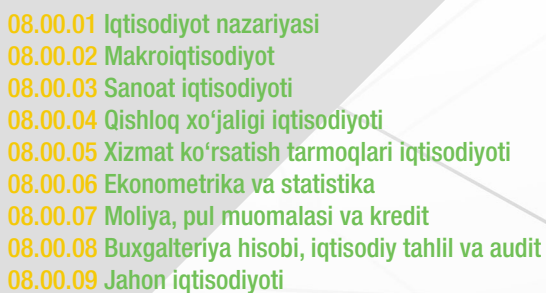


IQTISODIYOT
va
TARAQQIYOT

Ijtimoiy, iqtisodiy, siyosiy, ilmiy, ommabop jurnal



Yashil

IQTISODIYOT va TARAQQIYOT

Ijtimoiy, iqtisodiy, siyosiy, ilmiy, ommabop jurnal

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EMPIRICAL TEST OF REGIONAL ECONOMIC INNOVATION AND DEVELOPMENT ALONG THE BELT AND ROAD

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Abstract: the article adopts the method of fully corrected least squares between groups, and uses the data from 2010 to 2018 (affected by the new crown epidemic after 2019, the data is not regular), to analyze the trade facilitation and import of intermediate goods in the regions along the "Belt and Road". Conduct research with innovative development. The results show that the "Belt and Road" initiative has promoted trade facilitation, and enhanced innovation capabilities, but the phenomenon of regional imbalance is significant, which is greatly affected by the global economic situation.

Key words: trade facilitation; regional economy; innovation and development; "One Belt, One Road".

Annotatsiya: maqolada guruhlar o'rtasida to'liq tuzatilgan eng kichik kvadratlar usuli qo'llaniladi va 2010 yildan 2018 yilgacha bo'lgan ma'lumotlardan (2019 yildan keyin yangi toj virus epidemiyasidan ta'sirlangan, ma'lumotlar muntazam emas), savdoni osonlashtirish va oraliq tovarlar importini tahlil qilish uchun foydalaniladi. Innovatsion rivojlanish bo'yicha tadqiqot olib borish natijalari shuni ko'rsatadiki, "Belt and Road" tashabbusi savdoni osonlashtirish va innovatsion imkoniyatlarni oshirishga yordam beradi, ammo mintaqaviy nomutanosiblik fenomeni ahamiyatli bo'lib, bu global iqtisodiy vaziyatga katta ta'sir ko'rsatishi tahlil qilingan.

Kalit so'zlar: savdoni osonlashtirish; mintaqaviy iqtisodiyot; innovatsiyalar va rivojlanish; "Bir kamar, bir yo'l".

Аннотация: в документе используется метод полных наименьших квадратов с поправкой на группу и используются данные за период с 2010 по 2018 год (после 2019 года, затронутого новой эпидемией вируса короны, данные не являются регулярными), упрощение процедур торговли и промежуточные звенья, используемые для анализа импорта товаров. Результаты исследования инновационного развития показывают, что инициатива "Belt and Road" способствует развитию торговли и расширению инновационных возможностей, однако существенным является явление регионального дисбаланса, которое оказывает большое влияние на глобальную экономическую ситуацию.

Ключевые слова: упрощение процедур торговли; региональная экономика; инновации и развитие; «Один пояс, один путь».

I. INTRODUCTION

Since the joint construction of the “Belt and Road”, the degree of trade facilitation between China and countries along the route has improved, and trade cooperation has increased significantly. From 2013 to 2018, the total trade in goods between China and countries along the “Belt and Road” exceeded US\$6 trillion, with an average annual growth rate higher than that of China’s foreign trade during the same period, accounting for 27.4% of China’s total trade in goods. A World Bank study found that the joint construction of the “Belt and Road” will increase trade between participating countries by 4.1%. Relevant scholars have studied the “Belt and Road” trade facilitation and mechanism innovation, the import of intermediate goods and the improvement of total factor productivity of enterprises, but the research on whether trade facilitation under the “Belt and Road” initiative has promoted the import of intermediate goods and innovative development is still relatively weak. According to the theory of endogenous economic growth, technological progress is an important support for regional economic growth. In the medium and long term, the prosperity of a country or region is mainly driven by innovation and development. When this region gradually expands to the global market, trade facilitation The reduction in the cost of importing intermediate goods and the reform of more advanced systems and mechanisms have become an important driving force for innovation and development. Based on this, this paper empirically tests the relationship between trade facilitation, import of intermediate goods, and innovation and development along the “Belt and Road” to provide reference for deepening the “Belt and Road”.

