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UNDERSTANDING MARKET NARRATIVES: AN INTERDISCIPLINARY APPROACH TO IDENTIFICATION AND ANALYSIS

Davit Hayrapetyan (Yerevan State University, Yerevan, Armenia)

davidhaiarm@ysu.am

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Market narratives - collectively shared stories and economic discourses - significantly influence investor behavior, market sentiment, and asset pricing dynamics. The concept of narrative economics, pioneered by Robert Shiller, underscores the importance of understanding the propagation and impact of these narratives, particularly in today's digital era, where social media and digital news rapidly disseminate market stories. Despite the acknowledged importance, systematic identification and analysis of market narratives pose significant methodological challenges. Narratives are inherently subjective, dynamically evolving, and often embedded within large volumes of noisy textual data. This complexity complicates efforts to pinpoint narrative emergence, measure their influence on financial markets, and differentiate meaningful signals from market noise.

This article addresses the critical challenges associated with the scientific identification and analysis of market narratives. We explore interdisciplinary methodologies, integrating insights from behavioral finance, natural language processing (NLP), and machine learning to offer robust frameworks for narrative detection and assessment. The study critically reviews and evaluates methods including Structural Vector Autoregressions (SVARs) with narrative restrictions, redescription mining, storytelling algorithms, narrative mapping, news clustering, and textual analysis. Using empirical case studies, particularly focused on Microsoft Corporation, the effectiveness of each technique is analyzed, highlighting their respective strengths and limitations.

Our research proposes a hybrid analytical framework that combines news clustering, narrative mapping, and advanced NLP techniques for improved narrative coherence, enhanced thematic clarity, and effective sentiment analysis. By advancing the science of market storytelling, this approach provides investors, analysts, and policymakers with actionable

insights, enhancing their ability to anticipate market shifts, manage financial risks, and maintain market stability.

***Keywords**: Market narratives, Narrative economics, Behavioral finance, Investor sentiment, Natural language processing (NLP), Machine learning, Narrative identification, Sentiment analysis.*

Theoretical Background

Despite the growing recognition of the impact of narratives on financial markets, identifying and quantifying these narratives remains a major challenge. The primary issues include:

- Complexity and Subjectivity of Narratives: Unlike quantitative financial data, narratives are inherently subjective, evolving through interactions among investors, media, and policymakers.
- Data Overload and Noise: With the exponential growth of financial news and online discussions, extracting meaningful narratives from vast amounts of text data requires advanced computational methods.
- Dynamism and Evolution: Market narratives are not static; they shift based on economic events, investor sentiment, and media coverage. Tracking their evolution over time adds another layer of complexity.
- Impact Measurement: Even when narratives are identified, measuring their influence on stock market behavior remains a difficult task. Understanding whether a narrative drives market trends or merely reflects them requires sophisticated analytical models.

To address these challenges, this study reviews existing methods of narrative identification and presents computational approaches for extracting and analyzing market stories. By combining behavioral insights with advanced NLP techniques, we aim to enhance the understanding of how financial narratives shape investor behavior and market dynamics.

The concept of narrative economics revolves around two key elements: (1) the spread of ideas through word-of-mouth in the form of stories and (2) deliberate efforts to create and amplify compelling narratives. In many cases, large-scale economic narratives emerge from a combination of smaller interrelated stories, which, when viewed collectively, form a cohesive theme. This structure is comparable to epidemics of economic narratives, where ideas spread from person to person through direct conversation, phone calls, or social media. Additionally, narratives gain traction as news outlets and public figures reinforce them by referencing one another's content. Unlike traditional economic models based on time-series data, narrative-based economic theories incorporate consumer motives,

business objectives, and observed behavioral patterns, which are often inferred from introspection, interviews, or direct observations of market participants.

News media and public discourse frequently describe financial crises as panic-driven events, marked by a series of economic failures following periods of excessive complacency. While the use of terms like "panic" and "complacency" may seem exaggerated, they accurately reflect the psychological and behavioral responses observed during financial downturns.

Research indicates that individuals tend to overestimate the likelihood of a stock market crash, and these perceptions are heavily shaped by media coverage, particularly front-page news stories.

Contagion effects are also evident in online behavior. Studies show that exposure to trolling behavior increases the likelihood of engaging in similar conduct, suggesting that certain behaviors spread rapidly through social interactions. In the financial context, narratives can be intentionally shaped by marketers, leading to the formation of a "phishing equilibrium," where a certain level of misleading or exaggerated storytelling becomes an accepted part of market discourse.

These findings highlight the profound impact of market narratives on investor behavior, demonstrating how fear-driven and sensationalized stories can shape market expectations and financial decision-making. (Shiller, 2019)

In our early research we have proposed an approach, which goes beyond traditional views by emphasizing how individual biases and market narratives jointly shape market dynamics, contributing to phenomena like market overreaction, underreaction, and increased volatility. The study's proposed experimental model thus offers an innovative framework for observing how noisy traders' biases influence market efficiency and pricing. Our approach highlighed the role of psychological and behavioral factors in adaptive markets, suggesting that market inefficiencies and price distortions arise not only from information gaps but also from complex bias-driven behaviors that amplify volatility and impact market equilibrium over time. We proposed to examine Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN) as architectures worth exploring for in-depth analyses of behavioral patterns (biases) and their changes and adaptations over time and uncertainty (Hayrapetyan D., Melkumyan H., 2024).

