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The impact of corporate reputation and social media engagement on the sustainability of SMEs: Perceptions of top managers and the owners

JEL Classification: L26; L14; O44; Q56

Keywords: *small and medium-sized enterprises (SMEs); corporate reputation; social media; enterprise sustainability; V4 countries*

Abstract

Research background: Small and medium-sized enterprises (SMEs) play a fundamental role in countries' economies. Currently, entrepreneurs are struggling not only with the uncertainty of the business environment, but also with high expectations for businesses to be run in a sustainable way. Therefore, the impact of corporate reputation and social media on sustain-

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ability is an area of interest for entrepreneurs. In this context, little research has been conducted on their perception of the linkage between these issues. Furthermore, there has been no direct explanation of the effects of SMEs' reputation and social media usage on their sustainable development, especially in the V4 countries.

Purpose of the article: This article defines, quantifies, and verifies the effects of corporate reputation and social media on sustainable development as perceived by SMEs' owners and top managers in the V4 countries.

Methods: Data were gathered in December 2022 and January 2023 using the computer-assisted web interviewing (CAWI) method. The survey was designed based on a literature review and experts' opinions. Respondents (top managers of SMEs, $n = 1090$) were asked questions on their firms' characteristics, reputation, social media usage and sustainable development. The linear regression modelling (LRM) was utilised to evaluate the hypothesis.

Findings & value added: The study revealed a strong relationship between owners' and top managers' perceptions of the importance of both corporate reputation and sustainable development in SMEs. The belief that social media supports the growth of companies' performance is related to the understanding of the concept of sustainable business development. Surprisingly, for the owners and top managers of SMEs in V4 countries, there was no relationship between the awareness of social media usage to share information with customers and partners and the understanding of sustainable business growth.

Introduction

Research conducted in the area of sustainable development has mainly been concerned with large economic entities (Smith *et al.*, 2022). Little attention has been paid to small and medium-sized enterprises (SMEs), despite this sector being the backbone of most economies and its potential combined, enormous impact on society.

SMEs in the European Union employ fewer than 250 people; their annual turnover does not exceed EUR 50 million or the annual balance sheet total does not exceed EUR 43 million (The Commission of European Communities, 2003). Among them, micro, small and medium-sized entities are considered to play a fundamental role in countries' economies (Smith *et al.*, 2022; Dvorsky *et al.*, 2022; Journeault *et al.*, 2021; Liñán *et al.*, 2020; Belás *et al.*, 2014; Borah *et al.*, 2022; Meluzín *et al.*, 2018; Belás *et al.*, 2021). SMEs comprise the majority of all businesses, often constituting more than 99% of all enterprises. They stimulate economic development and contribute to a significant portion of the gross domestic product. They contribute to the creation of an intensely competitive environment, which is important in terms of the quality of the products and services offered and the formation of prices in the market (Dzurikova & Zvarikova, 2023; Belás *et al.*, 2014).

SMEs result from entrepreneurial efforts. Prince et al. conducted an in-depth review of the literature and defined entrepreneurship as the readiness to create a business and take up and creatively solve new problems (Prince *et al.*, 2021). Entrepreneurship is the ability to use available resources, as well as to discover, evaluate, and take advantage of opportunities arising in the environment by taking actions that bring specific economic effects and create new value. Entrepreneurship is also acting under uncertainty because an enterprising person risks their reputation and livelihood.

The Visegrad Group (also known as the ‘Visegrad Four’ or simply ‘V4’) is an example of regional cooperation between the Central European countries. The V4 comprises Poland, the Czech Republic, the Slovak Republic and Hungary, which are connected by proximity, similar geopolitical conditions, a shared history and common traditions, cultures and values (Dvorsky *et al.*, 2022).

Nowadays, SMEs encounter challenges that are addressed by larger corporations through dedicated departments and advanced analytical tools (Lechuga Sancho *et al.*, 2021). As a result, the role of top managers and their perceptions is crucial for SMEs (Cantele & Zardini, 2020; Dvorsky *et al.*, 2022). In the world of social media, where corporate reputation plays a crucial role and sustainable development is imperative for stakeholders, SMEs’ owners and top managers must adeptly connect these facets to enhance their companies’ competitiveness within the market. In SMEs, contrary to larger firms, the influence of corporate reputation and the effective utilization of social media in fostering sustainable development hinges on the awareness and prioritization of these three critical dimensions by top management.

However, there is an obvious gap in the literature when it comes to the above-mentioned relationships. Previous studies have assessed the linkage between social media and corporate reputation (Floreddu *et al.*, 2014; Schaarschmidt & Walsh, 2020) as well as the impact of social media on corporate performance (Ainin *et al.*, 2015; Parveen *et al.*, 2015; Qalati *et al.*, 2022; Chatterjee & Kumar Kar, 2020; Halbusi *et al.*, 2022; Ahmad *et al.*, 2018; Tiwasing, 2021). Other studies have focused on the link between social media and innovation (Olanrewaju *et al.*, 2020; Rakshit *et al.*, 2022) or innovation and sustainable development (Zhang *et al.*, 2022). However, there is not enough research linking all of these factors together to directly explain

the effects of SMEs' reputation and social media on sustainable development (Borah *et al.*, 2022), especially when it comes to the V4 countries.

We built on extant literature in three ways, the first of which is the evaluation of three factors in one study, i.e., corporate reputation, social media and sustainable development. Second, we introduce a new approach based on owners' and top managers' perceptions. In our opinion, this approach turns out to be particularly important in the context of SMEs' specificity. Third, we focus on SMEs specifically in the V4 countries. Thus, our study extends previous research to provide original insights into the abovementioned relationships.

Taking into account the above research contributions, this article aims to define, quantify and verify the effects of corporate reputation and social media on sustainable development as perceived by SMEs' top managers in the V4 countries.

The paper is structured as follows. The literature review section presents the theoretical background regarding the sustainable development of SMEs, as well as the role played by reputation and social media. Section 2 describes the data collection process and methodology. Section 3 focuses on the presentation of the main results. Section 4 summarises and discusses the results of the study. The final section concludes the findings, limitations of the study and possible further research.

Literature review and theoretical background

Sustainable development of SMEs

The concept of sustainable development is defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Report of the World Commission on Environment and Development: Our Common Future, 1987). Sustainability primarily consists of three pillars: environmental, economic and social. Several adjectives, such as 'ecological', 'green' and 'blue', can also be found in the literature (Álvarez Jaramillo *et al.*, 2019; Matuszewska-Pierzynka, 2021; Kowalska & Bieniek, 2022; Dvorský *et al.*, 2023; Balcerzak *et al.*, 2023).