II. RESEARCH PART

1. Theoretical analysis and research hypothesis

The essence of the process of trade facilitation in a country or region is a process in which institutional mechanisms are gradually brought into line with international standards. The internal logic of trade facilitation requires the construction of a supply chain system with convenient communication. The process of trade facilitation requires the construction of an international and legalized business environment. With the further optimization of the business environment, the institutional transaction costs of enterprises will drop significantly. Being able to “follow the rules” to the greatest extent, enterprises can concentrate on maintaining close ties with enterprises in other countries, and jointly promote product technology research and development and related mechanism changes [1]. Based on this, this paper proposes:

Hypothesis 1: Subject to other conditions, the optimization of institutional mechanisms brought about by trade facilitation is conducive to innovation and development.

The intermediate goods imported by countries or regions to promote trade facilitation promote innovation and development through two aspects: one is the technology spillover effect. With the facilitation of trade conditions, the scale and variety of intermediate products imported by countries or regions have increased [2]. The second is the cost structure optimization effect. Under the conditions of trade facilitation, the procedures for importing intermediate products are simplified, customs clearance time is shortened, circulation costs are reduced [3]. Based on this, this paper proposes:

Hypothesis 2: Limited to other conditions, the import of intermediate goods brought about by trade facilitation is conducive to the development of innovation.

On the one hand, with the rapid changes in the international economic situation, exchange rate levels, tariff rates, and foreign investment will fluctuate, which will inevitably increase trade costs, cause enterprises to reduce expenditures, and may slow down product technology research and development and system optimization [4]. On the other hand, due to the uncertainty of the global economic situation being transmitted to the country through trade channels, it has an impact on market expectations. According to information economics, market expectations are an important reference factor for enterprises to carry out all production and operation activities. If a relatively pessimistic The market expects that companies will take the initiative to make strategic adjustments, which is not conducive to innovation and development. Based on this, this paper proposes:

2. Research design

(1) Model setting

In order to study the relationship between trade facilitation, import of intermediate goods and innovation development, this paper is published in Bloom et al. (2016) [5], Yu Miaojie (2011) [6] on the basis of the theoretical research framework and according to the research focus of this paper, the following empirical analysis model is constructed:

$$\ln(\ln De_{jt}) = \alpha + \sum_{i=1}^n \beta_i \ln(TrFa_{jt}) + \sum_{i=1}^n \gamma_i \ln(Im pt_{jt}) + \sum_{i=1}^n \theta_i X_{jt} + \rho_j + \varphi_t + \delta_{jt} \quad (1)$$



In formula (1), $\ln(\ln Dejt)$ represents the level of innovation and development of countries along the “Belt and Road”, $\ln(\ln Fajt)$ represents the level of trade facilitation of countries along the “Belt and Road”, and $\ln(\ln Ptjt)$ is the middle level of countries along the “Belt and Road”. $\ln(Xjt)$ is a control variable, α is a constant term, β , γ , and θ are the coefficients of trade facilitation, import of intermediate goods, and control variables respectively, ρ and φ represent the country fixed effect and intermediate product fixed effect, respectively, and δ is disturbance term.

