THE IMPACT OF THE COMBINATION OF SCIENCE AND TECHNOLOGY AND FINANCE ON ECONOMIC RESILIENCE- EMPIRICAL EVIDENCE BASED ON QUASI-NATURAL EXPERIMENT OF "PROMOTING THE COMBINATION OF SCIENCE AND THCENOLOGY AND FINANCE"

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Abstract: *This paper raises the question of whether the difference in the level of financial development will lead to a difference in the implementation effect of the policy of "promoting the integration of science and technology and finance". The study found that the impact of policy on economic resilience is heterogeneous in cities with different geographical locations, political status and educational levels. In the regions with different levels of financial development, the policy of "promoting the integration of science and technology and finance" has different effects on economic resilience.*
Keywords: *FinTech Economic, economic resilience, level of financial development*
JEL: *G2; O3; E6; O1*

1. Introduction

The relationship between finance and economic stability is an important issue in economics. In recent years, countries have increasingly focused on economic resilience in the process of economic recovery. Economic resilience and its influencing factors have become a hot topic in current research (Petach, Weiler & Conroy, 2021; Bristow & Healy, 2017, p. 265-284;

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Petit, 2022, p. 377-398; Trippl, Fastenrath & Isaksen, 2024, p. 101-115). The Financial policy is an important factor affecting economic resilience (Gong & Hondroyiannis, 2023, p. 2493-2509). In the context of the rapid rise of the financial industry, China has enacted a series of financial policies to achieve long-term sound economic development, including the policy of "promoting the integration of science and technology and finance". The policy is proposed to support the development of start-ups and small and medium-sized enterprises, improving the efficiency of technological transformation and innovation-driven development capabilities. The policy of "promoting the integration of science and technology and finance" provides enterprises with diversified financing channels, which helps enterprises maintain stable development in economic uncertainty.

Previous studies have analysed the effectiveness of the implementation of "promoting the integration of science and technology and finance" policy by whether economic resilience has been improved (Guo & Chai, 2023, p. 1-10). But the evaluations of the implementation effect of the "promoting the integration of science and technology and finance" policy are lack of the level of local financial development. If the impact of differences in the level of financial development on policy implementation is not considered, it may lead to shortcomings in the evaluation of policy effectiveness. Therefore, this paper raised the quesiton is whether there are differences in the effect of the policy of "promoting the integration of science and technology and finance" on improving economic resilience under the different levels of financial development?

Based on panel data of 276 prefecture-level cities in China from 2009 to 2021, this paper considers the policy of "promoting the integration of science and technology and finance" as a quasi-natural experiment, using the difference-in-difference model and moderating effect model to explore the difference in the impact of the policy of "promoting the integration of science and technology and finance" on economic resilience at different levels of financial development. It is verified that the level of financial development can affect the implementation of the policy of "promoting the integration of science and technology and finance" and then affect the improvement effect of improving economic resilience. This paper hopes to break through the single analysis framework in previous studies, identifying the factors affecting policy implementation, making up for the lack of theoretical research, and providing a new perspective for the study of policy evaluation. At the same time, we can learn from this experience, providing an accurate basis for regional policy makers, ensuring the optimization of policy effects, and then maximizing economic resilience.

The structure of the rest of this paper is as follows: The second part introduces the literature review; the third part puts forward the research hypothesis. The fourth part introduces the model and variables. The fifth part carries out the empirical test, presenting the regression results and carrying out the robustness test. The sixth part is the conclusion and policy recommendations.

2. Literature review

2.1. "Promoting the integration of science and technology and finance" policy

So far, most research has focused on elucidating the various impacts of policies. Some scholars have identified that, for example, "promotion the integration of science and technology with finance" policy have a significant influence on carbon emissions (He et al., 2024), enterprise entry (Liu & Liu, 2024), low-carbon economic transformation (Zhang, Feng & Wang, 2024), local innovation (Ye, 2023), and green credit level (Zhao, Xin & Wang, 2024, p. 1074-1086). However, there is a scarcity of the studies that have focused on the influence of the policy environment on policy implementation. Consequently, there is a dearth of literature examining the impact of disparities in levels of financial development on policy implementation.

