

“Relationship between corporate social responsibility and employee loyalty: Evidence from full-time employees in the science and technology sector”

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RELATIONSHIP BETWEEN CORPORATE SOCIAL RESPONSIBILITY AND EMPLOYEE LOYALTY: EVIDENCE FROM FULL-TIME EMPLOYEES IN THE SCIENCE AND TECHNOLOGY SECTOR

Abstract

This study aims to explore the relationship between corporate social responsibility and employee loyalty, specifically examining the mediating roles of person–organization fit, organizational trust, corporate image, and employee satisfaction. A quantitative survey was conducted from December 2023 to June 2024 among 479 full-time employees at science and technology enterprises in Hanoi, Vietnam. Data were analyzed using partial least squares structural equation modeling, employing a two-stage approach to evaluate corporate social responsibility as a higher-order construct.

The results support that corporate social responsibility is positively associated with person–organization fit, organizational trust, corporate image, and employee satisfaction. In turn, employee loyalty is linked to these four factors. Additionally, the study confirms the existence of indirect effects of corporate social responsibility on employee loyalty via mediating variables. This paper integrates social exchange theory, social identity theory, stakeholder theory, responsible innovation, and the triple bottom line framework into a research model. Moreover, by integrating innovation into corporate social responsibility, this study suggests that it serves as a pillar for enhancing sustainable competitive advantage in the high-tech sector.

Keywords

satisfaction, trust, innovation, fit, corporate image

JEL Classification

J28, M14

INTRODUCTION

In the current era of innovation, science and technology (S&T) enterprises serve as vital engines of economic growth and digital transformation in Vietnam (Tran & Nguyen, 2020). This systemic importance is particularly pronounced in Hanoi, where the municipal government has strategically positioned the local S&T ecosystem as the motivation for the development strategy through 2030 (A. Nguyen & T. Nguyen, 2022). However, these firms face workforce instability, known as brain drain, in which highly skilled employees frequently leave their organizations. The Human Flight and Brain Drain Index for Vietnam is 4.4, which is significantly higher than that for Thailand (3.4) and Singapore (1.0) (Fund for Peace, 2024). This vulnerability is linked to a notable talent deficit in the domestic technology sectors through a two-wave attrition mechanism: elite computer science and engineering graduates migrate to international labor markets, while the remaining talent pool within S&T enterprises in Hanoi becomes subject to aggressive inter-firm poaching (Nguyen, 2014). This reality creates a practical imperative for tech firms to shift toward internal management frameworks, such as corporate social responsibility (CSR), to support long-term employee loyalty.

Most CSR research in Vietnam has focused on external factors, such as marketing, or has been limited to traditional service industries, such as banking and tourism. There is a lack of evidence on how CSR relates to employees' internal behavior in high-tech sectors, where professional values such as research ethics and innovation remain underexplored. Furthermore, the complex psychological process, specifically how CSR integrates with organizational trust, employee satisfaction, corporate image, and person-organization fit to loyalty, remains unclear in the Vietnamese S&T context.

Regarding the timing of this analysis, the empirical data were collected in 2024. Although the findings are being presented in 2026, they remain highly relevant because Hanoi has issued and implemented Plan 17/KH-UBND, which implements 6 resolutions of the City People's Council, identifying science, technology, innovation, and the digital economy as the main drivers of growth and sustainable development until 2030 (Minh Nguyet, 2026). In addition, highly skilled personnel are scarce, with senior-level talent comprising only nearly 20% of the total IT workforce and leader- or manager-level positions accounting for just 7% (TopDev, 2023). These ongoing labor shortages suggest an urgent need for tech firms to adopt value-driven strategies, such as CSR, to retain their workforce.

By addressing these specific industry gaps, this study moves beyond generic loyalty models to explore a CSR framework tailored for S&T enterprises. The paper identifies the need for specialized measurement scales that reflect the unique responsibilities of these firms, such as supporting innovation and maintaining legal integrity in technology development.

1. LITERATURE REVIEW AND HYPOTHESES

The relationship between corporate social responsibility (CSR) and employee loyalty is elucidated by integrating social exchange theory, social identity theory, and stakeholder theory. In the science and technology sector, these theories form a connected process that is highly relevant to specialized employees.

First, social exchange theory suggests that the relationship between two people or parties is viewed from an economic perspective (Blau, 1964). In the S&T sector, employees value socio-emotional support alongside financial rewards. When an organization invests in environmental, societal, and economic initiatives, employees perceive these actions as signals of institutional support and valuation. In return for these resources, personnel exhibit greater trust and satisfaction, psychological states that are consistently associated with long-term loyalty. Second, social identity theory explains individuals' membership in groups relative to out-groups, based on a person's self-concept (Tajfel & Turner, 1979). Employees in the S&T sector often possess a professional identity linked to company image and innovation. When a company applies CSR practices that support person-organ-

ization fit and a positive corporate image, it can enhance a sense of belonging among S&T employees.

The triple bottom line (TBL) framework, pioneered by Elkington (1994), measures organizational performance by integrating profit (economic), people (social), and planet (environmental) dimensions. The structural flexibility of the TBL framework enables its widespread application in strategic management and aligns closely with international policies, particularly the United Nations Sustainable Development Goals, including SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action) (Nica et al., 2025). In the context of S&T enterprises in Vietnam, the application of the TBL framework exhibits sector-specific characteristics tied to the knowledge economy and the national digital transformation project. Moreover, this study integrates the responsible innovation framework (Stilgoe et al., 2013; von Schomberg, 2013) as a pillar of CSR, framing the approach as an innovation-extended TBL framework. Grounded in stakeholder theory (Freeman, 1984), responsible innovation is conceptualized as a collective process that aligns technological advancements with societal values and ethical expectations. This framework responds to the limitations of traditional risk-management

models, in which the negative consequences of technology only become fully apparent after it has been deeply institutionalized in society. By prioritizing research intentions and public values from the outset, responsible innovation allows technology firms to proactively navigate ethical responsibilities during the early stages of technological development.

