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From Tweets to Insights: Social Opinion Mining on Corporate Social Responsibility

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ABSTRACT

Corporate Social Responsibility (CSR) has become increasingly critical as firms seek to balance financial goals with social and environmental responsibilities. Our study introduces a three-phase structured method to analyze stakeholders' opinions on CSR through Social Opinion Mining, utilizing stakeholder and legitimacy theories. The method involves collecting, cleaning, and analyzing a dataset of 349,370 Italian tweets (2006–2022) using sentiment analysis, topic modeling, and exploratory techniques. This approach highlights trends in CSR discussions, stakeholder sensitivities, and sentiment variations across regions. The findings contribute to CSR literature by offering a robust framework for firms to align CSR strategies with stakeholder interests and for policymakers to design targeted, sustainable initiatives. Our research advances understanding of CSR communication on social media, emphasizing its potential for strategic planning and stakeholder engagement.

1 | Introduction

Public awareness and concern regarding corporate responsibility for mitigating negative environmental and societal impacts have significantly increased recently (Amin et al. 2021; Arayssi et al. 2016). In response, firms have intensified their focus on corporate social responsibility (CSR)¹, driven by a growing recognition of the long-term competitive advantages that sustainable development can offer (Waheed and Zhang 2022). Nowadays, firms in all sectors are trying to consider social and environmental impacts both during and after their operations (Radwan and Russo 2024) and use CSR disclosure to improve stakeholders' views of their ethics and activities (Amin et al. 2021). However, CSR engagement goes far beyond merely shaping stakeholder perceptions (Waheed and Zhang 2022). Firms also strategically employ CSR to legitimize their activities in response to institutional pressures, to gain a competitive advantage by differentiating themselves in the market, and to comply with regulatory and social expectations that increasingly demand responsible practices (Radwan and Russo 2024).

By adopting CSR, firms navigate the evolving regulatory landscape, strengthen their reputation, and align with broader societal values, making it a key component of their long-term strategy (Radwan and Russo 2024; Waheed and Zhang 2022). Therefore, understanding CSR requires a multidimensional perspective that considers both its communicative and strategic functions.

In light of the current importance of CSR, numerous researchers have initiated investigations into how firms convey their CSR efforts (Radwan and Russo 2024).

Few studies have analyzed the many channels that firms use to provide information to stakeholders, and they directed their attention toward different business documents, such as integrated, sustainability, and annual reports (Ahmed and Hassan 2025; Cardoni and Kiseleva 2025). However, CSR communication is not limited to the simple dissemination of information by firms but also includes the reverse flow, in which stakeholders, through stakeholder engagement tools, express opinions, needs, and expectations (Kujala et al. 2022). Traditional methods

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include assemblies and consultations, roundtables, surveys, press releases, and advisory committees (Kujala et al. 2022; Touratier-Muller and Cournac 2025).

This two-way exchange, made increasingly relevant by the use of social media and interactive platforms, allows firms to gather valuable data and adapt their CSR strategies in line with societal demands. However, literature has largely overlooked the distribution of CSR information via social media platforms, thereby neglecting to analyze the extent and nature of CSR content shared through these mediums by firms' stakeholders (Aqueveque et al. 2018; Barbeito-Caamaño and Chalmeta 2020; Vollero et al. 2019).

Social media platforms support dialogical and involvement strategies and offer the chance to engage in conversation and communicate with various stakeholders (Okazaki et al. 2020). Managing stakeholders on social media increasingly involves focusing on the large, often anonymous groups of *friends* and *followers* rather than the smaller, more traditionally known groups (Freeman 2010). Many firms see this new wave as a chance to connect with stakeholders in a fresh way (Okazaki et al. 2020) and, consequently, firms give some degree of control over their reputation and brand to social media-interacting stakeholders (Amin et al. 2021; Radwan and Russo 2024). The aim of our research is to understand stakeholders' opinions on CSR as expressed through social media, enabling firms to utilize this information for effective stakeholder engagement. We integrate two theories to present comprehensive and lucid perspectives on the scope (Radwan and Russo 2024). Specifically, we utilized stakeholder and legitimacy theories. The majority of research employs stakeholder theory, which posits that a connection exists between a firm and its many internal and external stakeholders (Freeman 1994, 2010). Legitimacy theory is the second most prevalent theory (Radwan and Russo 2024; Suchman 1995), and we use it because firms are sensitive to any legitimacy challenges when interacting with stakeholders (Clarkson 1995; Freeman 1994). Therefore, it is important to align the firm's activities with the stakeholders' expectations to make the firm's actions *legitimate*.

To understand stakeholders' opinions regarding CSR, we analyzed a large dataset of 349,370 Italian tweets published between 2006 and 2022. Twitter (now X), as one of the most widely used microblogging platforms, provides a unique opportunity for firms to engage in two-way communication with a broad spectrum of stakeholders (Amin et al. 2021; Xiong et al. 2018; Shin and Ki 2022).

Our contribution lies in the development and application of a structured three-phase procedure, with particular emphasis on the final phase, which involves the systematic analysis of stakeholder-generated content. Drawing on established literature, we perform three complementary analyses: an exploratory analysis to detect participation trends and stakeholder profiles; a sentiment analysis using a state-of-the-art RoBERTa-based model to quantify affective orientations; and a topic modeling approach to uncover the latent thematic structure within the discourse (Marchi et al. 2022; Mastroeni et al. 2023; Müller-Hansen et al. 2022; Schallehn and Valogianni 2022). This integrated methodology allows us to map the intensity, tone, and

thematic focus of CSR-related discussions over time and across regions, offering a rigorous and scalable framework for social opinion mining in the CSR domain.

The results of our study contribute to the formulation of CSR strategies tailored to the Italian context, enabling firms to align their initiatives with the specific interests and sensitivities of stakeholders. Understanding stakeholder opinions via social media is crucial, as these platforms enable real-time dialogue, helping firms identify trends, address concerns, and refine CSR strategies (Okazaki et al. 2020; Radwan and Russo 2024). Research shows that social media can transform qualitative insights into measurable firm goals, improving CSR assessment and decision-making (Barbeito-Caamaño and Chalmeta 2020; García-Sánchez et al. 2022). Social opinion mining allows firms to move beyond traditional methods, fostering transparency and stakeholder trust through social media data-driven strategies (Bonsón and Bednárová 2015; Farache et al. 2018). This shift from passive disclosure to active engagement underscores social media's strategic role in firm sustainability and legitimacy (Colleoni 2013; Pons et al. 2021). Research focused on social media has, in fact, the potential to transform stakeholder engagement into measurable firm goals and provide a solid foundation for developing successful strategies.

Firms and policymakers can use our structured procedure to understand the interests of stakeholders. Policymakers can use our findings to gauge public sentiment and identify the barriers to CSR practice adoption and adjust their policies appropriately. Our research could also help policymakers gauge public opinion on proposed CSR and sustainability so that government agencies can better engage the public by monitoring their reactions in real time and responding accordingly.

Our paper adds to what is already known in the field in more than one way. First, it proposes a framework to comprehend the two-way dialogical relationship between firms and a large number of stakeholders. Second, while most prior research has concentrated on CSR disclosure in more conventional settings like printed media or firm websites, our paper presents new findings and insights about CSR disclosure on social media. Third, to give a full picture of how social media are being used for CSR disclosure, the paper uses a large sample size over a long period of time. Finally, the Italian case is examined for the first time.

Our study has the following structure: Section 2 discusses stakeholder engagement and legitimation in CSR strategies; Section 3 discusses CSR information and stakeholders' engagement with social media; Section 4 is the proposed method; Section 5 describes results and discussion; Section 6 presents managerial, policy implications, and conclusion.

2 | Stakeholder Engagement and Legitimation in CSR Strategies

Stakeholder engagement is the process by which a firm engages its key stakeholders to understand their expectations, build trusting relationships, and integrate their feedback into firm strategies (Kujala et al. 2022). Engagement can take place through various modes of communication and

active participation, with the goal of creating shared value and improving CSR (Kujala et al. 2022). The concept is based on the active participation of stakeholders in firm policy-making, decision-making, and monitoring of CSR practices (Touratier-Muller and Cournac 2025). Traditional tools for stakeholder engagement have long been used to facilitate dialogue and ensure that firms are able to respond to the expectations and needs of their stakeholders through established and formal means (Kujala et al. 2022; Touratier-Muller and Cournac 2025). Notable among the traditional methods are assemblies and consultations, roundtables, surveys, press releases, and advisory committees (Kujala et al. 2022; Touratier-Muller and Cournac 2025). The proliferation of social media and the subsequent emergence of interactive platforms, such as blogs and user communities, present an opportunity for stakeholder engagement (Viglia et al. 2018). On social media platforms, stakeholders exchange knowledge and experiences, discuss products and services, and express opinions, creating through their content information that firms can use to understand what topics are of interest to them and how they react to them (Viglia et al. 2018).

