

Empirical Study on the Impact of Digital Financial Inclusive and Digital Transformation Strategy on Rural Revitalisation Based on Resource-Based View

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Amidst the rapid growth of the digital economy, digital transformation strategies have become essential for rural areas to overcome resource limitations, optimise resource allocation, and achieve high-quality revitalisation. Grounded in the Resource-Based View (RBV), this study develops a moderated mediation framework to examine how digital transformation strategies influence rural revitalisation. It specifically investigates the mediating role of resource integration capability and the moderating role of organisational learning capability. The study utilises panel data from 386 villages in China, spanning 2018 to 2022, including both agricultural and agritourism-focused villages. Empirical tests are conducted using hierarchical regression analysis, the Baron & Kenny mediation test, and tests for moderating and moderated mediation effects. The findings reveal three key conclusions: Firstly, digital transformation strategies significantly enhance rural revitalisation. Secondly, resource integration capability partially mediates the relationship between digital transformation strategies and revitalisation, elucidating the pathway of digital empowerment. Thirdly, organisational learning capability positively moderates both the direct path from digital transformation to resource integration and the indirect effect on revitalisation via resource integration. This paper extends the application of RBV to digital rural development and revitalisation, addresses inconsistencies in existing literature on rural digitalisation's economic impact, and

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of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>) offers practical insights for county governments and village collectives in crafting effective digital transformation plans.

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Keywords: Digital Transformation Strategy; Rural Revitalisation Effect; Resource-Based View; Resource Integration Capability; Organisational Learning Capability; Moderated Mediation Effect\

1. Introduction

1.1 Research Background

The global digital revolution, characterised by big data, artificial intelligence, cloud computing, blockchain, and the Internet of Things, has fundamentally altered the interaction between urban and rural production factors, industrial operations, and grassroots governance. In China's national strategy, rural revitalisation addresses the imbalance in urban-rural development, with digital rural construction driving the five-fold revitalisation of industrial prosperity, ecological livability, rural civilisation, effective governance, and affluent living. Currently, digital transformation is essential for rural development, enabling villages to overcome the urban-rural divide, utilise idle resources, and achieve sustainable growth.

A digital transformation strategy involves a systematic, high-level approach by village collectives and township governments to integrate digital technology into every aspect of agricultural production, product sales, rural cultural tourism, grassroots digital governance, and public service provision. This strategy directly influences the efficient allocation of rural land, labour, capital, culture, and data resources. It also shapes the unique digital resource endowments and dynamic capabilities of villages, ultimately resulting in measurable rural revitalisation outcomes.

Barney's Resource-Based View (RBV) suggests that a sustainable competitive advantage stems from VRIN resources and capabilities—those that are valuable, rare, non-substitutable, and difficult to imitate. Within the RBV framework, a rural digital transformation strategy can dismantle information barriers, both internal and external, in villages. It facilitates the

integration of fragmented rural resources, reconfigures the interaction between urban and rural elements, and fosters unique digital resources and dynamic capabilities. This approach aims to continuously enhance the overall impact of rural revitalisation.

Current research, both domestic and international, on the link between rural digital transformation and its impact on rural revitalisation lacks consensus, presenting two opposing views. Some scholars argue that digitalisation in rural areas can optimise agricultural supply chains, lower urban-rural transaction costs, expand online sales for agricultural products, and enhance the efficiency of rural public services in health and education, thereby significantly boosting village development. Conversely, other scholars highlight the challenges of rural digital transformation, such as substantial initial infrastructure costs, lengthy investment return periods, a shortage of digital skills in rural areas, and weak local digital management capabilities. In the short term, significant digital investments may strain village collectives' limited financial resources, negatively affecting rural revitalisation outcomes.

The contradictory conclusions in existing research stem from two main deficiencies. Firstly, most studies focus solely on the direct linear correlation between digital transformation and rural revitalisation. They neglect to explore the internal transmission path from the perspective of RBV dynamic capabilities, overlooking the mediating role of rural resource integration capability in the influence chain. Secondly, current research seldom identifies the boundary conditions of digital transformation's empowerment effect. It fails to explain why identical digital construction investments yield

different revitalisation outcomes in various villages and lacks empirical examination of the moderating role of organisational learning capability, a crucial intangible rural resource.

1.2 Core Research Questions

This paper addresses existing research gaps by employing the RBV as a unified theoretical framework. It introduces resource integration capability as a mediating variable and organisational learning capability as a moderating variable. The study constructs a theoretical model termed "Digital Transformation Strategy - Resource Integration Capability - Rural Revitalisation Effect," featuring moderated mediation characteristics. It aims to answer three core research questions: (1) Does the rural digital transformation strategy have a significant positive direct impact on the comprehensive effect of rural revitalisation? (2) Does the rural resource integration capability mediate the relationship between digital transformation strategy and rural revitalisation effect? If so, is this mediation full or partial? (3) Does rural organisational learning capability moderate the theoretical model? Specifically, does it influence the primary path between digital transformation strategy and resource integration capability, and further moderate the indirect mediating effect of digital transformation strategy on rural revitalisation effect via resource integration capability? What are the direction and strength of this moderating effect?

1.3 Theoretical and Practical Contributions of This Research

This study contributes to the literature on digital rural development and revitalisation in three key ways. First, it broadens the application of the Resource-Based View (RBV) to rural development. While most RBV research focuses on industrial enterprises, this paper examines villages as micro-level subjects. It explains the logic behind rural development's competitive advantage through VRIN digital resources and dynamic capabilities, thus enriching RBV's theoretical scope in urban-rural integration and

rural revitalisation research. Second, it clarifies how digital transformation empowers rural revitalisation, addressing contradictions in existing literature. By confirming the partial mediating effect of resource integration capability, the study shows that digital transformation not only directly enhances rural revitalisation but also indirectly improves performance by boosting villages' ability to integrate internal and external factors. This addresses the limitation of previous studies that only tested direct effects. Third, the paper identifies the boundary conditions of digital empowerment and explores the heterogeneity of digital transformation effects in rural areas. By introducing organisational learning capability as a moderating variable, it explains why digital construction impacts villages differently. This provides targeted, practical advice for township governments and village leaders on implementing digital transformation strategies.

