economies

Article

Learn from Whom? An Empirical Study of Enterprise Digital Mimetic Isomorphism under the Institutional Environment

Ying Chen, **Haiyan Ma *** and **Tianyi Zhou**

School of Economics and Management, China University of Geosciences, Wuhan 430074, China; chen_ying@cug.edu.cn (Y.C.); dlmzka1206@163.com (T.Z.)
* Correspondence: mahaiyan@cug.edu.cn

Abstract: The digital economy is a prevailing trend in global development, yet traditional firms still face challenges in digital transformation. Under institutional pressure, firms might imitate the digital strategy of their peers to mitigate these issues; there is still a lack of empirical research to support this. Therefore, this study, drawing on new institutional theory, focuses on investigating whether and how the institutional environment influences companies in embracing digital transformation in the digital economy era. We employ generalized least squares (GLS) regression models on a sample of 2862 non-IT listed firms in China from 2012 to 2020. In addition, we conduct a series of robustness checks. The results show that firms' mimetic isomorphism of digital transformation is related to the institutional environment. Specifically, both industrial digitalization and regional digitalization promote digital mimetic isomorphism independently; their interaction is positively related to the digital mimetic isomorphism of successful firms but negatively related to similar firms. The results provide empirical evidence for non-IT firms to converge upwards in digital transformation and achieve high-quality development.

Keywords: digital transformation; industrial digitalization; regional digitalization; mimetic isomorphism

Citation: Chen, Ying, Haiyan Ma, and Tianyi Zhou. 2024. Learn from Whom? An Empirical Study of Enterprise Digital Mimetic Isomorphism under the Institutional Environment. *Economies* 12: 243. https://doi.org/10.3390/economies12090243

Academic Editor: Weixin Yang

Received: 1 July 2024
Revised: 29 August 2024
Accepted: 9 September 2024
Published: 11 September 2024

1. Introduction

Institutions have received increasing attention as influencing factors in enterprise digitalization decisions (Sarker et al. 2019; Kern and Gospel 2023). Prior research has focused on the impact of the institutional environment on digital transformation from the perspective of individual focal firms (Chen et al. 2022; Liu et al. 2024). However, digital technologies can disrupt the existing processes and structures of non-IT firms (Hinings et al. 2018). Under institutional pressures, organizations as participants in strategic decision-making may be inclined to refer to the current practices of other entities, aiming to learn from them, thus reducing the uncertainties and risks involved in digital transformation, while maintaining their legitimacy. However, based on the "follower–leader" dyadic relation perspective, the question of whether and how the institutional environment affects the mimetic behavior of enterprise digital decision-making has not been thoroughly explored.

During the process of digital transformation, firms encounter multiple institutional pressures from their external environment. Under the influence of digital economy trends and policy orientations, specific policies and regulations have been established at both industrial and regional levels to set targets for industrial digitalization and regional digital economy development. These measures shape the digital institutional environment within the industrial and regional fields. Currently, effective measures to drive corporate digital transformation include digital cultivation within core industries and regional digital infrastructure development (Xu et al. 2023). The former leverages the institutional forces within the industrial field to stimulate digital transformation, while the latter utilizes foundational and incentivizing policy support within the regional field to promote digital transformation

(Chen et al. 2022). However, institutional pressures from different fields impose varying requirements (Greenwood et al. 2010). How do firms respond to the institutional pressures of the industrial and regional fields?

Mimetic isomorphism can reduce the uncertainty faced by firms during digital transformation, thereby alleviating institutional pressures (Cao et al. 2024). Driven by learning and risk avoidance motives, firms tend to imitate the implemented behaviors of industry peers in decision-making (Lieberman and Asaba 2006), preferring to learn from similar firms or successful firms within the same industry when selecting learning targets (DiMaggio and Powell 1983; Haveman 1993). Specifically, similar firms in the same industry exhibit comparability in their endowment structure, strategic resources, and future development perspectives, resulting in stronger interactions (Chen et al. 2016). This, to a certain extent, diminishes the barriers to imitation. Successful firms, on the other hand, serving as industry benchmarks, stand out among numerous reference companies due to their visibility and authoritative traits, making them preferred subjects for organizational learning (Lieberman and Asaba 2006; Oh and Barker 2018). Then, it becomes another major dilemma for companies to imitate similar companies or successful companies in digital transformation. However, it is not yet clearly established whether the two institutional pressures, including industrial digitalization and regional digitalization, affect a company's choice of mimetic targets like similar enterprises and successful enterprises.

To address these research questions, this study investigates (1) the impact of digitalization in different fields on firms' mimetic isomorphism behavior, (2) the selection of mimetic objects, and (3) the interactive effects of industrial and regional digitalization. Based on panel data of 2862 non-IT listed firms in China from 2012 to 2020, we test our conceptual model (see Figure 1). This study expands the research on the antecedents of mimetic isomorphism and enriches the literature of digital transformation from a dyadic perspective, providing evidence of potential imitation behavior during digital transformation.

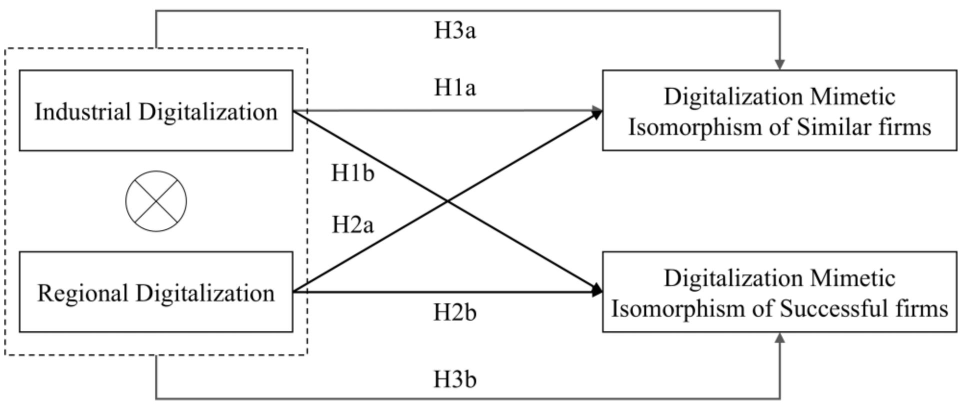

Figure 1. A conceptual model.

2. Theory and Hypothesis Development

2.1. New Institutional Theory and Mimetic Isomorphism

New institutional theory suggests that there are factors in the institutional environment that induce or constrain organizational behavior (Kostova and Zaheer 1999), causing organizations to exhibit a tendency to homogenize their behavior in order to gain legitimacy (Zimmerman and Zeitz 2002). The institutional environment exerts pressure on organizations to conform through three mechanisms, mimetic, normative, and coercive, which is seen as institutional isomorphism (DiMaggio and Powell 1983). Among these, normative and coercive pressures, while leading to organizational behavior convergence, do not lead to mimetic behavior. This is because under normative and coercive institutional pressures, the convergence of organizational behavior is not a result of the intentional imitation of other organizations but rather a consequence of organizations adopting similar behaviors to respond to institutional pressures and gain legitimacy within a similar institutional environment (Francis et al. 2009; Heugens and Lander 2009). In contrast, mimetic pressure arises when organizations, facing uncertainty, imitate the actions of more successful or legitimate organizations within their industry to guide their own decision-making (Cao et al. 2024). Therefore, mimetic isomorphism in new institutional theory is a response to uncertainty, aimed at gaining legitimacy.

For non-IT firms, digital transformation represents a break from constraints and an exploratory change, fraught with risks and uncertainties during the transformation process (Correani et al. 2020). However, imitating behaviors already undertaken by peers within the industry can reduce uncertainty risks during the transformation and effectively save on search costs (Sarrina Li and Lee 2010). Therefore, mimetic isomorphism may be a common practice for companies to gain legitimacy in response to the uncertainty of digital transformation. According to Haunschild and Miner (1997), inter-organizational imitation can be classified into the following three types: (1) trait-based imitation, which involves imitating organizations based on significant features such as scale or success, (2) frequency-based imitation, involving the replication of widely adopted behaviors, and (3) trait-based imitation, where behaviors expected to yield specific outcomes are replicated. Among them, trait-based imitation is the most common form of imitation. When there are no explicit action plans, managers often consider imitating successful peers as the best decision (Mizruchi and Fein 1999).

