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Does Digital Inclusive Finance Help County Level Governance in the Five Provinces of Northwest China, from the Perspective of Economic Resilience?

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Abstract: The sustainable development of a country requires stable funds to reshape and restore its economy, something which cannot be separated from the support of financial services. Digital financial inclusion, with its inclusive and extensive features, has provided a new impetus for economic development and governance. Based on the panel data of 193 counties in 5 provinces of northwest China from 2014 to 2021, this paper uses a bi-directional fixed effect model, an intermediary effect model and a threshold effect model in order to test digital inclusive finance and county-level economic resilience, and to explore the internal correlation details. The results show that digital inclusive finance will significantly enhance the economic resilience of the five northwestern provinces by improving capital allocation efficiency, enhancing entrepreneurship and employment vitality, and reducing pollution emissions. In addition, there is a double threshold effect between capital allocation efficiency and employment vitality, in which the threshold effect of capital allocation efficiency presents a progressively increasing state, and in which the threshold effect of entrepreneurship and employment vitality presents a state of fluctuating increase. Therefore, China needs to further improve the digital inclusive financial environment in its northwest; continue and deepen the significant functions of digital inclusive finance in resource allocation efficiency, entrepreneurship and employment vitality, and environmental protection; and provide guidance for solving regional imbalances and promoting national sustainable development.

Keywords: digital inclusive finance; governance; economic resilience; capital allocation efficiency; entrepreneurship and employment vitality; pollution emissions

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1. Introduction

"China's 2030 Agenda for Sustainable Development" aims to promote justice and equality in order to achieve inclusive and sustainable development. After the COVID-19 pandemic, the global economy is in ruins, international trade protectionism is on the rise, and global industrial and value chains are facing restructuring. China is also facing the endogenous impact of a deep transformation of old and new momentum, and is suffering from domestic and foreign shocks. As a result, strengthening governance has become a stable focus in the promotion of the sustainable and high-quality development of the Chinese economy. From the perspective of development economics, governance takes the government as the leader and supervisor that manages various activities, including the economy, with the aim of adjusting internal and external contradictions and risks and promoting the sound and healthy development of the economy. In recent years, the concept of governance ability has begun to be continuously enriched and improved. As part of this trend, Liu Ling's view has become widely recognized. In this view, governance capacity is the embodiment of the government's performance of governance functions in diversified fields, and mainly covers five dimensions of governance capacity—politics, economy, culture, ecology and society [1]. Especially now that the concept of "resilience" has entered the field of social science, the theory of economic resilience provides a theoretical means for

us to construct a more efficient and stable governance system. The 14th five-year plan and the 2035 long-term goal outline clearly put forward the building of livable, resilient and smart cities, and it is clear that building a safer and more resilient economy has become a new goal of governance [2]. So, what is economic resilience? So-called economic resilience means that an economic system can maintain its basic economic attributes, resist external shocks, adjust itself, and recover after experiencing sudden disturbances and shocks, is self-reinforcing and with sufficient redundancy to ensure its own development [3], and is also a powerful reflection of an economic system's ability to defuse risks. Enhancing economic resilience is an inherent requirement to enter a new stage of development and a necessary means for China to achieve high-quality and sustainable economic development [4]. The proverb "county governance, world peace" has one hundred years of history in China. Compared with the metropolis, the county economy has a deeper penetration in China and can more subtly reflect the regional situation. As an important component of China's urban system, the county seat is a key support for high-quality economic development. In China's governance structure, county-level administrative units connect urban and rural areas and are in a specific position and form a key node with which to connect urban and rural areas, which is an important foundation for economic development, ensuring people's livelihood and maintaining stability. According to data from the National Bureau of Statistics of the People's Republic of China, by the end of 2022 the population of county-level cities and urban areas accounted for 30% of the country's permanent urban population. Therefore, the resilience of each county's economy plays a key role in promoting China's comprehensive regional revitalization, optimizing economic structure, promoting new urbanization and promoting its balanced regional development. Especially in the northwest region, where the population is sparse, the question of how to achieve accurate governance is particularly important. By taking the county as a unit, regional governance is more likely to achieve precision and universal benefits. This shows that strengthening the resilience of county-level economic development plays an important role in the overall urbanization process of a country, is the inevitable requirement of the steady operation of a national economy and is a critical goal orientation of government administration.

Finance is one of the cores of a modern economy. With the gradual transformation and upgrading of the economy, the development of the financial system is becoming ever more important to China's real economy [5]. As the world enters the digital era, the model of "internet + finance" has gradually swept the world, and the financial model has ushered in changes. "Digital inclusive finance" represents a transformation and upgrading of traditional financial business that is based on digital and internet technology and is a new financial form combining modern technology and traditional finance [6]. With the wave of digitalization sweeping the world, the functions of digital inclusive finance have tended to be ever more diversified, including internet and mobile payments, online banking, financial services outsourcing, online loans, online insurance, online funds and other financial services, and achieves perfect financing in payment settlement, deposit financing, loan financing, and expanding profit channels [7]. This provides convenience for governance, especially because digital inclusive finance is closely related to people's lives. For example, Alipay, WeChat, mobile banking, online banking, and internet fund trading platforms in China, at this stage, all belong to the category of digital inclusive finance. "Inclusive finance" was first formally proposed by the United Nations in 2005 and refers to a financial system that can effectively and comprehensively provide services to groups at all levels of society. "Digital inclusive finance" is the embodiment of digital inclusive finance and refers to the provision of appropriate and effective financial services at an affordable cost to all social classes and groups that are in need of financial services based on the requirement of equal opportunity and the principle of commercial sustainability, representing the popularization and equalization of financial services. With the rapid development of digital technologies, such as mobile internet, big data and artificial intelligence, a digital-driven inclusive finance is accelerating its global formation, providing diversified financial services, such as payment, savings and financial management, to a wider range of people,

especially those who had previously faced "financial exclusion". As a result, financial services have been made available at a low cost to everyone with internet access. Since the G20 High-level Principles for Digital Financial Inclusion formally put forward the concept of "digital financial inclusion," China has gradually raised the development of digital financial inclusion to the height of its national strategy. The phenomenon of financial exclusion is a serious issue in the five provinces of northwest China. The emergence of inclusive finance has brought forth the dawn of financial development in this region. Compared with traditional finance, digital inclusive finance is more inclusive, with wide coverage, strong sharing, high convenience and low interest rates. It relies on digital technologies such as big data and blockchain, to play an important role in breaking down the boundaries of financial services, promoting the diversification of financial services, lowering financial barriers and providing more convenient financial services. Furthermore, it solves the problem of the long-tail customers that have long been ignored by financial institutions, improves the efficiency of financial services serving the real economy, and provides a comprehensive tool for governance, while also protecting financial services [8]. As a result, digital inclusive finance has become one of the ways that financial exclusion of the traditional financial system has been overcome and provides sustainable financial services for the disadvantaged, broadening the thinking for China's economic development and national governance [9].

The financial problems in the five northwestern provinces deserve public attention. The northwest region, also commonly known as the five northwest provinces, includes "three provinces and two regions", namely Shaanxi province, Gansu province, Qinghai province and the Xinjiang Uygur and Ningxia Hui autonomous regions. It encompasses a total area of about 3.079 million square kilometers and accounts for 31.96% of the total area of the country. By 2022, the permanent population of the five northwest provinces and autonomous regions at the end of the year was about 102.794 million, representing about 8% of the total population. The five provinces in northwest China are characterized by perennial drought, vast areas and sparse populations [10]. Compared with other regions in China, their economy is relatively backward and infrastructure construction is insufficient. Affected by factors such as their special geographical location, social conditions and resource endowment, the five provinces in northwest China not only have a low overall economic development level, but also a lack of financial resources, a serious imbalance of financial structure, a low degree of financial agglomeration and a more serious degree of financial exclusion. The level of inclusive finance development is low. However, the strategic importance of the five northwest provinces cannot be ignored. As the only way and key development object of the new "Silk Road", the northwest region is a strategic area of China's "One Belt and One Road". The economic development and long-term stability of the region play a guaranteeing role for the sustainable stability of the national economy, and also have important strategic significance for the coordinated and balanced development of the country and the region. Therefore, the current financial development of the five northwestern provinces has significant and powerful advantages. Firstly, the five northwestern provinces are located in the northwest inland of China, with large reserves of coal and oil resources, large energy investment scale, large output of various energy products, and rich resource endowments, which in turn lay a good material foundation for financial development. Secondly, the innovation and popularization of finance-related technologies is a dynamic process of change, and the emergence, agglomeration, accumulation and qualitative improvement of finance takes time [11]. As an underdeveloped region, this region has a strong late-comer advantage, which is conducive to directly absorbing, learning from and applying the advanced and mature experience and achievements of China's developed provinces, thereby contributing to the improvement of financial effectiveness and efficiency in the region. In addition, as the strategic highland of "Belt and Road" construction and with the establishment of China's "Silk Road Economic Belt" construction cooperation platform, the import and export trade volume of the five northwestern provinces has increased significantly. This is conducive to the promotion of the development of the

export-oriented economy in the region, promoting regional cooperation, providing a more open environment for financial development, and promoting the high-quality and sustainable development of China's economy, in turn becoming the biggest winner of the "Belt and Road" strategy.

