

Digital Turn for Sustainability: Unveiling the Role of Board Characteristics for Digital Transformation – CSR nexus

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ABSTRACT

This paper examines the influence on digital transformation on corporate social responsibility (CSR). This study also investigates the moderating role of gender diversity while examining the abovementioned nexus. With 1161 companies at the period 2019 to 2023 that are listed in the Pakistan Stock Exchange, the paper addresses the influence that digital transformation has on the companies' CSR performance and financial health. In this regard, it is proposed that company's higher digitization level is positively associated with CSR activities. Where there is a diversity of boards it means that there will be better CSR strategies, which proves a positive relationship between board diversity and CSR performance. In conclusion, this research affirms that the corporate governance, sustainability, and financial performance are significantly affected by the digital transformation, providing the ground for the different authorities' structures. This research is a reflection on the digital transformation as well as the board diversity and the corporate social responsibility on how the companies' value and performance are generated.

Keywords: Corporate Social Responsibility, Digitalization, Firm Size, Return on Assets, Gender Diversity.

INTRODUCTION

The digital era has given rise to outstanding concerns of corporate social responsibility (CSR) and digital transformation in firms. However, despite the integration of CSR into the digital transformation strategy undertaken by businesses, several obstacles and implications relating to the same should be taken into consideration (Karali & Öndeş, 2022). Recent studies are attempting to comprehend digital transformation-CSR relationship by figuring out CSR dynamics, barriers, and consequences after putting digital transformation in their framework along with the best practices for navigating the new integration effectively. The role of corporate social responsibility (CSR) in management is gaining growing importance as a consequence of the digitalization in business operations. Companies will have to deal with the complexity of digital transformation as time goes by, therefore, incorporation of responsible business conduct is inevitable to nurture long-term sustainable growth and society impacts (Zaoui & Souissi, 2020). It has become clear that companies with digital transformation strategies aligned with their CSR goals can tackle social and environmental challenges in society (Hanelt et al., 2021).

Digitalization is giving a chance to organizations to up the ante on CSR by implementing technology and new insights from effective utilization of large data sets. Through effective digital platforms and tools, businesses can manage to put in place the transparency, accountability, and stakeholders' participation; which are integral elements in CSR activities (Caliskana & Lecunab, 2020). Likewise, the use of cutting-edge technologies, such as Blockchain and Artificial Intelligence, can enable companies to measure and trace their performance in ways like never before (Emre & Derekoy, 2020). Therefore, CSR and digital transformation are going to converge which implies that there will be transformation in different sectors and communities to become more positive. Notably, past research has noted the role of various factors that are likely to influence the intensity and nature of relationship between digital transformation and CSR. For example, Na et al. (2022) found that digital transformation has propensity to enhance CSR performance. Of particular, they noticed that private enterprises and firms with higher market dependency indicated greater CSR improvement triggered by digital transformation. Likewise, Xu et al. (2023) suggested that digital transformation can significantly influence CSR, and external factors such as environmental uncertainty play contingent role in shaping this relationship. In addition, Huang and Shen (2024) also contend that contextual factors play important role to either strengthen or

weaken the digital transformation-CSR relationship. Keeping in view important role of digitalization in fostering CSR, it is worthy of investigating the factors that may catalyze and/or hinder the positive influence of digital transformation in reaping sustainability outcomes. Therefore, this study attempts to examine and understand the effect of digital transformation on CSR through the lens of gender diversity in emerging economy.

This study aims to discuss the ever-changing role of CSR and digital transformation; it will look into the ways in which companies can use emerging technologies as a tool for enhancing their CSR strategies and creating social impact for the communities (Msomi & Nzama, 2023). Specifically, this study attempts to highlight when and why digital transformation is important to prompt CSR. To answer, this study takes board members gender diversity as moderating variables. With the spotlight on the role of digital transformation in prompting CSR, the research aims to make a contribution to a more comprehensive understanding of the opportunities and threats that come with this overlap (Doğan & Kevser, 2020). This is imperative because digitalization with the ability to set the right atmosphere for CSR activities and cultivate a corporate social and environmental mindset within the organization is key to creating a team that makes a difference (Rodríguez-Abitia & Bribiesca-Correa, 2021). In addition to that, the study aims to examine whether gender diversity in a firm's board of members has significant influence on the relationship between digital transformation and CSR.

The study is organized as follows: a comprehensive review of the previous research is presented in the following section, which also provides an explanation of the theoretical foundations upon which our investigation is based. In Section three, which is titled "Methodology," the procedures for data collection and analysis that were utilized in this investigation are discussed in great detail (Emudainohwo, 2021). In the fourth section, the empirical findings and the implications of those findings are given. Section five provides a comprehensive discussion of the findings, as well as a summary of the comprehension that was achieved through the analysis of the data. In the final section, which is titled "Section six," we present our findings, provide some recommendations for practitioners in the industry, and point out some directions for further research (Djuarieriah & Winarta, 2020).

LITERATURE REVIEW

Corporate Social Responsibility

Corporate social responsibility refers to an ethical and philanthropic amalgamation contributed by the companies towards improving the lives of people as well as saving Mother Nature. It demonstrates that the company is operating a sustainable business in all aspects of the economy, society, and environment (Yundhari & Sedana, 2020). Earlier research has identified various benefits such as improved brand and goodwill, stakeholders' satisfaction, and improved financial performance, an organization may reap as a result of CSR activities (Kraipornsak & Poramapojn, 2021). Literature also highlights the vital role of digital transformation on CSR and advocates it as not only a driver of business scalability and efficiencies but also a key player in fostering societal well-being. Therefore, their impacts on organizational sustainability and societal impact should be considered (Yundhari & Sedana, 2020).