2.2. Economic resilience

The current literature on economic resilience is divided into two categories. The first is the concept of economic resilience. Briguglio, Cordina, Farrugia and Vella (2014, p.47-56) described economic resilience in two ways: the ability of the economy to recover from shocks, and the ability of the economy to withstand shocks. The second category is the influencing factors of economic resilience. Christopherson, Michie and Tyler (2010, p. 3-10) noted that innovation, infrastructure, a diversified industrial structure and a sound financial system have a long-term impact on economic resilience. Martin (2010, p.1-27) proposed that the regional economic structure, external resources, infrastructure, and residents' psychological factors would affect regional economic resilience. Hill et al. (2012, p.193-274) argued that the regional industrial structure, human capital, innovation capacity, policy environment and other factors have an impact on the regional economic resilience. Some scholars have proposed that financial development is conducive to improving economic resilience, and the impact of financial development on economic vulnerability is U-shaped (Nguyen & Su, 2021, p.237-252). Some scholars have also found that bias in scientific and technological progress can enhance economic resilience (Kuang & Fan, 2022, p.22-32). The structural characteristics of technological innovation can affect regional economic resilience (He et al., 2023, p. 4043-4070).

3. Research hypothesis

3.1. The policy of "promoting the integration of science and technology and finance", the level of scientific and technological development and economic resilience

The policy of "promoting the integration of science and technology and finance" enhances economic resilience by directly supporting the continuous operation of enterprises. China 's small and medium-sized enterprises are facing severe financial difficulties (Zhang, Cai & Gao, 2024). The financing difficulties have brought great challenges to the survival of

enterprises. The health and vitality of enterprises directly affect the strength of economic resilience (Zhao et al., 2024). The policy of "promoting the integration of science and technology and finance" aims to alleviate the financial difficulties faced by enterprises, ensuring the health and vitality of enterprises by supporting the continuous operation of enterprises, and thus enhancing economic resilience.

The policy of "promoting the integration of science and technology and finance" enhances economic resilience by improving the level of scientific and technological development. Enterprises are the main body of scientific and technological innovation [5]. The transformation of scientific and technological achievements into physical products is an important way to form social and economic benefits (Fang & Sheng, 2020). These economic benefits are important aspects that affect economic resilience (Tan & Hai, 2024, p.88-103). Financing difficulties reduce the transformation speed of scientific and technological achievements of enterprises and affect the development of scientific and technological innovation. Innovation is the key to improving economic resilience (Bristow & Healy, 2018, p.1-20). From the perspective of production efficiency, the high-level science and technology can significantly improve production efficiency and reduce costs (Thatcher & Oliver, 2001, p.17-45), thereby enhancing the viability of enterprises in market fluctuations.

Based on this, this paper proposes H1: the policy of "promoting the integration of science and technology and finance" can improve economic resilience.

H2: The policy of "promoting the integration of science and technology and finance" can improve economic resilience by improving the level of science and technology development.

3.2. The level of financial development plays a regulatory role in policy improvement of economic resilience

The imbalance of financial stagnation would lead to the improvement of the financial system and the maturity of the financial market, which would lead to the different effects of policy implementation. On the one hand, the imperfect financial system would lead to imperfect financial functions. The economic regulation function of finance includes the transmission from policy implementation to the market (Beck, 2012, p.161-203). In the areas with high levels of financial development, due to the perfect economic regulation function of finance, the policy intentions can be more effectively transmitted to the market and promote the effective combination of technology and financial resources. On the other hand, the mature financial markets are usually accompanied by a sound legal and regulatory framework, and laws and regulations are a necessary condition for corporate financing (La et al., 1997, p.1131-1150). With a stable and transparent legal and regulatory environment, it is easier for companies to obtain financing, reduce financing costs, and increase investment willingness, thereby promoting innovation and development. Therefore, the difference in the level of

[5] https://www.stdaily.com/index/yaowen/202407/4bc0e8ae977349cc8184bd5dd1857ba9.shtml

financial development would affect the implementation of policies, which in turn would affect the improvement of economic resilience.

