Journal of Management Science Research Review

https://jmsrr.com/index.php/Journal/about

Volume. 4 Issue No. 3 (2025)

Online ISSN: 3006-2047
Print ISSN: 3006-2039

EXAMINING THE IMPACT OF CORPORATE SOCIAL RESPONSIBILITY ON SUSTAINABLE FINANCIAL PERFORMANCE: THE MODERATING ROLE OF FINTECH ADOPTION IN PUBLIC LISTED OIL AND GAS COMPANIES IN PAKISTAN

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Abstract

This study examines the influence of Corporate Social Responsibility (CSR) on sustainable financial performance, with a specific focus on the moderating effect of FinTech adoption in publicly listed oil and gas companies in Pakistan. Using panel data from five major firms covering the period 2010 to 2024, the research applies Random Effects regression analysis to assess the individual and interactive effects of CSR dimensions—economic, legal, and ethical—on key financial performance indicators: Return on Assets (ROA) and Return on Equity (ROE). The study further explores how FinTech adoption, measured by the integration of blockchain, digital finance tools, and AI-based reporting systems, enhances or modifies the relationship between CSR and performance. The findings reveal that CSR practices have a significant influence on financial outcomes, but their impact varies across different dimensions and performance indicators. Economic and legal responsibilities positively influence ROA, while ethical responsibility has an adverse effect. Conversely, ethical CSR practices significantly boost ROE, suggesting long-term shareholder value is strengthened through ethical conduct. FinTech adoption is shown to enhance both ROA and ROE, highlighting its role as a strategic enabler of CSR effectiveness. The interaction of CSR and FinTech reveals a

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complementary relationship that can transform CSR from a cost center into a performance-enhancing strategy. Additionally, firm size and market capitalization exhibit distinct effects on financial metrics, reinforcing the importance of organizational context. The study contributes to theoretical frameworks by integrating stakeholder theory, legitimacy theory, and resource-based view (RBV), and empirically validates the significance of digital transformation in corporate sustainability strategies. It also fills critical research gaps in the South Asian context by offering a sector-specific analysis and introducing FinTech as a moderator in the CSR–performance nexus. Practical implications suggest that policymakers, regulators, and firm managers should promote both CSR initiatives and FinTech adoption to achieve sustainable financial growth in high-risk, capital-intensive sectors like oil and gas. Overall, the research provides a robust foundation for advancing corporate governance and responsible finance in emerging markets.

Keywords: Corporate Social Responsibility (CSR), FinTech Adoption, Sustainable Financial Performance, Return on Assets (ROA), Return on Equity (ROE), Oil and Gas Sector, Random Effects Model, Pakistan, Stakeholder Theory, Digital Transformation

Introduction

Corporate Social Responsibility (CSR) has of late found its way to be part and parcel of strategic management within companies across different industries; but most importantly within industries that are subjected to high environmental and social impacts like oil and gas. Under the mounting pressure of stakeholders, regulatory authorities, and civil society, companies are also supposed to take part in corporate social responsibilities that not only improve the state of society but also lead to the long-term sustenance of

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Online ISSN: 3006-2047
Print ISSN: 3006-2039

business. In this regard, CSR is no longer regarded as a marginal. It has become, and quite simply, the most significant determinant of the reputational wealth and even the economic performance of firms (Firdousi et al., 2023).

The CSR in countries like Pakistan with developing economies is still at its initial stages, especially in such areas like the oil and gas industries, where many environmental and ethical problems are encountered. The industry has its share in the national economy but it is also very detrimental to the environment. Thus, it is high time and important to understand the costs of CSR in this situation. Although developed economies have an elaborate structural system in determining the connection between CSR and financial performance, the countries experience scant and uneven empirical evidence in Pakistan (Farhood, 2024).

Sustainable financial performance can be defined as the capacity of a firm to sustain profitability over time coupled with the need to address issues on environment, social and governance (ESG). This two-fold motive of economic feasibility and social responsibility is particularly important in formulating economically sensitive industries like capital-intensive industries and environmentally sensitive industries. Besides efficiency in operations, oil and gas firms are examined on their social license to operate, which now is commonly linked to their CSR activities (Alshdaifat et al., 2024).

The past studies have produced inconsistent findings with respect to the interrelation between CSR and financial performance. Other researches have claimed that CSR increases the stakeholder trust, enhances the brand equity, and causes cost savings, which add to the high financial performance. The others argue that CSR incurs extra costs which can not necessarily be recovered in monetary terms especially in the short-term perspective. Thus

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there exists the necessity to establish this interplay in the institutional and sectoral context that is peculiar to Pakistan (Amimakmur et al., 2024).

FinFinancial technology (FinTech) is a major innovation in the delivery and management of financial service. FinTech has become the corporate financial game changer in the last few years, having provided two elements of greater financial reporting, more effective communication of events to stakeholders as well as a better way to manage things related to risk. Because FinTech provides an opportunity to coordinate it with CSR, it is possible to enhance their outcomes based on increased transparency, accountability, and real-time performance monitoring (Anwar et al., 2024).

The dampening effect of the FinTech use on the CSR-financial performance relationship is a little-discussed but very topical aspect, regarding especially emerging markets. Although CSR initiatives create the background of the sustainable business according tothe current business conditions, FinTech can be viewed as the moving force that enhances the power of the given initiatives. The use of technologies like blockchain, artificial intelligence and big data analytics allows firms to report the CSR results in a more credible and efficient manner to the stakeholders (Anwar et al., 2024).

At the same time, CSR in conjunction with FinTech is strategically relevant in the context of Pakistan in terms of its oil and gas industry. Our industry faces a unstable environment both in regulatory framework, and environment which is very sensitive to the loss of public confidence in our continuity. Companies implementing responsible attitude to business and innovative technology tools have more chances to improve their performance and reputation in terms of investors and regulators (Ashraf et al., 2022).

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In this research, we assume that the implementation of FinTech may help increase the strategic usefulness of CSR through facilitation of allocating the resources more efficiently, decreasing information asymmetries, and increasing the stakeholder involvement. Through this, it will be able to reduce CSR as a cost center to a competitive advantage. This study will help in identifying how governance made possible by technology can be used in increasing the effectiveness of CSR investment in returning sustainable financial performance by taking into consideration the moderating role of FinTech (Aziz et al., 2024).

Although the CSR and FinTech have increasingly gained global attention, little empirical research has dwelled on the two in the occurrence of publicly traded companies in Pakistan. The vast majority of existing literature approach the issues of CSR and FinTech as separate entities. Thus, this study is likely to close this gap and provide the comprehensive picture of the overall role that CSR endeavors, and the applied FinTech innovation play in ensuring sustainable financial performance.

In addition to that, the FinTech significance in facilitating ESG reporting, increasing financial inclusion, and promoting rule compliance provides another dimension of relevance to this research. In the case of oil and gas companies that are under an increased level of scrutiny, the FinTech solutions can be considered applicable in achieving both external and internal reporting standards as well as governance best practices. This is in consonance with international tendency towards digital sustainability and intelligent governance (Basheer et al., 2024).

In terms of theoretical foundations, the present study relies on the stakeholder theory, legitimacy theory, and resource-based view (RBV) to describe the possible relation between the effects of CSR, FinTech, and the

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performance of the firm. The stakeholder theory focuses on the fact that business practice should be aligned to the expectations of the stakeholders. According to the legitimacy theory, companies want to practice CSR to uphold their social licence to operate. Meanwhile, RBV assumes that CSR reputation or even the level of FinTech capability can be regarded as one of the strategic assets that offer a competitive advantage to the firms (Faizulayev et al., 2025).

Oil and gas industry in Pakistan has given a justifiable argument of conducting this research because of its strategic position in the economy, regulatory framework and environmental concern. The sustainability crisis in the sector provides a perfect environment to investigate how CSR activities, which are properly developed and accompanied by technology, can enhance not only a positive image but also financial evaluators like return on equity (ROE), return on assets (ROA), and earnings per share (EPS) (Hidayat-ur-Rehman & Hossain, 2024).

