the expanding artificial intelligence ecosystem.

Although the immediate trigger was linked to earnings-related developments, market commentary increasingly focused on a broader concern: whether the pace of AI-related revenue growth and monetization was sufficient to justify the exceptionally optimistic expectations embedded within market valuations. The event therefore represented more than a conventional earnings reaction, highlighting the growing importance of expectation management within AI-related capital markets.

From a PABD perspective, the case is particularly relevant because investor expectations regarding AI growth, infrastructure demand, and future profitability had been building long before the earnings announcement occurred. Market participants had already incorporated highly optimistic assumptions regarding future AI expansion, creating an environment in which expectations and positioning were established prior to formal earnings validation. Consequently, the announcement functioned less as the origin of market expectations and more as a validation point for narratives that had already shaped investor behavior.

The PABD framework emphasizes that behavioral and expectation-driven processes may emerge before formal information disclosure. In this case, investor positioning reflected evolving beliefs regarding future AI profitability and infrastructure demand before earnings results were released. The subsequent market reaction therefore highlights the importance of expectations formed during the pre-announcement period rather than information released solely at the moment of disclosure.

This case differs from the primary Iran-related event in that the relevant behavioral dynamics emerged through valuation expectations rather than geopolitical developments. Nevertheless, both cases exhibit a similar temporal structure in which expectations and market positioning developed before formal confirmation occurred. The event therefore provides additional evidence supporting the broader argument that observable market behavior may emerge prior to official information disclosure and may significantly influence subsequent market responses.

Date: 6 June 2026

Sources: CNN Business Arabic; Broadcom earnings announcement; U.S. semiconductor market developments; semiconductor sector market reports.

4.2.4 Case 5: Banking Consolidation and Pre-Announcement Strategic Repositioning

A fifth exploratory case concerns the proposed merger discussions between Banco BPM and Monte dei Paschi di Siena (MPS), reported on 7 June 2026. Public reports indicated that Banco BPM formally invited MPS to explore a potential merger that could create Italy's second-largest banking group, with a combined market value approaching EUR 50 billion and expected annual pre-tax benefits exceeding EUR 1.1 billion.

The event attracted attention not only because of its potential financial scale but also because it reflected broader consolidation trends within the European banking sector. Increasing regulatory requirements, technological investment demands, competitive pressures, and efficiency considerations have encouraged financial institutions to pursue larger scale and greater operational integration. Consequently, the proposed transaction was widely interpreted as part of a broader restructuring process within the Italian banking system.

From a PABD perspective, the case is relevant because

expectations regarding consolidation pressures, sector restructuring, and strategic banking realignment had been developing before the formal merger discussions became publicly visible. Market participants, investors, and analysts had already been evaluating the growing importance of institutional scale, regulatory efficiency, and competitive positioning within European banking markets. As a result, strategic expectations may have influenced market behavior and positioning before formal confirmation of merger-related developments.

The PABD framework emphasizes that market behavior can emerge through expectation formation and strategic anticipation before official disclosure occurs. In this case, expectations concerning consolidation trends, competitive pressures, and future banking-sector restructuring may have contributed to behavioral positioning prior to the public announcement. The formal disclosure therefore represented not only new information but also a confirmation point for broader expectations already developing within the market environment.

Although the underlying drivers differ from the geopolitical, technology, and trade-related cases examined previously, the event exhibits a comparable temporal structure. Expectations concerning future developments emerged before formal confirmation, creating a sequence in which strategic positioning and behavioral responses may have preceded official disclosure. The case therefore provides additional exploratory evidence supporting the broader proposition that market behavior can emerge before formal information consolidation under conditions of uncertainty and evolving expectations.

Date: 7 June 2026

Sources: Reuters; Financial Times; CNN Business Arabic; Banco BPM statements; Monte dei Paschi di Siena (MPS) reporting; Italian banking-sector reports.

5. Observed Behavioral Pattern

5.1 Sequence

The observed event reveals a temporal sequence that differs from the conventional ordering assumed in financial-market theory. Rather than following the standard progression in which information arrives first and market reactions follow, the observed sequence can be represented as:

Signal → Behavior → Price → Announcement

Within this structure, initial signals—whether partial, ambiguous, contextual, or not fully observable—are followed by concentrated trading activity. This behavior generates measurable price effects, after which a formal announcement is released.

Traditional financial theories generally assume that price adjustments occur after the arrival of new information [2,3]. In contrast, the observed sequence suggests that substantial trading activity may emerge before formal information disclosure occurs. The case therefore raises the possibility that market behavior can develop prior to official announcements, producing observable market effects before information is formally confirmed.

5.2 Timing Distortion (Temporal Dislocation)

A central characteristic of the observed pattern is the presence of timing distortion, in which the conventional temporal alignment between information and market response appears disrupted. Specifically, trading activity and price adjustments emerge before the announcement rather than after it.

This phenomenon may be interpreted as a form of temporal dislocation in which observable market effects are not synchronized with the official timing of information release. Previous research has acknowledged that informed trading can precede public announcements when private information exists [5,18]. However, these explanations continue to assume that identifiable information is available to certain market participants before the announcement occurs.