This information can be obtained through empirical research and can be embedded in a context factor which includes the industry sector, organizational culture, regulatory environment, stakeholder expectations, technological capabilities, and the level of integration of digital technologies within the organization's operations (Gong & Ribiere, 2021). Control variables will allow researchers to have more in-depth knowledge of the impact of digital transformation on CSR and identify potential hindrances to organizations as they seek to improve their CSR efforts such complex constructs as digital transformation and CSR can be captured only by a holistic approach which is cross-sectional to study these constructs (Erdoğan & Türkmen, 2021). In this way, the views are not only restricted to a canonical output of digital transformation and CSR but also include intermediary effects that may be mediated in various ways including the organizational culture, stakeholder engagement, and environmental performance (Albukhitan, 2020). Through the (carrying out) of careful and thorough investigation in this field, organizations will be provided with information on how digital disruption could be exploited to improve CSR efforts. The studies into Digital Transformation to the Corporate Responsibility can create a bridge for discussions on how different enterprises can apply modern technologies with the intention of not only fostering ethics but also advancing philanthropy (Bican & Brem, 2020).

Research results of this type may be used for developing CSR policy which complements globalization fully, thus, improving sustainability level in society. The comprehensive linkage of Digital Transformation among the duties of Corporate Social Responsibilities as well as induces the researched organizations to be sustainable and create social impacts (JIAN, 2020).

Besides that, it would also be advisable to bear in mind that unforeseen problems and challenges which digitalization and CSR will most likely bring about are not unexpected (Hilbert, 2020). Evaluating cross-functional issues such as integrating the complex elements of impacts measurement or monitoring the never-ending changes of digital transformation is a regular demonstration. In conclusion, we believe that the digital transformation and corporate social responsibility are quite interrelated and context sensitive approach in terms

of variables of control and possible or impossible preventive or boosting agents included (Feroz et al., 2021). It follows from this tactic that they are going to perceive the essence of the causal chain and the complexity of the situation. The outlined methodology for researchers might be appropriate for the facilitation of digitalization into programs after ensuring sustainability and social outcomes (Appio et al., 2021). Technology opens up possibilities that digital makes corporate social responsibility activities attractive and interesting to organization. In the light of this application, organizations will be able to better with their CRS programs, increase interaction with stakeholders and achieve good environmental outcomes. In addition, digitalization enables the tracking and measurement of CSR success as well as increases the organization's transparency and accountability. It can be a tool for finding missing parts to fill the empty spaces (Rodríguez-Abitia & Bribiesca-Correa, 2021).

Digital Transformation

The digital revolution which has taken place in various places of businesses over the past few years is based on digital technologies. It is common sense that the application of digital gadgets and the application of digitization strategies can be carried out in order to improve the organization performance and to cause good competition in the marketplace. The only widening in knowledge concerning information age and corporate social responsibility is still evident though (Ndatika et al., 2024). Numerous scholars have already pointed out what the advent of digitalization does to business performance—improving productivity, enhancing customer experience, and boosting innovation capacity—yet, still not much is discussed about the role of digital transformation on social responsibility (Van Veldhoven & Vanthienen, 2022). The lowly coined term 'digital transformation' is slowly becoming a buzzword that refers to the digitalization of every business element. It encompasses buying techs and digital solutions to enhance the productivity, evolve the customers' experience, and lead to new developments. Many researches indicate the role of technology on organization's performance highly through improving the efficiency, better decision making, and swift-responsiveness to any changing in the market (Fletcher & Griffiths, 2020). Our literature indicates that digital transformation mostly contributes to improved performance as well as efficiency in the business.

Despite the overwhelming fact that literature constantly gives studies that illustrate the bright side of (Fletcher & Griffiths, 2020) the digital transformation impacts on organizational performance, the connection between the digital revolution and impact on CSR remains insufficiently studied (Trenerry et al., 2021). As a part of corporate social responsibility, companies are likely to involve themselves in taking responsibility for their imprint on global environmental and social health. It includes actions such as giving back to the growth of sustainable development, mitigating carbon footprint, or supporting social projects. We have less data on which we can draw to figure out the digital transformation has an impact on corporate social responsibility (Kraus, 2021). Yet the digital revolution leads more and more businesses to innovative technologies since they optimize their processes and strengthen their market positions, therefore CSR practices have to be analyzed in terms of the discussed phenomenon. Examining this association can shed light on how to synergize and link digital strategies with sustainable and socially responsible business actions, respectively (Benavides et al., 2020). A conceptual model that explains the impact of digital transformation on the social responsibility of a company can be established based on the theories of the resource-based and stakeholder approach (HASSIM, n.d.).

Resource-based theory constitutes the place where companies try to draw the Competitive Advantage from valuable, rare, and inimitable sources of resources and capabilities (Tijan et al., 2021). Digital transformation may require organizations to use some digital assets and abilities to advance their Corporate Social Responsibilities, thus creating their own industry which regulates both financial and societal performance (Dąbrowska et al., 2022). According to the stakeholder theory, business organizations function within a set of networks with various stakeholders among whom there are employees, customers, suppliers, communities, and corresponding authorities such as regulatory bodies. The aspect of digital transformation engages these stakeholder relationships, which may have an effect on the organization's social and environmental responsibilities (Ghosh et al., 2022). The impact of digital transformation on the involvement of stakeholders and CSR practices is also investigated herein. Such investigation will, therefore, reveal the immediate implications of digitalization for society (Tomičić Furjan et al., 2020).