Literature adopts several theoretical perspectives to understand stakeholders'² opinions regarding CSR (Freedman and Jaggi 2005; Radwan and Russo 2024; Suchman 1995) and many authors rationalize the implementation of such a strategy by adopting instrumental, political, integrative, and ethical theories (Garriga and Melé 2004). In line with previous literature, our study thus integrates stakeholder and legitimacy theories (Bonsón and Bednárová 2015; Colleoni 2013; Giacomini et al. 2020; Radwan and Russo 2024). In particular, we adopt stakeholder theory because our study analyzes how stakeholders' views on CSR, expressed on social media, influence firm strategies, and legitimacy theory because it examines how firms align their CSR objectives with stakeholders to gain and maintain social legitimacy in a context of dynamic public interaction.

Stakeholder theory centers on the public-private relationship and emphasizes the importance of stakeholders' roles and expectations in CSR (Aguinis 2011; Dahlsrud 2008; Freeman 2010; Marais et al. 2020). Unlike shareholder theory, according to which firms are oriented toward profit maximization and the satisfaction of shareholders' needs only, stakeholder theory focuses on satisfying the needs of a wider range of subjects, stakeholders, who are interested in firm activity (Freeman 2010; Mitchell et al. 1997).

Stakeholder theory is founded on the principle that the political, social, institutional, and environmental context in which firms operate must be taken into account when examining the economic dimension (Deegan and Blomquist 2006). Stakeholders are able to affect firm performance because they provide strategic resources for firms (García-Sánchez et al. 2022). In fact, stakeholder theory posits that the existence and performance of firms hinge on addressing the needs of all stakeholder categories (Deegan and Blomquist 2006). Stakeholders are moral entities with their own rights, and firms should consider these needs using stakeholder engagement tools (Vitolla et al. 2019). Firms consider the interests of the more relevant stakeholders to achieve legitimacy, consent, and reputation in the context in which they operate (Ozdora Aksak et al. 2016). For these

reasons, firms integrate these considerations into both their decision-making processes and their communication and reporting practices (García-Sánchez et al. 2022).

Firms are especially sensitive to any legitimacy challenges when interacting with stakeholders (Clarkson 1995; Freeman 1994; Radwan and Russo 2024). Therefore, it is important to align the firm's activities with the stakeholder's expectations so as to make the firm's actions *legitimate*³. For this reason, studies on CSR communication have used legitimacy theory as their foundation (Bonsón and Bednárová 2015; Colleoni 2013; Radwan and Russo 2024).

Firms justify and legitimize their actions toward stakeholders and their social responsibility by disclosing CSR information (Cho et al. 2012). According to legitimacy theory, this practice aligns with the social evaluation of acceptability and desirability, meaning that firms seek to demonstrate that their activities are appropriate and beneficial in the eyes of society. By sharing CSR information, firms aim to legitimize their actions, reassuring stakeholders that their operations meet societal norms and expectations. In this evaluation, stakeholders look at how well a firm's actions and policies align with societal norms. As such, legitimacy could be considered a condition reflecting the cultural and social alignment of the firm (Cho et al. 2012). Firms establish their credibility through CSR communications, which demonstrate their commitment to social ideals and conformity with societal norms (Zimmerman and Zeitz 2002). According to legitimacy theory, firms are bound to grow in accordance with socially accepted values, principles, and standards; failing to do so would be a *breach of contract*, resulting in a loss of legitimacy and possibly the firm's demise (Deegan and Blomquist 2006).

In the context of CSR, active stakeholder engagement is essential for building strong relationships and gaining consensus. When used strategically, social media offers an effective channel for listening to and interacting with stakeholders, allowing firms to gather valuable information about their expectations. Aligning with these expectations improves firm reputation and enables firms to strengthen their legitimacy in the social and market environment.

3 | CSR Information and Stakeholders' Engagement With Social Media

CSR is based on the principles of openness and transparency to stakeholders (Lim and Greenwood 2017), who anticipate and require precise and accessible information to assess the implications of firm sustainability practices (Michelon and Rodrigue 2015).

Transparency in CSR communication is an ethical obligation and a strategic factor in managing stakeholder relationships, which are a source of competitive advantage (Surroca et al. 2010). Strong and positive stakeholder relationships can, in fact, generate financial benefits, protect the firm from hostile situations (such as product-related crises), and encourage the adoption of social responsibility practices (Barrena Martínez et al. 2016). In addition, active stakeholder engagement contributes to the firm's survival, as their trust and support are essential strategic resources (Viglia et al. 2018). In this context, transparency and openness in CSR practices strengthen stakeholders'

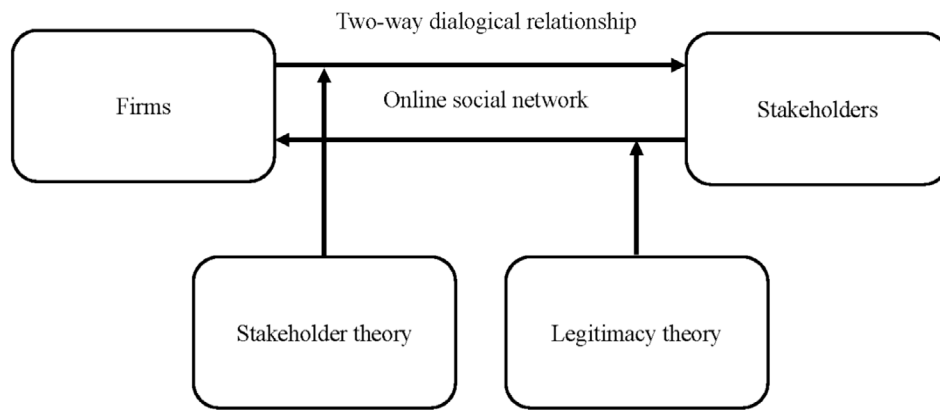


FIGURE 1 | Conceptual framework.

predisposition to support the firm with their resources (Viglia et al. 2018), creating a virtuous circle in which CSR is not just a means of communication but a key element for the long-term success and sustainability of the firm.

According to stakeholder and legitimacy theory, it is imperative that firms effectively align their CSR concerns with those of their stakeholders (Marais et al. 2020). So, a key component of CSR is stakeholder engagement (Radwan and Russo 2024).

The evolution of CSR communication has transformed the way firms disseminate sustainability information, moving from annual reports and firm websites (Radwan and Russo 2024) to more interactive and dynamic tools such as social media. Furthermore, it has also redefined the way firms can engage and interact with their stakeholders. Social media are distinguished by their capacity for real-time interactions (Kucukusta et al. 2019; Pilgrim and Bohnet-Joschko 2022). In business communication, social media enables firms to engage more effectively with clients through real-time conversations, which promotes intimacy and connection. This may also pertain to a cause highlighting social responsibility (Kucukusta et al. 2019; Pilgrim and Bohnet-Joschko 2022).

Literature has highlighted criticisms of firms for their engagement with stakeholders. Some research indicates that stakeholders consider CSR communication less reliable than financial reporting (Pizzi et al. 2021). However, other research suggests that social media tools in firm strategy communication can successfully address this shortcoming (Ma 2014; Song and Wen 2020). Some studies (e.g., Colleoni 2013) also show that the perceived authenticity of CSR messages depends on the interaction between firms and stakeholders and the level of control that firms exert over the narrative.

Nowadays, firms are embracing new, digital, and technologically advanced methods of sourcing useful information to integrate with their sustainability strategies and leveraging Web 2.0 applications (e.g., photo and video sharing sites, social networks, and blogs) to maintain ongoing interaction with stakeholders (Radwan and Russo 2024). In particular, using social media represents a solution to establish communication with stakeholders, satisfy their needs about environmental and social issues, improve firm reputation, and obtain legitimacy to operate in the reference context (Radwan and Russo 2024).

Social media have created new possibilities for broadcasting CSR-related information and managing stakeholder relationships that have progressed from a one-way to a two-way process (Barbeito-Caamaño and Chalmeta 2020; Pons et al. 2021) (Figure 1). Utilizing a two-way strategy in social media discussions with stakeholders yields significant information regarding stakeholder engagement (Lodhia et al. 2020). When firms participate in social media to encourage two-way interaction with stakeholders, it allows stakeholders' voices to be acknowledged and grants firms insight into issues significant to stakeholders, as well as the ability to address their concerns directly (Lodhia et al. 2020).

Firms utilize online social networks to convey their CSR initiatives, while their stakeholders employ online social networks to express their viewpoints and reflections regarding CSR (Barbeito-Caamaño and Chalmeta 2020). On the one hand, according to stakeholder theory, online social networks are deemed suitable for CSR communication that ensures interaction with stakeholders and enables the firm to understand their needs and subsequently develop the necessary actions (Barbeito-Caamaño and Chalmeta 2020). On the other hand, according to legitimacy theory, firms must ensure that their CSR communication aligns with stakeholder expectations to maintain and reinforce their legitimacy. Online social networks amplify stakeholder voices, making it easier for them to evaluate and challenge firms' actions. As a result, firms are compelled to adapt their CSR strategies and communication to reflect their stakeholders' evolving concerns and values. Failure to do so can lead to a loss of credibility and social legitimacy, while alignment with stakeholder expectations helps strengthen a firm's reputation and societal acceptance (Barbeito-Caamaño and Chalmeta 2020).

Users of online social networks who are stakeholders can actively participate in shaping a firm's CSR image by creating material on social media platforms (Acuti et al. 2019). CSR-related content that stakeholders post on online social networks can serve as a source of information for firms for stakeholder engagement (Barbeito-Caamaño and Chalmeta 2020).