Within this investigation, CSR is operationalized as a formative higher-order construct comprising four dimensions: CSR-Economic, CSR-Environmental, CSR-Social, and CSR-Innovation. The foundational tenets of responsible innovation are embedded and operationalized into specific, measurable behavioral indicators that constitute the CSR-Innovation dimension within the structural higher-order construct. This innovation dimension evaluates three core behavioral commitments: the strategic allocation of resources and dedicated budgets for R&D and technological process improvement, the institutionalization of intellectual property law into strict internal regulations to protect patents and stakeholder copyrights, and the active development of human capital alongside the protection of employees' economic rights regarding their creative research outputs. Besides, the economic dimension focuses on employee well-being, transparent career pathways, and compliance with technology and laboratory safety protocols. The environmental dimension prioritizes resource conservation, the safe management of laboratory and technological waste, adherence to environmental standards (such as ISO 14001), and the cultivation of ecological awareness among the employees. The social dimension addresses product ethics and data security, ensuring that technological solutions maintain absolute user privacy and technical transparency.

Grounded in stakeholder and social identity theories, CSR initiatives support a prestigious reputation, assisting personnel in aligning their personal values with the firm (Homer et al., 2023) and establishing cognitive perceptions of person–organization fit (Duarte & Mouro, 2022). Drawing on social exchange and identification frameworks, substantive CSR practices provide non-material resources that are linked to higher employee satisfaction (Aguinis & Glavas, 2012) and reinforce organizational trust by demonstrating corporate

integrity (Hwang et al., 2022). Furthermore, CSR initiatives map onto corporate image through cognitive categorization mechanisms, providing highly educated S&T professionals with an identity baseline that covaries with positive internal reputation perceptions (Vuong & Bui, 2023).

Social identity logic suggests that person–organization fit is related to employee loyalty by strengthening organizational identification and psychological dedication (Kim & Gatling, 2019). Similarly, social exchange theory positions both employee satisfaction and organizational trust as crucial prerequisites for loyalty; satisfied, trusting individuals exhibit lower turnover intentions owing to perceived reciprocity obligations and mitigated relational risks (La Paudi et al., 2022). Lastly, corporate image serves as an important psychological anchor for workforce retention, as a prestigious external reputation establishes a psychological bond where employees associate personal success with collective brand achievements (Chen et al., 2022).

Finally, under social identity principles, person–organization fit is directly related to employee satisfaction through value congruence, as S&T employees actively seek an intersection between their creative ideals and corporate development strategies (Verquer et al., 2003). Concurrently, grounded in social exchange mechanisms, organizational trust covaries with enhanced psychological safety and overall job satisfaction (Güney et al., 2022). These internal states are further supported since a favorable corporate image serves as an external signal of ethical reliability that is positively associated with stakeholder trust (Osman et al., 2024).

In the specialized S&T sector, fostering employee loyalty requires more than contractual agreements alone. Recent evidence suggests that person–organization fit is a primary role of psychological attachment and long-term loyalty (Jin et al., 2024). Within the S&T workforce, organizational trust serves as a pivotal relational anchor in the employee–employer relationship, translating perceived ethical conduct into sustained dedication (Jin et al., 2024). Moreover, employee satisfaction serves as a pivotal bridge to loyalty, as satisfied employees exhibit higher levels of institutional commitment and a marked reduction in turnover intentions

(Martensen & Grønholdt, 2006). Lastly, a positive corporate image internalizes the firm's prestige, effectively channeling organizational reputation into long-term loyalty (Rupp et al., 2006). Therefore, this study argues that the impact of CSR on loyalty is not always direct but is channeled through these internal psychological states.

This study aims to explore the impact of CSR on employee loyalty among S&T employees in Hanoi, Vietnam, specifically by analyzing person-organization fit, organizational trust, corporate image, and employee satisfaction as pivotal mediating variables (Figure 1). Based on the literature review, the following hypotheses are proposed:

- H1: CSR has a positive and significant influence on person-organization fit.*
- H2: CSR has a positive and significant influence on employee satisfaction.*
- H3: CSR has a positive and significant influence on organizational trust.*
- H4: CSR has a positive and significant influence on corporate image.*

- H5: Person-organization fit has a positive and significant influence on employee loyalty.*
- H6: Employee satisfaction has a positive and significant influence on employee loyalty.*
- H7: Organizational trust has a positive and significant influence on employee loyalty.*
- H8: Corporate image has a positive and significant influence on employee loyalty.*
- H9: Person-organization fit has a positive and significant influence on employee satisfaction.*
- H10: Organizational trust has a positive and significant influence on employee satisfaction.*
- H11: Corporate image has a positive and significant influence on organizational trust.*
- H12a: Person-organization fit mediates the relationship between CSR and employee loyalty.*
- H12b: Organizational trust mediates the relationship between CSR and employee loyalty.*