A narrow literature base out there, which addresses digital transformation and CSR implies maybe some positive linkages. An example of that is digital technologies that allow for more transparent supply chains, providing chances for tracking and reporting ethical sourcing and environmental impact. Besides that, electronic platforms and instrumentation could allow organizations to connect with their communities and stakeholders, facilitating discussion and collaboration on social and environmental matters (Nadkarni & Prügl, 2021).

Secondly, the integration of platforms is expected to improve the integrity and effectiveness of CSR efforts, which in turn will strengthen the company's credibility and trust in the hearts of consumers. An effective digital transformation can be achieved when data analytics and digital platforms are leveraged in order to tackle societal issues like climate change and social inequality so that CSR outputs are purposefully aligned with these efforts (Saarikko et al., 2020). Consequently, given the early stage of studies into digital transformation and

CSR, crucial lines of inquiry are left open. For starters, longitudinal studies can give an in-depth understanding of digital transformation in CSR practices and sustainability (Wessel et al., 2021). Besides, the cross-industry and cross-region comparative cases can be conducted to illustrate the impact of contextual factors on the relationship between digital transformation and CSR, (Vial, 2021) the interesting findings help shed light on this complex interaction. Similarly, in-depth qualitative explorations of the tactics and processes through which digitalization impacts CSR yield complex and contextual realities of the phenomenon. These qualitative studies are useful inasmuch as they portray diverse subjective accounts of organizational members about the use of digital technologies in CSR companies to use digital transformation and apply CSR practices (Hai et al., 2021). Understanding this leads to a significant realization of the linkage between digital transformation and CSR. Understanding these driving forces is a core foundation for a comprehensive understanding of digital transformation and CSR because they shed light on the motivations and intentions behind a company's actions (Lanzolla et al., 2020). The driving factors such as market pressures, competitive edge, government regulations, stakeholder expectations, and genuine concern for sustainability and social responsibilities are some of the main reasons for organizations initiating digital transformation. Namely, they do not only ensure their long-term survival and success but create a more environmentally friendly and fair world. In general, tangible proofs that digital transformation can have a great effect on sustainability and corporate social responsibility are shown by the literature (Zhai et al., 2022). It is crucial for organizations to realize the prime movers of digital transformation and CSR and to completely understand the connection between those two (Aulia & Ernandi, 2022). By understanding the driving factors behind digital transformation and CSR, organizations will be able to make informed decisions and use them strategically to get meaningful results in sustainability and social responsibility.

The main drivers for digital transformation and CSR can be various, for example, market competition and pressure, legal compliance, expectations of stakeholders, and the real corporate commitment to the environment and society issues (Karaçayır & Afşar, 2020). Knowing the motives and goals of these driving factors is basic for research in the field of digital transformation and social responsibility because it describes the reasons and will of organizations. The role of the elementary agents in the evolution of digital transformation and CSR in organizations is the understanding of what forces their behavior (Santos et al., 2020). This helps organizations to ensure that their actions meet the needs of society and environmental conditions. The recognition of the key triggers in the progression of digital transformation and CSR, and the subsequent elimination of these factors can help an organization deal with the complexities of today's business world, thus contributing to a sustainable and ethical future. Hence it can be hypothesized as

H1: Digital transformation has a positive impact on corporate social responsibility.

Moderating Role of Gender Diversity

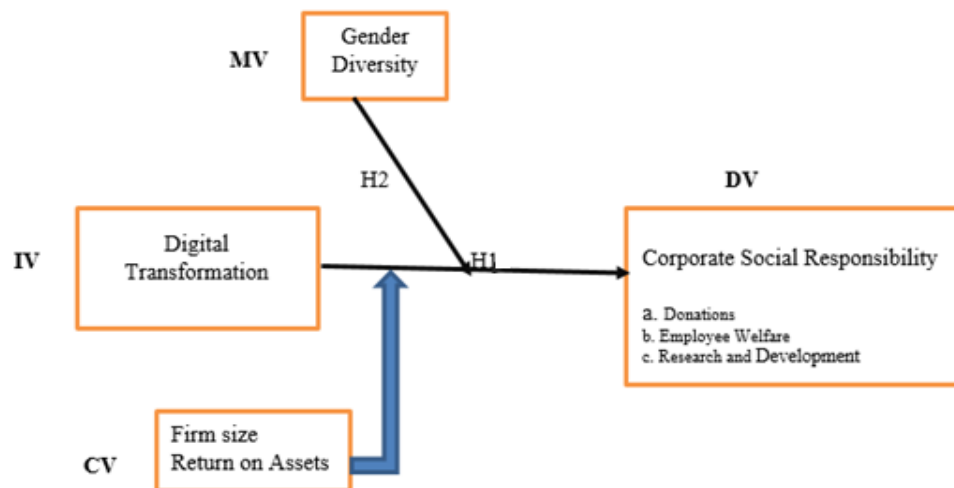
In addition, moderators play a central role, and gender diversity is the attributes that highly affect corporate governance and the decision-making process. It has been reported that gender-sensitive boards pay attention to the social and environmental problems of the company which then could result in better corporate social responsibility (CSR) practices within the organization (Mohamed Hashim et al., 2022). This is also tied to a higher degree of ethics and accountability leading to absorbing digital changes within CSR policies. The literature gives significant proof for the account that these moderators should be factored into the relationship between digital transformation and corporate social responsibility research. The moderators such as gender diversity is to be accounted for by the researchers as they study the impact of digital transformation on CSR (Ahmetoğlu & Yücel, 2022). Hence, the role of a moderator in their interactions with digital transformation to impact corporate social responsibility will be more nuanced and comprehensive. Finally, the use of control variables, such as the size of the firm, return on assets of the company, gender diversity, and board independence while studying this relationship between digital transformation and CSR not only adds depth but also increases the accuracy of the study, hence allowing complete examination of the factors that impact CSR outcomes (Llopis-Albert et al., 2021). Hence, researchers should take into consideration all such variables and their outcomes in the studies pertaining to the correlation between digital transformation and corporate governance. Research demonstrated that gender-diverse board rooms would emphasize social in terms of environmental issues and CSR practices to the strength of organizations (Jatoi & Rasheed, 2023). Through the introduction of gender diversity and legislation and independence as moderators, it is possible to consider how these factors influence the relationship between digital transformation and CSR (ÖZBEK, 2022). Hence, it is hypothesized that;