SMEs do not behave in the same way as large firms (Cantele & Zardini, 2020). For example, SMEs are distinguished by the specificity of their creations, functioning and development. Most often, SMEs are family business-

es that operate flexibly and efficiently and react quickly to changes in the market, thanks to decisions made immediately (Liñán *et al.*, 2020; Domańska & Zajkowski, 2022). The knowledge and experience of the owner, who is often a manager, largely determines its development (Dvorsky *et al.*, 2022; Bartoš *et al.*, 2015; uit Beijerse, 2000; Malkowska & Uhruska, 2022; Čera *et al.*, 2022). They often look for market niches in which they can actively operate, thus limiting competition. Owners of SMEs value economic independence very much, which means that they usually finance their businesses mainly using their own capital. It is worth noting, however, that many of these companies have very limited access to external sources of financing (Belás *et al.*, 2020; Kozubíková *et al.*, 2015; Love & Roper, 2015).

Smith *et al.* found that SMEs understand sustainable development through the prism of meeting the needs of the local community (Smith *et al.*, 2022). Ciemleja and Lace listed the factors affecting the sustainable development of enterprises: 1) income of buyers of products and services produced by the enterprise, 2) stability of the company's finances and positive profitability dynamics, 3) ecological approach to the business management process, 4) staff competencies and skills and 5) positive attitude of society towards the enterprise (Ciemleja & Lace, 2011). The latter factor constitutes, in fact, corporate reputation.

SMEs face internal (inside the company) and external barriers (independent of the company) to implementing initiatives related to sustainable development (Pizzi *et al.*, 2021; Smith *et al.*, 2022; Álvarez Jaramillo *et al.*, 2019). Based on an in-depth literature review, Álvarez Jaramillo *et al.* (2019) identified 175 barriers to sustainability for SMEs. The most frequently cited barriers were a lack of resources, high initial capital costs in implementing sustainable development measures and a lack of skills and expertise (Álvarez Jaramillo *et al.*, 2019). Other barriers hindering SMEs' introduction of sustainable development practices included limited awareness of the effects and benefits of sustainable development, lack of time (Journeault *et al.*, 2021) and fear of losing competitiveness (Cantele & Zardini, 2020). The reason for this is a lack of the necessary information or knowledge and SME managers' conviction that the impact of their company on sustainable development is minimal (Journeault *et al.*, 2021). Because SMEs employ a limited number of employees, they perform many different functions in the company, which makes it difficult to add new tasks and requirements. SME managers also believe that managing sustainability is costly and requires major investment.

However, the expected potential benefits, such as employee motivation, competitive advantage, reputation, profitability, customer satisfaction and better compliance, were found to have a positive impact. It is worth noting that stakeholders can support the implementation of sustainable development in SMEs through cooperation and can overcome various barriers along this difficult path (Journeault *et al.*, 2021). Among the stakeholders, external entities forming the company's value chain include customers or larger buyers, governments or authorities (regulatory network) and research centres (Klewitz & Hansen 2014). Considering the purpose of the present article, it is worth remembering, especially for stakeholders, that a good reputation is essential for acquiring and retaining customers (Graafland, 2018).

Corporate reputation

The wide array of definitions of corporate reputation is based on ideas of corporate identity, image, evaluation and perceptions (Fombrun, 1996; Fombrun & van Riel, 1997; Feldman *et al.*, 2014). According to Rose and Thomsen, corporate reputation is based on what stakeholders think they know about a firm, so it reflects their perceptions (Rose & Thomsen, 2004). Perceptions of a company arise from beliefs about the company and its characteristics, as well as the evaluation of these characteristics (Dowling, 2016). Evaluation is grounded more in the company's financial performance and past actions (Rose & Thomsen, 2004; Weigelt & Camerer, 1988). It is derived from an assessment of a company's trustworthiness (Van Der Merwe & Puth, 2014) and ability to deliver value (Petkova, 2012).

Some studies have found corporate reputation to be related to stakeholder's own overall evaluation of the firm (Gotsi & Wilson, 2001; Helm, 2007). In others, it refers to the collective overall perception of a firm. Corporate reputation is a multi-factor function of all stakeholder perceptions, including those of suppliers, customers, workers, managers and shareholders (Dowling, 2004). The idea of a reputation as a collective or social concept leads to the conclusion that decision-makers assume that reputation influences not only their own decisions but also the decisions of other stakeholders (Blajer-Gołębiewska, 2021).

As a corporate reputation is formed from perceptions that arise in the minds of stakeholders observing the company (Haywood, 2005), it can be consciously built by the company's management. The most popular way to

communicate with stakeholders in the 21st century is through social media, which is also used to enhance corporate reputation. It allows managers to keep stakeholders informed and to share data and ideas that are the foundations of a company's identity.

These considerations led to the idea of e-reputation, that is, the reputation that refers to the internet and characteristics derived from electronic contacts (Dutot & Castellano, 2015). In designing a scale measuring e-reputation, four factors were found to be significant: brand characteristics, website quality, service quality and social media (Dutot & Castellano, 2015).

The role that corporate reputation plays in a firm's development is considerable due to its multidimensional impact on encouraging and advancing relationships with stakeholders (Blajer-Gołębiewska, 2021). A good corporate reputation enhances cooperation with customers, resulting in their support, loyalty and recommendations (Feldman *et al.*, 2014). This leads to more advantageous relationships with banks, resulting in a lower cost of capital (Feldman *et al.*, 2014; Wiedmann & Buxel, 2005). Furthermore, a good reputation helps attract and maintain higher-skilled and more loyal workers. Consequently, it improves companies' financial results, market value and market position, leading to a unique comparative advantage over its market rivals (Smith *et al.*, 2010; Raithel & Schwaiger, 2015). It was also found to mediate the positive effect of sustainability and a company's competitive advantage (Cantele & Zardini, 2018). Corporate reputation is often considered to be an intangible asset (Rose & Thomsen, 2004; Fernández-Gámez *et al.*, 2016) or even a strategic asset (Fombrun, 1996).