The current research on mimetic isomorphism is examined from various angles, such as social networks, organizational learning, and institutional theory, encompassing behaviors such as IT investments, market entry, corporate mergers, and carbon management. However, there is a lack of research on the mimetic effects on enterprise digital transformation. From a social network perspective, organizations interconnected by board members are more inclined to adopt mimetic isomorphism, primarily driven by their role in information dissemination (Palmer et al. 1993). Cheng et al. (2021) used board interlocks as a social learning channel for IT investment decisions, whereby mimicking the investment intensity of linked firms can determine the amount of corporate IT investment and increase the return on corporate investment. Viewing through the lens of organizational learning, Brookes and Altinay (2017) used franchising as an example and found that the transfer of tacit knowledge can accomplish mimetic isomorphism through opening and ongoing support. This is primarily due to open platforms that offer more learning opportunities. Meanwhile, most studies adopt an institutional theory perspective, predominantly concentrating on mimetic isomorphism observed in corporate mergers and acquisitions. To gain legitimacy, organizations tend to emulate the most commonly recurring decisions in M&A, particularly those concerning the product relatedness between acquiring and target firms, the location of target firms, and the size of acquisitions, especially under uncertainty (Haunschild and Miner 1997; Tseng and Chou 2011).

The existing research has explored the antecedents of digital transformation from different theoretical perspectives. The resource-based view posits that corporate social responsibility (CSR) can enhance a firm's human, financial, and technological resources, thereby promoting digital transformation (Nie et al. 2024). Upper echelons theory suggests that CEO characteristics, such as CEO overconfidence and international experience, can lead to a stronger digital strategic orientation (Chen et al. 2023; Saesen et al. 2024). Meanwhile, institutional theory argues that macro factors such as industrial digitalization and the regional digital economy drive digital transformation (Chen et al. 2022). From an institutional perspective, digital transformation in firms denotes a synergistic effect of digital innovations emerging from new products and services enabled by digital technologies, including big data, the internet of things, cloud computing, and artificial intelligence (Gobble 2018; Correani et al. 2020). In contrast to IT firms, non-IT firms lack inherent IT capabilities and resources, inevitably leading to the transformation process altering the internal dynamics and upending the established operational logic of the organization (Zhou et al. 2023; Ye et al. 2023). The legitimacy of an organization profoundly impacts the success of its transformation. Mimetic isomorphism facilitates organizations to gain legitimacy, referring to the process where an organization imitates other organizations within the same context to resemble them (Yang and Hyland 2012). In this paper, we define digital mimetic isomorphism as the degree of similarity in digital strategy compared to other firms in the same industry.

2.2. Industrial Digitalization and Digital Mimetic Isomorphism

Faced with digital transformation, enterprises confront a dilemma. On one hand, they aspire to optimize their existing organizational capabilities and achieve digital transformation through digital strategies (Hansen and Siew 2015). On the other hand, they also express concerns about potential challenges during the digital transformation process, such as potential disruptions to existing processes and structures (Xie et al. 2016). Industrial digitalization helps alleviate the dilemma for companies hesitant to transition in uncertain environments. Through cognitive constraints and competition-driven pressures, it encourages companies to adopt the mimicry of digital transformation, thus enhancing their legitimacy.

First, at the cognitive level, industry practices that are commonly deemed legitimate and acceptable by stakeholders within the industry (Strang and Soule 1998). Deviation from these norms results in a loss of legitimacy. Industrial digitalization has propelled industrial advancement, gradually shaping a new set of "game rules" (Correani et al. 2020). Enterprises adjust their behavior in accordance with the new industry standards and join the ranks of digital transformation (Kolomeitsev et al. 2024). According to Hinings et al. (2018), maintaining a consistent form of digital innovation in the development and promotion of new products, aligning with the existing legitimacy of digital enterprises, will assist follower enterprises in gaining legitimacy at the cognitive level.

Second, industrial digitalization drives digital homogenization among companies through competition. Digital transformation is an inevitable stage of enterprise development (Wu et al. 2021). Higher levels of industrial digitalization imply that pioneering companies within an industry have already undergone digital transformation, putting subsequent enterprises at a competitive disadvantage and accelerating investment in digital technologies. Concurrently, industrial digitalization triggers a revolution in consumer demand (Luo and Jiang 2022). Companies must continuously enhance the value of digital products through additional services and intelligent features (Khin and Ho 2018; Zhang et al. 2016). The limited market capacity intensifies competition among companies, compelling peer enterprises to undergo digital transformation. For example, Walmart's adoption of Radio-Frequency Identification (RFID) technology and its requirement for suppliers to implement this technology to save time and costs triggered imitation among other retailers (Lai et al. 2006).

Regarding focal companies, the targets of imitation comprise similar enterprises and successful firms. Whether mimicking isomorphism with similar or successful enterprises within the industry, it can signal legitimacy to the external environment. Compared to successful enterprises, the intensity of competition among similar enterprises is stronger, as are the legal constraints associated with behavioral norms. The impact of digitalization among similar enterprises introduces more potent cognitive constraints and competitive drives, significantly influencing the digital isomorphism (Chen et al. 2016). Therefore, we hypothesize that:

H1a. *Industrial digitalization is positively related to the digital mimetic isomorphism of similar firms.*

H1b. *Industrial digitalization is positively related to the digital mimetic isomorphism of successful firms.*

2.3. Regional Digitalization and Digital Mimetic Isomorphism

Regional digitalization development will boost the construction of local digital infrastructure (Shen et al. 2023), making it easier for enterprises to access policy support and resource allocations from local governments, thereby acting as a significant driver in the digitalization journey of enterprises. Enhanced regional digitalization fosters a conducive digital environment for local enterprises, offering optimal conditions to overcome the dual constraints of resources and environment (Xu et al. 2023). This, in turn, enhances their willingness and capability to adopt the digital behaviors of similar and outstanding enterprises.

Higher regional digitalization levels expand the scope of information accessible to businesses through digital infrastructure (Wernsdorf et al. 2022) and reduce information access costs (Goldfarb and Tucker 2019). This facilitates both the active and passive dissemination and penetration of information among businesses and raises the level of technological spillover absorbed by businesses (Shen et al. 2023). This surge facilitates the inflow of digital capital into firms, alleviating their financial limitations (Tang et al. 2021), thereby providing technological and financial support for inter-business emulation. Under governmental support, the formulation and implementation of digital economic policies have cultivated a thriving atmosphere for digital innovation, drawing in numerous entrepreneurs driven by digital entrepreneurship (Quinton et al. 2018). Moreover, local governments, driven by the needs of businesses, have tailored policies to fit enterprise digitalization requirements, offering governance standards and financial support so that enterprises can gain a localized advantage over other regional businesses (Anwar et al. 2020). Overall, a favorable regional digital environment advances enterprise digital transformation, encompassing technology, funding, talent, and policies (Lai and Yue 2022).

A well-established regional ecosystem stimulates the innovative vitality and latent potential of digital technology, expanding the spillover of digital knowledge and technology, enhancing its observability (Greve 2009), thus creating convenient conditions for enterprises to learn from digitalization experiences. Due to the technical and competitive features of digital products, they can be continuously adjusted and modified at a low cost, undergoing constant iterative innovations (Ni et al. 2023). Comparatively, imitating successful enterprises yields a higher performance for enterprises than imitating similar companies (Chen et al. 2016). However, imitating similar firms brings more legitimacy resources; thus, regional digitalization drives firms to imitate both similar and successful firms. Based on this, we hypothesize that:

H2a. *Regional digitalization is positively related to the digital mimetic isomorphism of similar firms.*

H2b. *Regional digitalization is positively related to the digital mimetic isomorphism of successful firms.*

2.4. Interactive Effect of Industrial Digitalization and Regional Digitalization on Digital Mimetic Isomorphism

Due to the impact of both industrial and regional digitalization in promoting the mimetic isomorphism of enterprise digitalization, non-IT firms will seize the opportunities these two factors bring, aligning their behavior with digital transformation. However, within highly digitized industrial and regional environments, enterprises face complex institutional contexts, where the aforementioned industrial and regional pressures may interplay with one another, possibly leading to conflict or mutual enhancement under certain circumstances (Greenwood et al. 2010).

In the context of imitating similar enterprises, the impacts of industry and region collide, resulting in conflicting effects. Conversely, when imitating successful firms, these influences reinforce each other. Within the same industry, similar enterprises are often considered more legitimate. Successful firms, renowned for their high visibility and comprehensive capabilities, exert an exemplary influence. Organizations improve their chances of success by imitating these successful entities (DiMaggio and Powell 1983). When companies are situated in industries and regions characterized by high levels of digitalization, regional digitalization effectively reduces the concerns about the legitimacy of digital behaviors across industries for these firms. This alleviates the pressure to passively imitate similar firms in digital initiatives, while stimulating companies to actively emulate the digital strategies of successful firms.