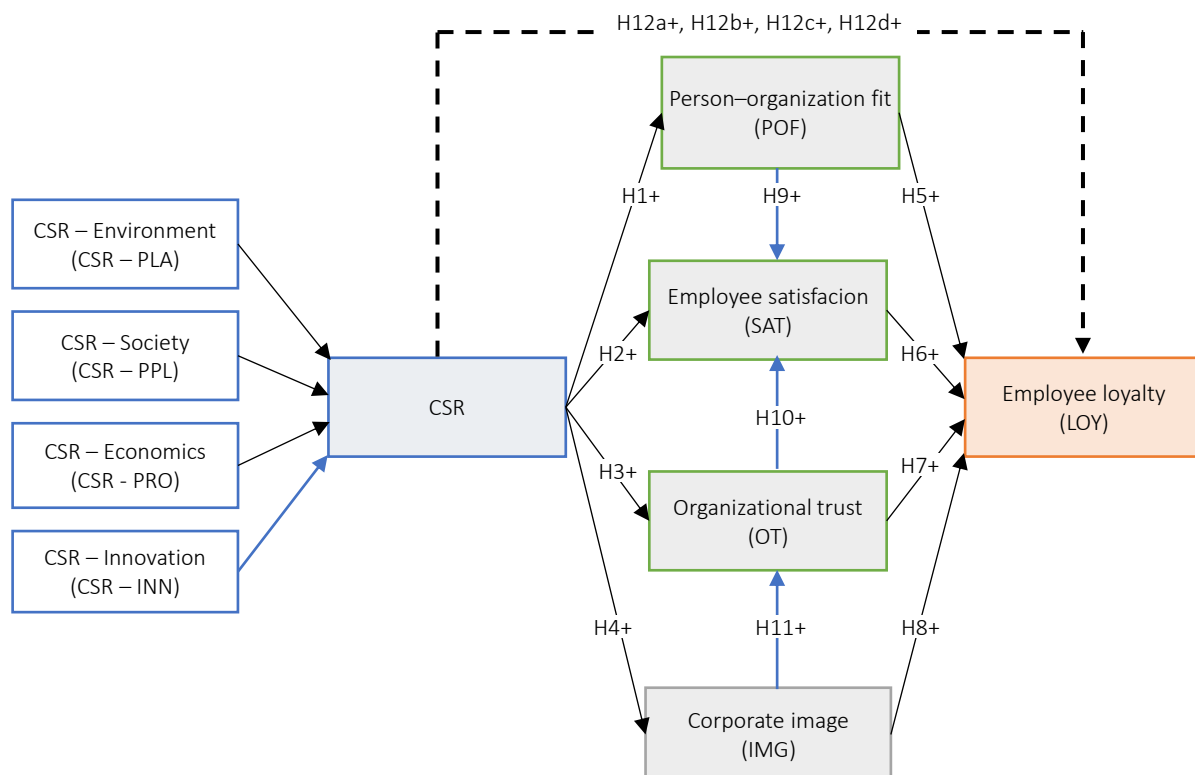


Figure 1. Proposed research model

H12c: Employee satisfaction mediates the relationship between CSR and employee loyalty.

H12d: Corporate image mediates the relationship between CSR and employee loyalty.

2. METHOD

A multi-stage systematic procedure was followed: (1) instrument development based on validated scales; (2) qualitative refinement via expert interviews; (3) quantitative data collection; and (4) data analysis using PLS-SEM.

Regarding ethical standards, an informed consent form was provided to all participants, outlining the academic purpose of the study. Anonymity and confidentiality were strictly maintained throughout the process; no identifying personal or corporate information was stored. The research protocol was reviewed and approved by the Ethics Committee of Duy Tan University (No. 02/CN-HDDD).

The research instrument was synthesized from established scales to ensure theoretical robustness. These specific scales were selected: CSR (Alvarado-Herrera et al., 2017; Turker, 2009), employee satisfaction (Chen et al., 2022; Spector, 1985), organizational trust (Mayer et al., 1995; Robinson & Rousseau, 1994), person–organization fit (Cable & DeRue, 2002; Kristof-Brown et al., 2005), corporate image (Dutton et al., 1994; Nguyen & Leblanc, 2001), and employee loyalty (Chen et al., 2022; Martensen & Grønholdt, 2006; Zeithaml et al., 1996).

Moreover, prior to the official launch, expert interviews were conducted with S&T scholars and human resource managers in Hanoi to contextualize the items. Adjustments were made to ensure that technical terms were correctly interpreted by the S&T workforce. A 5-point Likert scale was utilized for the final questionnaire (Ha, 2026).

The sampling frame for this study comprised S&T enterprises located in Hanoi. The list of organizations was derived from the official directory of S&T enterprises published by the Hanoi Department of Science and Technology (2024). According to the Ministry of Science and Technology, the target population consisted of full-time personnel who have “graduated from university or college and worked

in a science and technology field” (Ha, 2020). To ensure sample validity while respecting industrial confidentiality protocols in Hanoi’s high-tech sector, the questionnaire was distributed to firms on the list of Hanoi Department of Science and Technology (2024), so specific corporate and departmental identities were not recorded. Eligibility was restricted to full-time personnel aged 22 or older who held a university or college degree and were actively employed within these S&T enterprises. Consequently, the final sample includes full-time employees working across the entire S&T sector. Instead of limiting the research to top managers or senior experts, this study intentionally includes employees from all organizational levels to capture a comprehensive view of the workforce.

The official survey was conducted from December 2023 to June 2024. A multi-channel approach (direct, postal, and digital via Google Forms/Zalo) was employed to minimize non-response bias and maximize geographical coverage across Hanoi’s industrial sectors. Data were collected in 2024, a strategic period for Hanoi’s S&T ecosystem. The dataset remains valid for 2026 because the values of knowledge workers are enduring and structural challenges, such as brain drain, persist in the sector.

Of the 1,000 questionnaires distributed, 578 were returned, yielding a 57.8% response rate. A rigorous screening process was performed to exclude incomplete responses and straight-lining patterns, yielding 479 valid observations for the final analysis (Table 1).

