The Urbanization Effect of Foreign Trade and Its Action Mechanism

—An Analysis Based on Provincial Panel Data

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Abstract: This paper analyzed the urbanization effect of foreign trade, based on 30 provinces of the panel data, and used intermediary effect model to analyze its mechanism. Nationally, foreign trade has a positive effect on urbanization, and the positive part is through the fixed asset investment and the adjustment of industrial structure and foreign trade itself, the partial mediation effect accounted for the proportion of the total effect at 34.6%. The ministry of foreign trade promote effects of eastern and western region's urbanization level, the effect is not obvious in midland. Based on the conclusion, should optimize the industrial policy and investment environment, make foreign trade, industry, fixed-asset investment and urbanization form a good interactive mechanism.

1. Introduction

The Party's "18th National Congress" put forward the concept of a new type of urbanization, which is characterized by overall planning of urban and rural areas, integration of urban and rural areas, interaction between productive cities, conservation, livability and harmonious development. It is a urbanization in which large, medium and small cities, small towns, and new rural communities coordinate development and promote mutual progress. The improvement of urbanization is closely related to the development of domestic and foreign trade. With the deepening of urbanization research, scholars have explored the factors that affect urbanization from many perspectives. Li Qiang(2012) believes that government, market, and private forces promote the development of urbanization. It also summarizes the promotion model of Chinese urbanization: the establishment of development zones, the establishment of new districts and new cities, urban expansion, the transformation of old cities, the construction of central business districts, the industrialization of townships, and the industrialization of villages, but these factors are mainly focused on the impact of investment demand on the level of urbanization.Other scholars believe that population mobility has an important role in promoting the level of urbanization. Chenyongjun et al.(2013) believe that economic growth is still the most important factor in urbanization, in which population movements accelerate the urbanization process between the Eastern and Central and western regions.In addition to the above factors, the factors that affect urbanization also include

institutional factors such as the household registration system and the old-age insurance system. Yeyumin(2005) believes that the system affects the urbanization process in two ways. The factors that directly affect it include: the employment system, the household registration system, and the land system; Indirect effects mainly through industrialization and corresponding investment incentives. Huangxueli(2005) compared the time of urbanization and found that institutional factors are important factors in promoting urbanization.

At present, the study of urbanization is generally focused on economic growth, population movements and policies, but there is less literature on the relationship between foreign trade and urbanization, and the degree of economic openness and the development of international trade may have a significant impact on the level of urbanization in a country. Especially for developing countries. The relationship between foreign trade and urbanization is reflected in the following: first, foreign trade can not only exchange goods and services, introduce foreign technology and management experience, promote the productivity of the elements of this article and the expansion of various economic sectors, and thus increase employment and population concentration. Promote urbanization; Second, the development of foreign trade can increase the inflow of foreign capital and foreign direct investment, including fixed assets investment and infrastructure construction, and further promote urbanization. Therefore, based on the existing literature, this paper will study the relationship between foreign trade and urbanization, and will explore the mechanism of the urbanization effect of foreign trade.

2. Literature Review

International trade theory holds that both foreign trade and capital flows can promote the industrialization process, which in turn has an impact on urbanization. The development of foreign trade will promote the optimal allocation of factors among domestic departments and promote economic growth and urbanization. With the economic globalization, foreign scholars have done some research on the relationship between economic openness and urbanization. Moomaw(1996) found that a country's per capita GDP, industrialization degree, export dependence and urbanization rate are positively correlated, and industrialization, exports, and economic growth have all promoted urbanization. Economic growth, industrial restructuring and foreign direct investment will promote urbanization. In particular, foreign direct investment plays an important role in China's urbanization. Brihart(2011) believes that there is currently no mature model to predict the impact of trade openness on urban agglomeration. Most empirical studies have not proved that trade openness has an impact on urban agglomeration and regional inequality.