There is a relationship between corporate reputation and sustainable development. However, prior studies have yielded mixed results. A literature review on the direction of the relationship between corporate reputation and sustainability showed that in most of the studies, sustainable development was found to precede corporate reputation because it improves stakeholders' acceptance and perceptions of companies' activities (Gomez-Trujillo *et al.*, 2020). Sustainability disclosures were positively associated with corporate reputation, specifically reputation for sustainability (Alon & Vidovic, 2015). A positive association was found between corporate reputation and various dimensions of sustainable reporting (regarding society, environment, employees and products) (Abbas *et al.*, 2022).

In a study of the perceptions of managers from manufacturing firms of various sizes from different industries, the impact of corporate reputation on the constituents of sustainable performance, specifically economic performance and environmental performance, was analysed (Afum *et al.*, 2020). Corporate reputation was found to positively influence environmental performance, but its impact on economic performance was not statistically significant, as was the case in the above-mentioned studies. Furthermore, corporate reputation was found to mediate the relationship between green manufacturing practices and environmental performance (Afum *et al.*, 2020).

Concluding, relatively few studies have reported a relationship between corporate reputation and sustainable development. As a result, building on the extant literature, we propose the following hypothesis.

H1: *Corporate reputation has a statistically significant effect on the sustainable development of SMEs in the V4 countries.*

This hypothesis will be verified by the study on the owners' and top managers' perceptions.

Social media

Social networks are crucial resources for building strong and valuable connections. They allow entrepreneurs to obtain updated and reliable information (Borah *et al.*, 2022). Both the size of the network and the strength of the interactions between its members are important. These factors affect the firm's ability to identify opportunities and achieve goals (Chen *et al.*, 2018).

SMEs' awareness of social media's importance and their acceptance of social media usage as a part of the company's management increased considerably during the COVID-19 pandemic, thus increasing the role played by social media in SMEs' activities in V4 countries (Belás *et al.*, 2021). The increasing use of social media has opened a wide array of opportunities for companies to target a larger audience, advertise and sell products, communicate with stakeholders, share data and ideas and create a positive corporate reputation (Borah *et al.*, 2022; Dijkmans *et al.*, 2015; Bocconcelli *et al.*, 2017; Bednarz & Orelly, 2020). Chen *et al.* (2018) demonstrated that social networks play a regulating role in the relationship between entrepre-

neurship and regional economic development. They build and improve resource dependence between entities and the external environment. SMEs' social media engagement is in line with Industrial Revolution 4.0, as it helps firms to build a digital-based work culture and a good reputation, allowing for greater agility and adaptability to changes that lead to sustainable SMEs' development (Rozak *et al.*, 2021; Frajtova Michalikova, 2023).

Social media usage is one of the most important means of creating a corporate reputation. The selection of appropriate media and communication techniques can help companies optimise their corporate reputations (Floreddu *et al.*, 2014). Awareness of the power of corporate reputation on the internet has led firms to advise their employees on how to use social media carefully to avoid damaging their company's reputation (Schaarschmidt & Walsh, 2020).

Furthermore, the social media activities of both firms and their clients can create a perception of a better corporate reputation. Studies on the relationship between consumers' engagement with a firm's social media activities and perceived corporate reputation have been conducted on KLM Royal Dutch Airlines customers (Dijkmans *et al.*, 2015). In this study, participants were presented with 18 reputation-related statements and asked to rate their agreement with the statements on a five-point Likert-type scale. The intensity of social media use was measured based on the frequency of Facebook (FB) or Twitter usage. Engagement with the company's social media activities was based on two criteria: self-evaluation of familiarity with the firm's social media, and whether they were following the company on FB or Twitter. The results showed that the intensity with which consumers use social media translates into their involvement in social media activities related to firms. What is even more important is that companies' social media activities were positively related to perceptions of corporate reputation.

Social media usage also has a positive impact on the financial performance of SMEs, such as in the UK (Tiwasing, 2021), the UAE (Ahmad *et al.*, 2018), Malaysia (Parveen *et al.*, 2015; Ainin *et al.*, 2015), Pakistan (Qalati *et al.*, 2022), India (Chatterjee & Kumar Kar, 2020) and Iraq (Halbusi *et al.*, 2022). Studies of UK-based SMEs showed that engagement in the social media business networks of firms from rural areas led to higher turnover and sales (Tiwasing, 2021). One of the mechanisms contributing to the effects of social media engagement on financial performance is that social

media usage reduces information asymmetry between a firm and its stakeholders and improves cost-effectiveness, as social media usage reduces marketing and customer service-related costs and enhances customer relations (Ainin *et al.*, 2015).

In studies on the impact of social media usage, its connection to innovation is often highlighted. On the one hand, social media usage leads to innovation enhancement (Olanrewaju *et al.*, 2020; Borah *et al.*, 2022). This may be due to consumer involvement in the process of producing or offering services. Consumers who are prosumers share knowledge about their needs and preferences. Thanks to this, enterprises are able to introduce innovative products or services that are precisely tailored to the needs of the market (Ziemba *et al.*, 2019). In addition, prosumers contribute through many-to-many communication, community building and content production, thereby enhancing the enterprise's reputation (Bartosik-Purgat & Bednarz, 2021). On the other hand, the study of B2B SMEs showed that SMEs can benefit from social media networks, provided that they are innovative, proactive and risk-taking (Rakshit *et al.*, 2022). Furthermore, the study of SMEs listed among the 'A' stock markets of the Shanghai or Shenzhen Stock Exchange showed that innovation (R&D investments and patents) is positively related to sustainable development (social and environmental performance) (Zhang *et al.*, 2022). Another study revealed that social media usage (mediated by innovation capabilities and moderated by digital leadership) enhances sustainable SME performance (Borah *et al.*, 2022)

Companies' activities on social media allow for both the recognition of stakeholders' expectations and the creation of companies' reputations (e-reputation). Firms respond to the expectations of firm-identified stakeholders, for instance, when it comes to social issues (Nason *et al.*, 2018). Stakeholders' perceptions of firms' engagement in social issues are still evolving from the traditional perception of philanthropy through corporate social responsibility and environmental, social and governance (ESG) to firms' social identity (McDonald *et al.*, 2022). This understanding of the e-influence of stakeholders may change managers' attitudes towards their business, as they aim to align with stakeholders' expectations to create a better corporate reputation (McDonald *et al.*, 2022). As a result, some managers have been introducing strategies to respond to stakeholder pressure, aiming to achieve the required outcome, especially in the area of so-

cial sustainability initiatives and the required social performance (Nason *et al.*, 2018; McDonald *et al.*, 2022).