(2) Variable selection

This paper selects the annual average number of patents of enterprises above designated size in the industry to reflect the innovation and development capabilities of the country and region, and uses the number of times patents are used as the weight. The level of trade facilitation mainly includes three aspects, namely: tariff rate ($\ln(TaRa)$), which is measured by the weighted average tariff rate of intermediate goods; business environment ($\ln(BuNv)$), which refers to the “2019 Business The meaning of the indicators identified in the Business Environment Report; trade time ($\ln(TrTi)$), referring to the definition of Baniya et al. coming time loss [7]. In order to measure the impact of intermediate product imports on innovation and development, the analysis is carried out from two aspects: the quantity and quality of intermediate product imports. Control variables mainly include enterprise conditions, industry conditions and factor endowments. Among them, the enterprise conditions mainly include: profitability ($\ln(Prof)$), expressed by the net profit rate of the enterprise; wage level ($\ln(WaLe)$), expressed by the proportion of the enterprise’s annual average wage expenditure to the enterprise cost; the industrial conditions mainly include: Exchange rate level ($\ln(ExRa)$), expressed by the real effective exchange rate index; foreign investment impact ($\ln(FoCa)$), expressed by the proportion of FDI in GDP; technology aggregation (Gini), based on the research of Zhang Yongkai (2012) [6], expressed by the Gini coefficient of regional technological innovation activities.

$$Gini = \frac{1}{2n^2 \bar{X}} \sum_{i=1}^n \sum_{j=1}^n |X_i - X_j| \quad (2)$$

In formula (2), n is the sample size, $\bar{X}$ and is the mean value of X_i . The value range of the regional technological innovation Gini coefficient is 0-1. When the value is 0, it means that the technological innovation activities are absolutely evenly distributed in the regional space; when the value is 1, it means that the technological innovation activities are completely concentrated in the regional space.

Factor endowments mainly include: human capital ($\ln(HuCa)$), labor resources are measured by the proportion of the population aged 15-64 in the total population; market conditions (HHI), market concentration is measured by the Herfindahl-Hirschman index The calculation formula is as follows:

$$HHI = \sum_{i=1}^n \left(\frac{X_i}{X} \right)^2 \quad (3)$$

In formula (3), X is the total market size, X_i is the market size of company i , n is the number of companies in the industry; resource density ($\ln(AsDe)$), select oil and gas and other mineral resources exports accounted for in the “Belt and Road” A measure of the share of a country’s total exports.

In order to compare and analyze the status of participating in the “Belt and Road” initiative before and after 2013, a dummy variable $D1$ is introduced. Before 2013, $D1 = 0$, and after 2013, $D1 = 1$. In order to compare and analyze the role played by state-owned enterprises and non-state-owned enterprises in the joint construction of the “Belt and Road”, a dummy variable $D2$ is introduced, $D2 = 1$ means state-owned enterprises, and $D2 = 0$ means non-state-owned enterprises.

(3) Data source

The data used in this article mainly come from the United Nations Commodity Trade Statistics Database, the World Bank, Wind Database, etc. The sample period is from 2000 to 2018, and a small number of missing data are filled by interpolation. In order to compare and analyze the different characteristics of the regions along the “Belt and Road”, this paper draws on the research method of the National Information Center to divide the 71 countries along the “Belt and Road” into six major regions.

3. Empirical analysis

Analysis of regional differences

The regional regression results are shown in Table 1. The regression results of trade facilitation and innovative development in the six major regions are in line with theoretical expectations, indicating that with the further implementation of the “Belt and Road” initiative, the promotion of trade facilitation in regions along the route has been effectively promoted, and the ability of innovative development has been improved. The Asian Oceania region has the largest quality coefficient of intermediate product imports, 3.987, indicating that the



countries in the Asia Oceania region have significantly improved their core capabilities in technology research and development and innovation during the process of jointly building the “Belt and Road”. The tariff rate coefficient in Eastern Europe is -0.141, indicating that the tariff rate in Eastern Europe is generally high, and its ability to promote the import of intermediate products and the innovation and development of countries along the “Belt and Road” is relatively weak. The business environment in Central Asia, Africa and Latin America is the lowest, 0.001 and 0.012 respectively, indicating that countries in these two regions should further optimize their domestic business environment. The coefficient of trade time in Africa and Latin America is -0.014, and the cross term of trade time is only -0.125, indicating that trade time in Africa and Latin America may restrict the import of intermediate products and the development of regional innovation. Judging from the dummy variable of state-owned enterprises, Africa and Latin America have the largest regression coefficients, and South Asia ranks second. The role of state-owned enterprises in other regions in the process of innovation and development is relatively small, and it is not significant in Asia and Oceania. , reflecting that in Africa, Latin America, and South Asia, the main force driving innovation and development is state-owned enterprises, while in Asia and Oceania, it is mainly non-state-owned enterprises; the cross-term coefficient of intermediate product imports in Central Asia is the lowest, 0.118, indicating that in 2013 After that, the innovative development driven by trade cooperation between Central Asia and other regions along the “Belt and Road” was relatively small.