Firms can collect information on their stakeholders' opinions, thoughts, and actions through online social networks; this content is readily available and can be collected and analyzed using big data analytics (Barbeito-Caamaño and Chalmeta 2020). Online social networks are characterized by a large amount of information and the availability of real-time data. So, Social Opinion

Mining (SOM), a specific big data analytics, is developed (i.e., SOM is the discipline that deals with extracting opinions from web user-generated content) (Balazs and Velásquez 2016). Interest in harnessing the power of automatically detecting and understanding opinions is so high that SOM is one of the most popular areas of research in the Natural Language Processing and Computer Science communities (Bashar et al. 2024). Using big data to analyze CSR information provided by a firm's stakeholders could be an alternative approach to gain insights and discover previously unknown, hidden, accurate, and valuable connections, patterns, and information (Barbeito-Caamaño and Chalmeta 2020). Using SOM, firms can make more informed strategic CSR decisions, which allows for faster analysis, tailored responses to specific audiences or issues, and ultimately the creation of greater value for the community (Farache et al. 2018; Muniz et al. 2019). Since exposure to these ideas could affect stakeholders' perceptions of the firm, monitoring online sentiments and topics should be a top priority for businesses (Farache et al. 2018).

Despite the growing attention in the literature on the role of social media in CSR communication, most studies focus on firm strategies and how firms use these platforms to disseminate information and gain legitimacy (Cuervo-Carabel et al. 2023; De Luca et al. 2022; Lodhia et al. 2020; Pizzi et al. 2021). Many works have examined the effectiveness of firm posts in generating stakeholder engagement (Khanal et al. 2021; Kucukusta et al. 2019) and the ability of firms to control the CSR narrative through well-defined communication strategies (Giacomini et al. 2020; Viglia et al. 2018). However, little space has been devoted to the study of content generated by the stakeholders and their role in constructing the firm's sustainability discourse. This condition represents a significant gap in the literature, as stakeholders are not only passive recipients of CSR communication but also actively participate in the debate through the creation and dissemination of content on social media. Research has not yet investigated how stakeholder posts can influence the public perception of CSR and, consequently, push firms to adapt their strategies to maintain legitimacy. Our study aims to fill that gap by directly analyzing content posted by stakeholders on social media, examining how it contributes to the construction of the CSR narrative and how firms may respond to these dynamics. Unlike existing studies, which predominantly assess the effectiveness of firms' top-down CSR communication (De Luca et al. 2022; Lodhia et al. 2020), our research focuses on spontaneous stakeholder dialogue, offering a broader and more realistic perspective on the actual involvement and impact of digital communities in CSR.

We propose five research questions related to big data analysis on the online social network:

RQ1. *How widespread and discussed is the topic of CSR by various stakeholders?*

RQ2. *Who are the main stakeholders discussing the topic on Twitter, and with whom could the firm collaborate?*

RQ3. *What is the general sentiment of stakeholders concerning CSR and how does it vary across thematic dimensions? And how do they vary over time and regions?*

RQ4. *Which dimension (e.g., economic, social, environmental, or governance) generates the most stakeholder tweets on Twitter?*

RQ5. *Which topics on Twitter are most frequently discussed by stakeholders?*

These research questions aim to understand stakeholder perceptions of CSR and explore how firms can adapt their strategies in response to social media discourse, reinforcing the bidirectional nature of CSR communication.

4 | Proposed Method

With the rise of Web 2.0, the number of online users expressing opinions and sharing content has significantly increased. Online social networks like Facebook and Twitter play a crucial role, enabling users to share text, images, videos, and audio while interacting with each other. These platforms, characterized by vast amounts of real-time information, have facilitated the development of social media opinion mining (SOM), which extracts opinions from user-generated content, surpassing traditional market research tools such as surveys and questionnaires (Balazs and Velásquez 2016).

Twitter, in particular, is an optimal platform for content analysis (Cortis and Davis 2021).

The methods used to respond to our research questions integrated the approaches of several authors, who focused on only one or a few steps, into one comprehensive procedure (Cortis and Davis 2021; Loureiro and Alló 2020; Marchi et al. 2022; Schallehn and Valogianni 2022). We developed a procedure to assess whether geolocated tweets are positive, negative, or neutral, identify which dimensions of CSR are most commented on, and on which topics stakeholders are most sensitive, to align the CSR activities carried out by a firm with the affective needs of the stakeholders involved.

The method has three phases (Figure 2). In the first phase, we collect and store the stakeholders' tweets about CSR. In the second phase, we clean and treat the relevant CSR tweets. Finally, in the third phase, we perform explorative analysis, sentiment analysis, and topic modeling on the tweets.

4.1 | Phase 1: Data Collection

Twitter, an extremely popular microblogging platform, ranks among the top three social media platforms utilized by firms for sharing information and engaging with stakeholders (Cuervo-Carabel et al. 2023), and it remains a widely used source in Social Opinion Mining (SOM) studies due to the volume and diversity of user-generated content. While Twitter historically offered easy access to data through its APIs, recent policy changes (as of December 2023) have introduced limitations and paid tiers for data access. Nevertheless, its real-time nature, short-format content, and demographic variety continue to make it a valuable platform for analyzing public opinion (Cortis and Davis 2021).

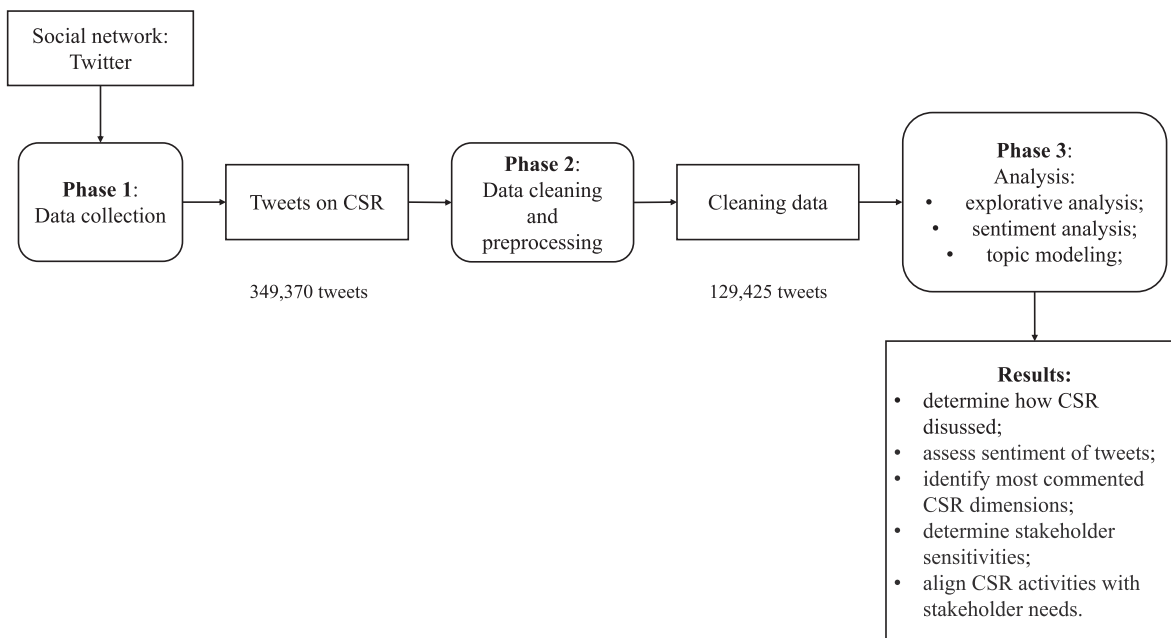


FIGURE 2 | Procedure.

All the collected tweets⁴ are written in Italian and published between 21 March 2006 (the day when the first tweet was posted) and 31 December 2022.

Python software was used to download the tweets, and the Twitter APIs were used to obtain all the information that users chose to share publicly, such as username, location, language, geolocation, presence of hashtags, *like* number, and retweets.

In line with existing literature (Loureiro and Alló 2020; Okazaki et al. 2020; Park et al. 2014), our keyword selection adhered to the following criteria:

- words related to CSR;
- words previously used in the literature for this type of study on CSR;
- systematic literature review about CSR;
- words associated with hashtags commonly used in relation to CRS discussions.

The resulting keywords are: Corporate Social Responsibility; *Responsabilità Sociale d'Impresa*; *Responsabilità d'Impresa*; *Impresa responsabile*; *Impresa sociale*; *Impresa etica*; *Business sostenibile*; *Business responsabile*; *Cittadinanza d'impresa*; *Etica d'impresa*; Environmental Social Governance; ISO 26000; SA 8000; Accountability Principles Standard 1000; *Bilancio sociale*; *Bilancio ambientale*; *Bilancio di sostenibilità*; *Bilancio sostenibile*; *Report di sostenibilità*; *Dichiarazione non finanziaria*; *Rendicontazione non finanziaria*.

To collect as many relevant tweets as possible and ensure representation, researchers also considered acronyms (such as CSR, RSI, and ESG) and plurals.

The total number of tweets downloaded is 349,370.

4.2 | Phase 2: Data Cleaning and Preprocessing

A preliminary analysis shows that the database contained elements of noise, including tweets written in non-Italian languages. For this reason, the data has been preprocessed to eliminate content that is not relevant to the study. After the cleaning process, 345,324 tweets remained.