The present case raises a different possibility. The observed timing pattern suggests that market behavior may not always be fully explained by identifiable information flows alone. Instead, behavioral responses, expectation formation, sentiment dynamics, and reactions to uncertainty may contribute to market activity before formal informational clarity emerges. Under this interpretation, the temporal relationship between information and behavior becomes more complex than conventional models typically assume.

5.3 Repetition Logic

Although this study focuses on a single event, the observed structure is consistent with patterns documented in prior research examining pre-announcement trading activity and abnormal market movements. Previous studies have shown that unusual trading volumes and abnormal returns may occur before

important announcements, often being attributed to information leakage or informed trading [19,6].

However, these studies generally treat such occurrences as isolated events rather than as components of a broader behavioral structure. The pattern observed in the present case suggests a potentially repeatable sequence in which:

- Partial, ambiguous, or indirect signals emerge;
- Market participants initiate trading activity;
- Prices respond to that activity; and
- Formal announcements subsequently occur.

This repetition logic does not imply that all pre-announcement activity follows an identical mechanism. Rather, it highlights the possibility that pre-announcement behavior may exhibit a recurring temporal structure that extends beyond isolated anomalies. If similar sequences repeatedly emerge across different market environments, then pre-announcement activity may represent a systematic feature of market behavior rather than a purely incidental occurrence.

Accordingly, the observed structure may not be event-specific but may be reproducible across comparable environments characterized by elevated uncertainty, evolving expectations, and incomplete information.

5.4 Behavioral Mechanisms of Pre-Announcement Trading

The observed pattern of pre-announcement trading activity may not be fully explained through information-based mechanisms alone. While information asymmetry, insider trading, and informed order flow remain important explanations within the literature [18,19], behavioral research suggests that investor psychology, social dynamics, expectation formation, and sentiment processes can also play significant roles in shaping market activity.

Behavioral economics and behavioral finance literature indicate that investors frequently make decisions under conditions of uncertainty, incomplete information, and cognitive limitations [7–11,22,27,33]. In such environments, market participants may rely on subjective interpretations, narratives, sentiment signals, and evolving expectations when forming trading decisions. As a result, observable trading activity may emerge before formal information becomes available.

These behavioral mechanisms provide an additional perspective for understanding why substantial market activity may occur before official announcements are released. Rather than viewing pre-announcement activity solely as evidence of informational advantages, a behavioral interpretation suggests that market participants may respond to uncertainty itself, generating trading behavior that precedes formal disclosure and contributes to the formation of market expectations.

5.4.1 Investor Psychology

Investor behavior is often influenced by psychological factors that extend beyond objective information processing. Financial markets are shaped not only by economic fundamentals but also by psychological forces, narratives, and collective sentiment [11]. Investor decisions are frequently affected by emotions, expectations, and interpretations of evolving events rather than by purely rational evaluations of available information.

Supporting this perspective, evidence has shown that investors often overreact to information, demonstrating that psychological biases can generate systematic departures from rational market behavior [24]. These findings suggest that investor reactions may be influenced by behavioral tendencies rather than solely by objective assessments of available information.

More recent research indicates that investor sentiment continues to exert a significant influence on stock-market behavior under both bull and bear market conditions [31]. Psychological factors and sentiment dynamics have been shown to affect market outcomes across different market environments, reinforcing the importance of behavioral explanations for investor decision-making.

During periods of uncertainty, investors continuously attempt to interpret market signals and assess potential future outcomes. This psychological process may encourage market participants to act before complete information becomes available. Consequently, observable trading activity may emerge in anticipation of future developments rather than as a direct response to formal announcements. The concentration of trading activity observed in the present case is therefore consistent with the broader behavioral-finance argument that psychological expectations can influence market behavior before information is officially disclosed.

5.4.3 Fear of Missing Out (FOMO)

The fear of missing out (FOMO) provides an additional

behavioral explanation for pre-announcement trading activity. FOMO has been defined as a psychological concern that others may be experiencing rewarding opportunities from which one is absent [14]. Although initially examined within broader social contexts, the concept has become increasingly relevant to financial markets characterized by rapid information flows, speculative activity, and evolving expectations.

In investment settings, FOMO may encourage traders to enter positions before obtaining complete information when they perceive that a significant market movement is developing. Investors may fear that waiting for official confirmation could result in missed profit opportunities or reduced returns. Consequently, market participants may act on expectations and perceived signals rather than on verified information.

This interpretation is consistent with evidence showing that investors frequently engage in excessive trading behavior that cannot be fully explained by informational advantages alone [32]. Such findings suggest that psychological motivations, subjective beliefs, and anticipation of future opportunities may play an important role in trading decisions, particularly under conditions of uncertainty and heightened expectations.

As a result, FOMO may contribute to the emergence of substantial trading activity before announcements occur, especially in markets that are highly sensitive to geopolitical, economic, or policy developments.

