

Study on the impact of urban investment bond issuance on regional economic development in the process of Urbanization

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Abstract

Regional economic development is bound to rely on urban investment and financing in the future. As the main source of funds for urban investment and financing, urban investment bonds are bound to play an important role in economic development in the future. This paper uses the total issuance of urban investment bonds, regional economic development level, urbanization rate and the issuance of PPP projects in China from 2012 to 2019 as research variables. With the help of empirical analysis methods, this paper explores the impact of urban investment bond issuance on regional economic development. The empirical results show that the issuance of urban investment bonds and the level of urbanization promote and promote regional economic development, and the higher the proportion of PPP projects in regional GDP, the inhibitory effect on regional economic development. The results also show that after the eastern region obtains the development dividend, the development scale of urban investment bonds, regional economic development level, urbanization rate and PPP project are more matched. Local governments should improve the independence of issuing bonds, let the market choose bonds, and improve the level and quality of regional economic development.

Keywords

Urban investment bond issuance, urbanization, PPP projects, regional economic development.

1. Introduction

At present, China has entered the first year of the 14th five year plan, and the national urbanization rate has been continuously improved. In order to achieve sustained economic growth, local governments have focused on the construction of public facilities and further improved the urbanization rate by building industrial new areas and characteristic towns. Worldwide research results show that the improvement of urbanization rate will play a positive role in promoting economic development. China's urbanization level has increased from 17.9% in the early stage of reform and opening up to about 57.35% in 2016. It is expected to exceed 65% in 2025 and 70% in 2035. Compared with other major economies in the world, the urbanization rate of developed countries in the same period exceeded 70% in 2016, and that of some countries exceeded 80%. In the process of development, all localities choose to issue urban investment bonds to raise funds and invest them in PPP projects in order to promote economic development at a higher level. In 2014, the new budget law and the No. 43 document of the Ministry of finance limited the government's traditional financing methods and channels, and the issuance of urban investment bonds was limited. With the increasing pressure on economic growth, the restrictions on the issuance of urban investment bonds were gradually relaxed in Document No. 1327 of the Ministry of Finance and its supplementary instructions in

2015, and the introduction of Document No. 88 in 2016 promoted the issuance of urban investment bonds. The issuance of urban investment bonds has experienced repeated tightening at the policy level. With the application of funds to PPP projects, what impact will urban investment bonds have on economic development? Based on the perspective of urban investment bonds, this paper studies the relationship between urban investment bonds issuance and economic development, and studies how local governments use urban investment bonds for economic construction, which is more conducive to regional development.

2. Organization of the Text

2.1. Theoretical analysis

In order to cope with the impact of the international financial crisis in 2008 on China's economic development, the state decided to implement the "four trillion" economic stimulus plan. The funds for completing the "four trillion" economic stimulus plan mainly come from the issuance of various bonds and investment in public infrastructure construction, which is of great benefit to the improvement of urbanization rate and the maintenance of economic vitality. As a result, the financial leverage ratio of local governments remains high. According to the 2020 China leverage ratio report released by the national finance and development laboratory, China's macro leverage ratio rose from 246.5% at the end of 2019 to 270.1% in 2020, an increase of 23.6%. In order to reduce the impact of macro-economic leverage ratio on investment confidence, Tightening market liquidity has become the main way of stable growth. In order to ensure that the regional economic development does not regress, the government needs to organize the operation mode of reducing leverage and stable growth. The "diversified" financing mode has become an important way for local governments to meet the capital gap. The improvement of urbanization construction level has become a new driving force to promote public goods, public choice and financial theory.

Public goods theory holds that public goods are non exclusive and the government is more familiar with the local situation. Therefore, it is more advantageous for the local government to provide public goods suitable for the local situation. Therefore, undertaking the infrastructure construction of local education, health and environmental protection is bound to lead to the expansion of financial expenditure. Under the background of fiscal decentralization, it is an inevitable result that fiscal revenue cannot make ends meet. With the state guiding urban investment bond funds to gradually tilt towards PPP projects, a large number of urban investment bond funds will enter PPP projects in the future to boost urban infrastructure construction. Therefore, hypothesis 1 is put forward.

Hypothesis 1: the expansion of the issuance scale of urban investment bonds can boost the economic development of the issuing place.

Public choice theory holds that the government is a rational person, and its investment decisions will fully consider its own interests and demands. At the same time, local officials will consider their own promotion, most projects will be launched smoothly, and excessive debt caused by insufficient funds in the construction process has become the norm. While adjusting the economic structure, improving infrastructure and urban services, improving the economic structure, promoting regional industrial development and providing "dividends" for economic growth, the debt of local governments is also rising. Therefore, whether the urbanization level pursued by all localities has really played an auxiliary role in promoting the economy? Based on this, hypothesis 2 is put forward.

Hypothesis 2: the process of urbanization effectively promotes the level of regional economic development.

Financial theory refers to the use of financial category to express the law of financial movement. In recent years, SPV companies established by local governments to implement PPP projects

can not guarantee stable income; In contrast, the financial contribution part has the external support of the government. At present, most of the funds invested by the government in the establishment of SPV company come from the issuance of securities, and urban investment bonds have become the main contribution in recent years. Some infrastructure projects have the problems of irrational investment, low investment efficiency, blind construction and excessive land transfer. The current development mode makes the "irrational" government investment prevail. The increase of local debt ratio and the uncertainty of project income level will affect the efficiency of financial resource allocation. Whether the rigid development requirements and slightly radical development mode can make the PPP project boost economic development and how much contribution the PPP project can make to regional economic development. Put forward hypothesis 3.

Hypothesis 3: PPP project can effectively promote the level of regional economic development.

2.2. Empirical analysis

2.2.1. Variable selection and data description

This paper uses the panel data of 30 provinces, cities and autonomous regions in China from 2012 to 2019 (Tibet Autonomous Region has a lot of missing data, so it is excluded). In order to prevent the impact of heteroscedasticity, except for the urbanization level, PPP project measurement indicators and industrial level, the remaining data are logarithmically processed. The statistical variables involved in this paper are shown in the table below: the data used in this paper are from flush database, provincial statistical yearbooks and relevant research reports.