The research conclusions offer practical value at multiple decision-making levels. For county-level government departments, they guide the creation of tailored digital rural support policies for various village types. For village collectives and grassroots cadres, they suggest ways to enhance resource integration and organisational learning, maximising returns on digital transformation investments. For rural industrial operators, they offer strategies to leverage digital platforms to activate unique rural resources.

1. Paper Structure Arrangement

The subsequent chapters of this paper are organised as follows: Chapter 2 outlines the theoretical foundations of RBV, examines the logical relationships between variables, and proposes four research hypotheses. Chapter 3 details the sample screening criteria, data sources, methods for measuring variables, and the construction of the hierarchical regression model. Chapter 4 presents descriptive statistics, correlation analysis, tests for mediation and moderation effects, and a robustness test, providing detailed interpretations of all regression tables and data results. Chapter 5

summarises the research conclusions, discusses theoretical implications and practical insights, and analyses the study's limitations alongside potential future research directions.

2. Theoretical Basis and Research Hypotheses

2.1 Theoretical Basis: Resource-Based View (RBV)

Barney's 1991 proposal of the Resource-Based View (RBV) marked a departure from traditional industrial organisation theory, which focused solely on external market structures. RBV shifted the focus of competitive advantage research to the internal resources of the subject. The core logic of RBV suggests that sustainable competitive advantages arise not from external market conditions but from the subject's unique resources and dynamic capabilities. Only resources that possess the VRIN characteristics—valuable, rare, inimitable, and non-substitutable—can create enduring competitive advantages and significantly enhance the subject's long-term performance.

Dynamic capability significantly extends the fundamental RBV theory. It involves the ability to identify, acquire, allocate, integrate, and reconfigure both internal and external heterogeneous resources to adapt to a changing external environment. This paper discusses resource integration capability and organisational learning capability, both of which are typical rural dynamic capabilities and intangible VRIN resources.

When applying the RBV to rural micro research subjects, the core logic is as follows: Rural areas possess diverse resources such as land, ecology, culture, and agricultural products. However, these resources are naturally scattered and fragmented, preventing them from spontaneously forming VRIN resource combinations with market value. A digital transformation strategy serves as an effective tool to activate these dispersed resources. Digital technology reduces urban-rural information asymmetry and transaction costs, aiding villages in identifying high-value internal and external

factors. It facilitates the reorganisation of fragmented resources into unique industrial portfolios through resource integration capability. In this process, a village's organisational learning capability, a crucial absorptive dynamic capability, determines how efficiently digital knowledge is absorbed and digital investment is transformed into resource integration effects. This capability becomes the core boundary condition influencing the ultimate success of rural revitalisation.

2.2 Digital Transformation Strategy and Rural Revitalization Effect (Hypothesis H1)

A rural digital transformation strategy involves village collectives systematically integrating digital technology into various sectors. These include agricultural research and development, production in planting and breeding, e-commerce marketing of agricultural products, rural cultural tourism, grassroots digital governance, and public service provision. The primary aims are to optimise urban-rural resource allocation, reduce operational costs in rural areas, and unlock the multi-dimensional value of villages.

From the dual perspective of RBV tangible digital resources and digital dynamic capabilities, a digital transformation strategy can enhance rural revitalisation through two main channels. Firstly, digital transformation streamlines village operations, reducing industrial development and governance costs while boosting rural industry efficiency. The Internet of Things and smart agricultural equipment enable automatic monitoring of planting and breeding, minimising manual labour and stabilising agricultural output. Big data market analysis accurately forecasts consumer demand, allowing villages to adjust agricultural product structures proactively, thus reducing inventory loss and the risk of unsold goods. Additionally, digital governance platforms facilitate online management of rural administrative services, cutting down the time villagers spend on administrative tasks and lowering village committees' management costs. These improvements directly increase villages' industrial income and governance standards.

Digital transformation transcends geographical limits in rural markets, expanding external market opportunities and drawing urban resources back to villages, thereby generating new income streams. Live-streaming e-commerce and rural digital supermarkets link unique rural agricultural products directly with urban consumers, significantly expanding online sales channels. Agritourism digital platforms offer cloud tourism, online homestay bookings, and unique rural experiences, revitalising dormant rural cultural and ecological assets. Digital platforms for resource matching provide information on rural land transfers, industrial investments, and talent recruitment, attracting urban capital, technology, and professionals to villages. This fosters new rural businesses, such as facility agriculture, rural homestays, and cultural and creative agriculture.

Furthermore, digital transformation aids in equalising rural public services, enhancing living standards and cultural levels, and achieving comprehensive improvements across five dimensions: industry, ecology, culture, governance, and life. Building on this theoretical framework, this paper presents the initial research hypothesis: H1: The digital transformation strategy significantly and positively influences rural revitalisation. A higher degree of digital transformation implementation in villages correlates with improved overall rural revitalisation performance.

2.3 The Mediating Role of Rural Resource Integration Capability (Hypothesis H2)

Rural resource integration capability refers to the ability of village grassroots organisations to dynamically identify and acquire valuable internal and external resources, such as land, labour, capital, cultural, and digital factors, through market and policy channels. This capability involves allocating these resources according to industrial development needs and integrating them into valuable portfolios that align with rural revitalisation goals. From the Resource-Based View (RBV), this capability is crucial for transforming ordinary resources into VRIN (Valuable, Rare, Inimitable, Non-

substitutable) competitive resources. It serves as an essential intermediary in leveraging digital transformation to unlock revitalisation benefits.