However, it is undeniable that China's financial development has led to an escalation of risks. While digital inclusive finance in the banking sector improves efficiency, its potential risks are also worthy of attention. The non-performing loan ratio of banks increases with the scale of digital financial inclusion and, from 2013 to 2020, the non-performing loan ratio of Chinese banks rose from 1.54% to 1.56%. The risk of corporate credit default increased, and the potential risk of the financial system gradually increased. Therefore, in China, and even around the world, credit risk, market risk, liquidity risk, operational risk and other financial risks have continued to escalate, and the spread of risks has accelerated significantly [12]. It can be seen that a series of problems brought by financial development has seriously affect the country's financial security and stability. In this regard, China has been strengthening financial supervision in recent years, especially since 2017, and a series of powerful reform measures have been implemented. In the face of the increasingly strict financial regulatory environment, the off-balance sheet business of banks, financial product innovation, and the development of new financial institutions in the five northwestern provinces will also be affected. At the same time, due to serious financial exclusion in the region, the relative lack of financial resources, and the serious imbalance of financial structure, the region is being supported by the era of big data [13]. The development, penetration and popularization of inclusive finance are of great significance to the economic stability and regional coordinated and balanced development of the five northwestern provinces.

There is abundant research on digital finance in the existing literature, covering domestic and foreign financial environments, financial instruments, characteristics of financial development, financial development trends and financial risks, etc. In addition, the research has mostly discussed financial issues from the perspective of the whole country, and it is rare to find discussion on financial topics related to local regions of the country, especially the backward regions. The overall area of China is vast, the problem of inter-regional development imbalance is prominent, and different financial development conditions and trends have different impacts on national and regional development and governance. There is an extreme lack of topics on finance in China's backward regions. The contributions of this paper are as follows. Firstly, and different from previous studies, this paper starts from the county administrative unit of the five northwest provinces to fully understand their interiors. Secondly, this paper analyzes the current financial development status of some backward regions in China through the five provinces in northwest China and judges their current financial development stage. The paper also offers in-depth study of the impact of financial development on governance in backward regions, in-depth analysis of the theoretical logic of digital inclusive finance on economic resilience, and construction of a new theoretical research system. Thirdly, capital allocation efficiency, entrepreneurship vitality and pollution emissions are included in the logical process of the impact of digital inclusive finance on economic resilience, in order to explore the question of how to promote the five northwestern provinces and regions so they can fully grasp the advantages of financial tools and promote local governance under the circumstances of a relatively weak economic foundation and lagging financial development. On this basis, countermeasures are proposed in order to pay attention to the problems of regional financial development in backward regions and to solve the problem of regional development imbalance, in turn seeking to promote the five northwestern provinces and helping them to seize financial opportunities, reduce the poor population there, narrow the urban–rural income gap, and contribute to the coordinated, stable and sustainable development of the national economy.

To sum up, this article intends to take the five northwest provinces as the research object, utilizing a county area perspective. It also seeks to construct a governance evaluation index system for the five northwest provinces, from the perspective of digital inclusive

finance, so as to discuss its impact on county governance and from there its impact on the county governance mechanisms of the five provinces in northwest China and other underdeveloped areas. This article focuses on the following issues: what are the characteristics of the current financial development and governance in the five provinces in northwest China? What is the impact of digital inclusive finance on governance at the county level in the five provinces in northwest China? What are the specific impact mechanisms and characteristics? Further study of the above issues has important theoretical and practical significance in understanding the current situation of financial development in the five less developed regions in northwest China, giving full play to the role of inclusive finance in the underdeveloped regions in enhancing governance capacity, and thus promoting coordinated and balanced regional development.

2. Theoretical Basis and Research Hypothesis

2.1. The Goal Orientation of Governance: Economic Resilience

Economic strength is the foundation of national strength. Economic level determines the standard of living, and its improvement makes social security more stable, is the foundation of a country or a region, is an important pillar of national prosperity, and plays a key role in the sustained, healthy and stable development of an economy. With the deepening of economic globalization, the frequent occurrence of hegemony, trade barriers and local conflicts, and the increasing destabilizing factors in the world economic environment, the "resilience of economic development" based on the ability to resist risks and to recover from them has received attention. The resilience of economic development is reflected in the ability to adjust, recover and stabilize an economy after a shock [14]. The report of the 20th National Congress of the Communist Party of China proposed the promotion of high-quality economic development, the improvement of the resilience and safety level of the industrial and supply chains, the active promotion of green development, and the promotion of harmonious coexistence between man and nature. Especially for the northwest of China, with agriculture as the main industry, GDP seriously lags behind that of the eastern provinces and is seriously affected by the natural environment, while economic instability seriously hinders the economic development of this region. With the unbalanced regional development of domestic economic growth and the uncertain external environment, addressing the questions of how northwest China can withstand internal and external shocks and stabilize its economy is the new goal of governance. This shows that China's economic development has entered a "new normal", one in which facing the dual challenges of insufficient internal impetus for domestic economic growth and an uncertain external environment and building a stable economy that can withstand external shocks is a new goal of governance [15]. Therefore, under the new development pattern, strengthening the resilience and stability of economic development is an important basis for achieving high-quality development in China, and has become the key goal orientation of governance.

The process of national economic governance requires strong target constraints and a primary direction of attack, and economic resilience has gradually entered the vision of national economic governance. Since its introduction, the concept of "resilience" has been applied to the field of economics from the research fields of engineering mechanics and ecology. Martin offered a more comprehensive definition of economic resilience, pointing out that economic resilience is the ability of an economic system to resist and recover from shocks, to reconstruct the ability to actively respond to shocks, and to renew the ability to achieve new economic growth. System theory defines economic resilience as the ability of a government to reconfigure economic structures to maintain the existing development path or to realize system renewal by taking advantage of shocks. According to the theory of development economics, economic resilience is an important source for the government when seeking to maintain its competitive advantage in dealing with risks. Therefore, economic resilience is a process by which to test whether the government can maintain, recover, adapt or transform the economy through effective governance under

the impact of risks [16], which is an effective measure of the goal and value orientation of governance.

2.2. The Theoretical Logic of Economic Resilience Enabled by Digital Inclusive Finance

(1) Does digital inclusive finance promote governance?

In the process of strengthening economic development, the government needs stable funds to reshape and restore the economy, something which cannot be achieved without the support of financial services. By providing asset management and risk hedging services for enterprises, financial services play a stabilizing role in the economic system and contribute to the formation of strong development resilience of the economy.

Early research gradually began to focus on the relationship between "digital inclusive finance" and "economic resilience". Existing studies have proved that digital inclusive finance can play the role of "economic stabilizer" to a certain extent, offering direct empowerment of economic resilience that is embodied in the incremental supplement effect, the effect of structural adjustment and the effect of monetary policy transmission [17]. Firstly, digital inclusive finance has an "incremental supplement" effect, whereby it compensates for the deficiency of traditional finance. With the penetration of digital power in the world, the combination of various digital technologies with the financial industry promotes the development of digital inclusive finance, playing an increasingly prominent role in increasing the amount of loanable funds available to enterprises and individuals, reducing financial costs, broadening the coverage of financial services, lowering the threshold of access to financial services, and widening the channels of capital supply for financial institutions [18]. The inclusive and sharing performance of digital inclusive finance can better realize the sinking and diversification of service objects, expand the financial availability of vulnerable groups and ease liquidity constraints, meaning that the long-tail population will realize greater economic effects [19]. Meanwhile, this not only reduces the financial cost of transtemporal transactions between financial institutions, enterprises and individuals, but also breaks the boundary of traditional financial services and lowers the threshold of access to digital financial services. Thus, the possibility of obtaining financial resources is raised, the phenomenon of financial exclusion is alleviated, the quality of service is clearly improved, and the degree of financial service convenience is continuously enhanced. Secondly, digital inclusive finance has the effect of "structural adjustment" [20]. The development of digital inclusive finance has eased the financing constraints of small and medium-sized enterprises and, to a certain extent, the structural imbalance of the financial system, making China's financial development gradually enter the financial stage in an inclusive manner [21]. Digital inclusive finance can also alleviate the financing constraint involved in the industrial transformation and upgrade that is achieved through technological progress and economies of scale, can contribute to employment and entrepreneurship, and can promote the continuous optimization and upgrading of industrial structure, so as to achieve the improvement of economic resilience [22]. The combination of digital technology and finance reduces the relevant costs of financial institutions, while the improvement of financial service reachability and the lowering of service thresholds can greatly expand the range of customers of financial institutions. This has led to the optimization of the capital allocation structure and the improvement of the efficiency of capital allocation, in turn improving the economic structure and enhancing economic resilience [23]. Digital inclusive finance will accelerate the flow of information in capital markets to meet the needs of enterprises seeking access to capital, improve the efficiency of market resource allocation to allow a more efficient flow of capital into innovation, and provide a convenient platform for information exchange, so as to stimulate diversified demand on both the supply and demand sides. Through these paths, financial agglomeration can provide effective financial support for the development of the market economy, improve the market structure, and enhance economic resilience [24]. Furthermore, digital inclusive finance has a "monetary policy transmission" effect. Some scholars have discussed the influence of digital inclusive finance on economic fluctuation through the lens of the transmission effect of digital in-