The next step was the geolocation of tweets (Nguyen et al. 2018). Reference has been made to the *author.location* information, which is the place where the user claims to live and not the momentary location where he/she is when he/she posts a tweet. Latitude and longitude data and country code were obtained. Tweets with a country code other than “it” were deleted, and, for the remaining tweets, the corresponding Italian region was obtained.

Algorithms only support English texts, so tweets have been translated using the *deep_translator* Python library and using its *GoogleTranslator* function. Noise elements such as “n,” “-,” “_,” “/,” “&,” and “amp” have been removed for the correct translation.

Only tweets from 2012 to 2022 were analyzed because the years between 2006 and 2011 had a too low a number of tweets. The total number of Italian tweets geo-located from 2012 to 2022 is 129,425.

To verify that the geolocalization process did not introduce distortions into the data, we compared the temporal distributions of tweets between the geolocalized sample and the initial universe using two statistical tests (i.e., Kolmogorov–Smirnov and Mann–Whitney *U*). The results of all tests showed *p* values greater than 0.05, indicating no significant differences between the two distributions, confirming that the geolocalized sample is representative of the initial universe.

4.3 | Phase 3: Analysis

4.3.1 | Exploratory Analysis

Due to the versatility of tweets, a wide range of exploratory analyses are conducted. Precisely, we quantify the number of tweets made within a given year, day, and region. Examining the dates with the highest tweet activity is crucial, as these peaks may correspond to significant events related to the topic. Effective visual representations, such as word clouds⁵, help explore the primary discussion topics (Barbeito-Caamaño and Chalmeta 2020; Müller-Hansen et al. 2022). To this end, we grouped the 10 most active Twitter accounts into five stakeholder categories based on an inductive manual coding process. Classification was carried out by analyzing public metadata associated with each account, such as the username, biography, institutional affiliation, and self-declared role. The five categories are as follows (Kujala et al. 2022; Viglia et al. 2018; Lindgreen et al. 2017): (1) Media and information platforms, accounts belonging to newspapers, online magazines, news aggregators, and thematic media channels specialized in sustainability or CSR. (2) Training and educational institutions, including universities, research centers, professors, and educational programs in the field of CSR and sustainability. (3) Associations and federations, such as trade associations, NGOs, professional networks, and CSR coalitions. (4) Activists, individuals or collectives that promote CSR themes through advocacy, public commentary, or grassroots mobilization. (5) Consulting, firms and professionals offering strategic advice, CSR reporting support, or sustainability consulting. This categorization reflects the diversity of actors shaping the CSR discourse in Italy and provides a structured lens through which to analyze stakeholder dynamics in the digital public sphere.

4.3.2 | Sentiment Analysis

Sentiment analysis is the computational study of people's opinions, attitudes, and emotions toward an entity, which can represent individuals or arguments (Medhat et al. 2014). By applying natural language processing and text analysis techniques, sentiment analysis aims to identify and extract subjective information from the text and classify its polarity, which can be positive, negative, or neutral (Hussein 2018).

Our paper used RoBERTa, an unsupervised machine learning model that acquires knowledge and experience for classification from a training set of data not labeled from different domains (Liu et al. 2019; Loureiro et al. 2022). These domains are: *BooksCorpus*, 800 million words; *English Wikipedia*, 2500 million words; *CC-NEWS*, 63 million English articles scanned between September 2016 and February 2019; *OPENWEBTEXT*, web content extracted from URLs shared on Reddit⁶; *STORIES*, a subset of data from CommonCrawl⁷. The initial model had been retrained eight times, adding 4.2 million tweets each time. RoBERTa is one of the best-performing models for the realization of sentiment analysis⁸ (Loureiro et al. 2022) and divides sentiment into three categories: positive, negative, and neutral (Batra et al. 2021).

As a further analysis, we calculated the positive comparative advantage index (Hoen and Oosterhaven 2006). It was calculated

by considering in the numerator the ratio between the number of tweets classified as positive made in a region and the sum of positive and negative tweets made in the region and, in the denominator, the ratio between positive tweets made in Italy and positive and negative tweets made in Italy. When the value is greater than 1, the attitude in an Italian region is more positive than in Italy in general. Conversely, when it is less than 1, it is more negative than in Italy in general.

4.3.3 | Topic Modeling

Topic modeling is a set of unsupervised machine learning techniques designed to identify the topics prevalent within a corpus of documents (Vayansky and Kumar 2020). The topic model used for our study is Latent Dirichlet Allocation, which is a hierarchical three-level Bayesian model (i.e., documents, arguments, and words) that, in input, provides a collection of text documents and, in output, returns several groups of words, each of which represents an accurate and consistent topic (Blei et al. 2003; Churchill and Singh 2022). Documents are considered a probabilistic distribution of arguments, and arguments are considered a probabilistic distribution of words (Messaoudi et al. 2022). Latent Dirichlet Allocation is based on the Bag Of Words approach, where the exact ordering of terms in a document is ignored, but the frequency of occurrence of each term is considered an important factor (Berry et al. 1999). This means that the words of a document are not all equally important, and to each word of the document, the model assigns a weight that depends on the number of occurrences in the document (Kherwa and Bansal 2018). In our study, topic modeling aimed to identify the three dimensions of CSR (i.e., environmental, social, and economic).

A new text cleanup was done, eliminating punctuation marks, usernames, links, double spaces, and making all characters lowercase.

With the goal of getting the two main inputs of the model, dictionary, and corpus, each tweet was broken down into individual words (i.e., tokenization). We recorded the words to insert as lemmas in the dictionary, focusing solely on names, adjectives, verbs, and adverbs. Instead, to create the corpus, an ID (*word_id*) was associated with each unique term of the text, and its frequency of occurrence (*word_frequency*) was determined.

Another key aspect of the Latent Dirichlet Allocation model is choosing the number of topics to consider. There must be the right compromise between topic number and topic coherence value. The *topic coherence* C_v is a metric specially developed for the evaluation of the goodness of the topics produced by the model (Röder et al. 2015). To identify the optimal number of topics, we employed a Grid Search procedure that systematically tested various configurations of the Latent Dirichlet Allocation model by varying the number of topics, as well as the Dirichlet hyperparameters α (document–topic density) and β (topic–word density). The optimal model is based on the highest topic coherence C_v (Rkia et al. 2024; Egger and Yu 2022).

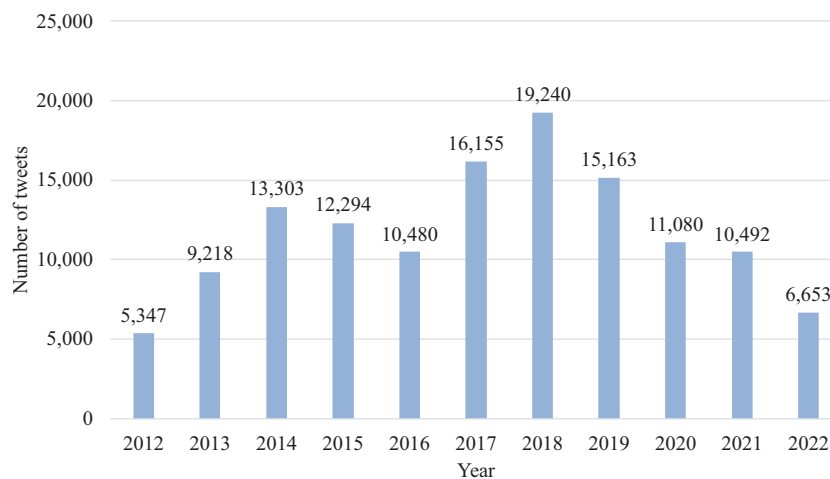


FIGURE 3 | Number of tweets per year, 2012–2022.

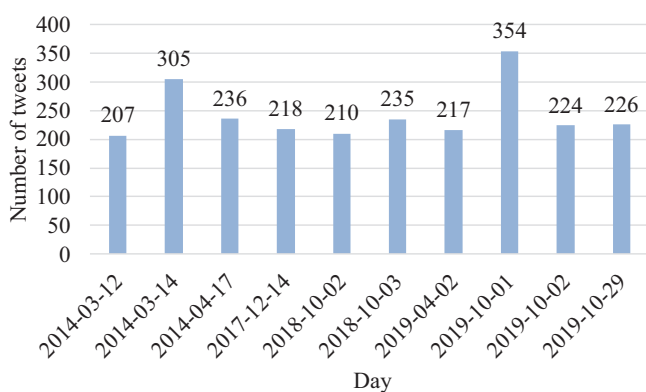


FIGURE 4 | Day with the highest number of tweets, 2012–2022.

5 | Results and Discussion

In response to [RQ1](#) and [RQ2](#), we conducted a wide range of exploratory analyses. First, we quantified the number of tweets made within a given year (Figure 3), day (Figure 4), and region (Figure 5).

The peak occurs in 2018 (19,240 tweets), while 2012 and 2022 are the years with the lowest number of tweets (5,347 and 6,653 tweets, respectively) (Figure 3). The trend fluctuates over time: after a strong initial growth, periods of increase and decline alternate, without a specific reason.

