CHAPTER 6. EVALUATION, MODELING, AND MANAGEMENT OF UKRAINE'S STATE DEBT DYNAMICS

6.1. The essence of government debt and its management instruments

Government debt is the normal phenomenon of the economic system. All countries of the world use the government borrowings. Though, during the centuries many questions arise regarding the influence of the government debt on the economies of countries. The opinions of scholars have varied significantly, and every economic school has its opinion about the government indebtedness.

Mercantilists considered the credit financing as one of the inflow of money to the economy as a positive phenomenon and one of the sources of national income. In contrast to mercantilists, the followers of other economic school- physiocrats- researched the sphere of production and considered the agriculture to be the sources of national income, not trade. They were proponents of the idea of economic liberalism, non-regulation of the state [1]. They thought that governmental borrowings divert resources from the productive sectors of the economy.

On the contrary to mercantilists, representatives of the classical school revealed government debt as negative phenomenon. Adam Smith in his “An Inquiry into the Nature and Causes of the Wealth of Nations” wrote, that increase of debts may cause troubles to the nations in Europe. The scientist pointed out that growth of government debt will cause the increase of taxes and this causes the outflow of capital. In other words, private capital is used on the servicing and repayment of debt instead of creation of the added value on the internal market. So, usage of debt financing influences the country negatively and may cause default. Other representative of classical school – David Ricardo had the similar opinion. He said that country is becoming purer as a result of useless expenditures of the government. Almost the only representative of the classical school, who had positive opinion on the government borrowings was Thomas Malthus, who thought about state borrowings as the way to increase the demand. He pointed out that government debt usage the government borrowings the interest rates increase and it leads to displacement of private investments. In general, the representatitives of Monetarism were not approving the idea of usage the state debt as the instrument of stabilization policy, as they considered the decrease of state expenditures as the main tool to influence the macroeconomic processes.

Topics of government indebtedness were also researched in the scientific works of James Buchanan. He did not agree on positive attitude to the government debt of Keynesians, and pointed out that increase of government expenditures with the usage of government borrowings made fiscal illusions. James Buchanan considered state debt as amoral thing, as far as next generation would pay for the borrowed money and it forms the debt burden.

In XX century the usage of mathematical and statistical methods for the research of government indebtedness developed, and this allowed to receive new practical results. Hansen H., Tarp F. made the research, which helped to reveal the influence of external government borrowings on the national savings in the developing countries. According to the investigation of the authors external debt influenced national savings negatively [5].

Borenstein E. with the help of econometric methods revealed the existence of negative impact of the government debt, in particular external one, on the internal investments and economic growth [6].

Burnsode C., Dollar D. also used econometric methods and could find that there was positive influence of external government borrowings on the economy of country only in the case of effective macroeconomic policy [7].

C. Macconel, S. Brue did not consider public debt as a burden. According to their opinion, government always can refinance debt, or increase taxes or arrange emission of currency to avoid the default. Economists paid attention that the internal debt is obligation to own citizens of the country, that is why national income is just redistributed inside the country. External debt they considered to be the burden for the economy, as in this case financial resources flow from the country while servicing and repaying of government debt [8] .

R. Dornbusch and S. Fischer had the similar opinion: they considered the internal debt to be the wealth of the country, as far as the debt securities are bought by citizens of financial institutions inside the country. At the same time external debt belongs to foreigners, and that is why it is not the wealth of the country and influences the increase of government debt. Economists pointed out that borrowings are a burden for the further generations. At the same they made a cautious assumption, that such situation is possible and justified during wars and economic crises [9].

During the development of economic thought, the research changed from the defining whether the debt is good or bad to defining the optimal level to minimize the economic loss. World financial crises of 2008 has given a new impetus to this research. In their publication “Growth in a Time of Debt” Carmen M. Reinhart & Kenneth S. Rogoff have made a conclusion, that exceeding a government debt of 90% of GDP leads to a recession and a 0.1% decline in the economy. For some period this research was highly popular and was used for the budget planning in some countries. In 2013 T. Herndon T, M.Ash, M., & R. Pollin have analyzed the influence of debt on economy. They have found that below a debt level of 54,5% of GDP, debt has a positive effect on growth, but above this level the impact of debt is negative. But at the same time the institutional quality has positive impact on improving the economic conditions and influence of debt [10].