clusive finance on monetary policy, and have concluded that digital inclusive finance can affect monetary policy through the interest rate and credit channels, thereby stabilizing the broader economy [25], greatly enhancing the effectiveness of monetary policy and laying a solid foundation for the macroeconomic regulation and control of counter-cyclical policies in China, which helps to reduce the scope of economic fluctuation, promote the smooth operation of the economy and enhance the economic resilience [26].

However, digital inclusive finance has brought serious challenges to China's financial governance and supervision. Qualitative changes and innovations in the world of digital inclusive finance have brought unprecedented risks, as exemplified by the issuance of digital currencies, such as ICOs. These are based on blockchain technology and a digital currency system [27]. ICO is an activity in which mainstream digital assets, such as bitcoin and ether, are raised by blockchain startups or ICO project leaders to raise funds by issuing initial cryptocurrencies (called tokens before large-scale circulation) and exchanging tokens with mainstream digital currencies such as bitcoin [28]. The ICO model brought technical defects, capital security problems, the deterioration of market speculation, difficulty in its effective regulation and other large risks, and was even suspected of association with the illegal absorption of public deposits, illegal business and other criminal activities, and money laundering, which have had an unexpectedly strong impact on national economic security and stability [29]. Due to the large risks and chaotic status quo of the industry, Chinese regulators have had to intervene in ICO, and the People's Bank of China and seven other departments jointly issued the Announcement on Preventing the Risk of Token Issuance Financing on 4 September 2017 (hereinafter referred to as the "Announcement") [30]. This temporarily suspended all ICO projects and defined ICO projects as unauthorized illegal financing activities, requiring that ICOs that had already been conducted make liquidation arrangements to protect investors' rights and interests. It also banned trading platforms and financial institutions from engaging in related activities [31]. In conclusion, once the development of digital inclusive finance is out of control, it will also bring a heavy blow to national economic stability and governance.

With the globalization of finance and the wide application of financial technology, China's current financial industry has formed a complete financial system, including banking, securities, insurance, funds and other fields, and the degree of marketization and opening-up of the financial industry has gradually deepened. However, it shows very obvious regional differences, and the level of regional financial development in the country presents a ladder distribution of "east–middle–west", with the financial development of the western region in particular lagging relatively behind. In terms of GDP, the eastern, central, western and northeastern regions account for 51.7 percent, 22.1 percent, 21.4 percent and 4.8 percent, respectively. Total social financing increased by 668.9 billion yuan over the previous year, and outstanding loans in local and foreign currencies increased by 10.4 percent at the end of 2022. The proportion of the central and western economies increased over the previous year, which is closely related to the economic stability package and follow-up measures implemented by the state in various regions. As early as 2021, the "No. 1 Central Document" for the first time explicitly proposed to "develop rural digital inclusive finance to support modern agricultural facilities and rural construction". The directive is intended to promote financial inclusion, assist financial institutions in risk management, strengthen the credit awareness of capital demanders, meet diversified financing needs through information integration, and give full play to the positive role of fintech in market construction, so as to promote the financial services industry to the backward regions [32]. However, less developed areas, such as northwest China, are located in remote areas and are affected by the relatively backward development of economy, science and technology and finance. Consequently, the financial space exclusion is clear and the financial technology investment is insufficient. According to statistics, the financial level of the five northwestern provinces is significantly lower than the national average. It can be seen that digital finance in the five northwestern provinces started late, so uncontrollable risks have not yet formed in the process of financial development. Therefore, for the less

developed regions in urgent need of development, the developmental advantages brought by digital finance clearly exceed the disadvantages.

On the whole, the higher the level of economic development, the better the local digital infrastructure, the higher the level of finance. The five northwestern provinces are restricted by geographical location and lack of digital infrastructure construction. Different provinces have different economic bases, industrial structures, development models and degrees of policy intervention, which lead to differences in financial level among different provinces, and thus to structural and regional differences in the impact on economic resilience. Beyond that, the development of digital finance continues to extend the basic and leading functions of finance and the derivative functions become more diversified, which will in turn have a great difference in the impact on the economy. Although there are certain risks in the financial industry, under the guidance of national policies, the current financial industry in underdeveloped regions has developed rapidly. This is especially the case for the development of digital inclusive finance and this has alleviated the phenomenon of financial exclusion and achieved remarkable results in financial services [33].

Therefore, this paper proposes Hypothesis 1, as follows: Digital finance will enhance governance and is an effective and innovative tool for governance, but its impact is heterogeneous.

(2) How can digital inclusive finance promote governance?

Digital inclusive finance can also make economies more resilient by increasing the efficiency with which capital is allocated, boosting the vitality of entrepreneurial employment and reducing emissions. Existing literature has demonstrated that digital inclusive finance can improve the efficiency of capital allocation and thus enhance economic resilience. Digital inclusive finance can create various financial service platforms, as well as diversified financial scenarios and diversified financial models. An information evaluation method that is based on big data can alleviate the information shortage of small and micro enterprises, and can then help to alleviate their financing, improve the efficiency of their capital allocation and enhance their survival and developmental ability [34]. Cui Gengrui [35] believes that the development of digital inclusive finance can achieve the functions of financial intermediation, risk management and payment and settlement through innovations in technology, channels and methods and that it is beneficial to alleviate the unbalanced distribution of financial resources and improve the efficiency of capital allocation. Feng Sixian and Xu Zhuo [36] argue that the development of information technologies such as data repositories, the internet, and cloud computing has created good conditions for financial institutions to make full use of industry network resources, search engines and platforms and that it is beneficial to eliminate the incompleteness of the economic system caused by the information matching imbalance, so as to ease the capital mismatch and improve the efficiency of capital allocation. Sun Zhenhua and Yi Xiaoli [37], relying on the extensive application of digital technology and the in-depth mining of data elements, assert that digital inclusive finance has effectively reduced information asymmetry; eased financial friction among banks, enterprises and households; and that it not only reduces the financing constraints faced by enterprises to help the development of the real economy, but also optimizes household asset allocation and improves the efficiency of asset allocation.

Moreover, the existing literature has demonstrated that digital inclusive finance can enhance economic resilience by boosting entrepreneurship and employment vitality. Zhang Haoran concluded that financial development can optimize the eco-chain of innovation, entrepreneurship and venture capital, thereby promoting the vitality of entrepreneurship and employment, and improving the applicability of the urban economic system, thus contributing to the greatly enhanced resilience of urban economy [38]. Xiong Jian, Dong Xiaolin [39], and Li Shufen et al. [40] point out that digital inclusive finance can significantly increase the activity of innovation and entrepreneurship and thus improve economic resilience. Zhang Zhihua believes that financial agglomeration can promote the construction of regional financial highlands for innovative industries; accelerate the optimization of financial ecology, mechanism innovation and resource agglomeration; and enhance the

continuity of innovative and entrepreneurial activities. This helps to upgrade the industrial structure and aids the rapid accumulation of human capital so as to strengthen the risk resistance of the urban economic system [41]. Gong Qilin and Zhang Bingbing [42] selected 223 prefecture-level and above cities to empirically test the economic resilience of cities enabled by digital inclusive finance. They concluded that the vitality of entrepreneurial employment plays a positive regulatory role. Clearly, while digital inclusive finance brings diversified financing channels and financial instruments, it also expands the scale of enterprises, creates more employment opportunities and significantly raises the level of employment and entrepreneurship, thus effectively stabilizing social employment. Furthermore, it plays an important role in enhancing the vitality of job creation and promoting high-quality employment.