Optimal digital ecosystems within industries and regions promote organizations to actively emulate successful firms. Organizational learning theory suggests that companies have the capacity to reorganize external knowledge continually and repeatedly with their existing knowledge. Utilizing performance feedback mechanisms, this iterative process induces alterations in organizational practices and norms (Argote and Miron-Spektor 2011), ultimately enhancing organizational capabilities and improving business performance (Jiménez-Jiménez and Sanz-Valle 2011). Imitation is a form of organizational learning where the crucial initial step is acquiring new knowledge, and accessing it externally is a significant channel (Kesidou et al. 2023). High-level digitalization within industries and regions offers organizations a robust knowledge foundation, facilitating experiential learning from the digital behaviors of other enterprises. The affordance and self-growth of digital resources have amplified their flexibility and shareability (Huang et al. 2017), diminishing an organization's control over resources and broadening the spectrum of accessible resources (Wei et al. 2021), making digital technology easier to imitate. This facilitates enterprises acquiring a wealth of advanced digital technologies and diverse knowledge from the market (Martínez-Noya and García-Canal 2021), and enhances their dynamic and innovative capabilities by imitating successful enterprises to gain a competitive advantage (Posen et al. 2023).

High-level industrial and regional digitalization mitigates the passive imitation of similar enterprises. The current research suggests that the efficacy of imitation relies on the diversity among enterprises. Imitating similar enterprises can help organizations achieve performance levels close to industry averages (Tang et al. 2011), yet it does not guarantee above-average profits (Posen et al. 2013). The excessive imitation of similar enterprises not only leads to resource wastage and redundant development but also exacerbates inter-firm competition, compelling companies to adopt low-cost strategies, resulting in profit erosion. Additionally, in regions with high levels of digitalization, there is a loosening of the legitimacy requirements for industrial digitization. When regional digitalization provides sufficient resources for imitating enterprises, companies tend to actively imitate successful enterprises, with very few choosing to imitate similar ones. In view of this, we propose H3a and H3b.

H3a. *The interaction of industrial digitalization and regional digitalization is negatively related to the digital mimetic isomorphism of similar firms.*

H3b. *The interaction of industrial digitalization and regional digitalization is positively related to the digital mimetic isomorphism of successful firms.*

3. Reseach Design

3.1. Sample and Data

To test our conceptual model, we conduct an empirical study examining the digital strategy choices of non-IT listed firms in China from 2012 to 2020, considering the unique context of Chinese companies. China is an ideal subject for this study, as the past decade has seen steady growth in its digital economy, with increasing encouragement for companies to integrate digitalization with technological innovation, with an increasing number of firms placing greater importance on the deployment of digital technologies. The definition of the IT industry in this study is based on the "Statistical Classification of Digital Economy and its Core Industries (2021)" published by the National Bureau of Statistics of China. Following the industry classification provided by the China Securities Regulatory Commission in its 2012 version, the IT industry includes three-digit industry codes consisting of a letter representing the category and two digits representing the major group. Specifically, the following industry codes are considered part of the IT industry: C39 (Manufacture of Computers, Communication Equipment, and Other Electronic Equipment), I63 (Telecommunications, Radio, Television, and Satellite Transmission Services), I64 (Internet and Related Services), and I65 (Software and Information Technology Services). Consequently, non-IT listed firms refer to those companies that do not fall within the IT industry category.

Our data, including company-level, regional-level, and industry-level, are sourced from multiple data channels. The revenue composition data at the company level, classified by industry, are obtained from the CCER Economic and Financial Database, while other financial and corporate governance data are sourced from the CSMAR Database. The regional-level data are derived from the China Statistical Yearbook and the Institute of Digital Finance, Peking. The industry-level data are sourced from the input–output tables (IOTs) published by the National Bureau of Statistics of China.

After identifying firms listed in the CSMAR database from 2012 to 2020, we process the initial data as follows: first, we merge the firm-level data with industry-level data based on the three-digit industry code of each listed firm, and then merge the firm-level data with regional-level data according to the city where each firm is located. Then, we exclude IT firms and those with missing values for key variables, resulting in a sample of 2862 firms with a total of 11,577 firm–year observations. Finally, we winsorize the continuous variables at the 1% level in both distribution tails to mitigate the influence of extreme values.

3.2. Variables and Measures

Dependent variables. Digital mimetic isomorphism is divided into two dimensions: similar enterprises and successful enterprises. The calculation method refers to Haveman (1993) and Chen et al. (2016). Initially, it identifies similar enterprises based on their digitalization level and then distinguishes successful enterprises through the financial performance and digitalization level of the companies, as detailed below.

First, $M1_{it}$ denotes the digital mimetic isomorphism of similar firms for firm i in year t, and Dc_{it} represents the digitalization level. Setting 0.5–1.5 times the digitalization level of this firm as the similar size window (0.5 Dc_{it}, 1.5 Dc_{it}), we can obtain the ratio of the number of other firms in the peer industry to the number of all the firms in the industry in this window. Ultimately, we used this ratio to measure similar firms' digital mimetic isomorphism.

Second, $M2_{it}$ represents the successful firms' digital mimetic isomorphism. The calculation process includes the following steps: (1) we ranked the firms in descending order of their total return on assets (ROA) by year and filtered out other firms with a higher ROA_{it} than firm i in year t, (2) firms whose digitalization level ranked in the top 1/4 of all firms in the same industry were flagged and the number of flagged firms was recorded, and (3) we calculated the number of flagged firms as a share of the total number of firms in the industry. This ratio is the successful firm's digital imitation isomorphism.

Finally, we use digital proximity to measure digitalization (Rahmati et al. 2021). Previous studies have employed questionnaire surveys (Chi et al. 2020), text analysis (Wu et al. 2021), and intangible assets (Zhang et al. 2021) measurement to assess corporate digital transformation. The first method suffers from limited research subjects, resulting in a lack of representativeness. The second method utilizes text analysis to measure the frequency of digital-related terms in the annual reports of listed companies, which may not fully reflect the actual progress in digitalization. The third method measures the proportion of intangible assets related to digitalization, but it may be influenced by firms' ostentatious investments (Triplett 1999). Digital proximity is a measurement approach that takes an outcome-oriented perspective and utilizes the concept of product space (Hidalgo et al. 2007; Hartmann et al. 2017). It is measured based on network analysis, providing a more accurate and comprehensive representation of a firm's digitalization status and its position within the digital landscape. This approach effectively addresses the limitations mentioned above. Following the measurement framework proposed by Rahmati et al. (2021), we first calculate the digital proximity at the industrial level. This involves measuring the distance from other industries to the digital industries (C39, I63, I64, I65) using Dijkstra's algorithm to calculate the average shortest path from a specific industry to all IT industries. Based on this, we compute the weighted average digital proximity for each company's business sectors, with the weights determined by the revenue generated in each industry in which the company operates.

Independent variables. To measure industrial digitalization, we use the IOTs to calculate the coefficient of complete consumption dependence to measure the digitalization level of inputs across various industries (Dai and Yang 2022). In this study, the coefficient of complete consumption represents the sum of the quantity of IT products directly and indirectly consumed by each production unit in an industry, reflecting the level of digital input fully consumed by that industry. Subsequently, we enhance the coefficient of complete consumption using the coefficient of complete dependence. The specific calculation formula is as follows:

$$Indd_{dj} = \sum_{d} \frac{Complete_{dj}}{\sum_{k=1}^{N} Complete_{kj}} \tag{1}$$

In Equation (1), d represents the IT industry, while $Complete_{kj}$ denotes the coefficient of complete consumption from industry j to industry k. Additionally, $Indd_{dj}$ represents the ratio of digital input to total input consumed by industry j. This ratio effectively characterizes the relative influence of digital input across all the intermediate sectors and provides insights into the level of digital investment inherent in each industry.

Regional digitalization. Drawing on the research by Zhao et al. (2020), we adopted principal component analysis to standardize and reduce the dimensionality of five indicators at the city level. These indicators include the number of internet broadband access users per hundred people, the proportion of employees in the computer services and software industry to urban employees, the per capita volume of telecommunications services, the number of mobile phone users per hundred people, and the China Digital Inclusive Finance Index. This approach helps alleviate the issue of substantial digital disparities between cities within the same province and contributes to addressing the problem of regional development imbalance.

Control variables. Building upon the study by Chen et al. (2022), we incorporated control variables at three levels to account for their influence on digital strategy convergence. At the industrial level, we utilized the Herfindahl index as a measure of industry concentration, where higher values indicate greater concentration. At the firm level, we included variables such as firm size, leverage ratio, cash holdings, asset return, revenue growth, firm age, and ownership. At the decision-maker level, we considered variables such as the ownership stake of the largest shareholder, the separation of ownership and control, CEO age, CEO education, and CEO tenure. Table 1 provides a description and the sources of each variable.

Table 1. Variable key.

Variables	Description	Source
Dependent variables		
M1	The level of digital mimetic isomorphism of similar firms	CCER
M2	The level of digital mimetic isomorphism of successful firms	CCER
Independent variables		
Indd	Industrial digitalization, complete dependency degree in input–output table calculations.	IOTs
Regd	Regional digitalization, the values obtained by applying principal component analysis for dimensionality reduction on the five aforementioned indicators	Statistical Yearbook et al.