The data were analyzed using SmartPLS 4. PLS-SEM was selected for its predictive capabilities in mediation models. CSR is operationalized as a higher-order construct using a reflective-formative framework (Amoozegar et al., 2026). At the lower-order level, the four dimensions (economic, social, environmental, and innovation) are specified as reflective components. At the higher-order level, CSR is specified as a formative construct because these four dimensions capture distinct, non-interchangeable facets of responsibility (Hair et al., 2021). To evaluate this structure without statistical bias, this study applied the two-stage approach (Sarstedt et al., 2019). This method ensures a robust validation of how each specific dimension contributes to the overall CSR framework before examining its structural effect on employee loyalty.

Table 1. Summary of survey response and data screening

Category	Description	Statistics
Survey Distribution	Total distributed	1,000
	Total returned	578
	Overall response rate	57.8%
Data Screening	Invalid responses (inconsistent/incomplete)	99
	Valid responses (final sample)	479
	Validity rate	82.8%

Beyond the evaluation of the higher-order CSR construct, the structural model is specified as an interconnected parallel framework (Table 2) with cross-construct pathways rather than an isolated parallel mediation model. This structural configuration explicitly accounts for two primary types of mediation mechanisms: (1) CSR → POF → LOY, CSR → SAT → LOY, CSR → OT → LOY, CSR → IMG → LOY; and (2) interconnected cross-pathway mediation, in which corporate image relates to organizational trust (IMG → OT), and both organizational trust and person-organization fit link to employee satisfaction (OT → SAT, POF → SAT).

3. RESULTS

Table 3 provides a comprehensive overview of the research sample based on demographic and socio-economic characteristics. The sample comprised 479 participants and features a relatively balanced gender distribution (51.6% female and 48.4% male). The respondents were primarily in

the 26–35 age group, representing the largest proportion (44.7%), and single individuals accounted for 54.9% of the total. Regarding educational level, 56% of participants held a Bachelor's degree, and 12.7% held a postgraduate degree. Regarding work experience and economic status, the largest share of respondents (36.1%) had between 2 and 5 years of experience, while the most common monthly income ranged from 15 to under 30 million VND (48.9%).

The measurement model assessment began with an evaluation of outer loadings. Indicator OT6 was removed because its loading (0.532) fell below the 0.7 threshold. After re-running the model, all indicators had loadings above 0.7, indicating their significance (see Appendix A).

Table 4 indicates that all latent constructs comprehensively meet the necessary criteria for internal consistency reliability, and validity. Every psychometric scale exhibited good reliability, with

Table 2. Framework for evaluating both the measurement and the structural model

Criteria	Threshold	Key Source(s)
Reflective measurement level (lower-order CSR dimensions, OT, SAT, POF, IMG, and LOY)		
Indicator Reliability	Outer Loadings ≥ 0.70	Hulland (1999); Hair et al. (2021)
Internal consistency reliability	Cronbach's alpha ≥ 0.70	DeVellis and Thorpe (2021)
	Composite Reliability (CR)	DeVellis and Thorpe (2021)
Convergent Validity	AVE ≥ 0.50	Fornell and Larcker (1981)
Discriminant Validity	HTMT ratio ≤ 0.85	Henseler et al. (2015)
	Fornell-Larcker Criterion	Fornell and Larcker (1981)
Formative measurement level (higher-order CSR construct in Stage 2)		
Collinearity	Inner VIF ≤ 3.0	Hair et al. (2021)
Significance of Indicators	Outer Weights: p-value < 0.05	Hair et al. (2021)
Structural Model		
Collinearity	Inner VIF ≤ 5.0	Hair et al. (2021)
R ²	(Weak: 0.25; Mod: 0.50; High: 0.75)	Cohen (1988)
f ²	(Small: 0.02; Med: 0.15; Large: 0.35)	Cohen (1988)
Q ²	(Low: 0.25; Med: 0.50; High: 0.50)	Hair et al. (2019)
Hypothesis Testing	p-value < 0.05 (t-stat > 1.96)	Hair et al. (2021)

Note: CSR means corporate social responsibility, OT means organizational trust, SAT means employee satisfaction, P-O fit means person-organization fit, IMG means corporate image, and LOY means employee loyalty.

Table 3. Characteristics of participants

Variable	Category	Frequency (N)	Percentage (%)
Gender	Male	232	48.4
	Female	247	51.6
	Total	479	100.0
Age Group	25 years and below	96	20.0
	26–35 years old	214	44.7
	36–45 years old	110	23.0
	Over 46 years old	59	12.3
	Total	479	100.0
Marital Status	Single	263	54.9
	Married	216	45.1
	Total	479	100.0
Education Level	Associate Degree	150	31.3
	Bachelor's Degree	268	56.0
	Postgraduate Degree	61	12.7
	Total	479	100.0
Monthly Income	< 15 million VND	167	34.9
	15 to < 30 million VND	234	48.9
	30 to < 45 million VND	56	11.6
	45 million VND and above	22	4.6
	Total	479	100.0
Work Tenure	Less than 2 years	105	21.9
	2 to under 5 years	173	36.1
	5 to under 7 years	94	19.6
	7 to under 10 years	56	11.7
	10 years and above	51	10.7
	Total	479	100.0

Cronbach's Alpha and composite reliability values (CR) exceeding the 0.7 threshold. Additionally, the average variance extracted (AVE) for each scale exceeded 0.5, thereby indicating convergent validity.