At present, the study on urbanization is not yet mature. Domestic research basically believes that foreign trade and foreign investment promote urbanization. Chengkaiming and Duan Cunzhang(2010) studied China's time series data from 1983 to 2007 and found that there is a long-term equilibrium relationship between foreign direct investment and urbanization. Wangduanyong and Zhunong(2007) proposed that urbanization is closely related to the level of regional economic development and labor migration. The inclusion of variable trade openness in the study found that foreign trade plays a significant role in the development of urbanization Zhaojinhua(2009)'s study found that the scale of foreign trade has a significant impact on provinces with high urbanization levels and has no significant impact on provinces with low urbanization levels.Domestic research focuses mainly on the impact of foreign direct investment on urbanization, and there is less literature directly on the relationship between foreign trade and urbanization. Xuchunxiang et al.(2014) will study Liaoning Province as a target and find that the relationship between foreign trade and urbanization is not obvious. The interaction mechanism between foreign trade and urbanization has not formed. In addition to different models and research methods, this

paper believes that the scope of research objects is relatively narrow. Taking a certain province as a research object alone can not explain the relationship between foreign trade and urbanization. On the basis of the previous literature research, this paper will use panel data analysis to study 30 provinces(except Tibet) in the country, eliminate the influence of time series limitations, improve the reliability of the research results, and will explore the impact of foreign trade on urbanization. Mechanism.

3. Variables, data and model descriptions

3.1 Variable description

In this paper, the urbanization level (U) is selected as the explanatory variable, except for the effects of the export orientation rate(M) and the import orientation rate(X) on the urbanization level. This paper also selects the per capita GDP of the control variables affecting the interpreted variables, the proportion of the output value of the secondary industry (T2), and the proportion of the output value of the tertiary industry (T3).

The explanation of the variables is as follows: The variable explained in this article is the level of urbanization (U). The population density and the proportion of urban population to the total population are used to indicate the level of urbanization. The proportion of urban population to the total population will be used for the robustness test of model 8. Due to the large statistical caliber and error, the proportion of urban population to the total population is used as an indicator. For the convenience of research, this paper chooses per capita GDP to represent economic growth; The output value of the secondary industry and the output value of the tertiary industry as a reaction to the changes in the industrial structure affect the level of urbanization, and as an intermediary variable to analyze the impact of urbanization; The fixed asset investment will be added to the model in the course of robustness test and intermediary effect test.

3.2 Data processing

The annual data for the period 2001-2011 will be used in this paper due to the differences in statistical data in the country's provinces and the lack of data in the Yearbook. The data comes from the "China Statistical Yearbook" and the statistical yearbooks of various provinces and cities and the official data of local statistical offices. If a time series is used, the estimated degree of freedom may be too small due to the short sample time. Therefore, this paper uses panel data to solve the small sample problem and uses panel data from 30 provinces(except Tibet) to analyze. In order to ensure the comparability of cross-annual data and eliminate the volatility of variable data, this paper has reduced and converted the relevant data for constant price in 2001. Fixed asset investment(F) and per capita GDP are all based on 2001 as the actual value of price changes at constant prices. The descriptive statistics of each variable are shown in table 1.

Table 1 Descriptions of variables

variable	definition	unit	Observation	Mean	standard deviation	minimum	maximum
U	Urbanization Level	person	330	615.42	424.28	123	2707
DM	export orientation		330	0.171	0.203	0.01	0.91
DX	Import orientation rate		330	0.163	0.246	0.01	1.34
AGDP	GDP per capita	yuan	330	18614.41	13946.7	2895.29	70073.97
TR2	Secondary production ratio	%	330	47.35	7.547	20.4	61.5
TR3	Third yield ratio	%	330	39.30	7.200	28.6	76.1
F	Investment in fixed assets	yi	210	3877.03	3732.15	191.08	21054.45

3.3 Model construction

Based on the above analysis, this paper will establish the following panel regression model based on the above selected variables:

$$Ln(U)_{it} = aLn(DM)_{it} + bLn(DX) + cLn(A\ GDP)_{it} + dLn(TR2)_{it} + eLn(TR3)_{it} + UI + Vit \quad (1)$$

Among them, in the above model, the lower corner Mark T represents the time, I represents the different provinces, UI represents the non-observable provincial characteristics, and is a random error item. UI and Vit are the error items of the model. The model of this paper also adopts the linear form to reduce the possible variance problem.