Table 1. *Cont.*

Variables	Description	Source
Control variables		
Herfindahl index	Squared sum of each company's market share within an industry	CSMAR
Firm size	Natural logarithm of the sum of total assets plus one	CSMAR
Leverage ratio	Total debts divided by total assets	CSMAR
Cash holdings	Cash and cash equivalents divided by total assets	CSMAR
Asset return	Net profit divided by total assets	CSMAR
Revenue growth	The growth rate of the operating revenue	CSMAR
Firm age	Natural logarithm of the sum of the listed age plus one	CSMAR
Ownership	The dummy variable takes a value of 1 if the actual controller of the company is state-owned, and 0 otherwise	CSMAR
Board size	Natural logarithm of the number of board members	CSMAR
Shareholding No.1	Natural logarithm of the ratio of shareholding held by the largest shareholder plus one	CSMAR
Separation	Natural logarithm of the control rights ratio minus ownership rights ratio plus one	CSMAR
CEO age	Natural logarithm of CEO age	CSMAR
CEO education	Values from 5 to 1: doctorate, master's degree, bachelor's degree, associate's degree, and technical diploma or other qualifications	CSMAR
CEO tenure	Natural logarithm of the age of a CEO during their tenure (denoted in months) plus one	CSMAR

3.3. Methodology

Prior to conducting the regression analysis, this study considers the estimation methods for Model (2) and Model (3). The data in this study correspond to the category of large N, small T panel data, which necessitates a focus on the issue of heteroskedasticity. The results of the White test reveal that all p-values were below 0.000, indicating strong evidence against the null hypothesis of homoscedasticity and confirming the presence of heteroscedasticity. Consequently, the generalized least squares (GLS) method is deemed appropriate for obtaining effective parameter estimates. The GLS is ultimately selected as the estimation model for this study. Furthermore, this study employs additional methods, including variable measurement substitution, changing the window period, propensity score matching (PSM) analysis, and changing the estimation model, to ensure the accuracy and robustness of the results.

$$M_{it} = \alpha_0 + \alpha_1 Indd_{ijt} + \alpha_2 Controls + \gamma_t + \varepsilon_{it} \quad (2)$$

$$M_{it} = \beta_0 + \beta_1 Regd_{iht} + \beta_2 Controls + \gamma_t + \varepsilon_{it} \quad (3)$$

where $Controls$ denotes a set of pertinent control variables, M_{it} represents $M1_{it}$ or $M2_{it}$, $Indd_{ijt}$ indicates the level of industrial digitalization for industry j for firm i in year t, $Regd_{iht}$ represents the level of regional digitalization in city h for firm i in year t, γ_t captures the year fixed effects, and ε_{it} is the error term. The values of α_1 and β_1 serve to test Hypothesis 1 and Hypothesis 2, respectively.

4. Results

4.1. Summary Statistics

Table 2 presents descriptive statistics. The mean values of digital mimetic isomorphism for similar companies (M1) and successful companies (M2) indicate that there is a higher proportion of companies resembling our enterprise in terms of digitalization within the same industry (20.9%). In contrast, the number of companies in the same industry with better profits and higher digitalization levels compared to our company is relatively lower (10.5%). The average level of industrial digitalization (Indd) stands at 0.086, indicating the average digital investment level within each industry is 0.086. As for regional digitalization (Regd), its mean and median values are proximate, suggesting a relatively even distribution. The maximum Variance Inflation Factor (VIF) among all the explanatory variables is 2.90, indicating the absence of significant multicollinearity issues in the regression model.

Table 2. Descriptive statistics.

Variables	Mean	S.D.	Median	Min	Max	VIF
M1	0.209	0.230	0.097	0.000	0.721	
M2	0.105	0.076	0.096	0.000	0.250	
Indd	0.086	0.132	0.032	0.006	0.593	1.09
Regd	0.200	0.080	0.188	0.065	0.417	1.08
Herfindahl index	0.091	0.090	0.065	0.014	0.555	1.02
Firm size	22.300	1.377	22.100	19.620	26.630	1.36
Leverage ratio	0.441	0.213	0.430	0.060	0.960	2.87
Cash holdings	0.173	0.121	0.141	0.011	0.601	1.07
Asset return	0.030	0.074	0.034	-0.362	0.201	2.90
Revenue growth	0.185	0.604	0.089	-0.661	4.429	1.00
Firm age	2.932	0.312	2.996	1.946	3.497	1.11
Ownership	0.364	0.481	0.000	0.000	1.000	1.37
Board size	2.126	0.202	2.197	1.609	2.708	1.15
Shareholding No. 1	3.468	0.449	3.495	1.162	4.511	1.13
Separation	0.972	1.210	0.000	0.000	4.013	1.06
CEO age	3.901	0.136	3.912	3.497	4.190	1.10
CEO education	3.186	1.295	4.000	0.000	5.000	1.03
CEO tenure	3.512	1.070	3.714	0.000	5.460	1.09

4.2. Baseline Results

Table 3 reports the results of the hypothesis tests. According to Table 3, the coefficients of the key explanatory variable Indd are all positive at the 1% level of significance ($\beta = 0.087$, $p < 0.01$ for M1; $\beta = 0.054$, $p < 0.01$ for M2) in Columns (1) to (2), as is the other key explanatory variable Regd ($\beta = 0.012$, $p < 0.01$ for M1; $\beta = 0.032$, $p < 0.01$ for M2) in Columns (3) to (4). The results show that both industrial digitalization and regional digitalization significantly promote firms' digital imitation isomorphism, whether of similar or successful firms. On the one hand, this confirms the views of Chen et al. (2022) and Chalmers et al. (2021) that the level of industrial and regional digitalization is conducive to facilitating firms to engage in innovative activities such as digital transformation. On the other hand, it responds to the studies of Haveman (1993) and Chen et al. (2016) that firms will choose similar firms and successful firms as imitation objects for learning. In summary, Hypothesis 1a, 1b, 2a, and 2b are valid.

Table 3. Baseline estimation results.

Variables	(1)	(2)	(3)	(4)
	M1	M2	M1	M2
Indd	0.087 ***	0.054 ***		
	(59.57)	(244.83)		
Regd			0.012 ***	0.032 ***
			(5.03)	(44.00)
Herfindahl index	−0.173 ***	0.031 ***	−0.185 ***	0.019 ***
	(−53.96)	(91.73)	(−64.81)	(27.07)
Firm size	−0.003 ***	−0.000 ***	−0.003 ***	−0.001 ***
	(−27.60)	(−3.33)	(−12.19)	(−7.32)
Leverage ratio	0.001 **	−0.011 ***	0.002 ***	−0.011 ***
	(2.39)	(−47.96)	(5.70)	(−32.63)
Cash holdings	0.022 ***	−0.093 ***	0.035 ***	−0.091 ***
	(15.38)	(−276.94)	(27.89)	(−110.80)
Asset return	0.013 ***	−0.087 ***	0.017 ***	−0.088 ***
	(5.91)	(−138.28)	(10.63)	(−97.83)
Revenue growth	−0.000	0.000	−0.000	0.000
	(−0.45)	(1.28)	(−0.42)	(1.41)
Firm age	0.003 ***	0.008 ***	−0.009 ***	0.006 ***
	(3.41)	(70.25)	(−12.69)	(40.69)
Ownership	0.006 ***	0.021 ***	0.005 ***	0.021 ***
	(7.99)	(154.46)	(7.36)	(100.04)
Board size	−0.002 *	−0.014 ***	−0.002 ***	−0.015 ***
	(−1.80)	(−65.27)	(−2.81)	(−52.82)
Shareholding No.1	0.018 ***	−0.019 ***	0.015 ***	−0.020 ***
	(41.55)	(−285.93)	(28.43)	(−171.35)
Separation	−0.001 ***	0.001 ***	−0.001 ***	0.001 ***
	(−7.65)	(23.34)	(−6.63)	(12.07)
CEO age	0.037 ***	−0.014 ***	0.030 ***	−0.015 ***
	(31.97)	(−84.98)	(26.32)	(−37.56)
CEO education	−0.002 ***	0.000 ***	−0.001 ***	0.000 ***
	(−15.88)	(11.62)	(−10.80)	(8.19)
CEO tenure	−0.002 ***	−0.002 ***	−0.002 ***	−0.002 ***
	(−12.46)	(−31.81)	(−15.87)	(−25.87)
Constant	0.051 ***	0.257 ***	0.113 ***	0.282 ***
	(9.79)	(180.07)	(17.54)	(112.25)
Year effect	Yes	Yes	Yes	Yes
Observations	11,577	11,577	11,577	11,577

Notes. Z-statistics in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

4.3. Robustness Checks

Adjusting variable measurement methods. Most of the previous studies on digital transformation were measured using text analysis based on the appearance of keywords related to digital transformation in the annual reports of listed companies. In order to avoid the problem of biased conclusions caused by the manner of data measurement, this paper refers to Wu et al. (2021), using text analysis to replace the measurement method for digitalization levels and recalculating dependent variables M1 and M2. The results, as shown in Table 4, are consistent with the conclusions of previous studies.