In addition, research on digital inclusive finance, environmental protection and pollution emission control is also beginning to emerge. Liu Shan and Ma Lili [43] combined the matching samples of China's industrial enterprise database and Industrial Enterprise Pollution Database from 2000 to 2013 and discussed the financial development and green transformation of manufacturing industry from the micro level, they conclude that financial development can significantly reduce energy consumption intensity and pollution emission intensity of enterprises, and drive the green transformation of manufacturing enterprises. Mao Xiaomeng and Wani examined the impact of digital inclusive finance on the development of a green economy, based on data from 286 Chinese cities at the prefecture level and above from 2011 to 2020. Their study found that digital inclusive finance significantly promotes the development of the green economy [44]. As the Chinese proportion of global carbon emissions continues to rise, problems such as the inefficient use of energy, extensive growth and environmental damage have moved into focus [45]. Based on the environmental Kuznets curve (EKC), Liu Feng et al. used panel data from 282 Chinese cities from 2011 to 2019, and empirically analyzed the impact of financial development on carbon emissions and the channels through which it works. The authors conclude that financial development significantly suppresses carbon emissions, and that it effectively exerts the carbon emission reduction effect by optimizing the energy consumption structure and via substantial green technology innovation [46]. Du Yan and ran Yuan selected panel data from 30 provinces to explore the spatial effect of financial development on carbon emissions from 2008 to 2021. Their results indicate that financial development suppresses carbon emissions in the region, and that it has a "local-neighborhood" spillover effect [47], which is of great significance when promoting the low-carbon transition of the real economy.

To sum up, Hypothesis 2 is proposed, as follows: digital inclusive finance will enhance governance by improving the efficiency of capital allocation, enhancing the vitality of entrepreneurship and employment, and reducing emissions, and the differences of capital allocation efficiency, the vitality of entrepreneurial employment and pollution emission will make the impact of digital inclusive finance different.

3. Model Design

3.1. Selection of the Model

(1) Benchmark model

Based on the previous assumption of relationship, this paper constructs a fixed-effects benchmark model, which is as follows:

$$res_{it} = \alpha_0 + \alpha_1 Fin_{it} + \alpha_2 \sum control_{it} + u_i + \varepsilon_{it} \quad (1)$$

where res_{it} denotes the economic resilience of county i in t-year, Fin_{it} denotes the digital financial level of county i in t-year, μ_i denotes the fixed effect of county i, and ε_{it} is an error term.

(2) The mediation effect model

$$eff_{it}(ent_{it}/pol_{it}) = \delta_0 + \delta_1 Fin_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

$$res_{it} = \gamma_0 + \gamma_1 Fin_{it} + \gamma_2 eff_{it}(ent_{it}/pol_{it}) + \gamma_3 \sum control_{it} + \mu_i + \varepsilon_{it} \quad (3)$$

This shows the economic resilience of county i in t-year; the digital financial level of county i in t-year; eff_{it}, ent_{it} and pol_{it} indicate the efficiency of resource allocation, the vitality of entrepreneurial employment and the emission of pollution, respectively; μ_i denotes the individual fixed effect of county i; μ_i denotes the fixed effect of county i; and ε_{it} is an error term.

(3) Threshold effect model

This paper further explores the threshold effects of capital allocation efficiency, the vitality of entrepreneurial employment and pollution emission.

$$res_{it} = \beta_0 + \beta_1 Fin_{it} * I(eff_{it} < q_0) + \gamma_2 * I(q_0 < eff_{it} < q_1) + ... + \gamma_3 \sum control_{it} + \mu_i + \varepsilon_{it} \quad (4)$$

where Res_{it} indicates the economic resilience of county i in t-year; Fin_{it} indicates the digital financial level of county i in t-year; eff_{it} indicates the efficiency of capital allocation; q_0 is the first threshold, q_1 is the second threshold, and so on; μ_i denotes the individual fixed effect of county i, which does not change with time; and ε_{it} is the error term. The formula with the vitality of entrepreneurial employment as the threshold variable is identical to Formula (4).

3.2. Variable Selection

(1) The explained variable

The explained variable is the economic resilience, which is mainly divided into four parts: recovery, applicability, organization and creativity. The weight of each part is calculated using the entropy method. Recovery includes risk aversion and risk prevention, applicability includes residents and economic stability, organization includes resource allocation and macroeconomic regulation and control, and creativity includes sustainability and innovation and development. The specific composition of indicators is shown in Table 1.

(2) The explanatory variable

The explanatory variable is digital inclusive finance, this paper uses the Digital Inclusive Financial Index (compiled by the Digital Research Center of Peking University).

The total index consists of a first-level subdivision index (coverage, depth and digital service) and a second-level subdivision index (financial coverage, payment, financial insurance, money fund and credit, financial investment, financial credit, and degree of digital service support). The specific composition of indicators is shown in Table 2.

(3) The mediating variables

The mediating variables are the efficiency of capital allocation, the vitality of entrepreneurial employment and the emission of pollution. The efficiency of capital allocation is measured by the loan balance of financial institutions at the end of the year. The vitality of entrepreneurial employment is expressed by entrepreneurial employment strength and is measured by the number of enterprises above the scale. The emission of pollution is expressed as the sum of the nitrogen oxide, soot, and sulfur dioxide emissions from industrial gases.

(4) Control variables

In order to reduce the impact of missing variables on economic resilience, the control variables are as follows: (1) population status (expressed by population density), (2) open environment (expressed by the actual utilization of a foreign capital index), (3) social consumption (expressed by the per capita retail sales of consumer goods), and (4) mechanized agriculture (expressed in terms of total agricultural machinery power).

Table 1. The composition of the economic resilience index.

Variable	Level One	Weight	Level Two	Level Three	Weight
Overall index of economic resilience	Recovery	28.19%	Risk aversion	Unit employment rate at year end	9.43%
				Urban–rural income ratio	3.72%
			Risk prevention	Added value of secondary sector of the economy/GDP	5.49%
				Balance of savings deposits of urban and rural residents	9.55%
	Applicability	30.46%	Residents	Electricity consumption of the whole society	6.01%
				Total stock of public libraries	2.75%
			Economic stability	Per capita gross domestic product	11.80%
				Per capita grain holdings	9.90%
	Organization	28.25%	Resource allocation	Social investment in fixed assets	9.65%
				Investment in real estate development	5.64%
			Macroeconomic regulation and control	The various taxes account for the proportion of the general budget revenue of local finance	5.19%
				The general budget expenditure of local finance accounts for GDP	7.77%
	Creativity	13.09%	Sustainability	Each full-time teacher in the primary school is responsible for students	6.21%
				Medical and health beds per capita	2.66%
			Innovation and development	Added value of tertiary sector of the economy/GDP	2.66%
				Number of mobile phone subscribers	1.56%

Table 2. The composition of the digital financial inclusion index.

	Level One	Level Two
Overall index of digital inclusive finance	Coverage	Financial coverage
	Depth	Payment Financial insurance Money fund and credit Financial investment Financial credit
	Digital service support	Degree of digital service support

3.3. Sources of Data

This paper focused on five provinces in northwest China: Shanxi, Gansu, Qinghai, Ningxia. The sample consisted of 193 counties in the five northwestern provinces from 2014 to 2021, the digital inclusive financial data come from China's 2014–2021 Financial Index, published by the Research Group of the Center for Digital Inclusive Finance of Peking University. The economic indicators are from the China Statistical Yearbook, the China Rural Statistical Yearbook, the China Urban Statistical Yearbook, the China County Statistical Yearbook, the Shanxi Statistical Yearbook, the Gansu Statistical Yearbook, the Qinghai Statistical Yearbook, the Ningxia Statistical Yearbook, and the Xinjiang Statistical Yearbook.

4. The Characteristics of Digital Inclusive Finance and Economic Resilience in the Five Northwestern Provinces

Figure 1 shows the development trends of digital financial inclusion and economic resilience in the five northwestern provinces from 2014 to 2021. It can be seen from the figure that the economic resilience index of the five provinces in northwest China is generally low and shows a trend of stable development; however, the increase rate is not large and the growth rate is slow, indicating that digital financial inclusion is developing rapidly and that the overall level is relatively high. Reviewing 2014 to 2021, the county-level economic resilience of the five provinces in the northwest has always maintained a "steady state", tending towards an overall trend of "seeking progress while maintaining stability". The economic resilience of most counties was between 0.1 and 0.15 in 2014, while a small number of counties were above 0.15, and its peak was only around 0.2. Most resilience was between 0.1 and 0.2 in 2021,with a peak that was above 0.3, which is a marked improvement on the resilience of the economy compared with 2014. The above evidence clearly shows that the economic resilience of the five northwest provinces has achieved significant results, although the development rate is still relatively slow and remains at a relatively low level. From the perspective of the development of digital inclusive finance, digital inclusive finance in the five northwestern provinces has increased significantly since 2014. Digital inclusive finance in most counties was in the range of 0~0.4 in 2014. During 2014 to 2018, finance expanded at an astonishing rate and the 193 counties in the five northwestern provinces were all above 0.5 in 2018, after which the development of digital inclusive finance develops at a slower pace. The average level of digital inclusive finance in the counties of the five provinces in the northwest of China has reached an average of over 0.7, indicating that significant progress has been made in the development level of digital inclusive finance in the five provinces in the northwest of China in recent years.

