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Signaling in the digital era: how digitalization influences financial and social reputation across contexts

Yuying Tang^a , Zikang Liao^b  and Wai-Yan Wong^a 

^aFaculty of Economics and Management, Universiti Kebangsaan Malaysia, Selangor, Malaysia; ^bCardiff Business School, Cardiff University, Cardiff, UK

ABSTRACT

Although corporate digitalization is increasingly recognized as an important signal, existing studies primarily focus on what signals digitalization conveys rather than how stakeholders interpret them. Drawing on signaling theory, this study addresses this gap by distinguishing between financial and social reputation to capture different stakeholder interpretations of digitalization signals and by examining how stakeholder expectations shape these interpretations. Using a sample of Chinese A-share listed firms from 2013 to 2024, this study investigates the effects of digitalization on financial and social reputation. It further examines the moderating role of stakeholder expectations by analyzing three organizational contexts associated with distinct stakeholder expectations, namely state ownership, high-polluting industries, and high-tech industries. The results show that digitalization enhances both dimensions of reputation. However, its effects vary according to stakeholder expectations. Digitalization exerts a stronger positive effect on social reputation but a weaker positive effect on financial reputation in state-owned enterprises. It also exerts a stronger positive effect on social reputation in high-polluting industries and a stronger positive effect on financial reputation in high-tech industries. This study shifts attention from what digitalization signals to how stakeholders interpret those signals. By integrating digitalization, multidimensional reputation, and stakeholder expectations, it explains why the same digitalization signal can generate different reputational outcomes when stakeholder expectations differ.

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1. Introduction

Corporate reputation reflects stakeholders' collective evaluations of a firm based on its past actions and future prospects (Fombrun, 1996; Gotsi & Wilson, 2001). Traditionally, stakeholders have focused mainly on financial reputation, as it reflects assessments of a firm's ability to generate sustainable profitability and shareholder value (Martinez et al., 2017). However, in today's context, where social and environmental issues can quickly escalate into reputational crises, companies are paying closer attention to enhance their social reputation (Lu et al., 2015). Social reputation captures evaluations of a firm's social responsibility and ethical conduct, helping firms strengthen their legitimacy and maintain favorable relationships with society and other external stakeholders (De Castro et al., 2006; Zarefar et al., 2024).

Digitalization has emerged as a central strategic transformation in the digital economy (Gradillas & Thomas, 2025; Leonardi & Treem, 2020). From a signaling perspective, digitalization serves as a signal through which firms communicate information to external stakeholders. According to signaling theory, effective signals must be both costly and credible (Connelly et al., 2011). Digitalization possesses both characteristics. On the one hand, digital transformation requires substantial investments in digital infrastructure, employee training, organizational restructuring, and technological upgrading (Guo et al., 2023). On the other hand, digitalization generates observable outcomes across multiple dimensions of

CONTACT Wai-Yan Wong  wongwy@ukm.edu.my  Faculty of Economics and Management, Universiti Kebangsaan Malaysia, Selangor, Malaysia.

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organizational activities, including operational efficiency, financial performance, organizational transparency, and environmental sustainability (Ali et al., 2024; Chen et al., 2023; Hu et al., 2025; Lin & Xie, 2023; Zhang & Jie, 2026). Consequently, digitalization leaves observable and verifiable traces across multiple dimensions of organizational activities, enabling stakeholders to assess whether firms' digital investments are supported by actual capabilities and outcomes (Chen et al., 2026). These multidimensional traces enable cross-validation, making it difficult for firms to fake digitalization credibly. Therefore, digitalization can be regarded as a costly and credible signal of firm quality.

Building on this premise, a growing body of research has applied signaling theory to explain the consequences of digitalization, yet this research has focused primarily on the information conveyed by digitalization signals (Elfedawy & Al-Asfour, 2026; Fan et al., 2024; Salvi et al., 2023). These studies generally argue that digitalization conveys positive information about firms' capabilities, quality, and future prospects, thereby eliciting favorable responses from external stakeholders. However, digitalization may also involve substantial implementation costs, organizational disruption, and technological uncertainty (Guo et al., 2023; Oludapo et al., 2024). In other words, signals of digitalization often contain both favorable and unfavorable information. Recent studies have begun to recognize this complexity. For example, Li et al. (2025) found that investors often reach different conclusions when evaluating the same digitalization signal because digital transformation conveys both favorable and unfavorable information. Similarly, Guo et al. (2025) reported substantial disagreement among analysts in their evaluations of firms' digital initiatives. Nevertheless, these studies continue to explain stakeholder responses primarily from a signal-content perspective, implicitly attributing differences in evaluation to the coexistence of positive and negative information within the signal.

However, identifying the information contained in a signal cannot fully account for differences in evaluation. The coexistence of favorable and unfavorable information may indicate that a signal is complex or ambiguous, but it cannot explain why different stakeholders arrive at fundamentally different interpretations. According to signaling theory, signal effectiveness depends not only on the characteristics of the signal itself but also on how receivers interpret that signal (Connelly et al., 2011). Receivers may attend to different informational cues embedded in the same signal and consequently assign different meanings to it (Connelly et al., 2025). As a result, the same digitalization signal may generate different evaluations among stakeholders. This insight is particularly important in the context of corporate reputation because reputation represents stakeholders' evaluations of firms (Fombrun, 1996; Gotsi & Wilson, 2001). Stakeholders typically evaluate firms along two broad dimensions, namely economic competence and social responsibility, which are reflected in financial reputation and social reputation, respectively. Consequently, distinguishing between financial reputation and social reputation provides a useful way to capture how stakeholders translate their interpretations of digitalization into reputational judgments.

At the same time, stakeholders do not necessarily assign equal attention to all informational cues embedded in a signal. Prior research suggests that signal interpretation is shaped by a variety of contextual factors (Gomulya & Mishina, 2017; Kim & Jensen, 2014), among which stakeholder expectations play a particularly important role (Gomulya & Mishina, 2017; Paruchuri et al., 2021; Tsai et al., 2023). Stakeholders tend to interpret corporate actions through the lens of their prior expectations and respond more favorably to signals that align with those expectations (Tsai et al., 2023). Conversely, signals that violate expectations may trigger less favorable evaluations (Paruchuri et al., 2021). As a result, stakeholder expectations may affect which aspects of digitalization become most salient during the evaluation process, thereby shaping the reputational consequences of digitalization. However, little is known about how stakeholders prioritize different informational cues embedded in digitalization when forming reputational evaluations.

To address these gaps, this study distinguishes between financial reputation and social reputation and further examines how stakeholder expectations shape the reputational consequences of digitalization. Specifically, this study focuses on three organizational contexts characterized by distinct stakeholder expectations. In the case of state-owned enterprises, stakeholders typically expect firms to fulfill broader social responsibilities and create public value, leading them to place greater emphasis on social responsibility and public objectives (Huang et al., 2024; Lin et al., 2020). For firms operating in high-polluting industries, stakeholders are particularly concerned with environmental responsibility and legitimacy

because of the environmental consequences of their operations (Chen & Zhang, 2025; Wu et al., 2022). In contrast, stakeholders generally expect high-tech firms to sustain innovation and future growth (Pronchakov et al., 2022; Ye & Liu, 2020), making innovation capability and growth potential particularly salient evaluation criteria. These contexts, therefore, provide an appropriate setting for examining how stakeholder expectations influence the salience of different informational cues embedded in digitalization and, ultimately, its effects on financial and social reputation.

Using a sample of Chinese A-share-listed firms from 2013 to 2024, this study examines the effects of digitalization on financial and social reputation. It further investigates whether these relationships vary across state-owned enterprises, high-polluting industries, and high-technology industries. The results show that digitalization enhances both financial and social reputation. More importantly, its reputational effects vary systematically across organizational contexts. In state-owned enterprises, digitalization exerts a stronger positive effect on social reputation but a weaker positive effect on financial reputation. In high-polluting industries, digitalization strengthens its positive effect on social reputation. In high-technology industries, digitalization strengthens its positive effect on financial reputation. These findings suggest that stakeholder expectations shape how digitalization signals are interpreted and translated into reputational outcomes.

This study contributes to the literature in two important ways. First, this study extends research on digitalization and corporate reputation from a signal-centered perspective to a signal-interpretation perspective. Existing studies primarily focus on the information conveyed by digitalization signals and assume that stakeholders' responses are determined by the signal's content. However, corporate reputation is inherently subjective, as it depends on how stakeholders interpret organizational actions and signals. Focusing solely on digitalization itself is therefore insufficient to explain how reputation is formed. To address this limitation, this study incorporates the receiver interpretation perspective from signaling theory and examines how stakeholders form reputational judgments by assigning specific meanings to digitalization signals. This shift in theoretical perspective enriches our understanding of the relationship between digitalization and corporate reputation.

Second, this study develops a signal interpretation framework that explains how stakeholder expectations shape the reputational outcomes of the same digitalization signal. Integrating digitalization signals, stakeholder expectations, and multidimensional reputation, the framework suggests that stakeholders do not respond solely to the information conveyed by the signal itself. Instead, stakeholder expectations influence which aspects of digitalization become salient during the interpretation process. By distinguishing between financial and social reputations, the framework captures how these interpretations are translated into distinct reputational evaluations. This distinction allows us to observe how stakeholder expectations shape the reputational outcomes associated with the same digitalization signal. In doing so, the study provides a more comprehensive explanation of how stakeholder expectations shape the reputational consequences of digitalization.

2. Hypotheses development

2.1. Digitalization and corporate reputation: financial and social dimensions

Based on signaling theory, the effectiveness of a signal depends not only on the information it conveys but also on how receivers interpret it (Connelly et al., 2011). As stakeholders often face information asymmetry, they rely on observable organizational actions when evaluating firms (Spence, 1974). When digitalization is interpreted as a positive signal of firm quality and future prospects, it can enhance both financial reputation and social reputation.

Digitalization is a high-investment, high-barrier strategic action that requires substantial expenditures on skilled labor, training, consulting, and system integration (Guo et al., 2023). Although such investments may involve considerable costs and risks, stakeholders are likely to interpret digital investments as credible signals of long-term confidence because such commitments are hard to fake and are empirically linked to breakthrough innovation (Chen et al., 2026). Furthermore, digital transformation extends beyond the adoption of new technologies. It requires continuous organizational adjustment, capability development, and strategic adaptation, demanding that firms continually enhance their flexibility and

adaptability (Gradillas & Thomas, 2025). Given the considerable challenges and high failure rates associated with digital transformation, successfully achieving a high level of digitalization is difficult for many firms (Oludapo et al., 2024). Therefore, stakeholders may interpret a high level of digitalization as evidence of superior organizational capabilities, which strengthens confidence in the firm's future competitiveness. In addition, digitalization has been widely associated with higher operational efficiency and stronger financial performance (Chen et al., 2023; Lin & Xie, 2023; Yonghong et al., 2023; Zhang & Jie, 2026). As a result, stakeholders are likely to view digitalization as an indicator of future competitiveness and growth potential. Such interpretations strengthen confidence in a firm's future prospects and enhance its financial reputation.

