DIGITAL ECONOMY, PROXIMITY AND REGIONAL INNOVATION CAPABILITY——EMPIRICAL RESEARCH BASED ON THE PERSPECTIVE OF COLLABORATIVE INNOVATION

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ABSTRACT

Background and Purpose: With fraud losses expected to reach USD 41 billion by 2027, the swift growth of digital finance has increased the dangers associated with international payment networks. According to reports, 72% of financial institutions have seen an increase in attempts at fraud. This study combines financial analytics, cybersecurity, and behavioral economics to create a real-time, adaptive fraud prevention system since it acknowledges that no single technology can eliminate these risks. By addressing both systemic and human vulnerabilities, the goal is to increase the resilience of the financial system.

Methods: Behavioral nudges, adaptive AI algorithms, and real-time transaction analysis were all combined to create a hybridsystem. Key cognitive biases that make people vulnerable to fraud were uncovered by the study, including overconfidence, loss aversion, hyperbolic discounting, and the familiarity heuristic. More than 10,000 anonymous bank transactions from the US, Japan, and India were used to test a prototype. To fortify defenses, the architecture integrated situational threat intelligence and Zero Trust security model concepts.

Results: Compared to previous models, the method increased the accuracy of fraud detection by 27% and decreased false alarms by 18%. Adaptive security techniques combined with behavioral insights greatly decreased algorithmic and human error. Early risk identification and user engagement were improved by its human-centered design, which included individualized learning prompts, decision aids, and real-time notifications.

Conclusion: The results highlight how behavioral economics and advanced analytics can be combined to improve cybersecurity and digital banking. Financial institutions are better equipped to manage changing digital risks thanks to this cross-disciplinary, data-driven approach. With useful ramifications for legislators, cybersecurity professionals, and financial institutions alike, the study emphasizes the significance of combining human behavioral aspects, adaptive machine learning, and Zero Trust security principles to combat payment fraud.

KEYWORDS

Digital Economy, Proximity, Regional Innovation Capability, Collaborative Innovation

1. INTRODUCTION

The digital economy is the main economic form after the agricultural economy and industrial economy, and it is the most distinctive feature of the economy and society in the new era. According to the "China Digital Economy Development Report (2023)" issued by the China Information and Communications Institute, in 2022, the scale of China's digital economy will reach 50.2 trillion yuan, accounting for 41.5 % of GDP, forming a common development pattern driven by the service industry and industrial digitization, which has rapidly improved China's regional innovation ability improved. The digital economy has a strong spatial effect of innovation spillover, and proximity is an important factor affecting the spatial spillover effect (Chen et al., 2022). Therefore, the digital economy and proximity are two key factors affecting regional innovation ability. In the early days due to the relatively low level of productivity development, proximity was regarded as one of the most important factors of economic development, and more attention was paid to the role of geographical proximity. And then the focus gradually shifted from geographical proximity to other proximity (Etzkowitz &

Leydesdorff, 2000). However, it is undeniable that the rapid development of the digital economy has indeed brought a certain impact on the role of proximity. With the increasing complexity of human economic and social life and the increasingly wide rang e of activity space, especially the rapid development of information technology, geographical proximity, as one of the factors affecting inter-regional innovation linkages, has evolved into a necessary condition for innovation spillover, and its importance is weakening. Innovation diffusion is increasingly affected by related factors such as technological proximity and institutional proximity (Boschma, 2005).

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3. MODEL DESIGN AND VARIABLE SELECTION

3.1 Definition of Variables

3.1.1 Explained Variable: Regional Innovation Capability (RIA)

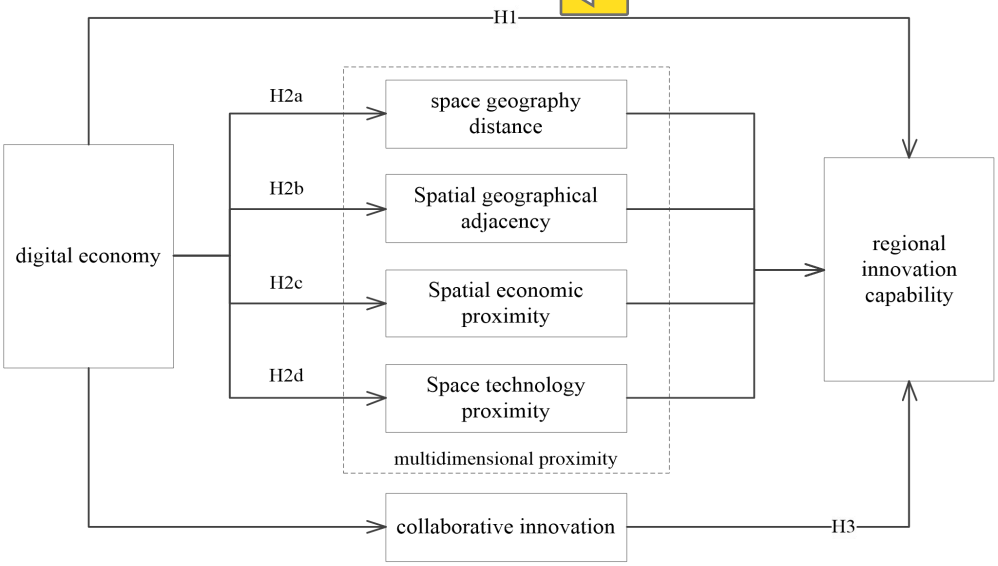

Figure 1 Logical Framework Diagram

..... the entropy weight method is used to determine the weight of each secondary index (see Table 1/Figure 1).....

Table 1 The Weight of Each Index of Regional Innovation Ability

First Grade Indexes	Second Index	Weight
Regional Innovation Ability (RIA)	Number of scientific papers (SCI) (papers)	0.185
	Total turnover of the technical contract (ten thousand yuan)	0.339
	Number of patent application authorizations (pieces)	0.246
	New product sales revenue of industrial enterprises above the designated size (ten thousand yuan)	0.230

.....The formula is as follows:

$$W_{inv} = \begin{cases} 0, i = j \\ \frac{1}{d_{ij}}, i \neq j \end{cases} \quad (1)$$

Among them, $\frac{1}{d_{ij}}$ is the reciprocal of the geographical distance between the provinces of i and j, W_{inv} the smaller the distance between the two provinces, the greater the distance between the two provinces.

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