Figure 4 shows how specific events significantly influenced tweet volumes. For example, in early October the CSR and Social Innovation Exhibition (CSRIS) took place, in which 216 organizations, including businesses, non-profits, public bodies and startups, participated. The CSRIS is the main event in Italy dedicated to the themes of CSR and social innovation, contributing to the diffusion of the culture of social responsibility and offering opportunities for updating and facilitating networking between the various social actors. Between September and mid-October 2019, the hashtag #CSRIS19 was the third trending on Twitter. On 1 March 2014 the conference “Social enterprise: a chance for work and development” was held, organized by VITA and Bocconi University to delve into the aspects of the

draft laws prepared for the Chamber and Senate which had the aim of adapting the legislation introduced by Legislative Decree 155/06 to the new economic-social context and the guidelines of the European Union on the subject of social economy and social entrepreneurship, and to reflect on the actions that the various subjects should have implemented so that the reform hypotheses are effective, producing effects in terms of development with employment.

These two examples help us understand how important it is to organize specific CSR events to generate awareness. These events function as catalysts for digital stakeholder engagement, confirming previous findings that CSR communication is not continuous but intensifies during moments of public attention (Colleoni 2013; Pilgrim and Bohnet-Joschko 2022). From a stakeholder theory perspective (Freeman 2010; Kujala et al. 2022), these dynamics highlight how stakeholders, particularly institutional actors, advocacy groups, and informed citizens, use digital platforms to voice their concerns and expectations around CSR in conjunction with high-visibility events. The peaks correspond to occasions where stakeholders perceive a “window of influence” and actively seek to participate in shaping the discourse, consistent with the view that stakeholders are not passive recipients but co-creators of meaning. At the same time, legitimacy theory (Suchman 1995; Colleoni 2013) helps explain why firms and institutions intensify their CSR communication during these events. CSR-related tweeting is not only informative but often strategically aligned with efforts to gain or maintain social legitimacy by signaling alignment with societal expectations.

Figure 5 represents the number of tweets made in each Italian region and the number of tweets divided by the thousands of people who use online social networks. The regions where people tweet the most are *Lombardia*, *Lazio*, and *Emilia Romagna* whether considering the value in absolute terms or relative to population density.

These geographic variations reflect socio-economic differences across Italian regions and align with previous studies (Schallehn and Valogianni 2022) that emphasize the role of regional context in shaping CSR practices and digital communication. More

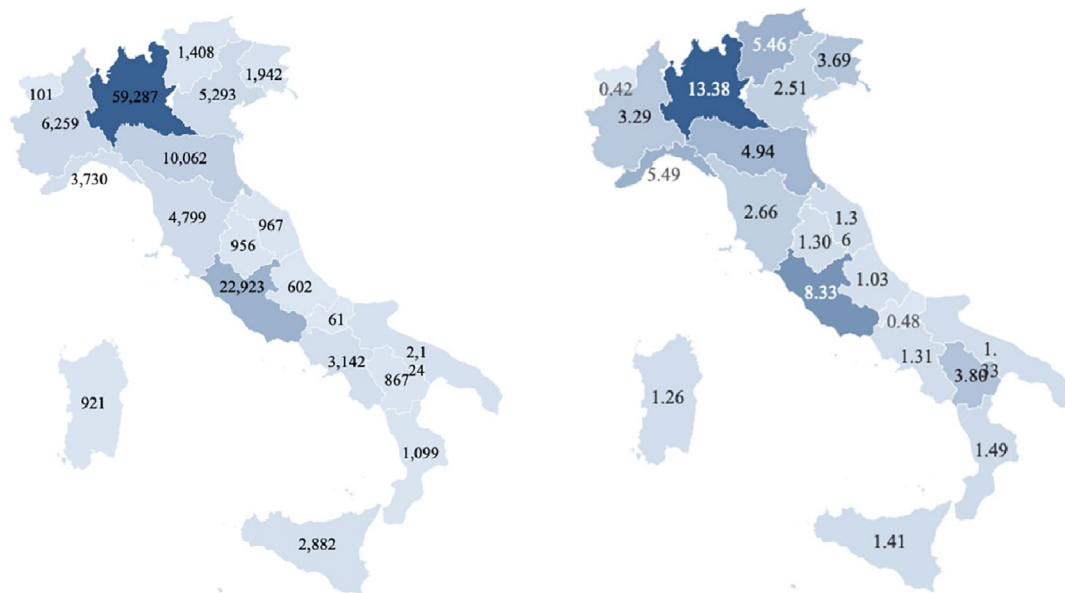


FIGURE 5 | Number of tweets for each region and number of tweets divided by the thousands of people who use online social networks, 2012–2022.

industrialized and institutionally dense regions are not only more active economically but also act as discursive hubs for CSR dialogue. From a stakeholder theory perspective (Freeman 2010), these findings suggest that stakeholders in these regions have both greater capacity and incentive to influence CSR narratives. Stakeholder engagement is here revealed not as uniform but as territorially contingent.

A word cloud was built to identify the most used words in tweets (Figure 6). The most used words are “sustainability,” “social enterprise,” and “social responsibility,” followed by other significant terms such as “esg,” “firms,” and “development.” Words align closely with these terms, indicating focused discussions. These words define the macro-topic and consider it an opportunity for firms and their business. No terms with a negative perception are identified. These results suggest that Twitter users in Italy frame CSR primarily in relation to opportunity and progress, echoing earlier observations by Amin et al. (2021) and Loureiro and Alló (2020) about the optimistic and opportunity-driven tone of CSR discourse on social media. Notably, no keywords suggest resistance, critique, or negative sentiment. According to legitimacy theory (Suchman 1995; Colleoni 2013), such discourse can be interpreted as a means by which stakeholders signal alignment with prevailing social norms around sustainability. The absence of adversarial or critical language implies a relatively high degree of normative consensus, which may reflect how CSR is being used not just for engagement but also to reinforce institutional legitimacy, especially among actors seeking to showcase compliance, innovation, or ethical alignment.

Similarly, we decided to identify the most used hashtags in tweets. Figure 7 represents this word cloud, which confirms what was deduced from the previous word cloud.

Finally for RQ2, we identify the most active stakeholders. The authors that publish the most on CSR in Italy can be classified into different categories of stakeholders, each with its own

specificity and role within the sustainability ecosystem: media and information platforms⁹, training and educational institutions¹⁰, associations and federations¹¹, consultancy¹², and activists¹³ (Figure 8).

This typology, consistent with digital stakeholder engagement frameworks (Kujala et al. 2022; Viglia et al. 2018; Lindgreen et al. 2017), reveals the plurality of actors shaping CSR discourse in Italy.

These five categories of stakeholders represent the fundamental pillars for the dissemination and implementation of CSR in Italy. Media and information platforms play a crucial role in raising awareness and providing up-to-date and relevant information; they are the category that tweets the most and thus have the greatest resonance and visibility. Associations and federations create a support and promotion network for CSR practices, and they are the second category in terms of the number of tweets. Training and educational institutions contribute to professional growth, training new generations of leaders and professionals in the field of sustainability, and they are the third category for the number of tweets. Activists are the faces of change, inspiring and driving the adoption of sustainable practices, and they are the fourth category for the number of tweets. Finally, consulting will provide the necessary strategic support to firms.

Taken together, these findings demonstrate that CSR discourse on Twitter in Italy is not just a mirror of firm strategies but a complex field of distributed legitimation, where actors seek to define, negotiate, and reinforce acceptable norms and expectations through visible digital practices.

5.1 | Sentiment Analysis Results

In response to RQ3, Figure 9 shows the results of the sentiment analysis that reveal the stakeholder's emotions for the 10 years considered. For all years, neutral tweets have dominated,

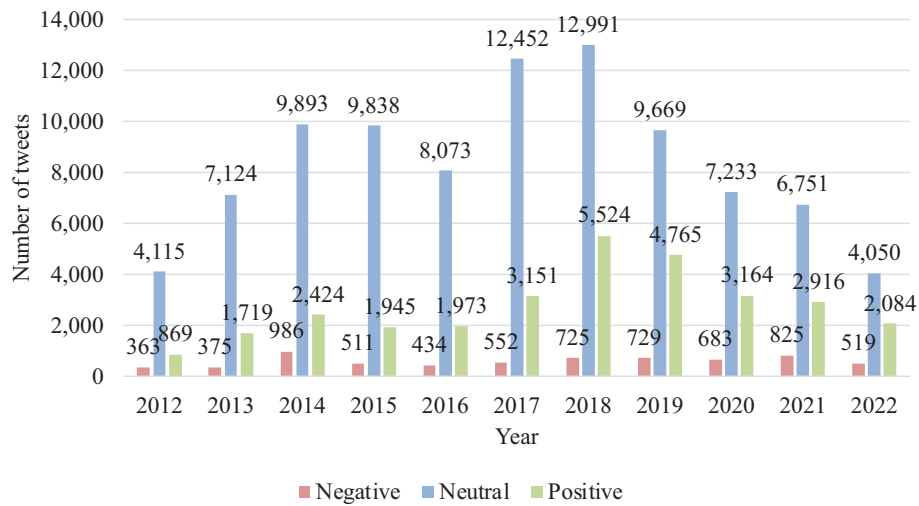


FIGURE 9 | Results of the sentiment analysis, 2012–2022.