Variable	Symbol	Number of samples	Mean value	Standard deviation	Max	Min
Economic level	GDP	240	25562.09	20004.41	107671.1	1893.54
Scale of urban investment bonds	debt	240	403.4841	396.5102	2284.8	0
Urbanization rate	rate	240	58.19577	11.86155	89.6	36.41
Total PPP projects/ Total regional GDP	PPP	120	0.394147	0.663806	4.467539	0.001888
General budget income	Ip	240	2872.07	2303.345	12651.46	238.5063
General budget expenditure	Op	240	4889.115	2714.694	17314.12	864.3616
Fiscal transparency	Ft	240	42.65888	18.43192	85.87	14
Completed amount of infrastructure investment	Inv	240	587.5481	413.2469	1981.029	29.0577
Total funds in place for infrastructure construction	Po	240	585.2649	417.6595	2077.832	19.8647
Actual utilized foreign capital	Fc	240	911280.2	812333.7	3579091	446
Industrial upgrading index	Ind	240	238.6083	12.82914	283.2	197

The explanatory variables of this paper are mainly the level of regional economic development. After referring to the results of relevant research literature, this paper adopts the regional GDP of the current year to express the regional economic development level of the current period; Recorded as GDP. The main explanatory variables include the scale of urban investment bonds, urbanization rate and total PPP investment. With the increasing variety of urban investment bonds in China's investment market, this paper only counts the data of corporate bonds, corporate bonds and medium-term notes in urban investment bonds, which are recorded as debt. The urbanization rate uses the statistical method widely recognized by the academic community, that is, the percentage of local urban population in the total local population as the evaluation method, which is recorded as rate. When using PPP projects for analysis, referring

to the research of Kan Chaolun and Zhou Yongmei (2020), the total amount of PPP projects / GDP per capita is used to measure the role of PPP projects. Referring to its research method, this paper uses the total amount of PPP projects / GDP as the measurement of PPP projects, which is recorded as PPP.

In the selection of control variables, this paper uses general budget revenue (IP), general budget expenditure (OP) and financial transparency (FT) as the financial influencing factors of local government. The completed amount of infrastructure investment (INV) and the total funds in place for infrastructure construction in the current year (PO) are used as the impact degree of infrastructure. The amount of foreign capital actually utilized in the current year (FC) indicates the attractiveness of financial development; Calculate the industrial upgrading index (ind) of each province to evaluate and measure the three types of industries in each region.

2.2.2. Model setting

In order to investigate the relationship between the scale of urban investment bonds and economic development, so as to test hypothesis 1, this paper constructs the model as follows:

$$GDP = \alpha_0 + \beta_1 debt_{it} + \beta_2 \sum control_{it} + \epsilon_i + \mu_{it}$$

In order to investigate the relationship between urbanization level and economic development and test hypothesis 2, this paper constructs the model as follows:

$$GDP = \alpha_0 + \beta_1 rate_{it} + \beta_2 \sum control_{it} + \epsilon_i + \mu_{it}$$

In order to investigate the relationship between PPP projects and economic development and test hypothesis 3, this paper constructs the model as follows:

$$GDP = \alpha_0 + \beta_1 PPP_{it} + \beta_2 \sum control_{it} + \epsilon_i + \mu_{it}$$

2.2.3. Empirical results and explanation

In the research process, the first regression of the three hypotheses only includes the main explanatory variables, and the subsequent regression successively increases the financial control variables, infrastructure control variables, financial development attraction and local industrial level. The results of Hausman test on the model show that the p value is 0.000, indicating that the use of fixed effect is more suitable for this study.

According to the regression results, the issuance level of urban investment bonds increased by 1%, and the level of regional economic development increased by 5.19%. With the increase of control variables, the issuance level of urban investment bonds will increase by 1%, and the local economic development level will increase significantly by 3.86%, 3.23%, 3.14% and 3.02% respectively. Therefore, hypothesis 1 has been verified.

Table 1 Empirical results of total issuance of urban investment bonds on economic development

	(1)	(2)	(3)	(4)	(5)
	GDP	GDP	GDP	GDP	GDP
debt	0.052**	0.039***	0.032***	0.031***	0.030***
	(0.024)	(0.010)	(0.010)	(0.010)	(0.010)
Ip		0.211***	0.208***	0.186***	0.181***
		(0.072)	(0.069)	(0.069)	(0.069)
Op		0.565***	0.521***	0.528***	0.547***

		(0.067)	(0.065)	(0.064)	(0.068)
Ft		0.049***	0.056***	0.062***	0.065***
		(0.018)	(0.018)	(0.018)	(0.018)
Inv			0.154***	0.151***	0.149***
			(0.041)	(0.041)	(0.041)
Po			-0.076**	-0.071**	-0.073**
			(0.036)	(0.036)	(0.036)
Fc				0.000**	0.000**
				(0.000)	(0.000)
Ind					-0.001
					(0.001)
_cons	9.845***	6.881***	6.556***	6.536***	6.784***
	(0.026)	(0.105)	(0.132)	(0.131)	(0.291)
N	233.000	231.000	231.000	231.000	231.000
r2	0.023	0.825	0.841	0.845	0.846

Urban investment bonds have gradually become an important source of financial support for local governments. As a market-oriented product, urban investment bonds are constantly expanding the industries involved, the government level of issuing urban investment bonds is also decreasing, and more and more county-level governments begin to issue urban investment bonds to raise funds. Under such a development trend, more local governments will choose urban investment bonds as a means of financing in the future. Economically underdeveloped areas can borrow domestic private capital for project construction. This investment model breaks the restriction that government revenue depends only on local taxes and gradually gets rid of the restrictions brought by "fiscal decentralization" on local finance.

The purpose of issuing bonds by local governments is to solve the problem of fund shortage in the process of development. In the case of insufficient financial funds, the expansion of the scale of urban investment bonds will bring new impetus and new benefits to regional economic development. Urban investment funds have improved the coverage of infrastructure in bond issuing cities, and improved the supply of external public goods and the integrity of public goods. At the same time, public goods improve the attraction of regional investment, and the improvement of regional economic level plays a certain role in promoting the process of urbanization. Table 2 shows the empirical results of urbanization level on economic development.

Table 2 Empirical results of urbanization level on economic development

	(1)	(2)	(3)	(4)	(5)
	GDP	GDP	GDP	GDP	GDP
rate	0.025***	0.009***	0.008***	0.009***	0.008***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Ip		0.001	0.000	0.000	0.000
		(0.001)	(0.001)	(0.001)	(0.001)
Op		0.002***	0.002***	0.002***	0.002***
		(0.001)	(0.000)	(0.000)	(0.000)
Ft		0.183***	0.161***	0.169***	0.156***
		(0.024)	(0.021)	(0.022)	(0.022)

Inv			0.226***	0.223***	0.224***
			(0.054)	(0.054)	(0.054)
Po			-0.039	-0.035	-0.034
			(0.049)	(0.049)	(0.049)
Fc				0.000*	0.000**
				(0.000)	(0.000)
Ind					0.003*
					(0.002)
_cons	8.412***	8.349***	7.365***	7.313***	6.610***
	(0.157)	(0.136)	(0.183)	(0.184)	(0.415)
N	240.000	240.000	240.000	240.000	240.000
r2	0.285	0.614	0.694	0.699	0.705

According to the regression results, the level of regional urbanization can have a significant positive impact on the local economic development, that is, the improvement of urbanization rate can drive the regional economic development. According to the regression results, when the urbanization rate increases by 1%, it can promote the regional economic development by 2.46%. Similarly, according to the regression results of urbanization level, when the urbanization level is increased by 1% after adding control variables one by one, it can promote regional economic development by 0.9%, 0.85%, 0.86% and 0.8%.

