Financial development, institutional quality and bilateral trade

-empirical analysis based on the trade data between china and the countries along "the Belt and Road"

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Background introduction

1.Background introduction

Financial development and *institutional quality* are important factors that affect the development of *bilateral trade* between China and the countries along "the Belt and Road". What impact will their *interactive effects* have on bilateral trade?What are the impacts of financial development, institutional quality and their *interaction effect* the development of bilateral trade between China and countries along "the Belt and Road"? From the perspective of *national income level*, is there any *heterogeneity* in the impact of financial development, institutional quality and their interaction effect on the development of bilateral trade? At present, there are still controversies and deficiencies in the existing literature research, and further research is necessary.

This paper will take the national income level as the breakthrough point, based on the trade data of countries along the "the Belt and Road ", and answer the above questions through empirical analysis. Then to provide the reference and suggestions for further improvement of "the belt and road "initiative trade policy and accurate assistance of trade enterprises.

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Theoretical analysis and theoretical hypothesis

2.1Theoretical analysis

Assuming two trading countries m and n, they can conduct international trade with other countries. P_m represents the supply price of goods in country m, and is also the net cost of the transaction between the two countries. P_{mn} is the price of goods from country m provided to consumers in country n. Because there is transaction cost, p_{mn} is greater than the domestic supply price. The transaction cost will exist in the process of exporters and importers transactions. It is also called a cost factor. Therefore, t_{mn} is the cost factor of transactions between countries m and n, and always have $p_{mn}=t_{mn}p_m$

2.1 Theoretical analysis

Then CES utility function: $U_n = (\sum_m \beta_m X_{mn}^{(\alpha-1)/\alpha})^{\alpha/(\alpha-1)}$ (1)

Among them, X_{mn} is the number of goods consumed by consumers in country n from country m; α is the substitution elasticity of commodities, α>1 ; then β_m >0, the coefficient is positive.

The budget constraint of consumers in country n is: $\sum_m P_{mn} X_{mn} = Y_n$ (2)

Y_n is the national income of country n.

Then the first-order optimization condition is: $X_{mn} = (\dfrac{\beta_m p_m t_{mn}}{P_n})^{(1-\alpha)} Y_n$ (3)

P_n is the price consumption index of country n, expressed as $P_n = [\sum_m \beta_m (p_m t_{mn})^{(1-\alpha)}]^{1/(1-\alpha)}$ (4)

In the case of market clearing: $Y_m = \sum_m X_{mn} = \sum_n (\beta_m t_{mn} p_m / P_n)^{(1-\alpha)} Y_n$ (5)

Y_m is the national income of country m.

2.1 Theoretical analysis

$$t_{mn} = \ell^{b_{mn}^{\gamma 1} + inst_m^{\gamma 2} + instfin_m^{\gamma 3}} \; fin_m^{\rho} \tag{10}$$

2.2 Theoretical hypothesis

• **_Theoretical hypothesis1:_** If the countries along "the Belt and Road" improve their levels of _financial development_, financing costs and risks will be decreased. It will have a positive effect on the bilateral trade among China and the countries along "the Belt and Road " .

• **_Theoretical hypothesis 2:_** If the countries along "the Belt and Road" have high _institutional qualities_, trading costs will be reduced. It will have a positive effect on the bilateral trade among China and the countries along "the Belt and Road " .

• **_Theoretical hypothesis3:_** The _interactive effect_ of institutional quality and financial development has a positive impact on the development of bilateral trade between China and the countries along "the Belt and Road " .

03

Model setting，indicators selection and data processing

3.1 Model setting

$$Trade_{ijt} = \alpha_0 + \alpha_1\ FIN_{it} + \alpha_2\ YH_{it} + \alpha_3\ YC_{it} + \alpha_4\ DIST_{ijt} + \alpha_5\ BOR_{ijt} + \alpha_6\ CD_{ijt} + \alpha_7$$

$$POP_{it} + \varepsilon_{ij} \tag{1}$$

$$Trade_{ijt} = \alpha_0 + \alpha_1\ INST_{it} + \alpha_2\ YH_{it} + \alpha_3\ YC_{it} + \alpha_4\ DIST_{ijt} + \alpha_5\ BOR_{ijt} + \alpha_6\ CD_{ijt} + \alpha_7$$