Changing the time frame. In order to ensure the robustness of the research findings across various sample conditions, this study altered the sample period for examination. The original sample spanned from 2012 to 2020, during which the unexpected outbreak of the COVID-19 pandemic in 2020 significantly impacted China's macroeconomic and social development. This event might have influenced the digital performance of businesses, potentially causing result biases. Hence, in the robustness testing, the regression for that year was excluded. The results, as shown in Table 5, confirm the robustness of our study's conclusions.

Table 4. Robustness check I: adjusting variable measurement methods.

Variables	(1)	(2)	(3)	(4)
	M1	**M2**	**M1**	**M2**
Indd	0.003 ***	0.003 ***		
	(86.80)	(68.47)		
Regd			0.115 ***	0.009 ***
			(180.32)	(10.59)
Controls	Yes	Yes	Yes	Yes
Constant	−0.122 ***	0.293 ***	−0.099 ***	0.298 ***
	(−72.81)	(153.56)	(−69.62)	(115.29)
Year effect	Yes	Yes	Yes	Yes
Observations	13,130	13,130	13,130	13,130

Notes. Z−statistics in parentheses. *** $p < 0.01$.

Table 5. Robustness check II: changing the time frame.

Variables	(1)	(2)	(3)	(4)
	M1	**M2**	**M1**	**M2**
Indd	0.081 ***	0.050 ***		
	(34.45)	(214.24)		
Regd			0.030 ***	0.025 ***
			(16.91)	(81.73)
Controls	Yes	Yes	Yes	Yes
Constant	0.033 ***	0.244 ***	0.059 ***	0.266 ***
	(5.85)	(134.73)	(9.61)	(158.57)
Year effect	Yes	Yes	Yes	Yes
Observations	8689	8689	8689	8689

Notes. Z-statistics in parentheses. *** $p < 0.01$.

Propensity score matching (PSM) analysis. Considering the potential endogeneity issues resulting from sample selection bias in the model, this study re-examines using PSM. The study distinguishes companies located in high-level digital industries/regions as the treatment group, setting the median as the benchmark. It utilizes propensity score matching to identify matched pairs (control group) and employs the nearest-neighbor matching method for the one-to-one non-replacement matching of the sample. For the selection of matching variables, this paper firstly selects all control variables as matching variables, and then compares the great likelihood values of different models, and then selects the matching variables to achieve the best fitting effect. When the treatment variable is industrial digitalization, the final selected matching variables are firm size, firm age, asset return, separation, ownership, CEO age, and shareholding No.1.[1] By matching the whole sample, the total number of matching successful samples is 9461, accounting for 83.27%. And the standardized deviation of the matched variables is less than 10%, and the results of the *t*-test do not reject the original hypothesis that there is no systematic difference between the treatment group and the control group, indicating that the matched samples satisfy the assumption of balance. The sample average treatment effect on the treated (ATT) between the treatment and control groups' post-matching is notably significant, with a t-value of 4.19. This signifies the continued substantial influence of industrial digitalization on fostering digital mimetic isomorphism. The treatment variable, defining regional digitalization, is not reiterated. The sample regression results' post-matching, detailed in Table 6, validates the earlier conclusions, affirming the study's findings under similar conditions.

Table 6. Robustness check III: PSM.

Variables	(1)	(2)	(3)	(4)
	M1	**M2**	**M1**	**M2**
Indd	0.056 ***	0.070 ***		
	(38.30)	(525.07)		
Regd			0.044 ***	0.023 ***
			(29.23)	(42.16)
Controls	Yes	Yes	Yes	Yes
Constant	0.039 ***	0.232 ***	0.018 ***	0.348 ***
	(7.14)	(181.45)	(5.34)	(137.11)
Year effect	Yes	Yes	Yes	Yes
Observations	9641	9641	9516	9516

Notes. Z-statistics in parentheses. *** $p < 0.01$.

Changing the estimation model. Furthermore, we conducted cross-sectional dependence tests, and the results indicated p-values below 0.05, confirming significant cross-sectional dependence within the panel data. Following the methods of Petersen (2009) and Brunnermeier et al. (2020), we employed two-way clustering to address dependence issues, applying the clustering of standard errors at both the firm and year levels. The regression results, as shown in Table 7, are consistent with the previous findings.

Table 7. Robustness check IV: changing the estimation model.

Variables	(1)	(2)	(3)	(4)
	M1	**M2**	**M1**	**M2**
Indd	0.075 *	0.047 *		
	(0.044)	(1.85)		
Regd			0.061 *	0.032 **
			(1.87)	(2.33)
Controls	Yes	Yes	Yes	Yes
Constant	−0.109	0.285 ***	−0.058	0.304 ***
	(0.173)	(10.98)	(−0.41)	(13.62)
Observations	10,916	10,916	10,916	10,916

Notes. T-statistics in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

4.4. Interaction Effect Results

Table 7 reports the results of the interaction effect. Column (1) of Table 8 provides evidence for the negative effect of the interaction of industrial digitalization and regional digitalization on the digital mimetic isomorphism of similar firms ($\beta = -0.155$, $p < 0.01$), but a positive effect on that of successful firms ($\beta = 0.218$, $p < 0.01$). The results indicate that the interaction between industrial digitalization and regional digitalization enhances firms' tendency to engage in mimetic isomorphism with successful firms, while having an opposite effect on similar firms. This finding aligns with the studies of Tang et al. (2011) and Giachetti and Torrisi (2018). When firms are situated in environments with high levels of industrial and regional digitalization, characterized by transparency and lower uncertainty, along with abundant resources, imitating similar firms can lead to fierce competition and average performance, prompting firms to imitate successful firms. Thus, H3a and H3b are both supported.

We plot moderated effects to support the interaction effect results (see Figures 2 and 3). Figure 2 reports the impact of the interaction effect on similar enterprises. From the left graph, it is evident that when the industrial digitalization level is high, the effect of low-level regional digitalization on similar enterprises is more pronounced than the effect of high-level regional digitalization. From the right graph, it is observed that when the industrial digitalization level is high, there exists a negative relationship between regional digitalization and digital mimetic isomorphism among similar enterprises. Figure 3 presents the impact of the interaction effect on successful enterprises. The left panel illustrates that, in situations with higher regional digitalization, the positive relationship between industrial digitalization and mimetic isomorphism among successful enterprises is significantly stronger than in cases with lower regional digitalization. Similar to the left panel, the results in the right panel mirror these findings. These results further confirm H3.

Table 8. Interaction effect results.

Variables	**(1)**	**(2)**
	M1	**M2**
Indd × Regd	−0.155 ***	0.218 ***
	(−13.90)	(36.70)
Indd	0.093 ***	0.044 ***
	(58.12)	(75.82)
Regd	−0.003	0.019 ***
	(−1.21)	(31.40)
Controls	Yes	Yes
Constant	0.048 ***	0.262 ***
	(6.57)	(100.67)
Year effect	Yes	Yes
Observations	11,577	11,577

Notes. Z-statistics in parentheses. *** $p < 0.01$. The regression process was centered on the independent and moderator variables to exclude the effect of multicollinearity.

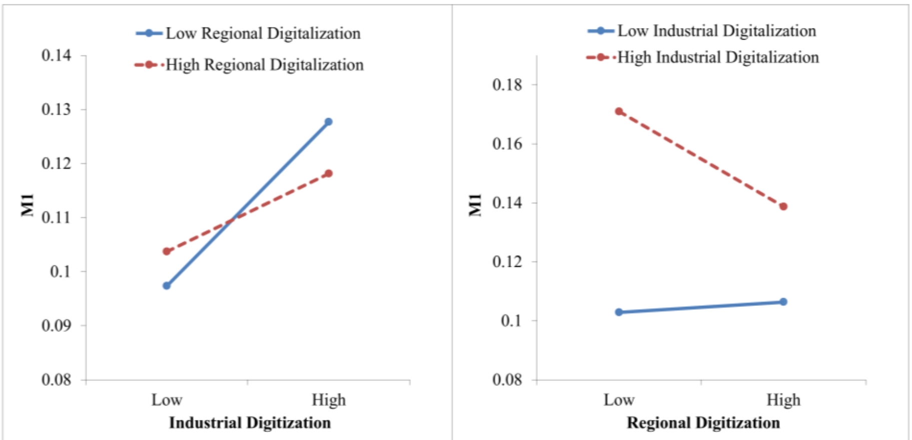

Figure 2. The moderating effect of industrial digitalization and regional digitalization on the digital mimetic isomorphism of similar firms.