Psychologists have observed that humans possess a uniquely advanced theory of mind, which refers to their strong inclination to form mental models of what others are thinking. In economic contexts, narratives frequently involve scripts - sequences of actions that individuals adopt simply because they have heard similar stories about others doing the same. Those who make economic decisions within the framework of narratives rarely articulate their reasoning. When asked to

explain their choices, they may struggle to find the right words or attempt to present their thoughts in economic terms.

Economists are generally aware of the narratives that accompany economic events, but many assume that these narratives merely emerge as a response to changes in fundamental economic forces. However, it is important to remain cautious of the assumption - often made by economists - that causality always flows from economic events to narratives and not the other way around. Economic narratives serve several functions: they remind individuals of forgotten facts, offer explanations about how the economy functions, and influence how people rationalize economic actions.

One of the most significant aspects of narrative economics is its feedback effect on the macro economy by shaping decision-making and behavior on a broad scale. This perspective aligns with earlier research on investor enthusiasm and irrational exuberance, which suggests that economic stories influence expectations, drive confidence, and sometimes instill fear in economic agents. The narrative turn in research brought increased attention to subjective human understanding, social discourse, and sense-making in disciplines such as political science, psychology, sociology, and science studies. During this shift, Deidre McCloskey pioneered an analysis of rhetoric and storytelling in economics, emphasizing that every mathematical model requires an underlying story to connect abstract equations to real-world dynamics. She further noted that economic theory is largely shaped by metaphors borrowed from the natural sciences, such as the velocity of money or the elasticity of demand, though economists rarely reflect on the implications of these linguistic choices. (Shiller R. J. 2019)

Akerlof and Shiller emphasize that economic decisions often rely on narratives, as stories shape individuals' expectations, influencing market confidence or fear. Extending this idea, Tuckett and Nikolic introduce Conviction Narrative Theory (CNT), explaining that people cope with uncertainty by creating believable narratives about possible outcomes. Such narratives assist individuals in making choices, committing to them, and sustaining their beliefs.

Narratives operate both personally, reflecting individual beliefs, and socially, involving storytellers and listeners. Social narratives succeed when the participants share similar belief systems; otherwise, a narrative convincing to the storyteller may appear illogical to listeners.

Collective economic narratives emerge within groups, offering shared interpretations of economic events and guiding coordinated actions. These narratives develop through social interactions and may also arise from interactions between different groups, sometimes highlighting conflicting beliefs. According to a complexity-based economic perspective, narratives are essential for coordinating

behavior in uncertain conditions, aligning expectations, and improving collective outcomes. (Roos M., Reccius M., 2023)

Market narratives play a fundamental role in shaping how investors interpret information and make financial decisions. Goetzmann, Kim, and Shiller suggest that these narratives act as explanatory tools, offering causal links between economic events and market movements. Such narratives frequently originate from sources like financial news, corporate earnings reports, macroeconomic trends, and geopolitical developments. By framing market dynamics in a structured manner, narratives assist investors in processing complex information and mitigating cognitive overload in an environment characterized by an overwhelming flow of data. (Goetzmann et al., 2022)

Taffler and collegues highlight the emotional power of narratives in driving market behavior. Economic stories evoke fear, optimism, panic, or euphoria, directly influencing investment decisions. Crash narratives, for example, amplify investor risk aversion, leading to herding behavior and market downturns. Conversely, bullish narratives encourage speculative activity, contributing to asset bubbles and increased market volatility. The figure illustrates how such things as events, speculations, and rumors etc. feed into the construction of economic narratives [i]. These generate the powerful emotions [ii] which drive investor decisions, and consequently, market prices and volatility [iii]. However, market behavior will also be reflected in stories written about the market in the media [iv], and will likewise impact investor emotions [v]. Similarly, their emotional states will influence financial journalists, and other commentators, and analysts [vi].

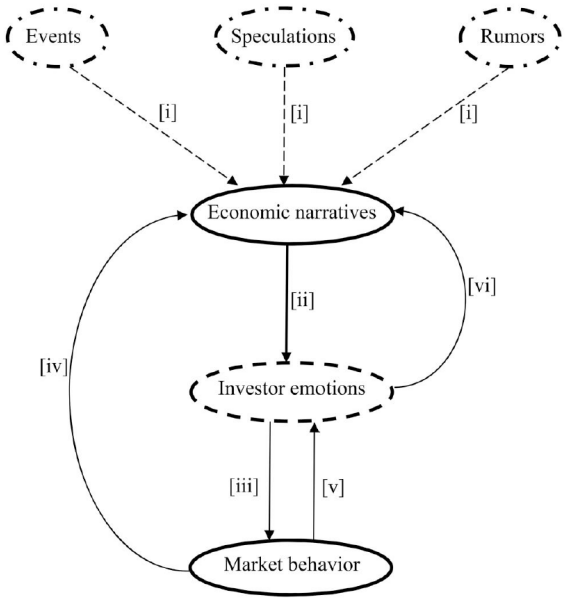


Figure 1. Interrelationships between narratives, emotions, and market behavior.

Storytelling plays a central role in how individuals interpret and make sense of the world. Humans have often been described as "homo narrans" or "homo fabulans," highlighting their nature as storytellers and interpreters of narratives. Narratives serve as a primary means of making human experiences meaningful, providing a structured way to understand complex events. According to Fisher, narrative rationality - or sense-making - arises from people's intrinsic awareness of narrative probability (what makes a story coherent) and narrative fidelity (whether a story aligns with their understanding of reality). (Taffler et al., 2024; Fisher, 1984)

Market narratives have a profound impact on asset pricing by shaping investor expectations and risk perceptions. Damodaran categorizes narrative shifts into three types:

Narrative Breaks: When external shocks completely alter prevailing market narratives (e.g., the 2008 financial crisis, COVID-19 pandemic).