5.4.4 Collective Expectations

Financial markets are fundamentally expectation-driven systems. Keynes argued that investment decisions are heavily influenced by expectations regarding future conditions rather than solely by current realities [15]. Similarly, research has demonstrated that investor beliefs and sentiment can shape market outcomes independently of immediate fundamental information [10].

Recent studies continue to support the importance of sentiment and expectation formation within financial markets. Reviews of asset-pricing literature have concluded that investor sentiment remains a significant explanatory factor and that market behavior frequently reflects expectations and perceptions extending beyond observable fundamentals [28]. Additional evidence suggests that shifts in investor sentiment and behavioral biases contribute to the formation of bull and bear market dynamics, highlighting the role of collective beliefs in shaping market outcomes [29].

Collective expectations emerge when large numbers of market participants develop similar interpretations regarding future developments. These expectations may be formed through news narratives, contextual signals, market rumors, geopolitical developments, or observable trading activity itself. As collective expectations strengthen, coordinated market responses may occur even before formal information is released. Under such conditions, trading activity increasingly reflects anticipated future outcomes rather than reactions to confirmed information.

The interaction between investor psychology, herding behavior, FOMO, and collective expectations provides a behavioral explanation for how pre-announcement trading activity can emerge and intensify before formal disclosure. Together, these mechanisms suggest that market participants may respond to evolving expectations and social signals under conditions of uncertainty, generating observable market effects before official information enters the public domain. This interpretation complements traditional information-based explanations and supports the broader concept of Pre-Announcement Behavioral Dislocation (PABD).

6. Interpretation

6.1 Traditional Explanation

The observed pre-announcement market activity can initially be interpreted through conventional financial frameworks. One explanation relies on rational expectations, whereby market participants anticipate future developments based on available signals, geopolitical context, historical patterns, or evolving expectations. Under this interpretation, prices may begin adjusting before formal announcements as investors incorporate anticipated outcomes into their trading decisions [3].

A second explanation focuses on insider trading or information leakage. According to this perspective, certain market participants may possess access to non-public information and act upon that information before official disclosure occurs. Empirical evidence has shown that abnormal trading activity preceding announcements is often associated with informed trading, informational advantages, and asymmetric information conditions [18,19].

Both explanations remain influential within financial economics because they preserve a common theoretical assumption: information, whether public, anticipated, or

privately held, precedes observable market behavior. Consequently, trading activity and price movements are interpreted as responses to information that already exists within the informational environment [3,18,19].

6.2 Limitations of Traditional Explanations

Although these explanations provide important insights, they face limitations when applied to the present case. In particular, they do not fully account for several notable characteristics of the observed event:

- The speed of the market reaction, which occurred within a highly compressed time interval;
- The scale of trading activity, involving exceptionally large trading volumes within minutes; and
- The absence of identifiable public information or verifiable evidence of information leakage during the pre-announcement period.

Rational-expectations frameworks generally assume that market participants gradually incorporate available information and expectations into prices. However, the observed behavior appears highly concentrated and discontinuous rather than incremental. The intensity and timing of the trading activity suggest a more abrupt behavioral response than would typically be expected from the gradual formation of rational expectations alone.

Similarly, insider-trading explanations require the existence of informational advantages that enable certain participants to act before public disclosure [18,19]. While such a possibility cannot be entirely excluded, the present case provides no direct evidence of identifiable information leakage or observable non-public information that would fully explain the scale and concentration of the observed trading activity.

These limitations do not invalidate traditional explanations. Rather, they suggest that existing interpretations may be insufficient to fully explain the temporal structure, intensity, and concentration of the observed market behavior. Consequently, additional analytical perspectives may be necessary to better understand how market participants respond under conditions of uncertainty when observable information remains incomplete or ambiguous.

6.3 Proposed Interpretation

This study proposes a behavioral-temporal interpretation of **Pre-Announcement Behavioral Dislocation**, in which market behavior may not always follow established understanding but may instead **precede and interact with uncertainty**.

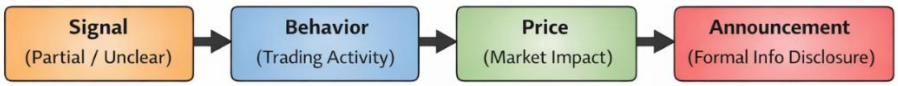

Figure 1. ***Pre-Announcement Behavioral Dislocation:*** A horizontal representation of the temporal sequence where trading behavior and price effects emerge prior to formal information disclosure.

The displacement of behavior relative to announcement timing reflects a structural temporal shift, where observable market activity emerges prior to formal information confirmation.

In this framework, trading activity is not viewed solely as a reaction to information but as a process that emerges under conditions of uncertainty, potentially reflecting exploratory, sentiment-driven, or anticipatory behavior. Rather than waiting for complete information, market participants may act on incomplete signals, evolving narratives, and subjective expectations, resulting in observable activity before formal confirmation.

This perspective is consistent with recent research emphasizing the role of sentiment and expectation formation in financial markets. Mino and Williamson [30] argued that sentiment dynamics can significantly influence market volatility during periods of geopolitical uncertainty, demonstrating that market behavior is often shaped by evolving expectations and interpretations before uncertainty is fully resolved. Their findings suggest that behavioral responses may contribute to market movements independently of immediate informational developments.