The expansion of urban investment bonds has also promoted the improvement of urbanization to a certain extent. In the process of urbanization, the urban agglomeration effect and the gradual establishment of urban agglomeration burst out new driving forces to drive economic growth. With the continuous completion of Characteristic Towns and industrial parks, the service capacity of public facilities in urban areas has been continuously improved, and the radiation effect of regional concentration has driven the employment, medical and health facilities in the surrounding areas. Centralized development has driven the expansion of supporting industries and expanded the volume of regional economy.

The improvement of urbanization level can narrow the gap between cities and villages and towns, drive villages and towns through cities, and realize the new situation of integrated development of urban and rural areas. It can be seen from past experience that the speed and level of urban development are often higher than those in township areas, and high-quality talents are the source of power for urban development. In order to maintain their own development power, all localities have issued preferential policies to attract high-quality talents to settle down, improve the urbanization of rural population, and reserve talents for regional economic development.

As the funds in the PPP project come from both government finance and social capital, there is no government participation standard or stripping statistics at present. Because the investment direction of PPP projects is mostly people's livelihood construction, the total amount of PPP projects / per capita GDP is used as the evaluation index in the existing research results. With the gradual expansion of the industrial coverage of PPP projects, this paper takes the total investment of PPP projects / regional GDP as the research index of PPP projects. Some provinces plan to promote regional economic development through PPP project investment, so this value is used as the research data of this paper.

Table 3 Empirical results of PPP project on economic development

	(1)	(2)	(3)	(4)	(5)
	GDP	GDP	GDP	GDP	GDP
PPP	-0.113***	-0.093**	-0.100***	-0.098***	-0.089***

	(0.037)	(0.035)	(0.036)	(0.036)	(0.034)
Ip		-0.000	-0.000	-0.001	0.000
		(0.002)	(0.002)	(0.002)	(0.002)
Op		0.001	0.001	0.001	-0.000
		(0.001)	(0.001)	(0.001)	(0.001)
Ft		0.140***	0.131***	0.134***	0.124***
		(0.037)	(0.038)	(0.038)	(0.036)
Inv			0.068	0.073	0.132
			(0.103)	(0.103)	(0.097)
Po			0.008	0.010	-0.061
			(0.086)	(0.086)	(0.082)
Fc				0.000	0.000
				(0.000)	(0.000)
Ind					0.013***
					(0.004)
_cons	10.067***	9.469***	9.040***	8.974***	5.820***
	(0.032)	(0.183)	(0.382)	(0.392)	(0.912)
N	120.000	120.000	120.000	120.000	120.000
r2	0.092	0.243	0.258	0.263	0.372

According to the regression results, there is a significant negative correlation between PPP projects and regional economic development. When the PPP project increases by 1%, the local economic development level will decrease by 11.26%. After adding control variables step by step, the increase of PPP investment will gradually bring 9.32%, 10%, 9.77% and 8.88% inhibition to the regional economy. From the regression results, the increase of total investment in PPP projects will not promote regional economic development. Therefore, hypothesis 3 has not been verified.

According to existing studies, PPP projects have a threshold effect on regional economic development; By observing the trend chart of PPP projects in 30 regions in the sample, there is a large policy oriented relationship between the investment of PPP projects and regional economic development. For example, after the construction of Hainan economic free trade zone was on track, the investment in PPP projects in Hainan Province soared in 2017, while the GDP of Hainan province did not increase by the same margin in the same period. PPP project has long investment cycle and high investment amount. Whether the income from the project can make up for the total investment and meet the external requirements of the project and its own profitability, the profitability of PPP project cannot be guaranteed in the process of market-oriented operation. Therefore, the increase of the proportion of PPP project investment in GDP can not bring obvious pulling effect to regional economic development.

2.3. Robustness check

2.3.1. Endogenous problem

In order to test the robustness of the research results, the endogenous test process replaces the main explanatory variables in the empirical research. Replace the total amount of urban investment bonds with the balance of local government debts, replace the urbanization rate with the population density of each province in the current year, and replace the investment amount of PPP project with the loan part invested in the fixed assets of public facilities.

table 4 Empirical results after replacing the total amount of urban investment bonds

	(1)	(2)	(3)	(4)	(5)
	GDP	GDP	GDP	GDP	GDP
LnDb	0.611*** (0.062)	0.434*** (0.077)	0.457*** (0.075)	0.473*** (0.075)	0.600*** (0.066)
Ip		0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.003*** (0.001)
Op		0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.001** (0.001)
Ft		0.135*** (0.030)	0.097*** (0.031)	0.103*** (0.031)	0.067** (0.033)
Inv01b			0.272*** (0.088)	0.269*** (0.087)	0.440*** (0.091)
Po01b			-0.122* (0.068)	-0.115* (0.067)	-0.179** (0.075)
Fc				0.000* (0.000)	0.000* (0.000)
Ind					0.002 (0.002)
_cons	4.809*** (0.531)	5.771*** (0.625)	4.773*** (0.658)	4.566*** (0.659)	2.242*** (0.680)
N	147.000	147.000	147.000	147.000	147.000
r2	0.453	0.536	0.584	0.598	

The regression results show that the regression results are significantly positive when considering all control variables and the significance is 1%. That is, the balance of government debt will increase by 1%, and the level of regional economic development will increase by 60%. Similarly, when all control variables are considered, if the population density increases by 1%, the regional economic development level will increase by 2.22%. The significance of the core explanatory variables is consistent with the previous research results, indicating that the research results are basically significant and robust.

