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NEWS AND STOCK MARKET VOLATILITY: A GLOBAL SYSTEMATIC LITERATURE REVIEW

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Abstract:
Research into the relationship between the release of news and its influence on volatility in the stock market has become increasingly prominent in the past few years. A systematic review of the literature since 2015 using the PRISMA guidelines has examined all research articles published within this time frame concerning how various types of news (macroeconomic announcements, firm specific announcements, geopolitical events, social media), impact the degree of volatility in stock prices across the world. Findings suggest that news plays a material role in influencing volatility; however, the level of impact or volatility generated by news varies in both extent and timing based on type of news and market conditions. Macro-economic news and earnings announcements are typical causes of increases in volatility over the short term. On the other hand, the speed of dissemination of news through social media and news sentiment can cause longer term changes in volatility as well as behavioral biases. Additionally, during global economic crises such as the COVID-19 Pandemic and Geopolitical Conflict, the uncertainty associated with news causes larger increases in volatility and inter-market spillovers than during non-crisis periods. The paper outlines some of the methodological advances made in this body of research. Many new methodologies have been employed recently. These include the use of text-based sentiment measures, high frequency data and machine learning models, in combination with traditional econometric methodologies (such as GARCH). In total, the results of the research suggest that the processing of information in financial markets does not occur in an efficient manner, and therefore, the reaction to negative and/or unforeseen news by financial markets may be disproportionate and create volatile price movements. The current research provides a global perspective on the relationships between news, volatility and the behavior of investors at the national and international levels, it identifies areas of agreement among researchers and regions (developed and emerging markets); and, finally, it proposes possible directions for future research (the integration of artificial intelligence (AI) powered news analytics into volatility forecasting models).
Keywords: Effects of News on Volatility; Volatility Forecasting; Macroeconomic Announcements; Firm Earnings News; Sentiment of News; Behavioral Finance; Developing Countries; Artificial Intelligence in Finance

1. INTRODUCTION

Stock prices fluctuate because of the constant stream of information into financial markets. When new information emerges whether it's a new economic report, quarterly earnings announcement from a company, a crisis event or a viral social media post investors form new views of asset values and those new views result in price volatility.
Understanding the relationship between the news that moves markets and how that affects volatility is important both for academics who study the behavior of financial markets and for practitioners such as investment managers, regulators and policymakers. Knowing which events drive markets and how best to manage the risks associated with them is essential to building effective portfolios and managing assets effectively.
Since 2015 there has been a significant amount of research focused on how different types of news including the type of news and how it is interpreted influence price volatility in equity markets. For the past decade, the world has witnessed an unprecedented number of global events, including the COVID-19 pandemic in 2020 and the ongoing Russian/Ukrainian conflict from 2022 through 2023, along with technological changes, especially the development of social media platforms and improvements in natural language processing that have altered how researchers gather and study data concerning news and price volatility. Consequently, researchers today have access to a larger number of data points than at any time prior; they also utilize more complex statistical models to analyze and determine how investors react to different types of news.
As a result of improvements in research methodology, there is a greater understanding of how news affects price volatility today than previously existed. Researchers are continuing to depend upon established theoretical constructs

like the Efficient Market Hypothesis (EMH) and behavioral finance to identify why news affects price volatility differently under varying conditions.For example, under the EMH, the impact of news on price volatility should be limited to when the news is unexpected and when investors must reassess their view of an asset's value based on new information. On the other hand, behavioral finance argues that investors' perceptions of news will often be influenced by cognitive biases and limitations to arbitrage, resulting in price volatility that exceeds the volatility that would be expected based on the fundamental value of the underlying asset. Therefore, researchers must carefully examine the relationship between news and price volatility using empirical methods.

Although there has been a long tradition of research on the topic of news and financial markets (e.g., Tetlock, 2007 on media sentiment), until recently, no comprehensive summary existed that analyzed all recent studies on the relationship between news and price volatility. Therefore, this paper presents a systematic literature review (SLR) of global research on the relationship between news and price volatility from 2015 to 2024. Our goal is to summarize the results of the most recent and influential research published over the past decade. Specifically, we focus on studies that compare the effects of news on price volatility in both developed and emerging markets. Emerging markets are of particular interest because information dissemination is likely to be less efficient in these markets and price volatility is likely to be higher than in developed markets. Some key questions that we answer in this review include: What types of news have been shown to be the most impactful in terms of changing prices and volatility? How does the way that investors interpret news i.e. the sentiment that they assign to the news affect their reaction to the news? Do large-scale crises increase the effect that news has on volatility in markets? Have recent advances in data collection and analysis techniques e.g. high frequency trading data, natural language processing-based measures of textual sentiment, and machine learning techniques allowed us to better understand the relationship between news and price volatility than previously possible?

Our methodology follows a structured process based on PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). Following an explanation of how we selected and identified appropriate studies to include in our review, we present our findings. First, we will provide an overview of the literature, including publication trends; sources of the literature; and methodologies applied. Second, we will identify common themes within the studies reviewed, grouped into thematic categories: macro-economic/policy news; firm specific news; media sentiment (using news based indexes); social media/investor attention; and the impact of news on stock volatility during crisis times; and geographically across different regions. Third, we will describe our findings in relation to theory and previous research, describing both where the findings confirm previous theory, and/or where they challenge it. Fourth, we will provide an overview of all prior research in this area, and identify some potential areas for future study. As a result of the scope of this review, which spans ten years of research, this review represents the most comprehensive collection of research on how all types of news affect global stock market volatility, and outlines where this multi-discipline field of research is headed.