In terms of social reputation, digitalization tends to be seen as an important signal of a firm's commitment to broader social goals. In China, digital transformation has become a key national development strategy. Therefore, stakeholders could interpret a high level of digitalization as evidence that the firm is actively responding to government initiatives and aligning its development with national priorities (Fan et al., 2024). In addition, digitalization enables firms to engage more effectively with stakeholders through multiple communication channels. By disseminating information more efficiently, increasing transparency, and responding more promptly to social concerns, firms can strengthen stakeholders' trust and shape public evaluations (Nasidi et al., 2024). For example, Odoom et al. (2025) found that sustainable digital marketing helps firms communicate ethical values and responsible business practices more effectively. Therefore, stakeholders may interpret a firm's digitalization efforts as a commitment to transparency and social responsibility, thereby enhancing its social reputation. More importantly, digitalization has become increasingly associated with sustainable development in both academic research and public discourse (Bendig et al., 2023; Wu et al., 2022; Zhou et al., 2023). Consequently, stakeholders are more likely to interpret digital transformation as a signal of environmental responsibility and commitment to sustainable development (Ma et al., 2025). Taken together, this study advances the following hypotheses:

H1a: Digitalization has a positive impact on corporate financial reputation.

H1b: Digitalization has a positive impact on corporate social reputation.

2.2. The moderating effect of state ownership

The institutional characteristics of Chinese state-owned enterprises (SOEs) require them to undertake broader political and social responsibilities, which distinguishes them from non-state firms (Huang et al., 2024). According to *The Guiding Opinions on Deepening the Reform of State-owned Enterprises* (State Council of China, 2015), SOEs belong to the people and serve as vital drivers of national progress and guardians of the public interest. Consequently, stakeholders expect SOEs to fulfill broader social responsibilities and contribute to public value creation (Garde Sánchez et al., 2017). In the context of digital economy growth, the government has introduced policies, such as the *Notice on Accelerating the Digital Transformation of State-owned Enterprises* (State-Owned Assets Supervision and Administration Commission of the State Council, 2020), to encourage SOEs to embrace digitalization. Therefore, SOEs' digital transformation is largely driven by policy pressure and the need to meet national goals, not for profit (Liu et al., 2024). By adhering to policies and fulfilling their social responsibilities, SOEs meet public expectations and strengthen their social reputation.

In contrast, stakeholders may have relatively low expectations regarding SOEs' ability to realize the economic benefits of digitalization. SOEs are often constrained by path dependence, bureaucratic inertia, and weak market discipline (Huang et al., 2018). However, successful digital transformation requires substantial organizational change, adaptability, and continuous innovation (Bughin et al., 2018; Wimelius et al., 2021). Consequently, the efficiency and competitiveness signals conveyed by digitalization may be inconsistent with stakeholders' prior expectations of SOEs. Such skepticism is further reinforced by evidence that even major state-owned telecom firms, including China Mobile and China Unicom, continue to face difficulties advancing digital transformation due to internal resistance and organizational rigidity

(G. Liu et al., 2024). As a result, stakeholders may question whether digitalization can be effectively translated into economic gains, thereby weakening its positive effect on financial reputation. This study advances the following hypotheses:

H2a: State ownership weakens the positive effect of digitalization on financial reputation.

H2b: State ownership strengthens the positive effect of digitalization on social reputation.

2.3. The moderating effect of operating in high-polluting industries

As ecological and environmental problems worsen, regulators and society have increasingly pressured firms to address environmental concerns and fulfill broader social responsibilities (Chen & Zhang, 2025). These expectations are particularly salient for firms operating in high-polluting industries, which are often viewed as major contributors to environmental degradation and therefore face stronger scrutiny regarding their environmental responsibility and social legitimacy (Wu et al., 2022). In response, enterprises in high-polluting sectors have adopted various measures to enhance public recognition of their legitimacy (Cheng & Liu, 2018). Digitalization contributes substantially to this process. It allows high-polluting enterprises to strengthen their capacity for green innovation (Pei et al., 2025; Rui & Jingbo, 2025) and reduce carbon and pollution emissions (Mai et al., 2025), thereby mitigating their environmental impact. In addition, digital technologies provide firms with multiple communication channels that transcend spatial and temporal boundaries (Etter et al., 2019) and allow them to engage more effectively with stakeholders. By strategically framing environmental information, firms can influence public interpretation and protect the perceived credibility of their disclosures before information becomes distorted (Lv & Wokutch, 2024). As a result, digitalization is more likely to be perceived as meeting stakeholder expectations and interpreted as a signal of environmental responsibility and improvement (Ma et al., 2025), thereby enhancing the social reputation of firms operating in high-polluting industries. This study advances the following hypotheses:

H3: In high-polluting industries, the positive impact of digitalization on social reputation is stronger.

2.4. The moderating effect of operating in high-tech industries

High-tech firms are commonly associated with innovation, technological leadership, and future growth opportunities (Ye & Liu, 2020; Zheng et al., 2020). Digitalization is closely linked to these attributes and is widely regarded as an important driver of technological innovation and future growth in high-tech enterprises (Pronchakov et al., 2022). In addition, digitalization enhances firms' ability to sense market information and adapt to changing environments (Xu et al., 2025), while high-tech firms are often better positioned to benefit from this transformation due to their organizational flexibility and dynamic capabilities (Sergei et al., 2023). Because stakeholders generally expect high-tech firms to possess strong innovation capabilities and growth potential, they are more likely to interpret digitalization as evidence of these attributes. Consequently, digitalization is more likely to enhance stakeholders' evaluations of firm value and strengthen financial reputation in high-tech industries. This study advances the following hypotheses:

H4: In high-tech industries, the positive impact of digitalization on financial reputation is stronger.

3. Research design

3.1. Model setting

In this study, we employ panel ordinary least squares (OLS) regressions with both firm- and year-fixed effects to evaluate the effect of digitalization on corporate reputation. Including these fixed effects enables the model to better isolate the net contribution of digitalization by accounting for unobserved heterogeneity across firms and over time. Because digitalization represents an extended, gradual transformation and companies vary substantially in their characteristics, it is crucial to adjust for firm-specific

traits as well as temporal factors to reduce estimation bias. The baseline model is represented by Model (1):

$$CR_{it} = \alpha_0 + \alpha_1 DIG_{it} + \sum Controls_{it} + \nu_i + \varphi_t + \varepsilon_{it} \quad (1)$$

where ν_i and φ_t represent the firm and time effects, respectively, while ε_{it} represents the error term. The moderating effect is represented by Model (2):

$$CR_{it} = \delta_0 + \delta_1 DIG_{it} + \delta_2 MO_{it} + \delta_3 (DIG_{it} * MO_{it}) + \nu_i + \varphi_t + \varepsilon_{it} \quad (2)$$

where MO represents the moderating factors, namely state ownership, high-polluting industries, and high-tech industries.

3.2. Key variables

3.2.1. Corporate reputation

Corporate reputation is divided into two dimensions in this study: financial and social. For the financial dimension, following prior studies (Arora et al., 2021; Endiana et al., 2025; Kaur & Singh, 2018), market capitalization is selected as the primary indicator. Financial reputation reflects stakeholders' overall evaluation of a firm's financial strength and future prospects (Fombrun, 1996; Gotsi & Wilson, 2001; Martinez et al., 2017). Among different stakeholder groups, investors are the stakeholders most directly concerned with firms' financial condition and future prospects because these factors are closely linked to their economic interests (Martinez et al., 2017). Moreover, investors, particularly institutional investors, possess greater expertise and broader access to firm information than other stakeholder groups (Yang et al., 2016), enabling them to make more informed evaluations of firms' financial prospects. These evaluations are incorporated into market valuations through investors' trading decisions. Consequently, market capitalization reflects investors' collective assessments of firms' financial strength, growth potential, and future value creation rather than merely firm size or current accounting performance (Batool et al., 2025; Ewens et al., 2024). Therefore, market capitalization provides an appropriate proxy for the financial dimension of corporate reputation. In addition, analysts and media play important intermediary roles in shaping stakeholders' perceptions and evaluations of firms (Connelly et al., 2025; Yu et al., 2013). Following previous studies (Matozza et al., 2019; OuYang et al., 2017; Yang et al., 2024), analyst evaluations and the overall sentiment of financial news coverage are chosen as two alternative indicators for the robustness analysis. These measures help verify the results from different perspectives.

Regarding social reputation, this study follows prior research (Burke et al., 2019; Hasan et al., 2022; Martinez et al., 2017) and measures it using ESG-related indicators. While several institutions provide ESG ratings in China, Huazheng Index has developed its own framework that adapts global standards to local conditions (Abdelbaky et al., 2025). Accordingly, this study adopts the average score of the Environmental (E) and Social (S) dimensions from the Huazheng ESG rating as the main indicator of social reputation. Social reputation reveals how stakeholders view a company's legitimacy and commitment to philanthropy, environmental protection, and social contribution (De Castro et al., 2006; Martinez et al., 2017; Zarefar et al., 2024). This definition emphasizes external legitimacy and social image rather than internal governance or financial performance. The E and S dimensions of the Huazheng ESG framework closely align with this concept. Detailed indicator information is provided in [Supplementary Appendix 1](#). To ensure robustness, the Hexun CSR rating is used as an alternative measure.

3.2.2. Digitalization

Previous studies have used four main approaches to assess corporate digitalization. The first approach is the survey method, which assesses firms' digitalization through questionnaires distributed to specific groups (Zhang et al., 2025). This method directly captures managers' or employees' perceptions but suffers from small sample sizes and strong subjectivity (Liu et al., 2024). The second approach is the intangible asset ratio method. It measures digitalization by computing the proportion of intangible assets related to digitalization to total assets (K. Jiang et al., 2022). However, firms often lack a detailed

classification of intangible assets in their disclosures, making it difficult to determine whether the investment is digital. Moreover, digital investments that are expensed rather than capitalized are not captured by this measure. This tends to underestimate the true level of digitalization. The third approach is the index system method, which employs comprehensive digitalization indices constructed by institutions or scholars (P. C. Li et al., 2025). Although this approach is systematic, its narrow scope, inconsistent indicators, and data limitations prevent it from fully capturing firms' actual level of digitalization (Yang & Gao, 2024).

The fourth approach is textual analysis. It measures a firm's digitalization level by counting digital-related keywords in annual reports (Pan & Wang, 2024; Wu et al., 2021; Zhao et al., 2021). This method also has some limitations. Annual reports may be promotional, and keyword selection is somewhat subjective. Even so, this method is reliable in the Chinese context. Chinese listed firms must follow strict reporting regulations set by the China Securities Regulatory Commission (CSRC). These rules standardize and make the reports consistent. Therefore, compared with other methods, textual analysis has better data availability and comparability, rendering it the most fitting method for this research.