Table 5 Empirical results after replacement Urbanization

	(1)	(2)	(3)	(4)	(5)
	GDP	GDP	GDP	GDP	GDP
density2	0.039*** (0.013)	0.035*** (0.008)	0.025*** (0.008)	0.025*** (0.008)	0.022*** (0.008)
Ip		0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Op		0.002*** (0.001)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)
Ft		0.217*** (0.022)	0.193*** (0.020)	0.200*** (0.021)	0.185*** (0.022)
Inv01b			0.194*** (0.056)	0.191*** (0.056)	0.196*** (0.055)
Po01b			-0.018	-0.015	-0.016

			(0.050)	(0.050)	(0.050)
Fc				0.000*	0.000**
				(0.000)	(0.000)
Ind					0.003*
					(0.002)
_cons	9.508***	8.428***	7.571***	7.526***	6.787***
	(0.116)	(0.118)	(0.171)	(0.172)	(0.423)
N	240.000	240.000	240.000	240.000	240.000
r2	0.039	0.618	0.685	0.690	0.695

In the single factor regression results considering only loan construction infrastructure projects, the coefficient is small. In the subsequent test of adding control variables, the results are significant, but the impact level is low. Considering only the single factor influence of the main explanatory variables, the first two of the three alternative variables have significant explanatory effects, which can explain that the alternative variables have a significant impact on economic development to a certain extent. Therefore, it can be explained that the original hypothesis and the setting and selection of original variables in this paper are valid.

2.3.2. Heterogeneity test

In order to study the relationship between the influencing factors and the level of economic development in different periods and regions, the year and time are divided nationwide. The Ministry of finance began to uniformly manage PPP projects in 2016, so the heterogeneity test is divided into years before and after 2016. In order to make a targeted analysis of the whole country, the whole country is divided into four parts: East, middle, West and northeast.

The eastern region includes Beijing, Tianjin, Shanghai, Hebei, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong and Hainan.

The central region includes Shanxi, Anhui, Jiangxi, Henan, Hunan and Hubei.

The western region includes inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang.

Northeast China includes Heilongjiang, Jilin and Liaoning.

After the heterogeneity test by region, the Stata results show that the explanatory ability of the main explanatory variables to GDP is not significant. The possible reasons are mainly due to the small amount of data in the group after years and regions, which can not fully explain the impact of economic status and economic development level. In order to explain the relationship between regional economic development and urban investment bonds, urbanization and the total amount of PPP projects, this paper takes the average value of various indicators to form an image to observe the relationship and trend between local economic development and relevant factors.

It can be seen from the image trend that the economic level of the eastern region is significantly ahead of the whole country. In the development process from 2016 to 2019, the economic level of the eastern region shows stable growth, and the total issuance of urban investment bonds and the total amount of PPP projects in the same period match the volume of economic level. The economic development level of the central region also shows a stable upward trend, and the total amount of PPP shows a large-scale growth. In contrast, there is a large gap between the total amount of urban investment bonds issued in the central region and the total amount of PPP projects.

Due to the underdeveloped economy in the western region and limited to the natural environment, the construction of public infrastructure is relatively backward throughout the country. After giving priority to the development of the eastern region, the state has gradually

turned its attention to the western region. The total amount of PPP projects in 2016 and 2017 ranked first in China for two consecutive years. In the same period, the GDP of the western region was at the lowest level in China, and the average level of 12 provinces was even lower than that of the three northeast provinces.