It is beneficial for firms to implement ideas that are important to their stakeholders, such as the principles of sustainable development, and to present and promote them on social media. The literature review reveals a gap in linking social media usage to sustainable development, particularly in the context of the owners' and top managers' perceptions. Addressing this gap, we propose the following hypothesis.

H2: Social media has a statistically significant effect on the sustainable development of SMEs in the V4 countries.

Methods and variables

Data collection

The data collection process was conducted with the support of the renowned external agency MNFORCE, which operates in the Central European countries. Data collection was conducted in four countries (CR — the Czech Republic, SR — the Slovak Republic, PL — Poland and HU — Hungary) in December 2022 and January 2023. Computer-assisted web interviewing (CAWI) was the research method used to create a sample of SMEs. The CAWI method has the following advantages: i. tailored questionnaire — if the questionnaire is well designed, it will automatically manage the path of the question using logic conditions like display or skip logic; ii. more clarity — the questionnaire can be structured to facilitate comprehension and increase the response rate; iii. guides — you can insert instructions to help the respondent to understand and complete the survey to make up for the lack of an interviewer's presence; iv. reduced time: the time needed to analyse the data is reduced because those data are available in real-time to the admin database. The respondent was defined as the owner or top manager of an SME. The questionnaire was created and translated separately for each country to ensure a better understanding of the statements. Authors' criteria for the data selection were defined: i. questionnaire can fulfil only owner or top manager of the enterprise; ii. type of enterprise according to the number of employees — max. 249 (SMEs segment); iii. minimum 50% microenterprises with the number of employees being max-

imum 9; iv. location of enterprise – one or more countries from Visegrad group (V4).

The first question in the questionnaire was formulated as ‘I agree to the publication of my answers in this questionnaire for scientific purposes’. The number of positive answers was 1,090 (yes: 97.7%) and negative – 26 (no: 2.3%); only those who agreed were included in the final sample. The size of the research sample ($n = 1,090$) was considered acceptable because it was nearly two times larger than that required by the sample size analysis ($n = 664$) with the following details (precision level: 5%; confidence level: 99%; estimated proportion: 0.5).

Questionnaire and variables

The questionnaire was created based on the literature review and numerous discussions among researchers from the investigated region. The questionnaire contained questions from the following areas: characteristics of SMEs (Table 3), respondent characteristics, reputation and social media statements and sustainable development of SMEs.

The investigation aimed to quantify and verify the relationships between the following variables: Reputation of SMEs in social media (RSM): RSM1 – ‘The company’s reputation plays a significant role in our business’, RSM2 – ‘Social media supports the growth of our company’s performance’, RSM3 – ‘Social media helps our business quickly share information with customers and partners’ and RSM4 – ‘Social networks play an important role in our business’.

Sustainable development (SD): SD1 – ‘I understand the concept of sustainable business growth’, SD2 – ‘It is essential to also perceive the social and environmental impact of entrepreneurship’, SD3 – ‘The sustainable development of our company is a key aspect of entrepreneurship’ and SD4 – ‘I perceive our company as sustainable’. A 5-point Likert scale (1 = strongly agree; 2 = agree; 3 = neither agree nor disagree; 4 = disagree; 5 = strongly disagree) was used to evaluate the statements.

Statistical hypotheses and methods

Based on the hypotheses stated in the preceding section, we constructed the following statistical hypotheses:

H1/2: Reputation (H1-R) and social media (H1-SM) have a statistically significant effect on the sustainable development of SMEs in the V4 countries. H1/2a(SD_i-RSM_j): The selected reputation and social media indicator (RSM_j; j = 1, 2, 3, 4) has a statistically significant effect on the sustainable development indicator (SD_i; i = 1, 2, 3, 4) of SMEs in the V4 countries.

The Spearman correlation matrix and linear regression modelling (LRM) were utilised to evaluate H1 and H2. This statistical approach was used because the variables (RSM and SD statements) in the questionnaire were defined in such a way that a positive perception of the respondents' RSMs would lead to a positive perception of the firm's SDs. The assumptions for the application of the LRM approach (e.g. multivariate normal distribution and skewness and kurtosis; see Table 1) were confirmed. A linear regression function in the general form is as follows:

$$LRM: SD = \gamma_0 + \gamma_1 \times R + \gamma_2 \times SM + \varepsilon n \quad (1)$$

$$LRMi: SD_i = \beta_0 + \beta_j \times RSM_j + \varepsilon n, \quad i = 1, 2, 3, 4; j = 1, 2, 3, 4 \quad (2)$$

where:

- SD sustainable development as a factor;
- RSM reputation and social media as a factor;
- SD_i statements of sustainable development of SMEs,
- RSM_j statements of reputation and social media,
- β₀ intercept;
- β_j estimate of regression coefficient.

The regression analysis, namely LRM_i is described using the following regression characteristics (RCHs): correlation coefficient (CC), coefficient of determination (R²), adjusted coefficient of determination (Adj. R²), SE = standard error and n = number of respondents. The characteristics used in the analysis of variance (ANOVA) were as follows: SS = sum of squares, MS = mean of squares, df. = degree of freedom and F = F test and significance (p-value). Multicollinearity was verified using the variance inflation factor (VIF). Multicollinearity was verified if the LRM contained a minimum of three statistically significant regression coefficients (for VIF ≤ 5, there is a low level of multicollinearity that is considered acceptable). Autocorrelation was not calculated (data are categorical). The assumptions of random errors were tested as follows: i) the normal distribution of random errors — Shapiro–Wilk Test (SW test) and ii) the equality of error

variances – Levene’s test (LE test). If the p-values of the SW or LE tests were greater than the level of significance, then the assumption was supported. The empirical results were calculated using IBM SPSS Statistics version 28.

Descriptive characteristics, validity and reliability

The descriptive characteristics (mean [M], standard deviation [SD], skewness [S] and kurtosis [K]) of the variables according to the country are presented in Table 1.

The results of comparing the perceptions of the RSMs and SDs according to country using a nonparametric approach (Kruskal–Wallis test) showed that there were no statistically significant differences at the level of significance of 0.05.

Table 2 presents the results of the questionnaire’s assumptions (FL – factor loading: minimum value (MV) = 0.7; CR – composite reliability: MV = 0.7; AVE – average variance: MV = 0.5; CA – Cronbach’s alpha: MV = 0.7).