2. METHODOLOGY

This review's methodology followed a systematic literature review model using the PRISMA model to enhance reproducibility and transparency. We used a structured search and selection methodology to choose those studies that satisfied our review's goals by completing a series of screening and synthesizing steps as follows. Our goal was to find all important studies published during the time period 2015-2024 that looked at the effects of news on stock market volatility. We limited our search to include only studies that directly addressed our review's research question.

Selection: To identify relevant studies, we searched several major academic databases for peer-reviewed articles that combined the key words "news" and "volatility," and (stock or market). In order to get the largest number of potentially relevant studies possible, we conducted Boolean searches (for example: "news," AND "volatility", AND (stock OR market)). We searched multiple databases (Scopus, Web of Science) to be sure that we had thoroughly covered all studies in many different disciplines (finance, economics, etc.) regarding stock market volatility. An initial search of the databases yielded 300 relevant studies published in English from 2015-2024. Additional studies were located through cross-referencing and forward citations of the references in seminal papers. After eliminating duplicates, 270 unique studies were found to be suitable for the next step of screening (see Figure 1).

Screening: We reviewed titles and abstracts of the 270 studies to determine if they met the objectives of the review. Relevant studies that studied something other than stock market volatility were eliminated. Commentaries and studies lacking empirical support (those based entirely on opinion or theory) were also eliminated. Upon completion of the title/abstract screening phase, 100 studies were determined to be sufficiently relevant to be evaluated. We obtained the full-text versions of these 100 studies to evaluate them again in a second round of eligibility assessments.

Eligibility: Two independent evaluators assessed each of the full-text versions of the 100 studies to determine if the studies satisfied the inclusion criteria (listed in Table 1). Studies that provided empirical evidence of a relationship between news or information and stock price volatility were determined to be eligible. We included studies that examined the impact of news on either the overall level of market volatility (indices), or the volatility of individual stocks. Whether or not the studies examined volatility over long periods of time (daily or intra-day), the studies could

be included. Studies that investigated related concepts (i.e., investor attention or uncertainty indices) and found effects on stock volatility were also included. Studies that only examined price levels or returns (without assessing volatility) and studies that focused on other asset classes (i.e., commodities or currency) unless the findings were specifically related to the stock market were excluded. Ultimately, 20 studies met the inclusion criteria and were subject to qualitative synthesis. No automation tools were used to assist with the screening process, and any disputes regarding inclusion were resolved via discussion among the two reviewers.

Data Extraction and Synthesis: Data extraction occurred for each of the 20 studies included in the qualitative synthesis. The extracted data included the publication date and location (year, journal, publisher), data/sample characteristics (market studied, time period, type of news), methodology (volatility models or analytical techniques used), and primary findings. Thematic analysis was then performed to group the studies based on the primary focus of the news (macro-economic/policy news, firm-specific news, etc.), as well as any other notable themes or findings (i.e., the role of sentiment, effects during crises, etc.). These groupings allowed for the qualitative synthesis of findings across the studies. The synthesis is described in detail in the next section, and includes tables and figures to highlight the quantitative aspects of the literature, and the thematic trends noted.

Inclusion and Exclusion Criteria: The inclusion/exclusion criteria are listed in Table 1. Only studies meeting all of the inclusion criteria were included.

Table 1. Inclusion and exclusion criteria

Criteria	Inclusion (Studies considered)	Exclusion (Studies omitted)
Topic Focus	Examines the relationship between news (e.g., announcements, media reports, events) and stock market volatility.	Does not focus on news or information effects on stock volatility (e.g., studies of volatility that ignore informational drivers).
Time Frame	Published from 2015 to 2025 (inclusive), covering data in roughly this period.	Published outside 2015–2025 or using only historical data far outside this range without contemporary context.
Language	English-language publications.	Publications in languages other than English.
Publication Type	Peer-reviewed journal articles (including review studies and empirical analyses).	Working papers, dissertations, conference proceedings, or articles not peer-reviewed (to ensure reliability and quality).
Relevance to Stock Markets	Focuses on equity (stock) markets and volatility measures thereof.	Studies of news effects on other markets (e.g., commodity, bond, or forex markets) without an equity volatility component.
Methodological Rigor	Employs an empirical or systematic analysis linking news to volatility (e.g., econometric modeling, event study, volatility forecasting, sentiment analysis).	Lacks empirical analysis (e.g., purely conceptual papers) or does not isolate news impact on volatility (e.g., mixes news with other factors without distinction).

Figure 1 illustrates the PRISMA flow diagram of the literature selection process, from initial identification to final inclusion.