Discriminant validity via the Fornell–Larcker criterion and the heterotrait-monotrait (HTMT) ratios are presented in Tables 5 and 6. As shown in Table 5, the square root of the AVE for each construct (diagonal) is higher than any of its corresponding

inter-construct correlations, satisfying the Fornell and Larcker (1981) requirement. Furthermore, all HTMT values range from 0.318 to 0.830, remaining below the conservative 0.85 threshold, establishing the empirical distinctiveness of the research constructs (Henseler et al., 2015).

The validity of the formative higher-order construct (HOC) for CSR was supported by evaluating outer weights and collinearity. As shown in Table 7, all

Table 4. Reliability and validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
CSR_INN	0.890	0.893	0.924	0.752
CSR_PLA	0.852	0.853	0.900	0.692
CSR_PPL	0.850	0.850	0.899	0.689
CSR_PRO	0.889	0.890	0.923	0.751
IMG	0.826	0.831	0.885	0.657
LOY	0.876	0.876	0.906	0.618
OT	0.909	0.910	0.930	0.687
POF	0.858	0.858	0.903	0.701
SAT	0.896	0.896	0.920	0.658

Note: CSR_INN means CSR – Innovation, CSR_PLA means CSR – Environment, CSR_PPL means CSR – Society, and CSR_PRO means CSR – Economics, IMG means corporate image, LOY means employee loyalty, OT means organizational trust, P-O fit means personal–organizational fit, and SAT means employee satisfaction.

Table 5. Fornell–Larcker criterion

	CSR_INN	CSR_PLA	CSR_PPL	CSR_PRO	IMG	LOY	OT	POF	SAT
CSR_INN	0.867								
CSR_PLA	0.280	0.832							
CSR_PPL	0.300	0.493	0.830						
CSR_PRO	0.436	0.316	0.315	0.867					
IMG	0.348	0.426	0.411	0.404	0.811				
LOY	0.371	0.460	0.427	0.478	0.491	0.786			
OT	0.342	0.374	0.383	0.402	0.457	0.533	0.829		
POF	0.368	0.439	0.446	0.400	0.341	0.626	0.419	0.837	
SAT	0.434	0.473	0.481	0.518	0.484	0.736	0.510	0.495	0.811

Note: CSR_INN means CSR – Innovation, CSR_PLA means CSR – Environment, CSR_PPL means CSR – Society, and CSR_PRO means CSR – Economics, IMG means corporate image, LOY means employee loyalty, OT means organizational trust, P-O fit means personal–organizational fit, and SAT means employee satisfaction.

Table 6. HTMT

	CSR_INN	CSR_PLA	CSR_PPL	CSR_PRO	IMG	LOY	OT	POF	SAT
CSR_INN									
CSR_PLA	0.318								
CSR_PPL	0.342	0.578							
CSR_PRO	0.488	0.362	0.362						
IMG	0.405	0.506	0.490	0.465					
LOY	0.418	0.531	0.495	0.541	0.573				
OT	0.378	0.422	0.434	0.446	0.524	0.596			
POF	0.419	0.513	0.523	0.456	0.402	0.721	0.473		
SAT	0.484	0.540	0.551	0.580	0.560	0.830	0.563	0.564	

Note: CSR_INN means CSR – Innovation, CSR_PLA means CSR – Environment, CSR_PPL means CSR – Society, and CSR_PRO means CSR – Economics, IMG means corporate image, LOY means employee loyalty, OT means organizational trust, P-O fit means personal–organizational fit, and SAT means employee satisfaction.

first-order dimensions exhibited statistically significant outer weights ($p < 0.001$), indicating their substantial relative contribution to the CSR framework. Furthermore, the structural integrity of the HOC was established as all variance inflation factor (VIF) values ranged from 1.293 to 1.397, remaining well below the conservative threshold of 3.0 (Hair et al., 2021). These results justify the use of the composite CSR score for subsequent structural model analysis.

The structural model was evaluated for its explanatory and predictive capabilities (Table 8). The coefficient of determination (R^2) indicates that

the model explains a substantial portion of the variance in the primary target construct (Cohen, 1988). Regarding the effect size (f^2), CSR exerted a strong impact on corporate image ($f^2 = 0.445$) and person–organization fit ($f^2 = 0.495$) (Cohen, 1988). Finally, the predictive relevance (Q^2) for all endogenous constructs was greater than zero, indicating the model's out-of-sample predictive power. Specifically, the Q^2 values for employee loyalty ($Q^2 = 0.398$) and employee satisfaction ($Q^2 = 0.318$) indicate a medium level of predictive relevance (Hair et al., 2019), further validating the structural integrity of the proposed framework.

Table 7. Evaluation of the higher-order construct (CSR)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	p-values	Variance Inflation Factor (VIF)
CSR_INN → CSR	0.259	0.258	0.049	5.314	0.000	1.293
CSR_PLA → CSR	0.361	0.360	0.046	7.867	0.000	1.385
CSR_PPL → CSR	0.359	0.357	0.047	7.638	0.000	1.397
CSR_PRO → CSR	0.405	0.405	0.047	8.645	0.000	1.323

Note: CSR_INN means CSR – Innovation, CSR_PLA means CSR – Environment, CSR_PPL means CSR – Society, CSR_PRO means CSR – Economics, and CSR means corporate social responsibility.