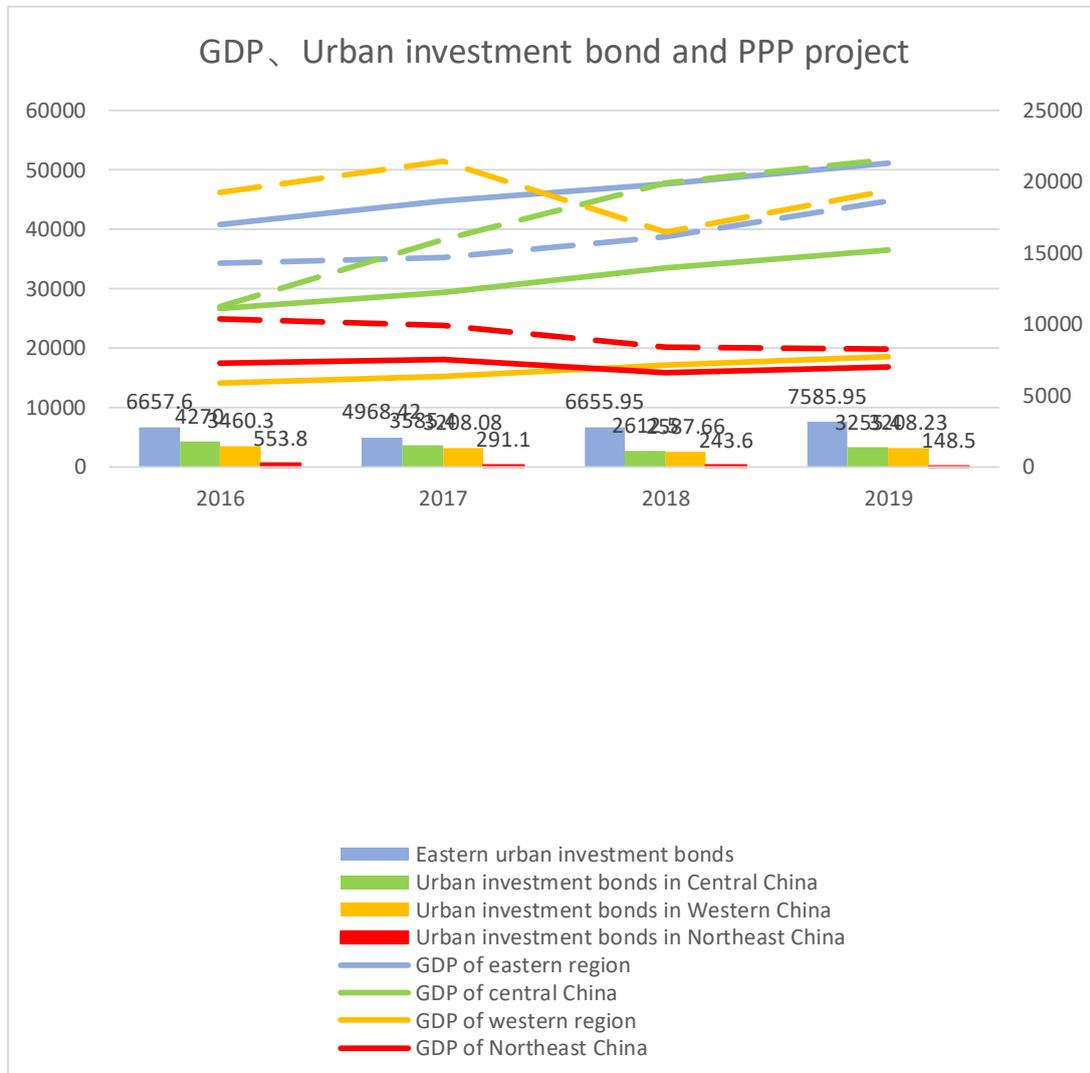


Chart 1 Number of GDP, urban investment bonds and PPP projects in each region

As China's old industrial base, Northeast China has a good level of municipal infrastructure. In addition, in recent years, Northeast China has been restricted by policies and industrial structure, and the level of economic development has decreased significantly, resulting in an obvious downward trend in the number of PPP projects and total investment reported for approval and statistics in recent years. With the implementation of a series of policies such as "de capacity and deleveraging" and environmental protection law in recent years, the economic development speed of Northeast China has been greatly limited. It can be seen from the image trend that the total investment of PPP projects in Northeast China is similar to the trend of GDP. To a certain extent, it can explain that the investment of PPP projects in Northeast China can not drive the regional economic development. If it is extended to the whole country, it can explain that the investment of PPP projects alone can not drive the growth of regional GDP.

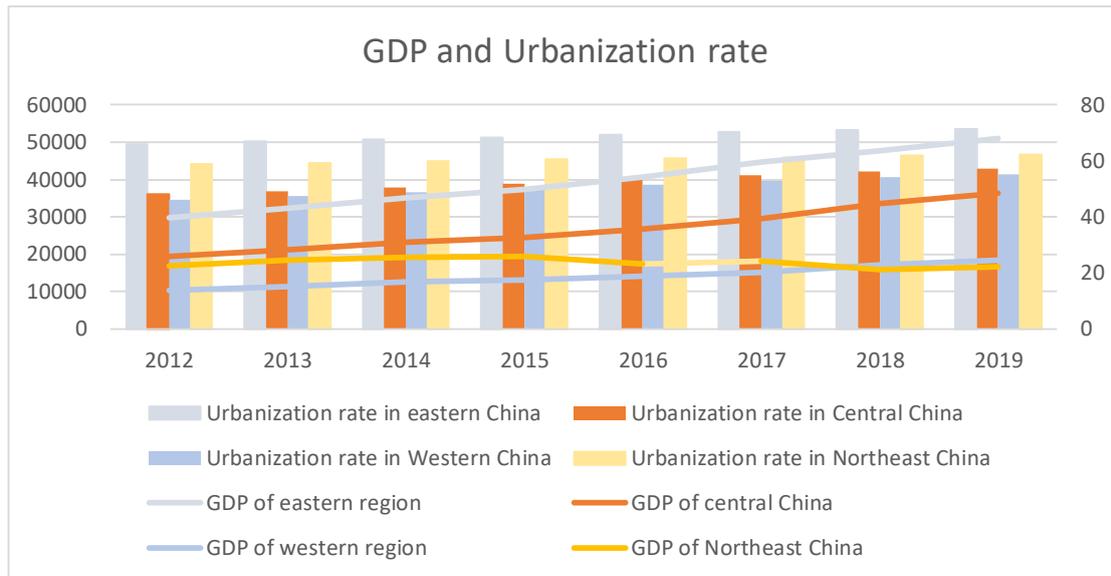


Chart 2 Relationship between GDP and urbanization rate

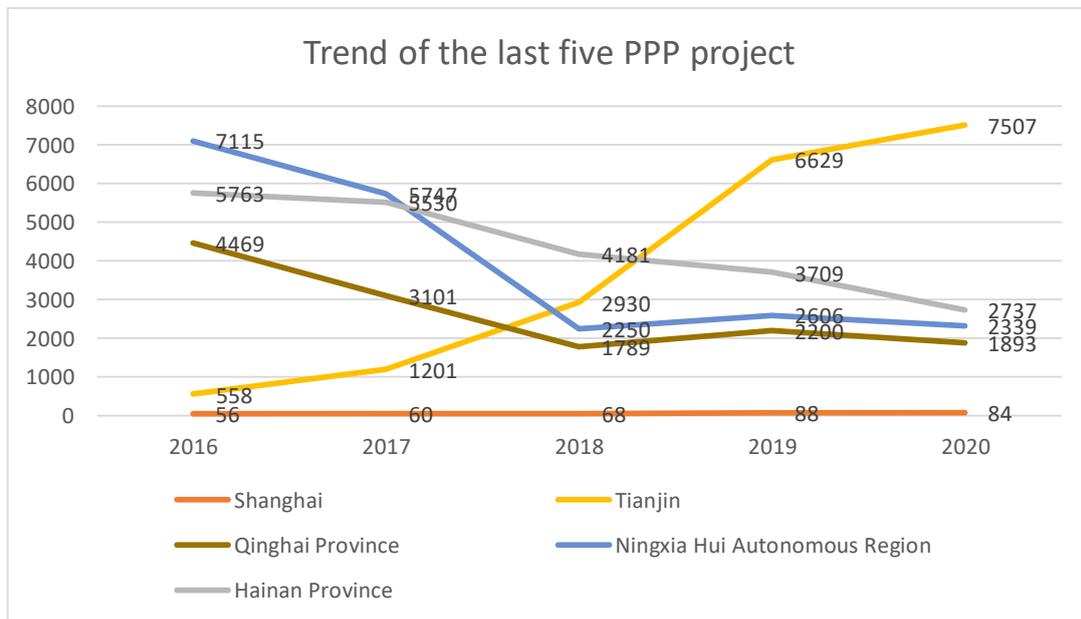
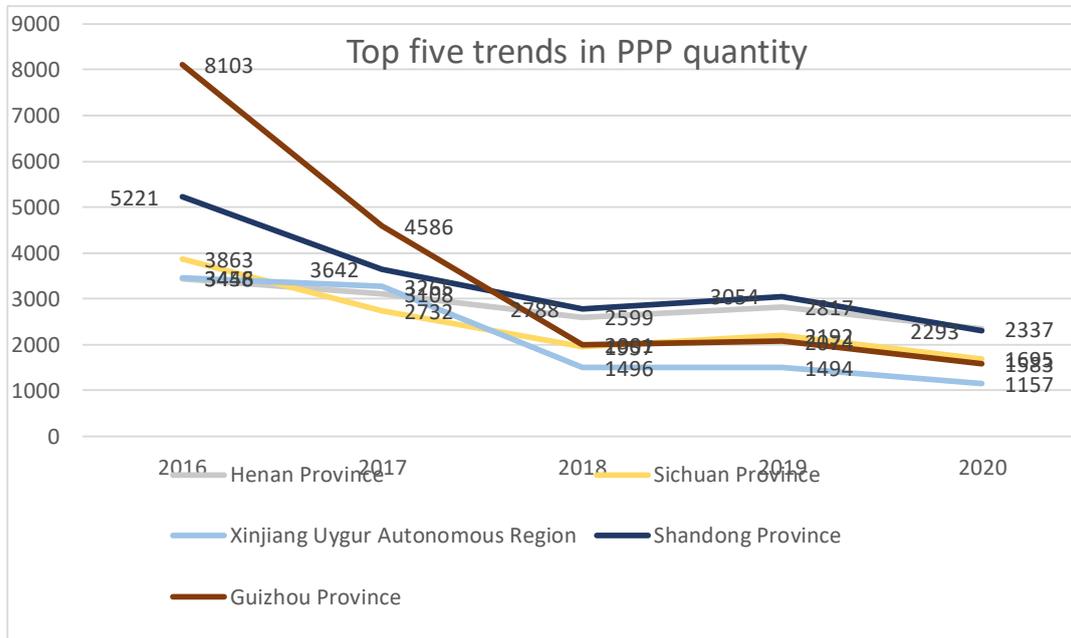
The urbanization rate is a percentage, which is small and cannot be fully reflected in the figure above. Therefore, GDP and urbanization rate are presented separately. Existing studies based on the whole country can significantly show that there is a close relationship between urbanization rate and regional economic development level, and the regression results can significantly show that urbanization rate plays a role in promoting economic development. The trend of the image can show a positive correlation between urbanization rate and GDP.