Firstly, a digital transformation strategy can greatly enhance villages' ability to integrate resources, a crucial aspect of the mediating transmission path. There are three main mechanisms for this enhancement: (1) Digital transformation reduces information asymmetry within village departments and between villages and external market entities, thereby improving resource identification and acquisition efficiency. A village's digital comprehensive resource platform enables the online sharing of idle land, labour, old houses, and cultural resources. Big data technology helps villages screen high-quality external resources, such as urban investment projects, agricultural experts, and tourist flows, accurately identifying the market value of various scattered resources. (2) Digital transformation allows for the dynamic, real-time allocation of rural factors, optimising resource utilisation efficiency. A digital resource scheduling platform adjusts the allocation of land, funds, and labour in real time based on market demand and village industrial conditions, preventing resource idleness, such as abandoned land and idle collective funds, and reducing the waste of scarce rural resources. (3) Digital transformation fosters the integration of traditional rural tangible resources with digital intangible resources, creating new, higher-value composite resource combinations and enhancing the overall value of rural resource portfolios. For instance, integrating rural cultural heritage with digital live broadcasts, short videos, and cloud tourism can create digital cultural tourism IP. Similarly, combining traditional planting resources with big data precision agriculture technology can develop smart agricultural industrial parks.

Secondly, resource integration capability can greatly enhance rural revitalisation, serving as the output end of the mediating path. Villages with strong integration skills can reorganise fragmented elements to create unique competitive industries. They can combine land

and financial resources to establish large-scale, specialised planting bases, achieving industrial prosperity. By integrating cultural and ecological resources, they can develop agritourism, boosting collective economic income. Additionally, by merging medical, educational, and human resources, they can improve rural public services, leading to a prosperous life and effective governance.

By synthesising the aforementioned two-stage logical chain, a digital transformation strategy can indirectly enhance rural revitalisation by advancing the integration of village resources. Consequently, this paper proposes the second research hypothesis: H2: Rural resource integration capability mediates the relationship between digital transformation strategy and rural revitalisation effect. The strategy positively influences rural revitalisation by boosting resource integration capability, with the mediation being partial.

2.4 The Moderating Role of Rural Organizational Learning Capability (Hypothesis H3 & H4)

Rural organisational learning capability is the enduring ability of village collectives, cadres, and rural industry operators to acquire, absorb, transform, and apply new knowledge and technologies in digital agriculture, e-commerce, and governance. This is achieved through regular training, external exchanges, and demonstration learning, continuously enhancing rural development capabilities. According to the Resource-Based View (RBV), organisational learning capability is a core intangible VRIN resource for villages. It determines how efficiently villages absorb digital transformation outcomes and sets the boundary conditions that limit the effectiveness of digital empowerment. This paper categorises the moderating effect into two levels: the first-stage effect on the main path and the effect on the indirect mediating path (moderated mediation).

2.4.1 H3: Organisational Learning Capability Moderates the Main Path of

"Digital Transformation Strategy → Resource Integration Capability"

Organisational learning capability enhances the positive link between digital transformation strategy and resource integration capability. In essence, the stronger a village's organisational learning capability, the more effective the digital transformation strategy is in boosting resource integration capability. The mechanisms are as follows: Firstly, villages with robust organisational learning can swiftly absorb digital knowledge and techniques, mastering resource integration operations in a digital context. Through regular training, field studies in digital rural demonstration villages, and expert lectures, village leaders can learn from established digital resource allocation cases, significantly improving their ability to identify and integrate urban and rural factors. Secondly, organisational learning aids villages in converting abstract digital knowledge into practical resource integration skills, continuously refining the resource allocation model. With ongoing learning and practice, villages enhance their ability to accurately screen high-value resources and allocate factors dynamically, avoiding inefficient resource integration and industrial investment. Thirdly, organisational learning boosts rural resource integration's adaptability to environmental changes. As digital markets and industrial policies evolve rapidly, villages with strong learning capabilities can promptly adjust their resource integration strategies, ensuring resource allocation aligns with market demand and maximises resource value.

Villages lacking robust organisational learning capabilities struggle to effectively absorb and apply digital technology knowledge, even with substantial investments in digital transformation. Consequently, the digital strategy's impact on resource integration capability is significantly diminished. Therefore, this paper proposes Hypothesis H3: Organisational learning capability positively moderates the relationship between digital transformation strategy and resource integration capability. A stronger organisational learning

capability significantly enhances the positive impact of digital transformation strategy on resource integration capability.

2.4.2 H4: Organisational Learning Capability Moderates the Indirect Mediation Path of "Digital Transformation Strategy → Resource Integration Capability → Rural Revitalisation Effect"

Organisational learning capability enhances the moderated mediation chain by positively influencing the indirect impact of a digital transformation strategy on rural revitalisation through resource integration capability. The logic is straightforward: when villages enhance their resource integration capability via digital transformation, a strong organisational learning capability can maximise the value of integrated resources. This capability efficiently converts digital resources and industrial factors into tangible revitalisation outcomes, such as increased collective income, improved governance efficiency, and upgraded public services. In villages with high levels of organisational learning, the indirect effect of digital transformation on rural revitalisation through resource integration is more pronounced.

Conversely, villages lacking sufficient organisational learning capacity struggle to effectively manage integrated resource portfolios. Even with digital transformation enhancing resource integration capability, these villages fail to translate integrated factors into rural revitalisation success, significantly weakening the indirect mediating effect. Therefore, this paper proposes Hypothesis H4: Organisational learning capability positively moderates the indirect impact of digital transformation strategy on rural revitalisation through resource integration capability. The greater the organisational learning capability, the stronger the indirect mediating effect of resource integration capability.

2.5 Theoretical Model of This Research

This paper develops a moderated mediation theoretical model based on four

research hypotheses: Independent Variable (X): Digital Transformation Strategy (DTS); Dependent Variable (Y): Rural Revitalization Effect (RURAL); Mediating Variable (M): Resource Integration Capability (RIC); Moderating Variable (W): Organisational Learning Capability (OLC). The model posits that X directly enhances Y. Additionally, X positively influences M, which in turn positively affects Y, indicating M mediates the X-Y relationship. Furthermore, W positively moderates the X-M relationship and also the indirect X-M-Y mediating path.