Narrative Transformations: When long-term structural changes reshape market outlooks (e.g., technological innovations, climate policies).

Narrative Adjustments: When minor updates modify existing narratives without fundamentally changing market sentiment. (Damodaran, 2017)

Empirical research indicates that investor sentiment, influenced by prevailing economic narratives, plays a significant role in shaping stock price movements. Mangee found that during periods of economic uncertainty, investors tend to rely more heavily on dominant narratives, which can result in mispricing and inefficiencies within financial markets. Additionally, Bhargava and colleagues demonstrated that negative sentiment in financial news is associated with lower asset valuations, underscoring the relevance of narrative analysis in investment decision-making. (Mangee, 2021; Bhargava et al., 2023)

Financial crises often give rise to powerful market narratives that influence investor psychology. Mangee argues that "Black Swan" events trigger narrative-driven market responses, leading to heightened volatility and irrational decision-making. Crisis narratives, such as those surrounding the dot-com bubble, the 2008 financial collapse, and the COVID-19 market crash, often result in:

- Increased risk aversion: Investors withdraw from risky assets, leading to liquidity shortages and sharp declines in asset prices.
- Herding behavior: Market participants follow dominant narratives, amplifying boom-and-bust cycles.
- Narrative contagion: Crisis-related stories spread rapidly through financial media and social networks, exacerbating panic-driven sell-offs.

Goetzmann et al. explored how media-driven crash narratives affect investor attention and market volatility. They found that increased media coverage of

downturns leads to higher search activity for crash-related terms, highlighting the role of financial narratives in shaping market trends. Advances in NLP now allow systematic analysis of these narratives, with researchers developing methods to measure narrativity in texts. For instance, Piper et al. used machine learning on historical texts to construct a narrativity indicator, showing that fiction and poetry exhibit high narrativity, while science and nonfiction score lower. Kahana synthesized research on memory, showing that recall follows principles of recency, semantic similarity, and temporal contiguity. These mechanisms help explain cognitive biases in financial decision-making. Mullainathan suggested that associative memory causes selective recall of past events, leading to biased forecasts. Gennaioli and Shleifer showed that bounded memory narrows probabilistic beliefs, while Bordalo et al. applied associative-memory models to behavioral biases. Enke et al. experimentally confirmed that associative recall can lead to overreaction to news, reinforcing the link between cognitive processes and investor behavior. (Goetzmann et al., 2022)

Blanqué and collegues developed an empirical framework to measure the intensity of economic narratives using machine learning models. Their findings indicate that:

- Narrative intensity correlates with market volatility: Higher levels of media coverage on negative economic stories coincide with increased market fluctuations.
- Sentiment-based trading strategies can exploit narrative trends: Investors who systematically track shifts in financial narratives can make informed decisions based on evolving market sentiment.
- Digital media accelerates the spread of market narratives: The rise of social media platforms has amplified the speed at which economic stories influence investor behavior, leading to more frequent market anomalies.

Investors and fund managers increasingly incorporate sentiment analysis into their trading strategies to anticipate market movements. Sentiment-driven models leverage NLP techniques to analyze financial news, earnings reports, and social media discussions. Studies by Deveikyte and Tetlock show that:

- Pessimistic sentiment in financial news exerts downward pressure on stock prices.
- Social media discussions with cashtags ($) exhibit stronger correlations with market returns.
- Market reactions to sentiment shifts are asymmetric, with negative news triggering larger price movements than positive news.

By systematically tracking sentiment fluctuations, investors can develop quantitative trading strategies that capitalize on shifts in narrative-driven market sentiment. (Deveikyte et al., 2022, Tetlock, 2007)

Several historical case studies highlight the influence of market narratives on financial crises and investor behavior:

The Dot-Com Bubble (1995-2000):

Narrative: "The internet will revolutionize business and create limitless growth opportunities."

Impact: Speculative frenzy led to extreme overvaluation of tech stocks, culminating in a sharp market collapse.

The 2008 Financial Crisis:

Narrative: "Real estate prices always go up, and mortgage-backed securities are safe investments."

Impact: Overconfidence in housing markets fueled excessive risk-taking, leading to a global financial meltdown.

COVID-19 Market Crash (2020):

Narrative: "The pandemic will cause prolonged economic devastation."

Impact: Panic-driven sell-offs in March 2020 resulted in one of the fastest market declines in history, followed by a rapid recovery fueled by stimulus measures and economic optimism. (James N., Menzies M., 2023)

Each of these crises demonstrates how dominant market narratives shape investor expectations, influence market trends, and contribute to the formation of speculative bubbles or sharp downturns.

Narrative identification is a complex process due to the inherent subjectivity and fluidity of narratives. One of the main challenges is defining what constitutes a narrative, as narratives can vary in structure, scope, and form, from personal anecdotes to grand societal myths. Another challenge is the ambiguity of textual and contextual meaning, where different individuals or groups may interpret the same narrative differently based on cultural, psychological, and ideological factors. Additionally, narratives often evolve over time, making their identification difficult when tracking their transformation across different mediums, discourses, and historical contexts.