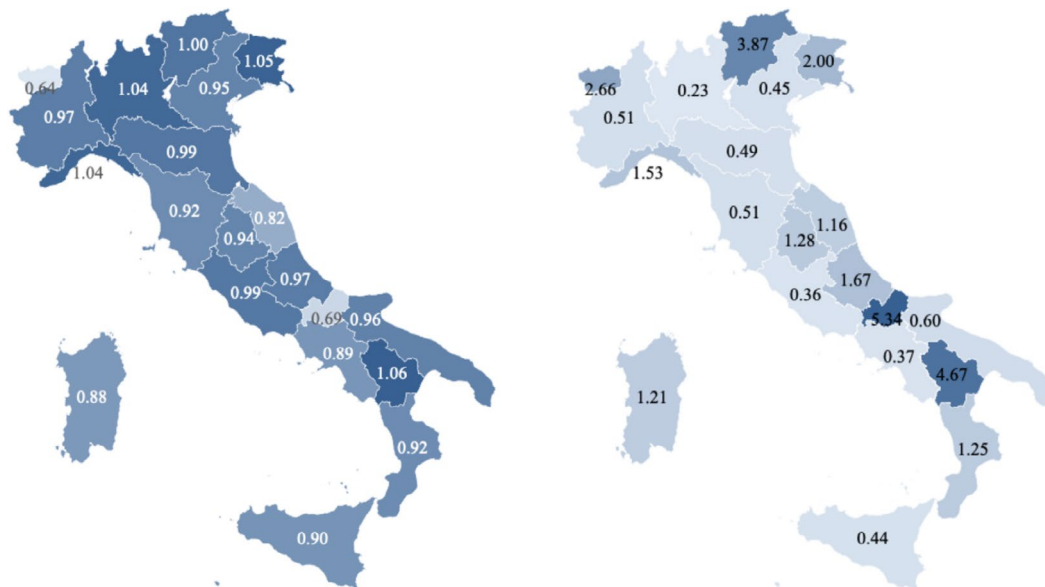


FIGURE 10 | Comparative advantage index for each region and comparative advantage index divided by the millions of inhabitants who use social media for each region, 2012–2022.

Italian public opinion, the most important CSR dimension is environmental (20.68% of tweets), followed by social (12.28% of tweets) and economic (12.24% of tweets). These findings align with studies by Colleoni (2013) and Amin et al. (2021), which observe that CSR discourse on social media tends to favor forward-looking and strategic themes. From a legitimacy theory perspective, the emphasis on innovation and environmental topics reflects efforts to align with globally accepted sustainability standards and a performance-oriented narrative.

Figure 12 presents the sentiments associated with each of the five identified topics. RoBERTa classifies most tweets as neutral for all the topics identified. Specifically, for the topic *CSR as a source of innovation*, neutral tweets are much greater than positive and negative tweets. Negative tweets are reduced for all topics; for

TABLE 1 | Topic titles.

Topic number	Topic title	CSR dimension
1	Sustainable investing and finance	Economic dimension
2	Ethical work	Social dimension
3	Communicating sustainability	General
4	Environment as a corporate strategy	Environmental dimension
5	CSR as a source of innovation	General

topics *Communicating sustainability* and *Environmental as a corporate strategy*, they are almost zero.

In response to RQ3, as already emerged, the dominance of neutral tweets suggests that users may be engaging with these topics more informatively and analytically rather than expressing strong emotions. This indicates a more mature discourse around CSR topics, where users prefer to share information and insights rather than polarized opinions.

The topic *Ethical works* stands out as an exception, with some negative tweets. The trend can be attributed to the inherently sensitive and controversial nature of ethical discussions, which often provoke strong emotional responses. Ethical issues tend to elicit negative emotions due to the moral implications and potential controversies surrounding unethical practices. Users might express dissatisfaction or criticism when discussing ethical lapses, reflecting the high emotional stakes involved. As noted by Freeman (2010), ethical expectations are a key driver of stakeholder reactions, and negative sentiment here reflects public scrutiny toward corporate behavior in sensitive areas.

Conversely, positive tweets are more frequent for the topic *CSR as a source of innovation*. The forward-looking and optimistic nature of innovation might drive the trend. Discussions around innovation often evoke positive sentiments, as they are associated with progress, future possibilities, and advancements that can bring about positive change. Users are likely to express

enthusiasm and support for innovative practices within CSR, viewing them as solutions to current challenges and as steps toward a better future. This confirms what prior literature suggests: innovation is widely perceived as a promising and engaging aspect of CSR, associated with opportunity, future orientation, and change (Radwan and Russo 2024).

The minimal presence of negative tweets for *Communicating sustainability* and *Environmental as a corporate strategy* suggests that these topics are generally perceived positively or neutrally. Such behavior could imply that users acknowledge and support efforts in these areas or that they discuss these topics more factually without strong emotional reactions. The almost zero negative sentiment in these areas could indicate a broad acceptance and approval of sustainability initiatives and environmental strategies as firm norms.

Understanding these sentiment trends is crucial for firms when crafting their communication strategies. For instance, the higher negative sentiment around ethics indicates that firms should approach ethical discussions with sensitivity, transparency, and a focus on addressing concerns to mitigate negative perceptions. On the other hand, leveraging the positive sentiment around innovation can help promote CSR initiatives that highlight innovative solutions and future-oriented projects, thereby gaining greater public support.

Furthermore, neutrality suggests that providing balanced, informative content is key to engaging users in meaningful discussions.

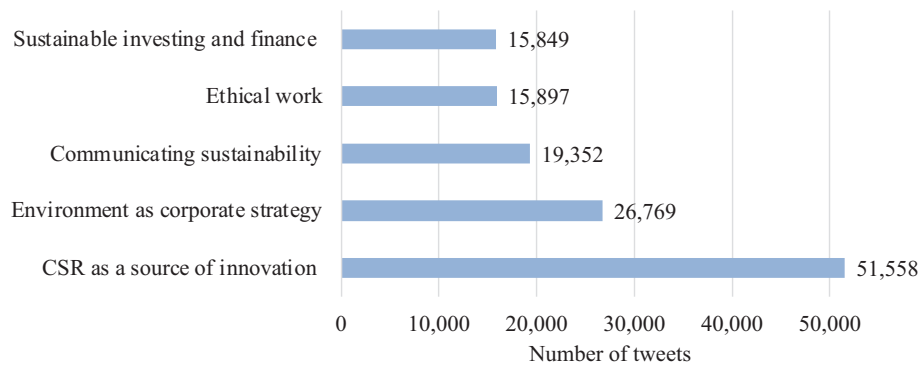


FIGURE 11 | Results topic modeling, 2012–2022.

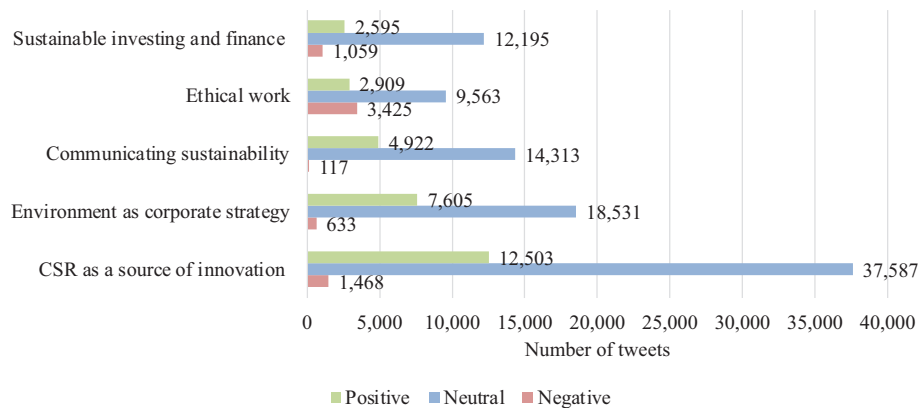


FIGURE 12 | Crosses the results of Sentiment Analysis and Topic Modeling, 2012–2022.

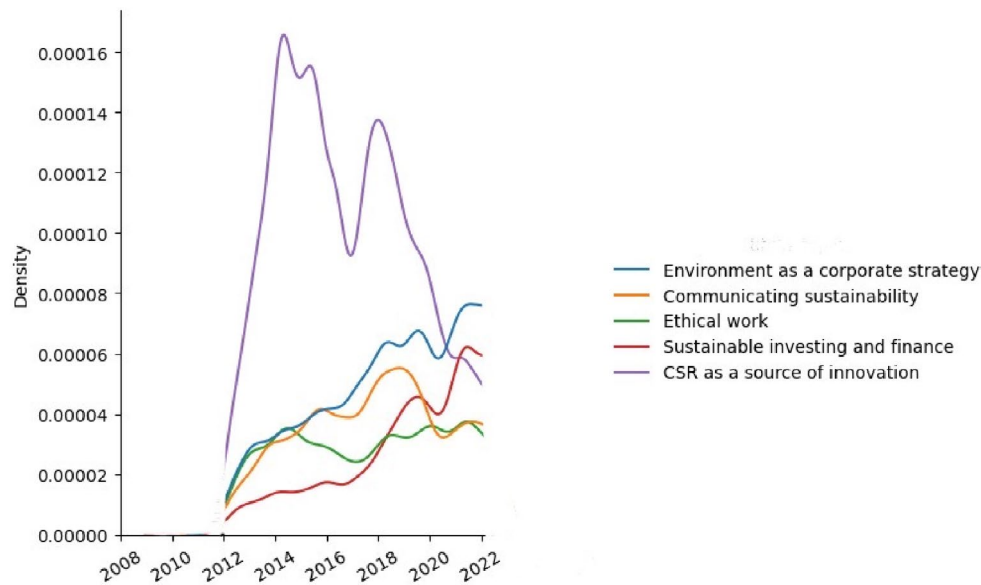


FIGURE 13 | Evolution over time of the topics, 2012–2022.