$$POP_{it} + \varepsilon_{ij} \tag{2}$$

$$Trade_{ijt} = \alpha_0 + \alpha_1\ FIN_{it} + \alpha_2\ INST_{it} + \alpha_3\ INST_{it} \times FIN_{it} + \alpha_4\ YH_{it} + \alpha_5\ YC_{it} + \alpha_6\ DIST_{ijt} +$$

$$\alpha_7\ BOR_{ijt} + \alpha_8\ CD_{ijt} + \alpha_9\ POP_{it} + \varepsilon_{ij} \tag{3}$$

3.2 Indicators selection

3.2.1 Explained variable

Bilateral trade volume (Trade), explains total foreign trade volume between China and the countries along "the Belt and Road". It represents the development degree of bilateral trade between China and the others.

3.2.2 Core explanatory variables

(1) **Financial development (FIN).** This paper will regard ratio of private credit to GDP as an index to judge the level of financial development of the countries along "the Belt and Road" (Hur et al, 2006, Bingzhan Shi et al, 2011)[27-28]. The larger the scale of private credit, the higher the financial development and the lower the financing cost of enterprises, which can further reduce the transaction cost of bilateral trade.

Institutional quality (INST). Nowadays, most scholars mainly use WGI to measure institutional quality (Yu Luo et al, 2017, Mengistu & Adhikary , 2011, Kolstad & Wiig, 2012).The "World Governance Indicators (WGI)" mainly includes six indicators. See Table 1 for detailed definitions. The value range of each indicator is [-2.5, 2.5],the higher the value, the higher the institutional quality of a country.

3.2 Indicators selection

Table 1 World Governance Indicators（WGI）

Variable Indicator name	Variable meaning
Voice and Accountability	Measure the degree of political democracy in a country
Political Stability No Violence	Measure the probability of the government being overthrown
Government Effectiveness	Measure the quality and efficiency of government public services
Regulatory Quality	Measure the government's ability to formulate and implement regulatory policies
Rule of Law	Measure the quality of contracts and contract execution
Control of Corruption	Measure the government's control over public power and judicial perfection

3.2 Indicators selection

Table 2 Definitions of Variables & Origins of Data

Variable Type	Variable Name		Variable Meaning	Origins of Data
Explained Variable	Trade		Bilateral trade volume	United Nations Commodity Trade Statistics Database
Explanatory Variables	FIN		Financial development	World Bank Financial Development Database
	INST	VA	Voice and Accountability	World Bank WGI database
		PS	Political Stability No Violence	World Bank WGI database
		RQ	Regulatory Quality	World Bank WGI database
Control Variables	YH		economic developing level of the the countries along "the Belt and Road"	World Bank WDI database
	YC		economic developing level of China	World Bank WDI database
	DIST		geographical distance	www.cepii.fr
	BOR		boundary	Virtual variable assignment
	CD		cultural distance	Virtual variable assignment
	POP		population size	World Bank WDI database

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Regression results and discussion

4. Regression results and discussion

Table 3 The Influence of *Financial Development* on *Bilateral Trade* between China and the Countries along "the Belt and Road"

Var	Total Sample	Trade High-income Countries	Middle-high -income	Middle-low -income Countries
FIN	0.002**	0.002	-0.001	0.011***
	（2.14）	（1.28）	（-0.46）	（3.68）
YH	1.193***	1.062***	1.288***	1.398***
	（13.28）	（5.49）	（5.95）	（4.58）
YC	1.106***	1.068***	1.134***	0.959***
	（20.77）	（13.80）	（10.93）	（6.13）
DIST	-1.531***	-4.231***	-0.873	-2.708*
	（-2.75）	（-2.77）	（-0.79）	（-1.78）
BOR	0.294	-1.614***	0.251	0.667
	（0.70）	（-1.37）	（0.23）	（0.89）
CD	0.450	-0.876***	1.254	0.761
	（1.12）	（-1.04）	（1.40）	（0.91）
POP	-0.153*	0.063	-0.041	-0.810**
	（-1.75）	（0.33）	（-0.18）	（-2.19）
α	-25.107***	-0.150	-35.745***	-5.091
	（-4.98）	（-0.01）	（-3.60）	（-0.35）
R2	0.830	0.814	0.902	0.808
N	714	280	238	196

