Study on the Relationship Between E-Commerce Logistics and High Quality Development of County Business System

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Abstract. The transformation of e-commerce policy is one of the important keys to promote the high-quality development of county commerce. In order to study the relationship between e-commerce logistics and the high quality of county commerce, based on the data of Liaoning Province from 2019 to 2021, combined with the experiment of "E-commerce to the countryside demonstration county", the impact of the policy on county economy was studied by using the difference-difference method. The research shows that the rural demonstration policy has a significant growth effect on the county economy, and the growth of the county economy can promote the high-quality development of the business system. Through the analysis of regional heterogeneity, it is found that the policy has a greater impact on the development of western Liaoning. Further analysis shows that the combination of counties and the development of e-commerce have promoted the combination of urban and rural areas, making the county commercial industry achieve high-quality development.

Keywords: county-level commercial system; Electronic commerce; doubled-difference

1 INTRODUCTION

The high-quality development of the county business system is an important part of promoting Chinese-style modernization. Building a county-level business system is of great significance to promoting rural revitalization and the integrated development of urban and rural areas. With a clear development goal of rural e-commerce, the national ministries and commissions have taken corresponding attention and actions to the development of rural e-commerce, carried out comprehensive demonstration work in the Ministry of Commerce rural e-commerce, the Ministry of Agriculture carried out information into the village and household project to promote demonstration work across[1] the province.

"County commercial system" refers to the relationship and environment sum between consumers, investors, producers, governments and other market entities and related facilities within the scope of county management, with the production, circulation,

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consumption and service of commodities as the purpose of activities[2]. The integration of commerce, logistics and finance has formed a complete commercial system within the county. To achieve high-quality development of the county commercial system, it is necessary to optimize the layout of county commercial outlets, enrich carrier functions, cultivate and expand market operators, constantly optimize the rural consumption environment, and comprehensively improve the level of safe consumption. With the sinking of the e-commerce market, more and more businesses will pay attention to the new opportunities of county e-commerce, and the national government also supports the development of rural e-commerce and promotes the development of county economy. In 2014, the national "e-commerce into rural demonstration under the county" plan was officially launched. The number of funded counties has also been slowly increasing, from 56 in 2014 to 1,231 in 2019, a qualitative leap. The plan has promoted the development of county-level commerce and gradually moved toward high-quality development, which is of great research significance for improving the county economy.

Compared with the past, China's county business system has developed rapidly, closely surrounding the weak links in the county, accelerating the construction and transformation of business facilities, and improving the construction of rural consumption network. At the same time, consumer demand in rural areas has been further tapped. The integration of rural logistics and e-commerce has been promoted to make greater contributions to the revitalization of rural areas in counties. With the development of the business system, there are more and more infrastructure, more and more perfect, and more and more merchants are settled. However, there is still a big gap to complete the high-quality development of the county business system. It is also necessary to break the restrictions of the regional environment, complete the construction of the three-level logistics system in counties and villages, and improve social services. Zhang Dezhong's research[4] on the development of rural commercial system under the background of rural revitalization believes that the network layout is imperfect, the facility environment and services are dysfunctional, the market players are not diversified enough, the township express service network is small, the village-level delivery service is slow, and the consumption quality and safety are weak. To speed up the shortcomings of the commercial system, improve the county distribution system, and develop commercial circulation enterprises, we must take the sinking service and the main line of agricultural products as the starting point, and constantly carry out digitalization, standardization, and high-quality upgrading and power.

2 LITERATURE REVIEW

Strengthening the construction of county business system, developing county business system with high quality and promoting rural economic growth are new ideas and new measures in China's rural revitalization strategy in recent years. There are two aspects to the high-quality development of the county commercial system. The first is about the county economy, specifically discussing the development of e-commerce to drive the economy to promote the consumption of county residents[3], income, social services