Based on this, this paper puts forward H3: the level of financial development plays a regulatory role in the promotion of economic resilience through the policy of "promoting the integration of science and technology and finance".

4. Model construction and variable description

4.1. Model construction

This paper considers the policy of "promoting the integration of science and technology and finance" as a quasi-natural experiment, and uses the difference-in-difference model to identify the impact of the policy on economic resilience. The specific benchmark model is as follows:

$$Resil_{it} = \alpha_1 + \beta_1 \times did_{it} + \theta_1 \times X_{it} + \omega_i + \varphi_t + \varepsilon_{it} \quad (1)$$

The coefficient β_1 is the focus of this paper, and it reflects the direct impact of the pilot cities of the " Pilot Programme for the Promotion of the Integration of Science, Technology and Finance" policy on the resilience of the local economy. In the model, the subscript i represents the city and t represents the year. $Resil_{it}$ is the economic resilience of city i in year t, representing the explanatory variable. X_{it} are a series of control variables for this article; ω_i is the fixed urban effect; φ_t is the fixed time effect; ε_{it} is a random error term.

4.2. Variable description.

This paper selects economic resilience (Resil) as the explanatory variable, and the implementation of the policy of " promoting the combination of science and technology and finance pilot " (did) as the core explanatory variable, and the level of financial development (FD) as the adjustment variable. The control variables contain per capita GDP (agdp), the ratio of total retail sales of social consumer goods to GDP (retail), the level of agglomeration (density), infrastructure construction (infra), openness (foreign), government behavior (budget). The following are specific variable information:

4.2.1. Dependent variable

Economic Resilience (Resil). Currently, there are two main ways to measure economic resilience in academia. The first is the single index method, and the second is the index system method. This paper uses a single indicator method, based on the causal structure model method of Martin et al. (2016, p.561-585), using the annual national real GDP growth rate as the counterfactual basis for the economic development of each city. The difference between the annual real GDP growth rate of each city and the counterfactual, represents the local economic resilience. The formula is as follows.

$$\left(\Delta P_i^{t+T}\right)^{expected} = G_N^{t+T}(P_i^t) \quad (2)$$

$$Resil_{i,t+T} = \frac{\left(\Delta P_i^{t+T}\right) - \left(\Delta P_i^{t+T}\right)^{expected}}{\left|\Delta P_i^{t+T}\right|^{expected}} \quad (3)$$

ΔP_i^{t+T} and $\left(\Delta P_i^{t+T}\right)^{expected}$ are the actual and expected changes in GDP of city i in year t+T, respectively; P_i^t is the GDP of city i in year t; G_N^{t+T} is the growth rate of national GDP between t and t+T; $Resil_{i,t+T}$ is the economic resilience of city i from year t to t+T.

4.2.2. Independent variable

In this paper, the dummy variable (did) is used to represent the implementation of the policy of "promoting the integration of science and technology and finance". During the sample period, 42[6] cities in 2011 and 9 cities in 2016 became pilot cities. If a city entered the list of pilot cities in 2011 or 2016, the city 's did value in the year of policy implementation and subsequent years is 1, otherwise the value is 0.

4.2.3. Regulating variables

Financial development level (FD). It is reflected by comparing the total loan and deposit balances provided by financial institutions with the economic output (GDP) of the region. The higher the value, the more developed the financial sector, and vice versa, the more limited the ability to obtain financial resources.

4.2.4. Control variables

This paper introduces a series of other factors that affect economic resilience as control variables, as follows:

Economic development: This paper uses per capita GDP (agdp) and the ratio of total retail sales of social consumer goods to GDP (retail) as economic development indicators to measure economic resilience. Agglomeration level (density): This paper uses population density to measure agglomeration level. Infrastructure construction (infra): The level of infrastructure construction is expressed by the area of real urban roads per capita. Openness (foreign): This paper uses the proportion of foreign capital actually utilized in GDP to measure the degree of openness. Government behavior (budget): This paper uses the ratio of government spending to GDP to reflect government behavior.