To overcome the main challenges, researchers employ various qualitative and quantitative methods. Qualitative approaches, such as discourse analysis and thematic coding, help in identifying key motifs, structures, and recurring themes in narratives. Quantitative methods, including natural language processing (NLP) and machine learning, allow for large-scale identification and classification of narratives across diverse datasets. Sentiment analysis and network analysis are also useful in understanding how narratives spread and gain influence in social and digital spaces. These combined approaches help in systematically identifying and analyzing narratives with greater precision and objectivity. The study of narrative identification benefits from an interdisciplinary approach, incorporating insights from linguistics, psychology and computational science. Advances in artificial

intelligence and big data analytics are further enhancing researchers' ability to detect and track narratives in real-time, particularly in digital media. However, ethical concerns regarding bias in narrative detection algorithms and the manipulation of narratives remain significant. As narrative identification techniques continue to evolve, a key challenge will be balancing technological efficiency with critical, human-centered interpretation to ensure responsible and insightful analysis.

Narrative identification techniques have evolved to incorporate both qualitative and quantitative methodologies, leveraging advancements in computational analysis. Below are some notable techniques of narratives identifications by their foundational equations and algorithms.

1. Structural Vector Autoregressions (SVARs) with Narrative Restrictions

In econometrics, Structural Vector Autoregressions (SVARs) are employed to understand the dynamic relationships between multiple time series variables. Narrative restrictions are incorporated into these models to impose inequality constraints on structural shocks during specific periods. This approach enhances the identification of economic narratives by aligning model constraints with historical events. The general form of an SVAR model is:

$A0yt = A(L)yt\text{-}1 + ut$

where A0 represents contemporaneous relationships, A(L) is a lag polynomial, and ut denotes structural shocks. Narrative restrictions are applied as inequality constraints on these shocks, such as:

$\varepsilon it \geq \max k \neq t(\varepsilon ik)$

This constraint implies that the structural shock at time is the largest positive realization within the sample. Implementing these restrictions requires specialized algorithms to ensure valid inference under such constraints (Juan A.-D., Rubio-Ramírez J. F., 2018).

2. Redescription Mining and Storytelling Algorithms

Redescription mining identifies different descriptions that define the same subset of data, facilitating the discovery of overlapping narratives within datasets. Storytelling algorithms extend this concept by connecting disjoint data subsets through intermediate descriptors, effectively constructing a chain of redescriptions that bridge distinct narratives. The storytelling problem can be formulated as finding a sequence of descriptors Z 1, Z 2, … Z k such that: $X \cap Z1 \neq 0$, $Z\ i \cap Z\ i+1 \neq 0$ $(1 \leq i < k)$, $Z\ k \cap Y \neq 0$

Here, X and Y are disjoint initial and target sets, respectively. The algorithm seeks to minimize the total cost or length of the chain, ensuring coherence between X and Y (Parida, L., & Ramakrishnan, N., 2005).

3. Narrative Maps and Optimization Techniques

Narrative maps provide a visual representation of events and their interconnections , aiding in the extraction and understanding of complex narratives from large datasets. The construction of a narrative map involves optimizing coherence while adhering to structural and coverage constraints. This can be formulated as an optimization problem:

maxMap Coherence(Map) subject to Coverage(Map) ≥ θ

where Coherence(Map) measures the logical flow between events, and Coverage(Map) ensures that the map includes a sufficient portion of the narrative elements, with θ being a predefined threshold (Brian F. K. N., Tanushree M., 2021).

4. News Clustering for Narrative Identification

News clustering techniques are widely used to identify emerging narratives by grouping similar news articles based on their textual content, themes, and sources. Clustering algorithms, such as k-means, DBSCAN, and hierarchical clustering, help detect common storylines and their evolution over time. The Term Frequency-Inverse Document Frequency (TF-IDF) method is often used for feature extraction in clustering: TF-IDF(t, d) = TF(t, d) x IDF(t)

where:

TF(t, d) is the term frequency of term t in document d.

IDF(t) = log (N / n_t), where N is the total number of documents, and n_t is the number of documents containing term t.

Clustering can then be performed using k-means, which minimizes intra-cluster distance:

$$J = \sum_{i=1}^{k} \sum_{x \in C_i} \|x - \mu_i\|^2$$

where x represents a news document vector, C_i is a cluster, and μ_i is the centroid. News clustering aids in tracking narrative evolution, misinformation propagation, and agenda-setting (Manning et al., 2008).

5. Textual Analysis for Narrative Detection

Textual analysis involves using Natural Language Processing (NLP) techniques to identify linguistic patterns in narratives. Methods such as named entity recognition (NER), sentiment analysis, topic modeling, and dependency parsing help extract key actors, themes, and emotional tones in narratives. One commonly used approach is Latent Dirichlet Allocation (LDA) for topic modeling, formulated as:

$$P(w|\theta, \beta) = \sum_z P(w|z, \beta) P(z|\theta)$$

where:

P(zIθ, β) is the probability of a word given a topic.

P(zIθ) is the probability of a topic given the document.

Sentiment analysis is another key method, which often relies on a lexicon-based approach:

$$S = \sum_{i=1}^{n} s(w_i)$$

where $s(w_i)$ represents the sentiment score of word . Machine learning models like BERT, GPT, and LSTMs further improve narrative detection by capturing semantic context and discourse structure (Blei et al., 2003).

In order to assess the differences and relative effectiveness of various narrative identification methodologies, an empirical study focused on narrative extraction and identification was conducted utilizing news articles related to Microsoft Corporation (MSFT). Microsoft represents an ideal case for narrative analysis based on news data for several reasons:

High Volume of News Coverage – Frequent reporting on areas such as artificial intelligence (AI), cloud computing, gaming, and financial performance ensures ample and timely data availability

Diverse Operational Segments – Microsoft's diverse business operations, including AI, enterprise software, gaming, and cloud computing, result in varied narrative content.