and other aspects. In the existing research, the study of county economy accounts for the vast majority. As a new form of regional development, whether the pull of e-commerce to county economy can promote county economy[23]. For example, Zhu Yon[5]gheng and Wu Qianle used[6] the difference method to analyze the impact of e-commerce driving policies on the development level of county economy. Yu Longmin studied the impact[7] of e-commerce on the economy of rural demonstration counties along with the development of digital economy and the development of county agriculture. Guo Yuhan also conducted experiments[8] based on this policy, and made an empirical analysis of this issue with the data of ten years after 2011, and reached a similar judgment. Pan Zejiang et al. took the establishment of rural e-commerce comprehensive[9] demonstration counties as a quasi-natural experiment to depict the construction of digital countryside. Yao Yaoli et al. analyzed the problems existing in county economic growth from[10] two aspects of rural e-commerce and financial HP finance. The research on county economy is a problem that can not be ignored in the development of rural e-commerce, and many scholars have analyzed it from different angles. From the collected data, the integration of the county economy and the high-quality development of the business system are less, and the development of the county economy cannot represent the comprehensive development of all aspects of the county, which needs to be further improved.

The second is to discuss the construction of the commercial system and how to achieve high-quality development. Tan Mingfang[11] believes that the high-quality development of county society affects the effectiveness of the implementation of the rural revitalization strategy, and the content of high-quality development of county society is reflected in the "five-in-one" development of county. Yang Yan[2]li believes that the decline of the business system is due to the emphasis on the speed of urbanization and industrialization, and discusses that the construction of the county business system should be coordinated with the development of new urbanization. Zhang Dezhong[4] thought about how to promote the construction of county commercial system in Ruxian County. Chen Yijuntel [14] concluded that the construction of commercial systems such as "agricultural products rising", "industrial products going to the countryside" and "rural e-commerce" has promoted the leap-forward development of county economy. According to the policies of e-commerce in rural demonstration counties, the relationship between county economy and commercial system and how to develop with high quality were studied, and the methods and specific policies for the synergistic development of the two were studied. This paper selects the data of national e-commerce demonstration counties in Liaoning Province from 2019 to 2021 as the basis, completes the empirical analysis according to the differential method, and makes a marginal supplement for the research on the high-quality development of e-commerce logistics and county business system.

3 THEORETICAL ANALYSIS AND RESEARCH HYPOTHESIS

This paper uses DID difference method to study the impact of the implementation of "Rural e-commerce demonstration County" in Liaoning Province on county economy, and further analyzes the impact of economy on the high-quality development of county business system. Based on the study of Zhang Leilei (2024) on the index system of high-quality development of county economy, four first-level indicators of development are proposed and an evaluation system of high-quality development level of county business system is calculated using entropy weight method. As a deep combination of digital economy and real economy, e-commerce is a new type of business with the fastest development and the most extensive[12] scope in recent years. The state's financial support for e-commerce in rural demonstration counties is mainly used for the high-quality development of the county business system, mainly for the training of rural e-commerce, and the construction [13]of the three-level logistics distribution system of counties and villages. The establishment of e-commerce demonstration counties has directly promoted the development of rural e-commerce from the government's point of view, which is conducive to promoting the construction of electronic information infrastructure and logistics infrastructure in the region where it is located, and has provided direct help for the development of county economy. Based on the above analysis, the following research hypotheses are proposed in this paper.

The e-commerce model county policy will break the original business system model, reorganize the industrial structure, and extend to a broader industrial chain. Under the original model, the development of the business system stagnated, affected by geographical factors, national policy development and other factors, due to lack of motivation, it is difficult to make countries complete the goal of improving the development of the business system. However, with the development of e-commerce logistics and the promotion of model county policies, more potential merchants and consumers are tapped to expand their cross-regional and borderless advantages, and producers are more willing to invest in e-commerce logistics to expand developing markets in order to enhance their own consumption power, enhance their own development momentum, and promote enterprises to obtain economies of scale.