Table 1: Regional regression results

	Asia, Oceania	Central Asia	West Asia	South Asia	Eastern Europe	Africa, Latin America
ln(lnDe)	4.257***	0.438***	1.524**	3.223***	2.149***	1.041***
ln(TaRa)	-0.158**	-0.245**	-0.132**	-0.047***	-0.141	-0.517***
ln(BuNv)	1.258***	0.001***	1.105***	0.983***	1.249**	0.012**
ln(TrTi)	-0.471**	-0.234***	-1.573***	-0.217***	-0.193**	-0.014**
ln(lmQn)	3.987***	1.11**	2.5**	2.445***	3.241***	3.241***
ln(lmQl)	0.258**	0.134***	0.872**	0.741***	1.286***	0.713***
D2	0.241	1.127**	0.571***	1.258***	0.571**	1.874**
D1*ln(TrTi)	-1.254**	-0.473***	-1.586***	-0.981***	-1.054**	-0.125**
D1*ln(lmQn)	2.529***	0.118***	1.873***	2.741***	0.872***	0.951***
ln(Prof)	1.547**	0.025***	1.257**	0.871***	0.143***	0.018***
ln(WaLe)	0.124***	0.324**	0.412***	0.164***	0.221**	0.137**
ln(ExRa)	-1.587***	-1.11**	-2.5**	-2.445***	-3.241	-3.241***
ln(FoCa)	1.258**	0.257***	0.412**	0.743***	0.142	0.472***
Gini	3.287***	0.124**	0.324***	1.257***	1.244**	1.761**
ln(HuCa)	1.247**	0.574***	0.788***	0.147***	1.125**	1.004**
HHI	0.587**	0.241***	0.254***	0.641***	0.571**	0.142**
ln(AsDe)	1.212**	0.247***	0.871***	0.428***	1.254**	0.479**
Fixed location	Yes	Yes	Yes	Yes	Yes	Yes
fixed year	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.257	0.172	0.31	0.157	0.112	0.147

The clustering of regional technology shows a significant positive correlation in the process of innovation and development in the six major regions, which proves that the improvement of the overall capability of regional technology may produce technology spillover effects and drive the innovation and development of enterprises in the region; which also reflects from the side. The international economic situation has a greater impact on further promoting the “Belt and Road” initiative.



III. CONCLUSION

By studying the relationship between regional trade facilitation, import of intermediate goods and innovation and development along the “Belt and Road”, this paper draws the following conclusions: (1) Trade facilitation and import of intermediate goods are conducive to the innovation and development of countries along the “Belt and Road”. Enterprises play an important role in the innovation and development process of the “Belt and Road”. Good enterprise conditions and factor endowments can help enterprises improve their innovation and development capabilities. Innovation and development are greatly affected by external factors such as exchange rates, foreign capital, and regional technology agglomeration. (2) Asia and Oceania have achieved the most obvious improvement in innovation and development capabilities in the process of jointly building the “Belt and Road”, mainly reflected in the relatively significant relationship between the quality of imported intermediate products and innovation and development; the overall level of innovation and development in South Asia is not high, but India is in the “The Belt and Road Initiative has achieved a relatively significant improvement in innovation and development capabilities; Eastern Europe is greatly affected by the economic and political situation in Europe, America and the world during the process of participating in the “Belt and Road” Initiative; national enterprises in Central Asia, Africa and Latin America Weak strength restricts the improvement of innovation capabilities. The technological agglomeration capabilities of Central Asia and West Asia are relatively weak. In the process of jointly building the “Belt and Road”, innovation and development capabilities need to be greatly improved. (3) The import of semi-finished products and parts has the most significant effect on promoting innovation and development; state-owned enterprises are the main channel for raw material imports; the increase in the exchange rate level may increase the import cost of semi-finished products and parts, weakening the accumulation of innovation capabilities to a certain extent.

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Yashil

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