

ESMA TRV Risk Analysis

Investor protection

Social media sentiment and retail trading behaviour



ESMA Report on Trends, Risks and Vulnerabilities Risk Analysis

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Summary

Social media has become deeply embedded in daily life and, in recent years, a major source of information on financial matters, with so-called "influencers" and other social media users regularly discussing investing and wealth accumulation. This growing role brings both benefits and risks. While social media offers market participants a valuable channel for analysis and communication, it also raises risks related to investor protection, market abuse and market stability.

ESMA has been drawing attention to the potential risks arising from increased social media activity for some years. This article adds to previous analysis by examining the effect of social media interactions on retail investors' realised returns as well as on the behaviour underlying retail investors' return realisation.

We find a significant relationship between social media interactions and both retail investor outcomes and behaviour. We show that when sentiment is positive, retail investors realise positive returns and sell more than they buy. When opinions diverge, they realise negative returns and buy more than they sell. This may suggest that investors lock in gains early, yet potentially missing further upside just as the outlook improves.

Our findings suggest that, alongside the risks of misinformation and manipulation, social media's influence on retail investor behaviour operates through a sentiment-driven channel that warrants attention. Going forward, we will continue to monitor the developments and the related risks and we will further explore the mechanisms behind this.

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Introduction

Social media has become embedded in everyone's daily life. The average person spends more than 18 hours a week on social media, actively using approximately seven different platforms each month. There are more than 100 social media platforms in 2026, though only around 15 genuinely matter for brands and creators.²

What began as a way to stay in touch with friends has, in recent years, become a major source of information on financial matters. Across platforms such as Instagram, YouTube, TikTok and LinkedIn, so-called "finfluencers" simplify subjects like investing, retirement planning and wealth accumulation into short, easily digestible content. Celebrities and other influencers, often without any financial background, have also jumped on this trend, using their considerable followers base to talk about money and financial products.

This growing presence of financial discourse on social media brings both benefits and risks. On the one hand, social media has become an important instrument in financial markets, both as a resource for market analysis and as a determinant of market sentiment. It provides immediate and convenient access to information. It also offers financial sector entities an effective channel for communication with the public. On the other hand, its growing role in financial markets raises three main categories of risk: investor protection, market integrity and financial stability. From an investor protection perspective, it increases interactions between amateur investors rather than with experts, heightening the risk of the spread of **inaccurate information** and potentially **financial losses**. This broadens the scope for **speculative behaviour and market abuse**. In turn, it may contribute to **price dislocations** hampering the orderly functioning of markets, with possibly wider implications for market stability.

Risks have, at times, materialised. The GameStop saga did not end with the 2021 short

squeeze. In 2024, social media triggered a renewed spike in the stock's price, resulting in significant subsequent losses for retail investors.

Another form of manipulation on social media is the so-called "ramp-and-dump" scheme, in which fraudulent actors advertise false investment groups on social media and direct victims to private messaging channels, to then coordinate the artificial inflation of low-volume stocks and liquidate their own positions. In the US, there has been a spike in complaints (300% increase year-on-year) linked to this type of fraud during 2025.³ Together, the two cases suggest that social media can distort market prices both through the influence of individual accounts and through intentionally engineered manipulation schemes.

So far, we have described social media as an **information source**, a primary channel for financial news, analysis and peer opinion that often outpaces traditional media in speed and reach. Yet, its role goes further: user-generated messages encode **bullish** or **bearish** views. Academic literature has shown that **sentiment** and **attention**, namely message volume, are measurable proxies for investor mood and market expectations (Cookson and Niessner, 2020 and Cookson et al., 2024). Furthermore, coordinated activity on platforms has demonstrated measurable price effects on individual stocks, particularly for retail investors (Sul et al., 2014; Tan and Tas, 2020, Sui and Wang, 2025).