Listed companies usually explain their operations, strategies, and business plans in the Management Discussion and Analysis (MD&A) section, which is characterized by greater objectivity and rigor (Xiao et al., 2022). This study focuses solely on the MD&A section of annual reports to avoid exaggeration and keep the content relevant. The study adopts the digitalization-related keyword set used by Wu et al. (2021) and Zhao et al. (2024) as the main measurement framework. The keywords about digitalization are provided in [Supplementary Appendix 2](#). The MD&A text is segmented using the jieba library, stop words are removed, and the frequency of digital-related keywords is calculated. To reduce skewness, the logarithm of (keyword frequency + 1) is taken. Furthermore, to address potential bias arising from the subjectivity of keyword selection, this study re-estimates the keyword frequencies using the keyword set developed by Zhao et al. (2021) as a robustness check. In addition, the index-system method is employed as another alternative measure to verify the results from a different perspective.

3.2.3. Moderator variables

The first moderator distinguishes whether a firm is SOE. According to *the Company Law of China*, the nature of ownership is primarily determined by the identity of the ultimate controlling shareholder. In this study, firms are categorized by the nature of their ultimate controller: those under state control are coded 1, and others are coded 0.

The second moderator distinguishes whether a firm operates in high-polluting industries. Following the classification issued by Ministry of Ecology and Environment of the People's Republic of China (2008) and consistent with Jiang et al. (2022), this study defines 15 industries, including the textile industry, as high-polluting industries. High-polluting industries are specified in [Supplementary Appendix 3](#). Firms in high-polluting industries are coded as 1, and those in other industries are coded as 0.

The third moderator distinguishes whether a firm is in high-tech industries. Following the classification adopted by Guo et al. (2019), this study identifies 15 industries, including pharmaceutical manufacturing, as high-tech industries. High-tech industries are specified in [Supplementary Appendix 3](#). Firms in these industries are coded as 1, and other firms are coded as 0.

3.2.4. Control variables

Drawing on prior studies (Kaur & Singh, 2018; Kuzey et al., 2024; A. Li et al., 2025; Navarro-García et al., 2022), this research includes several firm-level and governance-related control variables that could affect corporate reputation. These variables include firm size, firm age, profitability, leverage ratio, idle resources, market beta, board size, proportion of female directors, institutional ownership, and the shareholding ratio of the largest shareholder. The variable measurements are shown in [Table 1](#).

3.3. Data

This research uses data from Chinese A-share companies listed on the Main Board and the Growth Enterprise Market (GEM) from 2013 to 2024. Financial information at the firm-year level is collected from the CSMAR

Table 1. Measurements of variables.

Variables	Abbreviation	Method of calculation
Independent Variable		
Digitalization	DIGI	Text mining of annual reports to calculate the frequency of digital-related keywords.
Dependent Variables		
Financial reputation	CR_FR	Firm market value.
Social reputation	CR_SR	Average score of the Environmental (E) and Social (S) dimensions in the Huazheng ESG rating.
Moderator Variables		
State-owned enterprise	SOE	Equals 1 if the firm is state-owned, and 0 otherwise.
High-tech enterprise	TE	Equals 1 if the firm is classified as a high-tech enterprise, and 0 otherwise.
Polluting enterprise	PE	Equals 1 if the firm is classified as a polluting enterprise, and 0 otherwise.
Control Variables		
Firm size	FZ	Natural logarithm of total assets.
Firm age	FA	Number of years since firm establishment.
Return on assets	ROA	Net profit divided by total assets.
Leverage ratio	LEV	Total liabilities divided by total assets.
Idle resources	SLACK	Current assets divided by total assets.
Market beta	BETA	Estimated from the market model using monthly stock and comprehensive market returns within the same year. The comprehensive market return is the value-weighted average of all A-share listed firms, and the beta value is updated annually.
Board size	BS	Natural logarithm of total number of directors on the board.
Female board share	FBS	Number of female directors divided by the total number of board members.
Institutional ownership	INS	Shares held by institutional investors divided by total outstanding shares.
Largest shareholder ownership	LSO	Shares held by the largest shareholder divided by total outstanding shares

Table 2. Descriptive statistics of variables.

VarName	Obs	Mean	SD	Min	Max
DIGI	40234	1.216	1.277	0.000	4.644
CR_FR	40234	15.411	1.073	13.339	18.629
CR_SR	40234	69.061	5.817	53.140	84.700
FZ	40234	22.300	1.306	19.967	26.381
FA	40234	20.302	6.112	8.000	37.000
ROA	40234	0.036	0.066	−0.227	0.215
LEV	40234	0.422	0.203	0.060	0.897
SLACK	40234	0.570	0.201	0.101	0.950
BETA	40234	1.101	0.935	−1.809	4.448
BS	40234	2.103	0.197	1.609	2.639
FBS	40234	0.164	0.136	0.000	0.571
INS	40234	41.935	24.762	0.340	90.768
LOS	40234	33.389	14.767	8.120	74.020

The data are winsorized at the 1% level.

database. To obtain the final sample, several filtering steps are applied. First, firms classified as ST or ST* are excluded. Second, companies in the financial sector are removed. Third, all observations with missing data are eliminated. Moreover, continuous variables are winsorized at the 1st and 99th percentiles to lessen the influence of extreme values. After these adjustments, the final dataset includes 4620 firms, resulting in 40,234 firm-year observations. Descriptive statistics for all variables are reported in [Table 2](#).

4. Empirical results

4.1. Baseline regression

[Table 3](#) summarizes the findings from the baseline regression. The DIGI coefficient in Column 1 is 0.03846, and the coefficient in Column 2 is 0.25393, both significant at the 1% level. The positive coefficients indicate that firms with higher levels of digitalization tend to enjoy better financial and social reputations. These findings are consistent with signaling theory, which suggests that observable strategic actions can reduce information asymmetry and shape stakeholder evaluations. Because digitalization is often viewed as a costly and credible strategic initiative, stakeholders may interpret it as an indicator of firm quality and future prospects. At the same time, digitalization is increasingly associated with transparency, responsibility, and sustainable development, which can contribute to more favorable social evaluations. These findings suggest that digitalization generates reputational benefits beyond its operational and economic effects, highlighting its role as an important signal in shaping stakeholder perceptions. Accordingly, hypotheses H1a and H1b are supported.

Table 3. Baseline results.

Variables	(1)	(2)
	Financial	Social
DIGI	0.03846*** (8.06204)	0.25393*** (5.53694)
FZ	0.49841*** (39.89458)	1.34148*** (12.08126)
FA	0.00422 (0.36017)	−0.14690 (−1.35293)
ROA	1.28256*** (18.57546)	4.98009*** (8.90975)
LEV	−0.12173*** (−3.04215)	−1.04471*** (−2.82396)
SLACK	−0.31955*** (−8.03325)	0.48220 (1.25798)
BETA	0.01068*** (3.54431)	−0.06783*** (−2.80240)
BS	−0.13930*** (−4.59404)	0.03852 (0.12353)
FBS	0.01896 (0.50967)	0.38233 (1.03649)
INS	0.00633*** (12.68885)	0.00894** (2.12059)
LSO	−0.01343*** (−17.19742)	0.01257* (1.84394)
Constant	4.81297*** (13.18904)	40.94408*** (12.45925)
Year FE	YES	YES
Firm FE	YES	YES
Observations	40,234	40,234
R-squared	0.86769	0.60011

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively

4.2. Robustness test

4.2.1. Alternative dependent and independent variables

Alternative indicators for both the explanatory and outcome variables are employed in this study as a robustness check. Specifically, for the independent variable, the study re-estimates keyword frequencies using the digitalization-related keyword set developed by Zhao et al. (2021) as one alternative measurement of digitalization. Another alternative measure is the digitalization index obtained from the CSMAR database. This index has been widely adopted in previous studies as a proxy for digitalization (Li et al., 2025; Zhen et al., 2023). The results are reported in Table 4. Using the revised keyword set, digitalization remains positively associated with financial reputation ($B = 0.02358$, $p < 0.01$) and social reputation ($B = 0.35177$, $p < 0.01$). When the digitalization index is applied, the results are consistent, with positive and significant effects on financial reputation ($B = 0.00737$, $p < 0.01$) and social reputation ($B = 0.03069$, $p < 0.01$).

For the dependent variable, as mentioned earlier, this study employs analysts' recommendations and the Janis–Fader coefficient of imbalance in firms' financial news as alternative measures of financial reputation. Following Matozza et al. (2019), analysts' recommendations for each company are classified into five levels based on their strength, with scores ranging from 1 (weakest) to 5 (strongest). Unlike Matozza et al. (2019), who separately constructed two indicators for analysts' attention and recommendation strength, this study adopts a single comprehensive measure. Drawing on Chen et al. (2026), all final recommendations issued by analysts for a given firm within a year are aggregated to obtain an annual total score. This aggregated score reflects both the level of analysts' attention and the strength of their recommendations, providing an alternative measure of the firm's financial reputation.

The Janis–Fader coefficient of imbalance captures the sentiment orientation of firms' online financial news and reflects financial reputation from the perspective of media coverage. Following OuYang et al. (2017) and Yang et al. (2024), the coefficient is calculated as the ratio of the number of positive (P) and negative (N) financial news articles to the total number of news items (V). When positive news exceeds negative news ($p > N$), the coefficient is $(P^2 - P*N)/V^2$. When negative news exceeds positive news ($N > P$), it is $(P*N - N^2)/V^2$. If the number of positive and negative articles is equal, the coefficient equals zero.

Table 4. Results based on alternative measures of the independent variable.

Variables	(1)	(2)	(3)	(4)
	Financial	Social	Financial	Social
DIG1	0.02358*** (4.64391)	0.35177*** (7.24781)		
DIG2			0.00737*** (8.69232)	0.03069*** (3.55229)
FZ	0.50112*** (39.92630)	1.30755*** (11.73488)	0.49556*** (39.30728)	1.35144*** (12.11120)
FA	0.00306 (0.25938)	−0.16731 (−1.53487)	0.00624 (0.52559)	−0.13757 (−1.25738)
ROA	1.27157*** (18.36517)	4.85561*** (8.70621)	1.28688*** (18.67338)	4.98651*** (8.90214)
LEV	−0.12194*** (−3.03736)	−1.01376*** (−2.74347)	−0.11676*** (−2.91804)	−1.03405*** (−2.79006)
SLACK	−0.32048*** (−8.03218)	0.45628 (1.19193)	−0.31865*** (−8.04882)	0.48948 (1.27443)
BETA	0.01070*** (3.54772)	−0.06642*** (−2.74627)	0.01101*** (3.66013)	−0.06676*** (−2.75832)
BS	−0.13738*** (−4.51320)	0.03584 (0.11532)	−0.13763*** (−4.54045)	0.05465 (0.17511)
FBS	0.01862 (0.49853)	0.36647 (0.99395)	0.02296 (0.61764)	0.40214 (1.08807)
INS	0.00630*** (12.61645)	0.00840** (1.99260)	0.00638*** (12.72790)	0.00920*** (2.17777)
LSO	−0.01362*** (−17.41731)	0.01127* (1.65187)	−0.01354*** (−17.34268)	0.01167* (1.70952)
Constant	4.76887*** (12.97527)	41.63033*** (12.64529)	4.60201*** (12.53080)	39.67170*** (12.04886)
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Observations	40,234	40,234	40,234	40,234
R-squared	0.86738	0.60069	0.86780	0.59974

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively

Higher values of the coefficient reflect more favorable news and better financial reputation. Both data sets are obtained from the Chinese Research Data Services (CNRDS) platform. As an alternative measure of social reputation, the Hexun CSR ranking score is used.