This perspective implies a shift in the conventional sequence:

• Instead of: information → behavior

• The observed structure allows for: behavior → price → subsequent information confirmation

Such dynamics suggest that behavior can precede full informational clarity and may play an active role in shaping how uncertainty is resolved within the market. Under this interpretation, market activity becomes not merely a consequence of information but also a mechanism through which expectations, sentiment, and uncertainty are expressed and transmitted.

This interpretation does not reject the role of information but extends the analytical framework by recognizing that, under Pre-Announcement Behavioral Dislocation, behavior and uncertainty may interact prior to the formal consolidation of information. Accordingly, observable market activity may reflect a combination of informational expectations, sentiment-driven responses, and anticipatory decision-making processes that emerge before official disclosure occurs.

6.4 Robustness and Sensitivity Considerations

To strengthen the analytical robustness of the proposed Pre-Announcement Behavioral Dislocation (PABD) framework, it is necessary to consider whether the observed phenomenon remains interpretable under alternative assumptions and scenarios.

First, if the observed trading activity were driven primarily by leaked information or insider trading, one would expect trading behavior to emerge gradually over a longer pre-announcement window, reflecting incremental diffusion of private information. In contrast, the case analyzed in this study exhibits a highly concentrated and temporally compressed burst of trading activity, suggesting a different behavioral structure than gradual information leakage.

Second, under a rational expectations framework, pre-announcement trading should reflect the progressive incorporation of probabilistic expectations into market prices. However, the sharp concentration of trading activity within a narrow time interval, absent observable informational triggers, suggests that expectation formation alone may not fully explain the observed pattern.

Third, if the phenomenon were purely coincidental or noise-driven, similar levels of concentrated trading activity would be expected to occur randomly across comparable time intervals. The alignment between the observed trading cluster and the subsequent announcement indicates that the observed behavior is unlikely to be purely random.

These considerations do not eliminate alternative explanations but indicate that the observed pattern remains analytically relevant even under conservative assumptions. Future studies could strengthen robustness by applying systematic sensitivity analyses across multiple events, markets, and time intervals to evaluate the persistence and structural consistency of the PABD phenomenon.

6.5 Distinguishing PABD from Alternative Explanations and Empirical Testing Pathways

A critical aspect of the Pre-Announcement Behavioral Dislocation (PABD) framework is its conceptual separation from conventional explanations such as insider trading, information leakage, or purely speculative behavior. Traditional explanations assume that information precedes behavior, even if such information is private, unevenly distributed, or only partially observable. In contrast, PABD proposes that observable market behavior may emerge under conditions of uncertainty in ways not fully attributable to identifiable informational channels.

To empirically distinguish PABD from insider trading or information-based explanations, future research may

consider several methodological pathways. First, detailed order-flow analysis could be employed to determine whether the observed pre-announcement trading activity is concentrated among a small set of potentially informed participants or broadly distributed across market participants. A concentrated pattern would be more consistent with informed trading, while broader participation would support a behavioral or structural interpretation.

Second, high-frequency time-stamped transaction data could be used to assess whether trading intensity increases abruptly rather than gradually. A sudden escalation in activity within a compressed time window may indicate a behavioral trigger or regime shift rather than the gradual diffusion of private information.

Third, cross-market analysis could examine whether similar pre-announcement behavior occurs simultaneously across related instruments or markets. Coordinated pre-announcement activity across multiple assets would be less consistent with isolated insider activity and more indicative of broader behavioral dynamics under uncertainty.

Finally, future studies could employ event-study methodologies with extended pre-event windows to capture abnormal returns and trading activity prior to formal announcements. Redefining the event window in this manner would allow for a more accurate assessment of whether market responses systematically precede public information release [6].

Importantly, the PABD framework does not assume that pre-announcement activity is behavioral by default. Rather, it serves as an analytical framework for examining situations in which observable market behavior emerges before formal information disclosure. The framework remains compatible with explanations based on insider trading, information leakage, informed trading, or behavioral anticipation. Determining which explanation is most consistent with a particular event requires empirical investigation using transaction-level data, order-flow analysis, participant concentration measures, and related market evidence.

Alternative explanations therefore remain plausible. Pre-announcement activity may result from insider trading, information leakage, informed trading, rational expectation formation, algorithmic trading responses, or broader behavioral dynamics. The purpose of the PABD framework is not to replace these explanations but to provide a structured analytical lens for examining cases in which observable market behavior emerges before formal information disclosure. Determining the dominant explanation in any specific event remains an empirical question rather than a theoretical assumption.

Collectively, these approaches provide a pathway for empirically testing the PABD framework and distinguishing it from alternative explanations grounded in information leakage or traditional rational-expectations models.