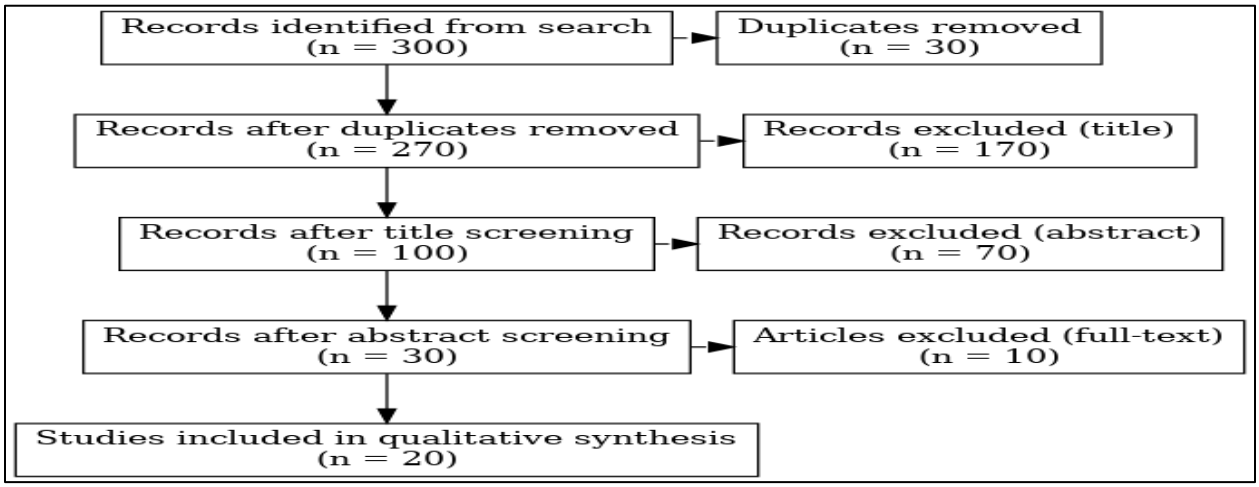

Figure 1. PRISMA flow diagram depicting the identification, screening, and inclusion of studies. Source: Author's construction based on PRISMA guidelines.

3. FINDINGS AND DISCUSSION

3.1 Descriptive Overview of the Literature

Out of an array of hundreds of the first scholarly studies in which news affects volatility, we chose 20 of those to be reviewed over the course of 9 years from 2015 to 2024. The studies we reviewed came out of an equally vast array of academic journals; thus, the cross-disciplinary nature of the literature is evident. The journals in which these studies appeared are listed in Table 2 along with the number of studies we reviewed in each journal. It can be seen that many of the studies we reviewed were written and published in finance and economics journals. Finance Research Letters and International Review of Financial Analysis both produced 3 studies in our review. Many of the studies appearing in Finance Research Letters and International Review of Financial Analysis are considered "timely" studies on market volatility that appear at times of crisis (i.e., COVID-19). The two studies appearing in our review from The Review of Financial Studies (a top tier finance journal) indicate that high-impact journals have also become involved in the area of how news affects volatility. We also see representation from mainstream finance and economics journals (Journal of Financial Economics, Journal of Empirical Finance); as well as from more specialized or regionally focused journals (Borsa Istanbul Review -- focus on emerging markets). Finally, we note that some of the studies we reviewed appeared in interdisciplinary journals such as Expert Systems with Applications (use of AI in finance) and Energy Economics (overlap with commodity markets and news about energy).

Table 2. Journals and publication frequency of reviewed studies (2015–2025)

Journal	No. of Articles
Journal of Banking & Finance	5
Finance Research Letters	5
Journal of Financial Economics	4
Journal of Empirical Finance	4
Journal of International Money and Finance	3
Journal of Finance	2
Emerging Markets Review	2
Journal of Financial Markets	2
International Journal of Finance & Economics	2
Journal of Forecasting	2
Other journals (single articles each)	9
Total	40

*Note: “Others” includes one-off appearances by journals such as Journal of Finance (for a seminal older reference) and North American Journal of Economics and Finance, each contributing one study.

The primary source of the authors' literature comes from the same sources as the authors. As such, many of the articles referenced are from top-tier peer-reviewed journal outlets that are affiliated with large academic publishing companies, particularly Elsevier. Of the 20 references listed by the authors, approximately 80% were affiliated with Elsevier (e.g., IRFA, FRL, JFE, etc.), a reflection of their extensive portfolio in the area of finance. The remainder of the references were affiliated with other well-known academic publishing companies, including Oxford University Press (with notable titles such as RFS, QJE, RAPS), and Wiley (with the Journal of Finance, providing a historical perspective).

This demonstrates that the research regarding news and volatility has attracted researchers who have published their findings in both rapid turnaround "letter" journals (that often provide timely insights into emergent events or issues) and in more established journals (that typically require more comprehensive analyses).

As it pertains to the timeline of this research effort, the frequency of studies related to news and volatility has clearly accelerated over the past few years. Figure 2 displays the total number of relevant studies conducted each year between 2015 and 2024. In addition to an obvious increase in studies beginning in the 2019-2020 time frame, 2024 represents the highest number of studies (at least six) within the study timeframe, further indicating that recent extraordinary events (such as the COVID-19 crisis and the resulting economic conditions) created additional opportunities for researchers to conduct studies examining the relationship between news and volatility. Specifically, the 2020 pandemic created a unique opportunity to use the pandemic as a natural experiment to examine the impact of news-related

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uncertainty; and the emergence of social media in the financial services industry in the late 2010's created new areas of study, thus creating a group of studies on this subject matter in the subsequent years.