This paper selects 276 prefecture-level and above cities in China from 2009 to 2021 as the research object and eliminates the sample of cities with more missing data. The urban

[6] The city of Longnan is excluded from this paper due to the high number of missing variables in that city.

resident population data at the end of the year are derived from the statistical yearbooks of various provinces and cities, and the missing data are supplemented by interpolation method. The data of economic and social indicators are mainly derived from the "China Urban Statistical Yearbook (2009-2022)" and the statistical yearbooks of various provinces and cities. Some missing values are collected and supplemented by CEIC, EPS, Wind and other data.

The descriptive statistical analysis of each variable is shown in Table 1.

Table 1 Descriptive statistics

Variable	N	mean	sd	min	max
Resil	3588	17.99	21.36	-11.45	161.40
did	3588	0.14	0.35	0	1
density	3588	0.18	0.12	0	1
agdp	3588	0.01	0.02	0	1
retail	3588	0.38	0.11	0	1
foreign	3588	0.41	0.03	0	0.71
budget	3588	0.07	0.04	0.01	1
infra	3588	0.26	0.02	0	0.44
Tech	3588	0.02	0.02	0	0.21
FD	3588	2.44	1.2	0.59	21.30

5. Results and some discussion

5.1. Benchmark regression and mediation mechanism test

Columns (1) - (4) in Table 2 show the results of the benchmark regression model. In Column (4) of Table 2, the influence factor of the policy "promoting the integration of science and technology and finance" (did) on economic resilience (Resil) is 4.263, and it passes the significance test at the level of 1 %. Columns (1) and (3) are models of unbound time and individual effects, and columns (2) and (4) are models of two-way fixed time and individual effects. Preliminary results in columns (1) and (2) show that the policy of "promoting the integration of science and technology and finance" has improved economic resilience. By adding control variables to the results of columns (3) and (4) to reduce the impact of ignoring control variables, it is found that the policy of "promoting the integration of science and technology and finance" still promotes economic resilience. Therefore, H1 is verified, and this paper can conclude that the policy of "promoting the integration of science and technology and finance" can improve economic resilience.

This paper adopts "Science and technology expenditure accounts for local general public budget expenditure" to measure the level of science and technology (Tech) in the region. Based on Model (1), the second step of mediating effect is constructed. The model is as follows.

$$Tech_{it} = \alpha_2 + \beta_2 \times did_{it} + \theta_2 \times X_{it} + \omega_i + \varphi_t + \varepsilon_{it} \quad (4)$$

This article focuses on the impact coefficient of the policy of "promoting the integration of science and technology and finance" on intermediary variables. If it is significant, it indicates that there is a mediating effect. The variables are consistent with Model (1) and $Tech_{it}$ is the intermediary indicator of this paper.

The results of the intermediary mechanism test are shown in Column (5) of Table 2. The estimated results in Column (5) of Table 2 show that the estimated coefficient of the "promoting the integration of science and technology and finance" policy (did) to the level of science and technology (Tech) is 0.005, passing the significance test at the 1 % level. It is believed that the "promoting the integration of science and technology and finance" policy can improve the level of science and technology. Therefore, it is believed that H2 is established, and the policy of "promoting the integration of science and technology and finance" can significantly increase the investment of public science and technology financial resources and enhance economic resilience by improving the level of science and technology. It is verified that improving the level of science and technology plays an intermediary role in the process of promoting economic resilience in the policy of "promoting the integration of science and technology and finance".

