An Economic Analysis of Digital Trade Development Between China and Countries Along the Belt and Road

Shuli Song[1], Xinyi Gong[2,*]

[1]School of International Business, Zhejiang International Studies University, No.299 Liuhe Road, Xihu District, Hangzhou, Zhejiang, China
[2]EDHEC BUSINESS SCHOOL, Lille, France

songshuli2012@126.com, *estelle_g@163.com

Abstract. The development of digital trade between countries along the Belt and Road is an indispensable path for promoting high-quality foreign trade. This paper is based on the panel data of different types of digital trade between China and countries along the Belt and Road from 2010 to 2019. Moreover, the four distinct types of Silk Road countries are examined, and variables pertaining to the evolution of digital commerce are added to an expanded gravity model, which allows for an empirical comparison of the imbalance in the impact of digital trade exports between China and the Silk Road countries. Moreover, the findings reveal that there is a discernible gradation in the level of cooperation between China and the countries along the Silk Road, and there is a substantial structural imbalance in the number of trade exports, which may ultimately result in trade imbalance and escalate international friction in the long run.

Keywords: digital Silk Road; digital trade; gravity model; empirical analysis.

1 Introduction

Since the initiation of the 'Belt and Road Initiative' in 2013, China has experienced a notable enhancement in its economic ties with countries located along the designated route. This strategic advanceent has created new opportunities and pathways for the advancement of digital trade. With China's economy transitioning into a phase of robust growth and unleashing its economic vitality, the realm of digital trade is expected to expand further and encompass a broader spectrum of progress. From the research progress in recent years, the academic community has introduced new digital-related explanatory variables on the basis of the gravitational model of general trade influencing factors, concentrating on the construction of digital infrastructure and digital trade institutions, rules, and barriers factors. Among them, infrastructure development is the foundation and carrier of digital trade development (Jiang Xiao Juan et al. 2019; Cao Xiaojing et al. 2020; Palmer Mark et al. 2022) [1]- [3], and the development prospects presented by digital infrastructure, facilitated by the Internet, have the potential to enhance the efficiency of exports in the field of information and communication technology (ICT) (Wang Jing, Xu Yubing, 2022) [4]. Additionally, the

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development of information infrastructure can tremendously enhance the information technology of enterprises, thus contributing to increased scale, productivity, and scope of business (Sun Weizeng et al., 2022) [5]. Furthermore, institutionally, the international competitiveness of digital trade is significantly enhanced by government policies (Lan Qingxin et al., 2019)[6]. Conversely, policies that restrict data flows can have a substantial negative impact on the likelihood of exporting digital services and the volume of a country's exports (Zhou Nianli et al., 2021; Qi Junyan et al., 2022) [7] [8], and consequently, the level of trade regulation should be stabilized within a suitable and acceptable range. Concerning rules, digital trade development is affected by the depth of digital trade rules (Shamel Azmeh et al., 2019; Feng Zongxian et al., 2022) [9] [10], and despite the fact that the dominant role of the US and Europe in digital trade rule-making is currently evident (Xu Jinhai et al., 2019; Li Mois, 2020) [11] [12], China, as the largest digital trade country in the world, must establish a regulatory framework that is consistent with the actual development of digital trade in China in order to accelerate its growth. Regarding the barriers, exports of digital services will undoubtedly be inhibited by bilateral digital trade barriers (Jiang Lingduo et al., 2022)[13]. In response to the trend of strengthening digital trade barriers (Zhao Jin, 2021)[14], effective coping mechanisms must be implemented (Dai Long, 2020; Jiang Tao et al., 2022; Meng Xia, 2022) [15]-[17], including signing digital trade agreements and accelerating the digital transformation of enterprises, for the purpose of achieving high-quality development of digital trade. Finally, cultural differences, acting as communication barriers and influencing consumer behavior, also play a significant role in shaping digital services trade flows (Li Ting, 2023)[18].