Table 8. Structural model quality assessment (R2, Q2, Effect Size (f2))

	R ²		Q ²	Effect Size (f ²)				
	R-square	R-square adjusted	Q ² (=1-SSE/SSO)	IMG	LOY	OT	POF	SAT
CSR			0.000	0.445		0.154	0.495	0.263
IMG	0.308	0.307	0.199		0.022	0.058		
LOY	0.654	0.651	0.398					
OT	0.314	0.311	0.212		0.025			0.056
POF	0.331	0.330	0.229		0.195			0.022
SAT	0.490	0.487	0.318		0.385			

Note: CSR means corporate social responsibility, IMG means corporate image, LOY means employee loyalty, OT means organizational trust, P-O fit means personal–organizational fit, and SAT means employee satisfaction.

As shown in Table 9, all inner VIF values are below the threshold of 3, suggesting that multicollinearity is not an issue in the structural model.

Table 9. Variance inflation factor (VIF)

	CSR	IMG	LOY	OT	POF	SAT
CSR		1.000		1.445	1.000	1.747
IMG			1.424	1.445		
LOY						
OT			1.523			1.418
POF			1.403			1.539
SAT			1.690			

Note: CSR means corporate social responsibility, IMG means corporate image, LOY means employee loyalty, OT means organizational trust, P-O fit means personal–organizational fit, and SAT means employee satisfaction.

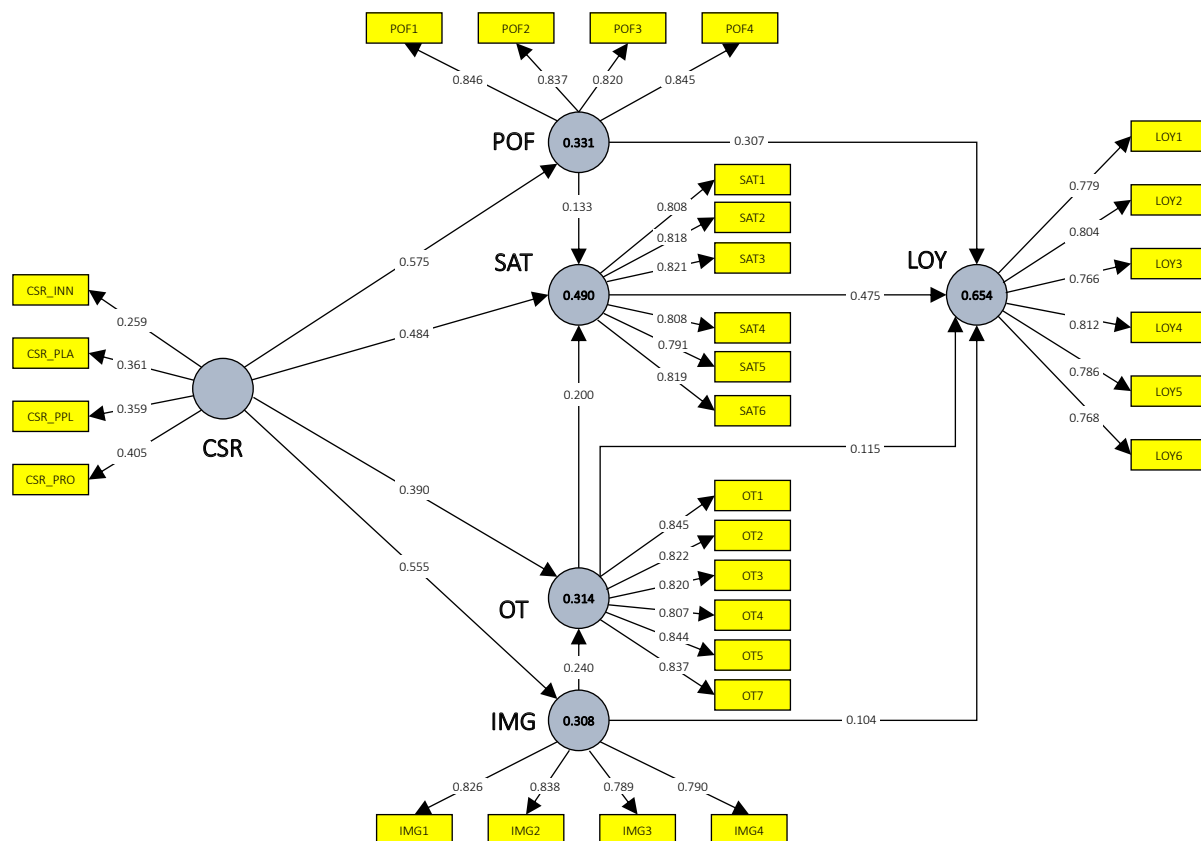
The structural model was validated through a bootstrapping procedure (5,000 resamples). All

hypotheses were empirically supported at the $p < 0.05$ or $p < 0.001$ significance levels (Table 10 and Figure 2). Regarding direct effects, CSR exerted its positive influence on person–organization fit ($\beta = 0.575$, $t = 14.996$) and corporate image ($\beta = 0.555$, $t = 19.313$). These findings suggest that for S&T enterprises in Hanoi, CSR serves as a highly effective signaling mechanism for organizational values and external image. Furthermore, employee satisfaction was identified as the most significant direct predictor of loyalty ($\beta = 0.475$, $t = 13.837$), corroborating its role as a fundamental psychological predictor in the S&T sector. Regarding indirect effects, all four mediating pathways were statistically significant. Notably, the path through employee satisfaction ($\beta = 0.230$, $t = 7.747$) emerged as the most substantial indirect mechanism through which CSR influences loyalty.