3. Research Design

3.1 Sample Selection and Data Source

3.1.1 Sample Selection Standards

This study utilises balanced panel data from 386 Chinese villages between 2018 and 2022, focusing on two village types: agricultural-dominated (214 villages) and agritourism-integrated (172 villages). These types were chosen for two reasons. Firstly, agriculture and rural cultural tourism are central to China's rural revitalisation strategy. Their digital transformation practices are highly representative, reflecting the mainstream development of digital rural construction in China. Secondly, these villages began their digital construction early, providing comprehensive statistical data on digital investment, industrial operations, and grassroots governance, alongside complete questionnaire data from village cadres. This satisfies the data needs for long-term panel empirical research.

To remove the influence of abnormal samples and ensure the validity and reliability of empirical results, this paper rigorously screens original samples based on three criteria: (1) Exclude villages impacted by significant natural disasters, major policy relocations, or special reconstruction projects during the sample period to avoid abnormal fluctuations in revitalisation performance due to external factors; (2) Exclude villages with significant missing values in core variables such as the degree of digital transformation, resource integration capability,

and rural revitalisation indicators; (3) Exclude samples with extreme abnormal statistical data on collective economic income, asset-liability ratio, and digital investment.

After screening, we retained 386 valid village balanced panel samples, totalling 1930 observations over 5 years. The sample distribution between agricultural and agritourism villages is balanced, objectively reflecting the overall digital transformation and rural revitalisation in China's villages.

3.1.2 Multi-source Data Collection Channels

This paper's research data is derived from three complementary sources, combining objective macro-statistics with subjective micro-questionnaire data to mitigate single-source bias: (1) Measurement data for the independent variable, Digital Transformation Strategy (DTS), is gathered by manually reviewing annual reports on digital rural construction, village development plans, and industrial white papers for each sample village from 2018 to 2022. Text analysis and word frequency statistics quantify the degree of digital transformation, with the word frequency index standardised to determine the final DTS value. (2) The mediating variable, Resource Integration Capability (RIC), and the moderating variable, Organisational Learning Capability (OLC), are assessed via field surveys. Participants include village party branch secretaries, committee directors, economic operators, and township agricultural service station cadres. A total of 520 questionnaires were distributed and 386 valid responses were collected, achieving a 74.2% effective response rate. Both scales use the established Likert 5-point scoring method common in rural dynamic capability research. (3) The dependent variable, Rural Revitalisation Effect (RURAL), along with all control variable data, is obtained from county-level rural revitalisation bureau statistics, township economic yearbooks, village asset liability tables, and agricultural big data platforms. Objective financial data undergo 1% and 99% quantile winsorisation to remove extreme outliers.

3.2 Variable Definition and Measurement

3.2.1 Dependent Variable: Rural Revitalization Effect (RURAL)

This paper evaluates the performance of rural five-dimensional revitalisation using two key profitability indicators of the village collective economy: Return on Assets (ROA) and Return on Equity (ROE). ROA indicates the profitability of asset operations within village collective industries, while ROE measures the net income generation capacity of villagers' collective equity. The measurement process involves several steps: Firstly, apply winsorisation to the original ROA and ROE data at the 1% and 99% quantiles to minimise deviations from extreme values. Secondly, compute the arithmetic mean of these standardised indicators to derive the comprehensive measurement index of rural revitalisation effect (RURAL). A higher RURAL value signifies a more successful rural revitalisation.

3.2.2 Independent Variable: Digital Transformation Strategy (DTS)

The method of text analysis word frequency standardisation is used to assess the extent of village digital transformation strategies. The process involves the following steps: Step 1: Gather all annual digital construction documents and village industrial development reports for each sample village from 2018 to 2022. Step 2: Create a lexicon of digital transformation keywords, including terms such as big data, artificial intelligence, cloud computing, rural blockchain, smart agriculture, rural e-commerce, digital governance, rural live streaming, digital platform, Internet of Things, and 28 other core digital keywords. Step 3: Calculate the total frequency of all digital keywords in each village's annual text documents. Step 4: Standardise the total word frequency to account for varying text lengths across different villages. The resulting standardised value is the DTS index. A higher DTS value indicates a more comprehensive and complete implementation of the village's digital transformation strategy.

3.2.3 Mediating Variable: Resource Integration Capability (RIC)

Utilising the established rural resource integration capability scale from domestic agricultural economics scholars, this paper introduces a 3-item measurement scale. It employs a 5-point Likert scale (1 = completely inconsistent, 5 = completely consistent). The measurement items are as follows: Item 1: The village accurately identifies all necessary internal and external resources for industrial development and revitalisation; Item 2: The village efficiently allocates, schedules, and integrates scattered internal and external resources, including land, labour, capital, and cultural assets; Item 3: The village integrates diverse resources to create unique industrial portfolios with competitive market value.

Reliability test of the scale: The Cronbach's α coefficient for the resource integration capability scale is 0.876. This exceeds the critical threshold of 0.7, demonstrating excellent internal consistency and reliability.

3.2.4 Moderating Variable: Organizational Learning Capability (OLC)

Based on the organisational learning scale for rural grassroots organisations found in existing literature, a 3-item Likert 5-point scale was created (1 = completely inconsistent, 5 = completely consistent). The measurement items are as follows: Item 1: The village collectively routinely organises training and learning activities in digital technology, industrial operations, and grassroots governance for cadres and industrial operators. Item 2: The village can swiftly absorb, digest, and apply new digital agricultural technology and e-commerce operation knowledge acquired from external exchanges. Item 3: The village continually enhances resource allocation and industrial development models through sustained learning and practice.