Table2. Benchmark regression

variable	(1) Resil	(2) Resil	(3) Resil	(4) Resil	(5) Tech
did	9.686***	3.845***	10.373***	4.263***	0.005***
	(8.011)	(2.360)	(7.237)	(2.657)	(3.193)
Control	No	No	Yes	Yes	Yes
Year fe	No	Yes	No	Yes	Yes
Id fe	No	Yes	No	Yes	Yes
N	3588	3588	3588	3588	3588
r2_a	0.025	0.801	0.049	0.809	0.745

*Note: *, **, and *** denote significant at the 10%, 5%, and 1% levels, respectively; clustered robust standard errors are in parentheses, as in the table below.*

5.2. Robustness test of benchmark regression

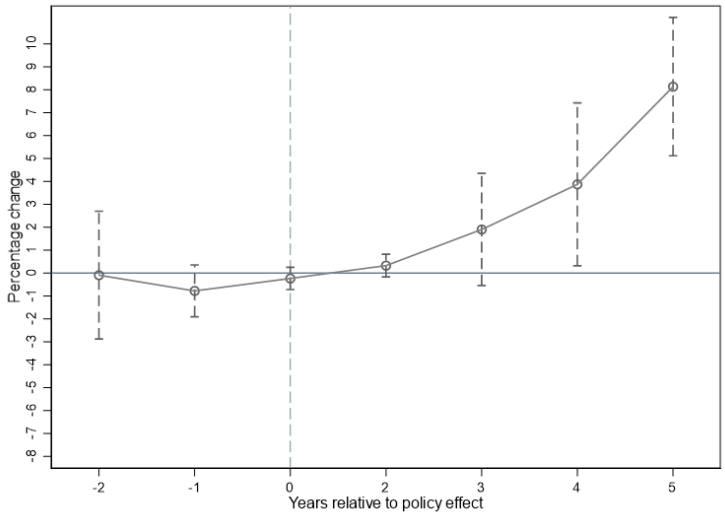
5.2.1. Parallel trend chart

To explore the impact of the policy of "promoting the integration of science and technology and finance" on economic resilience, we should first meet the parallel trend hypothesis. This paper refers to Beck et al. (2010, p.1637-1667) and takes one year after the implementation of the policy as the base period[7]. The regression coefficient and confidence interval are

[7] The -2, -1, 0, 1, 2... in the figure represent the two years before the policy was implemented, the year before the policy was

drawn as a parallel trend test chart. It can be seen from Figure 1 that in the years before the policy of "promoting the integration of science and technology and finance", there was no significant difference in economic resilience between pilot cities and non-pilot cities. After the fourth year of the policy, the economic resilience of pilot cities was significantly higher than that of non-pilot cities, and the parallel trend test passed.