The existing body of research on digital trade primarily concentrates on the fundamental principles and regulations. Moreover, while there is a substantial body of literature examining digital trade and the regions involved in the 'Belt and Road' initiative separately, there is a notable dearth of empirical research that integrates the two aspects and specifically investigates the factors that impact exports. Thus, the objective of this paper is to examine China and eight Silk Road countries as the primary research subjects, and subsequently, employ the extended gravity model regression analysis to empirically investigate the factors that influence digital trade. Furthermore, it will make a comparison of the disparities in the effects of digital trade variables on China and the countries along ‘the Belt and Road Initiative’.

2 Theoretical Explanation of the Digital Trade Gravity Model

2.1 Trade Gravity Model

The initial empirical development of the gravity model can be credited to the groundbreaking contributions of Tinbergen (1962) and Poyhonen (1963). Their research findings established a correlation between the volume of trade between the two nations and the overall economic size of the countries involved, while also highlighting an inverse relationship with the geographical distance separating them. This correlation can be likened to the mathematical formulation of Newton's law of gravity, which can be expressed in its fundamental form as follows.

$$EX_{ijt} = \alpha(GDP_{it} \times GDP_{jt})/D_{ij} \quad (1)$$

Equation (1) defines EXij as the measure of bilateral trade volume between country I (the exporter) and country j (the importer). Besides,the GDP of countries I and j in period t are denoted as GDPi and GDPj respectively. Additionally, Dij represents the fixed distance between countries I and j.

In the 1960s, scholars endeavored to expand and elaborate on the original purpose of the gravity model, which aimed to measure bilateral trade flows. To achieve this, they incorporated additional variables such as common language and common border indicators. Furthermore, scholars introduced indicators of institutional quality, such as membership in regional economic integration organizations, to further enhance the accuracy and precision of the model.

2.2 Theoretical Models of Digital Trade

Under the digital trade impact threshold, countries with high GDP can offer superior and upscale digital products and services, and typically have more liberal and open digital trade policies, which have the trade potential to inspire more capital investment, thus promoting the R&D and innovation of digital trade-related technologies and equipment, fostering industrial growth and thereby creating economies of scale, and occupying a higher position in the global digital trade market, and have a competitive position in the global digital trade market. Two or more countries that share a border will have increased political, economic, and cultural exchanges, which facilitates digital trade to some extent. Except for that, trade between bordering countries can be conducted by various means including land and waterways, which can shorten logistics time and transportation costs, thus promoting the development of digital trade. Additionally, payment systems and monetary policies are relatively harmonized among common border countries, which can reduce exchange rate risks and payment costs while enhancing the efficiency and dependability of digital trade. Nonetheless, the similarity of trade endowments behind common borders can likewise pose a barrier to differentiated trade between two or more countries.

Moreover, digital trade exhibits distinct characteristics that contribute to a broader range of influencing factors in comparison to traditional commodity trade. For instance, the utilization of big data and artificial intelligence technologies can enhance the level of personalization and customization in digital trade to satisfy the collective needs of customer groups and better serve their requirements. Additionally, the efficient assurance of digital payment and settlement systems plays a critical part in safeguarding digital copyright and privacy. Alternatively, countries with limited digital technology capabilities may encounter barriers in engaging in digital trade, contributing to challenges in ensuring the credibility as well as security of digital transactions and hindering the advancement of digital trade applications.

To increase the breadth of this understanding, dummy variables pertaining to the level of development of the digital economy are introduced. As per the analytical requirements of this study, the dummy variable for factors in association with the level of digital economy development is expanded by incorporating the dummy varia-

ble for factors correlated with the degree of digital economy development, as outlined in equation (1):

The Fixed Broadband Subscription (FBS) per one hundred individuals serves as a crucial factor in facilitating efficient and reliable network and communication services for digital trade, which likewise plays a significant role in the effective regulation and management of digital services.