Stock Price Responsiveness – Movements in Microsoft's stock price often exhibit sensitivity to narratives disseminated through media outlets.

Regulatory and Merger & Acquisition Influence – Significant events, such as large-scale acquisitions (e.g., Activision Blizzard) and strategic investments (e.g., OpenAI funding), frequently generate impactful news narratives.

Over a one-week period, 90 news items related to Microsoft stock were collected from a news dashboard to examine narrative trends and patterns. Two distinct narrative identification methodologies were applied: one utilizing complete news article texts and another relying solely on the news topics. After implementing both approaches, the topic-based method provided a more structured and analytically robust framework. Consequently, the discussion that follows will concentrate primarily on the results derived from the topic-focused narrative identification method.

It is important to note that the present study represents an initial methodological application designed to test the feasibility and comparative utility of various narrative identification techniques within a compressed temporal framework. Drawing on precedents from computational social science (Lazer et al., 2009) and narrative modeling (Blei et al., 2003), short-term datasets are often used as pilot environments to establish the interpretability and relevance of analytical pipelines prior to longitudinal expansion. Furthermore, Shiller (2019) and Mangee (2021) highlight that market narratives often exhibit episodic virality, where even brief narrative bursts can produce outsized financial impact. Thus, while the

dataset is temporally limited, it provides valuable insights into methodological reliability and forms a solid foundation for future multi-period narrative evolution studies.

The first method, Structural Vector Autoregressions (SVARs) with Narrative Restrictions, highlighted narratives centered around investment strategies involving AI stocks, AI-driven technological innovations, global market trends influenced by political events, and topics relating to sustainability and climate technologies. Despite the theoretical strength of SVAR in identifying structural relationships, the method faced practical difficulties. Specifically, the limited size of our dataset led to issues such as singular covariance matrices and instability during the estimation process, which prevented effective application of this approach.

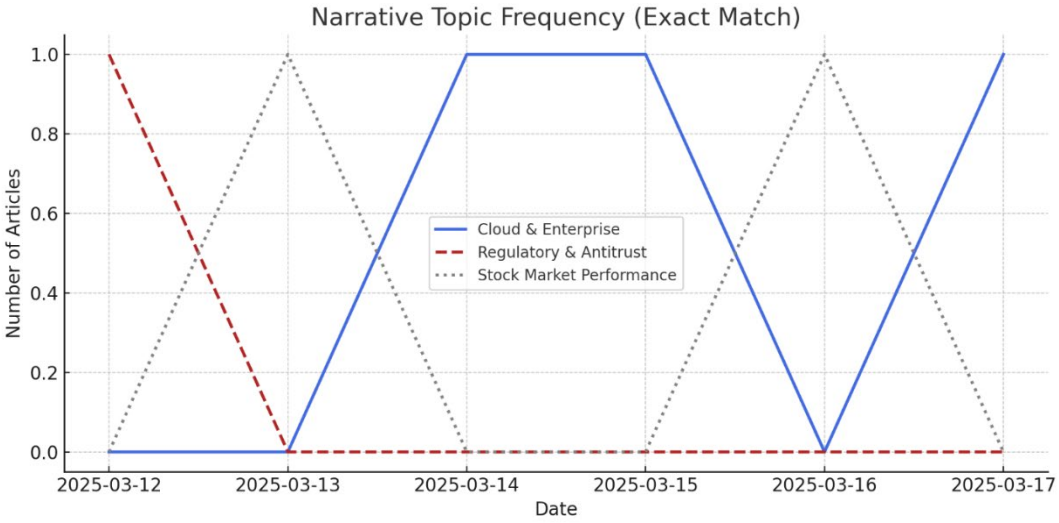
Next, Redescription Mining was utilized, successfully identifying overlapping narrative clusters within the news articles. This method efficiently uncovered thematic overlaps, enabling us to see clear groupings of related content. However, while excellent at highlighting these overlaps, Redescription Mining showed limitations in constructing linear narrative sequences, lacking explicit storytelling capabilities.

The Storytelling Algorithms method identified a clear, dominant narrative focusing on Al Gore's venture receiving significant funding from Microsoft and other investors. This method proved particularly strong in creating coherent sequences connecting thematic clusters. However, its effectiveness diminished due to weak inter-cluster connectivity, especially pronounced given the smaller dataset.

The application of Narrative Maps led to a highly structured narrative sequence emphasizing Microsoft's financial and strategic developments. This approach skillfully arranged events logically from investment strategies to strategic partnerships and finally to profitability. Nevertheless, the effectiveness of Narrative Maps depended heavily on the presence of strong narrative connections within the dataset; weaker connections presented challenges in maintaining coherent narratives.