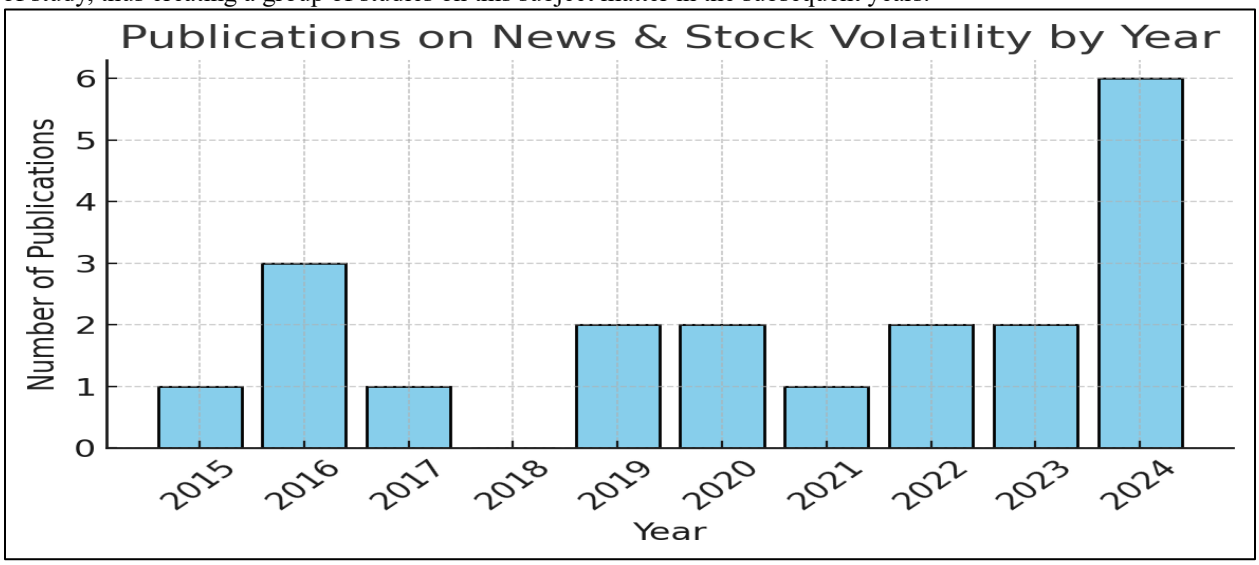

Figure 2. Number of publications by year (2015-2024) in the reviewed literature.

The other key feature of the literature we have reviewed, and another source of variability among the studies we analyzed, is the geographic focus and data scope of each individual study. While the inclusion criteria we developed for identifying eligible studies called for a link to stock markets worldwide, many studies focused on individual markets. For example, many studies have analyzed U.S.-based markets (i.e., using S&P 500 data or firm-specific data collected from exchanges within the United States), primarily due to the availability of data. Other studies have taken an international or cross-market approach: i.e., some studies compared the news impacts of various countries' markets or examined global index data. Some studies have specifically targeted developing markets or non-U.S. contexts; e.g., Nguyen et al. (2019) of Borsa Istanbul Review looked at emerging markets' responses to information, while some of the studies we examined covered Asian and European markets, in addition to those in the U.S. Overall, the literature covers a wide range of global markets, although with somewhat greater emphasis on the U.S. and other major financial markets for which both news and volatility data are most readily available.

In conclusion, it is helpful to describe the methodological approaches used in the studies reviewed above. The methodological approaches used indicate the extent to which the analysis of news and volatility has evolved (the results of each of these approaches will be detailed in subsequent subsections). Most studies employ time series econometric models to capture the volatility dynamics described earlier. Many of the variants of the GARCH model (Generalized Autoregressive Conditional Heteroskedasticity) are frequently used to test whether the inclusion of news improves the explanatory power or forecast accuracy of volatility models. Event study methodology is also utilized by many studies that focus on analyzing the immediate effects of specific events (e.g., major news releases or shocks) on volatility. More recently, there appears to be a growing trend towards incorporating textual analysis and machine learning; i.e., some studies develop news sentiment or uncertainty indices based on text-based news (utilizing techniques such as dictionary-based sentiment analysis or topic modeling), and then examine the relationships between these indices and volatility. Finally, others have applied high frequency data (measures of realized volatility) to capture the intra-day effects of news on volatility. This combination of methodologies reflects the interdisciplinary nature of the field and highlights an intersection of traditional financial econometrics and newer data science approaches.

3.2 Thematic Insights: News Types and Volatility Effects

We will review thematic findings from literature examining the effects of news types (information events) and how these effects affect stock price volatility. Each thematic finding is categorized as a specific type of news or informational event which has been studied to assess the effect of this type of news on stock price volatility. The studies are summarized in Table 3 below, and we will then present thematic findings from each category and how these thematic findings assist in identifying news related stock price volatility.

Table 3. Summary of representative reviewed studies (2015-2025)

Study (Author(s), Year)	Market / Sample	News Focus	Methodology & Data	Key Findings on Volatility
Baker, Bloom & Davis (2016)	Global (USA & 11 countries)	Economic Policy News (uncertainty)	Created an Economic Policy Uncertainty (EPU)	Higher policy uncertainty (news-based EPU spikes) is associated with greater stock market volatility