The paper aims at testing, quantitatively, the moderating role of FinTech adoption on the connection between CSR and sustainable financial performance. The publically listed Pakistani oil and gas companies will be survey to gather data using survey and secondary financial reports. The direct and the moderated relationship among the study variables will be explored through the Structural Equation Modeling (SEM) (Hunjra & Hussainey, 2024).

Through this study a theoretical and practical contribution shall be made. Theoretically, it will provide the idea on how both CSR and technological innovation combine to influence financial performances. In practice, it will help managers, policymakers, and investors to realize the significance of incorporating FinTech solutions with CSR practices to succeed in business long-term in high-risk industries (Hussain et al., 2024).

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After all, the question of how the contemporary structures of digital networking can assist in tending to sustainable and responsible business is also part of this study and not just an appraisal of the monetary returns of CSR. In Pakistan, a society with a resource-limited and transparent local economy, the collaboration of CSR and FinTech may be the opportunity to change corporate governance and value creation in the long term (Hussain et al., 2024).

The study is highly relevant in the larger discussion of sustainable corporate practice especially in the emerging economy of Pakistan where CSR is an immature concept as strategic organizational activity. Since organizations are increasingly looking at the environment, social, and governance (ESG) factors through the perspective of investors, regulators, and consumers, aligning to these aspects makes it empowering to be able to determine how CSR programs affect financial performance. In businesses operating in industries where the public gaze is sharp and the responsibility to the environment is high, e.g. oil and gas producers, businesses have to overcome a maze of financial, ethical and operational demands. This is based on the effectiveness of the oil and gas industry which targets specifically the publicly traded firms in Pakistan, creating insights which can be used to inform both management strategy and government policy (Iqbal et al., 2024).
The research is particularly relevant at the time because of the mounting pressures to use financial technology in order to enhance the transparency, efficiency, and the input of the stakeholders in the operations. Fintech does not only transform the field of banking and finance but also changes the way which companies report their CSR practices and estimates their sustainability performance. This coupling of CSR and FinTech is another frontier in corporate governance and corporate accountability. The examination of the

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moderating impact of FinTech adoption allows better insight into the likelihood and the means by which this digital adoption can increase the positive financial impact of the CSR practices. That is why the study is applicable to corporate strategists, technology adopters, regulatory authorities, and sustainability researchers (Javeed et al., 2025).

Although the global literature on the study of CSR and sustainable financial performance has increased, there are still few empirical research works that incorporate the moderating role of FinTech, especially when applied to the emerging market. The current studies usually discuss CSR individually or only country traditional financial measures without considering the relationship between technological innovations and social responsibility programmes to impact the performance. In the case of Pakistan, in particular, little research has been conducted in this area, although economically, regulatory, environmental peculiarities present obstacles to CSR implementation in the country (Kamran et al., 2024).

The other research gap that is critical is the fact that there is not a lot of sector focus in the literature on CSR in Pakistan. Previously conducted research tends to globalise the results of the study, disregarding the peculiarities and interests of the particular markets such as oil and gas, where high security levels are essential. The companies deal with the special demands of the environmental degradation, safety of the population, and energy security the issues that profoundly influence the CSR policies of the companies and their money earning. This research reduces the focus to this strategic sector that provides a more narrowed-down set of insights not available in literature yet (Kamran et al., 2024).

Furthermore, only a few research works done in Pakistan have managed to incorporate a broad conceptual model that encompasses

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dimensions of CSR, the use of FinTech, and the financial performance of firms within one study in an empirical investigation. Unavailability of integrative models provides a confused picture of the nature of interactions between sustainability, technology, and performance. This shortcoming is deemed in this research as conducted through a systematic form of analytical mechanism to conduct tests on moderated relations hence providing a more comprehensive image of the dynamics around corporate sustainability in the digital era.

This study will help fill these knowledge gaps and thereby contribute to theory and practice of CSR in the technologically changing corporate world. It will avail to future scholars an opportunity to further investigate the intricate, interdependent nature of the relationship between corporate ethics and digital innovation on financial sustainability. These results can also be used to influence the policymakers particularly in outlining recommendations to stimulate the CSR activities as well as adoption of technology among listed companies in Pakistan and other emerging economies.

Research Questions

1. Does Corporate Social Responsibility (CSR) impact the sustainable financial performance of publicly listed oil and gas companies in Pakistan?
2. Does corporate reputation mediate the relationship between CSR practices and sustainable financial performance?
3. Does FinTech adoption moderate the relationship between CSR practices and sustainable financial performance in these companies?

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Research Objectives

1. To examine the effect of CSR practices on the sustainable financial performance of public oil and gas companies in Pakistan.
2. To evaluate the mediating role of corporate reputation between CSR practices and sustainable financial performance.
3. To analyze the moderating role of FinTech adoption in the relationship between CSR and sustainable financial performance.

Literature Review

Corporate Social Responsibility (CSR) has become a very crucial element in determining the financial performance of companies, especially those in the banking and energy-intensive industries. Many empirical studies have been conducted to examine complex connections between CSR programs and firm-level performance. A distinguishing trend that can be drawn from the literature is that both reputational benefits, as well as the aspects of financial stability and stakeholder confidence, can be achieved as a result of CSR implementation, particularly when such practice is accompanied by an extensive framework of governance. When CSR is effectively carried out as a real and strategic practice, the potential reputational risk can be averted and stakeholder relations can be improved, leading to a better financial and non-financial performance or returns. Sindhu et al. (2024) discuss the impact of CSR on the financial and non-financial performance of the Pakistani banking industry with an important positive correlation. They have noted that corporate activities which are part and parcel of CSR like community engagements and the ethical conduct in the workplace increase the reputation of the corporation and therefore affect financial indicators such as Return on Assets (ROA) and Return on Equity (ROE). Innovation and corporate reputation are additional mediating variables that can further enhance this

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relationship. Their results further support the opinion that CSR may turn to be a strategic mechanism to ensure sustainable business performance when used in situations in which the expectations of stakeholders are high.

Liu et al. (2021) specify the moderator role of FinTech in CSR-financial performance nexus. They also report that their analysis of Chinese banking institutions indicates that the effect of CSR on some performance indicators such as the ROA, and Net Interest Margin (NIM) is heavily moderated by the extent of FinTech adoption. FinTech can enhance the value of CSR initiatives by enhancing capital accessibility, lower transaction costs and enabling data driven decision making through its cross cutting pillars of transparency, efficiency and its stakeholder engagement protocols. To elaborate on this point, Aziz et al. (2024) zero in on the contribution of FinTech to green growth in China and emphasise how technological advancements in finance stimulate green practices. Despite the fact that their interests revolve mainly around energy transition and the sustainability of the environment, the impact on CSR is immense. Blockchain and AI are FinTech tools that can be deployed on different levels, requiring more accountability and boosting both reporting on ESG and tracking CSR conformity. Such digital form of reinforcement enables organisations to achieve their sustainability objectives better.

Xu et al. (2024) explore the possibilities of FinTech in terms of sustainable mineral resources management in Australia and Industry 4.0 as a concept. This study proves that FinTech penetration will lead to open and effective operations management practices that favor environmental and local norms. The results resonate with the idea that the use of FinTech is not a partial optimization of operations but a strategic change that has the potential to supplement CSR in the realms of the most complex, resource-intensive industries. The case Muneer et al. (2025) based on Islamic banks in Saudi

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Arabia adds further to the knowledge of the financial relevance of CSR. Based on their study, environmental disclosures, instigated by such governance tools as Sharia Supervisory Boards (SSBs), goes a long way to improve financial sustainability. This paper introduces a new aspect of incorporating religious ethics to CSR, and pointing out how effective CSR can be implemented by employing governance forms that conform to the particular culture.