ESMA, jointly with National Competent Authorities (NCAs), has been drawing attention to the potential risks arising from increased social media activity. Following a first warning published in 2024, in January 2026, ESMA published a finfluencer factsheet which warns that breaches of disclosure rules can lead to legal responsibility for any adverse consumer outcome.⁴ In 2024, ESMA has also published a TRV risk analysis article investigating the relationship between social media sentiment

² See [Global Social Media Statistics](#) and [social media sites](#)

³ FINRA, December 2025, [Media 'Investment Group' Imposter Scams Continue to Rise](#)

⁴ See ESMA, February 2024 [Warning](#). ESMA, January 2026, [FINFLUENCERS - Tips for responsible promotion](#)

and stock excess returns.⁵ The analysis showed a significant correlation between social media interactions and stock excess returns at the very short term, suggesting that information spreading on social media platforms influences investor trading choices and may amplify short-term financial market movements.

Similarly, a recent AMF study published in July 2026, examined the relationship between activity on social media, namely Twitter/X, and French retail trading documenting the relation between interaction on social media and trading outcomes.⁶

Against this background, we extend our previous analysis by documenting whether social media activity affects retail investors trading outcomes and choices through **a sentiment channel** distinct from misinformation and market abuse. This channel may raise investor protection concerns that sit outside existing policy frameworks, potentially informing more efficient and effective regulatory responses.

First, we look at the effects of social media interactions on realised retail returns. Second, we investigate what is the behaviour behind return realisation. Our results confirm the existence of significant correlation between social media interactions, channelling sentiment and attention to individuals, and retail investor outcomes and behaviour.

The present analysis differs from previous research in that it is the first to make use of transaction data, reported to ESMA and National Competent Authorities under Article 26 of MiFIR, at an EU level.

The remainder of the article proceeds as follows. The next section provides a description of social media platforms. It then sets out the main variables of interest, our data and sample and our methodological approach. We finally present our main findings and conclusions.

Social media sentiment analysis

Data and sample

Social media data come from Stockpulse. We retrieve daily social media messages posted on Twitter/X, Reddit, StockTwits, SeekingAlpha, and Discord between 2022 and 2025 for all the 111 listed companies available in the database.⁷ More than 70% of total social media messages clustered on 100 companies. Among these, 89 were domiciled in the US, 2 in the UK, 1 in the European Union (EU) and 9 from other countries.⁸ To increase the number of EU-domiciled stocks covered, we also add the 10 most traded constituents of the EuroStoxx50 index.

Our identification strategy requires keeping stock-day combinations for which there are at least 10 messages across each social media platform. This allows to build consistent daily sentiment measures for our analysis. Having this in mind, we excluded SeekingAlpha and Discord from the sample due to lack of enough continuous days with at least 10 messages on a specific stock.⁹ Following the application of these criteria, the final sample consists of a total of 235 million messages posted on Twitter/X, Reddit and StockTwits for 99 companies, including 83 from the US, 2 from the UK, 5 from the EU, and 9 from other countries (Table 2 Panel A and Panel B).¹⁰

We combine this dataset with **transaction level** records of trades executed by retail investors, reported to ESMA and National Competent Authorities under Article 26 of MiFIR on the obligations to report transactions in financial instruments traded via any European Economic Area (EEA) intermediary. These data include information on time of execution (at timestamp level), price, quantity, executing entity, buyer and seller anonymised IDs, age and nationality

⁵ See ESMA, April 2024 [Social media sentiment: Influence on EU Equity Prices](#)

⁶ Nouail,C., 2026, “[The Influence of Social Media on Retail Investor Trading in CAC 40 Stocks](#)”, Working Paper, Autorité des Marchés Financiers.

⁷ The final sample consists of 111 companies. The summary statistics show 113 ISINs because some companies are associated with more than one ISIN.

⁸ Tesla is excluded.

⁹ The exclusion of SeekingAlpha and Discord results in a negligible reduction of the final sample.

¹⁰ More details on the characteristics of these platforms are presented later in this subsection.

of the retail investor. We aggregate transactions at stock-day level, which we then merge with the social media dataset. (Table A.1, Annex, Panel C)

We then turn to construct the key variables used in our analysis. Following Cookson and Niessner (2020), we first construct the social media sentiment measures. In a second step, we define our response variable to best capture retail investor outcomes (Table A.1, Annex, Panel D).