H2: Gender diversity in the board has a moderating effect on the relationship between CSR.

Control Variables

Finally, the analysis incorporating control variables including firm size and return on assets in studying the relationship between digital transformation and corporate social responsibility considers more depth and adds accuracy to the study, making it possible to conduct a comprehensive investigation into the factors which impact

on CSR(Porfírio et al., 2021). In summary, these variables might influence the precise effect of digitization on corporate responsibility. Therefore, both of them should be taken into account for further investigations. Moreover,digitaltransformations in the existing structures of the company can be diverse and the introduction of CSR is not always an easy process(Li, 2020). This being the case, researchers will have to judge the magnitude of digitalization in their study as it may play a role in the intensity and direction of the impact digitalization has on corporate responsibility. On that note, the research must also be contextually tailored to account for many different factors, and it must also control variables for the study to determine which of these correlated(Konopik et al., 2022).



*Where MV, IV, DV and CV represents Moderating Variables, Independent Variable, Dependent Variable and Control Variables respectively.

The donation, employee welfare and Research and Development are the dimensions of dependent variable

Figure 1: Proposed research model

METHODOLOGY

This study utilizes a quantitative research approach based on secondary data. The data was collected from the annual reports of companies listed on the Pakistan Stock Exchange (PSX) over the period from 2019 to 2023. The sample comprises 1,161 firms, providing a vigorous dataset for analysis. For Corporate Social Responsibility (CSR), three proxies were used: donations, employee welfare, and research and development (R&D) expenditures. Additionally, firm performance metrics such as Return on Assets (ROA) and firm size were measured through financial reports obtained from the companies. While the digitalization was measured through content analysis by counting the number of words; such as digitalization, information technology, digital transformation and artificial analysis.

The PSX annual reports offer comprehensive data on the financial and economic performance of listed companies, including information on shareholder backgrounds, top management team composition, and other relevant statistics. These reports are a reliable source frequently used in research focusing on publicly traded companies in Pakistan. By leveraging the PSX data, this study ensures the accuracy and relevance of the collected information, facilitating a thorough examination of the relationships between digital transformation, CSR, and the moderating effects of board characteristics and gender diversity.

RESULTS AND FINDINGS

Table 1: Sample and Population

Sr No	Year	Total No of Listed Firms (Population)	No of Firms selected (Sample)
1	2019	451	201
2	2020	531	240
3	2021	533	240
4	2022	531	240
5	2023	524	240
Total		2570	1161

The table 1 displays the number of companies listed on the PSX in relation to the year they were listed: 2019 – 2023. The table also includes the number of companies that issued annual reports on the PSX during the same time span. From last year till 2023, there has been a general increase in the number of companies listed on the PSX. Such an increase is also accompanied by the total amount of companies that issue annual report on the PSX over the last few years. In 2019, there were 451 firms listed on the Stock Exchange of Pakistan and out of them 201 companies issued their Annual Reports. This suggests that these organizations demonstrate a high degree of compliance with reporting standards. The trend appears when the number of listed companies grows and more annual reports are submitted, which points to a saturated and developing market presence on the PSX.

Table 2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Digital Transformation	1161	0	544	35.75	69.254
CSR	1161	.0000	.4560	.021383	.0558679
Gender Diversity	1161	7.14	37.5	16.3398	6.92798
Firm Size	1161	.00	6.82	4.0290	1.06970
ROA	1161	.0000	.6420	.069019	.0824807
Valid N (listwise)	1161				

Table 2 shows descriptive statistics for a number of key variables. Digital transformation may take the form of the movement from 0 to 544 degrees, with a mean value of 35.75 and a standard deviation of 69.254, showing a significant rhythmic variability among the full dataset. Compared to Corporate Social Responsibility which is narrower range of values mostly centered between the lower and middle part of the scale having a low average of 0.021, Corporate Governance is gap-conscious. Gender Diversity has mean value of 16.3398 and a standard deviation of 6.9279. ROA's values range from 0.00 to 0.642, with an average value of 0.069 and a standard deviation of 0.082. Overall, these statistics are instrumental in revealing the extent of spread in each variable along with the variability that goes along with it, thus giving a full appreciation of the range and central tendencies of each factor that has been considered.

Table 3: Correlation matrix

	Digital Transformation	CSR	Gender	Firm size	ROA
Digital Transformation	1				
CSR	.563**	1			
Gender	.014	.064*	1		
Firm size	.126**	-.097**	-.152**	1	
ROA	-.164**	-.125**	.066*	-.116**	1

Note: **p<0.01

The correlation table-3 correlations between digital transformation and various organizational factors. Digital transformation has a strong positive correlation with Corporate Social Responsibility (CSR) at .563, indicating that firms engaging in digital initiatives often emphasize CSR. Gender diversity and board independency show positive correlations with digital transformation at .064 and .248, respectively, suggesting that diverse and independent boards support digital efforts. Firm size also correlates positively at .127, indicating larger firms are more likely to undergo digital transformation. Conversely, Return on Assets (ROA) has a negative correlation of -.116 with digital transformation, suggesting that initial investments in digital initiatives may temporarily reduce profitability.