Since the implementation of "e-commerce into rural demonstration counties", the state has issued documents proposing to vigorously develop rural e-commerce, and strive to improve county infrastructure equipment, develop the information industry, and make the rapid development of e-commerce supply chain and production and marketing docking. Liaoning demonstration county is gradually establishing e-commerce public service centers, and has built more than 700 logistics and express delivery warehouses and e-commerce service outlets, driving nearly 20,000 rural households out of poverty. There are now more than 40 e-commerce service centers and more than 120 e-commerce warehousing and logistics centers in western Liaoning, and more than 10,000 people have been lifted out of poverty due to e-commerce platforms. With the policy of e-commerce demonstration in rural areas, the county can build a county-wide e-commerce live streaming base, create a county-wide public service center that attracts

live streaming e-commerce platforms, create a professional, distinctive and high-quality live streaming e-commerce platform, and improve the economic level.

Improve the level of residents' consumption, accelerate the development of rural e-commerce, accelerate the development of the county economy, and promote the high-quality development of the county business system. E-commerce demonstration county policies in villages can increase sales of agricultural products, reduce costs, improve profits and narrow the income gap between urban and rural areas. Therefore, hypothesis H1 is proposed: e-commerce logistics driving policies are conducive to the high-quality development and promotion of county economy.

Although the e-commerce rural demonstration county policy has been implemented in Liaoning County, it will produce different effects in different counties. For example, Changwu County, Fuxin City in western Liaoning Province, is a county-level city with good achievements in the development of rural e-commerce in Liaoning province. The poor county, where rich agricultural products could not be sold, has become a county commercial town with high-quality development. Like many developing countries, Liaoning suffers from regional imbalances.

To achieve high-quality development of the county business system, it is inevitable that the upgrading of industrial structure, upgrading of social services and financial development are the result[18][18] of integration and interaction. County level is the foundation of China's economic development. With county level basic education as an important carrier, it plays an important supporting role in guiding and promoting the balanced development of education, serving rural revitalization and advancing urbanization. For county-level governments, regional development is an important purpose, that is, by attracting the people in the county to buy and spend in the city, the formation of a closed financial system and the promotion of county economic development. The development level of county economy can be reflected by the popularization of county medical care and the development level of education. For the problem of difficult or slow logistics distribution in counties, demonstration counties have strengthened the construction of logistics distribution system, which can reduce the restrictions brought by geographical terrain and allow remote counties to have more connections with the market. The high-quality development of the county business system can promote the economic vitality of the surrounding counties, bring the industrial structure of the surrounding areas into the market, increase the degree of correlation, improve the construction of social services, and promote the development of industrial structure. [16]Therefore, hypothesis H2 is proposed: there is regional heterogeneity in e-commerce in rural demonstration counties.

3.1 Model Construction and Data Sources

As an important part of rural e-commerce and economic development, e-commerce in rural comprehensive demonstration counties has become a powerful measure[15] to build high-quality county development and empower county business system. This study takes the policies of rural e-commerce demonstration counties as the experiment, Zhu Yon[5]gheng takes the policies of rural e-commerce demonstration counties as the treatment group, and non-e-commerce demonstration counties as the control group. The

method of difference and difference was used to test what kind of economic differences existed between the control group and the treatment group. The basic model of this paper is as follows:

$$Y_{it} = \alpha + \kappa Treat_i \times Time_{it} + \sum \theta X_{it} + \mu_i + \nu_t + \varepsilon_{it} \quad (1)$$

Where i represents different countries and t represents different years. yit is the logarithm of the county's GDP in year t; In this paper, 2019 is taken as the policy implementation node, Treatititit=1 indicates after the policy implementation (t≥2019), Treat=0 indicates before the policy implementation (t<2019), Treat value is 1 or 0, indicating whether it is affected by the policy. The research sample of this paper is the demonstration counties in Liaoning Province from 2019 to 2021, among which Table 1 is the name of the demonstration counties in Liaoning Province from 2019 to 2021 from the list published on the website of the Ministry of Commerce of China. The data used in this paper are mainly from China County Statistical Yearbook and Liaoning Provincial Statistical Yearbook for 2019-2021. Considering that some data are missing, interpolation method is used to process the data and complete supplement the data.

Table 1. List of demonstration counties in Liaoning from 2019 to 2021.