News Clustering, employing TF-IDF and K-means algorithms, revealed five clear thematic clusters. The most dominant narrative, Cluster 4 (50.55%), focused significantly on regulatory and policy challenges affecting big tech companies. This narrative emphasized antitrust investigations, policy changes, climate change discussions, green investments, and sustainability initiatives, characterized by keywords like "climate," "sustainability," and "emissions." Cluster 3, with a coverage of 20.88%, addressed technology and AI advancements, highlighting AI-driven developments, cybersecurity strategies, regulatory changes, and Microsoft's influential role, illustrated by keywords such as "regulation," "antitrust," "FTC," and "policy." Cluster 1 (12.09%) was devoted to financial investments and market strategies, covering discussions related to stock investments, portfolio strategies,

and market trends. Keywords including "investment," "stocks," "portfolio," and "ken fisher" captured the essence of this narrative. Cluster 2 (8.79%) focused on corporate performance and profitability, emphasizing financial performance, earnings reports, corporate valuation, and innovations in AI and cybersecurity, marked by keywords like "ai," "cybersecurity," and "microsoft." Lastly, Cluster 5 (7.69%), the smallest narrative, concentrated on sustainability and climate initiatives, along with financial performance, earnings, and corporate profitability, indicated by keywords such as "market," "profitability," and "earnings." These clusters provide a structured overview of the dominant narratives throughout the week. The stacked area chart depicting these clusters demonstrated that regulatory and policy challenges (Cluster 4) consistently dominated, particularly towards the week's end. Technology and AI advancements (Cluster 3) maintained steady but fluctuating coverage. Financial investments and market strategies (Cluster 1) and corporate performance (Cluster 2) appeared sporadically as secondary themes. Sustainability and climate initiatives (Cluster 5) had minimal representation, being the least covered narrative across most days. However, it inherently lacked the



capability to construct sequential narratives, limiting its narrative coherence.

Figure 2. Temporal distribution of narrative topics in Microsoft-related news (March 12–17, 2025).

Lastly, Textual Analysis using Named Entity Recognition (NER), Sentiment Analysis, and Latent Dirichlet Allocation (LDA) (Figure 2) effectively identified dominant themes such as **Stock Market Performance** and **Cloud & Enterprise** which are consistently discussed. **Regulatory & Antitrust** saw a spike, likely due to

FTC-related developments. **AI & Innovation** is emerging but not dominant in the latest news cycle. **Business Growth & Investments** appears intermittently.

To improve readability and provide intuitive insight into the extracted clusters, key market narratives are summarized below in plain language.

To provide a clearer sense of how the identified narrative clusters translate into interpretable market storylines, we present a reconstruction of key thematic narratives as they emerged across the analyzed news cycle. These narrative summaries offer insight into the semantic and temporal coherence of each cluster while illustrating their underlying interpretive logic.

One of the most prominent narratives observed during the week revolved around **regulatory scrutiny and antitrust pressures**. Microsoft was frequently portrayed as a dominant force in the technology sector, yet one facing growing legal and ethical challenges. Media coverage highlighted its involvement in active antitrust investigations, raised questions about its expanding influence through acquisitions, and underscored policy debates about AI consolidation. The narrative cast Microsoft as both a technological leader and a subject of increasing institutional examination - a duality that shaped investor uncertainty.

Another recurrent theme centered on **enterprise infrastructure and cloud-based innovation**. Here, Microsoft emerged as a strategic frontrunner, driving growth through its Azure cloud platform and integrated AI tools. The narrative emphasized the company's partnerships, SaaS-based scaling strategies, and its continued investment in business-focused artificial intelligence. The tone across these articles reflected optimism, framing Microsoft as a resilient and forward-looking innovator amidst a rapidly evolving digital economy.

A more modest narrative thread focused on **stock price performance and valuation signals**. This storyline captured Microsoft's day-to-day market behavior in response to macroeconomic indicators, investor outlooks, and earnings disclosures. Though less dominant in coverage, this cluster played a stabilizing role by grounding investor attention in measurable financial outcomes and expectations.

To further illustrate narrative evolution, one specific **event-based narrative chain** is presented below, tracing the progression of Microsoft's AI-related positioning:

AI-Driven Strategic Expansion: The narrative begins with Microsoft's announcement of a multi-billion-dollar investment in OpenAI, sparking a wave of interpretive commentary. Analysts contextualized this move as part of a larger ambition to assert dominance in the enterprise AI market. This was followed by comparative framing in the media, with journalists drawing parallels between Microsoft's strategy and that of major competitors like Google and Amazon. The emerging concentration of AI power soon entered regulatory discourse, prompting questions around fairness, access, and market influence. As the story unfolded,

investor sentiment became increasingly optimistic, with the narrative culminating in a vision of Microsoft as a central architect of the future AI economy.

These reconstructions serve to bridge the technical and narrative components of the analysis. By translating topic clusters and timeline signals into coherent storylines, the study demonstrates the interpretability and explanatory power of market narrative detection frameworks.

Table 1 provides a comparative summary of five widely used methods: SVARs with Narrative Restrictions, Redescription Mining and Storytelling Algorithms, Narrative Maps and Optimization Techniques, News Clustering (TF-IDF/K-Means), and Textual Analysis (NER, LDA). We highlighted the core advantages of each approach - such as theoretical robustness, thematic identification, and structured coherence - while also noting key weaknesses, including data dependency, lack of sequencing, or instability. This comparative overview serves as a guide for selecting the most suitable method depending on whether the focus is on economic modeling, narrative structuring, sentiment analysis, or thematic clustering.

Table 1 - comparative table summarizing the strengths and weaknesses of each method.