Baseline regressions: digital transformation and CSR

The analysis results support the proposed hypotheses regarding the impact of digital transformation (DT) on corporate social responsibility (CSR) and the moderating effect of gender diversity (GENDER_D) on this relationship.

Table 4: Baseline regressions: digital transformation and CSR

Model Summary					
R	R-sq	F	Df1	Df2	P
.5927	.3513	208.8144	3.0000	1157.0000	.0000

Model					
	coeff	T	P	LLCI	ULCI
Constant	.0091	3.0728	.0022	.0033	.0148
DT	.0187	4.5924	.0000	.0170	.0267
Gender_D	-.0003	-1.5509	.1212	-.0006	.0001
Int_1	.0017	7.4287	.0000	.0013	.0022

The table 4 explains the regression model indicates a significant positive relationship between digital transformation and CSR (coeff = .0187, $t = 4.5924$, $p < .0001$). This result confirms Hypothesis 1, suggesting that as firms increase their digital transformation efforts, their CSR activities also increase, when first moderator gender is considered. It supports the Hypothesis 1 stated as Digital transformation has a positive impact on corporate social responsibility.

Table 5: Product Terms key
Int_1 : DT x GENDER_D

Test(s) of highest order unconditional interaction(s):					
	R2-change	F	Df1	Df2	p
X*W	.0309	55.1863	1.0000	1157.0000	.0000

Table 6. Conditional effects of the focal predictor at values of the moderator(s)

GENDER_D	Effect	T	P	LLCI	ULCI
10.0000	.0358	15.5059	.0000	.0312	.0403
14.2857	.0431	22.2673	.0000	.0393	.0469
28.5714	.0675	19.0752	.0000	.0605	.0744

The table 5 explains the interaction term (DT x GENDER_D) is significant (coeff = .0017, $t = 7.4287$, $p < .0001$), indicating that gender diversity on the board moderates the relationship between digital transformation and CSR. The significance of the interaction term and the change in R-squared ($R^2\text{-chng} = .0309$, $p < .0001$) further support this moderating effect. Where as in table 6 the conditional effects of digital transformation on CSR at different levels of gender diversity show that the positive impact of DT on CSR increases with higher levels of gender diversity. As at minimum gender diversity value of 10, the effect is .0358 ($t = 15.5059$, $p < .0001$) and at maximum gender diversity value of 28.5714, the effect is .0675 ($t = 19.0752$, $p < .0001$).

DISCUSSION

Digitalization is technology adoption meant for organizational purposes that strives to improve efficiency, innovation and competitiveness. Overall, digital transformation where it is successfully accomplished by a firm can be used by to make it possible to gain a competitive advantage in terms of CSR through utilization of digital resources. As an example, digital technologies can adequately promote transparency, ensure feasible communication with stakeholders, and also environmental sustenance activities, leading to good CSR (Hanelt et al., 2021). The RBT says that the diversity of a board may be vital in its contribution to the firms' efficiency since different perspectives and expertise come of diverse competencies (Akour & Alenezi, 2022). Gender diversity (as one of the forms of board diversity) impact the way that CSR activities addressing social challenges in the society are developed and operationalized in the company. As regards to RBT, it would be anticipated that compose boards with different kind of gender (Devina & Pradipta, 2021). These boards are more inclined to consider wider range of stakeholder interests, and then they would be able to implement CSR strategies, leading to an increasing firm value. The board is highly important as it deals with financial resources, decisions having a strategic effect and control of company activities (Holmström, 2022). A quality board is more likely to have high governance and direction thereby facilitating the organization's CSR activities as what fits with its direction. They point out this results in the boards that have strong governance structures and capabilities are more efficient in developing CSR strategies that in turn produce more value to the firm.

Firm size will increase if the firm operating with a large amount of scale and scope of operations. Major companies usually have sufficient, at least in financial terms, and are strongly organized capital to implement complex business and social responsibility activities (Kraus et al., 2021). The study forecasts that muscular firms have structural scale-related assets that may enable them to take a more complex digital transformation approach and corporate social responsibility programs implementation. Moreover, larger firms are more likely to take a proactive approach to CSR in all their operations including supply chains since they have a better ability to manage this type of activity and may also have larger visibility and resources (Trenerry et al., 2021). The level

on assets performance tells us about the financial outcome of the company, while transformation to digitalization and strategic responsibilities lead to this financial result.

However, studies have linked the financially significant effect to the digital capabilities and sustainable practices that provide firms with better asset returns they outperform the others (Ahmetoğulları & Yücel, 2022). Digital transformation can be beneficial to companies in facilitation of operational efficiency and innovation with the result being higher profitability. Likewise, this positive effect can influence brand reputation, growing brands and developing better relational ties with stakeholders which last at the same time (Supian, 2023). It has been proven that this is one of the critical indicators of financial performance, as reflected in ROA.

Limitations and Future Directions

The research pinpoints the impact of gender equality one of the most significant factors that can help modify the relationship between investment and corporate governance. It is worth noting that this relationship strength varies among countries because of various cultural and social customs. But other elements such as organizational culture, industry roles, and regulating environment may also impact the relationships of focus. Research to be undertaken in the future could facilitate the examination of these factors so as to supplement the findings with a more detailed and all-embracing picture.