Policy Year	Mock county name
2019	Donggang City, Wafangdian City, Kachin City and Leftiwing Mongolian Autonomous County
2020	Jianchang County, Haicheng City, Faku County, Xinbin Manchu Autonomous Region County, Xingcheng City, Ku, Andian Manchu Autonomous Region County, Fuxin Mongolian Autonomous Region County,
2021	Xiuyan Manchu Autonomous County, Zhangwu County, Beipiao City, Tieling County, Fengcheng City, Zhuanghe City

3.2 Selection of Variables

Drawing on Li Jiao[1]'s (2023) selection of indicators for high-quality economic development, this paper combines four dimensions of county economic quality, urban and rural efficiency, industrial structure and social service to build a high-quality development evaluation index system for county business system. As described in table 2 four first-level indicators and 12 second-level indicators are constructed, among which 12 indicators are positive indicators, representing that all of them can make the county business system develop in a high-quality and positive way.

Table 2. Evaluation index of high quality development of county commercial system.

First-level indicators	Secondary indicators	Indicator attributes
Economic quality development	Per capita GDP	+
	Average wage of working staff in urban units	+
	Per capita disposable income of urban residents	+

Efficiency development in urban and rural areas	Gross value of tertiary industry production	+
	Total retail sales of consumer goods	+
	Real estate development investment	+
Industrial structure development	General budget expenditure of local finance	+
	Balance of savings deposits of urban and rural residents	+
	Balance of various loans from financial institutions at the end of the year	+
Social service development	Number of students enrolled in ordinary middle schools	+
	Number of hospital beds	+
	Landline subscribers	+

In table 3,explanatory variables took 2019 as the time node, rural e-commerce demonstration counties as the treatment group, and non-demonstration counties as the control group. The decoded variables were selected as regional gross domestic product (GDP) and regional per capita GDP, respectively, to estimate the economic impact of e-commerce in rural demonstration counties, and further demonstrate the high-quality development of county commercial system.

Select control variables according to the evaluation index system. The added value of the tertiary industry is a relatively important indicator, which can reflect the stage of national economic development and the overall economic level (Liaoning Provincial Bureau of Statistics). The proportion of tertiary industry added value to the gross regional product of the demonstration county reflects the asset structure. Through the reflected industrial structure, it is possible to understand the industrial changes after the introduction of the demonstration county policy to reflect the development of the business system. As for the study of Yi Fimin, other variables that[10][10] can affect the development of county economy are controllable; The proportion of total retail sales of consumer goods to the gross regional product is used to represent the level of county economy; The logarithm of the number of students in ordinary middle schools was used to represent their education level, and whether the increase of employment rate had improved their education level and ensured the outflow of talents in the county; Referring to Zhu Yongheng, the logarithm of the number of hospital beds per capita was used to represent their medical level; The consumption level is expressed by the logarithm of the total retail sales of social consumer goods. The level of network infrastructure technology is measured by the number of landline subscribers. With reference to Tang Yuehuan's method[17], the number of fixed phone users is used to measure, and the development level of county business system construction of e-commerce digital countryside and development of smart agriculture is understood.

Table 3. Definitions and descriptions of variables.

Classification of variables	Variable name	The variable's code	Variable description
Explanatory variables	Rural e-commerce demonstration county policy	Tr&Ti	Policy Impact Period 1. Otherwise 0
Explanatory variables	Gross regional product	LnG	Logarithmic value of gross county product
	Gross regional product per capita	LnAG	County level per capita GDP
Control variables	Asset structure	A1	Value added of the tertiary sector as a percentage of GDP
	Level of consumption	A2	Total retail sales of consumer goods as a share of GDP
	Financial level	A3	Ratio of outstanding loans of financial institutions to GDP at year-end
	Education level	A4	Pairwise numbers of students enrolled in an ordinary secondary school
	Medical level	A5	Number of hospital beds per capita
	Level of network infrastructure	A6	Number of pairs for landline users

4 EMPIRICAL ANALYSIS

Since the government implemented the "e-commerce into rural comprehensive demonstration under the county" policy, the development of e-commerce has been significantly improved, in the e-commerce supply network service providers, sales transactions and other aspects have been significantly improved, driven the development of county economy, for the development of rural logistics, e-commerce training, providing ideas, agricultural product sales and other aspects, The county has built a high-quality development of the business system.