Social media sentiment measures

For each stock, we determine *Attention*, *Sentiment* and *Disagreement*:

- *Attention* for each platform is the fraction of firm-day number of messages over the total number of messages on that platform in a day. A value of *Attention* higher than zero measures a higher overall interest on a stock compared to other stocks in a specific day. Overall, it can be defined as the degree to which a stock is actively discussed.
- *Sentiment* measures the aggregate directional tone of the messages for a specific stock on a specific day. It is built as the difference between the number of messages with a positive and negative tone over the total number of messages. It takes values from -1, if all messages are negative, to 1, if all messages are positive.
- *Disagreement* measures the dispersion of opinions about a stock. It is computed as the standard deviation of *Sentiment*. The higher the disagreement, the higher the divergence of opinions within a social media platform. This measure reflects uncertainty about a stock.

Retail investor behaviour and outcomes

We build daily realised returns from complete round trips for each investor-stock-executing

entity combination within our timeframe. A complete round trip is defined as the whole cycle of a transaction involving both the opening and closing of a position in a security. In other words, a purchase followed by a subsequent sale that makes the aggregate stock position equal to zero. For each cycle, we compute the total monetary amount invested and the total monetary amount sold. The realised return is calculated as the difference between amount sold and invested divided by the original amount invested. For each stock every day, we then take the average return across investors.

To explore the mechanisms behind the realisation of returns associated to a change in sentiment across social media platforms, we build a *net buy ratio (NBR)* measure as a proxy for retail investors behaviour, to capture whether a stock was net-bought on a specific day. This is computed as the difference between purchases and sales over the total transactions. If daily NBR is negative (positive), selling (buying) pressure for a stock dominates at that point in time.¹¹

The net sign alone is ambiguous, because the same movement can come from either leg. A negative NBR may reflect more selling, consistent with the disposition effect, the tendency to realise gains and hold losses (Odean, 1998), or less buying, which points instead to contrarian behaviour, retail investors buying less of a stock that has already risen (Kaniel, Saar and Titman, 2008). Distinguishing the two requires looking at which leg moves and whether the effect differs between gains and losses. Table 1 summarises the different interpretations of the response of NBR to changes in sentiment.

Table 1
Net Buy Ratio (NBR) responses to sentiment change
Ambiguity in the net sign

Theory	S	B	NBR	Interpretation
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¹¹ The measure follows the logic of the buy-sell imbalance (BSI) from Barber and Odean (2008), with a focus suited to a social media context and to transaction-level data. While the BSI tests investor behaviour at the aggregate (i.e., a collective lean to buy/sell a high-

attention stock), our measure goes beyond attention since we want to establish a relationship between sentiment and disagreement and retail investor buying or selling behaviour.

Sentiment optimism	↓/↔	↑	↑	Improved sentiment raises speculative demand and expected returns
Attention-Induced Trading	↑	↑	↔	Attention increases buying and selling activity
Disposition Effect	↑	↓/↔	↓	Positive performance triggers profit-taking and selling pressure
Disagreement Trading	↑	↑	↔/↑	Divergent beliefs increase turnover on both sides
Contrarian Demand	↔	↓	↓	Sentiment-driven optimism considered as an overvaluation signal, leading investors to act as contrarians rather than sentiment chasers

Note: The table shows the different interpretations of the direction of the effect of Sentiment on NBR. Predictions derive from sentiment-based trading (De Long et al., 1990; Baker & Wurgler, 2006), attention-induced trading (Barber & Odean, 2008; Da et al., 2011), disposition effect (Shefrin & Statman, 1985; Odean, 1998), disagreement trading (Miller, 1977; Diether et al., 2002; Cookson & Niessner, 2020), and contrarian demand (Cookson et al., 2024). S = Sell, B = Buy, NBR = Net Buy Ratio. ↔ ≡ no directional impact, ↓ ≡ downward impact, ↑ ≡ upward impact.