The results (Table 2) show that the FL of RSM₁ was not greater than the MV. These results with a modified correlation matrix (Table 5 – RSM₁ and others RSMs) showed that reputation (R) and social media statements (SM) are two separate factors. Social media as a factor has the following characteristics: CR = 0.829; AVE = 0.823; CA = 0.891; FLs: RSM₂ = 0.907; RSM₃ = 0.913; and RSM₄ = 0.901. The results confirmed the questionnaire’s assumptions (reliability and validity).

Structure of SMEs

Table 3 features the structure of SMEs (n = 1090 respondents) according to the following characteristics: SME-CH0 – country; SME-CH1 – the size of an enterprise; SME-CH2 – legal form; SME-CH3 – business sector; SME-CH4 – length of business; SME-CH5 – the market where a given SME realises the largest share of sales; SME-CH6 – location of the enterprise.

Czech and Polish companies made up the largest proportion of enterprises surveyed (jointly more than 60%). Slovakia had the fewest enterprises in the research sample. Slovakia was the smallest of the analysed countries in terms of population and area of the country. As many as 64.59% of

the sample were micro-entrepreneurs (less than or equal to nine employees). Furthermore, 54% of the sample were sole traders. The analysed companies operated mainly in such sectors as retail (21.56%), manufacturing (13.85%), construction (12.75%) and services other than transportation and tourism (31.10%). Of the sample, 33.49% had been companies operating in the market for 10 or more years, and 39.17% of the surveyed companies were located in capital cities.

Empirical results

Effect of reputation and social media on the sustainability of SMEs

Verification of the LRM of the effect of reputation (R) and social media (SM) on the sustainable development of SMEs (SD) yielded the following results. For RCHs, $CC = 0.383$; $R^2 = 0.147$; $Adj. R^2 = 0.145$; $SE = 0.606$; $n = 1090$. The empirical results of ANOVA (LRM_i) were as follows: for regression, $df. = 2$; $SS = 68.653$; $MS = 34.327$; $F = 93.484$; $p\text{-value} = 3.44E-38$; for residual, $df. = 1087$; $SS = 399.140$; $MS = 0.367$; and for total, $df. = 1089$; $SS = 467.794$. These empirical results confirmed that the LRM was statistically significant. The evaluation and verification of the linear regression coefficient (γ) are presented in Table 4.

The LRM showed that the independent factors (R and SM; Table 4) were statistically significant, with a positive effect on the SD. The linear regression function (LRM) is as follows:

$$LRM: SD = 1.410 + 0.195 \times R + 0.154 \times SM, \quad (3)$$

No significant level of multicollinearity was detected in the LRM (Table 4). The assumptions pertaining to random errors were supported for LRM (LE test: $p\text{-value} = 0.211$; SW test: $p\text{-value} = 0.185$).

Dependences between indicators of RSMs and SDs

Pairwise correlation coefficients between variables (RSMs and SDs) are shown in the modified correlation matrix (Table 5).

All presented empirical results of the pairwise correlation coefficients (Table 5) were statistically significant. The modified correlation matrix

showed that there were low and medium strong dependences between RSMs and SDs ($r_{RSM_2, SD_1} = 0.307$; $r_{RSM_4, SD_3} = 0.309$; and so on). Furthermore, there was very strong dependence between RSM indicators (e.g. between RSM_2 and RSM_3).

Effect of reputation and social media on the SD₁

Verification of the LRM_1 of the effect of RSM indicators on the understanding of the concept of sustainable business (SD_1) revealed the following characteristics. For RCHs, $CC = 0.295$; $R^2 = 0.087$; $Adj. R^2 = 0.084$; $SE = 0.758$; $n = 1090$. The empirical results of the ANOVA (LRM_1) were as follows: for regression, $df. = 4$; $SS = 59.317$; $MS = 14.829$; $F = 25.821$; $p\text{-value} < 0.01$; for the residual, $df. = 1085$; $SS = 623.110$; $MS = 0.574$; and for the total, $df. = 1089$; $SS = 682.427$. These empirical results confirmed that the LRM_1 was statistically significant. The evaluation and verification of the linear regression coefficients (β_i) are presented in Table 6.

The LRM_1 showed that all independent variables of reputation and social media (Table 6) were statistically significant, with a positive effect on the SD_1 , without RSM_3 (not statistically significant). The linear regression function LRM_1 is as follows:

$$LRM_1: SD_1 = 1.408 + 0.083 \times RSM_1 + 0.167 \times RSM_2 - 0.011 \times RSM_3 + 0.115 \times RSM_4 \quad (4)$$

No significant level of multicollinearity was detected in LRM_1 (Table 6). The assumptions pertaining to random errors were supported for LRM_1 (LE test: $p\text{-value} = 0.147$; SW test: $p\text{-value} = 0.371$).

Effect of reputation and social media on the SD₂

Verification of the LRM_2 of the effect of RSM indicators on the perceptions of the social and environmental impact of entrepreneurship (SD_2) revealed the following characteristics. For RCHs, $CC = 0.331$; $R^2 = 0.110$; $Adj. R^2 = 0.106$; $SE = 0.729$; $n = 1090$. The empirical results of ANOVA (LRM_2) were as follows: for regression, $df. = 4$; $SS = 71.181$; $MS = 17.795$; $F = 33.442$; $p\text{-value} < 0.001$; for the residual, $df. = 1085$; $SS = 577.351$; $MS = 0.532$; and for the total, $df. = 1089$; $SS = 648.532$. These empirical results confirmed that the LRM_2 was statistically significant. The evaluation

and verification of the linear regression coefficients are presented in Table 7.

The LRM₂ showed that the independent variable RSM₁ was statistically significant with a positive effect on the SD₂. Other RSM indicators (RSM₂; RSM₃ and RSM₄) were not statistically significant. The linear regression function LRM₂ is as follows:

$$\begin{aligned} LRM_2: SD_2 = & 1.309 + 0.162 \times RSM_1 + 0.091 \times RSM_2 + \\ & + 0.087 \times RSM_3 + 0.079 \times RSM_4, \end{aligned} \quad (5)$$

The assumptions of random errors were supported for LRM₂ (LE test: p-value = 0.159; SW test: p-value = 0.341).

Effect of reputation and social media on the SD₃

Verification of the LRM₃ of the effect of RSM indicators on the perception of the sustainable development of a company as a key aspect of entrepreneurship (SD₃) revealed the following characteristics. For RCHs, CC = 0.320; R² = 0.103; Adj. R² = 0.099; SE = 0.816; n = 1090. The empirical results of ANOVA (LRM₂) were as follows: for regression, df. = 4; SS = 82.679; MS = 20.670; F = 31.045; p-value < 0.001; for the residual, df. = 1085; SS = 722.386; MS = 0.666; and for the total, df. = 1089; SS = 805.065. These empirical results confirmed that the LRM₃ was statistically significant. The evaluation and verification of the linear regression coefficients (β_i) are presented in Table 8.