Figure 1 Parallel trend test

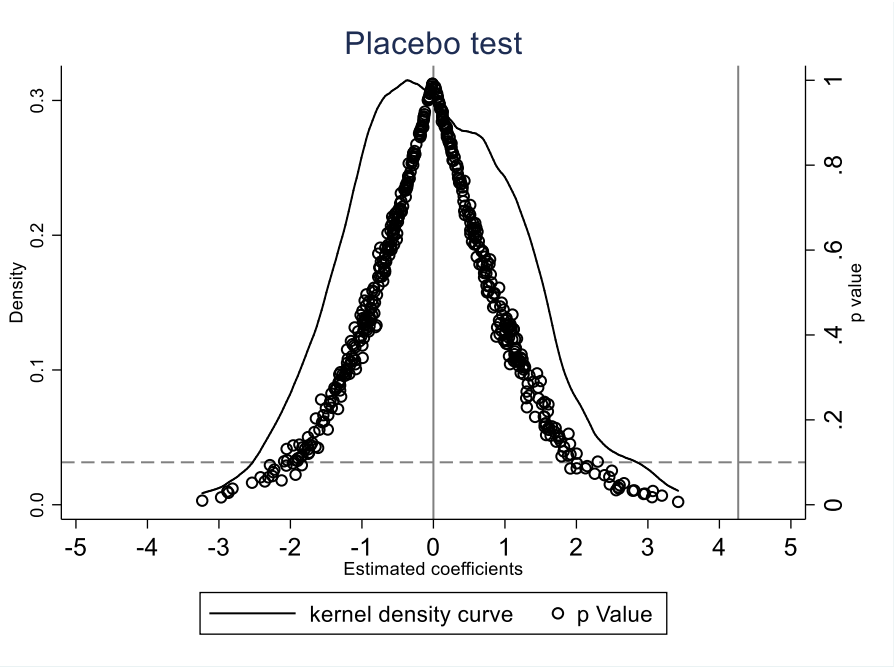


5.2.2. Placebo test

Referring to Cantoni et al. (2017, p.338-392), this paper randomly selects pilot cities to test whether the effect of the policy of "promoting the integration of science and technology and finance" on economic resilience caused by other unobservable factors, in order to further strengthen the credibility of the research results. After randomly selecting 51 cities as the experimental group, the virtual policy variables are constructed to re-estimate the Model (1), and 500 regressions are performed on the extracted data. The regression coefficients are gained, and the kernel density map is depicted as shown in Figure 2. The results show that the benchmark regression coefficient (4.263) is significantly different from the estimated coefficient. The distribution of the estimated coefficient is approximately 0, and the p value is basically greater than 0.1, which to some extent indicates that the benchmark regression conclusion of this paper is not caused by unobserved accidental factors.

implemented, the year before the policy was implemented, the first year of the policy was implemented, the second year of the policy was implemented... respectively.

Fugure2. Placebo test



5.2.3. Hysteresis effect

Since the implementation of the policy of "promoting the integration of science and technology and finance" often does not produce the desired results immediately, it has a long-term effect and needs a certain amount of time to observe its impact. In this paper, the regression analysis is carried out after the lag treatment of the policy of "promoting the integration of science and technology and finance". The regression results are shown in Table 3. The impact factors of the policy of "promoting the integration of science and technology and finance" lag 1 year (L.did), 2 years (L2.did) and 3 years (L3.did) on economic resilience (Resil) are 4.702,5.285 and 5.920 respectively. Both passed the significance test at the 1 % level. These shown that there is a lag effect on the impact of the policy of "promoting the integration of science and technology and finance" on economic resilience, and this lag effect increases with time.

Table3.Hysteresis effect result

variable	(1) Resil	(2) Resil	(3) Resil
L.did	4.702***		
	(2.753)		
L2.did		5.285***	
		(3.001)	
L3.did			5.920***
			(3.312)
Control	Yes	Yes	Yes

Year fe	Yes	Yes	Yes
Id fe	Yes	Yes	Yes
N	3312	3036	2760
r2_a	0.805	0.802	0.800

5.3. Heterogeneity analysis

5.3.1. Geographical location differences.

In this paper, different regions are grouped to construct dummy variables in the eastern and non-eastern regions, and dummy variables interact with explanatory variables in the model (1). And regression is performed in groups to further test the difference in the effect of the policy of "promoting the integration of science and technology and finance" on improving economic resilience. In columns (1) and (2) of Table 4, there are significant differences between eastern and non-eastern regions. The regression coefficient of the policy of "promoting the integration of science and technology and finance" in the eastern region to economic resilience is 2.630, which does not pass the significance test. The regression coefficient of the policy of "promoting the integration of science and technology and finance" in non-eastern regions on economic resilience is 5.729, which passes the significance test at the level of 5 %.

It can be found that compared with the eastern region, the non-eastern region has played a greater potential to "promoting the integration of science and technology and finance" policy to enhance economic resilience. The economic development of the eastern region is relatively mature, and the financial and technological industries have a high penetration rate, so the policy effect may be relatively less significant. Further policy development may play a "fine-tuning" role, rather than creating major changes. The problem of financial difficulties in the non-eastern regions is more severe. Therefore, the impact of the policy of "promoting the integration of science and technology and finance" in non-eastern regions on economic resilience is significantly greater than that of the eastern regions.

5.3.2. Political status difference.

Apart from geographical differences, there are also differences in political status of Chinese cities. Firstly, this paper constructs a dummy variable of provincial capitals and non-provincial capitals for cities with different political status, and interacts with the dummy variables with the explanatory variables in model (1) respectively, and groups them for regression to further test the difference in the effect of the policy of " promoting the combination of science and finance " on the improvement of economic resilience. In column (3) and column (4) of Table 4, there are significant differences in policy implementation between provincial capital cities and non-provincial capital cities. In provincial capital cities, the regression coefficient of the policy of "promoting the integration of science and technology and finance" on economic resilience is 5.286, which passes the significance test

at the level of 5 %. In non-provincial capital cities, the regression coefficient of the policy of "promoting the integration of science and technology and finance" on economic resilience is 3.059, which does not pass the significance test.