6.6 Linking the Observed Event to Market Microstructure and Price Discovery

The observed pre-announcement trading behavior can be interpreted through the lens of market microstructure and price discovery literature. Existing research highlights that trading activity itself plays a central role in the price formation process, particularly in environments characterized by asymmetric information and uncertainty. Models of informed trading demonstrate that order flow conveys informational content and contributes to price discovery even before public information becomes widely available [5,16].

Recent evidence further suggests that market participants increasingly incorporate signals derived from news flows and evolving information environments into trading decisions. Hashamia and Maldonado [26] demonstrated that news-based analytical approaches can provide valuable insights into oil-price volatility and market expectations, highlighting the growing importance of information interpretation and expectation formation in commodity markets. Their findings suggest that market participants may respond not only to confirmed information but also to emerging narratives and signals that influence expectations regarding future developments.

Within this context, the Pre-Announcement Behavioral Dislocation (PABD) framework extends the microstructure perspective by emphasizing not only how information is incorporated into prices, but also when behavioral and price dynamics emerge relative to formal information disclosure. While traditional models treat trading activity as a channel through which pre-existing information is revealed, the PABD perspective suggests that trading behavior may also emerge under uncertainty in the absence of identifiable information triggers, thereby participating in shaping the informational environment itself.

This interpretation aligns with the broader understanding that prices can reflect both informational and behavioral forces, particularly in fast-moving markets. However, it further suggests that temporal misalignment between behavior, price movement, and formal information release may be a systematic feature of certain market conditions rather than an anomaly. By explicitly connecting behavioral emergence to timing and structural sequencing, the PABD framework complements and extends existing price discovery and market microstructure theories.

Moreover, the findings of Hashamia and Maldonado [26] support the view that market expectations may begin forming before definitive information becomes available. In this sense, pre-announcement trading activity may reflect a dynamic interaction between information interpretation, expectation formation, and market behavior, contributing to the early stages of the price discovery process. This perspective reinforces the central argument of the PABD framework that observable market behavior may emerge before formal information disclosure and may itself influence how future information is interpreted by market participants.

7. Policy and Regulatory Implications

The phenomenon of pre-announcement market activity has implications that extend beyond theoretical discussions of market behavior. If significant trading activity can systematically emerge before formal information disclosure, regulators, market supervisors, and researchers may need to reconsider how markets are monitored, how abnormal trading is detected, and how event-related market reactions are analyzed. The concept of Pre-Announcement Behavioral Dislocation (PABD) therefore has potential relevance for market surveillance, insider trading detection, regulatory monitoring, and the methodological design of event studies.

7.1 Market Surveillance

Market surveillance systems are designed to identify unusual trading patterns that may indicate market abuse, information leakage, or other forms of misconduct. O'Hara [17] emphasized that trading activity itself can contain valuable information regarding underlying market conditions and participant behavior. Similarly, Hasbrouck [16] demonstrated that order flow contributes directly to the price discovery process and often reveals informational dynamics before formal announcements occur.

From a regulatory perspective, the existence of concentrated trading activity shortly before important announcements may warrant increased analytical attention. Traditional surveillance systems frequently focus on identifying suspicious activity after unusual price movements become apparent. However, the PABD framework suggests that regulators may benefit from monitoring abnormal trading clusters, volume concentrations, and order-flow anomalies occurring before public disclosures. Such an approach could improve the ability of regulators to identify emerging market distortions and unusual behavioral patterns at an earlier stage.

7.2 Insider Trading Detection

One of the most common explanations for pre-announcement market activity is insider trading. Meulbroek [18] provided evidence that abnormal trading frequently precedes important corporate announcements when non-public information is available to certain market participants. Similarly, Easley and O'Hara [19] argued that informed traders can influence prices through order flow before information becomes publicly available.

Additional evidence was provided by Aggarwal and Wu [21], who demonstrated that abnormal trading patterns and market manipulation activities can often be identified through unusual trading concentrations, timing anomalies, and deviations from expected market behavior. Their findings highlight the importance of monitoring trading activity that emerges before significant market events and reinforce the role of surveillance systems in identifying potentially suspicious market behavior.

While insider trading remains a plausible explanation for some pre-announcement market movements, the present study suggests that not all abnormal activity can automatically be attributed to informational misconduct. Behavioral mechanisms, collective expectations, and anticipatory decision-making may also contribute to observable trading activity before formal announcements. Consequently, regulators should distinguish between activity driven by unlawful informational advantages and activity generated by broader behavioral processes.

The PABD framework does not replace insider trading investigations. Rather, it provides an additional analytical layer through which regulators can evaluate

whether abnormal trading patterns are more consistent with information leakage, behavioral anticipation, or a combination of both. Such differentiation may improve the accuracy of enforcement efforts and reduce the risk of misclassifying legitimate market behavior as misconduct.

7.3 Regulatory Monitoring

Modern financial markets operate within increasingly complex informational environments characterized by rapid communication, algorithmic trading, social media influence, and global information flows. As noted by the International Organization of Securities Commissions [20], effective market regulation increasingly depends on the ability to detect unusual trading patterns and emerging sources of market risk.