Social media platforms differ in features and users

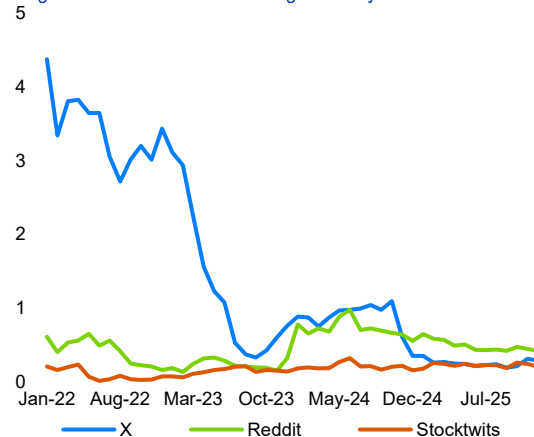
Ahead of going in detail into the methodological steps, it is important to understand social media platforms and their structural differences. In this analysis, we focus on three platforms: StockTwits, Reddit and Twitter/X. This matters because the same message could be perceived differently depending on the type of user and the platform it is posted on. Character limits, tagging conventions, and threading rules determine how much context and nuance a single post can carry.

StockTwits is a platform used almost exclusively by a financially motivated audience. It asks users to report an investment approach,

the typical holding period and their experience tier (novice through professional). The resulting label carries real information. In this sense, messages originating from self-identified professionals may have a different impact than those of novices. When posting, users can tag a message with a ticker and apply a built-in bullish/bearish toggle. In this way, a post is pre-classified by its author and tied to a specific security by construction.

Conversely, Reddit is a community-driven forum with a broader user base, not necessarily financially literate. Users are mainly hidden behind pseudonymous with no reported experience and no verification tag. Opinions accumulate in long, threaded posts that the community itself ranks through upvoting or downvoting them. What rises to the top reflects popularity, not a declared bullish or bearish view. Credibility is therefore built by adding supplementary information on account age and a norm of "due diligence" on posts where users show their reasoning.

Chart 1
Total number of messages over time
Strong decline for Twitter/X following February 2023



Note: Total number of monthly messages by social media platform, in mn.
Sources: Stockpulse, ESMA.

Twitter/X lies in between. It hosts three fundamentally different kinds of accounts interacting among each other. Starting from 8 February 2026, the platform began to offer the possibility for users to obtain a blue checkmark next to their screen name. For the largest part, accounts are from 'regular' users, with small follower count, casual conversational tone and low engagement. Normally, 'verified' users are celebrities or profiles belonging to traditional news sources like the Financial Times or Bloomberg. However, the blue badge can also

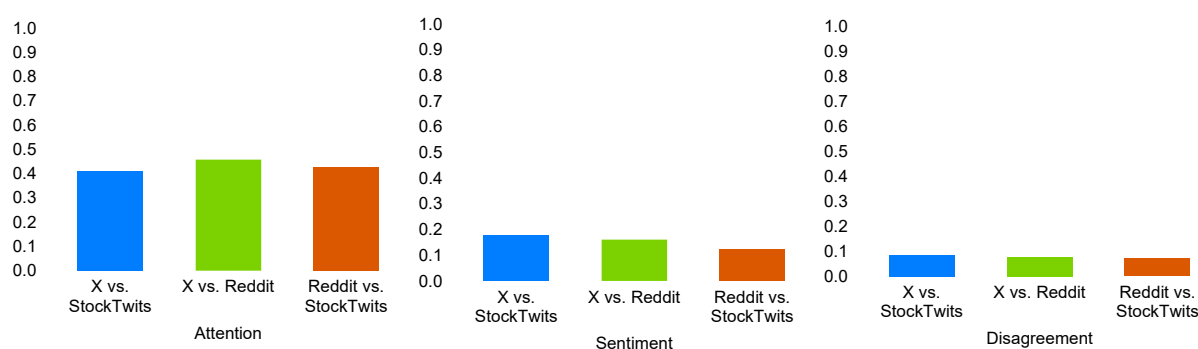
symbolise an active paid subscription and a minimally complete profile, so it is not necessarily a reliable guide. Twitter/X shares StockTwits cashtag convention, but the content has never been restricted to financial topics. Also, unlike StockTwits, posts can be looped into longer threads.