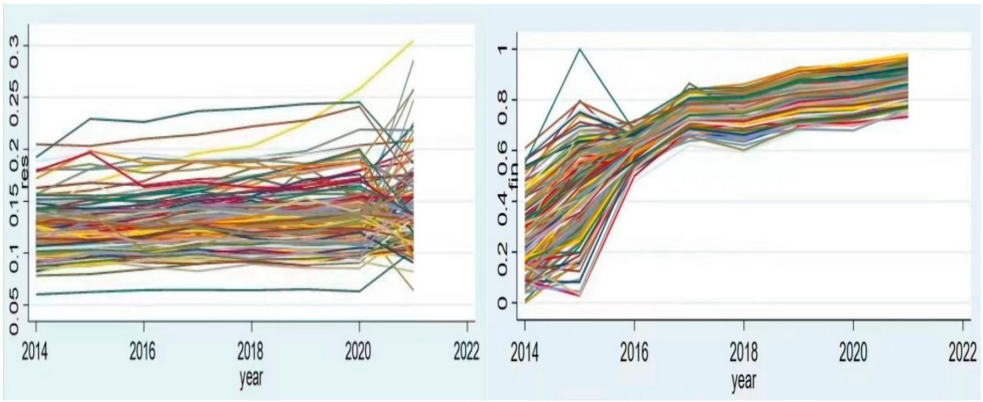

Figure 1. Chart of county economic resilience (**left**) and digital inclusive finance (**right**). Each line in the figure represents a county, and there are 193 lines representing the 193 counties studied.

5. Empirical Analysis

5.1. Benchmark Test

This paper uses Stata Software 17.0 to test the model relationship, the following 13 tables show the results of the empirical regression test.

According to the results of the Hausman test, this research paper rejected the original hypothesis of random effects, and finally selected the individual fixed effects model for empirical regression.

(1) Benchmark test

Table 3 shows the overall empirical test results of digital inclusive finance on economic resilience. The regression coefficients of model (1) and (2) were 0.028 and 0.025, respectively. The regression coefficients of model (3) were 0.012 and 0.05, and the regression coefficient of model (4) was 0.011, which passed the significance test of 0.1. The above shows that

digital financial inclusion has a strong positive impact on enhancing economic resilience. The emergence of digital inclusive finance has broadened financing channels for enterprises, provided credit funds and financial service support for enterprises, and has thus contributed to the increase of economic scale and enhanced economic resilience in the five provinces in northwest China. Therefore, speeding up the development of digital inclusive finance is an effective choice when seeking to enhance the economic resilience and improve the government's ability of governance in the five provinces of northwest China, which confirms the first hypothesis of this study.

Table 3. Tests of digital inclusive finance to economic resilience.

Variable	Economic Resilience			
	(1)	(2)	(3)	(4)
Digital inclusive finance	0.028 *** (15.69)	0.025 *** (11.99)	0.012 ** (1.97)	0.011 * (1.83)
Coefficient of constant term	0.109 *** (89.52)	0.091 *** (25.19)	0.115 *** (56.54)	0.118 *** (12.79)
Whether to add control variables	NO	YES	NO	YES
Fixed effect	YES	YES	YES	YES
Observed value	1544	1544	1544	1544
F value	246.11	164.84	359.32	473.41
R Squared	0.1542	0.3798	0.2047	0.3980

Note: The ***, **, * indicate that the regression coefficients are significant at the 0.01, 0.05, and 0.1 significance levels, respectively, the T statistic is shown in parentheses.

(2) The tests of potential financial risk to economic resilience

Next, we test the resilience of the economy by adopting digital inclusive finance as the first-level component index (coverage, depth, digital service support) in order to observe the possible negative impact of a certain component of digital financial inclusion.

Table 4 displays a digital inclusive finance sub-index (coverage, depth and financial digitization), with significant positive impacts on economic resilience. From the significance test, the influence coefficients of breadth, depth and financial digitalization are significant at the level of 0.01, indicating that the positive impact on economic resilience is extremely clear. In terms of the size of the regression coefficient, the impact effect is ranked as financial digitization (0.038) > breadth (0.033) > depth (0.023), which indicates that the emergence of digital inclusive finance has a generally positive impact on economic resilience.

After the relevant test of the first-level component index of digital inclusive finance, in order to further analyze whether digital inclusive finance has risk effects on economic resilience, we choose the second-level subdivision index for the test. The depth consists of payment, financial insurance, money fund and credit, financial investment and financial credit and other parts. Compared with the breadth of coverage and the degree of digital support for digital inclusive finance, its depth is likely to pose potential intangible risks to the resilience of county economies. This paper selects the stripping index from the depth of financial use to test whether it brings currency risk to resilience.

Table 5 displays the test of economic resilience by the digital financial inclusion sub-index, showing the financial risks brought about by stripping variables. The test results show that the influence coefficients of payment, financial insurance, financial investment and financial credit are, respectively, 0.037, 0, 0.024, 0.034 and 0.030, which are all positive, the influence coefficients of monetary fund and credit are −0.005, which is negative, indicating that monetary fund and credit do have a risk impact on economic resilience. However, the negative effects are much smaller than the positive effects, and are offset along the way. This confirms the hypothesis that the positive impact of digital financial inclusion is greater. From the perspective of significance, the impact of money and credit on

economic elasticity is not significant, while the impact of other sub-indices on resilience is significant. This may be because the innovation of inclusive financial instruments promotes the rapid growth of money and credit, forming a crisscross relationship between debt and credit. In the case of an unreasonable economic structure, an unsatisfactory credit environment, an imperfect governance structure of various economic entities, and a lack of internal control mechanism, excessive growth of money and credit also incurs large risks, and may even lead to overall financial crisis, endangering economic security. It thus has a negative impact on economic resilience.

Table 4. Tests of the first-level subdivision index to economic resilience.

Variable	Economic Resilience		
	(1)	**(2)**	**(3)**
Coverage	0.033 *** (8.07)		
Depth		0.023 *** (12.64)	
Digital service support			0.038 *** (9.02)
Coefficient of constant term	0.095 *** (21.34)	0.098 *** (31.41)	0.105 *** (32.80)
Whether to add control variables	YES	YES	YES
Fixed effect	YES	YES	YES
Observed value	1544	1544	1544
F value	141.96	169.51	146.67
R Squared	0.3453	0.3864	0.3527

Note: The *** indicate that the regression coefficients are significant at the 0.01 significance levels, respectively, the T statistic is shown in parentheses.

Table 5. Tests of the second-level subdivision index to economic resilience.

Variable	Economic Resilience				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Payment	0.037 *** (13.46)				
Financial insurance		0.024 *** (9.31)			
Money fund and credit			−0.005 (−0.69)		
Financial investment				0.034 *** (16.10)	
Financial credit					0.030 *** (17.66)
Coefficient of constant term	0.105 *** (60.94)	0.113 *** (69.76)	0.128 *** (30.22)	0.109 *** (91.11)	0.109 *** (100.62)
Fixed effect	YES	YES	YES	YES	YES
F value	181.13	86.59	0.48	259.18	311.84
R Squared	0.1183	0.0603	0.0006	0.1611	0.1876

Note: The *** indicate that the regression coefficients are significant at the 0.01 significance levels, respectively, the T statistic is shown in parentheses.

In order to further compare the financial risks brought by money fund and credit, this paper selects the money funds and credit of 57 counties in Guangdong province as the control group and compares the test results with those in underdeveloped regions. (Note: Guangdong province has a mature financial development and is in the first echelon of digital inclusive finance in China)

Table 6 shows the impact of money funds and credit on the economic resilience of Guangdong province. The results show that the influence coefficients of model (1) and model (2) are negative values of −0.021 and −0.023, respectively, which passes the significance test at the level of 0.01, indicating that the money funds and credit of developed provinces have a greater negative impact on the economic resilience of counties. By comparison, it can be seen that the influence coefficient of money funds and credit in Table 3 is only −0.005 and fails the significance test, which indicates that, compared with the Guangdong province, the financial risks brought by money funds and credit in the five northwestern provinces are lower. It can be seen that the welfare effects brought by the current digital inclusive finance in the five northwest provinces will offset the financial risks and enhance the economic resilience.

Table 6. Comparison with developed provinces.

Variable	Economic Resilience	
	(1)	**(2)**
Money funds and credit	−0.021 *** (−2.66)	−0.023 *** (−2.84)
Coefficient of constant term	0.191 *** (46.44)	0.189 *** (43.72)
Whether to add control variables	NO	YES
Fixed effect	YES	YES
F value	7.05	2.33
R Squared	0.0296	0.0488

Note: The *** indicate that the regression coefficients are significant at the 0.01 significance levels, respectively, the T statistic is shown in parentheses.