In Panjin, Liaoning province, 305 village-level supermarkets have been built in 89 communities and 100 villages, covering all rural consumption outlets. While improving the village-level commercial system, it is also building a commodity circulation system covering the whole region, forming a county-level circulation model of express delivery, customization, agency and distribution, and solving the upward problem of agricultural products through distribution. It is accelerating the construction of three-level county and rural commercial networks, opening up channels for industrial products to go down and agricultural products to go up through distribution centers, extending logistics distribution to towns and townships, sinking commercial circulation to towns and townships, transforming and upgrading county-level comprehensive business service centers, and guiding commercial circulation enterprises to realize modernization on the basis of the original infrastructure. A number of township commercial centers will be set up. So far, Liaoning has taken the form of financial support and cooperation with financial institutions such as the provincial Agricultural Development Bank. The

province has taken various measures to build 119 county-level comprehensive commercial centers and 548 township commercial centers, covering 100 percent of rural daily necessities. The number of directly operated stores and chain stores in administrative villages reached 2,861. The next step is to establish a county-level commercial system with counties as the core, towns as the core and villages as the basis, with a reasonable division of labor and complete planning. To meet the needs of rural residents at different levels of consumption, with counties as major consumption, townships as general consumption and villages as daily consumption.

4.1 Analysis of Parallel Trends

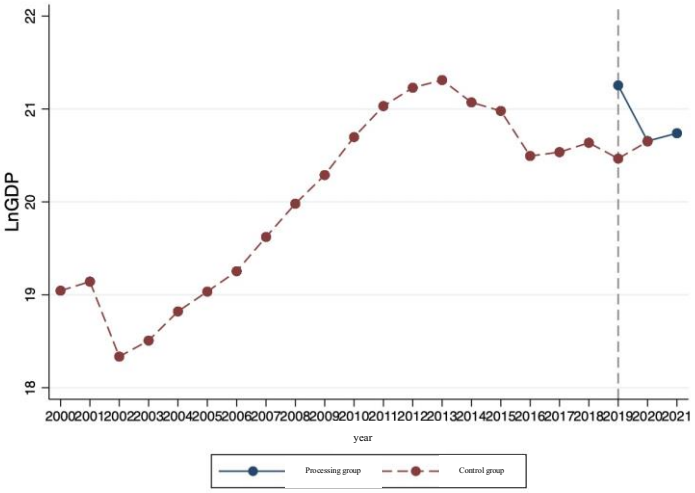

Fig. 1. Parallel trend test results.

The "double difference" effect vacation treatment group and control group met the same trend test. As shown in Figure 1, before the implementation of the e-commerce demonstration county policy in Liaoning Province, the regression coefficients were not significant, which proved that the development trend of the implementation of e-commerce demonstration counties in Liaoning Province was consistent, so it passed the parallel trend test.

4.2 Descriptive Analysis

Table 4 lists the descriptive statistics for this article. The maximum value of the explained variable LnGDP is 23.198, and the minimum value is only 16.646. This result shows that there is a significant gap in GDP between samples. The mean for this variable is 20.144 and the standard deviation is 1.480. This result indicates a higher level of overall GDP in the sample counties. Explanatory variable model county policy Treat_Time has a maximum value of 1 and a minimum value of 0. This result shows

that the degree of modeling of county policy varies greatly among the samples. The mean value of this variable is 0.080, and the standard deviation is 0.271, indicating that the policy level of the demonstration counties is not high on the whole. According to the results of descriptive statistics, we found that during the sample period, there were great differences among regions in terms of economic development level, geographical area, population size and informatization degree. These differences not only reflect the uneven development among different regions, but also the differences in resource allocation and policy implementation among different regions.