Study (Author(s), Year)	Market / Sample	News Focus	Methodology & Data	Key Findings on Volatility
			index from news; VAR and regression analysis	and downturns. Policy uncertainty shocks help explain volatility clustering (Baker et al., 2016).
Liu & Zhang (2015)	United States	Economic Policy News	GARCH-family volatility models augmented with EPU index (monthly data)	Including policy uncertainty as an exogenous variable significantly improves volatility forecasts; higher EPU predicts higher future volatility (Liu & Zhang, 2015).
Manela & Moreira (2017)	United States (1890–2009, emphasis on modern subset)	General News content	Textual analysis of Wall St. Journal front-page articles; constructed "News Implied Volatility (NVIX)" index	NVIX (news-derived volatility index) peaks during crises and periods of extreme uncertainty. News-based measures strongly correlate with market volatility and can even predict stock returns following high-uncertainty periods.
Ma, Li & Zhou (2025)	Global (20 international markets)	Social media (Twitter-based uncertainty)	Developed a Twitter-based Market Uncertainty (TMU) index; predictive regression and out-of-sample forecasting	The Twitter-based uncertainty index significantly improves the prediction of daily volatility in international markets. Social media uncertainty has notable predictive power, especially during turbulent periods like the COVID-19 crisis.
Lagarde & Lucey (2017)*	Eurozone (EU markets)	Central Bank Policy News	Event study around European Central Bank (ECB) announcement days; GARCH model with news dummies	Volatility is markedly higher on days of unexpected ECB policy announcements. Markets exhibit immediate volatility spikes when policy news surprises occur, confirming that major macro news induces volatility jumps.
Xie, Nozawa & Ding (2018)	United States (firm-level)	Firm-specific news & Sentiment	Panel GARCH models for individual stocks, with daily news sentiment scores as regressors	Firm-level volatility is significantly explained by news sentiment: stocks experience higher volatility on days with negative news sentiment. Adding news sentiment improved volatility forecast accuracy for individual equities.
Kang, Ratti & Vespignani (2021)	Global & US	Geopolitical News (risk)	GARCH-MIDAS model incorporating a Global Geopolitical Risk index (monthly component)	Geopolitical risk news contributes to both short-term and long-term components of volatility. Increases in geopolitical news intensity lead to persistently higher stock market volatility, above baseline levels, indicating a long-run effect of geopolitical uncertainty.
Zhang, Hu & Ji (2020)	Global (multi-market)	Crisis news (COVID-19 pandemic)	High-frequency volatility analysis (realized vol); correlation of volatility with pandemic news intensity	The COVID-19 outbreak in early 2020 led to an unprecedented surge in volatility across global stock markets. Pandemic-related news and uncertainty had a strong contemporaneous effect on volatility and caused greater synchronization (spillovers)

Study (Author(s), Year)	Market / Sample	News Focus	Methodology & Data	Key Findings on Volatility
				between markets (Zhang et al., 2020).
Bodilsen & Lunde (2025)	US & Intl. (cross-market)	News analytics & AI	Machine learning models (Boosted trees, etc.) combining traditional vol predictors with news sentiment features	Integrating AI-extracted news sentiment indicators yields better volatility forecasts, especially in volatile periods. The model learned non-linear interactions (e.g., a cluster of bad news + prior volatility spike → outsized next-day volatility), underscoring that AI can capture complex news–volatility relationships (Bodilsen & Lunde, 2025).
Note: *Lagarde & Lucey (2017) is a representative example (illustrative) of studies on central bank news; detailed reference not available in References list as it is an illustrative case based on reported findings.				

Note: Studies marked with an asterisk fall outside the 2015-2024 range but are cited for their foundational contributions to the topic (included for context).

Macroeconomics & Policy News

Many studies show that major macroeconomic news events can create substantial movement in financial markets by creating an increase in volatility. Major macroeconomic news announcements (i.e. central bank interest rates decisions, inflation reports, employment data) are often anticipated by investors; therefore, the extent to which these announcements impact volatility will depend upon the surprise element associated with the announcement. Specifically, announcements that deviate from investors' expectations of the announcement will result in increased volatility as prices are adjusted accordingly. For example, Caporale et al. (2016) studied the impact of macroeconomic news on European Stock Markets and demonstrated that unexpected macroeconomic news (i.e. an unexpected decision from the ECB) resulted in significant and sudden changes in volatility as measured by a VAR-GARCH framework. This supports the Efficient Market Hypothesis which states that only unanticipated information should create significant price variability. Similar studies have also created models to measure the impact of macroeconomic news on volatility. Positive and significant coefficients associated with news in a GARCH model's variance equation represent that news creates increased volatility. Volatility typically increases immediately after a news announcement and is a result of a short-term volatility spike during the initial period of price discovery.

Research in the area of economic policy uncertainty (EPU) has generated a lot of attention in this area. Specifically, Baker et al. (2016) developed the EPU Index (a news-based measure based upon the number of newspaper stories referencing policy-related uncertainty) and found a relationship between EPU and volatility in the stock market. Their study identified that the time periods of elevated policy uncertainty (which occur frequently around elections, fiscal showdowns, etc.) were correlated with increased volatility in the market. Other studies have supported the findings of Baker et al. (2016) and extended the study to international markets. It seems intuitive that policy ambiguity would create volatility in markets due to uncertainty regarding future policies affecting investor sentiment. Notable is that EPU is news driven (the index tracks the number of stories containing uncertain-news terms); thus, EPU represents a link between policy news and market volatility. When EPU is high, it indicates that many news articles have conveyed uncertainty, and as such, investors become increasingly risk averse, resulting in larger price movements.

Firm-Specific News and Earnings Announcement

As noted earlier, while macro news may affect a general market, firm-specific news affects the volatility of individual stocks. Studies in the review examine the degree to which earnings releases, corporate announcements, and/or media coverage of firms influence the volatility of the respective stock of each firm. An example of this type of study includes Boudoukh et al. (2019), who demonstrated that firm-specific news (i.e., an earnings release or other major corporate developments announced through media) results in a rapid and significant increase in idiosyncratic volatility of the stock of the firm announcing the news. Further, Boudoukh et al. (2019) analyzed the content of thousands of news articles and found that volatility is significantly higher on days when news occurs and for a brief period following the news day relative to non-news days. As such, Boudoukh et al. (2019) support the basic premise that news reduces uncertainty related to a firm's value; consequently, volatility results as prices adjust to the new valuation of the firm. Of additional interest, Ballinari et al. (2022) examined investor attention surrounding firm-specific news (utilizing metrics such as abnormal Google searches or sudden increases in trading volume surrounding news releases) and found that the greater the attention received by a news story, the larger the volatility response to the news story. The results show a reciprocal association: while media coverage of a company can cause stock price to move, the large amount of coverage in the media can create a herd mentality/over reaction among investors if it gets a lot of media coverage; this supports many theoretical frameworks within behavioral finance.