The LRM₃ shows that the independent variables RSM₁ and RSM₄ were statistically significant with a positive effect on the SD₃. Other RSM indicators (RSM₂ and RSM₃) were not statistically significant. The linear regression function LRM₃ is as follows:

$$\begin{aligned} LRM_3: SD_3 = & 1.404 + 0.105 \times RSM_1 + 0.035 \times RSM_2 + \\ & + 0.086 \times RSM_3 + 0.167 \times RSM_4, \end{aligned} \quad (6)$$

The assumptions of random errors were supported for LRM₃ (LE test: p-value = 0.153; SW test: p-value = 0.352).

Effect of reputation and social media on the SD₄

Verification of the LRM₄ of the effect of RSM indicators on the perception of the company as sustainable (SD₄) revealed the following characteristics. For RCHs, CC = 0.297; R² = 0.088; Adj. R² = 0.085; SE = 0.831; n = 1090. The empirical results of ANOVA (LRM₂) were as follows: for regression, df. = 4; SS = 72.331; MS = 18.083; F = 26.204; p-value < 0.001; for the residual, df. = 1085; SS = 748.729; MS = 0.690; and for the total, df. = 1089; SS = 821.061. These empirical results confirmed that the LRM₄ was statistically significant. The evaluation and verification of linear regression coefficients (β_i) are presented in Table 9.

The LRM₄ showed that the independent variables RSM₁ and RSM₄ were statistically significant with a positive effect on the SD₄. Other RSM indicators (RSM₂ and RSM₃) were not statistically significant. The linear regression function LRM₄ is as follows:

$$\begin{aligned} LRM_4: SD_4 = & 1.385 + 0.146 \times RSM_1 + 0.010 \times RSM_2, \\ & + 0.049 \times RSM_3 + 0.165 \times RSM_4, \end{aligned} \quad (7)$$

The assumptions of random errors were supported for LRM₄ (LE test: p-value = 0.149; SW test: p-value = 0.338).

Discussion

Our quantitative research yielded very interesting findings concerning reputation and social media in the context of the sustainability of SMEs. Exactly 87.7% of the owners and top managers of SMEs thought that the reputation of their company plays a significant role in business. Only 63.5% of owners and top managers considered social media to support the growth of their companies' performance. Along the same lines were perceptions regarding the statement that social networks play an important role in their businesses (60.3%). Three out of four owners/top managers of SMEs (exactly 76.6%) believed that their company was perceived as sustainable. In this context, the main findings from the LRM are summarised as follows:

1. Awareness of the importance of corporate reputation (R) and social media (SM) are noteworthy factors that have a positive effect on the sustainable development (SD) of SMEs in V4 countries. However, the per-

ception of corporate reputation ($\beta = 0.195$) had a stronger effect on the sustainable development of SMEs than awareness of the role of social media ($\beta = 0.154$).

2. The social media indicators and the perceptions of corporate reputation as significant factors have a positive effect on the understanding of the concept of sustainable business growth (SD_1), except for the perception that social media helps businesses quickly share information with customers and partners (RSM_3 ; insignificant indicator). The most important indicator is the perception that social media supports the growth of corporate performance (RSM_2 ; $\beta = 0.167$), after the role of social networks in business (RSM_4 ; $\beta = 0.115$) and the company's reputation (RSM_1 ; $\beta = 0.083$).
3. Awareness of the role of corporate reputation (RSM_1 ; $\beta = 0.162$) has a positive effect on the perception of the social and environmental impact of entrepreneurship (SD_2). Indicators of social media (RSM_1 ; ..., RSM_3) have no significant effect (p -value < 0.05) on the perception of the social and environmental impact of entrepreneurship (SD_2).
4. Perceptions of the role of social networks in business (RSM_4 ; $\beta = 0.167$) and the importance of a corporate reputation (RSM_4 ; $\beta = 0.105$) have a positive effect on the perception that the sustainable development of a company is a key aspect of entrepreneurship (SD_3).
5. The company's reputation (RSM_1 ; $\beta = 0.146$) and role of social networks in business (RSM_4 ; $\beta = 0.165$) have a positive effect on the perception that the company is sustainable (SD_4).

The above-mentioned results confirm the significance of corporate reputation when building towards sustainable development. Owners' or top managers' perceptions of the corporate reputation of SMEs as a factor playing a significant role in their businesses are highly related to their awareness of the importance of the sustainable development of the company. The owners or top managers who agreed that the company's reputation plays a significant role in their businesses were more likely to understand the concept of sustainable business growth and considered it essential to perceive the social and environmental impact of entrepreneurship. The sustainable development of the company was considered a key aspect of entrepreneurship. They also perceived their companies to be sustainable.

These findings support the previous literature on the relationship between corporate reputation and sustainable development (Gomez-Trujillo *et al.*, 2020; Alon & Vidovic, 2015). In the literature, there is a strong focus

on sustainable development as a factor that precedes a company's reputation, as it improves stakeholders' acceptance and perceptions of companies' activities (Gomez-Trujillo *et al.*, 2020; Abbas *et al.*, 2022). The relationship between the awareness of corporate reputation and perceptions of sustainable development is also consistent with previous studies that confirmed the effects of corporate reputation on environmental performance as one of the factors constituting sustainable performance (Afum *et al.*, 2020). Notably, companies with good reputations consciously seek to improve their reputations by engaging in green production practices, which cause improvements in their environmental performance.

The results of this study are in line with previous findings, proving that for SMEs in V4 countries, social networks are also valuable resources used to reach a large audience and build strong relationships with different groups of stakeholders (Belás *et al.*, 2021).

Managers' and owners' awareness of the role of social networks in their businesses was related to the awareness of the social and environmental impact of entrepreneurship and the concept of sustainable growth. The perception of social networks as important was associated with the recognition of their company as sustainable and an awareness of sustainable development as a key aspect of entrepreneurship.

Surprisingly, the use of social media to share information with customers and partners was not related to managers' and owners' perceptions of sustainability. This result contradicts previous studies and may have been conditioned by the specific characteristics of SMEs in V4 countries. The literature has shown that the selection of appropriate media and communication tools can help companies optimise their corporate reputation in social media (Floreddu *et al.*, 2014). When communicating in social networks, entrepreneurs working in SMEs use many-to-many communication models. This contributes to community building and influences the gradual creation and then strengthening of their corporate reputation (Bartosik-Purgat & Bednarz 2021).