Table 5 reports the robustness tests using alternative measures of reputation. Digitalization remains positively related to financial reputation, as measured by analysts' recommendations ($B=4.26292$, $p<0.01$) and the Janis–Fader coefficient ($B=0.00356$, $p<0.01$). The positive effect also holds for social reputation based on the Hexun CSR score ($B=0.24016$, $p<0.05$). These results confirm the robustness of the findings under alternative variable measures.

4.2.2. Alternative clustering levels and fixed effects

Since this study employs panel data, firms in the same year may be subject to similar external shocks such as macroeconomic cycles, digitalization policies, or industry trends. These time-specific shocks can simultaneously affect firms' digitalization levels and reputations, leading to potential correlation in the error terms across years. Therefore, standard errors are two-way clustered at the firm and year levels, which accounts for both within-firm serial correlation and cross-sectional dependence caused by common time shocks. As shown in Table 6, digitalization remains positively and significantly associated with both financial reputation ($B=0.03846$, $p<0.01$) and social reputation ($B=0.25393$, $p<0.01$).

Firms across industries may face different conditions in terms of technology, digital resources, regulation, and public attention. These factors can influence both digitalization and reputation, potentially biasing the results. To address this, the robustness tests include industry- and year-fixed effects to control for industry differences and time changes. As shown in columns (1) and (2) of Table 7, digitalization remains positive on both financial reputation ($B=0.03756$, $p<0.01$) and social reputation ($B=0.35568$, $p<0.01$). A similar situation occurs among firms in the same province, as some provinces have specific policies for digitalization or unique conditions affecting reputation. Therefore, this study also includes province- and year-fixed effects. The results are similar, with positive and significant coefficients for financial reputation ($B=0.07098$, $p<0.01$) and social reputation ($B=0.30663$, $p<0.01$).

Table 5. Results based on alternative measures of the dependent variable.

Variables	(1)	(2)	(3)
	Financial 1	Financial 2	Social
DIGI	4.26292*** (3.20909)	0.00356*** (3.44389)	0.24016** (1.99012)
FZ	49.25332*** (14.41252)	0.00905*** (4.35065)	2.91575*** (11.48696)
FA	2.81183 (0.87536)	−0.00192 (−0.79083)	0.39833 (0.77055)
ROA	520.96299*** (22.60183)	0.53019*** (35.06437)	84.52913*** (52.32212)
LEV	17.84623 (1.47730)	−0.00095 (−0.12046)	−2.00547** (−2.17119)
SLACK	−12.21780 (−1.09445)	−0.00751 (−0.96373)	2.43631*** (2.67338)
BETA	1.05981 (1.55896)	−0.00073 (−1.08951)	−0.33701*** (−5.32946)
BS	−20.56858** (−2.11399)	0.01452** (2.20408)	−0.85231 (−0.98745)
FBS	−4.38821 (−0.38251)	−0.01068 (−1.37926)	−0.76225 (−0.77716)
INS	1.57649*** (12.10104)	0.00055*** (6.25892)	0.00427 (0.42643)
LSO	−1.26681*** (−5.71967)	0.00023 (1.55602)	0.00342 (0.20351)
Constant	−1,066.56957*** (−10.57158)	−0.14376** (−2.07768)	−52.23609*** (−4.62295)
Year FE	YES	YES	YES
Firm FE	YES	YES	YES
Observations	24,359	40,032	24,014
R-squared	0.69329	0.41519	0.58916

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6. Results based on alternative clustering levels.

Variables	Clustered by firm and year	
	Financial	Social
DIGI	0.03846*** (4.83398)	0.25393*** (3.48686)
FZ	0.49841*** (27.91675)	1.34148*** (5.56164)
FA	0.00422 (0.37794)	−0.14690 (−1.36814)
ROA	1.28256*** (8.39640)	4.98009*** (4.44460)
LEV	−0.12173** (−2.79181)	−1.04471 (−1.65597)
SLACK	−0.31955*** (−6.34817)	0.48220 (1.05727)
BETA	0.01068 (0.61420)	−0.06783 (−1.28781)
BS	−0.13930*** (−4.12683)	0.03852 (0.13206)
FBS	0.01896 (0.48913)	0.38233 (0.95331)
INS	0.00633*** (6.44783)	0.00894* (2.00858)
LSO	−0.01343*** (−13.61714)	0.01257 (1.38459)
Constant	4.81297*** (10.71468)	40.94408*** (6.33595)
Year FE	YES	YES
Firm FE	YES	YES
Observations	40,234	40,234
R-squared	0.86769	0.60011

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

4.2.3. Excluding specific provinces and period

This study also changes the sample to see if results remain consistent. First, firms in coastal provinces are removed. This helps test if regional factors affect the link between digitalization and

Table 7. Results based on alternative fixed effects.

Variables	(1)	(2)	(3)	(4)
	Financial	Social	Financial	Social
DIGI	0.03756*** (7.04161)	0.35568*** (8.70463)	0.07098*** (13.71281)	0.30663*** (8.35707)
FZ	0.65346*** (82.62619)	1.60537*** (33.08771)	0.63546*** (78.37190)	1.61492*** (33.03008)
FA	0.00834*** (6.70780)	-0.02724*** (-3.23798)	0.00619*** (4.83323)	-0.01905** (-2.20229)
ROA	1.44685*** (15.20886)	9.00221*** (15.23600)	1.52988*** (14.60473)	8.93747*** (14.80440)
LEV	-0.58819*** (-14.85469)	-0.11592 (-0.42844)	-0.80607*** (-19.05143)	0.36790 (1.32135)
SLACK	-0.26932*** (-6.77833)	0.46720* (1.76168)	-0.22375*** (-5.74144)	1.53794*** (6.17385)
BETA	0.01996*** (4.99817)	-0.09563*** (-3.59218)	0.02523*** (5.93158)	-0.07105*** (-2.60715)
BS	-0.09024*** (-2.75820)	0.75531*** (3.39357)	-0.10275*** (-2.92287)	0.45847* (1.91161)
FBS	-0.01240 (-0.30344)	0.20135 (0.69425)	-0.03425 (-0.77735)	0.16841 (0.56068)
INS	0.00612*** (18.82514)	-0.00315 (-1.43017)	0.00619*** (17.86344)	-0.00634*** (-2.75483)
LSO	-0.00832*** (-15.62724)	0.00500 (1.42084)	-0.01015*** (-18.02551)	0.00193 (0.52043)
Constant	1.16505*** (6.53928)	31.29157*** (28.44268)	1.71462*** (9.35836)	30.99857*** (28.60860)
Year FE	YES	YES	YES	YES
Province FE	NO	NO	YES	YES
Industry FE	YES	YES	NO	NO
Observations	40,234	40,234	40,234	40,234
R-squared	0.69322	0.34387	0.66404	0.31498

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

reputation. Coastal areas have higher levels of digitalization, stronger markets, and greater media attention. These features may amplify the effect. Second, data from 2020 to 2022 are deleted. This avoids the impact of COVID-19, which disrupted business and digital progress. These adjustments help test the model's stability across regions and years. The persistence of consistent results under these alternative samples indicates that the results are stable and not driven by specific sample structures or extraordinary periods.

Table 8 reports the results. After excluding firms located in coastal provinces, digitalization remains positively associated with financial reputation ($B=0.02783$, $p<0.01$) and social reputation ($B=0.30070$, $p<0.01$). The results remain consistent when observations from the COVID-19 period are removed, with positive and significant effects on financial reputation ($B=0.04696$, $p<0.01$) and social reputation ($B=0.24114$, $p<0.01$). These findings confirm that the conclusions are robust to sample adjustments.

4.3. Endogeneity test

4.3.1. Instrumental variable

Firms with stronger reputations are more likely to invest in digitalization, which may create reverse causality and lead to endogeneity. Therefore, the instrumental variable (IV) approach is used to capture the part of digitalization unaffected by reputation, thereby allowing the true effect of digitalization on corporate reputation to be identified. Following Lewbel (1997), the instrument is defined as the cube of the difference between a firm's digitalization level and the average level of other firms in the same industry and year. Diagnostic tests in Table 9 indicate that the model is well identified and that the instrument is valid. In the second stage, digitalization remains positively associated with financial reputation ($B=0.03296$, $p<0.01$) and social reputation ($B=0.29154$, $p<0.01$), confirming the robustness of the main findings.

To address concerns that the instrumental variable may not be perfectly exogenous, this study further employs the plausibly exogenous instrumental variable approach proposed by Conley et al. (2012). This method relaxes the strict exogeneity requirement for the instrument and examines whether the estimated effect remains robust when the exclusion restriction is violated to a limited extent. Specifically,

Table 8. Results based on adjusted samples.

Variables	Excluding coastal provinces		Excluding epidemic period	
	Financial	Social	Financial	Social
DIGI	0.02783*** (3.61015)	0.30070*** (3.95855)	0.04696*** (8.92657)	0.24114*** (4.50961)
FZ	0.45039*** (21.52533)	1.26034*** (7.12885)	0.47638*** (40.54242)	1.46460*** (12.96972)
FA	−0.00813 (−0.28656)	−0.41151* (−1.94463)	0.00474 (0.41724)	−0.12114 (−1.06499)
ROA	1.35615*** (11.29940)	6.13945*** (6.27190)	1.09942*** (13.91529)	5.95456*** (8.40697)
LEV	−0.15770** (−2.45436)	−1.68474*** (−2.79788)	−0.12404*** (−3.02878)	−1.05167*** (−2.58756)
SLACK	−0.21421*** (−3.27411)	0.89952 (1.38655)	−0.28318*** (−6.95766)	0.47999 (1.16230)
BETA	0.01442*** (2.83328)	−0.01841 (−0.42885)	0.01115*** (2.99031)	−0.12605*** (−3.62576)
BS	−0.05696 (−1.22853)	0.48719 (1.06657)	−0.11620*** (−3.56174)	0.17940 (0.50624)
FBS	−0.06745 (−1.11267)	0.41864 (0.69863)	0.03818 (0.95346)	0.40173 (0.95860)
INS	0.00633*** (7.54015)	0.00731 (1.00520)	0.00477*** (9.35759)	0.01019** (2.25644)
LSO	−0.01424*** (−11.05891)	0.00516 (0.44771)	−0.01273*** (−16.29223)	0.01749*** (2.42330)
Constant	6.02166*** (8.14476)	46.87462*** (7.89436)	5.25600*** (15.12464)	36.84343*** (10.98305)
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Observations	14,426	14,426	28,729	28,729
R-squared	0.87647	0.62118	0.87515	0.62505

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 9. Results from the IV estimation.