Table 4. Descriptive statistical results.

	count	mean	min	max	sd
LnGDP	333	20.144	16.646	23.198	1.480
LnAVEGDP	351	13.505	13.484	13.526	0.013
Treat_Time	351	0.080	0.000	1.000	0.271
A1	333	0.377	0.027	2.538	0.449
A2	333	20.80	20.00	22.00	0.138
A3	333	20.80	20.00	22.00	0.104
A4	351	14.94	14.93	14.94	0.005
A5	351	12.85	14.288	17.93	0.188
A6	351	16.63	14.16	18.81	0.922

4.3 Correlation Analysis

The correlation coefficient between variables is mainly about determining the relationship between variables, but it has obvious limitations. Therefore, a correlation test does not fully represent the true relationship between the data of the variables. The correlation test results of variables between samples are shown in Table 5. Firstly, as can be seen from the positive and negative signs of the coefficients, the correlation coefficients of interpreted variable Gross regional product (LnGDP) and interpreted variable Treat_Time are both positive. This result is consistent with the previous hypothesis that there is a positive correlation between the model county policy and the gross regional product, which means that the higher the degree of implementation of the model county policy, the higher the gross regional product, and the more it can promote the high-quality development of the county business system.

From the comparison of coefficient sizes, it can be seen that the absolute value of the correlation coefficient between the explained variable and all explanatory variables, including the asset structure, is greater than 0.1. The results show that there is a linear correlation between each variable and the explained variable. At the same time, the absolute value of the correlation coefficient between the explained variable and most other control variables is less than 0.5. This result shows that the correlation coefficient between the control variable and the explained variable is significantly lower than the correlation coefficient between the explained variable, that is, the control variable will not cause multicollinearity problems affecting the empirical results of this paper.

Table 5. Related tests.

	LnGDP	LnAG	T&T	A1	A2	A3	A4	A5	A6
LnGDP	1.0000								
LnAG	0.0818* *	1.0000							
T&T	0.1272	0.0708* *	1.0000						
A1	0.8294	0.0239* *	0.1275	1.0000					
A2	0.8294	0.0239* *	0.1275	1.0000	1.0000				
A3	0.8294	0.0239* *	0.1275	1.0000	1.0000	1.0000			
A4	0.0808	1.0000	0.0708	0.0234* *	0.0233* *	0.0233* *	1.0000		
A5	0.4534	0.1060	0.2318	0.4426	0.4426	0.4426	0.1050	1.0000	
A6	0.4319	0.2475	0.2873	0.2782	0.2782	0.2782	0.2467	0.4192	1.0000

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.4 An empirical Analysis of the Impact of County Policy Demonstration on Regional GDP

Based on the empirical analysis of the gross domestic product (GDP) data of the rural e-commerce county policy demonstration area, a two-way fixed-effect regression model with rural e-commerce policy as the explanatory variable and GDP as the explained variable is adopted. In order to prove the effect of policies on regional GDP, the county economic model is analyzed in this paper. The concrete model of the empirical part mainly includes the step-up regression result (1) and result (2), and result (1) is the benchmark regression result of the impact of the model county policy on regional GDP in the absence of control variables. Result (2) is the empirical result of demonstrating the impact of county policies on GDP with the addition of control variables. From the perspective of the influence of control variables, the asset structure, financial level, education and medical level and network infrastructure level can improve the economy and have a positive impact on the county economy level. The higher the asset structure, the better the facilities and equipment, the better the resources, and the stronger the development level, all of which are conducive to the development of the county commercialization system. From the results in Table 6 below, result (1) is the benchmark regression result of the impact of model county policies on regional GDP. This shows that the establishment of e-commerce in rural demonstration counties is conducive to accelerating the accumulation of production factors in the county, accelerating industrial agglomeration, and forming scale advantages. To build e-commerce in rural demonstration counties, it is necessary to vigorously invest in digital infrastructure such as the Internet and big data, gather capital and labor together, form an agglomeration trend and form a scale effect to promote the development of county economy.

The adjusted R-square in the model is 0.013, indicating that the model results have a linear relationship. In order to avoid problems such as heteroscedasticity in the model

results, this paper chose to add clustering robustness. As can be seen from the results, the regression coefficients of e-commerce model county policies on GDP are positive and significant, indicating that the rise of model county policies is conducive to the improvement of GDP.