The reason for this difference may be that compared to ordinary prefecture-level cities, provincial capital cities have inherent advantages in obtaining resources, such as the right to pilot some reform policies, and a higher financial capacity to implement national policies. The impact of "promoting the integration of science and technology and finance" in provincial capital cities on economic resilience is significantly greater than that of the policy of "promoting the integration of science and technology and finance" in non-provincial capital cities on economic resilience.

5.3.3. Education level difference.

Difference in education levels would lead to differences in talents in science and technology development, which would affect policy implementation. In order to test the heterogeneity of the improvement of economic resilience caused by the difference in education level, this paper divides cities into cities with higher education development level and cities with lower education development level according to the "211 Project" university standard, interactings with the explanatory variables in model (1) and making regression respectively. The results show that for cities with higher education levels, the estimated coefficient of economic resilience of "promoting the integration of science and technology and finance" policy is 4.668, and it passes the significance test of 5 % level. For cities with low levels of education, the policy "promoting the integration of science and technology and finance" has an estimated coefficient of 3.059 for economic resilience, which does not pass the significance test.

It shows that in cities with higher levels of educational development, the impact of the policy of "promoting the integration of science and technology and finance" on economic resilience is significantly greater than that of the policy of "promoting the integration of science and technology and finance" at lower levels of educational development. The reason is that the talent generated by cities with higher levels of educational development can more effectively promote the combination of science and technology and finance, and more effectively implement policies.

Table4. Heterogeneity analysis result

variable	(1) Resil	(2) Resil	(3) Resil	(4) Resil	(5) Resil	(6) Resil
interact	2.630	5.729**	5.286**	3.059	4.668**	3.059
	(1.409)	(2.203)	(2.027)	(1.641)	(2.263)	(1.641)
Control	Yes	Yes	Yes	Yes	Yes	Yes
Year fe	Yes	Yes	Yes	Yes	Yes	Yes
Id fe	Yes	Yes	Yes	Yes	Yes	Yes

N	3588	3588	3588	3588	3588	3588
r2_a	0.809	0.809	0.809	0.809	0.809	0.809

5.4. Moderating effect

From the perspective of the level of financial development, this paper examined whether there are significant differences in the effect of the policy of "promoting the integration of science and technology and finance" under different levels of financial development. Based on the idea of the moderating effect model, this paper adds the adjustment variable of the level of financial development (FD) to interact on the basis of model (1), exploring the effect of policy implementation under different levels of financial development. The model is as follows.

$$Resil_{it} = \alpha_2 + \beta_2 \times did_{it} + \beta_3 \times FD_{it} + \beta_4 \times did_{it} \times FD_{it} + \theta_2 \times X_{it} + \omega_i + \varphi_t + \varepsilon_{it} \quad (5)$$

The test results of the adjustment mechanism of the policy of "promoting the integration of science and technology and finance" to enhance economic resilience are detailed in Table 5. In benchmark regression, the impact of "promoting the integration of science and technology and finance" policy on economic resilience is positive. From column (1) of Table 5, it is found that the coefficient (did * FD) of the interaction term between "promoting the integration of science and technology and finance" policy and the level of financial development is 3.893, and the significance test at the level of 1 % is passed. It can be seen that the level of financial development plays a positive role in regulating the impact of "promoting the integration of science and technology and finance" policy on economic resilience. In regions with high levels of financial development, the maturity of financial markets helps to allocate resources more efficiently, guide funds to the most promising technology projects, create a good environment for enterprises, promote cooperation between financial institutions and technology enterprises, accelerate the transformation of scientific and technological achievements, and then enhance economic resilience. It was found that the regulatory effect was significant. Therefore, it is believed that differences in the level of financial development would lead to differences in policies to enhance economic resilience.