The conceptualization and operationalization of digital transformation, CSR performance, and firm value may differ in various studies, which may be the reason for the inconsistency of the results. In the future, it would be valuable to come up with a standardized approach to measurement to make the results more comparable and reliable.

CONCLUSION

Digital transformation has captivated attention from experts and researchers. Only a limited researches have investigated the connection among digital transformation and corporate social responsibility. Digital financial system has contributed progressively to commercial expansion worldwide. DT is a broadly perceived phenomenon in the background of the existing digital ecosystem. Consequently, it is vital to discover the influences of digital transformation on corporate events. For now, the part of board characteristics is significant for sustainable development and companies' policy. Though, the literature typically disregards the role of corporate governance when investigating the relationship between CSR and firms' DT. By combining the literature on digitalization and stakeholder theory, this research measures the relationship between digital transformation and CSR of listed firms on PSX. The research also develops a novel theoretical framework to describe how gender diversity forms the association among digital transformation and corporate social responsibility, seeing the moderating role of gender diversity. In the experiential examination, this research uses panel data assessment model and we collect 1161 observations from 451 registered firms on Pakistan's stock exchange over five years 2019–2023 to test the hypotheses. We use a regression model on SPSS to determine the effect of digital transformation on CSR and moderating role of gender diversity on this relationship. To conclude, this research determines that digital transformation encourages companies' CSR. In relations of corporate governance, it represents that more female directors in boardroom reinforce the optimistic impact of digital transformation on corporate social responsibility. Our conclusions contribute to an improved understanding of CSR in the framework of evolving markets, which would also offer suggestions for the preparation and execution of effective corporate social responsibility strategies in the digital age.

REFERENCES

1. Ahmetoğulları, K., & Yücel, R. (2022). How do R&D and firm size play a role in the relationship between public incentives and firm performance? /kamu teşvikleri ve firma performansı ilişkisinde ar-ge ve firma büyüklüğü nasıl rol oynar?3. Sektör Sosyal Ekonomi Dergisi, 57(1).
2. Akour, M., & Alenezi, M. (2022). Higher education future in the era of digital transformation. Education Sciences, 12(11), 784.
3. Albukhitan, S. (2020). Developing digital transformation strategy for manufacturing. Procedia Computer Science, 170, 664–671.
4. Appio, F. P., Frattini, F., Petruzzelli, A. M., & Neirotti, P. (2021). Digital Transformation and Innovation Management: A Synstudy of Existing Research and an Agenda for Future Studies. Journal of Product Innovation Management, 38(1), 4–20. <https://doi.org/10.1111/jpim.12562>
5. Aulia, N. A., & Ernandi, H. (2022). Effect of Firm Size, Profitability and Capital Intensity on Effective Tax Rate (ETR). Indonesian Journal of Law and Economics Review, 16, 10–21070.
6. AYDIN, N. D., & BİLİCİ, N. S. (2022). Effect of the financial performance of companies in tourism sector on firm profitability: an applied study on developed countries. Stratejik Yönetim Araştırmaları Dergisi, 5(1), 36–55.

