



Research Article

Corporate Social Responsibility in the Metaverse: Accounting for Virtual Engagement and Firm Performance

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The study examines the impact of CSR in the metaverse on the performance of firms, particularly from an accounting perspective. The development of the immersive technologies, including metaverse, AI, and blockchain is changing the frontier of corporate social responsibility (CSR) and its interface with accounting and firm performance. Traditionally, CSR has been considered the incorporation of social, environmental, and ethical issues in the business activity. Nonetheless, little academic literature has been conducted to explore the accounting implications of metaverse CSR projects and its effects on firm performance. The quantitative research design was used to test the correlation between CSR in the metaverse and the performance of firms, where virtual engagement was taken into consideration as a moderating variable. The survey was taken using a structured questionnaire survey. The survey tool was sent to 320 individuals in accounts and finance, as well as sustainability departments of 25 companies. Following the removal of the incomplete responses, 280 questionnaires that could be used were retained for analysis, which had a response rate of 87.5%. The study tests hypotheses based on relationship between CSR in the metaverse, accounting disclosure of virtual engagement and firm performance using survey data of 280 accounting and finance professionals working in technology-driven companies and moderated regression analysis. The findings revealed that CSR initiatives conducted in the metaverse significantly and positively influence firm performance. While accounting for virtual engagement strengthens the CSR-firm performance relationship, suggesting that firms with robust digital reporting practices benefit more from metaverse-based CSR initiatives. The study concluded that the results of the present research have important consequences to managers, practitioners, and policymakers at the crossroad of CSR, accounting, and new digital technologies.

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I. INTRODUCTION

The development of immersive technologies, including metaverse, artificial intelligence (AI), and blockchain is changing the frontier of corporate social responsibility (CSR) and its interface with accounting and firm performance. Traditionally, CSR has been considered the incorporation of social, environmental, and ethical issues in the business activity (Aguinis & Glavas, 2012; Turker, 2009). CSR activities in the past decades were mostly restricted to physical boundaries- community development, philanthropy, or environmental programs. Nevertheless, the digital

economy has widened the range of CSR and provided companies with a chance to involve stakeholders online, provide them with transparent sustainability reporting, and construct intangible resources that directly impact performance (Dwivedi *et al.*, 2022). The metaverse, which can be described as a 3D, ongoing, and immersive virtual space facilitated by AI, extended reality, and blockchain, is gaining popularity among international companies to conduct socially responsible activities. CSR in the metaverse takes the shape of hosting carbon-neutral conferences and gamified sustainability campaigns, as well as the establishment of inclusive digital workspaces, a strategic frontier in not only

the stakeholder engagement but also the value creation in the long run (Mystakidis, 2022). These activities cannot be experienced as token activities, but when properly considered they have quantifiable results in the form of corporate image and consumer loyalty as well as financial performance (Kaplan & Haenlein, 2024). Accounting is a key element in defining, measuring and reporting the results of CSR initiatives in virtual realms. The issue is how to appreciate such intangible assets like digital engagement, virtual community development, and gamified sustainability programs. Through metadata management, AI-supported analytics, and valuation systems of digital assets, the accounting system can present a plausible process of incorporating metaverse-based CSR activities in corporate reporting (Bebbington *et al.*, 2020). This guarantees accountability, reduces chances of virtual greenwashing, and enhances investor confidence which are essential factors that determine the performance of firms. Nevertheless, there is a paucity of empirical studies examining the impact of CSR in the metaverse on the performance of firms, particularly from an accounting perspective. Most past researchers have concentrated on how CSR can increase employee behavior (Afsar & Umrani, 2020; Suganthi, 2019) or customer loyalty (Hafez, 2018), but not many of them have extended the argument to immersive technologies.