Firms can capitalize on this by sharing detailed reports, case studies, and factual information that encourage thoughtful discourse.

In response to RQ5, Figure 13 shows the evolution over time of the topics obtained by tracing their distributions by estimating the Kernel density¹⁴. Topic *CSR as a source of innovation* was the most discussed until 2020. After reaching its maximum peak in 2014, it followed a fluctuating and decreasing trend of discussion, which led it, in 2021, to be overtaken by the topic *Environmental as a corporate strategy* and the topic *Sustainable investing and finance*, characterized by a growing trend of discussion. This shift likely mirrors growing awareness of climate change and sustainable finance regulations (see EU Green Deal; Barbeito-Caamaño and Chalmeta 2020).

Topic *Ethical work* has an almost constant trend. Despite the continuous trend, ethical work consistently provokes negative sentiments, as noted previously. Constancy suggests that ethical concerns remain a steady focus, potentially due to the constant challenges and controversies associated with maintaining ethical standards in the workplace, as part of a long-term legitimacy strategy (Suchman 1995). Topic *Communicating sustainability* presents an increasing trend up to the maximum peak in 2018, with a consequent reduction.

Firms should take note of the rising interest in environmental strategies and sustainable finance and align their initiatives to meet the growing demand for sustainable practices. Adaptation is crucial for staying relevant and addressing stakeholders' evolving priorities. Given the steady interest in this topic, maintaining a consistent focus on ethical work is also essential. Transparent and ethical practices should remain at the core of firms' strategies. By proactively addressing ethical concerns, firms can help mitigate negative sentiments and build trust with their audience.

The peak in discussions in 2018 indicates that strategic moments can significantly boost engagement. Identifying and leveraging such moments can maximize impact, helping firms to convey their sustainability efforts and achievements effectively.

Lastly, despite the decline in discussions around CSR innovation, the importance of innovation within CSR remains crucial.

Firms should explore new areas within CSR innovation to reignite interest and stay ahead of emerging trends.

Finally, in response to RQ5, Figure 14 shows the percentage of presence of each topic for each area of Italy: North, Centre, South, and Islands. The prevalent topic in all geographical areas is *CSR as a source of innovation*. In the North and Centre, the most popular CSR dimension is the environmental one (21.88% and 19.84% respectively), while in the South and in the Islands, it is the social one (14.78% and 17.41% respectively). The social dimension is the least popular in the North (11.24%), while the Centre, the South, and the Islands are less interested in the economic dimension of CSR (8.54%, 5.86%, and 5.42%, respectively). Recent events concerning the conditions of laborers in the agricultural sector have brought attention to ethical work practices in the Islands. Reports of exploitation and poor working conditions for farmworkers have highlighted significant ethical concerns that need to be addressed. Context underscores the importance of ethical work as a critical aspect of CSR in the Islands. Given these recent developments, the focus on ethical work in the Islands is particularly pertinent.

These differences reflect regional stakeholder priorities, consistent with stakeholder theory's emphasis on context-specific expectations (Freeman 2010; Schallehn and Valogianni 2022).

6 | Managerial, Policy Implications and Conclusion

Our study has important managerial implications. Social media data analysis enables firms to understand CSR-related dynamics and stakeholder perceptions, reinforcing previous findings on the role of digital engagement in stakeholder theory (Okazaki et al. 2020; Radwan and Russo 2024). This helps tailor CSR strategies to local emotional needs and expectations, improving

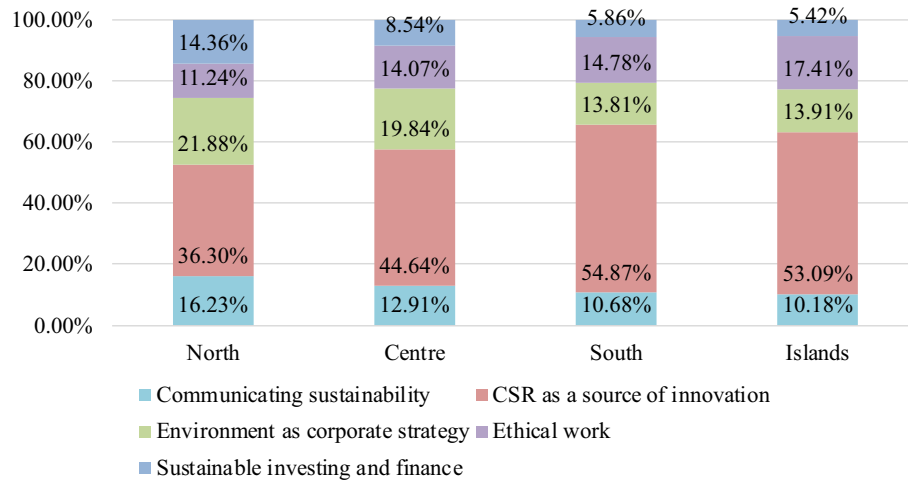


FIGURE 14 | Percentage presence of each topic for each area of Italy, 2012–2022.

stakeholder relationships and legitimizing firms, in line with legitimacy theory, which highlights the importance of aligning firm actions with societal expectations to maintain credibility (Bonsón and Bednárová 2015; Colleoni 2013; Radwan and Russo 2024). Analyzing content on Twitter can help firms align with stakeholder interests by engaging in a true bidirectional dialogue (Barbeito-Caamaño and Chalmeta 2020). Knowing the most discussed and sensitive CSR topics allows firms to adapt and improve their CSR activities to better respond to their stakeholders' concerns and desires. Also, CSR communication via social media helps firms gain legitimacy and foster stakeholder trust (Bonsón and Bednárová 2015). Sentiment analysis of social media conversations helps firms better understand public opinion and engage stakeholders more effectively, creating constructive and targeted dialogue. Furthermore, through social media, people can influence the goals or survival of the firm, creating a valid relationship with it, and their claims must be addressed quickly. Prior studies indicate that firms need to manage stakeholder relationships dynamically through continuous engagement on digital platforms (García-Sánchez et al. 2022; Pizzi et al. 2021). These analyses provide managers with concrete information for informed decision-making. They can guide the firm in identifying priority areas of focus.

In particular, we show how specific events significantly influenced tweet volumes. Firms should leverage key events to boost awareness and engagement in CSR. Hosting annual or biannual events could create regular peaks in discussions, keeping the topic of CSR in the public eye. Previous studies on CSR discourse in digital environments are consistent and suggest that while CSR topics generate discussion, they often do not provoke extreme emotional reactions (ElAlfy et al. 2024).

We identify the regions with the highest tweet volumes and the ones with strong positive sentiments when adjusted for population. Regional initiatives by firms could be tailored based on the level of engagement and sentiment towards CSR. For instance, firms might target regions with higher positive sentiments for pilot projects or sophisticated CSR programs, while regions with lower engagement might gain from awareness campaigns and introductory initiatives. Geographical differentiation supports prior findings that CSR engagement is not uniform

across regions but depends on local economic and social factors (Schallehn and Valogianni 2022).

We found the most frequently used words, indicating focused discussions. Firms should align their messaging with these key terms to resonate with the audience. Developing content and campaigns around these topics can enhance engagement. Moreover, monitoring trending hashtags can help in adjusting real-time communication strategies to stay relevant. Prior research shows that CSR communication on social media tends to cluster around key themes, such as sustainability, ethics, and corporate governance (Pizzi et al. 2021; Schallehn and Valogianni 2022).

Media and information platforms, training and educational institutions, associations and federations, consultants, personalities, and activists have significant roles in CSR discourse. This reflects the broader trend in stakeholder engagement, where non-firm actors play an increasingly critical role in shaping CSR narratives (Kujala et al. 2022). Firm collaboration with these subjects can amplify CSR messages. Strategic partnerships for content creation, joint events, and educational programs can leverage their established credibility and audience reach. Additionally, identifying and nurturing new influencers in regions with lower engagement could help broaden the impact.

Thanks to sentiment analysis, we found that neutral sentiments dominate, with positive sentiments following, while negative sentiments are minimal. Generally, CSR topics generate discussion, and they often do not provoke extreme emotional reactions (ElAlfy et al. 2024; Schallehn and Valogianni 2022). The predominance of neutral sentiments suggests a need for firms to create more compelling and emotionally engaging content to shift perceptions positively. Storytelling that highlights the tangible benefits and success stories of CSR initiatives can foster more positive sentiments. Also, addressing any emerging negative perceptions promptly can prevent them from gaining traction. An informative and fact-based approach to communication should be considered, as audiences tend to respond better to educational and informative content (Barbeito-Caamaño and Chalmeta 2020). Furthermore, understanding that the audience shows a tendency towards neutrality can help manage

expectations regarding emotional responses to published content. Firms' communication campaigns, therefore, should be designed accordingly. Finally, it is important to continue monitoring sentiment to identify any changes over time. Even if no significant trends emerge at present, the context and audience perceptions may evolve.