Nazir et al. (2024) discuss the ESG integration of the Pakistani banking industry and conclude that the subject of sustainable finance has a close connection to financial resilience. According to ESG report considerations, which are incorporated into core operations strategies, are financial stabilisers since the risk over a long term is contained and thus raising investor confidence. This concept aligns well with other sustainability paradigms, which allude to the fact that organisations should move away or simply shift to philanthropic CSR to closer to embedded ESG. Research also is unanimous on the necessity of board composition and governance on maximising the effects of CSR. According to Muneer et al. and Sindhu et al. diverse boards, particularly those having expertise in environmental and CSR matters, are in better position to make sustainability compatible with profitability. The diversity of boards promotes innovativeness, ethics oversight as well as stakeholder inclusion that are essential in the effectiveness of CSR in the long term (Kanwal et al., 2023). The moderating role of FinTech has also been evidenced empirically in that the area of technology improves the stakeholder engagement, transparency of data and the measurement of CSR performance. According to Liu et al., the higher the fintech preparedness of the banks, the higher their financial performance, as well as stronger the CSR results are reported. This highlights the importance of having companies invest in technological infrastructure. The first argument is that (Khémiri et al., 2024).

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CSR is also increasingly understood as a strategic requirement (not a regulatory or charitable one). As is growing to be evidenced by the literature, CSR may align the innovation, market differentiation, and intangible assets like a reputation, and trust. According to Sindhu et al., stakeholder-oriented CSR also directly leads to innovation and this mediates the financial performance (Kashif et al., 2024). Furthermore, in resource-intensive sectors like oil and gas, CSR has direct implications for operational legitimacy and risk management. The high environmental and social risks associated with these industries make CSR essential for securing community support and maintaining regulatory compliance. Here, FinTech can serve as an enabler of transparency, especially through digital reporting tools and sustainability dashboards (Khémiri et al., 2024). Despite robust findings, the literature also points to gaps. Most studies are geographically concentrated, with limited research on CSR and FinTech in South Asian sectors like oil and gas. Moreover, there is a need to empirically test complex moderated mediation models that consider both the direct and indirect pathways between CSR, FinTech, and performance.

Additionally, while stakeholder theory, legitimacy theory, and resource-based views are widely applied, there is scope to integrate newer frameworks like digital transformation theory to understand better how FinTech shapes CSR strategies in evolving market contexts. In conclusion, the literature confirms that CSR positively affects financial performance and that this relationship is significantly moderated by FinTech. The convergence of responsible governance, stakeholder orientation, and digital innovation emerges as a critical axis for sustainable financial outcomes. However, future research should address regional and sectoral gaps and employ more nuanced

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models to capture the dynamic interplay between CSR, FinTech, and firm performance in emerging economies like Pakistan (Ali et al., 2022).

H1: *Corporate Social Responsibility (CSR) practices have a positive impact on the sustainable financial performance of publicly listed oil and gas companies in Pakistan.*

As firms pursue long-term sustainability, CSR has grown to be a strategic asset to firms, where firms in such operations as the oil and gas industry come under a lot of environmental and social scrutiny. The hypothesis is the following: CSR initiatives that address economic, legal, ethical, and philanthropic responsibilities generate shared value by harmonising corporate interests and the interests of stakeholders. These are practices that increase loyalty and satisfaction of customers, satisfaction by employees, their confidence as investors thus improving key financial enhancements, Return of Assets (ROA), Return on Equity (ROE), and Tobin Q. The presupposition here is that pre-emptive CSR capital expenditure should pay off in image and internal efficiency payouts that ultimately result in better financial performances (Xing et al., 2024). This hypothesis is based on stakeholder theory and legitimacy theory, which claims companies receive long-term financial benefits when they react to society's expectations and develop relationships of trust. In relation to the oil and gas industry of Pakistan, where companies have to work in an industry that is environmentally sensitive and has high visibility, CSR can serve as a cushion to the reputation risk and regulatory fines. Issues such as reinforced transparency and perception management through CSR have the potential to minimise conflicts, social license to operate and create economic value over the span of time. So, when such conditions are met, the connection between

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CSR and sustainable financial performance will be considerably positive (Guo & Yin, 2024).

H2: *Corporate reputation mediates the relationship between CSR practices and sustainable financial performance.*

This hypothesis informs that CSR does not necessarily affect financial performance directly; its effects are instead guided by a rise in corporate reputation. When corporate entities participate in socially responsible practices and initiatives, they tend to receive admiration, confidence and loyalty of their stakeholders. This, on a long-term basis, will improve the image of the firm and establish value in the form of reputational capital, an intangible asset. A good reputation may mean higher customer retention, access to finance, higher morale, and lower operational risks, all of which will help in the enhancement of financial performance. Therefore, corporate reputation is a medium by which CSR programs bring about sustainable economic realities (Alshater et al., 2022). The hypothesis is consistent with the signaling theory and resource-based view (RBV). The signalling theory says that CSR will be sending positive messages to the market, and strengthen the company's. image reputation of reliability and morals. The RBV also promotes the concept that reputation is a distinctive, non-imitable resource that offers them an advantage in the competition. In the case of the Pakistani oil and gas industry, visual CSR is a must to create a good reputation in the face of adverse public relations effects caused by negative externalities like pollution or the displacement of people. Since CSR is able to boost reputation, and in relation to this, reputation is also able to improve financial performance, it is convenient to believe that reputation becomes an element mediating the CSR-financial outcome association (Nazeer et al., 2025).

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H3: *FinTech adoption positively moderates the relationship between CSR practices and sustainable financial performance.*

This theory is that the use of financial technology (FinTech) enhances the impact of CSR on financial sustainability. The use of such FinTech as blockchain, AI-based sustainability reporting, and digital audit path work in favor of greater transparency, real time tracking, and engagement with stakeholders. The technologies enable companies to measure, report, and prove their CSR activities in a more believable and effective way, thus raising investors' and regulatory and social confidence. When FinTech tools are applied so as to facilitate the use of CSR, its application and disclosure, then the financial benefits likely to ensue are bound to be bigger as far as the new valuation, market trustworthiness and investor confidence are concerned (Jaradat et al., 2025). Digital transformation theory and institutional theory argue the ground of the hypothesis, as the former stresses the importance of the technology that enhances the performance and legitimacy of its institutions, and the latter proves that the technology as such plays a role in institutional performance and legitimacy. Such is the case in the oil and gas sector, which has a high stakeholder scepticism and regulatory examination, wherein the usage of FinTech will enable showing the stakeholders how sustainable efforts can make the process more visible and verifiable. FinTech enables auto-reporting of ESG, tracking the impact, and disclosure of financial activities that create a sense of authenticity and efficiency of CSR activities. The integration of FinTech into the CSR system of firms should therefore have more positive effects on the financial performance of such firms in comparison with those that do not integrate it into their CSR systems (Gu et al., 2023).

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H4: *The moderating effect of FinTech adoption is stronger in firms with high levels of innovation and digital infrastructure.*

This hypothesis is based on H3 and tends to state that the positive moderating impact FinTech can make on CSR-financial performance depends on the internal ability of a firm to innovate and its digital maturity. It is not sufficient to embrace FinTech instruments, but the performance of the instruments actually relies on their perfect collaboration in the working and strategic systems of this company. Companies with good digital infrastructure and an environment of innovation get a better chance to use FinTech in a productive way to boost the application, monitoring, and reporting of CSR. Such firms have a higher opportunity to use AI, cloud solutions, data analysis, and blockchain to facilitate more transparency, responsiveness, and interaction among stakeholders (Eseimieghan & Onuorah, 2025). In this interactional hypothesis, the validity is borrowed from dynamic capabilities theory that stresses the suitability of the internal competencies to respond to the alternation brought by technological changes and extract value using innovation. In the Pakistani oil and gas company setting, where most businesses are using legacy systems, a comparative advantage is bound to be achieved by those that have made a forward-looking digital implementation. These companies are better placed to use FinTech in their sustainability reporting, stakeholder engagement as well as risk management processes. Consequently, the favourable moderating role of FinTech will be enlarged within digitally progressive companies, which further increases the association between CSR and financial performance (Alnsour, 2024).