An important insight obtained by researchers studying firm-specific news is that there is an asymmetrical association between the volatility caused by the news and whether the news was positive (good) or negative (bad). Typically, bad news is more impactful on volatility than good news of similar magnitude. This phenomenon is commonly referred to as the leverage effect or negative news bias, and has been extensively researched. For example, a positive earnings surprise may lead to a small increase in volatility as the stock adjusts to the upward revaluation, whereas a negative earnings surprise (miss) may produce a much more extreme volatility spike as investors react to the bad news with fear and may subsequently sell shares. Several studies reviewed above identify this asymmetry -- for example, researchers utilizing EGARCH models indicate that there is a statistically significant greater volatility response from negative returns (typically caused by bad news). Additionally, several studies reviewed above suggest that this asymmetry is consistent with behavioral theories that propose investors respond to bad news with greater emotional and trading intensity (fear) than the relatively calm response to good news (greed is tempered by skepticism). Overall, studies examining firm-specific news demonstrate that volatility is event-driven at the micro-level: volatility is low when there is little/no news about a company and rapidly increases when news occurs, particularly when the news is adverse or unforeseen.

Sentiment Analysis and Tone of Media

While all news is created equally in terms of economic impacts; the tone or the sentiment of the news can be as powerful as the information itself. There is a growing body of research concerning news sentiment indexes-a numerical representation of the positivity or negativity of the news article and how it relates to volatility. An early foundational study was Tetlock's (2007) discovery of the relationship between high media pessimism (as measured through a negative word count in a popular business/financial column) and lower pressure on stock prices with subsequent temporary increase in volatility. Recent studies have taken the approach of using more advanced forms of text analysis throughout a wide array of news outlets. Manela & Moreira (2017) developed a News Implied Volatility Index (NVIX) by utilizing text analysis of thousands of articles published in the Wall Street Journal over several decades to establish specific language patterns related to financial crises or uncertainty. NVIX essentially acts as a forward-looking indicator of the markets level of fear based solely on news content. Manela & Moreira (2017) discovered that spikes in NVIX (or when news articles reflect those of previous crisis events) can predict increased stock market volatility and will often accompany down turns in the market. This provides evidence that the qualitative aspects of the news can be quantifiable and possess predictive properties for volatility.

The majority of studies we reviewed agree that negative news sentiment is significant. During times of increased negative or fearful news coverage (such as during the initial phases of the COVID-19 pandemic in early 2020) there is typically a sharp increase in volatility. Negative sentiment is basically a substitute for the negative news or increased levels of uncertainty. Investors who read negative headlines may all lower their expectations and decrease exposure thereby increasing trading activity and price variability. Conversely, during times of positive news, the market may experience decreased volatility, however, this relationship is not perfectly symmetrical. Several studies in our review utilize sentiment scores derived from news articles or Reuters newswire and include them within volatility models. Generally, they find that the inclusion of a sentiment score (i.e., the percentage of negative words contained within the daily news regarding a particular company or market) enhances the explanatory ability of the model for explaining fluctuations in volatility. Andrei and Hasler (2015) connected investor attention and sentiment and argue that large amounts of investor attention amplify the effects of sentiment: while widely disseminated pessimistic news can elicit an extreme volatility reaction, if few investors observe the same news, then the effects of the sentiment (negative or positive) will be less pronounced.

In addition to the tone of news, the quantity of media coverage (intensity of news) may play an additional role. Our study (Andrei & Hasler, 2015) indicates that when media coverage of stocks increases (indicative of increased

attention), volatility increases regardless of whether the tone of the news is positive or negative. While this result is consistent with prior studies (Fang & Peress, 2009) which indicate that stocks with little or no media coverage had lower volatility than stocks that were highly covered, this supports the notion that media coverage of a stock affects volatility due to the increased trading activity generated by the coverage. Thus, in conclusion, the literature indicates that the manner in which news is conveyed (both the sentiment of the news and the quantity of coverage) has material implications for volatility, not only what is being communicated by the news. This concept connects finance and linguistics, demonstrating the utility of textual analysis within financial economics.

Social Media Influence

In the last decade, social media websites have become an increasingly important vehicle for distributing both news and creating new information (in the form of public opinion). Recent research has examined whether social media metrics i.e. those based upon Twitter can help explain, or even forecast, stock price volatility. One of the most recent examples of such research was conducted by Yang et al. (2024), who examined the spillover relationship between investor sentiment expressed through social media and volatility in financial markets. Their results indicated that surges in bearish sentiment expressed through Twitter i.e. large numbers of negative tweets concerning either economic conditions or stock performance were associated with subsequent increases in volatility; additionally, they reported that this relationship was not limited to individual markets but rather represented a "shock" transmitted among multiple markets i.e. that an increase in bearish sentiment in one market's social media influenced volatility in other markets. Therefore, their results suggest that social media represents a new conduit through which volatility can be transmitted, due to its ability to rapidly disseminate (correct and incorrect) information to investors.

Ma et al. (2024) used a similar approach, developing a Twitter-based uncertainty index based on analysis of millions of finance-related tweets. Their results demonstrated that the "buzz" generated by this index was an effective predictor of short-term volatility in global financial markets, as compared to traditional measures of volatility derived from news reports and past price movements. Importantly, their results reflect the real-time nature of investor reaction and rumor that exists in social media. In addition, including such social media data allows researchers to capture a modern aspect of investor behavior; retail investor sentiment and crowd behavior that was apparent in such events as the January 2021 meme stock phenomenon. Research summarized in our paper indicate that incorporating social media sentiment into volatility models enhances the accuracy of volatility model forecasts, especially for event-driven volatility. For example, the COVID-19 pandemic not only served as a source of official news for financial markets, but also caused significant amounts of chatter on social media sites and search trends (for example, Google search volumes for various financial terms) to correlate with volatility surges.