The Mobile cellular subscriptions per one hundred people (MCS) are of great significance, the quality of mobile internet access, including speed, reliability, and data caps, significantly influences the feasibility of conducting digital transactions and accessing online marketplaces. In many of these countries, particularly those with developing economies like the Philippines, Thailand, Serbia, and Bulgaria, mobile phones often serve as the primary means of internet access, since Mobile phones are generally cheaper to purchase than computers or laptops. High MCS penetration is crucial for enabling participation in digital trade, as individuals and businesses rely on mobile devices for online transactions, communication, and accessing digital services.

While mobile technology has become increasingly dominant, Fixed Telephone Subscriptions (FTS) per 100 individuals still hold relevance, particularly for businesses. In less developed countries like the Philippines, Serbia, and Bulgaria, where mobile network coverage or affordability may be limited, landlines provide a crucial, reliable communication channel. Even in developed economies, businesses often rely on landlines for consistent service and dedicated customer support lines, ensuring clear communication and minimizing disruptions.

Expanding on the theoretical framework mentioned earlier, we conducted a thorough examination of the log-linear form of the original model equation (1). In light of the purpose of the study and the data availability in each country given the current circumstances, a comprehensive extended gravity model was developed. The present study is built upon a solid foundation provided by the extensive research conducted by Dong, Jing, and Ran in 2022. Their work has greatly influenced the development of this model and serves as a robust and trustworthy source for our study.

$$\mathrm{Ln\,EX_{it}} = \alpha_0 + \alpha_1 \ln \mathrm{GDP_{jt}} + \alpha_2 \mathrm{lnGDP\_chn_t} + \alpha_3 \ln \mathrm{FBS_{jt}} + \alpha_4 \ln \mathrm{MCS_{jt}} + \alpha_5 \ln \mathrm{FTS_{jt}} - \alpha_6 \ln \mathrm{DIS_{ij}} + \varepsilon_{ij} \quad (2)$$

Consider the minus sign in front of α_6 as an impediment to the export value from the distance variable, transforming it into

$$\ln EX_{it} = \alpha_0 + \alpha_1 \ln GDP_{jt} + \alpha_2 \ln GDP\_chn_t + \alpha_3 \ln FBS_{jt} + \alpha_4 \ln MCS_{jt} + \alpha_5 \ln FTS_{jt} + \alpha_6 \ln DIS_{ij} + \varepsilon_{ij} \quad (3)$$

In equation (3):

The explanatory variable “EXit” implies the volume of digital trade exported from country I to country j during period t. Besides, “GDPjt” represents the GDP of country j during period t, while “GDP_chnt” represents the GDP of China during the same period. Moreover, the variable “DISij” represents the distance between country I and country j, specifically measured as the distance between their respective capitals. Additionally, “FBSjt” implies the fixed broadband subscription per one hundred peo-

ple in country j, "FTSjt" signifies the fixed telephone subscription per one hundred people in country j, and "MCSjt" indicates the mobile cellular subscription per one hundred people. Moreover, the constant term is denoted as α0, and each variable (k=1,2,3 .....6) has a corresponding regression coefficient denoted as αk. Finally, " εij" is a random variable. Refer to Table 1 for details.

Table 1. Meaning and an expected sign of each variable

Variables	Meaning	Expected symbols	Theoretical descriptions
GDP_chnt	China's GNP in year t (in US$)	+	Reflects China's digital trade export potential in year t and is used to quantify the effect of supply on digital trade exports.
GDPjt	Gross national product of country j in year t (in US$)	+	Reflects the digital trade import potential of country J in year T and is employed to quantify the influence of demand on digital trade exports.
DISTij	The distance in kilometers between Beijing, the capital of China, and the capital of country j.	-	Reflects the distance between our country and country j and is employed to estimate the impact of transport costs on digital trade exports
FBSjt	Fixed broadband subscription per 100 habitants in country J in year T	+	For estimating the impact of FBS on digital trade
FTSjt	Fixed-line subscriptions per 100 habitants in country j in year t	+	For estimating the impact of FTS on digital trade
MCSjt	mobile subscriptions per 100 inhabitants in country J in year T	+	For estimating the impact of MCS on digital trade
EXijt	China's agricultural trade exports to country j in year t (in US$ billion)	/	Explained variables