Table 10. Hypothesis testing results

Hypothesis	Relationship	Path Coefficients	Sample Mean (M)	Standard Deviation	t-Statistics	p-Values	Result
H1	CSR → POF	0.575	0.577	0.038	14.996	0.000	Supported
H2	CSR → SAT	0.484	0.486	0.047	10.358	0.000	Supported
H3	CSR → OT	0.390	0.393	0.050	7.862	0.000	Supported
H4	CSR → IMG	0.555	0.557	0.029	19.313	0.000	Supported
H5	POF → LOY	0.307	0.307	0.037	8.286	0.000	Supported
H6	SAT → LOY	0.475	0.476	0.034	13.837	0.000	Supported
H7	OT → LOY	0.115	0.116	0.033	3.505	0.000	Supported
H8	IMG → LOY	0.104	0.103	0.035	2.959	0.003	Supported
H9	POF → SAT	0.133	0.133	0.044	3.041	0.002	Supported
H10	OT → SAT	0.200	0.197	0.050	4.007	0.000	Supported
H11	IMG → OT	0.240	0.239	0.046	5.261	0.000	Supported
H12a	CSR → POF → LOY	0.177	0.177	0.026	6.938	0.000	Supported
H12b	CSR → OT → LOY	0.045	0.046	0.015	2.904	0.004	Supported
H12c	CSR → SAT → LOY	0.230	0.232	0.030	7.747	0.000	Supported
H12d	CSR → IMG → LOY	0.058	0.057	0.020	2.854	0.004	Supported

Note: CSR means corporate social responsibility, IMG means corporate image, LOY means employee loyalty, OT means organizational trust, P-O fit means personal–organizational fit, and SAT means employee satisfaction.



Note: CSR means corporate social responsibility, IMG means corporate image, LOY means employee loyalty, OT means organizational trust, P-O fit means personal–organizational fit, and SAT means employee satisfaction.

Figure 2. PLS-SEM result

4. DISCUSSION, LIMITATIONS AND FUTURE RESEARCH

The findings suggest that CSR initiatives influence employee loyalty exclusively through indirect pathways within the proposed mediation framework. Specifically, the path analysis supports the mediating roles of person–organization fit, organizational trust, employee satisfaction, and corporate image, providing insight into the gap between CSR and employee loyalty in the S&T sector.

Consistent with the recent findings of Jin et al. (2024) and Stojanović et al. (2021), this paper is aligned with the view that CSR is a critical antecedent for sustainable human resource management. However, while previous Vietnamese studies by Mai et al. (2022) and Ho (2021) focused on FDI and manufacturing sectors where loyalty is of-

ten driven by external rewards, this study reveals a different dynamic for S&T enterprises in Hanoi. For personnel within these S&T enterprises, the results show that employee satisfaction and person–organization fit are the dominant factors of loyalty. This suggests that in the tech sector, loyalty is not only about transactional benefits but also about fit and satisfaction in leaders and organizations. Interestingly, although corporate image functions as a statistically significant mediator, its indirect predictive power for loyalty is lower than the mediation effect channeled through employee satisfaction. This contradicts some earlier findings in traditional service sectors, where external reputation was the primary determinant of retention (Etikan, 2024). In the S&T sector of Hanoi, a corporate image is necessary for recruitment, but CSR, realized through person–organization fit and satisfaction, may enhance long-term loyalty.

The theoretical implications of this study are multi-layered. First, this study contributes to

social exchange theory by mapping the indirect mechanisms of organizational trust, employee satisfaction, and person–organization fit to the relationship between CSR and loyalty. Therefore, high levels of employee satisfaction, person–organization fit, and organizational trust generate a felt obligation to reciprocate, ultimately strengthening employees’ intent to remain with the organization. In line with the findings of Chatzopoulou et al. (2022), which emphasized external community CSR, our results highlight that the economic dimension of CSR (CSR-PRO) is the resource that tech workers value most. Meanwhile, Rawat and Gupta (2025) highlighted the relevance of internal CSR for the long-term development of firms following the COVID-19 pandemic. Second, from a social identity theory perspective, the indirect path through corporate image offers empirical support for the notion that organizational image is a mechanism for self-enhancement among tech workers. This result is consistent with Farooq et al. (2014).

Methodologically, this study validates CSR as a multi-dimensional, reflective-formative higher-order construct that integrates innovation alongside traditional pillars. By adding innovation to the CSR framework and using a simple two-stage approach, the study shows that these distinct dimensions can be combined effectively. This result aligns with Amoozegar et al. (2026), who evaluated CSR as a reflective-formative higher-order construct.

Moreover, this study provides some managerial implications for the S&T sector. First, firms might hold periodic dialogues to ensure that CSR initiatives align with the personal ethics of the knowledge workforce, thereby increasing person–organization fit and satisfaction. In addition, firms may leverage corporate image by encouraging employees to lead social projects and become CSR ambassadors. As a result, the image of firms might become positive to other employees and the public.

Despite the significant theoretical and practical contributions of this study, several limitations must be acknowledged to provide a balanced interpretation of the findings. First, the geographic and sectoral focus is restricted to S&T enterpris-

es in Hanoi, Vietnam. Consequently, the results may not fully encapsulate the unique characteristics of S&T firms in Vietnam, potentially limiting the external validity and generalizability of the conclusions. Second, reliance on self-reported survey data introduces the risk of social desirability bias, as respondents may overstate the effectiveness of their organization’s CSR initiatives. Finally, the study’s cross-sectional design captures data at a single point in time; therefore, the findings might not account for the temporal evolution of employee loyalty.