The relevance of these platforms has evolved over time, with structural changes in usage policies affecting their user composition. For example, it is possible to observe a decline in overall activity in Twitter/X following the introduction of 'premium' features. Conversely,

Reddit has started to gain more popularity pointing towards a potential migration of users from Twitter/X (Chart 1).

Overall, what investors notice tends to move together across platforms. However, given the platform's structure and user composition, the sentiment of authors might not align in the same way among platforms (Chart 2). This is also confirmed in Cookson et al. (2024). Being Reddit a community-driven platform, attention will likely play a larger role than sentiment, compared to other platforms.

Chart 2
Bivariate correlations of social media signals across platforms
Correlation higher for attention



Note: Bivariate correlations of raw firm-day signals between each of the social media platforms in our sample. Attention is the fraction of a platform's messages about a security on a given day; sentiment is the average sentiment of those messages; disagreement is their dispersion. The vertical scale is common across the three signals: attention correlates strongly across platforms, whereas sentiment and disagreement do not, which means investors on different platforms attend to the same securities but disagree about them.
Sources: Stockpulse, ESMA

Methodology

To investigate the effects of social media interactions on retail realised returns, we regress the daily retail investors realised return of each stock on our sentiment variables. To do so, it is necessary to clean the independent variable from confounding factors, so as to separate a real signal from noise. Publicly observable information moves sentiment mechanically and independently of genuine social media user beliefs contaminating raw social-media sentiment scores. Three categories of confounders matter the most:

- Company-level events such as earnings announcements, merger and acquisition activity, index reconstitutions, and regulatory filings, which shift the message

tone for reasons unrelated to retail investors' private views;

- Market-wide factors including aggregate index returns and spikes in implied volatility, which dampen or inflate sentiment across all stocks simultaneously, introducing a common component that is uninformative about firm-specific attention.
- News sentiment from professional outlets such as Financial Times, Bloomberg or other finance-related media, which generate correlated posting activity on social-media platforms, that would otherwise appear as an independent signal.

Keeping any of these confounders would make the sentiment measure redundant with information already available to market

participants. This would bias estimates toward zero or inflating them spuriously.

Thus, for each firm i and period t , we get the **residual sentiment score**: the component of social-media tone that cannot be explained by any information already in the public domain. This comes from regressing sentiment on earning announcements, stock cumulative abnormal excess returns and 5-day volatility, including **firm and time fixed effects**.¹²

Following Cookson et al. (2024), we use a **conditional principal component analysis (PCA)** to decompose the social-media measures into a component shared across social media platforms and a platform-specific idiosyncratic component, estimated separately for sentiment and for attention. For each platform, the residual score (labelled as z throughout the article) captures the same hidden investor sentiment but also each platforms' noise. The PCA recovers the linear combination of residuals that maximises the shared variation. In other words, it blends the three cleaned-up signals together in the way that best captures what they share, while filtering out what's unique to each one. This produces a composite measure more reliable than any individual platform signal.¹³

The **first principal component (PC1)** is our composite measure of social-media sentiment and attention. The remaining components (PC2, PC3) absorb platform-specific idiosyncratic variation and are discarded.¹⁴

Social media sentiment matters for returns

Table A.2 in Annex reports our main findings. Overall, social media sentiment measures are significantly correlated with retail investors' realised returns and trading behaviour. These

effects are consistent across platforms in lines with existing literature (Cookson et al., 2024).

Results show a negative relationship between sentiment, representing the tone of social media messages, and NBR. This can be related to two not mutually exclusive explanations. An amelioration in sentiment seems to be associated relatively with more selling rather than buying. This reflects positive correlation between realised returns and sentiment. As the perceived market outlook improves and prices climb, retail investors seem to be more inclined to sell their stock to lock-in gains rather than holding or buying more. Yet, those who sell risk mistiming the market and forgoing potentially higher returns (Odean, 1998).