Recent research further emphasizes the importance of regulatory structures and market-monitoring mechanisms in preserving market integrity. Cumming, Johan, and Li [23] found that exchange trading rules and surveillance mechanisms play a significant role in supporting market quality, liquidity, and the detection of abnormal trading behavior. Their findings suggest that effective monitoring frameworks contribute not only to enforcement efforts but also to broader market confidence and transparency.

Within this context, regulatory monitoring may benefit from incorporating behavioral indicators alongside traditional information-based indicators. Monitoring systems typically focus on price movements, transaction volumes, and disclosures. However, the PABD framework suggests that temporal patterns may also contain valuable information. Specifically, repeated instances of concentrated trading activity immediately preceding important announcements may signal the presence of recurring behavioral structures that warrant further investigation.

Accordingly, regulators may consider incorporating temporal anomaly detection, abnormal volume clustering, and pre-announcement activity analysis into broader surveillance frameworks. Such measures could improve regulatory awareness of evolving market dynamics and contribute to more proactive oversight.

7.4 Event Study Redesign

The findings also carry implications for academic research, particularly for event-study methodology. MacKinlay [6] established the announcement date as the central reference point for measuring abnormal returns and evaluating market reactions. This approach assumes that the announcement represents the beginning of market response.

However, if substantial trading activity and price movements can emerge before formal disclosure, then the traditional event-study framework may overlook important market dynamics occurring during the pre-announcement period. The assumption that announcements represent time zero may therefore be incomplete in certain contexts.

The PABD framework suggests that future research should consider extending event windows to capture pre-announcement activity more effectively. Researchers may benefit from examining abnormal returns, trading volumes, and order-flow behavior during periods immediately preceding announcements rather than focusing exclusively on post-announcement effects. Such an approach could improve understanding of how information, expectations, and behavioral factors interact over time.

Taken together, these implications suggest that pre-announcement market activity is relevant not only for behavioral finance theory but also for regulatory practice and empirical research design. By incorporating market surveillance, insider trading detection, regulatory monitoring, and event-study redesign into the analysis, the PABD framework provides a broader policy-oriented perspective that aligns with contemporary challenges facing financial markets and regulatory institutions.

8. Implications

8.1 Market Efficiency

The findings suggest that the traditional interpretation of market efficiency may be incomplete rather than invalid. Under EMH, prices are expected to reflect available information once it becomes known [2,3]. However, the observed pattern indicates that market behavior may emerge prior to formal information disclosure, raising questions about whether announcements truly represent the starting point of information incorporation.

This does not necessarily contradict EMH, but it implies that the timing of information relevance may extend beyond formally observable events, requiring a more flexible interpretation of when and how information enters the market.

8.2 Price Formation

The observed sequence suggests that price formation may begin before official announcements, rather than at the moment of disclosure. Traditional models assume that price adjustments are triggered by information arrival, yet the evidence indicates that trading activity and price changes can precede formal confirmation.

This implies that the process of price formation may involve pre-announcement phases, where market dynamics evolve in anticipation or interaction with uncertainty. As a result, defining the announcement as time zero may overlook critical early-stage adjustments in prices [6].

8.3 Policy and Regulation

The presence of significant trading activity prior to announcements has important implications for market surveillance and regulatory frameworks. Regulators typically monitor markets for signs of insider trading or information leakage, particularly when abnormal trading occurs before major events [18].

However, if pre-announcement trading is not always attributable to identifiable information leakage, this raises a broader challenge for regulators. Specifically, there may be a need to enhance monitoring mechanisms to distinguish between:

• Illicit informed trading, and

• Behavioral or structural market dynamics under uncertainty.

This distinction is critical for ensuring market integrity while avoiding over-attribution of abnormal activity to regulatory violations.

9. Limitations

This study is subject to several limitations that should be acknowledged when interpreting the findings.

First, although the study incorporates one primary case and four additional exploratory cases, the overall sample remains limited in size and scope. The selected events are intended to provide preliminary cross-context evidence rather than comprehensive empirical validation. Consequently, caution should be exercised when generalizing the findings across different markets, time periods, asset classes, or institutional environments.

Second, the study does not incorporate formal statistical testing or econometric modeling. Unlike traditional event studies that rely on abnormal return calculations and hypothesis testing [6], this analysis adopts a descriptive and interpretative approach. As a result, the findings should be viewed as exploratory rather than conclusive.

Third, there remains a need for a larger and more comprehensive dataset. A systematic analysis of a substantially larger number of events, covering different announcement types, industries, geopolitical developments, and market conditions, would be necessary to evaluate the robustness, consistency, and repeatability of the observed behavioral pattern.

Fourth, the exploratory cases presented in this study are based primarily on publicly reported developments and qualitative event interpretation. While they provide useful contextual support for the proposed framework, they do not constitute direct statistical tests of the Pre-Announcement Behavioral Dislocation (PABD) phenomenon. Future research should therefore incorporate high-frequency transaction data, order-flow analysis, and formal event-study methodologies to evaluate the empirical validity of the proposed framework.

These limitations do not invalidate the findings but highlight the preliminary nature of the study and the need for further empirical investigation.