Nobel Prize laureates Paul Krugman and Joseph E. Stiglitz criticized the policy of austerity and its measures for reducing budget deficits and levels of debt burden. They believed that it is possible to cut expences in the period of economic boom rather than crises, and public debt is effective instrument for stimulation of economy during the slowdown.

Followers of modern monetary theory consider government debt as accumulated budget deficits, which were formed in past and increased the financial assets, influencing the demand on goods and services. It allowed to maintain the increase of income, and influences the increase of financial assets faster, that it would be possible without deficit.

To conclude, most the enonomists aknowledge, that government debt is normal phenomena of modern financial and macroeconomic policy, but its impact depends on the phase of economic cycle, level of development of the economy, its usage. The excessive level of public debt can lead to slow down of economic growth, increase of interest rates, decrease of national savings and transfer of government debt burden to further generations.

To our opinion, it is very important to control the level of government indebtedness and its usage. In the current conditions, it is obvious, that government debt is almost the only source of covering the budget deficit in Ukraine.

In the article 2 of the Budget Code of Ukraine, the government debt is defined as the total amount of received and not paid loans (credits) on the reporting date arising from government borrowings [11]. The formation of the government debt occurs through external and internal borrowings and servicing the existing debt under conditions of repayment and maturity to finance the state budget.

Governemnt debt can be internal and external one: external government debt- it is all indebtedness to creditors inside the country (physical and legal entities of the country), and external government debt – debt of the country to foreign creditors (physical and legal entities of other countries, international organizations, government of foreign countries). Public debt is classified to direct government debt and guaranteed by state. Direct government debt is the amount of debt, which is borrowed by the government of the country, and guaranteed debt – it is total amount of indebtedness of the legal entitites of Ukraine, which are guaranteed by the state. That means that in case of non-payment by this companies, the government will take their obligations.

To our mind, it is additional problem of Ukrainian indebtedness, as government can have additional obligation and burden.

Public debt usually arises because of the lack of financial resources in the budget of the country to fulfill its main functions, such as maintaining economic stability, security of the country, carrying out international, social, ecological and other policy. In such cases the government should borrow with the aim to finance expenditures. The main reasons of the increase of the government debt can be the following: deficit of the budget, increase of state expenditures, fiscal policy, which is concentrated on the decrease of tax burden, automatic stabilizators - cyclical decrease of tax income and increase of social payments during the economic crisis with the aim to stabilize the national currency, political business-cycles [13].

Table 6.1. Classification of public debt

Criteria	Types
Based of the creditor's location	External Internal
By the extent of coverage of government debt obligations	Capital Current
By the type of recipient of borrowed funds	Conditional Direct
By the type of currency	In national currency of creditor In the currency of the third country In international settlement units
By the type of debt obligation	Long-term bonds Medium-term bonds Short-term bonds and bills Loans to finance budget deficit

Source: developed by authors based on data [12]

It is important to pay attention to such a phenomenon as monetization of the public debt. It is used in crisis situations, such as war, global financial crisis, revolution. Monetization is usually restricted or prohibited in the developed countries with the aim to maintain the independence of the central bank and providing the stability of the national currency. Monetization means buying of government bonds by the central bank on the secondary market in big amounts. In 2022 the National Bank of Ukraine used this financing of the state budget, but in 2023 it was prohibited.

Debt management is the system of measures taken by the government to pay interest income to creditors and repay loans, make changes in terms of existing loans, and define conditions for issuing new loans. Effective debt management is crucial to ensure the solvency of the state, availability of resources for debt repayment, and the timely receiving of these resources. At practice for the effective management in the state should be formed particular financial policy for coordination of monetary and fiscal policy in the questions of debt management, there are developed methods to decrease the debt burden in context of transit from anti-crisis to strategic management.

Management of public debt includes a rage of actions for the preparation of insurance government bonds, providing guarantees, servicing and repayment of government debt. Effective public debt management is crucial for maintaining fiscal stability, ensuring the availability of funding for public projects, and avoiding fiscal crises that can have severe economic repercussions. Effective public debt management includes:

- Ensuring that the level of debt is sustainable in the long term. This involves assessing the ability to service debt without undue economic hardship or risk of default.
- Identifying and managing risks associated with public debt, such as interest rate risk, currency risk, and refinancing risk.
- Developing a strategy for borrowing that optimizes the cost-risk tradeoff. This includes deciding on the mix of domestic versus foreign borrowing, short-term versus long-term debt, and fixed-rate versus floating-rate debt.
- Managing the composition of the debt portfolio to minimize costs and risks. This might involve restructuring existing debt or altering future borrowing plans.