Moreover, there are no studies that have investigated the effectiveness of accounting virtual engagement in boosting the predictive ability of CSR in explaining firm performance. To fill this gap, the current study examines the effect of CSR in the metaverse on the firm performance with consideration of virtual engagement as a major moderating construct. This research has a number of contributions. First, it augments the literature on CSR by providing the metaverse as a new arena of involving stakeholders and sustainability programs. Second, it combines the study of accounting and information systems by evaluating the impact of digital reporting practices, metadata organization, and AI-based disclosures on the CSR-performance relationship. Third, the research does not focus on the old industries but on technology-based firms and provides the insight into the way CSR in virtual worlds generates financial value. Lastly, it introduces fresh empirical data in a developing economy scenario, where practices of metaverse and digital CSR are still at the road, but with a potentially transformative potential of competitiveness.

II. HYPOTHESES DEVELOPMENT

A. Corporate Social Responsibility in the Metaverse

Corporate social responsibility (CSR) is the organizational activities that involve the issues of social, environment, ethics, and governance in the main operations (Aguinis & Glavas, 2012; Turker, 2009). The age of immersive technologies has made CSR go beyond the conventional physical programs and venture into digital and virtual ones. The metaverse as an interactive, persistent, and immersive virtual environment gives organizations fresh opportunities to use CSR in the form of sustainable virtual events, digital inclusion programs, and gamified campaigns to create

environmental awareness (Kaplan & Haenlein, 2024). CSR metaverse initiatives are not empty gestures. They create strategic value by improving corporate image, customer confidence and investor confidence (Dwivedi *et al.*, 2022). Additionally, these operations are consistent with the stakeholder theory that focuses on the idea that companies should meet the interests of more than two stakeholders collectively, including employees, consumers, shareholders, regulators and localities (Freeman, 1984). The metaverse is more participatory in terms of interacting with stakeholders enabling feedback in real-time, co-creation, and open visibility of CSR promises. Companies that vigorously participate in CSR in the metaverse will thus be likely to have better competitive advantage and better financial performance in the long run.

B. Metaverse CSR and Firm Performance

Firm performance is a set of financial and non-financial results, which include profitability, innovation, market share, brand equity, and satisfaction of stakeholders (Mahbuba & Farzana, 2013; Yu and Huo, 2019). The empirical literature has found a positive correlation between CSR and the firm performance and has proven that the socially responsible actions create trust, mitigate risks, and generate customer loyalty (Sprinkle & Maines, 2010; Usman & Amran, 2014). Applying the same reasoning to the immersive space, the metaverse CSR practices can enhance the brand image of the company and save on the expenses that might be incurred in the context of the traditional CSR (e.g., physical conferences, campaigns that require lots of carbon). In addition, CSR in the metaverse can generate additional performance metrics, including virtual interaction measurements and NFT-driven social cause fundraising or digital inclusion initiatives that can offer businesses intangible resources. When properly accounted it is these assets which enhance both market valuation and internal efficiency. Thus, it is proposed:

H1: CSR in metaverse positively impacts firm performance significantly.

C. Accounting for Virtual Engagement as a Moderator

The move to the digital platform presents a challenge in measuring and reporting of CSR activities. In contrast to the traditional CSR, metaverse-related initiatives usually comprise intangible resources, i.e., digital experience, metadata entries, or transactions in blockchains. Virtual engagement must be accounted by capturing, classifying and reporting such activities systematically to enhance transparency and comparability. It involves metadata tagging of CSR disclosures, artificial intelligence management of stakeholder involvement, and the valuation of digital resources utilized in CSR campaigns (Bebbington *et al.*, 2020). Virtual engagement is a threat that can be prevented through proper accounting to prevent the risk of virtual greenwashing, where claims about CSR are supported by verifiable information. It means that transparent reporting of metaverse-based CSR activities would also instill confidence in investors and regulators in the firm governance and accountability. Moreover, companies which publish CSR in

organized digital formulas (e.g., XBRL-tagged sustainability reports, blockchain-authenticated donations) will be at the advantage of illustrating the financial payback of their social accountability. Thus, the consideration of virtual engagement will be likely to moderate the CSR-firm performance relationship, and the positive effect of the latter will be felt stronger when strong digital reporting systems are established.