4. Empirical analysis

In estimating the panel model, the LLC test, Fisher-ADF test, and Fisher-PP test are used to avoid pseudo-regression due to the presence of unit roots of regression variables. The unit root test shows that the three variables of the export guide rate(M), import guide rate(X), and urbanization level(U) are all stable. In order to save space, the unit root test of other variables is not reported. The test results are shown in table 2.

Table 2 Unit Root Inspection

variable	LLC test	Fisher-ADF test	Fisher-PP test	stability
Ln(U)	-38.570	129.17	150.57	Stable
	0.000	0.000	0.000	
Ln(DM)	-6.621	138.04	76.46	Stable
	0.009	0.000	0.074	
Ln(DX)	-8.063	127.07	75.51	Stable
	0.000	0.000	0.008	

Since the panel model is used in this article, after the F test and the Hausman test, the fixed effect model or the random effect model is selected according to the P value. After the F test and the Hausman test, the P value was greater than 0.050. The results showed that the random effect model was suitable and the estimated result was as shown in table 3.

Table 3 Basic estimates

Interpreted variable/Explain Variables				Level of urbanization	
model	model1	model2	model3	model4	model5
Ln(DM)	0.054**	0.050*	0.059**	0.065***	0.064***
	(0.024)	(0.025)	(0.025)	(0.025)	(0.024)
Ln(DX)		0.015	-0.016	-0.016	-0.012
		(0.027)	(0.028)	(0.027)	(0.026)
Ln(AGDP)			0.060***	0.085***	0.160***
			(0.017)	(0.020)	(0.022)
Ln(TR2)				-0.006**	0.986***
				(0.002)	(0.159)
Ln(TR3)					0.771***
					(0.173)
Observation	330	330	330	330	330
R2	0.228	0.244	0.199	0.218	0.172

Note: "*", "**", "***" are significant at 10 %, 5 % and 1 %, respectively, and the values in parentheses are robust standard errors.

The estimates show that the positive effects of export orientation on urbanization levels persist when variables are added, and that other variables do not alter the impact on urbanization levels. The results of model 5 show that the increase of the export orientation rate will increase the level of urbanization, and the effect of the import orientation rate on the level of urbanization is not significant. To verify this relationship, robustness tests will be performed on the results of model 5. Per capita GDP, secondary output ratio and tertiary output ratio respectively have a significant positive impact on urbanization, which is in line with the expectations of this article, which means that economic growth, industrialization, and the development of service industries have a driving effect on urbanization level.

In order to verify the robustness of the estimation model, the robustness test part of this paper adopts the methods of panel mixing least squares estimation, variable substitution, increasing control variables, and sub-region research(eastern region, central region, Western region). Model 6 is a mixed least squares estimation. Model 7 is a replacement term for the delayed phase of the import-oriented and export-oriented rates as an explanatory variable. Model 8 uses the proportion of urban population to the total population as an explanatory variable. Model 9 is to add the total amount of imports and exports as an explanatory variable to the model. The results of the robustness test are shown in table 5. The minimum wage can have a positive effect on employment in the construction industry, and model 7-9 further confirms the conclusion of model 5. Model 6-Model 9 proves that the results in this paper are robust, and the test results further support the results in model 5. The results of model 8 are consistent with those of model 5, which further proves that foreign trade has an impact on urbanization.

Table 4 Determinant test results

Interpreted variable/Explain Variables	Level of urbanization			
model	model6	model7	model8	model9
Ln(DM)	0.064***		0.110***	0.062***
	(0.023)		(0.041)	(0.024)
Ln(DX)	-0.012		0.001	-0.012
	(0.025)		(0.034)	(0.026)
Ln(AGDP)	0.160***	0.146***	0.130***	0.162***
	(0.023)	(0.021)	(0.043)	(0.023)
Ln(TR2)	0.985***	0.728***	1.160***	1.006***
	(0.157)	(0.147)	(0.224)	(0.159)
Ln(TR3)	0.771***	0.595***	0.797***	0.802***
	(0.172)	(0.156)	(0.232)	(0.176)
Ln(DM) hysteresis		0.037*		
		(0.021)		
Ln(DX)hysteresis		-0.01		
		(0.023)		
Ln(F)				-0.01
				(0.009)
Observation	330	300	300	300
R2	0.172	0.165	0.189	0.173

Note: "*", "**", "***" are significant at 10 %, 5 % and 1 %, respectively, and the values in parentheses are robust standard errors.