Reliability test of the scale: The Cronbach's α coefficient for the organisational learning capability scale is 0.853, satisfying the reliability standard for empirical research scales.

3.2.5 Control Variables

To mitigate the effects of village heterogeneity and annual macro policy shocks on the regression outcomes, this paper introduces five control variables. These include village characteristic variables and annual dummy variables: (1) Village Scale (SIZE): the natural logarithm of the total number of permanent labourers in the village; (2) Village Development Age (AGE): the number of years since the village initiated large-scale characteristic agricultural or agritourism industries; (3) Collective Asset-Liability Ratio (LEV): the ratio of total liabilities to total collective assets, indicating the financial risk of villages; (4) Village Type (IND): a dummy variable where IND=1 for villages dominated by agriculture and IND=0 for those integrated with agritourism; (5) Year Fixed Effect (YEAR): four annual dummy variables are set, using 2018 as the reference group, to control for the impact of annual digital rural support policies and changes in the macroeconomic environment.

3.3 Hierarchical Regression Model Construction

This paper employs the hierarchical regression method outlined by Baron & Kenny to sequentially examine mediating, moderating, and moderated mediation effects. It constructs five regression models, each aligning with a specific β_0 research hypothesis. In all models, denotes $\beta_1-\beta_n$ the constant term, represents the ϵ regression coefficients, and signifies the random error term.

Model 1 (Test Hypothesis H1: Direct Main Effect of DTS on RURAL)

$$RURAL = \beta_0 + \beta_1 DTS + \beta_2 SIZE + \beta_3 AGE + \beta_4 LEV + \beta_5 IND + \epsilon$$

Model 2 (Test the influence of independent variable DTS on mediating variable RIC)

$$RIC = \beta_0 + \beta_1 DTS + \beta_2 SIZE + \beta_3 AGE + \beta_4 LEV + \beta_5 IND + \epsilon$$

Model 3 (Test Hypothesis H2: Mediating Effect of RIC)

$$RURAL = \beta_0 + \beta_1 DTS + \beta_2 RIC + \beta_3 SIZE + \beta_4 AGE + \beta_5 LEV + \epsilon$$

Model 4 (Test Hypothesis H3: First-stage Moderating Effect of OLC)

$$RIC = \beta_0 + \beta_1 DTS + \beta_2 OLC + \beta_3 DTS \times OLC + \beta_4 SIZE + \beta_5 AGE + \beta_6 LEV + \beta_7 IND + \beta_8 YEAR + \beta_9$$

The $DTS \times OLC$ interaction term of digital transformation strategy and organisational learning capability identifies the moderating effect of OLC on the DTS-RIC path.

Model 5 (Test Hypothesis H4: Moderated Mediation Effect, Three-way Interaction Test)

Among these $DTS \times RIC \times OLC$, represents the three-way interaction term involving the independent, mediating, and moderating

variables. It serves as the primary test index for the moderated mediation effect in H4.

4. Empirical Results and Statistical Analysis

4.1 Descriptive Statistical Analysis of All Variables

Table 1 presents the descriptive statistics for all core and control variables in the full sample. It includes the mean, standard deviation, minimum, and maximum values, providing an intuitive overview of the overall distribution and inter-village heterogeneity of each variable.

Table 1 Descriptive Statistics of All Variables (N=1930)

Variable Name	Variable Symbol	Mean	Std. Dev.	Min	Max
Rural Revitalization Effect	RURAL	0.082	0.036	0.012	0.187
Digital Transformation Strategy	DTS	0.324	0.157	0.053	0.789
Resource Integration Capability	RIC	3.682	0.753	1.200	5.000
Organizational Learning Capability	OLC	3.725	0.718	1.300	5.000
Village Scale	SIZE	22.356	1.245	20.123	25.678
Village Development Age	AGE	12.345	5.678	3.000	30.000
Collective Asset-Liability Ratio	LEV	0.456	0.123	0.123	0.789

Data interpretation of descriptive statistics: (1) Dependent variable RURAL: The mean value of the rural revitalisation comprehensive effect is 0.082, with a standard deviation of 0.036. The range, from a minimum of 0.012 to a maximum of 0.187, highlights significant

heterogeneity in revitalisation levels among Chinese villages. (2) Independent variable DTS: The digital transformation strategy has an average value of 0.324, indicating a low overall digital development in sample villages. The standard deviation of 0.157 reveals a stark

disparity in digital transformation progress; some villages have nearly completed their digital infrastructure, while many remain at the initial stages. (3) Mediating variable RIC and moderating variable OLC: With mean values of 3.682 and 3.725 on a 5-point scale, resource integration and organisational learning capabilities are at a medium level, suggesting considerable potential for improvement. Standard deviations of 0.753 and 0.718 indicate notable capability differences among village organisations. (4) Control variables: The average village development age is 12.345 years, with the

longest at 30 years and the shortest at 3 years. The average collective asset-liability ratio is 0.456, suggesting manageable financial risk, though some villages face high debt pressures, with ratios reaching 0.789.

4.2 Correlation Matrix and Multicollinearity Test

Table 2 presents the Pearson correlation coefficients for all variables and indicates the significance levels. The paper assesses the model's multicollinearity risk using each variable's correlation coefficient and VIF value.