Material and Method

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The study uses panel data analysis of the quantitative research design to study the correlation between Corporate Social Responsibility (CSR) and the sustainable financial performance and the moderating effect of FinTech adoption. The study revolves around five listed companies in oil and gas industry in Pakistan namely Attock Petroleum Limited, Pakistan state oil, Pakistan petroleum, Pakistan Oilfields Limited, and Oil and Gas Development Company (OGDCL) which acts in January 2010 to December 2024 at monthly intervals. The study population would be all oil and gas companies listed in the Pakistan Stock Exchange (PSX), and the sample will be the five firms, which were chosen on the basis of market leadership, frequent disclosures, and availability of financial and other CSR related details. To be valuable to the research scenario, sectorally comparable, and accessible, the purposive sampling strategy is used (Mahmood et al., 2022; 2023).

Corporate Social Responsibility (CSR), an independent variable, is quantified by using such structured indicators of the economic, legal, and ethical responsibilities recorded in the 5-point Likert scale, according to the content analysis of the annual reports, sustainability reports, and corporate disclosures. These dimensions are averaged, to create a composite CSR index over each firm and over each time period. Dependent variable- Sustainable Financial Performance is measured by using financial ratios such as Return on Assets (ROA) and Return on Equity (ROE) based on the monthly financial statements of the firms and its PSX filings. The moderating variable is the use of FinTech, which is indicated through such proxy measures as blockchain-based financial documentation, the use of AI-enabled reporting, and the presence of the digital payments platform. FinTech integration is measured on a firm-month basis by Likert-scale survey measures and firm disclosures content analysis. Also, the effect of control variables such as size (total assets

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in millions), market capitalization, and age (years since incorporation) of the firms are also considered and incorporated in an attempt to control the possibility of their impact on the financial performance.

Data processing and cleaning are conducted with the Python and Microsoft Excel blank to warrant the integrity of the time-series panel structure (Rasool et al., 2025; Naseem et al., 2025). The descriptive statistics, correlation matrices, and line graphs will be created to understand the distribution of variables, the central tendencies, and tendencies in variables (Sabir et al., 2020; 2022; Rauf et al., 2024). In order to test the hypotheses, panel data regression analysis is executed with both fixed-effects and random-effects model (chosen by using Hausman tests). To verify the moderating effect, the interaction term of CSR people and FinTech adoption are included, and the Variance Inflation Factor (VIF) is reckoned to verify multicollinearity existing between independent variables (Khan et al., 2022; Rasheed et al., 2024). Moreover, common robustness tests, which involve heteroskedasticity tests, autocorrelation-related tests, like the Wooldridge test, and unit root tests, like the Levin-Lin-Chu type of test, are conducted to guarantee the reliability of the estimated coefficients of the model (Rehman et al., 2021; Abdullah et al., 2021; Shabeer & Mahmood, 2025). Regression modeling is achieved with Stata since the data structure is unbalanced, and the size is large. The anticipated result of this approach is a statistical confirmation of the fact that the CSR practices can considerably affect financial performance and that the FinTech adoption can reinforce or undermine this relationship. Through using the longitudinal, firm-level research, the approach to the study has a depth of the empirical study and a contextual relevance to the larger body of research on CSR, FinTech, and corporate governance in new contexts.
Our econometric Model is given below,

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$$ROA = \beta_0 + \beta_1 CSR + \beta_2 FirmSize + \beta_3 MarkCap + ut$$

$$ROE = \beta_0 + \beta_1 CSR + \beta_2 FirmSize + \beta_3 MarkCap + ut$$

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Moderating Effect

$$ROA = \beta_0 + \beta_1 CSR + \beta_2 FirmSize + \beta_3 MarkCap + \beta_4 FinTech + ut$$

$$ROE = \beta_0 + \beta_1 CSR + \beta_2 FirmSize + \beta_3 MarkCap + \beta_4 FinTech + ut$$

Table 3.1: Measurement Model Table

Variable	Sub-Construct / Indicator	Measurement Type	Example Scale Item
Corporate Social Responsibility (CSR)	Economic Responsibility	Likert Scale	The company ensures fair wages and profitability
Corporate Social Responsibility (CSR)	Legal Responsibility	Likert Scale	The company complies with all legal standards
Corporate Social Responsibility (CSR)	Ethical Responsibility	Likert Scale	The company upholds high ethical norms
Sustainable Financial Performance	Return on Assets (ROA)	Financial Ratio	Net income / Total assets
Sustainable Financial Performance	Return on Equity (ROE)	Financial Ratio	Net income / Shareholder equity
FinTech Adoption	Use of Blockchain	Likert Scale	Our firm uses blockchain in financial documentation

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Firm Size (Control)	Total Assets	Continuous	Measured in millions
Market Capitalization (Control)	Market Value of Shares	Continuous	Calculated from stock data

Results and Discussion

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
CSR Economic	900	3.985	.587	3.009	4.999
CSR Legal	900	4.005	.586	3.01	4.999
CSR Ethical	900	4	.572	3	4.997
ROA	900	.055	.026	.01	.1
ROE	900	.123	.043	.05	.2
FinTech	900	3.498	.865	2.001	4.996
FirmSize	900	3.822	.285	3.023	4.176
Mark Cap	900	3.908	.345	2.703	4.301

The descriptive values provide significant implications on the distribution as well as size of every variable in the research. The data set has 900 records divided into each variable, namely, monthly data across five oil and gas companies between the years 2010 and 2024. The components of the Corporate Social Responsibility (CSR) such as economical, legal, ethical responsibility are measured on Likert scale with a range of 1-5. The average score of CSR Economic is about 3.99, and the standard deviation is 0.587, which implies that the level of economic responsibility is moderately high, featuring certain discrepancies across firms and dynamically. A score of 3.009 and 4.999 serves as the lower and upper limit, given that a higher percentage

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of companies usually record sound economic performance. The same is present with CSR Legal, which shows a mean of 4.005 and a similar standard deviation of 0.586, which is indicative of a steady trend of legal compliance. The same can be said with the ethics responsibility dimension, which has a mean of 4.000 and somewhat less fluctuation (standard deviation = 0.572), showing that honest behaviour can be rated as fairly well put into institutions in the said selected firms.

Regarding its financial performance, the mean Return on Assets (ROA) is 0.055 or 5.5% with a value of 0.01 and a maximum of 0.10. What this means is that companies tend to make cautious gains in their capital. ROE indicates a 0.123 or 12.3 per cent average, which is higher than the ROA, as was actually anticipated, because the ROE takes into consideration the effect of leverage. The ROE differs more, having the standard deviation of 0.043, and a range lying between 5 and 20 percentage points, reflecting different equity utilisation rates between companies. Speaking of the adoption of FinTech, the mean score is 3.498 on the scale of around 2 to 5, and the standard deviation is quite high, 0.865. This indicates that not all firms are on the same stage of technology adoption, or perhaps it is the case that over time, reflecting the fact that some firms are early adopters whilst others are in the laggard position.

The control variables are also helpful. The size of firms is calculated on the log form of the total assets where a mean of 3.822 was attained, a standard deviation of 0.285 and a considerably spread value of 3.023 to 4.176. This shows that the scale of firms is spread out somewhat moderately among the chosen companies. Again, the market capitalisation is averaged at 3.908 with a standard deviation of 0.345 and a minimum and maximum value of 2.703 and 4.301, respectively, and it is also log-transformed. All in all, the descriptive statistics demonstrate a substantively stable and reliable dataset

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with sufficient variability to permit the robust econometric forecasting, and there exists broadly high CSR activities, medium financial performance, and variable levels of FinTech involvement among Pakistani listed oil and gas companies.