10. Future Research

Future research should extend this study by incorporating systematic empirical validation across multiple events and market conditions.

First, applying event study methodologies to a broader set of cases would allow for a structured examination of pre-announcement behavior, particularly by redefining event windows to capture activity occurring before formal disclosures [6].

Second, constructing a multi-event dataset across different asset classes, geopolitical events, and announcement types would enable testing the consistency and generalizability of the observed pattern. Such a dataset would help determine whether pre-announcement trading behavior represents isolated anomalies or a repeatable structural phenomenon.

Third, future studies should focus on timing analysis, examining the precise temporal relationship between trading activity, price movements, and announcements. This includes identifying whether there are consistent lead-lag structures and whether these patterns vary across market environments or levels of uncertainty.

These directions would provide a more rigorous empirical foundation for understanding the role of timing and behavior in financial markets.

11. Conclusion

This study explored the phenomenon of **Pre-Announcement Behavioral Dislocation (PABD)**, a market condition in which observable trading activity and price effects appear before formal information disclosure. Using an oil futures market event as the primary case, supported by additional exploratory cases from different sectors and market environments, the analysis examined whether market behavior always follows information or whether it can emerge before formal confirmation becomes available.

The evidence presented in this study does not suggest that information is unimportant. Nor does it invalidate established theories of market efficiency, information diffusion, or price discovery. Instead, it highlights a more nuanced possibility: market participants frequently operate in environments characterized by uncertainty, incomplete information, evolving narratives, and shifting expectations. Under such conditions, observable market activity may begin before formal announcements are released.

A central implication of the study is that announcements may not always represent the true starting point of market response. In some cases, they may simply mark the moment at which an ongoing process becomes publicly visible. Trading activity, expectation formation, and price adjustments may already be underway before formal disclosure occurs. This observation has implications not only for behavioral finance but also for event-study methodology, market surveillance, and the interpretation of pre-announcement market activity.

The proposed PABD framework offers a preliminary lens through which such episodes can be examined. Rather than treating every instance of pre-announcement activity exclusively as evidence of information leakage or insider trading, the framework encourages consideration of behavioral and temporal mechanisms that may influence market behavior under uncertainty. While alternative explanations remain relevant, the findings suggest that timing itself deserves greater attention within financial analysis.

The study should be viewed as an exploratory step rather than a definitive conclusion. Additional empirical testing across larger datasets, different asset classes, and diverse market environments will be necessary to determine the prevalence and robustness of the proposed phenomenon. Future research may also develop measurement-oriented approaches capable of identifying and quantifying pre-announcement behavioral dynamics using transaction-level data, order-flow information, and high-frequency market observations.

Ultimately, the broader contribution of this study lies in drawing attention to a simple but important question: if market participants frequently act before formal information is released, then understanding when market behavior emerges may be as important as understanding what information eventually becomes public. Exploring that question may provide new insights into the relationship between expectations, uncertainty, and price formation in modern financial markets.

Author Contributions

Hasan Mohamed Husain Alaali conceived the study, developed the theoretical framework, collected and analyzed the data, conducted the literature review, interpreted the findings, and wrote and revised the manuscript. The author has read and approved the final version of the manuscript.

AI Use Statement

Artificial intelligence tools were used solely for language editing, formatting assistance, and manuscript organization. All conceptual development, theoretical arguments, interpretation, analysis, and final manuscript validation were conducted exclusively by the author. This manuscript follows the DFAS-FEP Protocol for AI authorship governance and transparency (Alaali, 2025a).

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Informed Consent Statement

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Data Availability Statement

The data used in this study were obtained from publicly

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Conflicts of Interest

The author declares no conflict of interest.

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Appendix A – DFAS-FEP Authorship Classification and Compliance:

This manuscript complies with the **DFAS-FEP Protocol,** a structured authorship governance framework introduced by **Hasan Mohamed Husain Alaali**.

DFAS-FEP (Dynamic Financial Applied Meta-Science – Future Engine Prototype Protocol) provides an ethical protocol to ensure transparent and accountable authorship in AI-assisted financial research. It defines and enforces the distinction between fully human-generated content and AI-supported elements to uphold integrity, intellectual responsibility, and traceability across all components of this manuscript.

This classification directly supports the ethical architecture of the **DFAS-IFRS Code of Ethics**, which applies DFAS-FEP standards to financial disclosures influenced by artificial intelligence.