The debt management can be divided to strategic and operational [14]. To achieve the best result country should approve the debt strategy. Debt strategy is the system of measures for the avoiding the problems with the government debt and ensuring solvency, and for the country, which already has some problems- for their regulation and restoring solvency.

Thus, the strategy maintains the goal of the debt policy. At the same time, operational management has the aim to manage current problems with the government debt, it defines the amount and conditions of borrowings, their structure and sources, and also the mechanism of repayment. Operational management concentrates on the problems of current liquidity and defines the main problems of managing of government debt.

Important element of public debt management is its structure and schedules of repayment. In the developed countries the main part of government borrowings is made on the internal markets, as far as the big amounts of external debt, especially short-term can lead to the external financial risks.

Shigeto Kitano's research shows, that external government debt is one of the factors of currency crisis. In the case, when government accumulates high levels of external government debt and do not use measures to decrease it, even in the conditions of high level of international reserves, there arises a risks of currency crisis in the country [15].

In general, management of government debt is the process of development and implementation of the strategy of government debt management with the aim to receive the necessary funds at desired level of cost and risk. To our mind, the main elements of management of government borrowings should include [16]:

1. Borrowings operations, including: development of debt management strategy, creation a government debt program with the defining the optimal structure, cost of borrowings, establishing official norms, developing effective cooperation with creditors, creation the country-borrowing image.
2. Usage of government debt, which includes: mandatory goal-oriented usage of borrowed costs, control on usage of state borrowings, formation of regular reports about the usage of government debt.
3. Servicing and repayment of government indebtedness: formation of the schedules of repayments and control over their effectiveness, monitoring of the process of interest and principal payments, compiling the reports and summary information.

The important element of the management of state borrowings is planning its amounts and schedules of repayments with the aim to avoid picks of payments for the state budget. Also, it is important to evaluate the current economic situation in the country, including the economic growth, export, import, amount of international reserves.

The necessary element is usage of the system of indicators for the quick analysis of indebtedness, for example, such as indicator of servicing of government debt, relation of current amount of external government debt to export, relation of government debt to GDP, relation of international reserves to short-term debt.

Besides, important element of government debt management is creation of the program of the distribution of resources for particular spheres and industries with detailed planning. Usage of borrowings can have a positive impact on the rebuild of economy of Ukraine after war, but important questions are the amount of state indebtedness and control of its usage. So, it can be active usage the credits of the World Bank, which have targeted and be directed into those sectors of economy, which are not enough attractive for private investors, for example, priority usage can be the development of infrastructure.

In general methods of government debt management can include: conversion, consolidation, unification, exchange under regressive terms, prolongment of repayment, debt cancellation, and debt buyback [17].

Conversion – it is the change of interest rate of loans, usually decline. Consolidation- it is the change of the period of debt obligation, it can be used together with conversion. Also it can be combined several obligations into one – this is called unification. This method can be used together with changing of the period of obligations -consolidation. Exchange under regressive terms- it is change of the previous debt obligations for the new one. Prolongment of payment- it means change of the date of payment for a more distance date in future. On the contrary to consolidation, prolongment of payment also considers stop of interest payments for some period. Usage of these methods in complex or partly is called the restructuring of the government debt. In this case the government do not refuse to pay, it just eases its servicing – a kind of compromise between creditor and borrower. But in the case, when the country does not want to go for compromise, it can announce its default. Another variant of managing the government debt is its buy back. The country can bay back its own bonds on the secondary market. It is the most convenient in the crisis situations, when their price decreases because of unfavorable conditions.

Another indirect methods of public debt management include the economic growth and fiscal consolidation. Economic growth helps to service the government debt and decrease the debt burden. Fiscal consolidation includes decrease of state expenditures and increase of taxes. The usage of this instrument in disputable in the economic literature as it influences business activity and the effects on the debt burden are low and need a long period of time (it can be considered the case of Greece).