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Table 3: Pairwise Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) CSR_Economic	1.000							
(2) CSR_Legal	-0.026	1.000						
(3) CSR_Ethical	-0.015	-0.007	1.000					
(4) ROA	0.005	0.014	-0.017	1.000				
(5) ROE	-0.049	0.001	0.008	0.042	1.000			
(6) FinTech	0.014	-0.007	-0.003	0.049	0.066	1.000		
(7) FirmSize	-0.009	0.030	0.029	-0.014	-0.030	0.048	1.000	
(8) Mark_Cap	-0.062	-0.010	0.005	0.042	-0.007	-0.028	0.036	1.000

The results given in the pairwise correlation matrix offer knowledge about the linear interrelationships between the significant variables of the study. The values of correlation are between -1 and 1, and values near zero imply a weak or no linear relationship. In this data, the three dimensions of CSR, economic, legal and ethical responsibilities, do not show robust mutual correlations and therefore appear to represent different dimensions of corporate responsibility. To give an example, CSR_ Economic correlates negatively with CSR_Legal (r = -0.026), and CSR_Ethical (r = -0.015), which implies that in this sample, economic responsibility does not go well with legal or ethical obligation.

When probing the relationship between CSR and financial performance measures, the correlation between ROA and ROE is very weak. CSR_Economic gives an almost zero (r = 0.005) and slight negative (r = -0.049) correlation with ROA and ROE respectively. Correlations between

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CSR_Legal and CSR_Ethical and ROA or ROE are also insignificant, suggesting that CSR activities in their present form lack a close direct linear relationship with financial performance reported across firms and the time range under investigation. Nevertheless, it does not exclude more complex or non-linear relations, which are going to be examined further on the basis of regression analysis.

Another critical variable in the study, FinTech adoption, also has significant positive relationships with both ROA (r = 0.049) and ROE (r = 0.066), which means a slight tendency of a more intensive use of FinTech to result in better financial results of firms. It has close to zero correlations with CSR dimensions, with the indicators showing little direct association between technological innovation and CSR initiatives at the firm level. Control measures, such as Firm Size and Market capitalisation, also show low correlations with financial performance and measures of CSR. As an example, Firm Size is weakly negatively related to ROA and ROE, Market Capitalisation is positive and weakly associated with ROA (r = 0.042) and negatively related to CSR_Economic (r = -0.062). All in all, the correlation table is an indication that would not consider multicollinearity a problem, and the relatively weak finding of the relationship only indicates that regression modelling would be required to find the deeper relationships between CSR, FinTech, and financial performance, as mentioned as being potentially moderated.

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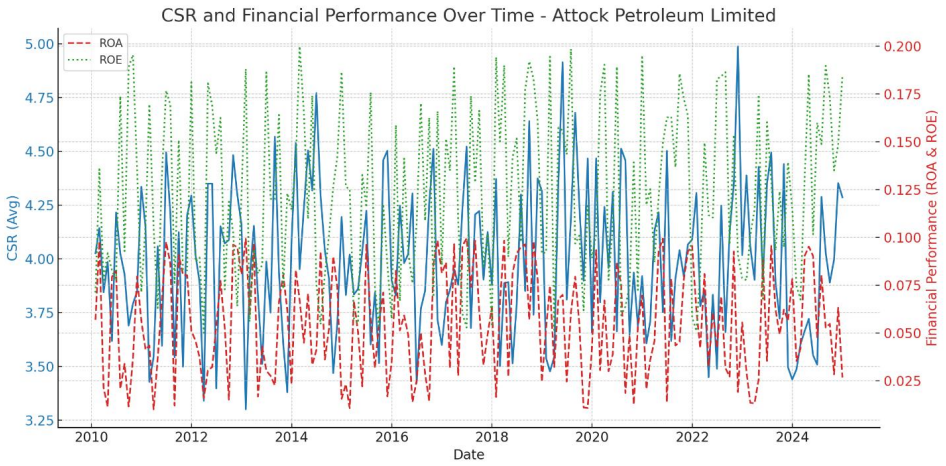

Figure 4.1: CSR and Financial Performance Over Time – Attock Petroleum Limited (2010–2024)

The figure shows the time series between the mean rating on Corporate Social Responsibility (CSR) and financial performance measures, Return on Assets (ROA) and Return on Equity (ROE) of Attock Petroleum Limited in the period between 2010 and 2024. The scores of CSR are relatively stable compared to time, where the scores are within the moderate range, about the value of 4.0, except for some episodes when it may reflect some strategic CSR efforts, regulatory reporting periods, or increased stakeholder interest. On the contrary, both ROA and ROE have a visible volatility, with ROE admittedly having longer spikes and higher amplitude, and ROA being substantially more consistent and not exceeding the 0.15 mark. It is noteworthy that there are multiple points at which the rise in CSR is correlated and, to a significant degree, accompanied by the increase in ROA and ROE, indicating that the CSR activities could positively affect the financial results, but only on some occasions and possibly with time delays. The years after 2020 have a bit more variation in CSR scores, but financial results, in particular, ROA, have more frequent drops between years, which may be related to large-scale

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macroeconomic shocks, e.g., the COVID-19 pandemic or the fluctuations in oil prices. The visual pattern supports the fact that the relationship between CSR and performance can be intricate and context-specific, and may also be influenced by unmentioned moderating variables such as FinTech adoption.

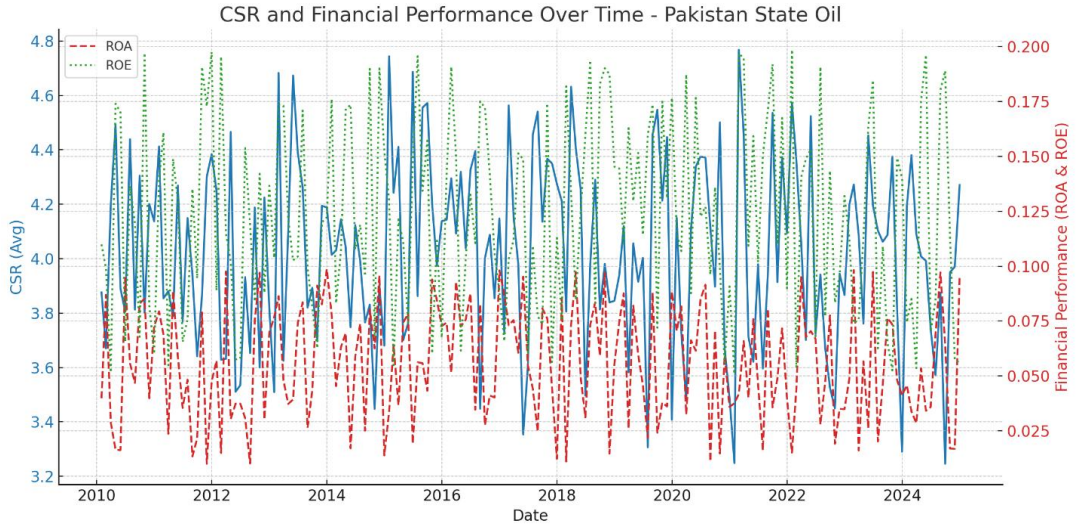

Figure 4.2: CSR and Financial Performance Over Time – Pakistan State Oil (2010–2024)

Corporate Social Responsibility (CSR) and financial performance over time graph shows a dynamic and vaguely related trend among the variables in terms of time nature between 2010 and 2024 in case of the Pakistani State Oil. The mean CSR score variations are moderate, with most of the score falling between 3.6 and 4.4, which means that the company has displayed a relatively stable manifestation of economic, legal, and ethical duty, with spikes of the score occurring at rather random moments which may be explained by either strategic planning or disclosure actions. By contrast, Return on Assets (ROA) and Return on Equity (ROE) are highly volatile during the period. ROE constantly exceeds ROA in terms of value and oscillation, and reaches higher than 0.15 much more often than ROA stays in the range of 0.03 to 0.08.

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Interestingly, it seems that at certain times when CSR scores were high, there was improvement in financial performance, especially ROE, suggesting some delay or conditionality effect of CSR on economic performance. Nevertheless, the correlation is not steady across the board, which indicates that other moderating factors, like technological innovation or the presence of the market, can affect the strength and the consistency of the CSR performance nexus. The post-2020 data also indicates a higher fluctuation in both CSR and financial indicators, which can be attributed to macroeconomic disturbances and points once again at the intricate relationship between strategic responsibility and the profitability of a given firm.