4. Regression results and discussion

Table 4 The Influence of *Institutional Quality* on *Bilateral Trade* between China and the
Countries along "the Belt and Road"

Var		Trade			
		Total Sample	High-income Countries	Middle-high -income Countries	Middle-low -income Countries
INST	VA	0.097	0.095	0.517***	-0.171
		(1.31)	(0.59)	(4.03)	(-1.15)
	PS	0.105**	0.167*	0.334***	0.045
		(2.19)	(1.71)	(3.64)	(0.59)
	RQ	-0.012	-0.062	-0.511***	0.397**
		(0.884)	(-0.42)	(-3.32)	(2.51)
YH		1.125***	1.062***	1.234***	1.090***
		(11.25)	(5.11)	(5.77)	(2.77)
YC		1.175***	1.137***	1.198***	1.202***
		(23.69)	(16.24)	(11.76)	(6.92)
DIST		-1.505***	-4.865***	-0.861	-2.600
		(-2.81)	(-2.60)	(-0.69)	(-1.50)
BOR		0.235	-2.012	-0.268	0.438
		(0.58)	(-1.60)	(-0.23)	(0.51)
CD		0.469	-1.161	1.273	0.870
		(1.21)	(-1.27)	(1.29)	(0.91)
POP		-0.073	0.105	0.090	-0.520
		(-0.73)	(0.54)	(0.37)	(-1.10)
α		-26.768***	2.885	-38.208***	-9.983
		(-5.56)	(0.18)	(-3.57)	(-0.61)
R^2		0.823	0.818	0.881	0.784
N		714	280	238	196

4. Regression results and discussion

Table 5 The *Interaction Effect* of Financial Development and Institutional Quality on *Bilateral Trade* between China and the Countries along "the Belt and Road"

Var		Trade			
		Total Sample	High-income Countries	Middle-high -income Countries	Middle-low -income Countries
FIN		0.003**	0.0002	-0.005*	0.014***
		(2.44)	(-0.07)	(-1.78)	(3.83)
INST	VA	-0.038	-0.287	0.730***	-0.005
		(-0.37)	(-1.49)	(3.66)	(-0.03)
	PS	0.173**	0.624***	0.486***	-0.134
		(2.31)	(3.08)	(3.98)	(-1.05)
	RQ	0.091	-0.201	-0.364&*	0.378*
		(0.81)	(-0.85)	(-1.77)	(1.87)
FIN		0.003**	0.0002	-0.005*	0.014***
		(2.44)	(-0.07)	(-1.78)	(3.83)
VA_F		0.002*	0.006***	-0.004	-0.020***
		(1.94)	(3.21)	(-1.40)	(-3.88)
PS_F		-0.002	-0.006**	-0.004**	0.004
		(-1.49)	(-2.44)	(-2.17)	(1.53)
RQ_F		-0.002	0.003	-0.004	0.002
		(-1.27)	(1.22)	(-1.08)	(0.59)
YH		1.105***	0.944***	1.399***	0.688*
		(10.87)	(4.72)	(5.98)	(1.87)
YC		1.128***	1.134***	1.111***	1.140***
		(20.81)	(14.64)	(10.26)	(7.02)
DIST		-1.460***	-5.383***	-0.706	-1.401
		(-2.65)	(-3.13)	(-0.48)	(-1.30)
BOR		0.285	-2.659**	-0.195	0.395
		(0.68)	(-2.31)	(-0.14)	(0.76)
CD		0.490	-1.214	1.546	1.123*
		(1.23)	(-1.47)	(1.32)	(1.96)
POP		-0.037	0.367*	-0.074	0.126
		(-0.37)	(1.87)	(-0.28)	(0.31)
α		-26.020***	6.348	-38.135***	-20.112*
		(-5.23)	(0.43)	(-3.01)	(-1.88)
R2		0.819	0.806	0.865	0.796
N		714	280	238	196

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Stability test

5. Stability test

Table 6 The 2SLS Regression Results about
Financial Development Lag One Period and *Bilateral Trade*