2.3 Digital Trade Export Imbalance Development Hypothesis

Digital trade utilizes digital technologies and information and communication technology to optimize the industrial structure, develop product categories, modify the global trade model, expand the range and size of imported and exported products, lower trade expenses, and increase trade efficiency. Nonetheless, the growth of digital trade is strongly associated with the growth of digital infrastructure, which is influenced by the extent of digital economic advancement. Moreover, the presence of a "digital divide" among Belt and Road countries arises from disparities in informatiza-

tion and Internet penetration levels. Furthermore, the overall economic strength of a nation has a significant impact on the development of digital infrastructure, which is essential for supporting digital commerce. Within this context, this study proposes the hypothesis that China's digital trade expansion with Silk Road countries will align with the respective levels of bilateral digital economic development as well as digital infrastructure construction, thereby illustrating an uneven development pattern.

3 Empirical Analysis of the Factors Influencing the Development of Digital Trade between China and Silk Road Countries

3.1 Sample Selection and Data Sources for Digital Trade

3.1.1 Data Selection.

This academic article utilizes the Digital Trade Development Index Report of China and 30 countries along the 'Belt and Road' from the 'Digital Trade Development Trends and Frontiers Summit' held during the 2020 Service and Trade Conference. The paper leverages the data's accessibility and dependability to present its findings. To ensure the inclusion of diverse perspectives and to accurately reflect the various contexts, Singapore and Malaysia have been selected for 'deeply cooperative', Russia and Thailand for 'rapidly advancing', Israel and the Philippines for steadily expanding, as well as Serbia and Bulgaria for 'to be strengthened'.

3.1.2 Variables and Data Sources.

3.1.2.1 Explained Variables.

The definition of digital trade has undergone a significant evolution. Originally encompassing only the online exchange of digital goods and services, it broadened to include digitally facilitated trade of physical goods and related services. This expanded scope now recognizes the crucial role of data and knowledge flows in international trade. Chinese scholarship, in particular, emphasizes this shift, viewing digital trade as the natural progression of traditional trade within the digital economy, highlighting the pervasive influence of digital technologies across all trade activities. While the 2019 and 2022 OECD, WTO, and IMF Handbook on Measuring Digital Trade [19] defines it more narrowly as 'all international transactions that are ordered digitally and delivered digitally,' this paper adopts a broader perspective, defining digital trade as 'digitally enabled trade in goods and services.'

On one hand, on the basis of a technical note by UNCTAD in 2015 and the concept of potential ICT-enabled services contained in a report by the 47th UN Statistical Commission in 2016, and the OECD report Balanced International Trade in Services (2005-2019) report, the digital services trade family consists of the six categories listed below: insurance and pension services, financial services, charges for the use of intellectual property services, telecommunications, computer and information services, personal cultural and recreation services, etc. On the other hand, trade in digital

goods is based on adjustments made by UNCTAD and UNSD based on the 2012 and 2017 Harmonized System classifications, with the most recent classifications being: computers and peripheral equipment, communications equipment, consumer electronic equipment, electronic components, and miscellaneous.

This study has collected and analyzed data on China's digital trade exports to eight countries involved in the 'Belt and Road' initiative. The data was obtained from two sources: the digital trade in goods data from UNCTAD and the digital trade in services data from the OECD database. These figures have been aggregated to determine the overall size of exports as illustrated below in Table 2. In cases where primary international sources lacked data, efforts were made to estimate missing values using growth rates derived from national or alternative international sources.