The Public Debt Management Agency, which was established in 2020 in the structure of the Ministry of Finance in Ukraine, has the following functions: management of government debt and guaranteed government debt, including the management of risks, connected with it, providing external and internal borrowings within the middle-term strategy of government debt management, emission of government bonds, repayment and servicing of the government debt [18]. Repayment means fulfilling debt obligations towards the creditor by paying the principal amount of the debt, while servicing involves paying interest according to the terms of the loan agreement or issuance of debt securities. Effective management of government debt is one of the key factors of macroeconomic stability. It influences the budget expenditures, the level of international reserves, level of interest rates and investment climate. That is why it is rather important to provide debt management within strategy. In Ukraine it was approved the Middle-term strategy of government debt management for the year 2022-2024, but because of the beginning of war the need of financing increased, so the usage of Strategy decreased.

Regarding the evaluation of government indebtedness, the general amount of government debt is less informative, that its relation to GDP, relation of external government debt to export of goods and services, relation of the amount of the annual debt payments to the currency income from the export of goods and services. These indicators help to understand how big is the burden of the public debt for the economy.

After the war important element for rebuild and stabilization of the economy will by the adoption of the system of indicators for debt usage control and following the rules. We depend highly on creditors, which has the political desire to help. But it is obvious, that in future creditors will be more demanding, it can be seen on the programs of IMF. Ukraine will need more controlled and balanced approach to borrowing. Therefore, it will become important to adhere to a medium or long-term dent strategy with established debt indicators that will be appropriate to Ukraine and for creditors.

There is no rule for determining whether a government debt is practically sustainable or not. Analyzing the sustainability of debt involves forecasting and assessing fiscal, macroeconomic, and financial variables over the long-term period. A significant but complicated task is evaluating liabilities of government and creating meaningful scenarios. In practice, to prognose how debt will accumulate is quite hard. Review of the International Monetary Fund's (IMF) reports for countries with advanced economies under Article IV showed that in most cases, the increase in government debt during the global crisis of 2008 was not anticipated, even under the most extreme shock scenarios [19]. Debt sustainability means that debt must be serviced at any time. For this, governments must be both solvent and liquid.

According to the Article 18 of the Budget Code of Ukraine, the total amount of government debt cannot exceed 60% of GDP. If the amount is expected to be higher, it is submitted request to the Parliament of Ukraine to deviate from the norm and also plan of actions to resolve the situation.

There are many indicators of evaluation of the debt sustainability. Most of them are developed by the international financial organizations.

International Organization of Supreme Audit Institutions – INTOSAI has proposed the three types of indicators, which are used for analysis of the government debt [20]. Every type has its own peculiarities and they are considered in the complex (Table 6.2). By usage of these indicators, governments and audit institutions can effectively monitor and evaluate the risks and sustainability of public debt. This helps in making informed decisions about debt management, fiscal policies, and economic planning.

Table 6.2. Indicators of evaluation the government indebtedness according to the INTOSAI methodology

Indicators of vulnerability	Financial indicators	Indicators of autonomy
Debt/ internal budget revenues	Interest rates and yield curve	Fiscal coherence indicator
Debt servicing/ internal budget revenues	Average payment terms and maturity period	Butler index
Present value of debt servicing/ internal budget revenues	Debt repayment schedule	Short-term balance of payment indicator
Interest payments/ gross domestic product	Loses in the risk scenarios	Autonomous fiscal position indicator
Interest payments on external debt/ internal budget revenues	Credit ratings	Currency availability indicators
External debt/export	Sovereign risk indexes	
Net international reserves/ external debt		
Amortization of debt/ external debt payments		

Source: developed by authors based on data [21]

Among the indicators, which international organizations use for the evaluation the level of government debt, can be considered the following [16]:

- Debt indicators, including: debt maturity, repayment schedules, interest rate sensitivity, share of foreign currency debt;
- Indicators, which relate to the international reserves. They are necessary, as help to evaluate the possibility to avoid the crisis of liquidity. Relation between the international reserves and short-term debt is the key parameter of the evaluation of the vulnerability of the country with the limited access to the capital markets;
- Indicators of financial stability, which reflect the evaluation of financial sector. They include: capitalization of financial institutions, quality of assets, profitability and liquidity, rates and quality of credit growth. These indicators allow to analyze sensitivity of financial system to market risks, changes of interest rates and exchange rates.