The social and economic dimensions are less discussed topics. The focus on innovation indicates a forward-looking perspective on CSR. However, it is necessary to balance this focus with more discussions on the social and economic dimensions to ensure a holistic approach. Programs that highlight social impacts and economic benefits of CSR could help. The North and Center of Italy focus more on environmental dimensions, while the South and Islands prioritize social dimensions. The geographic disparity in CSR discourse reflects the different socio-economic realities of these regions, supporting findings that CSR engagement varies based on local economic structures and industry presence (Schallehn and Valogianni 2022). CSR strategies should be region-specific, addressing the predominant concerns and interests of each area. For instance, environmental initiatives might gain more traction in the North and Center, whereas social initiatives could be more impactful in the South and Islands. Tailoring CSR activities to regional priorities can enhance their effectiveness and community acceptance, as suggested by stakeholder theory (Freeman 2010).

Our study also has important policy implications (García-Sánchez et al. 2022; Radwan and Russo 2024). The information gathered can be used to develop policies that support and promote CSR based on an in-depth understanding of citizens' opinions and needs. Prior studies have highlighted that public opinion plays an important part in determining effective CSR policies, as regulatory frameworks that align with societal expectations tend to be more impactful (Michelon and Rodrigue 2015). By knowing the most relevant and discussed dimensions of CSR, policymakers can promote the most effective and sustainable CSR practices within communities and firms. Furthermore, the results of the analysis provide an empirical basis for monitoring and evaluating the impact of CSR policies, enabling policymakers to make evidence-based and up-to-date changes. Governments can adopt subsidized tax policies, tax breaks, or other financial incentives to promote the adoption of CSR practices by firms. Empirical studies suggest that financial incentives play a significant role in encouraging firms to integrate CSR into their firms' strategies, particularly in industries with high environmental and social impacts (Radwan and Russo 2024). Using the results of our study, policies can be designed to target areas of greatest stakeholder sensitivity and interest. Public policies can promote education and awareness of CSR issues, both among firms and the general public, with the aim of increasing positive sentiment about CSR among the population. Some examples are awareness campaigns, training programs for businesses, and the inclusion of CSR in school and university curricula. Governments can promote collaboration between the public and private sectors to address social and environmental challenges, starting with the results of SOM. Policies that facilitate dialogue and cooperation among stakeholders can foster the development of shared and sustainable solutions to address CSR issues. This aligns with stakeholder theory, which highlights that multi-sector engagement leads to more legitimate and widely accepted CSR practices (Freeman 2010).

Policymakers should use significant events related to the firm's activity to increase participation and knowledge of CSR. Studies indicate that CSR discussions tend to peak around key events, suggesting that strategic timing in policy initiatives can maximize engagement (ElAlfy et al. 2024). Organizing yearly or biannual events could spark conversation at regular intervals and maintain CSR in the public discourse. Event planners should consider digital campaigns to ensure that engagement continues after the events.

Depending on the degree of participation and attitude toward CSR, regional programs could be customized. For instance, advanced CSR programs or pilot projects may be directed toward areas with stronger favorable feelings, while awareness campaigns and introduction activities may be more beneficial for regions with lesser engagement. Also, because neutral feelings are so common, policymakers can encourage the creation of more interesting and emotionally powerful CSR content by encouraging stories that show how CSR projects have helped people in real ways. This can help shift perceptions more positively and increase engagement. Previous research on CSR communication strategies highlights the effectiveness of emotional appeals in increasing engagement and public trust (Farache et al. 2018).

Finally, as innovation in CSR is a much-discussed topic, it is important to balance the focus on innovation with discussions on the social and economic dimensions of CSR by promoting programs that highlight the social impacts and economic benefits of CSR initiatives.

Given the relevance of CSR in today's world and the significant economic and social implications it can bring to firms that implement it, it is important to know how stakeholders stand on the topic. Our article contributes to this direction, developing a Social Opinion Mining study on Italian tweets between 2012 and 2022. Twitter, being an extremely popular microblogging platform with millions of users sharing millions of personal posts daily, provides an extremely truthful view of a large range of stakeholders' opinions.

Based on stakeholder and legitimacy theory, our paper extends current knowledge about the relationship between CSR and firms. The paper outlines a structured method for determining how CSR issues are discussed, assessing the sentiment of social media conversations, identifying the CSR dimensions that are most discussed and sensitive to stakeholders, and finally aligning a firm's CSR activities with the emotional needs of the stakeholders involved.

For future projects, consider extending the analysis to other States and developing a SOM framework at a European and global level. Comparing the results of different states could also be fascinating, as it would show and help understand how possible congruences or differences of opinion can derive from the culture and thinking of citizens belonging to different geographical areas. Moreover, the majority of studies lack a longitudinal approach. Although our study provides valuable insights, it represents only one contribution, leaving ample room for further investigation (Radwan and Russo 2024).

Another important aspect to consider is the detection of fake news related to CSR. With the increase in the use of social

media, more and more people are accessing news through these channels rather than traditional media. While this ensures low cost, easy access, and rapid dissemination of information, it can also lead to the spread of fake news, which has strong negative impacts on individuals and society.

Acknowledgements

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Endnotes

- ¹ Although there is no consistency in the CSR definition, CSR can be defined as the approach that encompasses the economic, legal, and ethical impacts and obligations of a firm towards society. Still, the Green Book states that *CSR is the voluntary decision to contribute to the advancement of society and environmental protection by integrating social and ecological concerns into business operations and interactions with stakeholders* (European Commission 2001).
- ² Stakeholders are any individual or group of individuals capable of influencing or being influenced by the achievement of corporate objectives (Freeman 1994). There are three important criteria for stakeholders to be considered salient: they must have the ability to affect the firm's aims or survival, they must have a valid relationship with the firm, and their claim on the firm must be addressed quickly (Mitchell et al. 1997). So, stakeholders are those groups or individuals the firm is trying to affect (Murray and Vogel 1997).
- ³ Suchman (1995) defines corporate legitimacy as a *generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions*.
- ⁴ Access to academic research has been requested. The service will allow users to download a maximum of 10 million tweets per month and provide advanced features designed to support research.
- ⁵ World cloud is a container of words, in the shape of Twitter icon, where the main words that make up the document are positioned, with the characteristic that the larger the font of a word, the more important it is in the document in question.
- ⁶ It is a social news, entertainment and forum website where registered users can publish content in the form of text posts or hyperlinks (www.reddit.com).
- ⁷ It is a non-profit firm that scans the Web and provides its archives and data sets to the public free of charge (www.commoncrawl.org).
- ⁸ Sentiment analysis has two distinct types of classifications. The first, binary classification, involves categorizing sentiment into positive and negative groups (Supriya et al. 2016). The second type, multi-class classification, allows for dividing sentiment into three categories: positive, negative, and neutral (Batra et al. 2021).
- ⁹ ETicaNews and VITA.it are two media and information platforms, specialized respectively in news on sustainable finance and corporate social responsibility, and in social and sustainability issues. These portals provide updated news, insights and analysis, helping to spread awareness and knowledge on CSR issues.
- ¹⁰ The School of Social Enterprise and AICCON fall into the category of training and educational institutions. The first is a training institution dedicated to the management of social enterprises and CSR, while AICCON promotes the culture of cooperation and non-profit through research and training activities, supporting professional growth in these sectors.
- ¹¹ Associations and federations such as Federsolidarietà IT, the Forum for Sustainable Finance, and Impronta Etica play a crucial role in

promoting sustainability and social responsibility. Federsolidarietà IT is a federation representing social cooperatives and social enterprises, while the Forum for Sustainable Finance promotes sustainable finance in Italy. Impronta Etica is an association that works to promote CSR and sustainability among firms.

- ¹² Chiappe Revello stands out in the field of consultancy and strategic support, offering consultancy services in the CSR and sustainability fields. Their activity is crucial for businesses seeking to integrate sustainability into their business strategies.
- ¹³ Activists such as Giuseppe Guerini and Davide Dal Maso represent leading figures in the field of CSR. Giuseppe Guerini, president of Federsolidarietà, is an activist known for his commitment in the sector, while Davide Dal Maso is an entrepreneur and promoter of sustainability and CSR.
- ¹⁴ A non-parametric way to estimate the probability density function of a random variable.

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under their personal responsibility that the article is the outcome of their common considerations.

Specifically:

1. **Introduction** is attributable to Chiara Leggerini and Mariasole Bannò
2. **Stakeholder Engagement and Legitimation in CSR Strategies** is attributable to Chiara Leggerini and Mariasole Bannò
3. **CSR Information and Stakeholders' Engagement With Social Media** is attributable to Chiara Leggerini
4. **Proposed Method** is attributable to Chiara Leggerini
5. **Results and Discussion** is attributable to Chiara Leggerini
6. **Managerial, Policy Implications and Conclusion** is attributable to Chiara Leggerini and Mariasole Bannò

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