For reference, see the published DFAS-FEP Protocol:
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5260517

Appendix A.1 – (DFAS-FEP) Authorship Classification Table for This Manuscript (PABD):

Manuscript Component	DFAS–FEP Class	Justification (Concepts Explicitly Introduced in This Manuscript)
Core Conceptual Philosophy and Meta-Theoretical Framework	Class 1	Introduction of Pre-Announcement Behavioral Dislocation (PABD) as a distinct analytical concept; examination of the temporal relationship between information disclosure, expectation formation, and market behavior; proposal that observable trading activity may emerge before formal information disclosure under conditions of uncertainty; integration of behavioral economics, behavioral finance, and market microstructure perspectives into a unified interpretive framework.
Causal Science and System Architecture (Laws, Algorithms, Engines, Decision Gates)	Class 1	Development of the behavioral-temporal sequence (Signal → Behavior → Price → Announcement); identification of temporal dislocation as a recurring structural pattern; formulation of PABD as a framework for analyzing timing misalignment between market activity and formal information disclosure; conceptual distinction between information-based and behavior-based explanations of pre-announcement activity.
Calibration Principles and Contextual Governance Logic	Class 1	Establishment of analytical conditions under which PABD may emerge, including uncertainty, incomplete information, expectation formation, sentiment dynamics, and compressed pre-announcement time windows; differentiation between insider trading, information leakage, and behavioral anticipation; interpretation boundaries designed to avoid automatic attribution of pre-announcement activity to informational misconduct.
Operational Blueprint and Implementation Architecture	Class 1	Construction of an event-based analytical framework for identifying and evaluating pre-announcement market behavior; incorporation of exploratory multi-event evidence; proposal of future empirical testing pathways including order-flow analysis, extended event windows, high-frequency transaction analysis, and measurement-oriented approaches for quantifying PABD dynamics.
Illustrative Case Studies and Applied Scenarios	Class 1	Application of the framework to a March 2026 oil futures market event involving concentrated trading activity approximately fifteen minutes before a political announcement concerning Iran; inclusion of four additional exploratory cases involving AI infrastructure competition, tariff-driven capital relocation, AI expectation compression, and banking-sector consolidation to examine potential structural reproducibility across different contexts.

Narrative Structure and Analytical Exposition	Class 2	Linguistic refinement, organization of arguments, explanatory structure, readability improvements, and manuscript presentation; no original conceptual contribution.
Tables, Figures, and Conceptual Diagrams	Class 2	Formatting and presentation of tables, case summaries, temporal sequences, and supporting visual structures; no original analytical contribution.
Literature Review and Cross-Referencing	Class 2	Reference formatting, Vancouver citation conversion, literature organization, and source integration; all theoretical synthesis, interpretation, and conceptual development are author-generated.
Appendices and Compliance Documentation	Class 2	Formatting, disclosure statements, compliance documentation, author declarations, and DFAS–FEP classification reporting; no conceptual contribution.

Overall Manuscript Classification: Class 2 – AI-Assisted, Author-Validated

Core Conceptual Framework, Causal Architecture, and Governance Logic: Class 1 – Fully Human-Authored

Additional Clarifications

Human-Originated Content (Class 1):
All concepts introduced in this manuscript — including **Pre-Announcement Behavioral Dislocation (PABD)**, **temporal inversion of market response**, **behavior as an active mechanism under uncertainty**, **signal–behavior–price–announcement sequence**, **temporal dislocation**, and **structural reproducibility logic** — were independently conceptualized, derived, and documented by the author without any AI involvement.

AI-Assisted Content (Class 2):
AI tools were used strictly for non-substantive support functions, including **linguistic refinement, formatting alignment, and citation structuring**. No AI tools were used in conceptual reasoning, causal analysis, or theoretical development. All AI-assisted outputs were manually reviewed and validated by the author.

Integrity Safeguards:
All AI-assisted contributions were subjected to **DFAS-FEP v1.6 compliance auditing**, including manual verification, authorship classification review, and documentation of traceability, ensuring full reproducibility and institutional accountability.

Appendix B – Version History Log (VHL)

Version 1.0 – First Published in OSF Preprint Dated 05-04-2026.
• **SSRN DOI: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6523799**
• The manuscript's conceptual architecture, **Pre-Announcement Behavioral Dislocation (PABD) framework**, temporal inversion logic, behavioral–uncertainty interaction model, signal–behavior–price–announcement sequence, and structural reproducibility framework were fully human-authored. AI tools were used exclusively for non-substantive support functions, limited to formatting alignment, structural layout refinement, and controlled linguistic polishing, in full compliance with DFAS-FEP v1.6 presentation standards.

• **Version 2.0 – Revised for Journal Submission (June 2026).**
Expanded and revised to meet journal requirements, including Vancouver-style citations, additional behavioral economics and policy content, exploratory multi-event evidence, and enhanced methodological discussion.
• **Alaali-ACS:** 0 | **Classification:** Class II – AI-Assisted, Author-Validated

Appendix C – Supplementary Video Material

Path Signal 048 – Behavioral Dislocation: When the Market Moves Before Reality.
This video provides a conceptual illustration of the behavioral–temporal mechanism discussed in this paper and serves as

supplementary material to support understanding of the Pre-Announcement Behavioral Dislocation (PABD) framework. **Author Platform Link:** *https://studio.youtube.com/video/fL6ilbr-IG4/edit* The video is disseminated through the author's structured research communication platform, which operates under the DFAS-OAFS charter. This platform is intended to communicate analytical frameworks, methodological structures, and observational research outputs in alignment with open-science principles, transparency, and reproducibility standards.

Governed by DFAS-OAFS-C01 Charter. DOI: https://zenodo.org/records/18621545

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