Improving sentiment could also itself be the result of investors already holding a stock and continuing to hold it, expecting the price will continue to rise. This continues to further generate positive sentiment among investors (Sui and Wang 2025).¹⁵

Additionally, an increase in disagreement, when opinions diverge, signals higher ambiguity. Attention-grabbing events bring a wide variety of investors who interpret the same information differently. This generates greater dispersion in beliefs. In this sense, stockholders are more inclined to refrain from selling while less-informed investors keep on buying. Moreover, misleading information may drive less savvy individuals to pick the wrong investment and incur in losses (negative coefficient on disagreement). These results hold across platforms (Cookson and Niessner, 2020). Conversely, attention delivers mixed results. PC1 is not significant in both Table A.2 in Annex Panel A and Panel B, suggesting that attention is not consistently associated with realised returns. When platforms are considered individually, however, attention matters mainly

¹² Firm fixed effects absorb time-invariant, firm-level determinants of sentiment. Time fixed effects absorb calendar-period shocks common to firms (e.g., macroeconomic announcements). Together, the fixed effects and the three sets of controls ensure that the residual captures only within -stock, and -period sentiment variation not attributable to public information.

¹³ This approach follows Baker and Wurgler (2006) in cleaning sentiment measures of macroeconomic fundamentals and extends the conditional PCA

framework of Cookson et al. (2024) to the multi-platform setting of Twitter/X, Reddit, and StockTwits.

¹⁴ The PC1 is the linear combination that maximises the share of total cross-platform variance explained. The weights are determined by the data, assigning greater importance to the platform whose cleaned residual co-moves the most with the common latent factor.

¹⁵ This article presents both these potential explanations as we are currently further investigating these aspects. This analysis would be part of the forthcoming working paper.

in the case of Reddit, plausibly a consequence of the structural features of this platform, being a community-based platform characterised by upvoting and downvoting mechanism. This is consistent with prior literature showing that greater attention to a stock generates buying pressure (Cookson et al. 2024).

Table A.3 in Annex shows the results for the analysis when all platforms are combined, to explore platforms heterogeneity. StockTwits shows different dynamics than Twitter/X and Reddit. This may be related to the fact that the users of StockTwits are a more homogeneous group of mainly active, probably better-informed traders. They leverage on sentiment and attention to lock-in gains, while following the dynamics described before when buying/selling in response to a social media signal. Twitter/X users tend to behave like the average user (i.e., the signs of the coefficients are in line with those in Table A.2 in Annex). For Reddit, the only relevant remaining effect is that of attention on the selling behaviour of individuals.

Conclusion

This article explores whether social media could affect retail investors, using, for the first time, a novel dataset on retail investor transactions data reported under MiFIR at an EU level. We investigate whether social media interactions affect retail realised returns, and the investor behaviour that lies behind return realisation.

We document **a significant relation between social media sentiment and financial returns**: Positive sentiment is associated with realised gains and net selling; divergent opinions are associated with realised losses and net buying, consistent with previous literature (Cookson et al. 2025; Cookson and Niesser, 2020; AMF, 2026). These patterns are consistent with retail investors locking in gains early, yet potentially forgoing further upside as the outlook is most favourable (Odean, 1998; Sui and Wan 2025). Taken together, our findings show that social media's growing role in financial markets is not confined to the risks outlined earlier in this article: the spread of inaccurate information, market abuse, and manipulation schemes such as ramp-and-dump fraud. It also extends to a more **direct channel of influence** shaping retail investors trading behaviour and related gains. In other words,

ordinary social media activities could shape trading behaviour and realised returns by channelling sentiment and attention as well as by the speed at which information spreads. Beyond the risks of misinformation and potential market abuse, attention and sentiment can have notable influence on retail investors' choices and returns regardless of information accuracy. **The speed** at which these effects materialise and dissipate, often faster than any policy response, is itself a matter of concern.