Var	Trade			
	Total Sample	High-income Countries	Mid + igh -income Countries	Middle-low -income Countries
FIN_{t-1}	0.002**	0.002*	-0.002	0.004
	（2.29）	（1.93）	（-0.23）	（0.85）
YH	1.112***	1.117***	1.117***	1.733***
	（31.12）	（11.06）	（4.45）	（7.79）
YC	1.013***	0.902***	1.117***	0.787***
	（10.73）	（7.22）	（6.32）	（3.53）
DIST	-1.412***	-3.923***	-0.546	-2.924***
	（-8.72）	（-7.90）	（-0.59）	（-6.64）
BOR	0.259**	-1.377***	0.340	0.777***
	（2.11）	（-3.53）	（0.52）	（3.64）
CD	0.497***	-0.818***	1.556	0.341
	（4.23）	（-3.17）	（1.34）	（1.50）
POP	-0.116***	-0.007	0.017	-0.997***
	（-3.53）	（-0.07）	（0.07）	（-4.40）
α	-21.934***	1.723	-34.761**	-2.964
	（-7.05）	（0.29）	（-2.58）	（-0.39）
R2	0.824	0.810	0.902	0.808
N	663	260	221	182

5. Stability test

Table 7 The GMM Regression Results about *Institutional Quality* and *Bilateral Trade*

Var		Total Sample	High-income Countries	Trade Middle-high -income Countries	Middle-low -income Countries
INST	CC	0.103 (1.01)	0.160 (0.88)	0.383* (1.91)	-0.515 (-1.55)
	GE	0.391*** (2.75)	0.002 (0.01)	1.048*** (4.68)	0.283 (1.08)
	RL	-0.307** (-2.30)	0.561*** (3.25)	-0.710*** (-4.00)	-0.956** (-2.31)
YH		1.054*** (23.25)	0.919*** (9.43)	0.669*** (7.00)	2.973*** (8.17)
YC		1.174*** (14.60)	1.083*** (10.09)	1.247*** (10.84)	0.662*** (2.99)
DIST		-1.469*** (-12.83)	-4.994*** (-8.14)	-1.664*** (-5.05)	-4.426*** (-7.82)
BOR		0.228** (2.22)	-1.322*** (-2.92)	-0.263 (-1.13)	0.895*** (6.09)
CD		0.424*** (4.54)	-1.539*** (-4.87)	0.098 (0.29)	-0.579** (-2.13)
POP		-0.050 (-1.22)	0.228** (2.20)	0.476*** (4.59)	-0.520*** (-1.10)
α		-25.714*** (-9.77)	6.963 (1.01)	-24.894*** (-5.84)	1.973 (0.25)
R^2		0.833	0.839	0.919	0.845
N		714	280	238	196

06

Conclusion
and enlightenment

6.1 Main conclusion
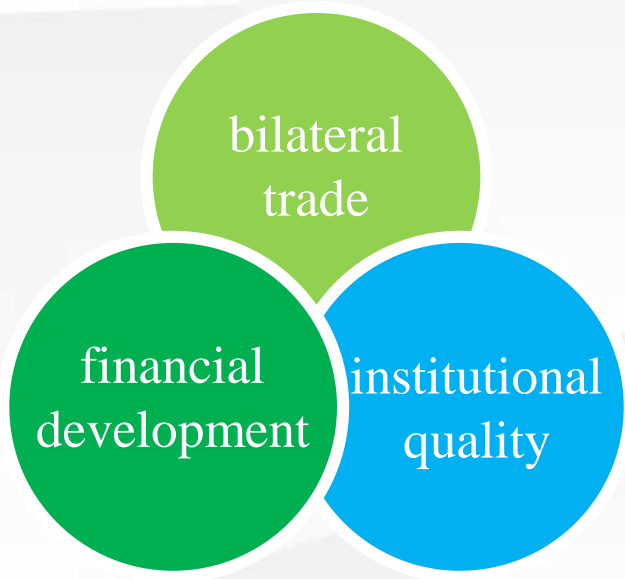
6.2 Policy enlightenments

01 Accelerate the implementation and advancement of "the Belt and Road" initiative.

02 Improve the financial development level of "the Belt and Road".

03 Optimize trade cooperation with countries along "the Belt and Road ".

Thanks for your listening and guidance