Establishment of early warning index of local government debt risk -- taking Hubei province of China as an example

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Abstract. With the enhancement of local governments' public management functions and the continuous development of economic and social undertakings, the scale of debt has shown a trend of continuous expansion, and the hidden dangers related to local government debt have also become increasingly apparent, which has seriously troubled the finance at all levels and caused extensive concern from all sectors of society.

1. Introduction

During the "Thirteenth Five-Year Plan" period, the international environment is brewing new changes, domestic economic development has entered a new normal state, and the local government's financial operation is also facing a new normal of increasing revenue and expenditure contradictions and continuing deficit growth.

In view of this situation, the “Opinions of the State Council on Strengthening Local Government Debt Management” (the State Council [2014] No. 43) was promulgated on October 2, 2014, which stipulates that the issuance of government bonds is the only way for local governments to borrow money, marking the transition from unified issuance of government bonds by the Ministry of Finance to the Ministry of Finance granting local governments appropriate borrowing authority in accordance with the law.

In May 2017, six ministries, including the Ministry of Finance and the Ministry of National Development and Reform, jointly issued a document No.50, which mainly clarified once again that local government bonds were the only legal means for local governments to borrow money, banned all kinds of implicit guarantees provided by local governments to urban investment companies, and banned real debt projects with clear shares.

In April 2019, the annual "Opinions of the Ministry of Finance on Doing a Good Job in Issuing Local Government Bonds" further implemented the strict management of local government bond issuance work, and standardized the words on the local bond issuance management for the first time. Under such a policy, in order to effectively prevent and resolve the debt risk, the credit risk quantification of local debt stocks has become a key point.

2. Analysis of local government debt risk during the 13th Five-Year Plan period

In recent years, China's local government bond issuance has shown a spurt of growth, mainly characterized by a large total amount, complex debt nature and a mismatch in term structure.

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As far as Hubei Province is concerned, the scale of debts repaid by local governments in 2016-2018 has maintained rapid growth, with growth rates of 11.99% and 16.80% in 2017 and 2018, respectively. As of the end of 2018, the balance of debts with responsibility for repayment in Hubei Province was 667.57 billion yuan, of which the general debt balance was 374.23 billion yuan, the special debt balance was 293.34 billion yuan, and the debt balance was 235.376 billion yuan.

Based on the three stages of debt, debt phase and debt repayment, this paper analyzes the important indicators that can evaluate the local government debt risk in Hubei Province.

2.1. Debt stage
From the perspective of funding sources, the Hubei Local Government's debts with repayment obligations mainly come from the issuance of local government bonds, which are low-cost, open and transparent, and easy to manage. Therefore, from these two perspectives, the Debt level and Dependence degree of debt are regarded as assessment indicators.

2.2. The debt phase
From the perspective of capital investment, most of the debt is used for public welfare projects, mainly for public welfare projects such as transportation, municipal construction, affordable housing, land reserve, ecological construction and environmental protection, which have an indirect impact on local economic growth. At the same time, the replacement of debt is mainly used to repay local debts that are about to expire or have expired. From this perspective, the Financial burden index and Input-output index should be considered as assessment indicators.

2.3. Debt repayment
The debt-paying term structure of the Hubei Local Government with repayment responsibility is relatively reasonable. By the end of 2018, the debts of the Hubei Local Government with repayment obligations accounted for the total debts due in 2019, 2020, 2021 and 2022 and subsequent years. The proportion of debt is 9.24%, 13.40%, 17.39% and 59.97%, respectively, and there is little pressure on centralized repayment. Therefore, the ability of local finance to repay debt basically determines the debt risk. From this perspective, there is a deficit risk at this stage, and the Deficit level should be regarded as a assessment indicator.

3. Basic principles of indicator design
In the selection process, the following conditions must be considered.

3.1. Scientific
The indicators used should be close to the frontiers or common standards at home and abroad to ensure the rationality and scientificity of the indicator system. [4]

3.2. Importance
In accordance with the impact on financial activities, the reasonable choice of indicators, the selected indicators should have a clear economic significance.

3.3. Comprehensiveness
The classification of various indicators should be carried out, so that the system can fully reflect the debt risk situation. Avoid duplication or omission between indicators while ensuring that the total number is appropriate.

3.4. Targeted
It is necessary to understand the characteristics and laws of local government debts, and set indicators according to different situations in each province to improve the accuracy of early warning.
3.5. Easy to operate

That is, each indicator has a reliable source of data, and the calculation method is easy to understand and easy to implement.

Based on the above work, through calculation and comparison, our team finally adopted five indicators -- Debt level, Financial burden index, Input-output index, Dependence degree of debt and Deficit level [1] -- as indicators for risk quantification and early warning, and analyzed them with specific data.

| Table 1. Indicator summary table and safety range |
|--------------------------------------------------|
| Restricted factor | Evaluation index | Result | Safety range |
| Debt scale | Debt level | 16.96% | ≤10% |
| Debt scale | Financial burden index | 66.58% | ≤100% |
| Ability to spend | Input-output index | 90.39% | ≤70% |
| Ability to spend | Dependence degree of debt | 8.16% | ≤20% |
| Deficit risk | Deficit level | 11.7% | ≤2.6% |

In order to verify the selection of the above indicators, the following is the correlation analysis result between the debt status of each prefecture-level city and General public revenue.

| Table 2. Correlation analysis data |
|-----------------------------------|
| City | General public revenue | The total amount of liabilities |
|-----------------------------------|
| Wuhan | 1528.7 | 2649.98 |
| Xiangyang | 295.5 | 543.37 |
| Yichang | 237.23 | 534.3 |
| Huanggang | 139.24 | 356.21 |
| Xiaogan | 130.19 | 67.29 |
| Jingzhou | 134.31 | 120.21 |
| Huangshi | 117.02 | 208.06 |
| Shiyan | 113.3 | 373.32 |
| Jingmen | 105.76 | 198.37 |
| Xianning | 91.32 | 183.41 |
| Ezhou | 57.93 | 120.39 |
| Suizhou | 47.38 | 114.76 |

Verification of correlation between the general budget revenue of each city or state and the total liabilities of municipal governments at the local level:

| Table 3. Correlation verification |
|----------------------------------|
| Factor1 | Factor2 |
| The total amount of liabilities | Pearson correlation | .995 |
| | Sig. (double tail) | .000 |
| | The case number | 12 |
| General budget revenue | Pearson correlation | .995 |
| | Sig. (double tail) | .000 |
| | The case number | 12 |

The results showed that the correlation was significant. And the verification of the results conforms to the proportion of the total debt of each city.
4. Conclusion

With the "Notice of the General Office of the State Council on Printing and Distributing the Main Points of Government Affairs Opened in 2018" and the Ministry of Finance's "Local Government Debt Information Disclosure Measures" further request for the disclosure of local government debt information, the Department of Local Finance also set up a local government bond column for information disclosure. The emphasis on the status quo at the national and local levels makes the local government debt risk in Hubei Province long-term controllable on the policy front.

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