Our findings also acknowledge that there are **different types of investors** that might react differently to social media signals. As sentiment improves, some stockholders sell to lock-in gains early enough, while others hold hoping prices will further increase. In light of this, we will continue to monitor the developments and explore further the precise mechanism behind sentiment and net buying and selling. Also following evidence of heterogeneity across platforms, to better understand these dynamics, further analysis under development, leveraging on the richness of the MiFIR datasets, distinguishes between the different types of social media users. Clustering retail investors along these dimensions, for instance, distinguishing younger, less experienced investors from older or more sophisticated ones, could reveal whether certain groups are more susceptible to social media-driven behavioural patterns, with corresponding implications for targeted investor protection measures.

Such heterogeneity calls, indeed, for careful consideration when shaping initiatives targeted to favour retail access to capital markets monitoring, particularly within less financially aware population segments.

Against this background, it is important to raise awareness on the risks of social media at national level via initiatives that target the broader population, especially those individuals that are reaching the legal age for investing.

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Annex

Table A.1

Descriptive statistics

Social media volume and sentiment and retail transactions

Panel A: Platform activity and coverage

Platform	Messages			Mentions		
	Mean	St. Dev.	% Positive messages (%)	Securities	Firm-days	Full sample (%)
StockTwits	128.12	384.51	57.4	110	772,936	65.3
Twitter/X	436.52	1294.57	63.6	113	1,037,598	87.7
Reddit	349.76	722.90	57.6	113	909,074	76.8

Note: Messages are the volume of messages exchanged daily on each platform and are computed on the final sample, following the application of the criterion to have >10 messages. Mentions are computed on the full pre-filtered sample of 113 stocks and 1,182,944 firm-days: 'Securities' counts distinct ISINs ever mentioned, with at least one message on the platform, and 'Firm-days' counts firm-day observations with strictly positive message volume.

Panel B: Message characteristics by platform

Variable	Mean	S.D.	P10	Median	P90	N
Total words (StockTwits)	29.835	14.320	16.879	27.000	45.017	230,990
Total words (Twitter/X)	22.047	5.794	14.839	22.166	29.354	230,990
Total words (Reddit)	78.834	57.522	35.646	67.714	122.891	230,990

Note: Message length word count per firm-day.
Source: ESMA.

Panel C: Retail trading outcomes

Variable	Mean	S.D.	P10	Median	P90	N
Purchases (n. trades)	5,406	10,169	250	2,356	12,727	230,990
Sales (n. trades)	3,674	6,941	166	1,541	8,516	230,990
NBR (net buying ratio)	0.183	0.300	-0.176	0.193	0.547	228,999
Retail returns	0.042	0.101	-0.063	0.029	0.157	227,380
Holding period (days)	80.097	60.015	11.241	73.042	153.965	227,380
log(Holding period)	3.992	1.088	2.452	4.295	5.038	226,563

Note: Retail returns are winsorised at the 1st and 99th percentiles throughout. NBR is the net buying ratio (purchases - sales) / (purchases + sales), measured at the firm-day level.

Panel D: Social media signals by platform

	Sentiment		Disagreement		Attention	
	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.
StockTwits	0.249	0.350	0.877	0.215	0.0350	0.0665
Twitter/X	0.348	0.346	0.849	0.197	0.0242	0.0275
Reddit	0.215	0.352	0.896	0.165	0.0306	0.0449

Note: Sentiment is the firm-day average message sentiment. Disagreement is the within firm-day dispersion of message sentiment, measured as standard deviation of sentiment. Attention is the firm-day share of a platform's messages devoted to the security, so its level is mechanically small and is comparable across platforms but not against sentiment.