This paper will be divided into three regions: East and West to study the relationship between foreign trade and urbanization. As the estimated results show in table 5, the export-led rate has a

significant positive effect on the urbanization level in the Eastern and western regions, while the effect on the central regions is not obvious. The eastern region has the advantages of location, and foreign trade has a significant role in promoting urbanization. The western region has the advantages of factors, the relatively low price of land and manpower, and the country's policy support. Therefore, foreign trade will increase the level of urbanization. Foreign trade and urbanization in the central region have not formed a good interaction mechanism, and it is possible that the scope of economic activities in foreign trade is relatively narrow, and that foreign trade has not made good use of local idle resources to give play to the advantages of factor endowment in the central region. Therefore, the central region needs to make further optimization in terms of industrial policy and trade policy, and give play to the role of foreign trade in driving urbanization.

Table 5 Estimates based on sub-regions

Interpreted variable/Explain Variables	Level of urbanization		
model	Eastern region	Western region	Central region
Ln(DM)	0.283***	0.01	0.043**
	(0.086)	(0.028)	(0.021)
Ln(DX)	-0.191**	0.003	-0.001
	(0.087)	(0.036)	(0.022)
Ln(AGDP)	0.108**	0.119***	0.109***
	(0.049)	(0.038)	(0.037)
Ln(TR2)	1.124***	-0.186	0.432
	(0.252)	(0.296)	(0.291)
Ln(TR3)	0.646*	-0.161	0.299
	(0.371)	(0.304)	(0.215)
Observation	121	88	121
R2	0.270	0.283	0.174

Note: "*", "**", "***" are significant at 10 %, 5 % and 1 %, respectively, and the values in parentheses are robust standard errors.

So, what mechanism will foreign trade use to influence the level of urbanization? This paper will try to clarify the mechanism of the impact of foreign trade on urbanization. To this end, the following assumptions are put forward: First, foreign trade will drive local fixed asset investment, and the increase of fixed asset investment will increase the level of urbanization; Second, foreign trade may lead to the development of secondary and tertiary industries, attract labor from rural areas to cities, and increase the level of urbanization. Based on the above two assumptions, this paper will analyze the intermediary effect.

In order to reduce the error rate when testing partial intermediate effect and complete intermediate effect, this paper uses the intermediate effect and complete effect test method proposed by Wenzhonglin(2004)[11] And ... The first step is to test the correlation between foreign trade and urbanization levels. The results are shown in Table 3 model 5. The regression coefficient is significant so that the second step can be carried out. The second step is to examine foreign trade and investment in fixed assets, foreign trade and secondary and tertiary industries

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significant so that the second step can be carried out. The second step examines the relationship between foreign trade and fixed asset investment, foreign trade and secondary industry and tertiary industry; The relationship between investment in fixed assets and urbanization level, proportion of secondary output and proportion of tertiary output and urbanization level. The test results are shown in table 6, step 2, with significant test coefficients. The impact of foreign trade(export orientation) on the level of urbanization is achieved at least in part through investment in fixed assets and the impact of industrial structure. The third step is to do a complete intermediary effect test. The test result is as shown in step 3 of table 6. The impact of foreign trade on urbanization is a partial intermediary effect, not a complete intermediary effect. There are other factors that affect urbanization, but this does not affect the analysis of this article.

As shown in table 6, the test results are significant and the intermediary effect is significant. The proportion of the intermediary effect of fixed asset investment to the total effect is 13.9 %(0.151 × 0.059 / 0.064); The proportion of intermediary effects in the secondary industry accounted for 8.1 % of the total effects(0.080 × 0.065 / 0.064); The proportion of intermediary effects in the tertiary industry accounted for 12.6 % of the total effects(0.132 × 0.061 / 0.064); The intermediate effect of industrial restructuring on urbanization accounts for 20.7 % of the total effect. Therefore, the effect of foreign trade on the level of urbanization through investment in fixed assets and changes in industrial structure accounts for 34.6 % of the total effect, and the effect of self-impact on urbanization accounts for 6.4 % of the total effect, which shows that there are still many factors affecting the level of urbanization. However, this paper can still conclude that foreign trade has a significant positive effect on the level of urbanization.