In this paper, other robustness tests are used to further verify the credibility of the adjustment effect results to confirm the above conclusions.

1.Excluding extreme values. In regression, extreme values may affect the evaluation conclusion of this paper. In order to eliminate the influence of extreme values on empirical results, this paper deals with the explanatory variables by 1 % tail reduction method, and then performs regression again. The regression results are shown in the column (2) of Table 5. It can be found that the estimated coefficient of the interaction between the level of financial development and the policy of "promoting the integration of science and technology and finance" on economic resilience is 2.350, which passes the significance test of 1 % level.

2. Shorten the sample period. Since 2020, the outbreak and continued spread of the novel coronavirus have had a significant impact on economic resilience. Therefore, in order to eliminate the bias caused by the COVID-19 epidemic on the regression results, this paper shortens the sample period to 2019 and re-does the regression test. The regression results are shown in column (3) of Table 5. It can be seen from the Table 5 that after excluding 2020 and 2021, the estimated coefficient of the interaction between the level of financial development and the policy of "promoting the integration of science and technology and finance" on economic resilience is 4.112, which passes the significance test of 10 %.

3.Excluding municipalities. This paper considers that municipalities would have a strong specialty in both financial development and urban economic resilience due to their rapid development. Therefore, this paper would conduct regression test again after excluding municipalities in the research sample. The regression results are shown in Column (4) of Table 5. It can be found that after excluding the sample of municipalities, the estimated coefficient of the policy of "promoting the integration of science and technology and finance" on economic resilience is 4.308, and it has passed the significance test at the 1 % level.

Therefore, through the above robustness, this paper believes that the conclusion of the different financial development level would lead to the difference in policy to enhance economic resilience is robust.

Table5. Moderating effect result

variable	(1) Resil	(2) Resil	(3) Resil	(4) Resil
did	-8.731***	-8.360**	-2.258	-10.376***
	(-2.288)	(-2.299)	(-0.948)	(-2.675)
FD	-5.955***	-5.671***	-3.198***	-6.012***
	(-3.400)	(-3.429)	(-3.139)	(-3.368)
did*FD	3.893***	3.737***	1.467*	4.531***
	(3.298)	(3.327)	(1.903)	(3.662)
Control	Yes	Yes	Yes	Yes
Year fe	Yes	Yes	Yes	Yes
Id fe	Yes	Yes	Yes	Yes
N	3588	3588	3036	3536
r2_a	0.831	0.849	0.831	0.832

6. Conclusions and policy recommendations

Based on panel data of 276 prefecture-level cities from 2009 to 2021, this paper considers the pilot policy of promoting the combination of science and technology and finance as a quasi-natural experiment to verify that the level of financial development can affect the

implementation effect of the pilot policy of promoting the combination of science and technology and finance, and then affect the improvement of economic resilience. The results show that the implementation of the policy of "promoting the integration of science and technology and finance" has significantly improved local economic resilience. Heterogeneity analysis shows that the policy is heterogeneous in improving economic resilience in the regions with different geographical locations, different political status and different levels of education. In areas with high levels of financial development, the policy of "promoting the integration of science and technology and finance" has a stronger effect on economic resilience. In areas with weak levels of financial development, the policy of " promoting the combination of science and technology and finance " has a weaker effect on economic resilience, but it still promotes economic resilience. Differences in levels of financial development affect the effect of policy implementation.

These research findings can provide reference for different cities to enhance economic resilience with the help of the policy of "promoting the integration of science and technology and finance". The following policy implications are as follows: First, the policy of "promoting the integration of science and technology and finance" should be carried out according to local conditions. In areas with low levels of financial development, the priority should be given to the development of the basic financial industry. After basic financial services have matured, a combination of finance and technology should be proposed. Second, the government should strengthen personnel training. In order to promote the deep integration of technology and finance, we must pay attention to the cultivation and introduction of talents. The fields of finance and science and technology needs talent with interdisciplinary knowledge. By constructing a diversified talent training system, it provides human support for the combination of science and technology and finance.

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