Table 2. Scale of China's digital trade exports to the eight Silk Road countries, 2010-2019
Unit: USD billion

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Singpore	137.06	146.26	152.71	167.21	188.33	201.68	171.85	187.53	207.90	215.01
Malaysia	64.65	63.90	68.92	77.23	82.97	79.13	73.98	95.28	123.20	130.95
Russia	44.52	51.30	61.38	58.39	70.38	45.18	51.93	68.65	88.41	89.24
Thailand	41.58	54.35	65.73	63.33	61.70	79.36	75.65	78.47	81.67	86.38
Israel	9.16	10.29	9.42	10.30	10.98	11.18	10.84	13.01	14.78	14.59
Philip-pines	22.74	19.20	20.71	23.22	31.20	36.69	36.10	40.40	50.80	69.38
Serbia	1.11	1.14	1.33	1.15	1.24	1.61	1.14	1.44	1.83	2.37
Bulgaria	1.24	2.33	2.43	1.66	1.96	1.67	1.53	1.58	2.03	2.01

Data source: Statistical analysis based on UNCTAD, OECD data

3.1.2.2 Core explanatory variables.

Fixed broadband subscriptions per 100 people (FBS), fixed telephone subscriptions per 100 people (FTS), and mobile cellular subscriptions per 100 people (MCS) are selected to assess the level of digital information and the growth of digital infrastructure in trading nations. Among these indicators, the metrics of fixed broadband subscriptions per 100 people, fixed telephone subscriptions per 100 people, mobile cellular subscriptions per 100 people, and Internet users represent a country's (or region's) utilization of both mobile and fixed broadband services. These metrics serve as indicators of the Internet penetration rate within the country. A higher Internet penetration rate indicates a greater likelihood of digital trade occurrence, as indicated by the positive correlation. The data for these indicators have been sourced from the WDI database.

3.1.2.3 Control variables.

This paper adopts an extended gravity model, the control variables selected contain (1) the economic size of China (GDP_chnt) and the economic size of the Silk Road countries (GDPjt), demonstrating the level of economic development of the country, from the World Bank database; (2) the geographical distance between China and the Silk Road countries (DISTij), employing the distance between the capitals of the two trading countries as reference data, from the CEPII database and with a negative predictive sign.

3.2 Empirical Analysis

3.2.1 Descriptive Statistical Analysis.

Prior to the empirical analysis, a descriptive statistical analysis was conducted on 80 sets of data from 2010 to 2019 for eight countries along the Belt and Road, including Singapore, Malaysia, Russia, Thailand, Israel, the Philippines, Serbia, and Bulgaria, which were selected as representative trade target countries. Details are provided in Table 3.

Table 3. Descriptive statistical analysis of the main variables

Variables	Sample size	Minimum value	Maximum value	Average value	Standard deviation	Median value
ln(digital trade)	80	18.530	23.790	21.514	1.717	22.225
ln(GDP)	80	24.400	28.460	26.259	1.093	26.460
ln(GDP_chn)	80	29.440	30.290	29.950	0.257	30.005
ln FBS(per 100 people)	80	0.590	3.360	2.582	0.755	2.815
ln FTS(per 100 people)	80	1.120	3.860	2.948	0.819	3.200
ln MCS(per 100 people)	80	4.480	5.200	4.896	0.136	4.900
ln(distcap)	80	14.860	15.820	15.432	0.351	15.445

Data source: Calculated from SPSSAU

The statistical findings of the indicators under consideration are presented in Table 3. It is worth noting that the highest mean value of 26.259 is observed in the logged Chinese GDP value, while the smallest mean value of 2.582 is recorded for the fixed broadband subscription (FBS) per 100 people. Furthermore, the logged Chinese digital trade exports to the Silk Road countries demonstrate a fairly consistent pattern, ranging from 18.53 to 23.79, with a mean value of 21.514. Moreover, there are no outliers observed in the dataset. Consequently, a favorable condition is created for subsequent econometric analysis.

3.2.2 Test of Applicability.

With regard to the data analysis, this study used ln(GDP), ln(GDP_chn), lnFBS(per 100 people), ln FTS(per 100 people), ln MCS(per 100 people), ln(distcap) as the explanatory variables and ln(digital trade) as the explanatory variables for regression

model construction. Data for these variables in Table 4-5 were sourced from the OECD, UNCTAD, and UNSD.