(3) Tests of digital inclusive finance to sub-dimensions of economic resilience.

In order to further discuss how the digital financial inclusion index specifically affects economic resilience, the digital financial inclusion index is selected in order to empirically test the subdivision component dimension (recovery, applicability, organization and creativity) of economic resilience.

Table 7 displays the way in which digital inclusive finance tests the sub-dimensions of economic resilience. The empirical results show that the regression coefficients of recovery were negative and did not pass the significance test, while the regression coefficients of applicability, organization and creativity were significantly positive and passed the significance tests at the levels of 0.1, 0.01 and 0.01, respectively. This indicates that digital inclusive finance has a restraining effect on the recovery of a county's economy in the five provinces of northwest China, but that it will greatly enhance the applicability, organization and creativity of the economic system. The reason for this phenomenon may be that, after the impact of digital inclusive finance, the five northwest provinces, whose economic strength is generally backward, will bring unpredictable risks to a county's economy, whose ability to resist and guard against risks is already fragile, and will make it difficult to recover and adjust quickly, resulting in the negative impact of finance on the recovery of the economic system. The breakthrough of the new financial model has injected vitality into the five provinces of northwest China, which has greatly enhanced the economic system's applicability, organization and creativity.

Table 7. Tests of digital inclusive finance to sub-dimensions of economic resilience.

Variable	Recovery	Applicability	Organization	Creativity
Digital inclusive finance	−0.001 (−0.78)	0.002 * (1.85)	0.013 *** (11.06)	0.011 *** (17.06)
Coefficient of constant term	0.041 *** (15.03)	0.017 *** (9.17)	0.018 *** (8.83)	0.015 *** (13.42)
Whether to add control variables	YES	YES	YES	YES
Fixed effect	YES	YES	YES	YES
Observed value	1544	1544	1544	1544
F value	69.18	7.55	57.07	166.03
R squared	0.2044	0.0273	0.1749	0.3815

Note: The ***, * indicate that the regression coefficients are significant at the 0.01 and 0.1 significance levels, respectively, the T statistic is shown in parentheses.

Furthermore, with regard to the absolute value of the regression coefficient of the subdivision dimension, the subdivision dimensions are arranged in order from large to small as follows: organization (0.013) > creativity (0.011) > applicability (0.002) > recovery (−0.001). These regression results confirm the following prediction: first, digital inclusive finance will clearly empower the organizational and creative capacity of a northwest county's economic system, even where overall economic conditions and the ecological environment are relatively fragile. This is due to the fact that financial derivatives,, on the one hand, provide new tools for the government to allocate resources rationally and to offer effective macroeconomic regulation and control, and, on the other hand, provide an inexhaustible impetus for the innovative development of the economic system and the realization of sustainability. Additionally, digital inclusive finance has a certain degree of positive impact on the adaptability of the economic system. This is because the derivative of digital inclusive finance has broken the traditional mode of production and life, creating benign advantages for improving residents' lives and maintaining social stability. However, the unpredictability of digital inclusive finance and the potential risks of diversification may reduce the resilience of the five northwestern provinces, and it is not conducive to the self-recovery of their economic systems.

5.2. Mechanism Testing

The regression results in Table 8 illustrate the effects of capital allocation efficiency, the vitality of entrepreneurial employment and pollution emissions on economic resilience in digital inclusive finance.

Model (1) indicates that the impact coefficient of digital inclusive finance on economic resilience is 0.025, which is significantly positive, passing the significance test at the level of 0.01. Model (2) demonstrates that the impact coefficient of digital inclusive finance on capital allocation efficiency is 0.047. Model (3) shows that the regression coefficients of digital inclusive finance and capital allocation efficiency to economic resilience are 0.021 and 0.088, respectively. All pass the significance test of 0.01. Therefore, we can conclude that digital inclusive finance has a very significant positive effect on economic resilience, and that the direct effect and part of the intermediary effect are significant, reducing the imbalance in the distribution of financial resources so as to enhance economic resilience.

Model (4) is consistent with model (1), showing that the influence coefficient of digital inclusive finance on economic resilience is 0.025, which is significantly positive and passes the significance test of 0.01. Model (5) demonstrates that the impact coefficient of digital inclusive finance on the vitality of entrepreneurial employment is 0.039, which is significantly positive, and also passes the significance test of 0.01. Model (6) illustrates that the regression coefficients of digital inclusive finance and the vitality of entrepreneurial employment to economic resilience are 0.022 and 0.080, respectively, both passing the

significance test of 0.01. It can be seen that the employment vitality of entrepreneurship plays a significant part in mediating the impact of digital inclusive finance on economic resilience, as more business opportunities and jobs were created, which led to the expansion of enterprises and the improvement of the level of employment and business start-up.

Table 8. Mechanism test.

Variable	Capital Allocation Efficiency			Entrepreneurial Employment			Pollution Emission		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Digital inclusive finance	0.025 *** (11.99)	0.047 *** (5.83)	0.021 *** (10.50)	0.025 *** (11.99)	0.039 *** (5.82)	0.022 *** (10.72)	0.025 *** (11.99)	−0.007 * (−1.67)	0.025 *** (11.89)
cap/ent/pol			0.088 *** (13.37)			0.080 *** (9.77)			−0.028 *** (−2.19)
Coefficient of constant term	0.091 *** (25.19)	−0.056 *** (−3.98)	0.096 *** (28.09)	0.091 *** (25.19)	0.026 ** (2.24)	0.089 *** (25.42)	0.091 *** (25.19)	1.009 *** (128.76)	0.119 *** (9.02)
Whether to add control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES
Fixed effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observed value	1544	1544	1544	1544	1544	1544	1544	1544	1544
F value	164.84	249.75	185.31	164.84	110.79	162.94	164.84	0.87	138.56
R squared	0.3798	0.4813	0.4525	0.3798	0.2916	0.4209	0.3798	0.0032	0.3820

Note: The ***, **, * indicate that the regression coefficients are significant at the 0.01, 0.05, and 0.1 significance levels, respectively, the T statistic is shown in parentheses.

Model (7) is consistent with models (1) and (4). Model (8) indicates that the influence coefficient of digital inclusive finance on emission is −0.007, which is significantly negative. Model (9) demonstrates that the regression coefficients of digital inclusive finance and pollution emission to economic resilience are 0.025 and −0.028, respectively, and all pass the significance test of 0.01. This proves that reducing pollution emissions has a significant role in mediating the impact of digital inclusive finance on economic resilience. To a certain extent, digital inclusive finance has reduced pollution emissions, while innovative financial instruments are conducive to environmental sustainability and thus enhance economic resilience.

In summary, digital inclusive finance can enhance the resilience of a county's economy by improving the efficiency of capital allocation, enhancing the vitality of entrepreneurship and employment, and reducing the emission of pollutants. This hypothesis has been effectively confirmed. Furthermore, Table 4 shows that the absolute value of the impact coefficient of digital inclusive finance is smaller than that of the intermediary variable, indicating that the impact of the new financial model (digital inclusive finance) is smaller than that of the intermediary variable (capital allocation efficiency, enhancement of entrepreneurship and employment vitality, and reduction of pollutant emission). This may be related to the financial development level of the five provinces and counties in the northwest of the underdeveloped region. The development of county finance started late, the development level is relatively lagging, and the impact on economic resilience is not enough to match the intermediary variables.

5.3. Heterogeneity Analysis

(1) Based on the heterogeneity of different provinces

Table 9 illustrates the regression results of digital inclusive finance on county economic resilience of Shanxi, Gansu, Qinghai, Ningxia and Xinjiang. From the absolute value of the regression coefficient of digital inclusive finance, the order of the influence of digital inclusive finance on economic resilience is as follows: Shanxi > Ningxia > Gansu > Xinjiang > Qinghai. Among these, the regression coefficients of the four provinces of Shanxi, Gansu, Ningxia and Xinjiang passed the significance test at the level of 0.01, and were significantly positive, while the regression coefficients of the Qinghai digital inclusive finance were

extremely small, and did not pass the significance test. This proves that the effect of digital inclusive finance in Shanxi, Ningxia, Gansu and Xinjiang provinces is more obvious, while in Qinghai, the effect of digital inclusive finance is extremely insignificant, which may be closely related to the difference of financial development level in different provinces. Specifically, Shaanxi, Gansu, Ningxia and Xinjiang have been given more favorable welfare policies in recent years and the improvement of the economic environment has attracted potential investment. While Qinghai has a weak base, there are few leading ICT enterprises, and the credit environment is relatively poor, which is the possible reason for the regression results. In addition, it is an undeniable fact that the impact coefficient of digital inclusive finance on economic resilience is positive in different provinces, which fully shows the stimulating effect of digital inclusive finance on economic resilience.