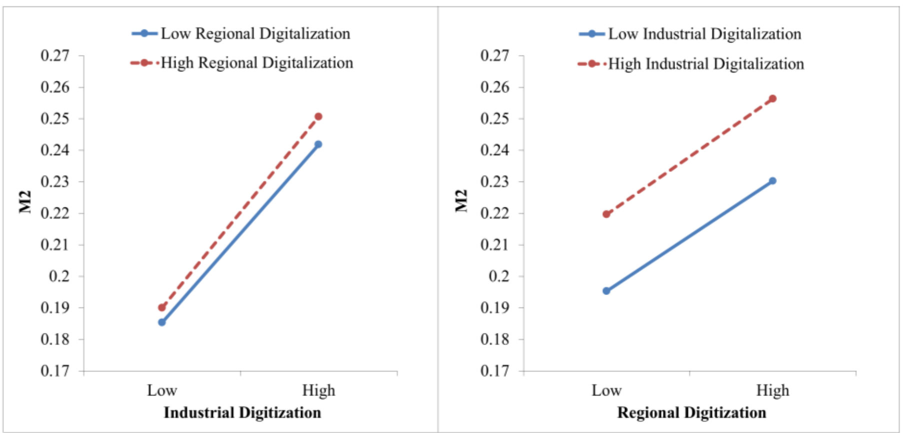

Figure 3. The moderating effect of industrial digitalization and regional digitalization on the digital mimetic isomorphism of successful firms.

5. Discussion and Conclusions

Digital transformation represents a key avenue for firms to achieve high-quality development within the digital economy. However, most non-IT firms in China are at the initial exploration stage of digital transformation, facing the dilemma of "difficulty in transformation" and "wishing to transform but hesitating to do so". Both the government and academia are highly concerned about how to drive the process of digital transformation. This study aims to investigate how industrial digitalization and regional digitalization affect firms' digital mimetic behavior, both separately and interactively, from an institutional environment perspective.

5.1. Conclusions

This study provides answers as to how firms can address the decision-making dilemmas associated with digital transformation, enriching the study from the perspective of the institutional environment. Using non-IT firms on China's A-share market from 2012 to 2020 as samples, this study provides evidence that both industrial digitalization and regional digitalization environments play crucial roles in digital strategic decision-making, encouraging the imitation of both similar and successful enterprises. Moreover, our results indicate that the interaction of industrial digitalization and regional digitalization is positively related to the digital mimetic isomorphism of successful firms but negatively related to similar firms. This extends the research of Chen et al. (2022) by further differentiating the targets of digital transformation imitation and revealing the heterogeneous responses of digital strategy choices under various institutional pressures. It also demonstrates that the diverse industrial structure and uneven regional digitalization in China present challenges for digital transformation. Firms are encouraged to make strategic decisions based on their external institutional environment. The results are valuable for promoting the digital transformation of Chinese firms, enhancing the overall quality and competitiveness of the national digital economy. Accelerating the digital transformation process will invigorate the economy, promote industrial upgrades, and create more high-value jobs, thus fostering sustainable economic growth.

5.2. Theoretical Contributions

Compared to the existing literature, this study may make several marginal contributions. First, this study extends research on mimetic isomorphism to the context of digital transformation. Previous studies have focused on mimetic isomorphism related to IT investments (Cheng et al. 2021), mergers and acquisitions (Tseng and Chou 2011), and carbon management (Liu et al. 2018). Chen et al. (2022) focuses on the impact on single entities, whereas we provide a novel perspective by focusing on the dyadic relation between followers and leaders. This study examines how institutional environments shape digital mimetic isomorphism and reveals the mechanisms driving the diffusion and spread of digital transformation.

Second, this study enriches the research on the antecedents of mimetic isomorphism. The previous literature explored various external factors, including regional cultural ties (Li et al. 2016), technological advancements and openness to international trade (Ozturk et al. 2021), uncertainty (Haunschild and Miner 1997; Sarrina Li and Lee 2010), and cultural environments (Li and Parboteeah 2015). Additionally, internal elements like organizational status (Han 1994; Durand and Kremp 2016) and experience (Ando 2011) were considered. However, this study reveals the impact of institutional environments on mimetic isomorphism from an institutional perspective and further contrasts the mimetic isomorphism towards similar firms and successful firms.

Third, this study incorporates two different types of digital institutional fields into a framework to compare their influence on promoting firms' digital transformation from the perspective of mimetic isomorphism. Extending the prior research that considers single institutional pressures as antecedents (Liu et al. 2024), our findings reveal that organizations respond differently to institutional pressures from various fields, addressing the call for applying institutional theory in strategic management (Suchman 1995).

5.3. Practical Implications

Our research has several implications. First, policymakers and related government entities provide targeted support for the digitalization of core industries and industry clusters by developing digital industry parks. Industrial digitalization serves as a critical source of institutional pressure for firms' digital transformation efforts. Shifting the focus of local government policies towards fostering the digitalization of core industries can improve the efficiency of policy implementation. Furthermore, the advancement in regional digital economies can facilitate firms' responses to pressures for industrial digitalization. By actively supporting industry clusters and prioritizing the digitalization of these clusters, local governments can maximize the policy's effectiveness and drive digital transformation among firms within the region.

Second, it is important to recognize the influence of highly visible leading firms. Under the pressures of industrial digitalization and regional digitalization, the impact of leading firms is more pronounced. National and regional governments should focus on directing and supporting leading firms in their digital transformation initiatives. By capitalizing on the positive demonstration effects of successful firms, governments can foster a positive development of digitalization.

Third, managers should fully leverage the role of the institutional environment in facilitating digital transformation. They should actively follow digitalization trends in their industry and region, including regularly reviewing relevant policies, regulations, and incentives, and participating in industry forums. By leveraging these trends, managers can formulate strategies for their digital transformation. Embracing the opportunities provided by digitalization can enhance a firm's market position and competitive advantage.

5.4. Limitations and Future Research

Although the empirical findings of this paper are consistent with the theoretical predictions, there are some limitations. First, the research context is incomplete. The analysis in this study was based on data from Chinese listed companies from 2012 to 2020, thereby restricting the overall applicability of the research conclusions. Future studies could enhance this area by conducting comparative research in other emerging or developed economies.

Second, it is suggested to employ additional research methods, including the integration of meta-analysis and structural equation modeling (MASEM), to conduct a more in-depth analysis of the factors influencing mimetic behavior. This approach could further investigate the differences in digital mimetic isomorphism and the role of environmental factors between firms in developed and emerging economies.

Third, this study concentrates on investigating mimetic isomorphism behavior. The mechanisms driving organizational homogeneity are mimetic, normative, and coercive. However, this paper primarily focuses on imitative behavior, specifically within the realm of digitalization. This concentration is due to the substantial uncertainty associated with the decision-making process of digital transformation in enterprises, leading most companies to adopt learning through imitation from their industry counterparts. Subsequent research could explore the impact of institutional environments on normative and coercive isomorphism.

Author Contributions: Conceptualization, Y.C. and H.M.; methodology, Y.C. and T.Z.; software, Y.C. and T.Z.; validation, Y.C., H.M. and T.Z.; formal analysis, Y.C. and T.Z.; investigation, H.M.; resources, T.Z.; data curation, Y.C.; writing—original draft preparation, Y.C. and T.Z.; writing—review and editing, Y.C. and H.M.; visualization, Y.C. and H.M.; supervision, H.M.; project administration, H.M.; funding acquisition, H.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the National Natural Science Foundation of China under Grant 71973130 and 72272138 and the National Social Science Foundation of China under Grant 22AZD126.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data that support the findings of this study are available from the authors, upon reasonable request.

Conflicts of Interest: The authors declare no conflicts of interest.

Note

1 When the treatment variable refers to regional digitalization, the selected matching variable are firm size, firm age, seperation, ownership, CEO education, shareholding No. 1, asset return, and CEO tenure. Moreover, all results pass the matching balance test, signifying the significant value of the ATT.