H2: Virtual engagement moderates the relationship between CSR in the metaverse and firm performance positively, in that the relationship is larger when virtual engagement is well-accounted and weaker when it is poorly accounted for.
Conceptual Research Model

III. METHODOLOGY

A. Procedures and Participants in the Study

The quantitative research design was used to test the correlation between CSR in the metaverse and the

performance of firms, where virtual engagement was taken into consideration as a moderating variable. The survey was taken using a structured questionnaire survey with the sample size being made up of managerial level employees working in technology based and service based firms with operations in [Country/Region]. These organizations have been chosen due to their increasing presence in the digital transformation and virtual platforms. The survey tool was sent to 320 individuals in accounts and finance, as well as sustainability departments of 25 companies. Following the removal of the incomplete responses, 280 questionnaires that could be used were retained for analysis, which had a response rate of 87.5%. The percentage of males (68) and females (32) were almost equal. On age structures, 49 percent were aged 30 to 40 years, 33 percent aged 41 to 50 years and the other above 50. In terms of work experience, 35% had less than 5 years, 40% had between 6-10 years and 25% had more than 10 years. Table I presents the demographic profile of the respondents.

TABLE I DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS (N = 280)

Characteristics	Classification	Frequency	Percentage
Gender	Male	190	67.9
	Female	90	32.1
Age	21-30	51	18.2
	31-40	137	48.9
	41-50	92	32.9
Job Experience	Less than 5 years	98	35.0
	6-10 years	112	40.0
	11 years or more	70	25.0

Source: Authors' computation (2025)

IV. MEASURES

A. The Metaverse-Related Corporate Social Responsibility (CSR-M)

Metaverse CSR practices were assessed by an 8-item scale, which is adjusted to the virtual environment. Such statements were used in the items: Our organization runs sustainability initiatives in virtual worlds (e.g., carbon-neutral virtual events) and Our organization leverages immersive digital platforms to facilitate social and community engagement. The answers were registered on the 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

B. Firm Performance (FP)

A 7-item scale developed based on Mahbuba and Farzana (2013) and Yu and Huo (2019) was used to measure firm performance. They were both financial (profitability, return on investment, market share) and non-financial (brand equity, trust of stakeholders, the results of innovations) aspects. One of the questions was: CSR in the metaverse of our organization affected its long-term financial performance positively.

C. Accounting for Virtual Engagement (AVE)

The scale of AVE was based on the 6-item scale that was designed in the framework of this study and based on the Bebbington *et al.* (2020) scale. Such points were used: Our organization utilizes metadata frameworks to monitor CSR actions in the metaverse, and AI-driven analytics are utilized to quantify stakeholder involvement in virtual CSR campaigns. The scale measured the levels of accounting, reporting and valuation practice which is organized to the virtual CSR initiatives.

D. Control Variables

Control variables were gender, age, job experience, and firm size, in agreement with prior CSR -performance research (Suganthi, 2019).

E. Data Analysis

In the study, descriptive statistics were used, correlation was applied, and moderated regression was conducted with the help of EViews 10. The regression process was in a three-step process: (1) any type of control was entered, (2) the main effects of CSR-M and AVE were tested, (3) the interaction term (CSR-M x AVE) was added to study moderation effects.

Scale reliability was carried out using Cronbach's alpha and validity was measured using Confirmatory factor analysis (CFA).

V. DATA ANALYSIS AND RESULTS

A. Descriptive Analysis

Table II shows the means, the standard deviations and the correlations between all the variables. The metaverse csr (csr-

m) was discovered to have a positive correlation with firm performance ($r = 0.482$, $p < 0.01$) and explaining the virtual engagement ($r = 0.561$, $p < 0.01$). In addition, the consideration of virtual engagement was found to have a positive correlation with firm performance ($r = 0.497$, $p < 0.01$). These preliminary results give a first-hand support to our hypotheses.