The eastern and northeast regions have had a high urbanization rate in the process of development and accumulation for a long time in the past. The data show that the economic development level of the eastern region is steadily improving, while the northeast region has decreased significantly limited by factors such as industrial development. In recent years, major cities in the central and western regions are constantly attracting highly educated talents to settle down. The result of the policy of attracting and settling down is that the urbanization rate is increasing year by year, and the economic level is also rising with the improvement of urbanization level. Therefore, the role of urbanization rate in promoting the economy is significant in any region.

It can be seen from the image trend that there are great differences between the number and amount of PPP projects in each province. There are many PPP projects in central and western regions. It can be seen from the statistical results that the top five provinces in the number of projects are Guizhou, Shandong, Sichuan, Henan and Xinjiang, and only Shandong is located in the eastern region. Shanghai, Tianjin, Qinghai, Chongqing and Beijing are the last five provinces and cities in the number of PPP projects.

Correspondingly, among the total investment of PPP projects, the total investment of Guizhou, Yunnan, Shandong, Sichuan and Henan ranked among the top five in China, while Shanghai, Tianjin, Qinghai, Ningxia and Hainan ranked among the bottom five in China. Shanghai and Tianjin are among the lowest in China in terms of the number of projects and total project investment. As municipalities directly under the central government, the two places are in a leading position in economic development in the country, and there are policy and location advantages in economic development. In addition, the construction level of urban public infrastructure and the urbanization process of the two cities are also at the head of the whole country. The economic development of the two places has multi industry and multi-faceted support, and there is no need to rely on PPP projects to stimulate local economic development. Therefore, the performance of the two places in the total amount of urban investment bonds and the total amount and total amount of PPP projects is not eye-catching. It can be seen from

the trend chart that the number of PPP projects and total investment are decreasing throughout the country, and the GDP value of all provinces is generally rising steadily. This result also verifies that the PPP projects obtained above can not effectively promote regional economic development.



Similarly, the characteristics of the high urbanization rate in economically developed areas and the lack of prominence between the issuance scale of urban investment bonds and the amount related to PPP projects come from the advantageous geographical location and long-term development advantages. In recent years, the total issuance of urban investment bonds and the establishment level of PPP projects in provinces that have gradually revealed their development potential are significantly higher than those in economically developed areas; The economic development level of the underdeveloped areas in the central and western regions is low, and the fiscal revenue is difficult to bear the expenditure brought by large-scale public fixed facilities investment. At the same time, most central and western provinces are limited by the natural environment, there are a lot of inconvenience in the construction of public

infrastructure, and the superposition of a variety of adverse factors can not realize the high externality of project construction. The above results further support the role of urban investment bonds and urbanization level in promoting regional economic development. PPP projects can not promote regional economic development, and even inhibit regional economic development under certain circumstances.

3. Literature review

3.1. Research status abroad

At present, most foreign research results believe that there is an obvious inverted U-shaped relationship between government public debt and economic growth. There is a complementary relationship between social public capital and private investment (reinikka and Svensson, 2002). In addition, the increase of public investment has a negative impact on private investment. A reasonable scale of urban investment bond funds for public facilities investment can reduce the cost of private investment to a certain extent. Under the joint action of appropriate large public investment and private consumption, macro and micro economy can jointly promote economic growth.

The investment of urban investment bond funds in public infrastructure will form public capital, which has positive externality (pintea and Turnovsky, 2006). The expansion of the scale of positive externalities will improve the marginal productivity of private capital, and then promote private capital growth and capital accumulation (Cavallo and daude, 2011). The investment of urban investment bonds will improve the regional economic vitality. Therefore, the use of urban investment bonds for public infrastructure investment will affect the threshold and convenience of private investment. Infrastructure will reshape private investment decisions by affecting investment costs. Empirical research shows that the increase of government deficit and debt has a significant impact on the rise of urban investment bond interest (cebula, 2014). High deficit ratios and public debt have led to a significant increase in the number of long-term interest rate bonds. Therefore, improving the use efficiency of financial funds is of great benefit to alleviate the dilemma of financial revenue and expenditure. The effect of government debt on economic growth depends on the investment direction, use efficiency and government debt bearing capacity of urban investment funds. If the debt scale is properly controlled and applied to infrastructure, the debt deficit will help to correct the market failure caused by the negative externality of public goods and promote economic development through limited private crowding out effect.

3.2. Domestic research status

3.2.1. Research status of urban investment bonds

In order to regulate the scale of local liabilities, the new budget law issued in 2014 requires regional governments to improve financial transparency. In terms of the national average, if the financial transparency is raised to a higher level, the issuance scale of urban investment bonds will expand by 4% (Xu Hong and Wang Feng, 2019). In provinces and cities with low financial transparency, the improvement of financial transparency can significantly and positively promote the increase of the issuance interest rate of urban investment bonds (Wen Laicheng and Ma Yun, 2019). With the promotion of fiscal decentralization and the gradual appearance of the effect of the "replacing business tax with value-added tax" policy in 2016, the development of urban investment bonds in different regions shows different effects. After the implementation of "replacing business tax with value-added tax", the scale of national urban investment bonds has increased significantly, and the expansion speed of urban investment bonds in the eastern region is faster than that in the western region (Su Hang, Wei Jianjian, Zhang Meisha, 2019). According to the experience of issuing urban investment bonds, local

governments need to allocate financial resources according to the implementation cost to ensure the matching of financial and administrative powers of governments at all levels (Liu Jinlin, 2014).