References

Ando, Naoki. 2011. Isomorphism and foreign subsidiary staffing policies. *Cross Cultural Management: An International Journal* 18: 131–43. [CrossRef]

Anwar, Muhammad, Kayhan Tajeddini, and Rizwan Ullah. 2020. Entrepreneurial finance and new venture success—The moderating role of government support. *Business Strategy & Development* 3: 408–21. [CrossRef]

Argote, Linda, and Ella Miron-Spektor. 2011. Organizational Learning: From Experience to Knowledge. *Organization Science* 22: 1123–37. [CrossRef]

Brookes, Maureen, and Levent Altinay. 2017. Knowledge transfer and isomorphism in franchise networks. *International Journal of Hospitality Management* 62: 33–42. [CrossRef]

Brunnermeier, Markus, Simon Rother, and Isabel Schnabel. 2020. Asset Price Bubbles and Systemic Risk. *The Review of Financial Studies* 33: 4272–317. [CrossRef]

Cao, Shaopeng, Xin Cui, Jing Liao, Chunfeng Wang, and Shouyu Yao. 2024. A good neighbor, a found treasure: Do local neighbors affect corporate innovation? *Journal of Product Innovation Management* 4: 1–22. [CrossRef]

Chalmers, Dominic, Russell Matthews, and Amy Hyslop. 2021. Blockchain as an external enabler of new venture ideas: Digital entrepreneurs and the disintermediation of the global music industry. *Journal of Business Research* 125: 577–91. [CrossRef]

Chen, Limin, Jingya Liu, and Shilei Zhang. 2016. Influence of Mimetic lsomorphism on Firms' lnternationalization Performance Relationship-An Empirical Study Based on Legitimacy Perspective in Institutional Theory. *China Industrial Economics* 9: 127–43. [CrossRef]

Chen, Yujiao, Tiebo Song, and Jianbin Huang. 2022. Digital transformation of enterprises: Ls the company following peers in the same industry? Or in the same area? Research on decision process based on institutional theory. *Studies in Science of Science* 40: 1054–62. [CrossRef]

Chen, Yujiao, Rui Li, and Tiebo Song. 2023. Does TMT internationalization promote corporate digital transformation? A study based on the cognitive process mechanism. *Business Process Management Journal* 29: 309–38. [CrossRef]

Cheng, Zhuo, Arun Rai, Feng Tian, and Sean Xin Xu. 2021. Social Learning in Information Technology Investment: The Role of Board Interlocks. *Management Science* 67: 547–76. [CrossRef]

Chi, Maomao, Dingling Ye, Junjing Wang, and Shanshan Zhai. 2020. How Can Chinese Small-and Medium-sized Manufacturing Enterprises lmprove the New Product Development (NPD) Performance? From the Perspective of Digital Empowerment. *Nankai Business Review* 23: 63–75.

Correani, Alessia, Alfredo De Massis, Federico Frattini, Antonio Messeni Petruzzelli, and Angelo Natalicchio. 2020. Implementing a Digital Strategy: Learning from the Experience of Three Digital Transformation Projects. *California Management Review* 62: 37–56. [CrossRef]

Dai, Xiang, and Shuangzhi Yang. 2022. Digital Empowerment, Source of Digital Input and Green Manufacturing. *China Industrial Economics* 9: 83–101. [CrossRef]

DiMaggio, Paul J., and Walter W. Powell. 1983. The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review* 48: 147–60. [CrossRef]

Durand, Rodolphe, and Pierre-Antoine Kremp. 2016. Classical Deviation: Organizational and Individual Status as Antecedents of Conformity. *Academy of Management Journal* 59: 65–89. [CrossRef]

Francis, John, Cong Cong Zheng, and Ananda Mukherji. 2009. An Institutional Perspective on Foreign Direct Investment: A Multi-level Framework. *Management International Review* 49: 565–83. [CrossRef]

Giachetti, C. Claudio, and Salvatore Torrisi. 2018. Following or Running Away from the Market Leader? The Influences of Environmental Uncertainty and Market Leadership. *European Management Review* 15: 445–63. [CrossRef]

Gobble, MaryAnne M. 2018. Digital Strategy and Digital Transformation. *Research-Technology Management* 61: 66–71. [CrossRef]

Goldfarb, Avi, and Catherine Tucker. 2019. Digital Economics. *Journal of Economic Literature* 57: 3–43. [CrossRef]

Greenwood, Royston, Amalia Magán Díaz, Stan Xiao Li, and José Céspedes Lorente. 2010. The Multiplicity of Institutional Logics and the Heterogeneity of Organizational Responses. *Organization Science* 21: 521–39. [CrossRef]

Greve, Henrich R. 2009. Bigger and safer: The diffusion of competitive advantage. *Strategic Management Journal* 30: 1–23. [CrossRef]

Han, Shin-Kap. 1994. Mimetic Isomorphism and Its Effect on the Audit Services Market. *Social Forces* 73: 637–64. [CrossRef]

Hansen, Rina, and Kien Sia Siew. 2015. Hummel's Digital Transformation Toward Omnichannel Retailing: Key Lessons Learned. *MIS Quarterly Executive* 14: 51–66.

Hartmann, Dominik, Miguel R. Guevara, Cristian Jara-Figueroa, Manuel Aristarán, and César A. Hidalgo. 2017. Linking Economic Complexity, Institutions, and Income Inequality. *World Development* 93: 75–93. [CrossRef]

Haunschild, R. Pamela, and Anne S. Miner. 1997. Modes of Interorganizational Imitation: The Effects of Outcome Salience and Uncertainty. *Administrative Science Quarterly* 42: 472–500. [CrossRef]

Haveman, Heather A. 1993. Follow the Leader: Mimetic Isomorphism and Entry Into New Markets. *Administrative Science Quarterly* 38: 593. [CrossRef]

Heugens, Pursey P. M. A. R., and Michel W. Lander. 2009. Structure! Agency! (And Other Quarrels): A Meta-Analysis of Institutional Theories of Organization. *Academy of Management Journal* 52: 61–85. [CrossRef]

Hidalgo, César A., Bailey Klinger, Albert-Laszlo Barabási, and Romeu Hausmann. 2007. The Product Space Conditions the Development of Nations. *Science* 317: 482–87. [CrossRef]

Hinings, Bob, Thomas Gegenhuber, and Royston Greenwood. 2018. Digital innovation and transformation: An institutional perspective. *Information and Organization* 28: 52–61. [CrossRef]

Huang, Jimmy, Ola Henfridsson, Martin J. Liu, and Sue Newell. 2017. Growing on Steroids: Rapidly Scaling the User Base of Digital Ventures Through Digital Innovaton. *MIS Quarterly* 41: 301–14. [CrossRef]

Jiménez-Jiménez, Daniel, and Raquel Sanz-Valle. 2011. Innovation, organizational learning, and performance. *Journal of Business Research* 64: 408–17. [CrossRef]

Kern, Philipp, and Howard Gospel. 2023. The effects of strategy and institutions on value creation and appropriation in firms: A longitudinal study of three telecom companies. *Strategic Management Journal* 44: 343–66. [CrossRef]

Kesidou, Effie, James H. Love, Serdal Ozusaglam, and Chee Yew Wong. 2023. Changing the geographic scope of collaboration: Implications for product innovation novelty and commercialization. *Journal of Product Innovation Management* 40: 859–81. [CrossRef]

Khin, Sabai, and Theresa Cf Ho. 2018. Digital technology, digital capability and organizational performance: A mediating role of digital innovation. *International Journal of Innovation Science* 11: 177–95. [CrossRef]

Kolomeitsev, Sergei, Kristie J. N. Moergen, Jason W. Ridge, Dan L. Worrell, and Scott Kuban. 2024. Peer Response to Regulatory Enforcement: Lobbying by Non-Sanctioned Firms. *Journal of Management* 1–24. [CrossRef]

Kostova, Tatiana, and Srilata Zaheer. 1999. Organizational Legitimacy Under Conditions of Complexity: The Case of the Multinational Enterprise. *Academy of Management Review* 24: 64–81. [CrossRef]

Lai, Kee-Hung, Christina W. Y. Wong, and T. C. Edwin Cheng. 2006. Institutional isomorphism and the adoption of information technology for supply chain management. *Computers in Industry* 57: 93–98. [CrossRef]

Lai, Xiaobing, and Shujing Yue. 2022. Do Pilot Smart Cities Promote Corporate Digital Transformation? An Empirical Study Based on a Quasi-natural Experiment. *Foreign Economics & Management* 44: 117–33. [CrossRef]

Li, Chengguang, and K. Praveen Parboteeah. 2015. The effect of culture on the responsiveness of firms to mimetic forces: Imitative foreign joint venture entries into China, 1985–2003. *Journal of World Business* 50: 465–76. [CrossRef]

Li, Xinchun, Wenping Ye, and Hang Zhu. 2016. Trapped in or Free from the Cage: The Relationship between Regional Guanxi Culture and Guanxi Strategy of Entrepreneurial Firms. *Journal of Management World* 10: 88–102. [CrossRef]

Lieberman, Marvin B., and Shigeru Asaba. 2006. Why Do Firms Imitate Each Other? *Academy of Management Review* 31: 366–85. [CrossRef]

Liu, Guanyu, Jiaqi Liu, Ping Gao, Jiang Yu, and Zhengning Pu. 2024. Understanding mechanisms of digital transformation in state-owned enterprises in China: An institutional perspective. *Technological Forecasting and Social Change* 202: 123288. [CrossRef]

Liu, Yong, Nan Wang, and Juanjuan Zhao. 2018. Relationships between isomorphic pressures and carbon management imitation behavior of firms. *Resources, Conservation and Recycling* 138: 24–31. [CrossRef]

Luo, Jianqiang, and Qianwen Jiang. 2022. Priority evolution of product and service innovation under digital transformation-Based on the case of Haier smart home. *Studies In Science of Science* 40: 1710–20. [CrossRef]

Martínez-Noya, Andrea, and Esteban García-Canal. 2021. Innovation performance feedback and technological alliance portfolio diversity: The moderating role of firms' R&D intensity. *Research Policy* 50: 104321. [CrossRef]

Mizruchi, Mark S., and Lisa C. Fein. 1999. The Social Construction of Organizational Knowledge: A Study of the Uses of Coercive, Mimetic, and Normative Isomorphism. *Administrative Science Quarterly* 44: 653–83. [CrossRef]

Ni, Jiacheng, Qian Gu, and Huajing Li. 2023. The Later, the Slower, the Better? A Study on the Relationship Between lterative lnnovation and Entrepreneurial Outcomes of Digital Startups. *Nankai Business Review* 8: 1–22. Available online: http://kns.cnki.net/kcms/detail/12.1288.F.20230831.0915.002.html (accessed on 31 August 2023).