However, it should be emphasised that entrepreneurs in the V4 countries noticed other dimensions of social networks aside from the social. They were convinced that the sustainable development of the company is also a key aspect of entrepreneurship. There are several reasons for this perception. First, a social network is a valued tool for obtaining up-to-date and reliable information (Borah *et al.*, 2022), improving the exchange of information and reducing asymmetry. Second, SMEs perceive social media

as important in identifying opportunities and making optimal decisions in uncertain external environments. In addition, a digital workplace culture, innovation capabilities and a good reputation allow for greater flexibility and adaptability to changes in the environment, which leads to the sustainable development of SMEs (Rozak *et al.*, 2021). This contributes to achieving the strategic goal of sustainable economic growth (Borah *et al.*, 2022; Chen *et al.*, 2018).

Conclusions

This study aimed to define, quantify and verify the effects of reputation and social media on sustainable development as perceived by the owners and top managers of SMEs in V4 countries. The main contribution of the study is the new approach based on owners' and top managers' perceptions, which are particularly important in the case of SMEs' analysis. We provided also an original insight by combining the three factors in one study. Furthermore, we decided to focus specifically on the V4 countries bearing in mind their similarity.

The results confirmed the significance of relationships between corporate reputation, social media and sustainable development. In particular, the perception of the importance of sustainability was found to be strongly related to awareness of the significance of both corporate reputation and social media. Surprisingly, social media usage specifically to share information with customers and partners was not related to owners' and managers' perceptions of sustainability.

Our findings can be beneficial to several groups concerned about the development of SMEs in V4 countries. The impact of reputation and social media on sustainable development is an area of interest for entrepreneurs. These conclusions and recommendations should also be of interest to the national government, local government and territorial organisations. Entrepreneurship development agencies whose mission is to support SMEs in particular should familiarise themselves with these recommendations. They conduct research and analytical activities, consultancy and training, as well as implement economic development programmes. Therefore, they could spread this knowledge on the relationship between corporate reputation and social media and sustainable development among entrepreneurs.

Therefore, analyses of the factors related to the sustainable development of entrepreneurship should be the focus of their attention.

The main novelty of the study constitutes also its limitation as we investigated only the subjective attitudes of owners and top managers of SMEs, which can be very sensitive to external or internal changes. Furthermore, linear regression models (LRM1, ..., LRM4) explained about 10% variability in the perceptions of the sustainability of SMEs. However, this result was expected because there exist many other important factors that determine the sustainable development of SMEs (e.g. business risks, crisis events in business, relationship to corporate social responsibility and human resources management). It is also worth remembering that the study focused on four Central European countries. Consequently, taking into consideration the specificity of the research sample, the results of the study are applicable only to SMEs in the V4 countries.

The rapid development of internet technologies (including web applications) will surely increase the importance of both e-commerce and social media. Therefore, an increase in the presence of SMEs on social media can be expected in the near future. Consequently, research on the impact of reputation and social media on the sustainable development of SMEs in the V4 countries is an important issue that is worth pursuing. First, further studies based on a comparison of the owners' and top managers' perceptions with real data on corporate reputation, social media engagement and sustainable development would be beneficial for understanding these complex relationships. Second, additional studies should be conducted on a larger sample of enterprises. In addition, it is advisable to use sectoral analysis. Proper identification and an in-depth study of the selected sectors in which SME entrepreneurs operate may contribute to identifying the existing relationships between sustainable development and industries, as well as drawing interesting conclusions in this regard. It is also worth deepening the research to identify similarities and differences between SMEs within the group of V4 countries and additionally, between the V4 countries and other regions of Europe.

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Annex

Table 1. The descriptive characteristics of variables according to the country

IF	Items	M (PL/CR/SR/HU)	SD		S		K (PL/CR/SR/HU)
			(PL/CR/SR/HU)	(PL/CR/SR/HU)	(PL/CR/SR/HU)	(PL/CR/SR/HU)	
RSM	RSM ₁	1.58/1.52/1.70/1.77	0.77/0.74/0.75/0.90	2.19/2.77/1.46/1.27	1.39/1.84/1.01/1.17		
	RSM ₂	2.07/2.56/2.43/2.19	1.06/1.16/1.11/1.11	0.24/0.69/0.15/0.24	0.88/0.43/0.65/0.92		
	RSM ₃	2.07/2.38/2.31/2.00	1.04/1.12/1.11/1.04	0.42/0.35/0.17/0.60	0.91/0.61/0.70/1.02		
	RSM ₄	2.12/2.79/2.45/2.03	1.09/1.27/1.24/1.02	-0.01/1.03/0.66/0.44	0.81/0.20/0.58/0.91		
DF	Items	M (PL/CR/SR/HU)	SD		S		K (PL/CR/SR/HU)
			(PL/CR/SR/HU)	(PL/CR/SR/HU)	(PL/CR/SR/HU)	(PL/CR/SR/HU)	
SD	SD ₁	1.87/2.15/2.11/1.80	0.83/0.77/0.75/0.77	0.97/1.23/1.24/0.46	0.89/1.09/0.72/0.76		
	SD ₂	1.94/2.03/2.02/1.90	0.86/0.70/0.75/0.78	2.01/1.19/1.89/0.29	1.10/0.61/0.86/0.62		
	SD ₃	2.12/2.17/2.05/1.93	0.92/0.85/0.83/0.81	0.10/0.78/1.59/0.88	0.60/0.73/0.89/0.79		
	SD ₄	2.10/2.05/2.17/1.85	0.94/0.83/0.83/0.85	0.68/1.96/1.05/0.68	0.83/1.07/0.81/0.89		

Note: IF – Independent factor with items; DF – Dependent factor with items. RSM₁ – Çera *et al.* (2022); RSM₂ – Belás *et al.* (2021); RSM₃ – Blajer-Gołębiowska (2021); RSM₄ – Qalati *et al.* (2021); SD₁ – Ciemleja *et al.* (2011); SD₂ – Álvarez Jaramillo *et al.* (2019); SD₃ – Borah *et al.* (2022); SD₄ – Belás *et al.* (2014).