Table 6. shows this. Impact of baseline regression.

	(1)	(2)
	LnGDP	LnGDP
Treat_Time	0.6771 * *	0.5683 * * *
	(2.3327)	(3.4974)
A1		2.4537 * * *
		(24.7137)
A2		0.542* * *
		(2.81)
A3		0.723* * *
		(2.81)
A4		2.4100
		(0.2606)
A5		0.5055* * *
		(12.33)
A6		0.4260 * * *
		(7.9253)
Year Fixed	None	Yes.
Zone Fixed	none	Yes.
_cons	20.0868 * * * (238.6590)	22.1032 (0.1597)
N	333	333
adj.R^2	0.013	0.738

T statistic in brackets * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Result (2) shows the regression results of the impact of the county policy model on GDP by adding control variables. According to result (2), the Treat_Time regression coefficient of the county policy impact model on GDP is 0.5683, which is significant at 1% statistical significance level. The results also show that the county policy model is positively correlated with GDP. The regression coefficient of consumption level A2 to GDP is -2.81, which is significant at the 1% statistical significance level. This result also indicates that asset structure is negatively correlated with regional GDP. The regression coefficient of data level A6 to GDP is 0.4260, which is significant at the 1% statistical significance level. This result also shows that the datamation level is positively correlated with GDP. The regression coefficient of A4 education level to GDP is 2.4100. This result also shows that education level is positively correlated with GDP. In summary, the baseline regression results prove that the hypothesis of significant positive correlation between the policies of the demonstration counties and GDP is valid. Among the control variables, asset structure, financial level, education and medical

level and network infrastructure level are positively correlated, indicating that the variables have a positive and significant impact on the commercialization level of the county, while the asset structure level is negative, indicating that the consumption level of the county needs to be improved.

4.5 Robustness Test

Due to the existence of robustness problems such as missing variables, this paper chooses a variety of methods to test the robustness of the benchmark model. As described in table 7,first this paper chooses to replace LnGDP with LnAVEGDP, and replaces the results (1) and (2) of the benchmark regression to obtain results (3) and (4). Secondly, this paper chooses to delay Treat_Time by one phase to L.Treat_Time, and results (5) and (6) are obtained. It can be seen from the results that the degree to which the model county's policies explain the explanatory variable GDP has changed after replacing it with LnAVEGDP. However, the hypothesis that county policies are positively correlated with GDP still holds. That is, the positive correlation model of county policies to GDP is robust.

Table 7. shows this. Robustness test.

	(3)	(4)	(5)	(6)
	LnAG	LnAG	LnGDP	LnGDP
Treat_Time	0.0001 * * *	0.0002 * * *	0.7317 *	0.5229 * *
	(2.6253)	(6.2895)	(1.6913)	(2.2484)
Other control variables	NO	Yes	No	Yes
Time \ individual fixed effect	Yes	Yes	Yes	Yes
_cons	13.5037 * * * (1590479.9764)	27.1678 * * * (95.3829)	20.1404 * * * (242.6617)	29.2099 (0.2058)
N	351	333	326	326
's R	0.998	0.99	0.006	0.735

T statistic in brackets * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.6 Heterogeneity Analysis

In order to verify the impact of county policy demonstration on county economy in eastern, central and western Liaoning, we conducted the following heterogeneity analysis, and the results are shown in Table 8. As can be seen from the results, the introduction of e-commerce in rural demonstration counties has significant effects in the three regions, but there are still obvious differences. The model county policy plays the most important role in the west Liaoning region. Most areas in western Liaoning vig-

orously develop e-commerce live streaming platforms, and have achieved good development in resource allocation, policy research, and public services. It has attracted a large number of livestream technical talents to sell local specialties, which has driven the development of the county economy in Liaoxi, thus completing the high-quality development of the county business system. The economic development of Liaodong and central regions is relatively slow, and the demonstration investment of county policies has not played a full role. Due to the disadvantage of geographical location, the application of e-commerce lacks good creativity. To sum up, the demonstration of e-commerce county policies in western Liaoning Province is superior to central and eastern Liaoning Province, which plays a positive role in the high-quality development of county business system.