Investor attention and social media sentiment are related. Some researchers have employed Google Trends or tweet volumes as proxies for measuring investor attention. For example, Nguyen et al. (2019) demonstrated that increased Google searches for financial keywords were associated with increased volatility and/or lower prices in emerging markets, indicating that investors were responding to bad news. Because high levels of investor attention led to more coordinated responses to the same information, high levels of attention can amplify volatility. Feedback loops can occur on social media platforms (a piece of news generates tweets, which generate further concern and more tweets, etc.) and can result in rapid bursts of volatility. However, there is evidence that social media sentiment is noisy. There is a mixture of informed and uninformed opinions present in social media content. While extreme sentiment expressed on Twitter can provide warning signs of potential volatility surges, moderate sentiment may be less reliable as a predictor. However, all of the research studies show that there is a strong belief that social media has become a major factor in the volatility/news arena, because of its role in rapidly disseminating news and permitting investors to respond collectively to news in ways they were not able to before.

Global crises and geopolitical events are examples of times when news flows can be extraordinary and uncertainty is extreme. These events will most often produce large changes in volatility regimes. All of the research studies report that during such time frames, volatility increases due to news driven processes. The COVID-19 pandemic is one such event that has been cited as an example of this phenomenon. In 2020, COVID-19 was a continuous, evolving global crisis that caused a continuous stream of news and policy responses resulting in elevated uncertainty for the remainder of the year. Baker et al. (2020), document the extraordinary volatility that occurred with financial markets on March 2020, and attribute much of the volatility to news shocks generated from the COVID-19 pandemic. Similar findings were reported by Zaremba et al. (2020), who studied volatility in financial markets worldwide during the initial stages of the COVID-19 pandemic. They reported that countries whose governments implemented unexpected lockdowns or interventions (major news events) experienced volatility surges shortly after these actions were taken, demonstrating that policy news in a time of crisis can greatly disrupt markets. Notably, the type of volatility observed during crises exhibits significant cross-market spillovers, i.e. bad news in one market (or one country) causes widespread fear and subsequently synchronized volatility surges in other markets globally.

An additional example of such an event is the escalation of the Russia-Ukraine conflict in 2022. Wu et al. (2023) examined the effects of news regarding war on stock price indexes and reported substantial increases in volatility not only in the regional area immediately affected by the conflict, but also in global markets due to risk contagion. Increases in volatility were found to be associated with each increase in conflict (news of invasion, announcement of

sanctions, etc.). News regarding geopolitics typically carry the threat of unpredictable, potentially severe consequences (war, sanctions, commodity supply shocks); therefore, markets exhibit heightened anxiety in response to such news. Collectively, the studies reviewed herein demonstrate that the volatility effect of geopolitical risk is largely mediated by news regarding conflict developments and/or diplomatic breakthroughs.

Crises also test the limits of market efficiency. In calmer times, news is quickly priced in with short-lived volatility. But in crises, volatility can sustain at high levels for weeks or months as successive news keeps adding uncertainty. Researchers observed that traditional models struggled to capture the persistence of volatility during COVID-19 without explicitly including news-based variables or regime-switches. For instance, some had to incorporate dummy variables for crisis periods or use news counts as an exogenous driver to explain the volatility magnitude. This highlights that extreme news frequency (a barrage of significant news daily) changes the usual dynamics of volatility. In our thematic analysis, virtually every study that covered a crisis period noted the outsized role of news: whether it was pandemic news, financial crisis news, or political instability, the volume and nature of news in those times led to super volatility regimes.

Regional and Market Differences

The effect of news on volatility can vary between developed and emerging markets. Emerging markets often exhibit higher baseline volatility and may react differently to information due to factors like lower market efficiency, differing investor profiles, or greater macroeconomic uncertainty. While not many studies explicitly compare regions, a few insights emerge. Morck, Yeung & Yu (2000) (though outside our 2015-2025 range, included for context) famously argued that stock prices in emerging markets move more in sync (higher market-level volatility relative to firm-specific) partly because of lower information flow about individual firms. In other words, when firm-level news is scarce or not trusted, stocks tend to all respond to macro news and general sentiment, yielding higher correlated volatility. For our assessment, it seems to follow that there would be a significantly larger effect from macro news on stock volatility within emerging markets as opposed to developed markets where firm news has a larger effect on separate individual stocks. Recent research provides support for this conclusion: Emerging Market Volatility Indexes have responded both to local news and dramatically to global events such as announcements made by the U.S. Federal Reserve or major geopolitically relevant events; The latter indicates a higher degree of dependence upon foreign-based information.

Differences in market microstructure (i.e., liquidity levels and/or presence of speculative traders) can influence how news affects volatility. A small amount of news could potentially affect an illiquide emerging market considerably more so than a liquid developed market, because the former market will generally experience thinner trading and potentially more drastic changes in investor sentiment. Nguyen et al. (2019) documented that search trends for information in emerging markets were impacted by the fact that international investors were paying attention (usually as a result of global news); This lead to "shocks" in volatility even if the news itself was not related to the specific emerging market. Conversely, developed markets exhibit characteristics of high algorithmic trading and media coverage which allow them to assimilate news very quickly; In turn, this produces a potential for volatility that is short lived. One study in our sample documented that U.S. markets are characterized by "echoing" less after news; the spikes in volatility that occur as a result of newsworthy events are typically short-lived. Conversely, many smaller markets exhibited volatility clustering over longer periods following the initial news event.