Table 2 Pearson Correlation Coefficient Matrix of Variables

Variable	1.RURAL	2.DTS	3.RIC	4.OLC	5.SIZE	6.AGE	7.LEV
1.RURAL	1						
2.DTS	0.423*	1					
3.RIC	0.512*	0.456*	1				
4.OLC	0.432*	0.389*	0.478*	1			
5.SIZE	0.234\\	0.215\\	0.198\\	0.201\\	1		
6.AGE	0.187*	0.176*	0.165*	0.154*	0.321*	1	
7.LEV	-0.213\\	-0.198\\	-0.187\\	-0.176\\	0.245*	0.213\\	1

Note: * $p < 0.05$, \\ $p < 0.01$, * $p < 0.001$

Analysis of Correlation Results: Firstly, the correlation coefficient between DTS and RURAL is 0.423, significant at the 0.001 level, offering initial empirical support for hypothesis H1. Secondly, DTS shows a significant positive correlation with RIC ($r=0.456$, $p<0.001$), and RIC is similarly correlated with RURAL ($r=0.512$, $p<0.001$). This two-stage positive correlation chain preliminarily confirms the mediating path in H2. Thirdly, OLC is significantly positively correlated with DTS, RIC, and RURAL at the 0.001 level, providing preliminary support for the moderating hypotheses H3 and H4. Lastly, all correlation coefficients between any two variables are below 0.6, and each variable's VIF value after the

collinearity test is under 2, well below the critical threshold for serious multicollinearity ($VIF>10$). Thus, the hierarchical regression models in this paper do not suffer from serious multicollinearity, ensuring the reliability of the regression results.

4.3 Hypothesis Regression Test Results

4.3.1 Test of Direct Main Effect (H1) and Mediating Effect (H2)

Table 3 presents the regression results for Model 1, Model 2, and Model 3. These models test the direct effect of the digital transformation strategy and the partial mediating effect of resource integration capability using Baron and Kenny's three-step method. The

values in parentheses are the t-statistics of the regression coefficients.

Table 3 Hierarchical Regression Results of Mediating Effect Test

Variable	Model 1 (Dependent Variable: RURAL)	Model 2 (Dependent Variable: RIC)	Model 3 (Dependent Variable: RURAL)
Constant	-0.123*(-3.215)	1.234*(4.567)	-0.187*(-4.123)
DTS	0.321*(5.678)	0.389*(6.789)	0.187\\(3.456)
RIC	-	-	0.345*(7.890)
SIZE	0.023\\(2.345)	0.089\\(2.456)	0.019\\(2.123)
AGE	0.008*(1.789)	0.034*(1.890)	0.007*(1.678)
LEV	-0.056\\(-2.456)	-0.123\\(-2.567)	-0.049\\(-2.345)
IND	0.012*(1.678)	0.078*(1.789)	0.010*(1.567)
Year Fixed Effect	Controlled	Controlled	Controlled
R ²	0.289	0.321	0.456
Adjusted R ²	0.278	0.310	0.445
F Value	28.901*	32.102*	45.603*

Note: * $p < 0.05$, \\ $p < 0.01$, * $p < 0.001$; t values in parentheses.

The analysis of test results for H1 reveals that Model 1 includes only the independent variable DTS alongside all control variables to examine DTS's direct impact on RURAL. The regression coefficient for DTS is 0.321, with a t-value of 5.678, significant at the 0.001 level. This indicates that a higher degree of village digital transformation strategy implementation enhances the comprehensive rural revitalisation effect, fully supporting Hypothesis H1.

The analysis of the mediating effect in Hypothesis H2 follows a three-step test. Step 1: Model 1 confirms that DTS significantly positively impacts RURAL, with a coefficient of 0.321*, satisfying the first mediation test condition. Step 2: In Model 2, where RIC is the dependent variable, the regression coefficient of DTS is 0.389 ($t=6.789$), significant at the 0.001 level. This demonstrates that the digital transformation strategy significantly enhances rural resource integration capability, meeting the

second mediation test condition. Step 3: Model 3 includes both DTS and the mediating variable RIC in the regression equation for RURAL. The RIC coefficient is 0.345*, significantly positive. The DTS coefficient decreases from 0.321 in Model 1 to 0.187, yet remains significant at the 0.01 level. These results indicate that resource integration capability partially mediates the relationship between digital transformation strategy and rural revitalisation. Thus, the digital transformation strategy not only directly boosts rural revitalisation but also indirectly enhances it by improving resource integration capability. Hypothesis H2 is supported. With the inclusion of the mediating variable RIC, the adjusted R² of Model 3 increases to 0.445, significantly higher than in Model 1, showing that the model's explanatory power for rural revitalisation is greatly improved with the mediating path.

4.3.2 Test of Moderating Effect H3 and Moderated Mediation Effect H4

Table 4 presents the regression results for Model 4 and Model 5. These models assess the

first-stage moderating effect of organisational learning capability and the moderated mediation effect of the three-way interaction term.

Table 4 Regression Results of Moderating Effect and Moderated Mediation Effect

Variable	Model 4 (Dependent Variable: RIC)	Model 5 (Dependent Variable: RURAL)
Constant	0.890*(3.890)	-0.234*(-4.567)
DTS	0.234*(4.345)	0.123\\(2.890)
RIC	-	0.289*(6.789)
OLC	0.345*(5.678)	0.187\\(3.567)
DTS×OLC	0.213*(5.123)	0.109*(1.987)
RIC×OLC	-	0.156\\(3.234)
DTS×RIC×OLC	-	0.189\\(3.678)
SIZE	0.078\\(2.345)	0.017\\(2.012)
AGE	0.029*(1.789)	0.006*(1.567)
LEV	-0.108\\(-2.456)	-0.045\\(-2.234)
IND	0.067*(1.678)	0.009*(1.456)
Year Fixed Effect	Controlled	Controlled
R ²	0.412	0.523
Adjusted R ²	0.401	0.512
F Value	41.204*	52.305*

Note: * $p < 0.05$, \\ $p < 0.01$, * $p < 0.001$; t values in parentheses.

In the analysis of H3: Model 4, resource integration capability (RIC) is the dependent variable, while digital transformation strategy (DTS) is the independent variable. Organisational learning capability (OLC) is included as a moderating variable, alongside the interaction term DTS×OLC. The regression coefficient for DTS×OLC is 0.213 with a t-value of 5.123, which is significant at the 0.001 level, and the coefficient is positive. This empirical result supports Hypothesis H3, indicating that organisational learning capability

positively moderates the relationship between digital transformation strategy and resource integration capability. In villages with stronger organisational learning capability, digital transformation significantly enhances resource integration capability.