7. Benavides, L. M. C., Tamayo Arias, J. A., Arango Serna, M. D., Branch Bedoya, J. W., & Burgos, D. (2020). Digital transformation in higher education institutions: A systematic literature review. *Sensors*, 20(11), 3291.
8. Bican, P. M., & Brem, A. (2020). Digital business model, digital transformation, digital entrepreneurship: Is there a sustainable “digital”? *Sustainability*, 12(13), 5239.
9. Bygstad, B., Øvrelid, E., Ludvigsen, S., & Dæhlen, M. (2022). From dual digitalization to digital learning space: Exploring the digital transformation of higher education. *Computers & Education*, 182, 104463.
10. Caliskana, M. T., & Lecunab, H. K. S. (2020). The determinants of banking sector profitability in Turkey1, 2. *Business and Economics Research Journal*, 11(1), 161–167.
11. Chawla, R. N., & Goyal, P. (2022). Emerging trends in digital transformation: A bibliometric analysis. *Benchmarking: An International Journal*, 29(4), 1069–1112.
12. Dąbrowska, J., Almpapoulou, A., Brem, A., Chesbrough, H., Cucino, V., Di Minin, A., Giones, F., Hakala, H., Marullo, C., Mention, A., Mortara, L., Nørskov, S., Nylund, P. A., Oddo, C. M., Radziwon, A., & Ritala, P. (2022). Digital transformation, for better or worse: A critical multi-level research agenda. *R&D Management*, 52(5), 930–954. <https://doi.org/10.1111/radm.12531>
13. Devina, M., & Pradipta, A. (2021). Pengaruh Fasilitas Perpajakan, Return on Asset, Leverage, Ukuran Perusahaan, dan Intensitas Aset Tetap Terhadap Manajemen Pajak. *E-Jurnal Akuntansi Tsm*, 1(1), 25–32.
14. Djuaeriah, N., & Winarta, B. J. (2020). The Effect of Capital Structure on Firms' Profitability: A Case Study of Indonesian Firms. *Conference Series*, 3(1), 107–121. <https://www.adi-journal.org/index.php/conferenceseries/article/view/414>
15. Doğan, M., & Kevser, M. (2020). The determinants of cash conversion cycle and firm performance: An empirical research for Borsa Istanbul Turkey. *Management and Economics Review*, 5(2), 197–206.
16. Emre, K., & Derekoy, F. (2020). Analysis of the relationship between exchange rate changes and profitability in turkey: Example of bist manufacturing sector. *Journal of Business Economics and Finance*, 9(4), 304–319.
17. Emudainohwo, O. B. (2021). Determinants of earnings management: The study of Nigerian nonfinancial companies. *Ekonomski Horizonti*, 23(2), 139–155.
18. ERDOĞAN, E. Z., & TÜRKMEN, S. Y. (2021). The effect of working capital management on profitability: Borsa Istanbul manufacturing sector case. *Finans Ekonomi ve Sosyal Araştırmalar Dergisi*, 6(4), 886–896.
19. Feroz, A. K., Zo, H., & Chiravuri, A. (2021). Digital transformation and environmental sustainability: A review and research agenda. *Sustainability*, 13(3), 1530.
20. Fletcher, G., & Griffiths, M. (2020). Digital transformation during a lockdown. *International Journal of Information Management*, 55, 102185.
21. Ghosh, S., Hughes, M., Hodgkinson, I., & Hughes, P. (2022). Digital transformation of industrial businesses: A dynamic capability approach. *Technovation*, 113, 102414.
22. Gong, C., & Ribiere, V. (2021). Developing a unified definition of digital transformation. *Technovation*, 102, 102217.
23. Hai, T. N., Van, Q. N., & Thi Tuyet, M. N. (2021). Digital transformation: Opportunities and challenges for leaders in the emerging countries in response to COVID-19 pandemic. *Emerging Science Journal*, 5(1), 21–36.
24. Hanelt, A., Bohnsack, R., Marz, D., & Antunes Marante, C. (2021). A Systematic Review of the Literature on Digital Transformation: Insights and Implications for Strategy and Organizational Change. *Journal of Management Studies*, 58(5), 1159–1197. <https://doi.org/10.1111/joms.12639>
25. HASSIM, S. (n.d.). The relationship of auditor characteristics and aggressive tax planning among public listed companies in Malaysia. Retrieved April 4, 2024, from https://etd.uum.edu.my/10781/2/s829355_02.pdf
26. Hilbert, M. (2020). Digital technology and social change: The digital transformation of society from a historical perspective. *Dialogues in Clinical Neuroscience*, 22(2), 189–194. <https://doi.org/10.31887/DCNS.2020.22.2/mhilbert>
27. Holmström, J. (2022). From AI to digital transformation: The AI readiness framework. *Business Horizons*, 65(3), 329–339.
28. Jatoi, M. Z., & Rasheed, A. (2023). Impact of dividend policy on firm performance: Evidence from non-financial firms of Pakistan. *Pakistan Journal of Humanities and Social Sciences*, 11(2), 1220–1228.
29. JIAN, T. P. (2020). The impact of capital structure and board characteristics on firms performance: evidence from Malaysian plantation industry. https://etd.uum.edu.my/10388/2/s823643_01.pdf
30. KARAÇAYIR, E., & AFŞAR, A. (2020). Effect of investment and financing decisions on firm value; example of bist industrial index. *Uşak Üniversitesi Sosyal Bilimler Dergisi*, 13(2), 13–24.
31. Karali, M., & Öndeş, T. (2022). Cash-holding policy in businesses: an application on insurance companies. *Kafkas Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 13(26), 626–639.