Method	Strengths	Weaknesses
SVARs with Narrative Restrictions	Robust theoretical grounding	Requires large datasets, unstable
Redescription Mining and Storytelling Algorithms	Good for identifying thematic overlaps	Poor narrative sequence capabilities
Narrative Maps and Optimization Techniques	Logical and structured narrative coherence	Relies heavily on robust data connections
News Clustering (TF-IDF/K-means)	Clear thematic identification and visualization	Lacks inherent narrative sequencing
Textual Analysis (NER, LDA)	Effective thematic and sentiment extraction	Does not provide explicit narrative flow

Considering the strengths and limitations, particularly the significant dominance of regulatory and policy narratives captured clearly by News Clustering, we recommend integrating News Clustering with Narrative Maps and Textual Analysis for a more comprehensive approach. This combined methodology leverages the thematic clarity and dominance visualization of News Clustering, the structural coherence of Narrative Maps, and the detailed thematic extraction of Textual Analysis.

While the comparative table provides a structured overview of the narrative identification techniques, it is important to clarify that the current study focuses on methodological exploration rather than predictive validation. In line with narrative modeling practices outlined by Bhargava et al. (2023) and Tetlock (2007), our primary goal is to evaluate the interpretability, thematic coherence, and structural utility of each method prior to their integration in predictive financial models. Future work will involve validating narrative outputs through econometric frameworks such as ARIMA-X and GARCH-X, where narrative intensity and sentiment will be treated as exogenous regressors. Additionally, coherence scores and narrative decay dynamics will be tested for their explanatory power in forecasting market returns and volatility.

An important ethical consideration in the use of machine learning for narrative detection involves the risk of algorithmic bias. Sentiment analysis models trained on financial news may unintentionally amplify negative sentiment due to asymmetric tone calibration or skewed training corpora. As Binns (2018) and O'Neil (2016) highlight, such biases can result in misleading conclusions, especially in high-stakes domains like finance. Moreover, the selective identification or amplification of fear-based narratives could create feedback loops that reinforce investor anxiety and destabilize markets. Narrative-driven tools must therefore incorporate mechanisms for transparency, human oversight, and bias audits. Future implementations should adopt human-in-the-loop systems, context-aware lexicons, and calibration against diverse narrative datasets to ensure ethical robustness and minimize unintended consequences in market interpretation.

As financial markets become increasingly influenced by digital media, the role of narrative economics is likely to grow. Future developments in NLP and AI-driven sentiment analysis will enable investors to:

- Track evolving economic narratives in real-time.
- Identify emerging market trends based on shifts in narrative intensity.
- Enhance risk management by incorporating narrative sentiment analysis into portfolio strategies.

Additionally, policymakers and financial regulators can leverage narrative analysis to monitor market sentiment, detect early signs of asset bubbles, and implement preemptive measures to mitigate financial instability.

The proposed hybrid method, integrating news clustering, narrative mapping, and textual analysis, has significant potential for real-time deployment in investment and policymaking contexts. With the increasing availability of live news APIs and streaming sentiment data, these techniques can be embedded into real-time monitoring systems. For investors and portfolio managers, the method could serve as an early-warning system to detect shifts in dominant narratives, such as emerging regulatory concerns or changing sentiment around technological sectors.

For policymakers and financial regulators, the framework can provide insight into the public and market response to new policies, enabling more responsive governance and improved communication strategies. Adapting the method for real-time use would involve integrating automated data ingestion, incremental topic modeling, and dynamic sentiment scoring, combined with dashboard-style visualizations. Such an implementation could aid decision-makers in tracking narrative-driven risks and market expectations as they evolve.

Market narratives are a fundamental force shaping investor behavior and financial decision-making. By providing explanatory frameworks for economic events, narratives influence risk perceptions, asset pricing, and market cycles. Advances in NLP and sentiment analysis offer new opportunities to quantify and track market narratives, enhancing investment strategies and market stability. Understanding the mechanisms through which narratives influence market behavior will be increasingly essential for investors, policymakers, and financial analysts in the years to come.

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ՇՈՒԿԱՅԻ ՆԱՐԱՏԻՎՆԵՐԻ ՀԱՍԿԱՑՈՒՄ. ՆՈՒՅՆԱԿԱՆԱՑՄԱՆ և ՎԵՐԼՈՒԾՈՒԹՅԱՆ ՄԻՋԴԻՍՑԻՊԼԻՆԱՐ ՄՈՏԵՑՈՒՄ

Դավիթ Հայրապետյան (Երևանի պետական համալսարան, Երևան, Հայաստան)
davidhaiarm@ysu.am