Table 9. Tests in different provinces.

Variable	Economic Resilience				
	Shanxi	**Gansu**	**Qinghai**	**Ningxia**	**Xinjiang**
Digital inclusive finance	0.044 *** (10.50)	0.021 *** (6.42)	0.0001 (0.02)	0.034 *** (4.71)	0.018 *** (4.30)
Coefficient of constant term	0.093 *** (10.04)	0.089 *** (14.86)	0.137 *** (10.87)	0.086 *** (7.23)	0.104 *** (14.35)
Whether to add control variables	YES	YES	YES	YES	YES
Fixed effect	YES	YES	YES	YES	YES
Observed value	400	472	80	104	488
F value	81.87	49.33	50.1	10.54	45.35
R squared	0.5426	0.3768	0.7940	0.3801	0.3495

Note: The *** indicate that the regression coefficients are significant at the 0.01 significance levels, respectively, the T statistic is shown in parentheses.

(2) Based on the heterogeneity of different levels of digital inclusive finance

Table 10 shows the results of heterogeneity regression based on different levels of digital inclusive finance. Taking the average value of county level digital inclusive finance in the five provinces of northwest China as the boundary, county samples are divided into two groups: counties with low level of digital inclusive finance and counties with high level of digital inclusive finance. On the whole, digital inclusive finance has a significant positive effect on economic resilience in both low-level and high-level regions. Compared with the regions with a low level of digital inclusive finance development, the regions with a high level of digital inclusive finance development have a more significant impact on economic resilience and the absolute value of the regression coefficient is larger in the high-level region of digital inclusive finance. In conclusion, digital inclusive finance in the areas within the region of a high level of financial development had a more significant impact.

Table 10. Tests of groups of different financial levels.

Variables	Economic Resilience in Areas with a Low Financial Level		Economic Resilience in Areas with a High Financial Level	
	(1)	**(2)**	**(3)**	**(4)**
Digital inclusive finance	0.008 *** (6.28)	0.006 ** (2.51)	0.082 *** (8.83)	0.053 *** (6.16)
Coefficient of constant term	0.115 *** (197.86)	0.116 *** (22.17)	0.067 *** (9.12)	0.057 *** (5.64)

Table 10. *Cont.*

Variables	Economic Resilience in Areas with a Low Financial Level		Economic Resilience in Areas with a High Financial Level	
	(1)	(2)	(3)	(4)
Whether to add control variables	NO	YES	NO	YES
Fixed effect	YES	YES	YES	YES
Observed value	548	548	996	996
F value	39.39	9.33	77.99	82.34
R squared	0.1001	0.1177	0.0866	0.3403

Note: The ***, ** indicate that the regression coefficients are significant at the 0.01 and 0.05 significance levels, respectively, the T statistic is shown in parentheses.

5.4. Robust Test

Table 11 displays the results of the robustness test. In order to test the robustness of the benchmark regression and mitigate the effects caused by endogenous problems and individual extremes, the robustness of the benchmark regression is discussed as follows. (1) Dynamic effect. Given that there may be endogenous problems in the regression and that the current economic resilience may be influenced by the previous economic resilience, this paper introduces a lag-period-explained variable into the model and replaces it with a dynamic panel model, by replacing the original variables with the economic resilience lag variable one (t + 1), the economic resilience lag variable two (t + 2) and the economic resilience variable lag three (t + 3), the regression results show positive values, and pass the significance test of 0.01. This suggests that the benchmark regression of digital inclusive finance to economic resilience is robust. (2) Data tail reduction. Considering the influence of the extreme data in the regression, the original data were shrunk by more than 99%, 1% and 5%, and the regression results are shown in Table 11. The enhancement effect of the economic resilience of digital inclusive finance is still positive, and the significance test of 0.01 shows that the regression is stable after excluding the influence of extreme values.

Table 11. Robust test.

Variables	Economic Resilience					
	t + 1	t + 2	t + 3	Above 99% Percentile	Quantiles of Upper and Lower 1%	Upper and Lower Quantiles of 5%
Digital inclusive finance	0.027 (16.08)	0.050 *** (15.79)	0.065 *** (14.31)	0.024 *** (12.53)	0.024 *** (12.62)	0.023 *** (13.16)
Coefficient of constant term	0.085 (17.89)	0.088 *** (21.72)	0.045 *** (8.70)	0.094 *** (27.30)	0.093 *** (27.35)	0.095 *** (29.60)
Whether to add control variables	YES	YES	YES	YES	YES	YES
Fixed effect	YES	YES	YES	YES	YES	YES
Observed value	1544	1544	1544	1544	1544	1544
F value	97.67	100.68	64.78	172.62	174.96	140.77
R squared	0.2975	0.3440	0.2968	0.3907	0.3939	0.3434

Note: The *** indicate that the regression coefficients are significant at the 0.01 significance levels, respectively, the T statistic is shown in parentheses.

6. Further Exploration

Through the above-mentioned test of intermediary effects, it can be seen that the efficiency of capital allocation, the vitality of entrepreneurial employment and the reduction of pollutant emissions play a pivotal part in the intermediary role; therefore, one must analyze whether the threshold effect is significant and measure different thresholds.

The threshold tests for the efficiency of capital allocation, the vitality of entrepreneurial employment and pollution emission are shown in respective tables. According to the test results in Table 12, it is clear that the single-threshold F value of the efficiency of capital allocation is 176.71 with a *p* value of 0.0000; the double-threshold F value is 32.09, with a *p* value of 0.0300; and the triple-threshold F value is 27.85, with a *p* value of 0.20. This indicates that the efficiency of capital allocation is significant at the level of 5%, the double threshold is significant, and the thresholds are 0.20 and 0.34. Table 13 shows that the single-threshold F value of the vitality of entrepreneurial employment is 82.72, with a *p* value of 0.00; the double-threshold F value is 38.38, with a *p* value of 0.0000; and the triple-threshold F value is 23.97, with a *p* value of 0.42. The results prove that the vitality of entrepreneurial employment is significant at the level of 5%, that the triple threshold is not significant, and that there are two thresholds, 0.20 and 0.16. Table 14 indicates that the single-threshold F value for pollutant emissions was 31.51, with a *p* value of 0.02; the double-threshold F value was 6.72, with a *p* value of 0.53; and the triple-threshold F value was 7.44, with a *p* value of 0.64. The results illustrate that the triple threshold and double threshold are not significant, but that the emission of pollutants is significant only at the level of 5%; however, the subsequent threshold regression results with pollution emission as the threshold variable are contrary to reality, so there is no threshold effect on pollution emission. Next, we further dive into the threshold effect of capital allocation efficiency, entrepreneurship and employment vitality, and the empirical regression results are shown in Table 15.

As Table 15 illustrates, allocative efficiency serves as a double threshold for the impact of digital inclusive finance on economic resilience. When the capital allocation efficiency is less than 0.2142, the impact coefficient of digital inclusive finance on county economic resilience is 0.023, and passes the significance test of 1% level. When the capital allocation efficiency is greater than 0.2142 and less than 0.3439, the influence coefficient of digital inclusive finance is 0.050 and passes the significance test of 1% level. When the efficiency of resource allocation is greater than 0.3439, the influence coefficient of digital inclusive finance is 0.071 and also passes the significance test of 1% level. This strongly proves that the influence of digital inclusive finance on economic resilience is gradually increasing with the difference of capital allocation efficiency; the bigger the threshold, the more clear is the positive effect of digital inclusive finance.

Table 12. Threshold tests of efficiency of capital allocation.

Threshold Type	F Value	*p* Value	1%	5%	10%	Threshold
Single threshold	176.71	0.00	25.53	29.24	34.13	0.21
Double threshold	32.09	0.03	22.80	28.41	52.89	0.34
Triple threshold	27.85	0.20	39.37	51.56	65.20	0.16

Table 13. Threshold tests of the vitality of entrepreneurial employment.

Threshold Type	F Value	*p* Value	1%	5%	10%	Threshold
Single threshold	82.72	0.00	23.93	27.80	38.48	0.20
Double threshold	38.38	0.00	20.43	25.52	34.03	0.16
Triple threshold	23.97	0.42	39.55	46.22	58.19	0.34

Table 14. Threshold tests of pollutant emissions.

Threshold Type	F Value	*p* Value	1%	5%	10%	Threshold
Single threshold	31.51	0.02	38.01	24.04	17.96	1
Double threshold	6.72	0.53	68.13	51.73	38.21	1
Triple threshold	7.44	0.64	39.92	18.49	15.77	1

Table 15. Threshold effect regression.