Nie, Jun, Xin Jian, Juanjuan Xu, Nuo Xu, Tangyang Jiang, and Yang Yu. 2024. The Effect of Corporate Social Responsibility Practices on Digital Transformation in China: A Resource-Based View. *Economic Analysis and Policy* 82: 1–15. [CrossRef]

Oh, Won-Yong, and Vincent L. Barker. 2018. Not All Ties Are Equal: CEO Outside Directorships and Strategic Imitation in R&D Investment. *Journal of Management* 44: 1312–37. [CrossRef]

Ozturk, Ayse, S. Tamer Cavusgil, and O. Cem Ozturk. 2021. Consumption convergence across countries: Measurement, antecedents, and consequences. *Journal of International Business Studies* 52: 105–20. [CrossRef]

Palmer, Donald A., P. Devereaux Jennings, and Xueguang Zhou. 1993. Late Adoption of the Multidivisional Form by Large U.S. Corporations: Institutional, Political, and Economic Accounts. *Administrative Science Quarterly* 38: 100–31. [CrossRef]

Petersen, Mitchell A. 2009. Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *The Review of Financial Studies* 22: 435–80. [CrossRef]

Posen, Hart E., Jan-Michael Ross, Brian Wu, Stefano Benigni, and Zhi Cao. 2023. Reconceptualizing Imitation: Implications for Dynamic Capabilities, Innovation, and Competitive Advantage. *Academy of Management Annals* 17: 74–112. [CrossRef]

Posen, Hart E., Jeho Lee, and Sangyoon Yi. 2013. The power of imperfect imitation. *Strategic Management Journal* 34: 149–64. [CrossRef]

Quinton, Sarah, Ana Canhoto, Sebastian Molinillo, Rebecca Pera, and Tribikram Budhathoki. 2018. Conceptualising a digital orientation: Antecedents of supporting SME performance in the digital economy. *Journal of Strategic Marketing* 26: 427–39. [CrossRef]

Rahmati, Pouya, Ali Tafti, J. Christopher Westland, and Cesar Hidalgo. 2021. When All Products Are Digital: Complexity and Intangible Value in the Ecosystem of Digitizing Firm. *MIS Quarterly* 45: 1025–58. [CrossRef]

Saesen, Julie, Corinna Vera Hedwig Schmidt, and Steffen Strese. 2024. The more, the better: The influence of overconfident CEOs on their firms' digital orientation. *Journal of Business Research* 183: 114809. [CrossRef]

Sarker, Suprateek, Sutirtha Chatterjee, Xiao Xiao, and Amany Elbanna. 2019. The Sociotechnical Axis of Cohesion for the IS Discipline: Its Historical Legacy and its Continued Relevance. *MIS Quarterly* 43: 695–719. [CrossRef]

Sarrina Li, Shu-Chu, and Chen-Yi Lee. 2010. Market uncertainty and mimetic isomorphism in the newspaper industry: A study of Taiwan's mainstream newspapers from 1992 to 2003. *Asian Journal of Communication* 20: 367–84. [CrossRef]

Shen, Kunrong, Jianwei Lin, and Yuanhai Fu. 2023. Network Infrastructure Construction, Information Accessibility and the lnnovation Boundaries of Enterprises. *China Industrial Economics* 1: 57–75. [CrossRef]

Strang, David, and Sarah A. Soule. 1998. Diffusion in Organizations and Social Movements: From Hybrid Corn to Poison Pills. *Annual Review of Sociology* 24: 265–90. [CrossRef]

Suchman, Mark C. 1995. Managing Legitimacy: Strategic and Institutional Approaches. *Academy of Management Review* 20: 571–610. [CrossRef]

Tang, Chang, Yuanyuan Xu, Yu Hao, Haitao Wu, and Yan Xue. 2021. What is the role of telecommunications infrastructure construction in green technology innovation? A firm-level analysis for China. *Energy Economics* 103: 105576. [CrossRef]

Tang, Jianyun, Mary Crossan, and W. Glenn Rowe. 2011. Dominant CEO, Deviant Strategy, and Extreme Performance: The Moderating Role of a Powerful Board. *Journal of Management Studies* 48: 1479–503. [CrossRef]

Triplett, Jack E. 1999. The Solow Productivity Paradox: What do Computers do to Productivity? *The Canadian Journal of Economics / Revue Canadienne d'Economique* 32: 309–34. [CrossRef]

Tseng, Jen-Jen, and Ping-Hung Chou. 2011. Mimetic isomorphism and its effect on merger and acquisition activities in Taiwanese financial industries. *The Service Industries Journal* 31: 1451–69. [CrossRef]

Wei, Jiang, Jialing Liu, and Yang Liu. 2021. New Trends and Problems of Innovation Strategy Theory in the Context of New Organization. *Journal of Management World* 37: 182–97+13. [CrossRef]

Wernsdorf, Kathrin, Markus Nagler, and Martin Watzinger. 2022. ICT, collaboration, and innovation: Evidence from BITNET. *Journal of Public Economics* 211: 104678. [CrossRef]

Wu, Fei, Huizhi Hu, Huiyan Lin, and Xiaoyi Ren. 2021. Enterprise Digital Transformation and Capital Market Performance: Empirical Evidence from Stock Liquidity. *Journal of Management World* 37: 130–44+10. [CrossRef]

Xie, Kang, Yao Wu, Jinghua Xiao, and Xuehua Liao. 2016. Strategic Risk Control in Organizational Change: A Multi-Case Study of Organizational Transformation towards Internet. *Journal of Management World* 2: 133–48. [CrossRef]

Xu, Qiong, Xin Li, and Fei Guo. 2023. Digital transformation and environmental performance: Evidence from Chinese resource-based enterprises. *Corporate Social Responsibility and Environmental Management* 30: 1816–40. [CrossRef]

Yang, Monica, and MaryAnne Hyland. 2012. Re-examining mimetic isomorphism: Similarity in mergers and acquisitions in the financial service industry. *Management Decision* 50: 1076–95. [CrossRef]

Ye, Dan, Meifang Yao, Baoshan Ge, and Liyi Zhao. 2023. The Mechanism of Digital Technology Driving Digital lnnovation Performance in Non-lnternet Enterprises: The Moderating Effect of Organizational Legitimacy. *Science & Technology Progress and Policy* 40: 11–18. [CrossRef]

Zhang, Jing A., Fiona Edgar, Alan Geare, and Conor O'Kane. 2016. The interactive effects of entrepreneurial orientation and capability-based HRM on firm performance: The mediating role of innovation ambidexterity. *Industrial Marketing Management* 59: 131–43. [CrossRef]

Zhang, Yongshen, Xiaobo Li, and Mingqiang Xing. 2021. Enterprise Digital Transformation and Audit Pricing. *Auditing Research* 3: 62–71. [CrossRef]

Zhao, Tao, Zhi Zhang, and Shangshen Liang. 2020. Digital Economy, Entrepreneurship, and High-Quality Economic Development: Empirical Evidence from Urban China. *Journal of Management World* 36: 65–76. [CrossRef]

Zhou, Yaying, Young-Seok Ock, Ibrahim Alnafrah, and Abd Alwahed Dagestani. 2023. What Aspects Explain the Relationship between Digital Transformation and Financial Performance of Firms? *Journal of Risk and Financial Management* 16: 479. [CrossRef]

Zimmerman, Monica A., and Gerald J. Zeitz. 2002. Beyond Survival: Achieving New Venture Growth by Building Legitimacy. *Academy of Management Review* 27: 414–31. [CrossRef]