After the article of Blankart (1990), the most widely used in economic literature indicator for the evaluation of debt is the relation of government debt to GDP and its tendencies [22]. This indicator allows to evaluate the level of government debt burden in relation to the economic activity in the country. In this case, resources of GDP are enough for financing the government debt, however it is not the absolute truth. At the same time, this indicator is used as the most popular for the evaluating the level of government debt of the country. Some of other similar indicators have the goal to evaluate the relation of interest payments or amount of debt to different indicators of the income of the country. Others are based on the determining the structure of the indebtedness, which involves external and internal obligations, share of the obligations with the fixed, variable and real rates, the amount of short-term, medium-term and long-term indebtedness. These are important indicators for the evaluation of debt and solvency, they provide information about the deterioration or improvement of the situation [16].

Between the international organizations there is no clear consensus on establishing the minimum acceptable levels for the various indicators.

The Table 6.3 has the information about limits of indicators for the level of government indebtedness for the countries, which were developed by two international organizations.

Table 6.3. The maximum limits of the vulnerability indicators of government debt

Vulnerability indicators	International Monetary Fund	Debt Relief International
Debt servicing/ Budget revenues	25%-35%	28%-63%
Present value of debt/ Budget revenues	200%-300%	88%-127%
Interest payments / budget revenues	7%-10%	4.6%-6.8%
Debt/GDP	25%-30%	20%-25%
Debt / Budget revenue	90%-150%	92%-167%

Source: developed by authors based on data [16, 23]

C. Wyplosz in his article «Debt Sustainability Assessment: Mission Impossible» is evaluating the procedures of assessing debt sustainability, proposed by the International Monetary Fund. Author argues, that considering the current conditions, it is impossible to evaluate if the debt is stable, as far as the prognoses of the government debt are sensitive to the considerations regarding growth, results of the budget year and interest rates. Fundamental reason is that the debt sustainability is a perspective concept with the very big horizons with the stable variables, which are based on the assumptions and the previous patterns [24].

In Ukrainian economic literature it is often used the term of debt security, which includes several indicators, which are responsible for the stable level of debt and solvency of the country as a whole.

In the table 6.4. there are mentioned the main indicators, which are calculated for the assessment of the debt security

Table 6.4. Indicators of debt security of the country

Debt indicators	Description	Optimal level	Limited value
Relation of government debt to GDP	Characterizes the total amount of debt indebtedness	20%	>60%
Weighted average yield of government securities on the primary market adjusted for inflation expectations, in percentage points	Shows the level of expenditures, connected with the servicing of internal government debt	4%	>11%
Spread Emerging Markets Index Plus Ukraine	Difference between the yields of the Emerging Markets Index and the yields of Ukrainian government bonds	200	>1000
Ratio of official international reserves to gross external debt, in percentages	It shows the ability of the country to pay for its obligations to foreign creditors	50%	<20%

Source: developed by authors based on data [25, 26, 27]

So, there is a significant amount of researches on the international organizations regarding the evaluation of the government debt and limits of government indebtedness. It is obvious, that estimates of the limits of possible amounts of government indebtedness vary. But, to our opinion, the important element, which influences the limits of the public debt, which country can service, is the economic situation. Developed countries, which have the stable economic growth, can service the higher amounts of the government debt. Though, historically, countries tend to borrow more in the periods of economic crisis, which leads to increase of government debt.

6.2. An examination of government debt and analysis of debt sustainability indicators in Ukraine

Since the moment of proclaiming the independence of Ukraine in 1991, the management of government debt was made by different methods. The government debt of Ukraine during the period of 1991-2000 was characterized by the higher amount of external borrowings and the increasing of government indebtedness. After the 10 years of independence it was accumulated 14,1 billion USD (10,3 billion USD of external debt and 3,8 billion USD of internal debt).

The main goal of usage the government borrowings was the coverage of budget deficit. Firstly, the document, which regulated the process of government borrowings was issued in 1995 [28]. The history of cooperation with the international financial organizations started in 1994. During the 1990s because of ineffective usage of loans, taken by companies, which were guaranteed by the state, there was observed the increase of guaranteed government debt. According to the data of the Accounting Chamber, as of January 1, 2000, the total amount of overdue dent on guaranteed government obligations amounted to 1,03 billion US dollars. The ineffective policy of the government debt management caused the situation, that the total amount of government indebtedness exceeded the legally allowed level, and the total amount of international reserves was significantly lower than the interest rate payments. This situation caused the necessity of debt restructuring and total change of debt policy. In fact, it was a technical default, which caused a decrease of credit rating. Effective measures of restructuring and debt policy, which became more cautious, influenced the increase of trust to Ukrainian financial market. In 2008 the global financial crisis