Variables	First-stage	Second-stage	
	DIGI	Financial	Social
IV	0.12435*** (21.24271)		
DIGI		0.03296*** (3.79399)	0.29154*** (3.73983)
Control variables	YES	YES	YES
Year FE	YES	YES	YES
Firm FE	YES	YES	YES
Kleibergen-Paap rk LM statistic		789.607***	789.607***
Kleibergen-Paap rk Wald F statistic		451.264 [16.38]	451.264 [16.38]
Observations	40,105	40,105	40,105
R-squared	0.84470	0.24359	0.02897
Conley et al. (2012) 95% CI		[0.02597, 0.05386]	[0.18739, 0.40983]

Note: Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively; The final row reports Conley et al. (2012) plausibly exogenous confidence intervals, which assess the sensitivity of the IV estimates to potential violations of the exclusion restriction.

under the exclusion restriction, the instrument (Z) in the model $Y = \beta X + \gamma Z + \varepsilon$ should have no direct effect on the dependent variable (Y), implying that $\gamma = 0$. Conley et al. (2012) relax this assumption by allowing $\gamma \neq 0$ and assessing the sensitivity of the instrumental variable estimates of the parameter β to potential violations of the exclusion restriction.

Following Conley et al. (2012), this study adopts the Union of Confidence Intervals (UCI) approach, which evaluates the robustness of the estimated coefficient by specifying a plausible range for γ . Consistent with Ao et al. (2022), the instrumental variable is directly included in the baseline regression model to obtain a reference value for γ . The estimated instrumental variable coefficients are −0.00102 and 0.00700 in the financial reputation and social reputation models, respectively. Although neither coefficient is statistically significant, these estimates provide a conservative benchmark for specifying the plausible range of γ . Accordingly, the range of γ is set to [−0.00102, 0.00102] for the financial reputation model and [−0.00700, 0.00700] for the social reputation model.

Under these assumptions, the 95% confidence intervals of the coefficient on digitalization are [0.02597, 0.05386] and [0.18739, 0.40983], respectively. Both confidence intervals remain entirely above zero, indicating that the main findings remain robust even when the strict exogeneity assumption of the instrumental variable is relaxed.

4.3.2. Propensity score matching

Because firms' digital transformation decisions are not random, potential sample selection bias may arise if digitally active firms systematically differ from others. The Propensity Score Matching (PSM) technique is therefore adopted to reduce this bias, with all control variables included as covariates. Firms with higher digitalization levels than the median are placed in the treatment group, and those with lower levels are placed in the control group. Each treated firm is matched with a similar untreated firm through the nearest-neighbor approach, after which the baseline regression is performed again based on the matched sample. The results in Table 10 show that digitalization continues to have a positive effect on financial reputation ($B=0.03996$, $p<0.01$) and social reputation ($B=0.28359$, $p<0.01$), confirming the stability of the findings.

4.3.3. Heckman two-stage model

To reduce sample selection bias, the Heckman two-step model is used. First, a dummy equals one if a firm's digitalization level exceeds the industry average in a given year. A Probit model is then estimated with control variables and an instrument, the mean digitalization of other firms in the same industry and year. The inverse Mills ratio (IMR) is calculated from this model. In the second step, the IMR is added to the main regression to correct for selection bias. Table 11 shows that the instrument is significant at the 1 percent level, confirming its relevance. For financial reputation, the IMR is insignificant, indicating that sample selection bias is unlikely to be a concern. Digitalization remains positive and significant ($B=0.03574$, $p<0.01$). For social reputation, the IMR is significant, indicating some bias. However, digitalization still has a positive and significant effect ($B=0.20779$, $p<0.05$). Overall, the main finding remains robust after controlling for sample selection.

Table 10. Results from the PSM estimation.

Variables	(1)	(2)
	Financial	Social
DIGI	0.03996*** (6.80389)	0.28359*** (4.91105)
FZ	0.48640*** (32.48818)	1.28069*** (9.43560)
FA	-0.00605 (-0.38797)	-0.22497* (-1.80413)
ROA	1.27864*** (14.88348)	5.38294*** (7.28143)
LEV	-0.08972* (-1.81672)	-0.94743** (-2.07416)
SLACK	-0.31439*** (-6.38572)	0.15238 (0.34051)
BETA	0.00870** (2.07757)	-0.02900 (-0.82572)
BS	-0.14449*** (-3.78755)	0.02533 (0.06584)
FBS	0.06429 (1.45354)	0.02128 (0.04584)
INS	0.00633*** (10.24233)	0.00923* (1.78694)
LSO	-0.01305*** (-14.49499)	0.01702** (2.03129)
Constant	5.27239*** (11.46245)	43.89702*** (10.97505)
Year FE	YES	YES
Firm FE	YES	YES
Observations	20,824	20,824
R-squared	0.87848	0.63037

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 11. Results from the heckman model.

Variables	(1)	(3)	(2)
	Treat	Financial	Social
IV	−0.52528*** (−10.53106)		
DIGI		0.03574*** (3.81604)	0.20779** (2.26727)
imr		−0.05137 (−0.64852)	2.39661*** (2.90790)
Constant	−4.46613*** (−13.29849)	4.44599*** (7.40461)	30.72099*** (5.73850)
Control variables	YES	YES	YES
Year FE		YES	YES
Firm FE		YES	YES
Observations	40,154	17,069	17,069
R-squared		0.89265	0.64512

Robust z-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

4.3.4. Difference-in-differences method

To further address concerns regarding reverse causality and omitted-variable bias, this study employs an event-study-based difference-in-differences approach. A treatment event is defined as the first year in which a firm begins a period of at least two consecutive years of digitalization. A firm is considered digitalized when its digitalization measure is greater than zero. The treatment year corresponds to the first year of the initial two-year consecutive digitalization period. The treatment indicator equals one in the treatment year and all subsequent years, and zero otherwise. By requiring two consecutive years of digitalization, the analysis focuses on sustained digital transformation rather than temporary or sporadic digitalization activities. Firm and year fixed effects are included in all specifications.

To strengthen identification validity, several sample restrictions are imposed. First, firms with fewer than 2 years of observations prior to the treatment event are excluded to ensure sufficient pre-treatment information for assessing parallel trends. Second, firms with fewer than 2 years of post-treatment observations are removed to ensure adequate post-treatment observations for estimating treatment effects. Third, firms that had already entered a sustained digitalization stage at the beginning of the sample period are excluded because no pre-treatment observations are available for identifying the transition into digitalization. These restrictions improve the reliability of the event-study estimates and enhance the comparability between treated and control firms.

Table 12 presents the DID estimation results. The coefficients on the treatment indicator are significantly positive for both financial reputation ($B=0.08822$, $p<0.01$) and social reputation ($B=0.49898$, $p<0.01$), indicating that digitalization significantly improves firms' financial reputation and social reputation. These findings are consistent with the baseline results and provide further support for the positive effect of digitalization on corporate reputation. To validate the DID identification strategy, we further examine the parallel trends assumption, which requires that treated and control firms follow similar trends before the treatment. Using the year immediately before treatment as the reference period, the coefficients for three and two years before treatment are statistically insignificant, indicating no systematic pre-treatment differences between the two groups. This finding supports the parallel trends assumption and suggests that the subsequent differences are unlikely to be driven by pre-existing trends. In contrast, the coefficients for the treatment year and the subsequent one, two, and three years are all significantly positive, indicating that the treatment effect emerges only after digitalization and persists over time.

4.4. Moderating effects

This study further examines whether the relationship between digitalization and corporate reputation varies across contexts characterized by different stakeholder expectations. The analysis focuses on three moderators, namely state ownership, high-polluting industries, and high-tech industries.

Table 13 presents the results for state ownership. The interaction between digitalization and state ownership is negative and significant in the financial reputation model ($B=-0.04394$, $p<0.01$), showing

Table 12. Results from difference-in-differences method and parallel trends analysis.

Variables	DID		Parallel trends analysis	
	Financial	Social	Financial	Social
Treat*Post	0.08822*** (5.25437)	0.49898*** (3.27933)		
Pre3			−0.01490 (−0.90909)	0.04712 (0.28122)
Pre2			−0.01226 (−0.78928)	−0.01901 (−0.12519)
Current year			0.11499*** (7.35787)	0.31203** (2.03935)
Post1			0.12023*** (7.65868)	0.36096** (2.30629)
Post2			0.08851*** (6.09003)	0.36354** (2.39123)
Post3			0.05178*** (4.05065)	0.21190* (1.78244)
Constant	5.82218*** (10.06267)	45.52765*** (9.14921)	5.88770*** (10.22833)	45.45297*** (9.09493)
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Control variables	YES	YES	YES	YES
Observations	19,735	19,735	19,735	19,735
R-squared	0.86159	0.60906	0.86237	0.60892

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 13. Results based on the moderating effect of state ownership.

Variables	(1)	(2)
	Financial	Social
DIGI	0.05181*** (9.06933)	0.08812* (1.66997)
SOE	−0.05009* (−1.77070)	−0.75920*** (−2.83437)
SOE*DIGI	−0.04394*** (−4.83001)	0.54302*** (5.41941)
FZ	0.49299*** (39.13262)	1.36144*** (12.04760)
FA	0.00249 (0.20749)	−0.15457 (−1.44700)
ROA	1.27431*** (18.19408)	4.79771*** (8.48009)
LEV	−0.11213*** (−2.78859)	−1.00098*** (−2.70225)
SLACK	−0.31530*** (−7.83627)	0.34585 (0.89072)
BETA	0.01045*** (3.43629)	−0.06620*** (−2.70126)
BS	−0.12350*** (−4.02565)	0.02520 (0.07998)
FBS	0.01422 (0.37844)	0.39517 (1.06360)
INS	0.00666*** (13.06952)	0.01015** (2.34709)
LSO	−0.01365*** (−17.25527)	0.00963 (1.38454)
Constant	4.93667*** (13.31834)	41.06383*** (12.44589)
Year FE	YES	YES
Firm FE	YES	YES
Observations	39,333	39,333
R-squared	0.86837	0.60280

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

that state ownership reduces the positive impact of digitalization on financial reputation. This suggests that the financial reputational benefits associated with digitalization are weaker for SOEs than for non-SOEs. As argued earlier, stakeholders may hold relatively low expectations regarding the ability of SOEs to successfully translate digitalization into economic benefits. Although digitalization conveys signals of efficiency, competitiveness, and future growth potential, stakeholders may question whether SOEs

can effectively realize these benefits because of concerns regarding organizational rigidity, path dependence, and weak market discipline. Consequently, the economic value creation signals conveyed by digitalization are less likely to be interpreted favorably, weakening its positive effect on financial reputation.