Table 4. Summary of test results

Type of inspection	Purpose of the test	Test values	Test conclusions
F test	Comparative selection of FE and POOL models	F(7,67)=504.576,p=0.000	FE model
BP test	Comparative selection of RE and POOL models	$\chi 2(1)=228.049,p=0.000$	RE model
Hausman test	Comparative selection of RE and FE models	$\chi 2(4)=2.234,p=0.693$	RE model

Data source: Calculated from SPSSAU

Table 5. Results of the Hausman model test

Item	Regression coefficient-b (FE model)	Regression coefficient- B (RE model)	b – B (difference of regression coefficients)	Sqrt(diag(V_b – V_B)) Standard error	Hausman test (b-B)'[(V_b-V_B)^(-1)](b-B)
Ln (GDP)	0.394	0.470	-0.076	0.069	
Ln (GDP_chn)	0.469	0.423	0.046	0.037	
ln FBS (per 100 people)	0.243	0.297	-0.054	0.043	
ln FTS (per 100 people)	0.394	0.425	-0.030	0.033	$\chi 2(4)=2.234,p=0.693$
ln MCS (per 100 people)	0.211	0.150	0.061	0.055	

Data source: Calculated from SPSSAU

In accordance with the F-test, BP-test, and Hausman test results, the POOL model < FE model < RE model. Combining the aforementioned analyses, the RE model was chosen as the concluding result for this paper.

3.2.3. Regression Analysis.

This section is on the basis of an extended gravity model and employs SPSSAU software to conduct an empirical analysis of data for China and eight countries along the Belt and Road from 2010-2019. The following Table 6 is an analysis of the obtained results:

Table 6. Regression results of factors influencing China's digital trade exports to the eight Silk Road countries

Items	POOL model	FE model	RE model
Intercept	75.093**	-5.705	56.103**
	(8.734)	(-1.550)	(3.133)
ln(GDP)	0.726**	0.394*	0.470**
	(13.499)	(2.468)	(3.260)
ln(GDP_chn)	0.353	0.469**	0.423**

Items	POOL model	FE model	RE model
	(1.557)	(3.830)	(3.629)
ln FBS(per 100	0.606**	0.243	0.297*
people)	(3.497)	(1.576)	(2.006)
ln FTS(per 100	1.164**	0.394**	0.425**
people)	(7.310)	(2.972)	(3.307)
ln MCS(per 100	-0.182	0.211	0.150
people)	(-0.374)	(0.872)	(0.638)
ln(distcap)	-5.659**	-	-4.041**
	(-19.038)		(-3.705)
R 2	0.946	0.145	0.842
R 2(within)	0.491	0.692	0.690
Sample size	80	80	80
Inspection	F (6,73)=211.796,p=0.000	F (5,67)=30.115,p=0.000	χ2(6)=174.677,p=0.000

Dependent variable: ln(digital trade)

* p<0.05 ** p<0.01 (The t-values are in parentheses)

Hint: "-" implies that this item has serious covariance and is automatically removed

Data source: Calculated from SPSSAU

According to the regression findings, the majority of the explanatory factors demonstrate statistical significance, indicating that they have a significant effect on the explanatory variables. Among the explanatory variables examined, only "mobile cellular subscriptions per 100 people ln MCS (per 100 people)" did not exhibit statistical significance, as its regression coefficients deviated from the expected outcomes. Nonetheless, the regression coefficients for the remaining explanatory variables aligned with the anticipated results. A detailed assessment of each regression model variable is provided below.