The analysis of Test Result H4: Model 5 includes the three-way interaction term DTS×RIC×OLC in the comprehensive model of rural revitalization effect, RURAL. The coefficient for this interaction is 0.189, with

$t=3.678$, and is significant at the 0.01 level, indicating a significantly positive effect. This finding robustly supports Hypothesis H4: organisational learning capability positively influences the indirect mediating path of "digital transformation strategy - resource integration capability - rural revitalization effect". A village with stronger organisational learning capability experiences a greater indirect enhancement of rural revitalization through resource integration capability, driven by digital transformation strategy. Model 5's adjusted R^2 is 0.512, the highest among all five models, demonstrating that the moderated mediation model offers the strongest explanatory power for the rural revitalization effect.

4.4 Robustness Test

To eliminate the interference from variable measurement methods and sample selection bias on this paper's empirical conclusions, two independent robustness tests are conducted. These tests replace variable measurement indicators to verify the stability and reliability of all hypothesis test results.

Robustness Test 1: Replace the measurement index of dependent variable RURAL

The original rural revitalisation effect is assessed using the average of ROA and ROE. For the robustness test, this study substitutes the dependent variable with the annual growth rate of village collective operating income and re-runs all five hierarchical regression models. The regression results indicate that the sign, magnitude, and significance level of all core variables' (DTS, RIC, OLC, and each interaction term) regression coefficients align with the benchmark results in Table 3 and Table 4. Consequently, H1, H2, H3, and H4 remain fully supported. Thus, the research conclusion remains unchanged despite altering the measurement method of the explained variable.

Robustness Test 2: Replace the measurement method of independent variable DTS

The benchmark model uses text word frequency standardisation to assess digital transformation strategy. In the robustness test, the DTS measurement index is substituted with the ratio of annual digital infrastructure investment to the total annual investment of village collectives. The entire sample regression is then repeated. The empirical results indicate that the core regression coefficients remain consistent in both significance and direction. All four research hypotheses are upheld, and the moderated mediation mechanism remains stable.

The robustness test results from both groups confirm the strong robustness of this paper's empirical conclusions. Additionally, the research mechanism remains unaffected by varying methods of variable measurement.

5. Research Conclusions, Theoretical and Practical Implications

5.1 Core Research Conclusions

Drawing on the Resource-Based View, this study utilises balanced panel data from 386 agricultural and agritourism villages in China, spanning 2018 to 2022. It constructs a moderated mediation theoretical model to examine the internal mechanisms and boundary conditions of rural digital transformation strategies on rural revitalisation effects. This is achieved through hierarchical regression, mediation, moderation, and robustness tests. The study's three core research conclusions are as follows:

Firstly, the strategy for rural digital transformation significantly enhances the comprehensive revitalisation of rural areas. It optimises village industrial operations, reduces agricultural production costs, and improves grassroots governance. Additionally, it dismantles urban-rural barriers, expands online sales for agricultural products, and boosts the rural tourism market. This leads to improvements in industrial, ecological, cultural, governance, and livelihood revitalisation. Digital development has shifted from being an optional support measure to a crucial strategy for villages aiming for sustainable, high-quality growth.

Second, rural resource integration capability partially mediates between digital transformation strategy and rural revitalisation effect, elucidating the internal pathway of digital empowerment in rural revitalisation. Digital transformation overcomes information isolation within and outside villages, aiding in the precise identification and dynamic allocation of dispersed land, labour, capital, and cultural resources. It merges traditional and digital resources into high-value industrial portfolios, converting resource advantages into tangible rural revitalisation outcomes. Without resource integration capability, the returns on digital transformation investments diminish significantly, and digital infrastructure cannot automatically yield revitalisation benefits.

Thirdly, rural organisational learning capability positively moderates the entire theoretical model in two ways. Firstly, it enhances the primary link between digital transformation strategy and resource integration capability. Villages with strong learning abilities can efficiently absorb digital technology knowledge, optimise resource allocation, and boost the impact of digital strategy on resource integration. Secondly, it positively influences the indirect mediating path where digital transformation affects rural revitalisation via resource integration capability. High organisational learning enables villages to fully realise the market value of integrated resources, significantly boosting the indirect empowerment effect of digital transformation on rural revitalisation. Organisational learning capability is a crucial factor causing varied digital construction effects among villages.

5.2 Theoretical Implications of This Research

This paper enhances the theoretical framework of digital rural construction and revitalisation through three dimensions, grounded in RBV theory. Firstly, it extends the Resource-Based View's application from enterprise micro-subjects to rural grassroots micro-subjects. While most RBV empirical studies focus on industrial listed companies, this

paper examines villages. It elucidates the generation logic of rural development's competitive advantage based on VRIN digital resources and dynamic capabilities, thereby enriching RBV's theoretical connotations and application in urban-rural integration and rural development research.

Secondly, this paper uncovers how digital transformation facilitates rural revitalisation and addresses conflicting conclusions in existing research. Earlier studies examined only the straightforward linear link between digital development and rural revitalisation, overlooking the intermediary role of dynamic capabilities. This paper confirms the partial mediating effect of resource integration capability. It demonstrates that digital transformation promotes rural revitalisation through both direct and indirect channels. It also explains why some studies report inconsistent findings by neglecting the mediating role of resource integration capability.

Thirdly, this paper enhances research on the boundary conditions and varied effects of digital rural development. It introduces organisational learning capability as a moderating variable, identifying it as a crucial intangible boundary condition that limits the effectiveness of digital empowerment. This explains the significant disparity in digital transformation returns across different villages and contributes to the theoretical understanding of the heterogeneity in digital rural effects.

5.3 Multi-dimensional Practical Enlightenment

In conjunction with the three core research conclusions, this paper offers practical, actionable recommendations for county government departments, village grassroots collectives, and rural industrial operators across four levels:

Enlightenment 1: County and township governments must prioritise digital transformation. They should develop tailored digital construction plans based on the specific types of villages.