In the social reputation model, the interaction is positive and significant ($B=0.54302$, $p<0.01$), indicating that state ownership strengthens the effect of digitalization on social reputation. This indicates that SOEs obtain substantially greater social reputational benefits from digitalization than non-SOEs. As argued earlier, stakeholders hold stronger expectations regarding the social and political responsibilities of SOEs. Consequently, when SOEs undertake digital transformation, stakeholders are more likely to focus on the legitimacy, responsibility, and public value dimensions embedded in the digitalization signal. Digital transformation is therefore more likely to be interpreted as evidence of compliance with national priorities and commitment to public interests, leading to stronger social reputation gains. These results support hypotheses H2a and H2b.

Table 14 reports the moderating effect of operating in high-polluting industries. The interaction term is not significant for financial reputation, suggesting that the relationship between digitalization and financial reputation does not vary significantly across high-polluting and non-high-polluting industries. For social reputation, the interaction term is positive and significant ($B=0.25306$, $p<0.05$), suggesting that firms operating in high-polluting industries obtain greater social reputation benefits from digitalization. This result supports H3. As argued earlier, firms in high-polluting industries face stronger stakeholder expectations regarding environmental responsibility and social legitimacy. Consequently, stakeholders are more likely to focus on the environmental information embedded in the digitalization signal. Because digitalization can facilitate green innovation, environmental management, pollution reduction, and stakeholder communication, it is more likely to be interpreted as evidence of environmental improvement and responsible corporate behaviour. Therefore, digitalization is more effective in satisfying stakeholder expectations in high-polluting industries, resulting in stronger gains in social reputation.

Table 14. Results based on the moderating effect of operating in high-polluting industries.

Variables	(1)	(2)
	Financial	Social
DIGI	0.03810*** (7.37844)	0.21537*** (4.29192)
POL	-0.05366 (-1.47196)	0.17292 (0.44008)
POL*DIGI	0.00001 (0.00104)	0.25306** (2.34532)
FZ	0.49814*** (39.89058)	1.34294*** (12.10868)
FA	0.00462 (0.39494)	-0.15335 (-1.41569)
ROA	1.28599*** (18.64045)	4.93201*** (8.83281)
LEV	-0.12195*** (-3.05583)	-1.03955*** (-2.81430)
SLACK	-0.32489*** (-8.19590)	0.49705 (1.30164)
BETA	0.01068*** (3.54691)	-0.06780*** (-2.80200)
BS	-0.13998*** (-4.61901)	0.04704 (0.15111)
FBS	0.01982 (0.53316)	0.38020 (1.03110)
INS	0.00632*** (12.67861)	0.00888** (2.10892)
LSO	-0.01344*** (-17.18489)	0.01238* (1.81833)
Constant	4.82786*** (13.21486)	41.00324*** (12.49131)
Year FE	YES	YES
Firm FE	YES	YES
Observations	40,234	40,234
R-squared	0.86772	0.60026

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 15. Results based on the moderating effect of operating in high-tech industries.

Variables	(1)	(2)
	Financial	Social
DIGI	0.02364*** (3.42041)	0.29238*** (4.31424)
TECH	0.01696 (0.59447)	0.13405 (0.41253)
TECH*DIGI	0.02599*** (2.94407)	−0.06782 (−0.78113)
FZ	0.49836*** (39.99369)	1.34202*** (12.07412)
FA	0.00429 (0.36622)	−0.14725 (−1.35355)
ROA	1.28798*** (18.67503)	4.97267*** (8.90082)
LEV	−0.12064*** (−3.02133)	−1.03798*** (−2.81215)
SLACK	−0.31924*** (−8.05094)	0.48688 (1.26904)
BETA	0.01051*** (3.49065)	−0.06754*** (−2.79095)
BS	−0.14012*** (−4.62918)	0.03823 (0.12264)
FBS	0.01971 (0.53016)	0.38156 (1.03397)
INS	0.00635*** (12.73144)	0.00892** (2.11571)
LSO	−0.01339*** (−17.17151)	0.01249* (1.83203)
Constant	4.79901*** (13.16207)	40.87212*** (12.38923)
Year FE	YES	YES
Firm FE	YES	YES
Observations	40,234	40,234
R-squared	0.86779	0.60012

Robust t-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 15 reports the moderating effect of operating in high-tech industries. The interaction term with high-tech industries is positive and significant in the financial reputation model ($B=0.02599$, $p<0.01$), indicating that firms operating in high-tech industries experience a stronger positive effect of digitalization on financial reputation. This finding is consistent with H4. As argued earlier, the competitive environment of high-tech industries leads stakeholders to place greater emphasis on firms' innovation capability, technological advancement, and future growth potential. Because digitalization is closely associated with these attributes, stakeholders are more likely to interpret digitalization as a signal of core competitiveness and future growth in high-tech industries. Consequently, digitalization exerts a stronger positive effect on financial reputation. In contrast, the interaction term is insignificant for social reputation, suggesting that the relationship between digitalization and social reputation does not vary significantly across high-tech and non-high-tech industries.

5. Conclusion

5.1. Main findings

Using a sample of Chinese A-share listed firms from 2013 to 2024, this study examines the impact of digitalization on financial and social reputation. The results show that digitalization enhances both dimensions of corporate reputation, but its effects are contingent on stakeholder expectations. Specifically, digitalization has a stronger positive effect on social reputation but a weaker positive effect on financial reputation in state-owned enterprises. Similarly, the positive effect of digitalization on social reputation is stronger in high-polluting industries, where stakeholders place greater emphasis on environmental responsibility and organizational legitimacy. In contrast, digitalization has a stronger positive effect on financial reputation in high-tech industries, where stakeholders prioritize innovation capability and growth potential. Overall, the findings suggest that the reputational consequences of digitalization depend not only on the information it conveys but also on how stakeholders interpret that information.

The same digitalization signal can yield different reputational outcomes depending on stakeholder expectations.

5.2. Discussion

This study adopts a stakeholder interpretation perspective to understand the reputational consequences of digitalization. Consistent with signaling theory, our findings suggest that the effects of digitalization depend not only on the information conveyed by the signal itself but also on how stakeholders interpret that signal (Connelly et al., 2011, 2025). To capture the outcomes of this interpretation process, we distinguish between financial reputation and social reputation, two dimensions along which stakeholders typically evaluate firms. The results show that digitalization enhances both dimensions of corporate reputation. While prior studies have primarily explained the consequences of digitalization through the information embedded in digitalization signals (Elfedawy & Al-Asfour, 2026; Fan et al., 2024; Salvi et al., 2023) or the channels through which such signals are communicated (Guo et al., 2025), our findings suggest that understanding the reputational value of digitalization also requires attention to how stakeholders interpret digitalization signals. In this regard, our study extends existing research by highlighting the importance of signal interpretation in shaping the reputational consequences of digitalization.

More importantly, this study provides evidence that stakeholder expectations play a critical role in the interpretation process. When corporate actions are consistent with stakeholder expectations, stakeholders tend to respond more favorably and assign more positive evaluations (Tsai et al., 2023). In contrast, actions that violate stakeholder expectations may trigger skepticism and less favorable evaluations (Gomulya & Mishina, 2017; Paruchuri et al., 2021; Tsai et al., 2023). By examining state-owned enterprises, high-polluting industries, and high-tech industries, three organizational contexts characterized by distinct stakeholder expectations, we find that stakeholder expectations systematically shape the reputational consequences of digitalization. Our findings also complement prior studies documenting heterogeneous responses to digitalization signals (Kim & Jensen, 2014; X. Li et al., 2025). While previous research has shown that stakeholders may respond differently to the same signal, our results highlight stakeholder expectations as an additional mechanism underlying such differences.

5.3. Practical implications

This study provides several practical implications. First, managers should view digitalization not only as a technological transformation but also as a strategic signal that shapes stakeholder evaluations. Our findings show that digitalization enhances both financial and social reputation, suggesting that its value extends beyond operational improvements. Managers should therefore recognize that digitalization influences not only what firms do, but also how firms are perceived by external stakeholders.

Second, firms should align their digitalization strategies with stakeholder expectations to maximize reputational benefits. Because the reputational value of digitalization depends not only on the signals conveyed by digitalization but also on how stakeholders interpret those signals, managers should not assume that digitalization investments will automatically translate into reputational gains. Instead, firms should clearly communicate the objectives and outcomes of their digitalization initiatives while emphasizing those aspects that are most consistent with stakeholder expectations to maximize the reputational benefits of digitalization.

Specifically, for state-owned enterprises, managers should continue to emphasize the public value and social contributions of digitalization to further strengthen its social reputational benefits. At the same time, given that the positive effect of digitalization on financial reputation is relatively weaker in state-owned enterprises, managers should devote greater attention to communicating the economic value of digitalization to stakeholders in order to strengthen its contribution to financial reputation. For firms operating in high-polluting industries, managers should place greater emphasis on the environmental value of digitalization, as this is more consistent with stakeholder expectations and can further strengthen social reputation. For high-technology firms, managers should emphasize how digitalization supports innovation and future growth, as these aspects are more consistent with stakeholder expectations and contribute to strengthening financial reputation.

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Author contributions

CRedit: **Yuying Tang**: Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing; **Zikang Liao**: Conceptualization, Writing – original draft; **Wai-Yan Wong**: Funding acquisition, Project administration, Supervision, Writing – review & editing.

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About the authors

Yuying Tang is a PhD candidate at Universiti Kebangsaan Malaysia. Her research interests include corporate finance, corporate governance, and corporate digitalization.

Zikang Liao is a PhD graduate of Cardiff University. His research interests include macroeconomics, economic policy, and corporate digitalization.

Wai-Yan Wong is a Senior Lecturer at the Faculty of Economics and Management, Universiti Kebangsaan Malaysia. She holds a PhD from Universiti Sains Malaysia. Her research interests include corporate finance, corporate governance, political connections, and firm behavior in emerging markets.