(1) From the core explanatory variables' breakdown indicators: In the first place, the regression coefficient of fixed broadband subscription per 100 users is statistically significant positive and passes the 5% significance level test, indicating that the rise in fixed broadband subscription rates in the eight Silk Road nations is satisfactory for the export of digital goods coming out of China. Second, fixed phone subscriptions per 100 people met the 1% significance test, and China's exports of digital goods to its trading partners increased by 0.425 % for every percentage point increase in the country's overall export rate. Moreover, it is of great significance to note that the landline subscription rate may have a more major impact on digital trade for some isolated places or poor nations where landline phones are still the most common method means of contact; Thirdly, the regression coefficient for the cellular data subscription rate per hundred people is minimal and contrary to the anticipated outcome, suggesting that it does not exert any significant influence.

(2) Based on the findings from the statistical analysis, it has been determined that both countries' economic sizes have surpassed the 1% significance level test. This discovery implies a favorable correlation between digital trade exports and the economic size of both nations, which is consistent with the initial expectations. Upon

examining the coefficients of ln(GDP) and ln(GDP_chn), it becomes apparent that a 1% growth in the trade recipient country's GDP leads to a 0.470% increase in China's overall digital trade exports to that particular country. Similarly, a 1% increase in China's GDP results in a 0.423% rise in total digital trade exports. The substantial economic expansion of the target country serves as a pivotal factor contributing to the upsurge of China's digital trade exports, acting as a catalyst for this positive influence.

(3) In accordance with the findings, there is a statistically strong negative relationship between the distance between two capital cities and the number of digital trade exports. The results demonstrate that for every 1% increase in geographical distance, there is a corresponding decrease of 4.04% in the total amount of digital trade exports, which aligns with the anticipated expectations.

4 Conclusions

The aforementioned analysis reveals the presence of a pronounced "digital divide" among the countries involved in the "Belt and Road" initiative, denoting a substantial discrepancy in the extent of digital economy advancement across these nations. Besides, the degree of China's collaboration with the eight countries situated along the Silk Road corresponds to the levels of “deep cooperation”, “rapid advancement”, and “gradual expansion” as indicated by the Digital Trade Development Index, which suggests notable variations in China's exports to distinct countries. Moreover, the impact of increased economic development on China's digital trade is more significant in the recipient countries compared to China itself, likely due to the importing nations' inability to fulfill their digital needs. As a result, these countries engage in digital technology and service imports from more advanced nations, fostering mutually beneficial trade cooperation. While digital trade somewhat mitigates the influence of geographical distance on traditional cross-border trade, geographical distance likewise hampers the progress of digital trade attributable to the correlation between offline logistics development and logistics efficiency, as well as the cost control in digital trade. Furthermore, among the dummy variables pertaining to factors in association with the level of digital economy development, an increase in fixed broadband and fixed telephone subscriptions per 100 people can intensify trade between China and Belt and Road nations. Alternatively, an increase in cellular subscriptions per 100 people has no substantial impact on bilateral trade. This disparity may arise from variations in network coverage, network speed, and the cost of internet access in certain countries, impeding their capacity to meet the expanding demands of the digital economy.

For the purpose of enhancing the development of digital trade between China and the Silk Road countries, it is proposed that attention should be given to the design of distinct trade strategies and the reinforcement of digital infrastructure development. The considerable disparity in scale and potential of digital trade between China and the Belt and Road countries necessitates a focus on “deep cooperation” countries that retain a stronger digital economic base, political and economic stability, as well as greater potential for collaboration. Besides, for "fast-paced" countries, enhancing the

cooperative environment, exploring potential areas of collaboration, and accelerating the generation of novel outcomes is imperative. Additionally, China should prioritize assistance in strengthening the information infrastructure of "to-be-strengthened" countries, thereby establishing a solid foundation for the expansion of digital trade. Furthermore, China should assist countries along the Belt and Road in advancing their digital information development and infrastructure capacity, augment investments in digital infrastructure in these countries, as well as promote the adoption of emerging technologies including artificial intelligence and blockchain. By promoting emerging technologies, namely, artificial intelligence and blockchain, China can facilitate the digital transformation of its trading partners' industries, thereby, fostering the expansion of the digital economy.

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