In the short term, the realization of government assets can indeed solve the problem of local government debt compensation (Yang Zhiyong, 2017), but most local governments beautify and package the ratings of urban investment companies and urban investment bonds to a certain extent in order to ensure the stability of urban investment funds and the market's confidence in urban investment bonds. The "financial packaging" with the help of local governments has led to the continuous expansion of the credit rating of urban investment bonds, which may further increase the leverage ratio of local governments and deepen the debt risk (Zhang Lu, 2020). In order to control risks, urban investment companies gradually tend to choose external credit enhancement methods for risk control. Professional guarantee companies can effectively control the risk of bond issuance, so as to improve the bond issuance rating and reduce the financing cost of urban investment bonds; Moreover, the guarantee effect of mortgage and pledge guarantee, third-party guarantee and professional guarantee on the spread of urban investment bonds has gradually increased (Chen Shanshan and Luo Yefei, 2020).

In the actual process of issuing bonds, the impact of government implicit guarantee on interest rate depends on the economic development of the place where the bonds are issued (Wang Li and Chen Shiyi, 2015). A good financial ecological environment can effectively reduce the cost of local debt financing; Similarly, a good regional economic foundation and government governance level also help to reduce financing costs (Pan Jun, 2015). When urban investment enterprises with local government as the background issue bonds, both explicit and implicit government information have an important impact on bond pricing (Wang Bosen and LV Yuanzhen, 2016). Even the replacement of the municipal Party secretary or mayor will increase the risk and cost of issuing bonds (Luo danglun, she Guoman, 2015).

3.2.2. Research status of urban investment bonds and PPP projects

Excellent infrastructure conditions are the prerequisite for local economic development. At the same time, infrastructure also plays a subordinate and guiding role in local economic development. In recent years, with the deepening of the requirements for high-quality development, the investment scope of infrastructure projects began to tilt to modern service industries such as energy conservation and environmental protection, ecological medical treatment, culture and education, tourism and so on. Among them, the development of transportation, tourism, culture and education projects has a significant positive role in promoting urbanization (Xu Haifeng, Wang Xiaodong, 2020). PPP project and urbanization development are in close partnership, sharing benefits and risks. The good use of PPP projects can make up for the capital gap, improve the supply level of public goods and services, and disperse the overall risk of public facilities supply (Roman, Wang Haixia, 2014). As an important source of extra budgetary funds of local governments, urban investment bond funds are mostly used for non productive infrastructure construction projects, which are introduced to the market through PPP mode. Local fiscal deficits are expanding, and local governments take the initiative to expand the scale of urban investment bonds to transfuse local finance. Traditional infrastructure projects are short of capital, long project cycle, large investment, high cost and low rate of return. After strict supervision by the government, the participation rate of social capital and project landing rate are both low; PPP mode improves the speed of regional urbanization through public bidding and BOT operation mode. The PPP model will bring greater implicit burden to the finance of the central and western regions, while the original implicit debt in the eastern region is relatively low. Issuing urban investment bonds for PPP projects will help to reduce the financial burden (Meng Chun, 2014). Nationwide, when the local

government's implicit debt expands to a certain extent, the continuous launch of PPP projects will increase the government's implicit debt burden (Xie Jincheng, Zhang Zongze, Liang Hongzhi, 2020). At the macro level, the level of regional infrastructure is consistent with the level of regional economic development. As the State implements the strategy of giving priority to the development of the eastern coastal areas, the infrastructure construction level in the eastern region is higher than that in the central and western regions. Every 1% increase in investment in urban infrastructure construction can drive economic development in the same direction (Niu ting and Zhao Shouguo, 2010). At the same time, local finance needs to issue bonds according to the local industrial structure and characteristics and in combination with the regional development level. The investment behavior of local governments beyond the scope of financial resources will bring the payment amount of PPP projects into the annual budget, which increases the operation risk of PPP projects and government debt risk on the one hand. Under such conditions, the regional development level will inhibit the promotion of local government debt on the scale of PPP projects (Kan Chaolun and Zhou Yongmei, 2020).

3.2.3. Urbanization development and regional economic level

Urbanization development and regional economic level need the support of supporting infrastructure in the process of urbanization. The research shows that for every 1% increase in the new urbanization rate in China, the investment amount will reach 7 trillion yuan (Shi Yarong, 2019). Proper borrowing by the government is not only a manifestation of bearing public risks, but also a means to promote the sustainable development of regional economy (Liu Shangxi, 2017). According to the current research results, the scale of urban investment bonds has a significant positive impact on the level of urbanization. The scale of urban investment bonds increases by 1% and the level of urbanization increases by 1.489; The impact level of the eastern region is significantly higher than that of the central and western regions. The scale of urban investment in the eastern region increases by 1%, and the urbanization level increases by 2.147, while the urbanization level of the central and western regions can only increase by 0.683 (Shi Yarong, 2020). Every 1 percentage point increase in urbanization can contribute 7.1% to local economic growth (Zhu Konglai, Li Jingjing, Le Feifei, 2011). In order to promote sustainable economic development, qualified local governments should be allowed to issue bonds by themselves and raise funds in an open and transparent manner (Zhu Ying and Wang Jian, 2018). The improvement of supporting facilities such as transportation, electric power, water conservancy and network will help to improve the attraction of investment, reduce investment costs and promote the process of regional urbanization. In the process of development, when the financial budget cannot cover government expenditure, local governments generally adopt the way of "off balance sheet financing" to alleviate the financial pressure, and the issuance of urban investment bonds is an important transmission channel to alleviate the expenditure pressure and promote urban economic growth (Xiao Ye, 2019).

3.2.4. Urban investment bonds and regional economy

At present, most studies believe that there is an "inverted U-shaped" relationship between the scale of urban investment bonds and economic development, and the large-scale issuance of urban investment bonds causes financial pressure on the government. Although the issuance of urban investment bonds by local governments can promote the regional per capita GDP (Si Haiping, Li Qun, Yu Yongcheng, 2019), the local financing platform issuing urban investment bonds may lead to the problem of soft budget constraints of local governments (Wang Yongqin, Chen Yinghui, Du Julan, 2016). The high debt ratio weakens the promotion effect and even has a negative effect (Liu Zhexi, Ren Jiajie, Chen Xiaoliang, 2020). In recent years, there have been substantial defaults on many urban investment bonds. Therefore, the government needs to make more reference to the local economic level when issuing bonds.