Table 8. Isomerism regression.

	(1)	(2)	(3)
	Eastern	Central	In the west
Tr&Ti	0.4267 *	0.9152 *	1.7021 * * *
	(0.2196)	(0.5078)	(0.3838)
Control variables	Yes.	Yes.	Yes.
Time fixation effect	Yes.	Yes.	Yes.
Individual fixation effect	Yes.	Yes.	Yes.
_cons	262.8541 (497.9653)	2011.709 666.3226	1613.305 986.2325
N	127	82	124
R2's	0.6697	0.0137	0.1988

T statistic in brackets * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5 CONCLUSIONS AND POLICY RECOMMENDATIONS

Through the pilot of e-commerce in rural demonstration county, the impact of the demonstration county on the high-quality development of county commercial system is empirically analyzed by using DID difference method. The results show that the national e-commerce policy in the rural demonstration county has a promoting effect on the county economy, and passes the parallel trend test and the robustness test. The data analysis results show that the model county policy has a significant positive effect on the asset structure, financial level, economic level, education and medical level, network infrastructure level, but has no significant economic effect on the consumption level, and the consumption level within the county needs to be improved, so continue to improve the urban rate within the county. The introduction of e-commerce in rural demonstration counties has completed the high-quality development of the county's commercialization system and promoted the county's economic level by improving economic growth in social services and finance. The policies of western Liaoning have played a positive role in promoting the high-quality development of the county's commercial system. In order to promote the high-quality development of the commercial

system, combined with the specific policies of e-commerce into rural demonstration counties, the following suggestions are put forward.

First, it is necessary to implement the policy of e-commerce into rural demonstration counties, attach importance to the important role of e-commerce for county economic development, narrow the gap with cities and towns, and use the effect of e-commerce to build high-quality development of commercial system. Improve the county consumption capacity, narrow the gap with urban and rural consumption, popularize e-commerce while cultivating the willingness of online shopping in the county, and enhance the degree of rural digital life by increasing the penetration rate of rural e-commerce in the county. Secondly, promote the skills training of e-commerce industry and eliminate the technical barriers of e-commerce. The development of different counties to give corresponding technical and financial support. Determine the positioning of business system and the selection of business sectors in different counties. It is necessary to consider the surrounding traffic, environment and other factors to ensure that the development of the commercial agglomeration area is coordinated with the surrounding urban planning. Finally, give full play to the radiating driving role of policies in the surrounding areas, make the comprehensive development of e-commerce into rural demonstration county policies, and promote the more stable and high-quality growth of the regional business system. Strengthen the exchanges and cooperation between e-commerce development and surrounding counties, jointly improve the level of digital infrastructure, and optimize the environment for e-commerce development.

Second, adapt to local conditions, give full play to regional advantages, and further improve the high-quality development of the county business system. In eastern Liaoning, the popularity of e-commerce is low, and there are fewer e-commerce technicians in the county. The level of talents in the county determines the effect of the popularization and promotion of e-commerce. Local governments should strengthen the training of relevant practitioners, actively learn from the experience of e-commerce development in other regions, and improve the conversion[12]. Encourage the development of e-commerce live streaming platforms in eastern Liaoning, lead and cultivate more talents, promote the online development of local industries, realize the intensification of modern agriculture, and provide more decision-making support for the local through policy guidance (Chen Yijun 2022) to provide the basic talent foundation for the high-quality development of the county business system. Central Liaoning should improve the social service system, mainly strengthen education, medical care and communication, provide more resources to build high-quality county commercialization, and narrow the gap between urban and rural social services. Actively promote the standardization of education school construction, give more resources, and coordinate the urban-rural integrated development of vocational education. We will build an information society service platform in information circulation to facilitate the construction of county business systems. Give full play to the advantages and preconditions of relatively developed economy in western Liaoning, and actively promote the development of e-commerce in Liaodong and China. While making up for the short board of e-commerce in the backward areas of county economic development, it will make use of its advantages to actively develop emerging industries and further improve the high-quality development of county business system.

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