ORCID

Yuying Tang  <http://orcid.org/0009-0003-2351-4610>

Zikang Liao  <http://orcid.org/0009-0003-8633-1336>

Wai-Yan Wong  <http://orcid.org/0000-0003-4140-1890>

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

References

- Abdelbaky, A., Liu, T., Mingyang, X., Shahzad, M. F., & Hassanein, A. (2025). Real earnings management and ESG performance in China: The mediating role of corporate innovations. *International Journal of Finance & Economics*, 30(4), 3476–3499. <https://doi.org/10.1002/ijfe.3074>
- Ali, E., Bataka, H., Wonyra, K. O., Awade, N. E., & Braly, N. N. (2024). Global value chains participation and environmental pollution in developing countries: Does digitalization matter? *Journal of International Development*, 36(1), 451–478. <https://doi.org/10.1002/jid.3823>
- Ao, X., Chen, X., & Zhao, Z. (2022). Is care by grandparents or parents better for children's non-cognitive skills? Evidence on locus of control from China. *China Economic Review*, 71, 101734. <https://doi.org/10.1016/j.chieco.2021.101734>
- Arora, N., Saggarr, R., & Singh, B. (2021). Nexus between risk disclosure and corporate reputation: A longitudinal approach. *Journal of Strategy and Management*, 14(4), 529–544. <https://doi.org/10.1108/JSMA-06-2020-0162>
- Batool, F., Iftikhar, K., & Shabbir, M. N. (2025). Does green innovation pay off in China? Market valuation, investor sentiment, and risk-taking in A-listed firms: F. Batool et al. *Risk Management*, 27(3), 13. <https://doi.org/10.1057/s41283-025-00166-8>

- Bendig, D., Schulz, C., Theis, L., & Raff, S. (2023). Digital orientation and environmental performance in times of technological change. *Technological Forecasting and Social Change*, 188, 122272. <https://doi.org/10.1016/j.techfore.2022.122272>
- Bughin, J., Catlin, T., Hirt, M., & Willmott, P. (2018). Why digital strategies fail. *McKinsey Quarterly*, 1, 61–75.
- Burke, J. J., Hoitash, R., & Hoitash, U. (2019). Auditor response to negative media coverage of client environmental, social, and governance practices. *Accounting Horizons*, 33(3), 1–23. <https://doi.org/10.2308/acch-52450>
- Chen, A., Zhao, G., He, Z., & Ma, L. (2026). Reputation of the emerging market companies: Does ESG rating help? *Journal of Business Ethics*, 205(3), 451–467. <https://doi.org/10.1007/s10551-025-06096-5>
- Chen, N., Yang, S., & Li, L. (2023). Research on the influence of digital transformation on enterprise internal control quality. *Journal of Global Information Management*, 31(6), 1–21. <https://doi.org/10.4018/JGIM.321187>
- Chen, W., & Zhang, Q. (2025). Can corporate climate risk drive digital transformation? Evidence from Chinese heavy-polluting enterprises. *Technological Forecasting and Social Change*, 212, 123990. <https://doi.org/10.1016/j.techfore.2025.123990>
- Chen, Z., Hajiheydari, N., Zhang, M., & Lin, Y-e (2026). Corporate digital transformation attention and innovation: Strategic commitment or symbolic signalling? *The Journal of Strategic Information Systems*, 35(2), 101971. <https://doi.org/10.1016/j.jsis.2026.101971>
- Cheng, J., & Liu, Y. (2018). The effects of public attention on the environmental performance of high-polluting firms: Based on big data from web search in China. *Journal of Cleaner Production*, 186, 335–341. <https://doi.org/10.1016/j.jclepro.2018.03.146>
- Conley, T. G., Hansen, C. B., & Rossi, P. E. (2012). Plausibly exogenous. *Review of Economics and Statistics*, 94(1), 260–272. https://doi.org/10.1162/REST_a_00139
- Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management*, 37(1), 39–67. <https://doi.org/10.1177/0149206310388419>
- Connelly, B. L., Certo, S. T., Reutzel, C. R., DesJardine, M. R., & Zhou, Y. S. (2025). Signaling theory: State of the theory and its future. *Journal of Management*, 51(1), 24–61. <https://doi.org/10.1177/01492063241268459>
- De Castro, G. M., López, J. E. N., & Sáez, P. L. (2006). Business and social reputation: Exploring the concept and main dimensions of corporate reputation. *Journal of Business Ethics*, 63(4), 361–370. <https://doi.org/10.1007/s10551-005-3244-z>
- Elfedawy, A., & Al-Asfour, F. (2026). How digital transformation shapes accounting conservatism: Evidence from Egypt. *Journal of Financial Reporting and Accounting*, 1–23. <https://doi.org/10.1108/JFRA-05-2025-0360>
- Endiana, I., Sudana, I. P., Ariyanto, D., & Asri Dwija Putri, I. (2025). Sustainability reporting quality on corporate reputation: The role of political and military connections. *Economics and Environment*, 92, 918. <https://doi.org/10.34659/eis.2025.92.1.918>
- Ministry of Ecology and Environment of the People's Republic of China. (2008). *The catalogue of classified management of environmental verification for listed companies*. https://www.mee.gov.cn/gkml/hbb/bgth/200910/t20091022_174891.htm
- Etter, M., Ravasi, D., & Colleoni, E. (2019). Social media and the formation of organizational reputation. *Academy of Management Review*, 44(1), 28–52. <https://doi.org/10.5465/amr.2014.0280>
- Ewens, M., Peters, R. H., & Wang, S. (2024). Measuring intangible capital with market prices. *Management Science*, 71(1), 407–427. <https://doi.org/10.1287/mnsc.2021.02058>
- Fan, X., Zhao, S., Shao, D., Wang, S., & Zhang, B. (2024). Talking and walking: Corporate digital transformation and government subsidies. *Finance Research Letters*, 64, 105444. <https://doi.org/10.1016/j.frl.2024.105444>
- Fombrun, C. J. (1996). *Reputation: Realizing value from the corporate image*. Harvard Business School.
- Garde Sánchez, R., Rodríguez Bolívar, M. P., & López Hernández, A. M. (2017). Perceptions of stakeholder pressure for supply-chain social responsibility and information disclosure by state-owned enterprises. *The International Journal of Logistics Management*, 28(4), 1027–1053. <https://doi.org/10.1108/IJLM-05-2016-0118>
- Gomulya, D., & Mishina, Y. (2017). Signaler credibility, signal susceptibility, and relative reliance on signals: How stakeholders change their evaluative processes after violation of expectations and rehabilitative efforts. *Academy of Management Journal*, 60(2), 554–583. <https://doi.org/10.5465/amj.2014.1041>
- Gotsi, M., & Wilson, A. M. (2001). Corporate reputation: Seeking a definition. *Corporate Communications*, 6(1), 24–30. <https://doi.org/10.1108/13563280110381189>
- Gradillas, M., & Thomas, L. D. (2025). Distinguishing digitization and digitalization: A systematic review and conceptual framework. *Journal of Product Innovation Management*, 42(1), 112–143. <https://doi.org/10.1111/jpim.12690>
- Guo, C., Ho, K.-C., Gong, Y., & Yu, J.-Q. (2025). Public opinion shaping: The impact of corporate digital transformation on analysts' optimistic forecast bias. *Finance Research Letters*, 85, 107855. <https://doi.org/10.1016/j.frl.2025.107855>
- Guo, L., Xiao, S., Li, X., & Li, W. (2019). Non-executive employee equity incentive and innovation outputs: Empirical evidence from high-tech listed companies in China. *Accounting Research*, 7, 59–67.
- Guo, X., Li, M., Wang, Y., & Mardani, A. (2023). Does digital transformation improve the firm's performance? From the perspective of digitalization paradox and managerial myopia. *Journal of Business Research*, 163, 113868. <https://doi.org/10.1016/j.jbusres.2023.113868>
- Hasan, M. M., Habib, A., & Zhao, R. (2022). Corporate reputation risk and cash holdings. *Accounting & Finance*, 62(1), 667–707. <https://doi.org/10.1111/acfi.12803>

- Hu, M., Su, Y., & Yu, X. (2025). Does corporate digitalization improve disclosure quality? *Internet Research*, 35(4), 1535–1553. <https://doi.org/10.1108/INTR-12-2023-1149>
- Huang, K. G., Jing, R., Xia, J., Zhang, C. M., Zhong, W., & Zhu, D. H. (2024). Coevolution of SOEs and the Chinese economy: The roles of SOE heterogeneity from the institutional, strategic, and organizational perspectives. *Management and Organization Review*, 20(5), 704–715. <https://doi.org/10.1017/mor.2024.68>
- Huang, S.-J., Xiao, H.-J., & Wang, X. (2018). Study on high-quality development of the state-owned enterprises. *China Industrial Economics*, 10, 19–41. 1006-480X(2018)10-0019-23
- Jiang, K., Du, X., & Chen, Z. (2022). Firms' digitalization and stock price crash risk. *International Review of Financial Analysis*, 82, 102196. <https://doi.org/10.1016/j.irfa.2022.102196>
- Jiang, Y., Guo, C., & Wu, Y. (2022). Does digital finance improve the green investment of Chinese listed heavily polluting companies? The perspective of corporate financialization. *Environmental Science and Pollution Research International*, 29(47), 71047–71063. <https://doi.org/10.1007/s11356-022-20803-z>
- Kaur, A., & Singh, B. (2018). Corporate reputation: Do board characteristics matter? Indian evidence. *Indian Journal of Corporate Governance*, 11(2), 122–134. <https://doi.org/10.1177/0974686218797758>
- Kim, H., & Jensen, M. (2014). Audience heterogeneity and the effectiveness of market signals: How to overcome liabilities of foreignness in film exports? *Academy of Management Journal*, 57(5), 1360–1384. <https://doi.org/10.5465/amj.2011.0903>
- Kuzey, C., Uyar, A., Ellili, N. O. D., & Karaman, A. S. (2024). Corporate social responsibility performance and social reputation via corporate social responsibility awarding: Is there a threshold effect? *Corporate Governance*, 24(5), 993–1020. <https://doi.org/10.1108/CG-03-2023-0128>
- Leonardi, P. M., & Treem, J. W. (2020). Behavioral visibility: A new paradigm for organization studies in the age of digitization, digitalization, and datafication. *Organization Studies*, 41(12), 1601–1625. <https://doi.org/10.1177/0170840620970728>
- Lewbel, A. (1997). Constructing instruments for regressions with measurement error when no additional data are available, with an application to patents and R&D. *Econometrica*, 65(5), 1201–1213. <https://doi.org/10.2307/2171884>
- Li, A., Wu, D., & Wang, J. (2025). Can narrative disclosure in annual reports preserve corporate reputation: Evidence from letters to shareholders. *Asian Review of Accounting*, 33(5), 927–955. <https://doi.org/10.1108/ARA-07-2024-0222>
- Li, P. C., Chen, Y. B., & Guo, X. C. (2025). Digital transformation and supply chain resilience. *International Review of Economics & Finance*, 99, 104033. <https://doi.org/10.1016/j.iref.2025.104033>
- Li, X., Pu, H., & Zhang, M. (2025). Does corporate digital transformation affect investor trading behaviour?—A perspective based on investor divergence. *Technology Analysis & Strategic Management*, 37(11), 2096–2109. <https://doi.org/10.1080/09537325.2024.2344076>
- Lin, B., & Xie, Y. (2023). Does digital transformation improve the operational efficiency of Chinese power enterprises? *Utilities Policy*, 82, 101542. <https://doi.org/10.1016/j.jup.2023.101542>
- Lin, K. J., Lu, X., Zhang, J., & Zheng, Y. (2020). State-owned enterprises in China: A review of 40 years of research and practice. *China Journal of Accounting Research*, 13(1), 31–55. <https://doi.org/10.1016/j.cjar.2019.12.001>
- Liu, Z., Chen, Z., & Hu, L. (2024). Can enterprise digital transformation improve ESG performance? *Managerial and Decision Economics*, 45(7), 5088–5103. <https://doi.org/10.1002/mde.4307>
- Liu, G., Liu, J., Gao, P., Yu, J., & Pu, Z. (2024). Understanding mechanisms of digital transformation in state-owned enterprises in China: An institutional perspective. *Technological Forecasting and Social Change*, 202, 123288. <https://doi.org/10.1016/j.techfore.2024.123288>
- Lu, Y., Abeysekera, I., & Cortese, C. (2015). Corporate social responsibility reporting quality, board characteristics and corporate social reputation: Evidence from China. *Pacific Accounting Review*, 27(1), 95–118. <https://doi.org/10.1108/PAR-10-2012-0053>
- Lv, D., & Wokutch, R. (2024). Framing as a strategy for defending the perceived authenticity of voluntary environmental disclosure in the digital era. *Corporate Social Responsibility and Environmental Management*, 31(2), 1142–1155. <https://doi.org/10.1002/csr.2618>
- Ma, J., Shang, Y., & Liu, L. (2025). Green image, digital transformation, and corporate green innovation. *International Review of Financial Analysis*, 106, 104518. <https://doi.org/10.1016/j.irfa.2025.104518>
- Mai, W., Xiong, L., Liu, B., & Liu, S. (2025). Spatial-temporal evolution, drivers, and pathways of the synergistic effects of digital transformation on pollution and carbon reduction in heavily polluting enterprises. *Scientific Reports*, 15(1), 11963. <https://doi.org/10.1038/s41598-025-96834-6>
- Martinez, A. D., Russell, Z. A., Maher, L. P., Brandon-Lai, S. A., & Ferris, G. R. (2017). The sociopolitical implications of firm reputation: Firm financial reputation × social reputation interaction on firm financial performance. *Journal of Leadership & Organizational Studies*, 24(1), 55–64. <https://doi.org/10.1177/1548051816656005>
- Matozza, F., Biscotti, A. M., & Mafrolla, E. (2019). Financial reputation repair through environmental performance: A study of restatements in polluting industries. *Sustainability Accounting, Management and Policy Journal*, 10(5), 798–821. <https://doi.org/10.1108/SAMPJ-05-2018-0134>
- Nasidi, Q. Y., Ahmad, M. F., Adamu, A., & Sani, H. M. (2024). Effect of corporate digital communication on organisational performance: Systematic literature review. *Zhongguo Kuangye Daxue Xuebao*, 29(4), 304–311.
- Navarro-García, J. C., Ramón-Llorens, M. C., & García-Meca, E. (2022). Female directors and corporate reputation. *BRQ Business Research Quarterly*, 25(4), 352–365. <https://doi.org/10.1177/2340944420972717>
- Odoom, R., Odoom, P. T., Amu, P. Y., & Adams, M. (2025). Sustainable digital marketing practices and consumer brand engagement—a brand reputation mediation investigation. *Journal of Strategic Marketing*, 33(2), 1–17. <https://doi.org/10.1080/0965254X.2025.2453690>