To address these constraints, future research should expand the geographic and cultural horizons of this model through cross-national or cross-sectoral studies. Comparing developing economies with developed Western or East Asian clusters would help determine which CSR effects on employee behavior are universal and which are culture-specific. Methodologically, subsequent research should adopt longitudinal or experimental designs to more accurately examine the causal mechanisms and long-term impacts of CSR. To mitigate common method bias, researchers are encouraged to use multi-source data, integrating evaluations from supervisors, peers, and customers, as well as objective financial indicators. Furthermore, it is essential to distinguish between substantive CSR, which reflects authentic commitment, and symbolic CSR, often viewed as greenwashing, to better understand how perceived sincerity influences employees’ sincerity and loyalty. Beyond these methodological improvements, expanding the mediating and moderating mechanisms remains a vital frontier for future research. Models could incorporate variables such as the meaning of work, mental well-being, and work-life balance to identify the boundary conditions of CSR effectiveness. Finally, researchers should broaden the scope of behavioral outcomes to investigate the impact of CSR on internal socially responsible behavior, psychological health, and digital advocacy. Integrating CSR research with the United Nations’ Sustainable Development Goals and exploring digital communication strategies, such as corporate storytelling on social platforms, would offer valuable insights into how CSR can be leveraged as a strategic human resource management tool in an increasingly globalized era.

CONCLUSION

This study aims to examine the factors influencing employee loyalty through CSR pathways among S&T employees in Hanoi. The findings reveal that the relationship between CSR and loyalty is mediated by person–organization fit, organizational trust, corporate image, and employee satisfaction. In particular, employee satisfaction plays a significant mediating role in translating these perceptions into long-term loyalty, while corporate image exhibits a more limited role in sustaining loyalty.

These findings lead to several important conclusions. First, in the high-tech sector of an emerging market, employee satisfaction and personal-organizational fit serve as key mechanisms by which organization-led initiatives are internalized by knowledge workers. Second, the distinct roles of internal satisfaction and corporate image indicate that talent retention in S&T enterprises relies heavily on continuous investment in internal human capital. Finally, these results suggest that CSR should be framed not as a peripheral activity, but as a strategic condition for stabilizing intellectual capital in competitive sectors. While limited by its cross-sectional design, this study establishes a foundational framework for value-driven management and highlights the need for future research to use longitudinal data to examine how these internal states evolve across organizational lifecycles.

AUTHOR CONTRIBUTIONS

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DECLARATION OF AI IN ASSISTED WRITING

The authors declare that no generative AI was used for the initial preparation of this manuscript. Grammarly was used during the revision process solely for language enhancement. The authors retain full responsibility for the integrity and accuracy of the content.

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APPENDIX A

Table A1. Outer loading of indicator variables (with OT6)

	CSR_INN	CSR_PLA	CSR_PPL	CSR_PRO	IMG	LOY	OT	POF	SAT
CSR_INN1	0.869								
CSR_INN2	0.867								
CSR_INN3	0.859								
CSR_INN4	0.874								
CSR_PLA1		0.817							
CSR_PLA2		0.840							
CSR_PLA3		0.825							
CSR_PLA4		0.846							
CSR_PPL1			0.820						
CSR_PPL2			0.843						
CSR_PPL3			0.832						
CSR_PPL4			0.826						
CSR_PRO1				0.856					
CSR_PRO2				0.877					
CSR_PRO3				0.877					
CSR_PRO4				0.857					
IMG1					0.826				
IMG2					0.838				
IMG3					0.788				
IMG4					0.789				
LOY1						0.779			
LOY2						0.804			
LOY3						0.766			
LOY4						0.812			
LOY5						0.786			
LOY6						0.768			
OT1							0.829		
OT2							0.813		
OT3							0.809		
OT4							0.795		
OT5							0.819		
OT6							0.532		
OT7							0.816		
POF1								0.846	
POF2								0.837	
POF3								0.820	
POF4								0.845	
SAT1									0.808
SAT2									0.818
SAT3									0.822
SAT4									0.807
SAT5									0.791
SAT6									0.819

Note: CSR_INN means CSR – Innovation, CSR_PLA means CSR – Environment, CSR_PPL means CSR – Society, and CSR_PRO means CSR – Economics, IMG means corporate image, LOY means employee loyalty, OT means organizational trust, P-O fit means personal–organizational fit, and SAT means employee satisfaction.

Table A2. Outer loading of indicator variables (after excluding OT6)

	CSR_INN	CSR_PLA	CSR_PPL	CSR_PRO	IMG	LOY	OT	POF	SAT
CSR_INN1	0.869								
CSR_INN2	0.867								
CSR_INN3	0.859								
CSR_INN4	0.874								
CSR_PLA1		0.817							
CSR_PLA2		0.840							
CSR_PLA3		0.825							
CSR_PLA4		0.846							
CSR_PPL1			0.820						
CSR_PPL2			0.843						
CSR_PPL3			0.832						
CSR_PPL4			0.826						
CSR_PRO1				0.856					
CSR_PRO2				0.877					
CSR_PRO3				0.877					
CSR_PRO4				0.857					
IMG1					0.826				
IMG2					0.838				
IMG3					0.789				
IMG4					0.790				
LOY1						0.779			
LOY2						0.804			
LOY3						0.766			
LOY4						0.812			
LOY5						0.786			
LOY6						0.768			
OT1							0.845		
OT2							0.821		
OT3							0.820		
OT4							0.807		
OT5							0.844		
OT7							0.836		
POF1								0.846	
POF2								0.837	
POF3								0.820	
POF4								0.845	
SAT1									0.809
SAT2									0.818
SAT3									0.821
SAT4									0.808
SAT5									0.791
SAT6									0.819

Note: CSR_INN means CSR – Innovation, CSR_PLA means CSR – Environment, CSR_PPL means CSR – Society, and CSR_PRO means CSR – Economics, IMG means corporate image, LOY means employee loyalty, OT means organizational trust, P-O fit means personal–organizational fit, and SAT means employee satisfaction.