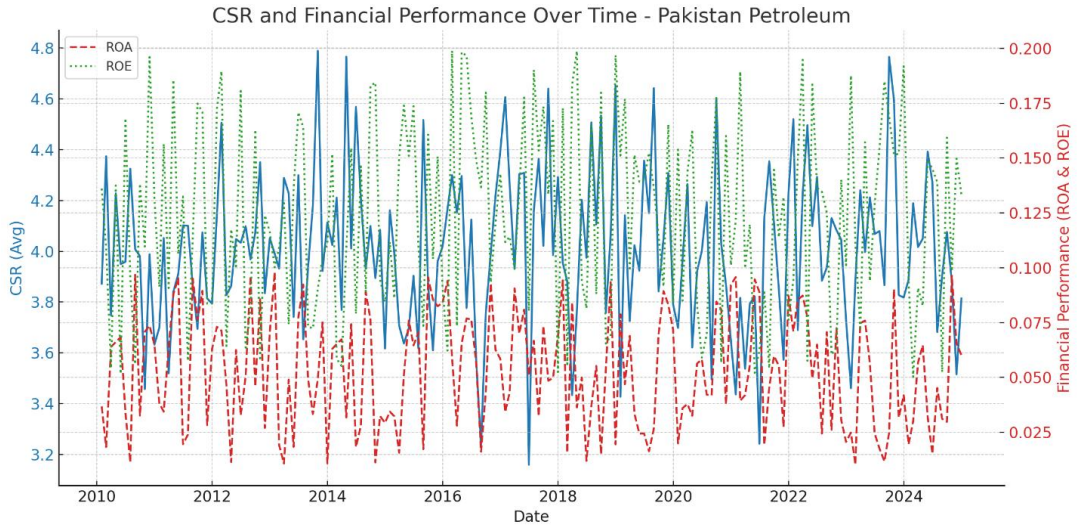

Figure 4.3: CSR and Financial Performance Over Time – Pakistan Petroleum (2010–2024)

The graph presents the trends of the average Corporate Social Responsibility (CSR) and the financial performance indicators or measures Return on Assets (ROA) and Return on Equity (ROE) of the Pakistan Petroleum in the period between 2010-2024. The blue line shows the CSR scores that are usually moderate, with values between 3.6 and 4.4 which indicate that the company

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has paid close attention to CSR over the years with small shocks that an increased amount of CSR reporting or incorporation of new programs may have caused. A conjoint red depicts ROA and ROE dashed and green dotted line, which demonstrates a significant fluctuation within the period. The values of ROE are always much higher than ROA and highly cyclical, in fact, it tends to go beyond the 0.15 threshold whereas ROA is relatively modest, and it seems to lie in the 0.03-0.08 scale. The periods in which CSR scores increase are at times reflected in a short-term increase of ROA or ROE, indicating a possible positive relation, although the variability of trends shows that CSR perhaps does not necessarily always lead to financial performance. All three indicators are more volatile in the post-2020 years as external shocks like the disruption of the global oil market and economic uncertainty are also possible. These trends support the idea that, although CSR is one of the determinants in the development of financial performance, its performance can be moderated by other factors, such as firm strategy, technological embeddedness, and macro conditions.

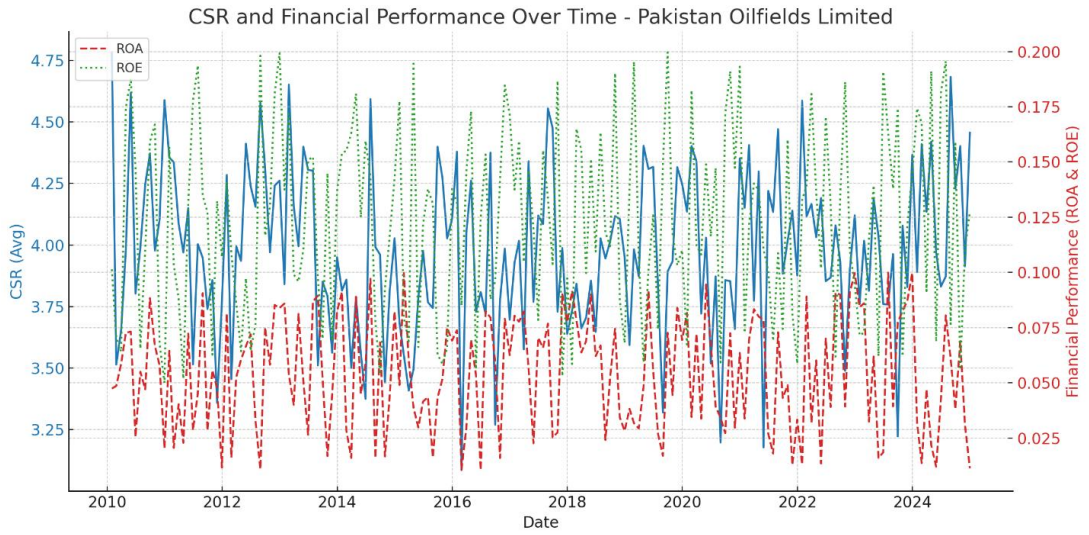

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Figure 4.4: CSR and Financial Performance Over Time – Pakistan Oilfields Limited (2010–2024)

This is a graph which shows the correlation among average Corporate Social Responsibility (CSR) and financial performance- Return on Assets (ROA) and Return on Equity (ROE) of Pakistan Oilfields Limited during the period 2010-2024. Aggregate CSR scores characterized by the blue line have been averagely between 3.5 and 4.5, which shows an overall commitment towards CSR activities on economic, legal and ethical fronts with intermittent increases, which are likely to be a result of special CSR campaigns or an improved effort to be compliant. When compared, ROA and ROE performed with significant volatility over time under observation. ROE is always at a higher level than ROA, and very often it approaches or exceeds 0.15, whereas ROA is relatively constant and shifts in the range of 0.03-0.08. The fact that CSR growth usually coincides with ROE/ROA maximum implies possible instances during which the CSR activity could have been used to improve financial measurements. These associations do not, however, hold constant over time, which implies that although CSR can have a positive effect on financial indicators, its impact is most likely moderated by some other contextual variables like the efficiency of operations, external economic statistics, or technology. The post-2020 era is characterised by a bit of instability in terms of both CSR scores and financial returns, which might be connected to a rise in uncertainty in the world markets, as well as in sector-specific shocks. On the whole, the graph indicates that as much as CSR practices are maintained, their financial effects are not constant, pointing to the fact that the effects of CSR on performance depend and may be reinforced by other approaches.

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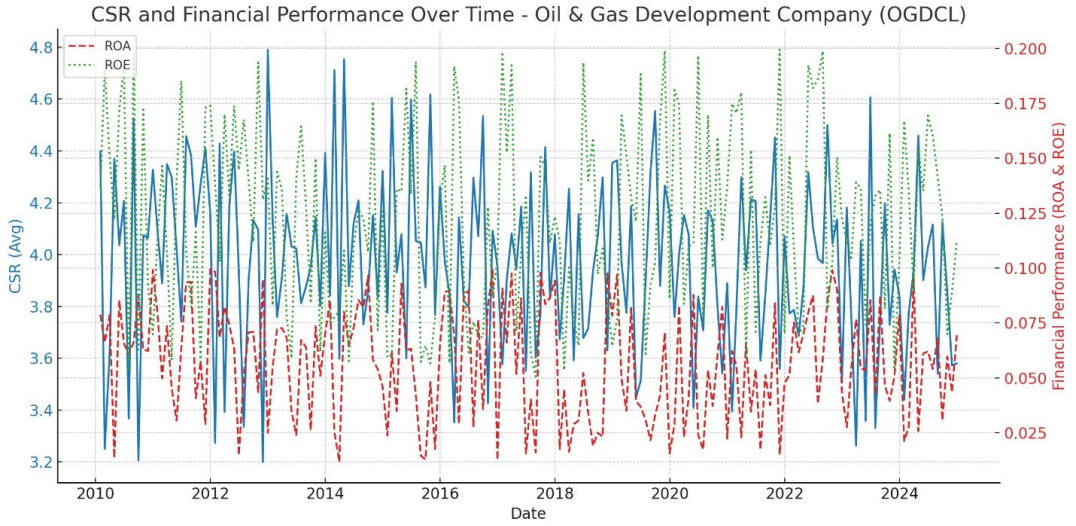