- Oludapo, S., Carroll, N., & Helfert, M. (2024). Why do so many digital transformations fail? A bibliometric analysis and future research agenda. *Journal of Business Research*, 174, 114528. <https://doi.org/10.1016/j.jbusres.2024.114528>
- OuYang, Z., Xu, J., Wei, J., & Liu, Y. (2017). Information asymmetry and investor reaction to corporate crisis: Media reputation as a stock market signal. *Journal of Media Economics*, 30(2), 82–95. <https://doi.org/10.1080/08997764.2017.1364256>
- Pan, X., & Wang, X. (2024). Does digital transformation reduce managers' excess perks consumption? *Emerging Markets Finance and Trade*, 60(15), 3538–3558. <https://doi.org/10.1080/1540496X.2024.2354800>
- Paruchuri, S., Han, J.-H., & Prakash, P. (2021). Salient expectations? Incongruence across capability and integrity signals and investor reactions to organizational misconduct. *Academy of Management Journal*, 64(2), 562–586. <https://doi.org/10.5465/amj.2018.0698>
- Pei, X., Song, J., Li, N., & Cao, B. (2025). Digital transformation and the spillover of green innovation: Evidence from peer firms in heavily polluting industries. *European Journal of Innovation Management*, 28(9), 4257–4283. <https://doi.org/10.1108/EJIM-04-2024-0477>
- Pronchakov, Y., Prokhorov, O., & Fedorovich, O. (2022). Concept of high-tech enterprise development management in the context of digital transformation. *Computation*, 10(7), 118. <https://doi.org/10.3390/computation10070118>
- Rui, Z., & Jingbo, F. (2025). Digital transformation and green innovation efficiency in heavy-polluting enterprises: A focus on knowledge and slack resources. *Journal for Economic*, 1, 101–121.
- Salvi, A., Petruzzella, F., Raimo, N., & Vitolla, F. (2023). Transparency in the digitalization choices and the cost of equity capital. *Qualitative Research in Financial Markets*, 15(4), 630–646. <https://doi.org/10.1108/QRFM-02-2022-0015>
- Sergei, T., Arkady, T., Natalya, L., Pathak, R. D., Samson, D., Husain, Z., & Sushil, S. (2023). Digital transformation enablers in high-tech and low-tech companies: A comparative analysis. *Australian Journal of Management*, 48(4), 801–843. <https://doi.org/10.1177/03128962231157102>
- Spence, A. M. (1974). *Market signaling: Information transfer in hiring and related processes*. Harvard University Press.
- State Council of China. (2015). *The guiding opinions on deepening the reform of state-owned enterprises*. https://www.gov.cn/zhengce/2015-09/13/content_2930440.htm
- State-Owned Assets Supervision and Administration Commission of the State Council. (2020). *The notice on accelerating the digital transformation of state-owned enterprise*. <http://www.sasac.gov.cn/n2588020/n2588072/n2591148/n2591150/c15517908/content.html>
- Tsai, J.-Y., Yuan, S., & Coman, I. A. (2023). Theorizing issue-driven public attention and expectations in audience responses to corporate sociopolitical activism: A mixed-method analysis. *Public Relations Review*, 49(4), 102353. <https://doi.org/10.1016/j.pubrev.2023.102353>
- Wimelius, H., Mathiassen, L., Holmström, J., & Keil, M. (2021). A paradoxical perspective on technology renewal in digital transformation. *Information Systems Journal*, 31(1), 198–225. <https://doi.org/10.1111/isj.12307>
- Wu, F., Hu, H., Lin, H., & Ren, X. (2021). Enterprise digital transformation and capital market performance: Empirical evidence from stock liquidity. *Management World*, 37(7), 130–144.
- Wu, Y., Sun, H., Sun, H., & Xie, C. (2022). Impact of public environmental concerns on the digital transformation of heavily polluting enterprises. *International Journal of Environmental Research and Public Health*, 20(1), 203. <https://doi.org/10.3390/ijerph20010203>
- Xiao, T., Sun, R., Yuan, C., & Sun, J. (2022). Digital transformation, human capital structure adjustment and labor income share. *Journal of Management World*, 38(12), 220–237.
- Xu, Y., Ji, J., Qiao, Y., & Huang, J. (2025). How and when does digital transformation promote technological innovation performance? A study of Chinese high-tech firms. *Technovation*, 146, 103294. <https://doi.org/10.1016/j.technovation.2025.103294>
- Yang, L., Goh, J., & Chiyachantana, C. (2016). Valuation uncertainty, market sentiment and the informativeness of institutional trades. *Journal of Banking & Finance*, 72, 81–98. <https://doi.org/10.1016/j.jbankfin.2016.07.009>
- Yang, R., Wei, J., Li, Y.-N., & Michelson, G. (2024). Using corporate social responsibility to enhance media reputation following a firm crisis: Evidence from China. *Public Relations Review*, 50(4), 102487. <https://doi.org/10.1016/j.pubrev.2024.102487>
- Yang, Y., & Gao, M. (2024). Enterprise digital transformation: Concepts, technical routes of statistical measurement, and ideas for improvement. *Statistical Research*, 41(3), 62–73. <https://doi.org/10.19343/j.cnki.11-1302/c.2024.03.005>
- Ye, B., & Liu, W. (2020). How do institutional investors swell firm innovation: Evidence from China's high-tech companies. *Journal of Applied Finance and Banking*, 10(5), 19–40.
- Yonghong, L., Jie, S., Ge, Z., & Ru, Z. (2023). The impact of enterprise digital transformation on financial performance—Evidence from Mainland China manufacturing firms. *Managerial and Decision Economics*, 44(4), 2110–2124. <https://doi.org/10.1002/mde.3805>
- Yu, Y., Duan, W., & Cao, Q. (2013). The impact of social and conventional media on firm equity value: A sentiment analysis approach. *Decision Support Systems*, 55(4), 919–926. <https://doi.org/10.1016/j.dss.2012.12.028>
- Zarefar, A., Agustia, D., & Soewarno, N. (2024). The role of foreign board and ownership on the quality of sustainability disclosure: The moderating effect of social reputation. *Corporate Governance*, 24(4), 900–918. <https://doi.org/10.1108/CG-05-2022-0236>
- Zhang, J., Miao, X. M., & Shang, T. T. (2025). Impact mechanism of digital transformation on supply chain resilience. *Finance Research Letters*, 76, 106993. <https://doi.org/10.1016/j.frl.2025.106993>

- Zhang, S., & Jie, Z. (2026). Digital transformation and corporate financial performance: Evidence from marketization level. *Applied Economics Letters*, 1–5. <https://doi.org/10.1080/13504851.2026.2648736>
- Zhao, C., Wang, W., & Li, X. (2021). How does digital transformation affect the total factor productivity of enterprises. *Finance & Trade Economics*, 42(7), 114–129. <https://doi.org/10.1016/j.technovation.2025.103294>
- Zhao, X., Chen, Q.-A., Yuan, X., Yu, Y., & Zhang, H. (2024). Study on the impact of digital transformation on the innovation potential based on evidence from Chinese listed companies. *Scientific Reports*, 14(1), 6183. <https://doi.org/10.1038/s41598-024-56345-2>
- Zhen, H., Wang, X., & Fang, H. (2023). Administrative protection of intellectual property rights and corporate digital transformation. *Economic Research Journal*, 58(11), 62–79.
- Zheng, Y., Cheng, Y., & Li, L. (2020). Factors affecting regional economic synergy in China—based on research on high-tech industry. *IEEE Access*, 8, 14123–14133. <https://doi.org/10.1109/ACCESS.2019.2959409>
- Zhou, M., Jiang, K., & Zhang, J. (2023). Environmental benefits of enterprise digitalization in China. *Resources, Conservation and Recycling*, 197, 107082. <https://doi.org/10.1016/j.resconrec.2023.107082>