TABLE II MEANS, SD, AND INTER-CORRELATIONS

Variables	Mean	SD	1	2	3	4
1. CSR in the Metaverse	4.18	0.63	1			
2. Firm Performance	4.25	0.54	0.482**	1		
3. Accounting for Virtual Engagement	4.20	0.59	0.561**	0.497**	1	
4. Control Variables (Gender, Age, Experience, Firm Size)	-	-	0.12(n.s)	0.08(n.s)	0.06(n.s)	1

Notes: $p < 0.01$; M = Mean, SD = standard deviation, n.s. = not significant

B. Hypothesis Testing

Main Effects:

First (H1) hypothesis: CSR in the metaverse has a positive effect on the firm performance. Regression analysis (Table III) indicates that CSR-M was significantly related to firm performance ($r = 0.281$, $p < 0.001$), when the demographic variables were taken into account. This gives a good argument in support of H1.

1. Moderating Effects: Hypothesis (H2) assumed that virtual engagement as a moderator would have a weaker effect on CSR-M firm performance relationship, but the second effect would be more significant in the presence of a high AVE. The results indicated that the interaction term (CSR-M x AVE) was positive and significant ($r = 1.732$, $p < 0.001$, as indicated in Table III). A change in R^2 (0.049) and F change (19.421) also prove that AVE is a significant addition to the explanatory ability of CSR-M on the performance of firms. Thus, H2 is supported.

TABLE III RESULTS OF MODERATED REGRESSION ANALYSIS DEPENDENT VARIABLE: FIRM PERFORMANCE

Variables	B	t-value	p-value	F-value Change	R ²	ΔR ²
Control Variables						
Gender	-0.024	-0.356	0.722			
Age	0.067	0.821	0.412			
Job Experience	0.042	0.593	0.553			
Firm Size	0.059	0.831	0.407	0.914	0.012	0.012
Main Effects						
CSR in the Metaverse (CSR-M)	0.281	4.712	0.000	66.532	0.334	0.322
Accounting for Virtual Engagement (AVE)	0.364	5.902	0.000			
Interaction Effects						
CSR-M x AVE	1.732	4.408	0.000	19.421	0.383	0.049

Source: Authors' computation (2025)

Table III reveals that the result of the moderated regression analysis, h1 was supported, thus, that csr initiatives conducted in the metaverse significantly and positively influence firm performance. While h2 was supported that accounting for virtual engagement strengthens the csr-firm performance relationship, suggesting that firms with robust digital reporting practices benefit more from metaverse-based csr initiatives.

VI. RESULTS AND DISCUSSION

This research was aimed to analyze how corporate social responsibility (CSR) in the metaverse influences the

performance of firms, and whether the effects of virtual engagement moderate the relationship between variables. According to our hypotheses, the findings supported the fact that CSR in the metaverse affects the performance of firms in a significant and positive way and that the associations become stronger when the virtual engagement is strong.

The impact of CSR on firm performance in the metaverse is also considerable, which confirms the fact that immersive technologies redefine the creation and capture of value in an organization. By introducing CSR initiatives like organizing carbon-neutral virtual events, developing inclusive online

workplaces, or organizing gamified awareness programs, firms can not only make spending on physical activities less significant, but also build trust and a favorable brand image among the stakeholders. These non-monetary rewards are converted to monetary gains, customer retention and innovation deliverables all which form the main core of firm performance. The given finding is consistent with previous ones that have shown the positive relationship between CSR and performance (Sprinkle and Maines, 2010; Usman & Amran, 2014), yet it introduces the literature by placing CSR into the framework of immersive technologies.