Figure 4.5: CSR and Financial Performance Over Time – Oil & Gas Development Company (OGDCL) (2010–2024)

The graph contains the trends in the average Corporate Social Responsibility (CSR) scores as well as the trends in the financial performance of Oil & Gas Development Company (OGDCL) which was reflected in the Return on Assets (ROA) and Return on Equity (ROE) between the years 2010 and 2024. The CSR scores only slightly changed, and the most extensive range of their values used to be between 3.6 and 4.4, which means that the efforts are expressed mainly consistently in the economic, legal, and ethical aspects. Nevertheless, it can be observed that there are some peaks connected with the increase in CSR activities or reporting during these years. By contrast, ROA and ROE have more wide-ranging and common swings. ROE drawn as the green dotted line is also likely to be much higher than ROA and exceeds 0.15 several times, which indicates the period of solid equity-based returns. ROA depicted by the red dashed line is lower on average, mainly between the 0.05-0.08 levels, with occasional temporary drops and increases. There also seem to exist instances that an increase in CSR activity goes hand in hand with improvements in

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financial performance (especially ROE). This implies that CSR could have some positive effect on shareholder value. However, the time inconsistency of these patterns suggests that the impact of CSR on financial indicators can be attributed to other factors and aspects, including the conditions under which operations are carried out, the dynamics in the market, or the internal management strategy. The post-2020 data indicates some modest growth in volatility, which could be related to the global economic earthquakes and industry-related upset, which supports the belief that the impact of CSR is not always direct but somewhat relative. On the whole, the graph affirms the hypothesis that CSR can improve the financial performance and also indicates the existence of moderating influences on this relationship formation.

Table 4: Shapiro-Wilk W test for Normal Data

Variable	Obs	W	V	z	Prob>z
CSR_Economic	900	0.949	29.315	8.329	0.000
CSR_Legal	900	0.951	27.997	8.216	0.000
CSR_Ethical	900	0.957	24.519	7.889	0.000
ROA	900	0.954	26.280	8.060	0.000
ROE	900	0.957	24.877	7.925	0.000
FinTech	900	0.954	26.125	8.045	0.000
FirmSize	900	0.916	48.041	9.547	0.000
Mark_Cap	900	0.883	66.840	10.362	0.000

The findings provided by the Shapiro-Wilk W test indicate that the critical variables used in the research are generally not distributed. The test applied on each of the variables was to determine the absence or the abnormality in their distribution relative to being in a normal distribution where the null hypothesis was that the data has a standard type distribution. The p-values are also given as 0.000 in all the scenarios, which is much lower compared to the

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generally accepted 0.05. It implies that the null hypothesis should not be accepted in every variable, suggesting that all the variables will have critical deviations from normality. The W values, which show the extent of the data fitting a normal distribution (where 1 means the data follow the normal distribution perfectly), are 0.883 in the case of market capitalisation and 0.957 in the case of both CSR ethical responsibility and return on equity. The lower the W values are, the more severe are the departures of a bell-shaped normal curve.

Market capitalisation and firm size record the highest non-normality level, because their W values are 0.883 and 0.916, respectively, amongst the variables that were tested. This indicates that these financial measurements could be exceptionally biased or have outliers, and this is viable with financial details at firm level. CSR elements all, i.e. economic responsibility, legal responsibility, and ethical responsibility, do not pass the normality test either and have somewhat larger W values, i.e., between 0.949 and 0.957. Financial performance indicators like the return on the assets and return on equity also do not abide by the normality assumption with their p-values standing at 0.000. W value depicting the FinTech adoption variable is 0.954, which means that, although the deviation of normalcy is statistically meaningful yet, it is not excessive.

Although the data are not normal, it does not affect the intended regression analysis much because of a large sample and the implications of the panel data estimation methodology. Both fixed effects and random effects models do not presume normally distributed independent variables. Using these models, even with non-normal data, can be justified using the central limit theorem when the number of observations is large. Nonetheless, there is still a caution similarly required on the interpretation of residual-based tests

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or upon conducting these analysis problems which are vulnerable to the distribution of the data. Robust standard errors or clustered standard errors are recommended to be used to promote robustness. Logarithmic scaling of highly skewed variables such as firm size or market capitalisation can also be recommended. Finally, although it has been shown to be non-normal, it cannot weaken the validity of the econometric approach taken in the current research.

Table 5: Hausman (1978) Specification Test

	Coef.
Chi-square test value	1.015
P-value	.985

The outcomes of the Hausman (1978) specification test will give valuable information on the type of model required to use with panel data regression, i.e. Fixed Effects (FE) and Random Effects (RE) models. In the Hausman test, the null hypothesis is that the Random Effect explaining model is better than the other models that assume the basis of not correlating between the explanatory variables and the error term. The alternative hypothesis substantiates the application of the Fixed Effects model with the view that such correlation actually exists.

Your test provided a value of 1.015 of Chi-square with a p-value of 0.985. The p-value is quite significant, approximately nine times higher than the generally accepted 0.05; thus, the result is not important. This implies that you do not reject the null hypothesis, and hence, the Random Effects model is considered appropriate. It assumes that the effects associated with the individuals (i.e. the unobserved characteristics at the firm level) are uncorrelated with the regressors, which justifies the application of the RE model to achieve more efficient and consistent estimates.

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Practically speaking, having the Random Effects model means you can consider matrices relating to time-invariant variables (such as the age of the firm or inter-sector peculiarities), which is not possible in Fixed Effects models because of within-transformation. In that way, according to this test, we may continue with a further econometric analysis by assuming a Random Effects estimation, and it is preferable to take a close approximation to heteroskedasticity or serial correlation within firms by using clustered standard errors.

Table 6: Random Effect Model

	(1)	(2)
VARIABLES	**ROA**	**ROE**
CSR_Economic	0.291***	-0.367***
	(0.148)	(0.244)
CSR_Legal	0.669***	0.113***
	(0.148)	(0.45)
CSR_Ethical	-0.731**	0.635***
	(0.152)	(0.251)
FinTech	0.152***	0.00337**
	(0.100)	(0.00166)
FirmSize	-0.167***	-0.507***
	(0.305)	(0.503)
Mark_Cap	0.335***	-0.856***
	(0.253)	(0.417)
Constant	0.00422	0.00145
	(0.0186)	(0.0307)
Observations	900	900

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Number of firm_id	5	5

The findings of the Random Effects regression model indicate that there are significant and moderated interconnected relationships between the diverse entities of Corporate social responsibility (CSR) and FinTech adoption on sustainable financial performances of the Pakistani based five oil and gas firms in the period of 2010 to 2024, as measured in the form of Return on Assets (ROA) and Return on equity (ROE). The performance of these models is also controlled/adjusted with firm-level characteristics, including the size of the firm and market capitalisation.

The economic dimension of CSR in the ROA version has positive and significant impact as recorded by its coefficient of 0.291 ($p < 0.01$). This implies that the companies that focus on economic responsibility e.g. fair wages, profitability and creating economic value over an extended period are bound to have a higher asset productivity as well as better overall operating returns. This finding supports the fact that the financially responsible CSR strategies are stakeholder-centered and they improve internal performance indicators. On the same note, CSR Legal also shows a significant and positive relationship with ROA (beta = 0.669, $p < 0.01$), thus indicating that adherence to law and regulation also facilitates financial sustainability and operational integrity. Companies which comply with regulatory frameworks are likely to suffer fewer legal interference, fewer legal compliance risks, and boosted reputational compliance, all of which can indeed affect the operational outcomes of a company positively.