The results of the intermediary effect test prove that the above two assumptions that foreign trade affects the level of urbanization by affecting fixed asset investment and industrial structure changes; The impact of foreign trade, investment in fixed assets, and changes in industrial structure on urbanization accounted for 34.6 % of the total effect, which means that there are other factors that affect the level of urbanization, including government policies(household registration system, etc.), population movements, and infrastructure investment.

Table 6 Intermediary effect test results

	Model2				Model3			
	Ln(F)	Ln(TR2)	Ln(TR3)	U	U			
Ln(DM)	0.151*	0.080**	0.132*		0.065***	0.061**	0.059**	0.062***
	(0.014)	(0.016)	(0.012)		(0.025)	(0.025)	(0.025)	(0.024)
Ln(DX)					-0.016	-0.016	-0.016	-0.012
					(0.027)	(0.017)	(0.028)	(0.026)
LnAGDP					0.085***	0.060***	0.060***	0.162***
					(0.020)	(0.017)	(0.017)	(0.023)
Ln(TR2)				0.143*	-0.006**			1.006***
				(0.088)	(0.002)			(0.159)
Ln(TR3)				0.054**		0.075		0.802***
				(0.110)		(0.002)		(0.176)
Ln(F)				0.026**			0.010	-0.01
				(0.009)			(0.009)	(0.009)

Note: "*", "**", "***" are significant at 10 %, 5 % and 1 %, respectively, and the values in parentheses are robust standard errors.

5. Conclusions and implications

This paper analyses the impact of foreign trade on the level of urbanization and the mechanism for its operation, using panel data from 30 provinces (except Tibet), and tests the robustness of the results to ensure their reliability. Verify that foreign trade will have a positive effect on the level of urbanization.

The main conclusion of this paper is as follows: First, from a national perspective, the export-led rate has a significant positive impact on urbanization. When other factors affect urbanization, the proportion of export value in GDP will increase the level of urbanization. The import-oriented ratio has no significant effect on the level of urbanization, and the relationship between the import-oriented ratio and urbanization needs to be further analyzed. Second, the export orientation rate has a significant positive impact on the urbanization level in the Eastern and western regions, and it has no obvious impact on the central regions; This may be related to the geographical advantages of the eastern region. The eastern region is located in the coastal areas, the economy is relatively open, and foreign trade is relatively developed. The western region has factors such as factor advantages and the country's industrial policy support. The insignificance of the effects in the central region may be related to factors such as local policy environment, population movements and foreign direct investment. The import orientation rate has a significant negative impact on the eastern region and may be related to import substitution effects; Not a big impact on the Midwest. Third, through the intermediary effect test, we found that foreign trade affects the level of urbanization by affecting investment in fixed assets and changes in industrial structure, of which 13.9 % is through investment in fixed assets and 20.7 % is through changes in industrial structure. The effect of its own influence accounts for 6.4 %. Other intermediary factors may include foreign direct investment and population flow. The effect of foreign trade on employment accounts for 34.6 % of the total effect. Fourth, foreign trade is an important factor that affects the level of urbanization. However, it does not mean that excessive reliance is placed on increasing the export-oriented rate to promote urbanization. According to the actual conditions, local governments should optimize the trade environment and investment environment and other institutional aspects to provide institutional benefits for urbanization.

Based on the conclusion, this paper holds that: first, local governments should actively improve their foreign trade policies and make full use of external demand to promote local urbanization. The development of foreign trade needs to create a good external policy environment. Second, the promotion of urbanization by foreign trade does not mean that we should rely too much on foreign trade to promote urbanization, and ignore the role of domestic demand in promoting urbanization. We should expand domestic demand while taking advantage of external demand and prevent the "crowding out effect" of foreign trade. Third, local governments should improve their industrial development policies and investment environment so as to form a better mechanism for interaction in foreign trade, industrial development, investment in fixed assets and urbanization. We will build an interactive mechanism between foreign trade and new urbanization, promote China's economic growth, promote industrial agglomeration and structural adjustment, and realize the interaction between foreign trade and new urbanization.

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