4. Conclusions and policy recommendations

4.1. Conclusion

This paper analyzes the impact of local urban investment bond issuance scale, urbanization rate and PPP project investment on regional economic development. Using the provincial panel data from 2012 to 2019, this paper makes an empirical analysis on the relationship between the above variables and regional economic development, and the conclusions are as follows.

First, the expansion of the scale of urban investment bonds can promote regional economic development. Adding different control variables can significantly explain the role of urban investment bonds in promoting regional economic development. The inexhaustible driving force of regional economic development comes from people who devote themselves to industry. The improvement of urbanization rate can significantly promote regional economic development. This result can be verified nationwide. PPP projects will bring negative effects to regional economic development to a certain extent. Previous experience can no longer meet the current requirements of economic development. Infrastructure construction alone can not stimulate regional economic development. The initiation and investment of PPP projects need to consider the local economic level and the inclination of central policies. Stimulating economic development with PPP projects requires local support in many aspects and the cooperation of the whole industry.

Second: after regional research, the infrastructure construction level and urbanization rate of the eastern region are ahead of the whole country. Therefore, issuing urban investment bonds can effectively help regional development. With the support of location advantages and policy inclination, PPP projects can give full play to their external advantages. PPP projects can not only provide services, but also recover their own costs within the corresponding time, and gradually enter a benign development stage, so as to bring a higher level of services to the region.

Based on the above conclusions, this paper believes that the issuance of urban investment bonds by all provinces will promote regional economic development, but the extent to which the construction of urban investment bonds into PPP projects can promote regional economic development needs to be further studied. The issuance of urban investment bonds in the central and western regions is low and the regional economic level is not strong. Most of them rely on the central financial allocation or the cooperation between leading enterprises in relevant industries and local governments for construction.

In the process of urbanization, talent introduction can bring talent reserve to regional economic development. There is interaction between urbanization rate and regional economic development. Relevant supporting industries and natural environment in economically developed areas can improve talent attraction and talent retention rate. The increase of the total urban population and the proportion of high-quality talents in the urban population will bring new momentum and dividends to industrial development. Regional economic development is inseparable from the pulling role of industry. The introduction of high-quality talents can solve the shortcomings of regional industrial underdevelopment and slow upgrading.

In recent years, most of the national PPP projects have been approved to serve the people's livelihood, while the profit-making PPP projects have a longer profit rate and recovery cycle in the central and western regions with low population density than in the eastern and northeast regions. Therefore, it is still necessary to increase investment in infrastructure construction in economically underdeveloped areas, and reduce investment in projects with weak profitability or too dependent on demographic dividends. Construction projects that match the level of

regional economic development and urban population can bring momentum to regional development.

4.2. Policy suggestion

4.2.1. Improve the independence of government bond issuance

The enthusiastic pursuit of investors makes urban investment bonds become synonymous with guarantee once they are issued. In recent years, the default of urban investment bonds continues to occur and has an expanding trend. Therefore, it is necessary for the market to make choices and restrictions on urban investment bonds. Giving local governments higher independence in issuing bonds can not only enable the government to face the market and investors, but also enable investors to make more rational investment decisions on bonds. The market has more stringent requirements and standards for bond interest rates and bond audit standards, which is conducive to the establishment of long-term and reasonable bond issuance standards. Urban investment bonds are the product of financing by local governments in order to supplement the lack of financial funds. Local governments are the indirect responsible person of liabilities. It is necessary to reduce the purchase threshold and purchase mode of urban investment bonds, and introduce corresponding property preservation measures, tax reduction and exemption measures and other incentives to ensure purchase enthusiasm and attractiveness.

4.2.2. Raise the level of new urbanization rate

The focus of traditional urbanization is registered residence. The urbanization in the new stage of high quality development will expand more attention to improve the living standards of residents and meet the needs of life. At present, the evaluation standard of residents for the level of regional urbanization has been much higher than meeting the basic living needs. At present, urbanization is an organic whole involving space, industry, environment and humanities. With the change of life rhythm and lifestyle, cities should not only meet the quality of life, but also meet the efficiency of life. The construction of large urban agglomerations and living circles has been gradually enriched and improved. With the integration of information by big data, cloud computing and artificial intelligence technology, the coordinated development of large, medium and small cities is more suitable for the current development requirements. Therefore, combining the local industrial structure and industrial characteristics and reasonably planning the future construction content is not only conducive to the development level of urbanization, but also conducive to urban attraction and local economic development.

4.2.3. Combination of PPP project expansion speed and regional economic development speed

In order to develop the local economy, we should not only rely on infrastructure projects, but also make reasonable planning in combination with the local natural environment and economic aggregate. At the same time, relevant departments of the State Council shall strengthen the identification of approval conditions and control of PPP projects. For PPP projects that have been put into operation but have not achieved the expected results, they are wholly-owned by social capital. For PPP projects in the construction stage, strengthen supervision and inspection. For projects in the declaration period, conduct high standard value for money evaluation and financial affordability evaluation. At the same time, strengthen the degree of information disclosure and improve the transparency of local PPP projects so that PPP projects can be carried out under social supervision. Combine PPP projects with government budgets to reduce the scale and level of local debt. At the same time, more opportunities will be given to the enterprises participating in the project, so that the PPP project can achieve its original purpose and strengthen the local infrastructure construction and public service level through the combination of government and social capital cooperation.

Controlling PPP projects not only improves investment efficiency, but also reduces the rise of local government debt leverage. While the government requires to improve the quality of PPP projects, it should also make more detailed choices for the bid winning enterprises and encourage diversified enterprises to participate in the process of infrastructure construction.

4.2.4. Open up regional economic investment channels and promote financial marketization and diversification of investment sources

One of the reasons for the restriction or negative impact of PPP project investment on regional economic development is the excessive government intervention. At present, most bid winning enterprises are state-owned enterprises or central enterprises, and local financing platforms have obtained more credit funds. Therefore, stimulating the development of PPP projects with the help of urban investment bond funds needs to integrate a series of related industries and related factors such as regional economy, business environment and fiscal revenue and expenditure. At the same time, the government should also reduce its bias towards the winning bidder and strengthen its comprehensive management ability in the process of operation. From the experience of developed countries, China needs to establish a professional PPP management organization, promote the externality of public infrastructure projects through the joint management of the central and local governments, and improve the supervision and guarantee of PPP projects by the state and relevant departments at all levels.

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