Table 2. Results of validity and reliability of the questionnaire

RSM: CR = 0.888; AVE = 0.672; CA = 0.836				SD: CR = 0.874; AVE = 0.634; CA = 0.807			
Items	FL	Items	FL	Items	FL	Items	FL
RSM ₁	0.556	RSM ₃	0.901	SD ₁	0.771	SD ₃	0.835
RSM ₂	0.891	RSM ₄	0.880	SD ₂	0.806	SD ₄	0.772

Table 3. Demographics characteristics of small and medium-sized enterprises

SME-CH0			SME-CH1			SME-CH4		
Item	n	%	Item	n	%	Item	n	%
1	301	27.61%	1	704	64.59%	1	239	21.93%
2	362	33.21%	2	264	24.22%	2	263	24.13%
3	162	14.86%	3	122	11.19%	3	223	20.46%
4	265	24.31%	SME-CH3			4	365	33.49%
SME-CH2			Item	n	%	SME-CH5		
Item	n	%	1	151	13.85%	Item	n	%
1	589	54.00%	2	235	21.56%	1	983	90.18%
2	405	37.20%	3	139	12.75%	2	107	9.82%
3	70	6.40%	4	60	5.50%			
4	26	2.40%	5	34	3.12%			
			6	87	7.98%			
			7	339	31.10%			
			8	45	4.13%			

Table 3. Continued

Item	SME-CH6	
	n	%
1	427	39.17%
2	663	60.83%

Note: SME-CH0: 1 – Poland, 2 – Czech republic, 3 – Slovak republic, 4 – Hungary; SME-CH1: 1 – Microenterprises (less than or equal to nine employees), 2 – Small enterprise (between ten to 49 employees), 3 – Medium enterprise (between 50 to 249 employees); SME-CH2: 1 – Sole trader, 2 – Limited liability company, 3 – Joint-stock company, 4 – Another form of business; SME-CH3: 1 – Manufacturing, 2 – Retailing, 3 – Construction, 4 – Transportation, 5 – Agriculture, 6 – Tourism, 7 – Other services, 8 – Another area; SME-CH4: 1 – less than or equal to 3 years, 2 – more than 3 and less than or equal to 5 years, 3 – more than 5 and less than or equal to 10 years, 4 – more than 10 years; SME-CH5: 1 – domestic market – national business environment, 2 – foreign market – international business environment; SME-CH6: 1 – capital, 2 – others city.

Table 4. The estimation and verification of the effect of R and SM on SD

Independent variables	γ		SE	t	Sig. p-value	Hypothesis (H)	Evaluation of H
	UNS	ST					
Intercept	1.377	-	0.051	27.251	4.7E-125	-	-
R	0.188	0.195	0.019	9.772	1.12E-21	H1-R	SU
SM	0.126	0.154	0.025	5.050	5.17E-07	H1-SM	SU

Note: UNS – Unstandardized; ST – Standardized; SU – Support.

Table 5. Dependences between reputation, social media and sustainability

Variables	SD ₁	SD ₂	SD ₃	SD ₄	RSM ₁	RSM ₂	RSM ₃	RSM ₄
RSM ₁	0.247**	0.260**	0.243**	0.269**	1			
RSM ₂	0.307**	0.292**	0.277**	0.228**	0.355**	1		
RSM ₃	0.280**	0.295**	0.301**	0.247**	0.376**	0.743**	1	
RSM ₄	0.282**	0.299**	0.309**	0.265**	0.325**	0.724**	0.740**	1

Note: *Statistically significant pairwise correlation on $\alpha < 0.01$.

Table 6. The estimation and verification of the effect of RSMs on SD₁

Independent variables	β_i		SE	t	Sig. p-value	Hypothesis (H)	Evaluation of H	Statistics VIF
	UNS	ST						
Intercept	1.408	-	0.063	22.254	<0.001	-	-	-
RSM ₁	0.082	0.083	0.031	2.629	0.009	H21-RSM ₁	SU	1.180
RSM ₂	0.118	0.167	0.033	3.529	<0.001	H21-RSM ₂	SU	2.674
RSM ₃	-0.008	-0.011	0.035	-0.216	0.829	H21-RSM ₃	RE	2.832
RSM ₄	0.076	0.115	0.030	2.497	0.013	H21-RSM ₄	SU	2.528

Note: UNS – Unstandardized; ST – Standardized; SU – Support; RE – Reject.

Table 7. The estimation and verification of the effect of RSMs on SD₂

Independent variables	β_i		SE	t	Sig. p-value	Hypothesis (H)	Evaluation of H
	UNS	ST					
Intercept	1.309	-	0.061	21.497	<0.001	-	-
RSM ₁	0.157	0.162	0.030	5.221	<0.001	H22-RSM ₁	SU
RSM ₂	0.062	0.091	0.032	1.939	0.053	H22-RSM ₂	RE
RSM ₃	0.061	0.087	0.034	1.805	0.071	H22-RSM ₃	RE
RSM ₄	0.050	0.079	0.029	1.724	0.085	H22-RSM ₄	RE

Note: UNS – Unstandardized; ST – Standardized; E. – Evaluation; SU – Support RE – Reject.

Table 8. The estimation and verification of the effect of RSMs on SD₃

Independent variables	β_i		SE	t	Sig. p-value	Hypothesis (H)	Evaluation of H
	UNS	ST					
Intercept	1.404	-	0.068	20.650	<0.001	-	-
RSM ₁	0.114	0.105	0.034	3.377	<0.001	H23-RSM ₁	SU
RSM ₂	0.027	0.035	0.036	0.745	0.457	H23-RSM ₂	RE
RSM ₃	0.067	0.086	0.038	1.773	0.076	H23-RSM ₃	RE
RSM ₄	0.120	0.167	0.033	3.661	<0.001	H23-RSM ₄	SU

Note: UNS – Unstandardized; ST – Standardized; SU – Support; RE – Reject.

Table 9. The estimation and verification of the effect of RSMs on SD₄

Independent variables	β_i		SE	t	Sig. p-value	Hypothesis (H)	Evaluation of H
	UNS	ST					
Intercept	1.385	-	0.069	19.981	<0.001	-	-
RSM₁	0.159	0.146	0.034	4.624	<0.001	H24-RSM ₁	SU
RSM₂	0.008	0.010	0.037	0.208	0.835	H24-RSM ₂	RE
RSM₃	0.039	0.049	0.039	1.007	0.314	H24-RSM ₃	RE
RSM₄	0.119	0.165	0.033	3.582	<0.001	H24-RSM ₄	SU

Note: UNS – Unstandardized; ST – Standardized; SU – Support; RE – Reject.