32. Kargin, H., & Alp, S. (n.d.). Effect of working capital management on firm performance. Retrieved April 4, 2024, from https://www.researchgate.net/profile/Hasan-Kargin-5/publication/373855659_effect_of_working_capital_management_on_firm_performance/links/655e319cce88b8703100c7d4/effect-of-working-capital-management-on-firm-performance.pdf
33. Konopik, J., Jahn, C., Schuster, T., Hoßbach, N., & Pflaum, A. (2022). Mastering the digital transformation through organizational capabilities: A conceptual framework. *Digital Business*, 2(2), 100019.
34. Kraipornsak, P., & Poramapojn, P. (2021). Determinants of The Market Value of Listed Firms in The Services Sector: A Case of Thailand. *International Journal of Economics and Finance Studies*, 13(1), 155–172.
35. Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). Digital Transformation: An Overview of the Current State of the Art of Research. *SAGE Open*, 11(3), 215824402110475. <https://doi.org/10.1177/21582440211047576>
36. Lanzolla, G., Lorenz, A., Miron-Spektor, E., Schilling, M., Solinas, G., & Tucci, C. L. (2020). Digital transformation: What is new if anything? Emerging patterns and management research. In *Academy of Management Discoveries* (Vol. 6, Issue 3, pp. 341–350). Academy of Management Briarcliff Manor, NY. <https://journals.aom.org/doi/abs/10.5465/amd.2020.0144>
37. Li, F. (2020). Leading digital transformation: Three emerging approaches for managing the transition. *International Journal of Operations & Production Management*, 40(6), 809–817.
38. Llopis-Albert, C., Rubio, F., & Valero, F. (2021). Impact of digital transformation on the automotive industry. *Technological Forecasting and Social Change*, 162, 120343.
39. Mohamed Hashim, M. A., Tlemsani, I., & Matthews, R. (2022). Higher education strategy in digital transformation. *Education and Information Technologies*, 27(3), 3171–3195. <https://doi.org/10.1007/s10639-021-10739-1>
40. Msomi, T. S., & Nzama, S. (2023). Analyzing firm-specific factors affecting the financial performance of insurance companies in South Africa. *Insurance Markets and Companies*, 14(1), 8.
41. Mugge, P., Abbu, H., Michaelis, T. L., Kwiatkowski, A., & Gudergan, G. (2020). Patterns of Digitization: A Practical Guide to Digital Transformation. *Research-Technology Management*, 63(2), 27–35. <https://doi.org/10.1080/08956308.2020.1707003>
42. Na, C., Chen, X., Li, X., Li, Y., & Wang, X. (2022). Digital transformation of value chains and CSR performance. *Sustainability*, 14(16), 10245.
43. Nadkarni, S., & Prügl, R. (2021). Digital transformation: A review, synstudy and opportunities for future research. *Management Review Quarterly*, 71(2), 233–341. <https://doi.org/10.1007/s11301-020-00185-7>
44. Ndatika, U. W., Purwidiyanti, W., & Tubastuvi, N. (2024). The Influence of Financial Performance and Company Size on Company Value with Good Corporate Governance as a Moderating Variable. *Jurnal Ekonomi Dan Bisnis Digital*, 3(1), 231–246.
45. Nevin, Ö. (n.d.). Chapter i the effect of firm size on profitability and market value. *Administrative and economics sciences*, 1.
46. Oluwole, F. O., & Ajayi, O. S. (n.d.). Corporate governance and financial performance of listed deposit money banks in nigeria. Retrieved April 4, 2024, from https://www.academia.edu/download/66678371/7_94_109g_oluwole_galley.pdf
47. ÖZBEK, A. (2022). The impact of working capital management on profitability: an analysis on companies in the bist wholesale and retail sector. *International Journal of Social and Humanities Sciences Research (JSHSR)*, 9(86), 1446–1453.
48. Porfírio, J. A., Carrilho, T., Felício, J. A., & Jardim, J. (2021). Leadership characteristics and digital transformation. *Journal of Business Research*, 124, 610–619.
49. Rodríguez-Abitia, G., & Bribiesca-Correa, G. (2021). Assessing digital transformation in universities. *Future Internet*, 13(2), 52.
50. Saarikko, T., Westergren, U. H., & Blomquist, T. (2020). Digital transformation: Five recommendations for the digitally conscious firm. *Business Horizons*, 63(6), 825–839.
51. SAKIN, İ., & İlker, K. (2024). The Impact of Carbon Emissions on Firms' Financial Performance: An Application in BIST Sustainability Index. *Trends in Business and Economics*, 38(1), 39–47.
52. Santos, J. S. G. dos, Pereira, C. C., & Lustosa, P. R. B. (2020). Effect of market analysts forecasts in the outcomes of 2004-2009 brazilian ipos. <http://rebacc.crcrj.org.br/handle/123456789/5101>
53. Supian, D. (2023). Pengaruh Current Ratio terhadap Return on Assets Studi Kasus pada PT. Telekomunikasi Indonesia Tbk. *Jurnal Pendidikan Tambusai*, 7(3), 23500–23511.
54. TANÇ, Ş. G., & ÇETİNEL, T. (2020). Corporate governance and financial performance of selected quoted companies in Turkey. *Journal of Accounting and Taxation Studies*, 13(3), 819–828.
55. Tijan, E., Jović, M., Aksentijević, S., & Pucihar, A. (2021). Digital transformation in the maritime transport sector. *Technological Forecasting and Social Change*, 170, 120879.

56. Tomičić Furjan, M., Tomičić-Pupek, K., & Pihir, I. (2020). Understanding digital transformation initiatives: Case studies analysis. *Business Systems Research: International Journal of the Society for Advancing Innovation and Research in Economy*, 11(1), 125–141.
57. Trenerry, B., Chng, S., Wang, Y., Suhaila, Z. S., Lim, S. S., Lu, H. Y., & Oh, P. H. (2021). Preparing workplaces for digital transformation: An integrative review and framework of multi-level factors. *Frontiers in Psychology*, 12, 620766.
58. Van Veldhoven, Z., & Vanthienen, J. (2022). Digital transformation as an interaction-driven perspective between business, society, and technology. *Electronic Markets*, 32(2), 629–644. <https://doi.org/10.1007/s12525-021-00464-5>
59. Vaska, S., Massaro, M., Bagarotto, E. M., & Dal Mas, F. (2021). The Digital Transformation of Business Model Innovation: A Structured Literature Review. *Frontiers in Psychology*, 11, 539363. <https://doi.org/10.3389/fpsyg.2020.539363>
60. Vial, G. (2021). Understanding digital transformation: A review and a research agenda. *Managing Digital Transformation*, 13–66.
61. Wessel, L., Baiyere, A., Ologeanu-Taddei, R., Cha, J., & Blegind-Jensen, T. (2021). Unpacking the difference between digital transformation and IT-enabled organizational transformation. *Journal of the Association for Information Systems*, 22(1), 102–129.
62. Xu, Y., Wang, L., Xiong, Y., Wang, M., & Xie, X. (2023). Does digital transformation foster corporate social responsibility? Evidence from Chinese mining industry. *Journal of environmental management*, 344, 118646.
63. Yıldırım, H., & Karabayır, M. E. (n.d.). Firm-Specific and Macroeconomic Factors Affecting Capital Structure. *Mehmet Akif Ersoy Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 11(1), 329–345.
64. Yundhari, N. W. T., & Sedana, I. B. P. (2020). The effect of profitability, growth, and asset structure on company value with capital structure as mediation on consumer goods companies in Indonesia Stock Exchange. *International Journal of Business Marketing and Management (IJBMM)*, 5(1), 21–33.
65. Zaoui, F., & Souissi, N. (2020). Roadmap for digital transformation: A literature review. *Procedia Computer Science*, 175, 621–628.
66. Zhai, H., Yang, M., & Chan, K. C. (2022). Does digital transformation enhance a firm's performance? Evidence from China. *Technology in Society*, 68, 101841.