Table A.2

Regression results

Social media signals correlated with retail investors' behaviour and outcomes

Panel A: Realised returns and social media sentiment

	Platforms pooled		Platforms individually					
	(PC1)		Stocktwits (z)		Twitter (z)		Reddit (z)	
Sentiment	0.0046***		0.0025***		0.0050***		0.0019***	
Attention	0.0004	0.0005	0.0008	0.0010	0.0002	0.0001	0.0003	0.0006
Disagreement		-0.0015*		-0.0001		-0.0025***		0.0000
Constant	-0.0125	-0.0098	-0.0107	-0.0102	-0.0105	-0.0085	-0.0078	-0.0076
N	220,485	220,485	221,073	221,073	220,864	220,864	221,259	221,259
R-squared	0.5200	0.5165	0.5177	0.5166	0.5197	0.5166	0.5165	0.5161

Panel B: NBR and social media sentiment

	Platforms pooled		Platforms individually					
	(PC1)		Stocktwits (z)		Twitter (z)		Reddit (z)	
Sentiment	-0.0148***		-0.0127***		-0.0134***		-0.0042**	
Attention	0.0018	0.0010	0.0035*	0.0021	-0.0030	-0.0029	0.0046***	0.0039**
Disagreement		0.0060***		0.0033*		0.0056***		0.0031*
Constant	0.3565***	0.3522***	0.3549***	0.3528***	0.3603***	0.3571***	0.3562***	0.3559***
N	220,941	220,941	221,542	221,542	221,321	221,321	221,729	221,729
R-squared	0.2549	0.2530	0.2542	0.2530	0.2543	0.2528	0.2527	0.2526

Note: The table reports results for a pooled regression estimating the average effect of social media measures across platforms as well as results of three separate regressions for each platform. Panel A reports how realised returns relate to social media sentiment and attention, and to disagreement and attention. Panel B reports how net buying (NBR) relates to social media sentiment and attention, and to disagreement and attention. Stars indicate statistical significance of the coefficient using the p-value, namely * p<0.1, ** p<0.05, *** p<0.01. All regressions include stock and time fixed effects and the following control variables: cumulative abnormal returns (1-5 days and 6-30 days windows), 5-days volatility, holding periods and earning announcements. All regressions include ten lags (t - 1 to t - 10) of sentiment, ten lags of attention and ten lags of disagreement. (z) denotes a standardised variable (mean 0, standard deviation 1 using the estimation sample statistics). PC1 is the first principal component of sentiment, attention and disagreement. It combines the z-score of each individual platform to capture the aggregate effect of social media signals on investor outcomes and behaviour.

Source: ESMA

Table A.3

Regression results

Social media signals correlated with retail investor behaviour and outcomes

		All platforms combined			
		Realised returns		NBR	
StockTwits		(1)	(2)	(3)	(4)
	Sentiment	0.0021**		-0.0102***	
	Attention	0.0027*	0.0027*	0.0023	0.0015
Twitter	Disagreement		0.0002		0.0031*
	Sentiment	0.0055***		-0.0101***	
	Attention	0.0014	0.0008	-0.0054*	-0.0046
Reddit	Disagreement		-0.0022**		0.0031*
	Sentiment	0.0009		0.0010	
	Attention	0.0015	0.0012	0.0035	0.0050*
	Disagreement		0.0010		0.0000
	Constant	-0.0115	-0.0095	0.3586***	0.3541***
	N	220,932	220,932	221,395	221,395
	R-squared	0.521	0.5176	0.256	0.254

Note: The analysis is based on a regression, combining the three platforms and estimating platform-specific regressions that allow to identify the idiosyncratic characteristics of each single platform. Columns (1) and (2) report the results on how realised returns relate to social media sentiment and attention, and to disagreement and attention. Columns (3) and (4) report the results on how net buying (NBR) relates to social media sentiment and attention, and to disagreement and attention. Stars indicate statistical significance of the coefficient using the p-value (p), namely* p<0.1, ** p<0.05, *** p<0.01. All regressions include stock and time fixed effects as well as the following control variables: cumulative abnormal returns (1-5 days and 6-30 days windows), 5-days volatility, holding periods and earning announcements. All regressions also include ten lags (t - 1 to t - 10) of sentiment, ten lags of attention and ten lags of disagreement. For each social media signal, the z-score is used.

Source: ESMA.