Շուկայի նարատիվները՝ համատեղ կիսվող պատմություններն ու տնտեսական դիսկուրսները, զգալի ազդեցություն ունեն ներդրողների վարքագծի, շուկայի տրամադրության և ակտիվների գնագոյացման դինամիկայի վրա: Նարատիվ տնտեսագիտության գաղափարը, որը առաջադրել է Ռոբերտ Շիլլերը, ընդգծում է այս նարատիվների տարածման և ազդեցության ըմբռնման կարևորությունը, հատկապես մերօրյա թվային դարաշրջանում, որտեղ սոցիալական մեդիան և թվային նորությունները արագորեն տարածում են շուկայի պատմությունները: Չնայած ճանաչված կարևորությանը, շուկայի նարատիվների համակարգված նույնականացումը և վերլուծությունը զգալի մեթոդաբանական մարտահրավերներ են առաջացնում: Նարատիվները բնույթով սուբյեկտիվ են, դինամիկ զարգացող և հաճախ ներդրված մեծ քանակությամբ աղմկոտ տեքստային տվյալների մեջ: Այս բարդությունը դժվարացնում է նարատիվների առաջացման հայտնաբերումը, դրանց ազդեցության չափումը ֆինանսական շուկաների վրա և շուկայի աղմուկից իմաստալից ազդանշանների տարբերակումը: Այս հոդվածը անդրադառնում է շուկայի նարատիվների գիտական նույնականացման և վերլուծության հետ կապված կարևոր մարտահրավերներին: Մենք ուսումնասիրում ենք միջդիսցիպլինար մեթոդաբանություններ՝ ինտեգրելով վարքագծային ֆինանսների, բնական լեզվի մշակման (NLP) և մեքենայական ուսուցման ոլորտների պատկերացումները՝ առաջարկելու ամուր շրջանակներ նարատիվների հայտնաբերման և գնահատման համար: Ուսումնասիրությունը քննադատաբար վերանայում և գնահատում է մեթոդներ, ներառյալ կառուցվածքային վեկտորային ավտոռեգրեսիաները (SVAR) նարատիվային սահմանափակումներով, վերանկարագրման հանքարդյունահանումը, պատմության պատմման ալգորիթմները, նարատիվային քարտեզագրումը, նորությունների կլաստերացումը և տեքստային վերլուծությունը: Օգտագործելով էմպիրիկ դեպքերի ուսումնասիրություններ, հատկապես կենտրոնացած Microsoft Corporation-ի վրա, վերլուծվում է յուրաքանչյուր տեխնիկայի արդյունավետությունը՝ ընդգծելով դրանց համապատասխան ուժեղ և թույլ կողմերը: Մեր հետազոտությունը առաջարկում է հիբրիդ վերլուծական շրջանակ, որը համատեղում է նորությունների կլաստերացումը, նարատիվային քարտեզագրումը և առաջադեմ NLP տեխնիկաները՝ նարատիվային համահունչության բարելավման, թեմատիկ հստակության բարձրացման և արդյունավետ տրամադրության վերլուծության համար: Շուկայի պատմության գիտությունը զարգացնելով՝ այս մոտեցումը ներդրող-

ներին, վերլուծաբաններին և քաղաքականություն մշակողներին տրամադրում է գործնական պատկերացումներ՝ բարելավելով նրանց կարողությունը կանխատեսելու շուկայի փոփոխությունները, կառավարելու ֆինանսական ռիսկերը և պահպանելու շուկայի կայունությունը:

Հանգուցային բառեր՝ *շուկայի նարատիվներ, նարատիվային տնտեսագիտություն, վարքային ֆինանսներ, ներդրողների տրամադրություն, բնական լեզվի մշակում (NLP), մեքենայական ուսուցում, նարատիվների նույնականացում, տրամադրության վերլուծություն:*

ПОНИМАНИЕ НАРРАТИВОВ РЫНКА: МЕЖДИСЦИПЛИНАРНЫЙ ПОДХОД К ИДЕНТИФИКАЦИИ И АНАЛИЗУ

Давит Айрапетян (Ереванский государственный университет, Ереван, Армения)
davidhaiarm@ysu.am

Рыночные нарративы - коллективно разделяемые истории и экономические дискурсы - существенно влияют на поведение инвесторов, рыночные настроения и динамику ценообразования активов. Концепция нарративной экономики, предложенная Робертом Шиллером, подчёркивает важность изучения распространения и влияния этих нарративов, особенно в условиях современной цифровой эпохи, где социальные сети и цифровые СМИ быстро распространяют рыночные истории. Несмотря на признанную значимость, систематическая идентификация и анализ рыночных нарративов сопряжены со значительными методологическими сложностями. Нарративы по своей природе субъективны, динамически изменчивы и часто скрыты в больших массивах зашумлённых текстовых данных. Эта сложность затрудняет выявление возникновения нарративов, измерение их влияния на финансовые рынки и дифференциацию значимых сигналов от рыночного шума.

В данной статье рассматриваются ключевые проблемы, связанные с научной идентификацией и анализом рыночных нарративов. Изучаются междисциплинарные подходы, объединяющие знания из поведенческих финансов, обработки естественного языка (NLP) и машинного обучения, чтобы предложить надёжные подходы для выявления и оценки нарративов. Критически анализируются и оцениваются такие методы, как структурные векторные авторегрессии (SVAR) с нарративными ограничениями, редескриптивный анализ данных (redescription mining), алгоритмы построения историй (storytelling algorithms), картирование нарративов (narrative mapping), кластеризация новостей и текстовый анализ. На основе эмпирических

исследований, особенно на примере корпорации Microsoft, анализируется эффективность каждого метода с указанием их преимуществ и ограничений.

Наше исследование предлагает гибридный аналитический подход, объединяющий кластеризацию новостей, картирование нарративов и передовые методы NLP для улучшения согласованности нарративов, повышения тематической ясности и эффективного анализа рыночных настроений. Развивая науку рыночного сторителлинга, данный подход предоставляет инвесторам, аналитикам и лицам, принимающим решения, ценные практические инсайты, повышая их способность предвидеть изменения на рынке, управлять финансовыми рисками и поддерживать стабильность рынка.

Ключевые слова: рыночные нарративы, нарративная экономика, поведенческие финансы, настроения инвесторов, обработка естественного языка (NLP), машинное обучение, идентификация нарративов, анализ настроений.

Information about the authors

Davit Hayrapetyan, Yerevan State University, PhD, Associate professor, Faculty of Philosophy and Psychology, Chair of General Psychology, davidhaiarm@ysu.am, https://orcid.org/0000-0003-3474-5169

ԲՈՎԱՆԴԱԿՈՒԹՅՈՒՆ * СОДЕРЖАНИЕ * CONTENTS