Causally, interestingly, CSR Ethical variable implies a negative coefficient of -0.731 (< 0.05), statistically significant in the ROA model. This means that ethics like transparency, anti-corruption policies and fairness are ethically desirable, but their immediate implication on the efficiency of assets could be

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damaging. This is possibly explained by the fact that ethical efforts can be rather expensive, including, but not limited to, training, compliance and internal audit investments, and may not be instantly turned into corresponding net returns. Ethical responsibility can also compel the firms to forego ethically dubious, yet profitable opportunities, hence it can decrease the ROA in the short run.

The coefficient of the FinTech adoption variable is positive and statistically significant (0.152, $p < 0.01$). It means that the firms that combine financial technologies, including blockchain, digital payments, and artificial intelligence-driven reporting systems, experience better ROA. FinTech would be able to simplify the processes, lower the transaction costs and enhance the accuracy of financial data hence enhancing the output of assets. This discovery proves the overall argument that technology implementation is used as a high-performance enabler in contemporary business settings.

Concerning control variables, the firm size is negatively related and significantly ($\beta = -0.167$, $p < 0.01$) to the ROA. This may imply diseconomies of scale or inefficiency in the operations of larger companies in this industry, which lowers asset returns. Alternatively, big companies might be less risky or bureaucratic, and this would prevent their agility to market opportunities. On the same note, market capitalisation is also positively related to ROA (beta = 0.335, $p < 0.01$), which means that companies with a greater market capitalisation have a better asset-based performance. This may show investor sentiment, easier access to capital or advantageous position on markets.

The relationships that exist under the ROE model are more or less similar, although they have some relevant differences. CSR Economic acquires negative and significant value (beta = -0.367 and $p < 0.01$), which is intuitive. This implies that an emphasis on economic roles could minimise equality-

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based returns. One of them is that economic CSR programs, like using the proceeds to finance sustainability or stakeholder well-being projects, to benefit the shareholders in the short term. CSR Legal, on the contrary, exhibits a positive and sizeable impact on ROE (0.113, $p < 0.01$), which supports the theory that compliance positively affects the legitimacy of the company and its trust level among investors, which is essential to value equity. Unlike its impact on ROA, CSR Ethical exhibits a positive and significant coefficient of 0.635 ($p < 0.01$) on ROE model. Such a reversal points to the direction that ethical responsibility does not necessarily improve efficiency at the asset level, but could, instead, robustify equity-based returns. Moral behaviour can enhance shareholder value in a number of ways by increasing stakeholder loyalty, attracting social conscious investors, and generating long term reputational capital, all of which positively contribute to shareholder value. This variable of FinTech is positive and significant (beta = 0.00337, $p < 0.05$) but with a smaller effect as evidenced in the ROA model. This also lends credibilities to the argument according to technological integration gives a financial performance impetus, perhaps through enhanced use of capital and reporting efficiency.

ROE model The control variables behave similarly in the ROE model. Firm size also presents a negative and significant impact (beta = -0.507, $p < 0.01$) and one can only be concerned that large firms are not able to utilise their equity base as effectively as smaller and more nimble firms. In the meantime, the market capitalisation has a strong negative correlation with ROE (B = -0.856, $p < 0.01$) as opposed to its correlation with ROA. This was seen to imply that greater market value helps in the performance of the asset, but it can also lead to an excessive rise in equity bases, which in the end reduce the returns in equity.

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Conclusively, these Random Effects models lend a lot of empirical evidence that supports the hypothesis that the dimensions of CSR and FinTech adoption have extensive significance to financial performance, but in opposite directions, based on the measure of performance. The legal and economic aspects of CSR seem to be the most dominant, and the ethical responsibility, too, is a central element, at least when it comes to the equity of performance. The use of FinTech positively influences ROA and ROE, proving its moderating or enhancing character in the financial efficiency once again. The models also indicate that factors within firms, like size and market value, are crucial determinants of performance, giving a more balanced idea of interaction among CSR, technology, and firm-level success in the oil and gas sector of Pakistan.

Conclusion and Policy Recommendations

The results of this study present strong arguments to address the research questions that have been defined initially and indeed proves that Corporate Social Responsibility (CSR) can have a significant contribution to the sustainable financial performance of publicly listed oil and gas producers in Pakistan and the moderating relationship between the two is significant as represented by the degree of FinTech adoption. To answer the initial research question, i.e., whether CSR has any financial performance impact, the regression findings are more than evident in that the different dimensions of CSR have quite different financial impacts. In particular, economic and legal aspects are positively related to return on assets (ROA), and it can be stated that firms that behave fairly and profitably in the economy and obey the law are likely to allocate their assets more effectively. On the other hand, ethical responsibility, which is inversely associated with ROA, has a great positive correlation with Return on Equity (ROE), suggesting its indispensability in

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determining long-term shareholder value. These results support hypothesis (H1) that CSR practices will have some effect on the financial performance of firms, albeit in different directions and of varying levels, depending on the dimension of CSR and financial indicator chosen.

In further answering the second research question, which is to say that, does FinTech adoption works to moderate the relationship between CSR and performance, the study provides a positive answer with respect to the moderating effect of technology. The use of FinTech shows a stable and positive tie to ROA and ROE, which supports the hypothesis H3 that FinTech tools and platforms can improve the performance of CSR activities. FinTech potentially enhances the CSR positive outcomes through simplification of the financial procedures, better accuracy of ESG reporting, and stakeholder transparency, especially in industries that are capital-intensive, like oil and gas. The findings also correspond with hypothesis H4, which presupposes that the better the digital infrastructure and innovative power of a firm is, the higher the performance outcomes of CSR undertaken in the technological form.

Practically, these insights are a significant burden to company management and politics. To corporate managers, the implications of the results indicate the significance of a CSR strategy being aligned with strategic financial objectives. Responsible business practices are not necessarily sufficient, and integration of FinTech tools will allow bringing the activities to the next level by making them performance-driven initiatives rather than symbolic. Potential insertions of the form of blockchain-based audit trail tracking technologies, AI that provides stakeholder communication, digital dashboards allowing real-time monitoring can help make CSR execution more effective, transparent and results-oriented. Additionally, the realisation as to

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which dimensions of the CSR are more rewarding with regards to money enables the firms to focus on those activities that keep not only ethically and lawfully within the realms of what is right in the matter but also with direct financial stability.

This study also provides good lessons to policy makers. Some of the regulatory authorities and stock exchanges must consider inducing such CSR reporting and the use of digital by giving compliance incentives or listing benefits to companies that show concerted efforts in these factors. Besides, top-down policies that support the implementation of the FinTech infrastructure, including digital payment systems, open banking platforms, etc., have the potential to improve the CSR performance of listed companies indirectly by increasing the accessibility of technology tools and their affordability. This integration can be further expedited by the training programs and public-private partnerships which intend to enhance digital literacy among the corporate governance professionals especially in industries where technological maturity has been inexplicably low.

Academically, the study helps to fill the empirical research gap in the literature of CSR and FinTech, especially with reference to emerging economies such as Pakistan. It evidences the usefulness of a stakeholder theory, legitimacy theory, and a resource-based view (RBV) to the explicability of a joint influence on a firm-level financial performance of CSR and digital innovation. In addition, the work supports the assumption that technology and sustainability are not separate paradigms, as they are variables that are mutually dependent on each other, determining contemporary business performance. The subtle interplays that were forged between the CSR elements and the various financial measures provide future researchers with

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guidelines by which they can study the relationships in additional high-risk, high-reward industries.

Combined, this evidence indicates that sustainable financial performances in the Pakistani oil and gas sector necessitate something more than the conventional compliance or charity. It requires a high-level orientation between CSR activities and technological capability. Not only will businesses that incorporate both of these spheres enjoy the amassing of goodwill and stakeholder confidence, but they will also experience an actual conversion to financial returns. Therefore, the study not only has the answers to the given questions but also paves the way for more integrative and technology-intensive models of corporate sustainability in the developing world.

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