Capital Allocation Efficiency		Entrepreneurship and Employment Vitality	
X < 0.2142	0.023 *** (11.97)	X < 0.1552	0.033 *** (13.45)
0.2142 < X < 0.3439	0.050 *** (14.66)	0.1552 < X < 0.2026	0.020 *** (9.75)
X > 0.3439	0.071 *** (17.07)	X > 0.2026	0.051 *** (14.29)
Coefficient of constant term	0.098 *** (28.95)	cons	0.095 *** (27.49)
F value	158.9	F value	138.53
R Squared	0.4528	R Squared	0.4191

Note: The *** indicate that the regression coefficients are significant at the 0.01 significance levels, respectively, the T statistic is shown in parentheses.

Table 15 also indicates that there are double thresholds for the vitality of entrepreneurial employment, but that the threshold effect and capital allocation efficiency are different. When the vitality of entrepreneurial employment is less than 0.1552, the impact coefficient of digital inclusive finance on county economic resilience is 0.033, passing the significance test of 1%. When the vitality of entrepreneurial employment is greater than 0.1552 and less than 0.2026, the influence coefficient of digital inclusive finance shrinks to 0.020, indicating that the influence of digital inclusive finance decreases. After crossing the threshold of 0.2026, the influence coefficient of digital inclusive finance expanded to 0.051 and passed the significance test of 1%. The results prove that the impact of digital inclusive finance on economic resilience has a fluctuating growth effect with the threshold value of the vitality of entrepreneurial employment, which may be closely related to the risks of digital inclusive finance for entrepreneurial employment.

7. Conclusions and Enlightenment

This paper analyzes the current situation of digital inclusive finance and economic resilience in Shanxi, Gansu, Qinghai, Ningxia, Xinjiang and other northwestern provinces from 2014 to 2021, and further puts forward a theoretical mechanism and research hypothesis on the impact of digital inclusive finance on economic resilience. In order to verify this hypothesis, this paper builds a theoretical framework for the impact of digital inclusive finance on economic resilience and uses the county data of five provinces in northwest China to test the overall impact of digital inclusive finance on the economic resilience of five provinces in northwest China, using a total index and sub-index respectively. Further, it discusses the impact of potential financial risks and examines the intermediate roles of capital allocation efficiency, entrepreneurship, employment vitality, and emission reduction in the influencing process. Additionally, it explores the threshold effects of intermediate variables in depth.

8. Conclusions Are as Follows

(1) On the whole, digital inclusive finance in the five provinces of northwest China significantly enhance economic resilience, and provide a powerful and effective tool effect for Chinese governance. The coverage, depth and digital service support of the digital financial inclusion sub-index have positive impacts on economic resilience. Moreover, digital inclusive finance has a significant positive impact on the applicability, organization and creativity of the economic resilience sub-index, but has an inhibitory effect on the recovery sub-index. This indicates that digital inclusive finance has a positive impact on the coordination, organization and innovation of the economy in the five northwestern provinces but has a negative impact on the economic recovery.

(2) The efficiency of capital allocation, the vitality of entrepreneurial employment and the reduction of pollution emissions play a significant part in mediating the role of digital inclusive finance in enhancing the economic resilience of China's five northwest provinces.
(3) The impact of digital inclusive finance on economic resilience is heterogeneous, and it appears as Shanxi > Ningxia > Gansu > Xinjiang > Qinghai. These effects are more significant in high-level areas of financial development.
(4) There is a double-threshold effect in the process of the impact of digital inclusive finance on economic resilience, in which the capital allocation efficiency has a gradually increasing threshold effect. The vitality of entrepreneurial employment has the effect of fluctuating growth threshold.

Based on the above characteristic facts and empirical test conclusions, several important conclusions can be elucidated, as follows:

Further improving the development environment of digital all-inclusive finance in the five northwest provinces is an important measure by which to enhance the economic resilience of the five northwest provinces [48]. Firstly, one should promote the continuous innovation of financial instruments and financial models by broadening financial channels and promoting financial innovation [49], provide tax incentives to relevant institutions and enterprises that provide digital inclusive financial services, continue to expand the coverage of inclusive financial services and deepen inclusive financial services, and provide high-level, high-quality and diversified services to the five northwestern provinces and regions. To meet the diversified financial needs of the northwest region, one should provide it accurate financial services [50], fully release the marginal spillover effect of digital financial inclusion benefiting the long-tail group, and strive to change the phenomenon of digital financial services that deeply inhibits consumption in the northwest region, so as to enhance economic resilience. Secondly, one should increase the construction of infrastructure such as mobile finance and the internet, make use of advanced financial technology such as artificial intelligence and big data [51], and increase the publicity of digital financial inclusion to promote its development. In addition, financial supervision will be strengthened. One should comprehensively improve the level of financial risk management, establish and improve the financial supervision system, and use digital platforms to achieve accurate prediction and effective control of financial risks [52]. In addition, the distribution of financial resources in the five northwestern provinces is seriously uneven, and the provinces with a high level of inclusive financial development will have a better effect on enhancing economic resilience. Therefore, the allocation of financial resources should be taken as an important task of "western development" and the implementation of financial support policies for the northwest region should be further deepened.

Giving full play to the role of digital financial inclusion in improving the efficiency of capital allocation, enhancing the vitality of entrepreneurship and employment, and reducing pollution emissions is an important way by which to enhance the economic resilience of the five northwestern provinces [53]. First of all, one should accelerate the innovation and development of financial instruments and promote the fair distribution of financial resources, so that relatively vulnerable small, medium and micro enterprises, urban low-income groups and farmers in northwest China can better enjoy the inclusive results of digital finance [54], alleviate the original financial exclusion and inefficiency [55], and help improve the efficiency of capital allocation [56]. Secondly, one should focus on the coordination between the development of digital inclusive finance and the policy of stable employment and promotion of employment; on the development needs of small, medium and micro enterprises in the northwest provinces and the entrepreneurial needs of college graduates and urban and rural residents; innovate financial products and services; and provide strong support for the development and growth of small and medium-sized enterprises and the expansion of income channels for vulnerable groups, thus improving the entrepreneurial and employment environment in northwest China [57]. We will provide plans by which to increase the vitality of entrepreneurship and employment and strengthen

economic resilience [58]. In addition, digital inclusive finance has certain environmental protection functions, which are related to the way in which inclusive finance greatly improves the efficiency of capital allocation and shortens the relevant procedures. The focus should therefore be gradually placed on improving the efficiency of inclusive finance and expanding environmental protection functions.

9. Note

In my opinion, the topic of digital inclusive finance and economic resilience in northwest China is closely related to sustainability.

Regionally unbalanced development is a major problem for China in terms of achieving sustainable economic development. Due to its remote geographical location and poor natural and social conditions, northwest China has a clear economic gap with the developed regions of China, which hinders China's sustainable and high-quality development process. China's development road is the road of Chinese-style modernization, and the most fundamental goal is to achieve common prosperity for all Chinese people. Therefore, it is an inevitable requirement of the Chinese government to focus on the backward areas in northwest China, provide preferential policy support, accelerate its development, narrow the gap with China's developed provinces, and promote the balanced and coordinated development of China's regions. It is also an inevitable choice to achieve sustainable development of China's economy.

Economic resilience represents the ability of an economy to adjust, recover and reshape itself. Its essence is such that it can adjust itself to maintain self-stability after facing a series of shocks, which is an important reflection of the effect of macro management and sustainable development. At present, China has entered the double cycle stage of domestic and foreign. Facing a double impact at home and abroad, the question of how to promote the stable development of an economy is the inevitable requirement if China is to achieve sustainable development.

The issue of financial development is an important and core issue of China's economy and even that of the world. Financial risk breaks space limits. On the one hand, financial development has positive advantages in realizing the sustainable development of China's economy. Now the Chinese government is faced with domestic and foreign shocks it needs stable funds to reshape and restore the internal economy, which cannot be achieved without the support of financial services. Financial services can play a stabilizing role in the economic system by providing asset management and risk hedging services for enterprises.

Digital inclusive finance was born in the era of digital globalization. Compared with "financial exclusion," digital inclusive finance has the fundamental characteristics of inclusivity and extensivity. With the help of "internet + finance," it breaks the restrictions of traditional finance, alleviates the phenomenon of financial exclusion suffered by marginal groups, greatly improves the possibility of credit, and improves the quantity and quality of financial services. It can better meet the financial needs, so as to achieve the purpose of enhancing the resilience of the economy. From the perspective of its inclusive and extensive characteristics, it is of great significance to the sustainable development of the region and the country.

From the perspective of the mechanism effect of digital inclusive finance, the paper found that digital inclusive finance can enhance economic resilience by reducing emissions, which indicates that the emergence of digital inclusive finance has a slight environmental protection function. This shows that the emergence of inclusive finance is a major innovation in financial technology, creating a new financial development model that integrates economic functions, social functions and environmental protection functions, and is of remarkable significance for China to achieve the stability, sustainable and inclusive development of the national economy as a whole.

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