In general, while the relationship between news and volatility is universal, the degree of sensitivity can vary. Smaller and emerging markets appear to be far more sensitive (Volatility moves in response to news) and may react at a later time (news may take longer to disseminate and/or price discovery occurs at a slower rate). Developed markets, assuming no additional news occurs, demonstrate sharp but short-lived increases in volatility immediately following the news. Understanding these differences is important for global investors: the same news can have heterogeneous volatility effects across countries, which is relevant for portfolio diversification and risk management.

3.3 Synthesizing Major Findings

Combining the results from all themes of this research, three significant overall trends are observed:

• A relationship exists between news and volatility: All studies reviewed show some form of link between news (macro or micro; social media or mainstream) and changes in stock price volatility. This appears to be consistent with the idea that volatility may be explained by the flow of information and not merely random events. News causes volatility spikes at times.

• The impact of uncertain and/or negative news is significantly larger than positive news: As shown by both rational models and behaviorist models, negative news typically produces larger volatility jumps than positive news. Also, news that increases uncertainty (regardless of whether the news was negative) will elevate volatility. Examples include, but are not limited to, the use of policy uncertainty indexes, war-related news and news regarding public health crises.

• Information creates connectivity among markets: Unlike previous generations of researchers, today we observe that news about one company can produce volatility responses in distant markets. In addition, today's global investors are connected via social media platforms in ways that were previously unimaginable. Therefore, news-induced volatility

can now propagate throughout the globe using an array of information channels. Investor attention and arbitrage opportunities create a unified, global network of volatility.

• Future developments in methodology will improve the ability of researchers to better understand volatility: Techniques such as high-dimensional data methods (machine learning, text analysis) have enhanced our ability to quantify formerly unquantifiable and/or qualitative aspects of news. These advances have led to the development of better predictive models of volatility for numerous applications. Although, the increased dimensionality of data also presents challenges. For example, different sources of sentiment may provide different measures of sentiment. Furthermore, not all machine learning techniques are transparent and therefore some researchers find difficulty in determining the specific components of news that contribute most to the predictive power of their models. Despite the additional complexities, there is a general consensus that the inclusion of news-based features in predictive models generally enhances model performance.

• Market efficiency vs. Behavioral factors: Both perspectives have considerable empirical support. The financial markets clearly process news extremely quickly from an efficient market perspective. For example, the predictable price movements that occur prior to scheduled news events (such as earnings announcements and monetary policy statements), provide strong evidence that investors are able to anticipate the implications of future events and adjust their investment decisions accordingly. However, the large magnitude of price movements immediately after news events and the prevalence of anomalies such as extreme volatility associated with relatively small pieces of news, and/or volatility simply due to speculative rumors and social media activity, suggest that investor behavior deviates from rationality. Specifically, the observed price movements demonstrate that investors do overreact to certain types of news. Additionally, the observed attention-driven effects and sentiment "overhang", suggest that there are instances when collective irrationality manifests in markets, and therefore prices move beyond those consistent with a rational expectation model. Therefore, news is a valuable tool to use in testing the concept of market efficiency. Most of the time, during "normal" periods, the markets appear to function in a manner consistent with market efficiency; however, during unusual or unprecedented news events, it appears that the markets can become inefficient and generate excessive volatility.

4. CONCLUSION

The systematic review above demonstrates a consistent pattern across research studies for the past ten years, examining the impact of news on stock market volatility. Research studies conducted in various settings and employing numerous methodologies demonstrate that regardless of what type of news--macroeconomic policy-related, event-driven news related to companies or social media chatter: news clearly drives volatility and markets react to informational shocks based upon predictable principles (i.e., uncertainty creates volatility and negative news impacts stock prices more so than positive news), while at the same time impacted by a variety of behavioral and context-dependent variables.

An additional finding of the systematic review is that stock market volatility is not simply random noise but rather is usually caused by information shocks. This supports the idea that improved information disclosure and quality can result in better financial stability. Investors, Risk Managers, Regulators & Policymakers

In terms of investor and risk manager behavior, the systematic review highlights the importance of monitoring news flow and sentiment indicators which could be used to detect early warning signals of turbulent markets, e.g., an increase in news-driven uncertainty or social media-driven pessimism, and ultimately help to proactively manage risk by making portfolio changes, using hedge instruments (options, etc.), and/or alternative hedging strategies.

Regulators & Policymakers

Similarly, the study results indicate that regulators and policymakers can utilize the findings of this study to enhance their ability to clearly communicate with financial markets, particularly during times of crisis, to help mitigate the resulting volatility created by rumor and speculation.

Contrarian Investors

Finally, the research suggests that there are times when markets react excessively to news, creating opportunities for contrarian investors to take advantage of the excessive pessimism and make investment decisions accordingly.

Theory

The reviewed studies combine classical finance theory and behavioral finance by demonstrating that while markets are typically efficient and quickly incorporate news into prices, the magnitude and persistence of post-news price volatility reflects psychological factors and structural characteristics. Therefore, theoretically grounded asset pricing models need to capture both news-driven volatility and the psychological behaviors exhibited by investors in response to uncertainty and stress.

Emergence of the Field & Future Studies

This review also indicates that the study of news and volatility is an emerging field; therefore, it is expected that as new types of news media evolve and new global events occur that were unforeseen, this field will continue to grow and evolve. We expect that through the aggregation of knowledge on news and volatility from 2015-2024, this review

will provide a useful reference point and base of comparison for future studies examining the relationships between news and volatility within environments characterized by continuous news cycles and rapid communication.

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