The mediating role of explaining virtual engagement shows the significance of clear reporting and organized valuation of activities related to metaverses based on CSR. By tracking, classifying, and reporting their virtual CSR activities systematically (with metadata structures, AI-based analytics, and blockchain verification), firms are in a better position to show accountability and prevent the risks of so-called virtual greenwashing. We find that, with strong accounting practices, the positive impact of CSR-M on the performance of firms is much greater. This implies that when the credible and auditable data is facilitated by the stakeholders and the investors the latter trusts the CSR initiatives more. These results add to the increasing literature on CSR, accounting, and the emerging technologies in the following ways. To start with, they present empirical data to support the fact that CSR within immersive environments is not a mere show but has tangible positive effects on the performance of firms. Second, the paper provides accounting as a decisive facilitator of these benefits especially in situations where intangible resources and virtual interaction prevail. Third, the findings are a reaction to recent demands to incorporate digital governance mechanisms into CSR research (Bebbington *et al.*, 2020; Kaplan & Haenlein, 2024), thus contributing to the academic and practical knowledge.

To conclude, this paper has shown that CSR activities in the metaverse are strategic projects that increase the competitiveness of firms. What is more important is that these gains are magnified by the existence of good accounting mechanisms of virtual interaction that enhance transparency, comparability, and accountability.

VII. CONCLUSION AND MANAGERIAL IMPLICATIONS

The results of the present research have important consequences to managers, practitioners, and policymakers at the crossroad of CSR, accounting, and new digital technologies. To start with, the research established that CSR activities in the metaverse have a positive and significant impact on firm performance. This indicates that strategic incorporation of immersive technologies in the CSR strategies of firms that aim to improve their competitiveness is advisable. Organizing virtual conferences that are carbon-neutral, establishing inclusive digital engagement environments, and using the power of gamified sustainability initiatives do not only reinforce corporate image, but also

produce real financial and non-financial gains. Second, the research showed that consideration of virtual engagement mediates the CSR-firm performance relationship. This demonstrates the significance of the systematic reporting and open valuation of virtual CSR activities. Without a solid accounting framework, metaverse CSR can be interpreted as shallow or symbolic, and become distrusted by the stakeholders. Nevertheless, as companies utilize AI-driven analytics, metadata management, and blockchain authentication to their CSR reporting, the stakeholders become more confident in the credibility of the efforts in question, thus, magnifying the performance results. To managers, it means that metaverse-based CSR should not be viewed as a marketing tool but as a key strategic investment with well-established accounting systems. Finance and sustainability teams need to work together to establish frameworks on how to measure intangible virtual assets, engagement metrics, and integrate them into integrated financial and sustainability reports. To policy makers, the findings imply that regulatory principles should be given regarding disclosure of digital and virtual CSR practices. Standardized frameworks like the ones in use in current financial reporting systems like eXtensible Business Reporting Language (XBRL) could be used to assure comparability and accountability across firms. Lastly, the paper is valuable both academically and practically since it has shown that CSR in the metaverse, when paired with open accounting of virtual interaction, is not only a social responsibility but also a contributing factor to long-term financial and strategic performance.

VIII. LIMITATIONS AND FUTURE RESEARCH

The research offers useful ideas on CSR in the metaverse, virtual engagement, and performance of the firms, though a number of limitations exist. The study only considered 280 practitioners in a single nation which diminishes the ability to generalize to other sectors or regions. They used self-reported surveys, which can create bias; the future research should consider such secondary sources as financial reports, blockchain CSR, or engagement analytics. The mediating effect of accounting virtual engagement was examined separately, which is why it might have been possible that the other variables, including digital literacy, culture, or governance, had an influence. Also, there were no mediation effects (e.g., brand equity, investor confidence, customer loyalty). These shortcomings notwithstanding, the study contributes to the CSR and accounting research in digital settings and provides opportunities to explore further how technological transformation transforms corporate responsibility and performance.

Declaration of Conflicting Interests

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