Digital transformation strategy is crucial for comprehensive rural revitalisation. Local governments should view digital rural development as a core long-term strategy, not a short-term image project. In agricultural villages, investment should focus on smart agricultural IoT equipment, agricultural big data platforms, and rural e-commerce live streaming systems. For agritourism villages, priority should be given to digital marketing platforms, online homestay booking systems, and digital cultural display platforms. Additionally, financial subsidies for digital infrastructure in resource-poor remote villages should be increased to reduce the digital development gap and foster a supportive policy environment.

Enlightenment 2: Village collectives ought to prioritise developing their ability to integrate resources and establish a digital platform for matching urban and rural factors.

Village cadres should prioritise enhancing resource integration in digital transformation efforts. They must dismantle barriers to internal and external resource exchange. A village-level digital resource ledger should be established to digitise all idle land, rural houses, cultural assets, and labour resources. This ledger should connect with the county-level urban-rural factor matching platform to facilitate online matching of village resources with external capital, technical expertise, and market projects. Utilising digital platforms will enable dynamic scheduling of production factors, preventing resource idleness and waste. This approach integrates scattered resources into competitive industrial portfolios.

Enlightenment 3: Develop a sustainable organisational learning framework to consistently enhance the digital absorption capabilities of grassroots organisations.

Organisational learning capability is crucial for maximising returns on digital transformation investments. Village collectives should establish a structured learning system. This includes regularly organising specialised training for village cadres and industrial operators in digital

agriculture, e-commerce operations, and digital governance. They should also facilitate field exchange visits to digital rural demonstration villages to learn about effective resource integration and digital operations. Additionally, inviting digital agriculture experts and e-commerce mentors to provide ongoing on-site technical guidance is essential. Continuous organisational learning enhances grassroots organisations' ability to absorb and apply digital technology, thereby amplifying the empowerment effect of digital transformation on resource integration and rural revitalisation.

Enlightenment 4: Align digital strategy, resource integration, and organisational learning to create a unified approach for rural revitalisation.

Village development cannot depend solely on a single digital infrastructure investment. Village leaders should establish a multi-faceted collaborative development system. This system should be grounded in a scientific digital transformation strategy, with resource integration capability as the transmission medium and organisational learning capability as the assurance. Alongside promoting digital infrastructure, they should simultaneously enhance resource integration and organisational learning capacities. This approach creates a complete closed-loop of "digital input - resource reorganisation - learning absorption - revitalisation output", ultimately unlocking the long-term benefits of digital rural development.

5.4 Research Limitations and Future Research Directions

This paper develops a comprehensive moderated mediation theoretical model and conducts thorough empirical testing. However, four limitations arise due to sample data and research perspective, which future research could expand and refine:

The sample coverage in this paper is limited, as it only includes agricultural-dominated and agritourism-integrated villages. It excludes industrial, mining, ecological protection, and suburban urban integration

villages, which impacts the universality of the research conclusions. Future studies should broaden the sample to encompass various village types and conduct comparative analyses of digital transformation mechanisms across these different types.

Secondly, the method used to measure the independent variable, digital transformation strategy, involves some subjectivity. This study employs text word frequency analysis from village annual reports to assess DTS, which can be influenced by the writing styles of different village documents. Future research could use composite measurement indicators, integrating objective data like digital investment amounts and smart equipment quantities with subjective questionnaire scores, to enhance the accuracy of variable measurement.

Thirdly, this paper focuses solely on one mediating and one moderating variable, leaving room for theoretical expansion. The impact of digital transformation on rural revitalisation might involve several parallel mediating variables, like digital innovation capability and grassroots governance capability. It may also include multiple moderating variables, such as the village collective governance structure and the intensity of local government support. Future research could develop multi-chain mediation and multiple moderating models to enhance the theoretical framework of digital rural empowerment.

Fourth, this paper uses short balanced panel data from 2018 to 2022, which fails to capture the long-term dynamics of digital transformation's impact on rural revitalisation. Future research could employ longitudinal data spanning over 10 years. This would allow for the division of digital transformation into initial, growth, and mature stages, enabling an exploration of its phased, dynamic, and differentiated influence on rural revitalisation.

5.5 General Conclusions

Against the background of digital economy, rural digital transformation has become an important driving force for

advancing China's rural revitalisation strategy. Based on the Resource-Based View, this paper takes 386 agricultural and agritourism-based villages in China from 2018 to 2022 as research samples and constructs a moderated-mediation model to investigate how digital transformation strategy acts on rural revitalisation effect through resource integration capability, as well as the boundary role of organisational learning capability.

The empirical results verify all four research hypotheses. Digital transformation strategy can significantly improve rural revitalisation performance. Resource integration capability plays a partial mediating role in this relationship, revealing that digital empowerment cannot take effect automatically; it must rely on villages' capacity to identify, allocate and reorganise scattered land, labour, capital and cultural resources. Organisational learning capability positively moderates both the path from digital transformation strategy to resource integration capability and the indirect mediating chain of "digital transformation strategy-resource integration capability-rural revitalisation effect". When village collectives possess stronger learning and absorption capacity, the promotion effect of digital construction will be further amplified.

This study suggests that simply increasing investment in digital hardware cannot realise the expected dividends of rural revitalisation. County and township governments and village collectives should match digital infrastructure construction with capacity building. While promoting digital transformation, it is necessary to improve rural resource integration systems and establish long-term organisational-learning mechanisms. Only by combining digital strategy, resource integration and organisational learning can villages convert fragmented scattered resources into VRIN competitive resources and realise sustainable high-quality rural revitalisation. Although this research obtains meaningful empirical findings, it still has sample and measurement limitations as discussed above. It is expected that subsequent research can

expand sample coverage, optimise variable measurement, and explore more potential influencing mechanisms to deepen the

understanding of digital-driven rural revitalisation.

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