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Global liquidity models, indicators, and indices: challenges, current state, and opportunities

Andrii Chaban,

Postgraduate Student, Individual Entrepreneur, Ukraine,

<https://orcid.org/0009-0007-1698-658X>

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Abstract. *In the current context of global financial instability, the issue of assessing the level of global liquidity is gaining particular relevance, both in theoretical and applied dimensions. Global liquidity is a key factor influencing the scale and direction of monetary transmission, shaping the conditions for banking system resilience, regulating access to capital, and affecting the cyclicalities of financial markets. However, the absence of a unified indicator, methodological inconsistencies, and fragmented data availability complicate the quality of macroeconomic analysis.*

*The **purpose** of this article is to systematize approaches to measuring global liquidity, identify methodological features of leading indicators, and test a practical example: the global liquidity index developed by the Bank for International Settlements (BIS), based on aggregated credit in U.S. dollars to the non-bank sector.*

Methods. *The study applies methods of structural-logical analysis, content analysis of analytical and statistical sources, and elements of comparative evaluation of indicators based on BIS data. Special attention is paid to series*



*Q.USD.3P.NAIDUSD, which reflects the volume of cross-border and local credit in U.S. dollars granted to non-bank entities worldwide. The **results** of the analysis indicate that the most relevant source for assessing global financial liquidity is the combination of indicators that integrate data on both banking credit and debt securities. The chosen BIS series demonstrates a significant expansion of global USD liquidity from 2020 to 2022, driven by highly accommodative monetary policy, and its contraction from 2023 to 2024 amid the global interest rate tightening cycle led by major central banks.*

Conclusions. *The current methodological approach to the global liquidity framework requires further harmonization, particularly through the integration of monetary and financial liquidity indicators, the inclusion of digital assets, and consideration of the fiscal context. Future research should focus on developing a synthetic global liquidity index with high sensitivity to financial shocks.*

Keywords: *macrofinancial liquidity parameters, financial liquidity indicators, BIS, monetary policy, financial stability, international reserves, monetary transmission, foreign currency credit.*

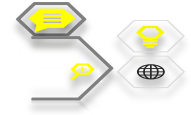
Глобальні моделі, показники та індекси ліквідності: виклики, поточний стан і можливості

Чабан Андрій Тарасович,

аспірант, ФОП, Україна,

<https://orcid.org/0009-0007-1698-658X>

Анотація. *У сучасних умовах світової фінансової нестабільності питання оцінювання рівня глобальної ліквідності набуває особливої актуальності як у теоретичному, так і в прикладному вимірі. Глобальна ліквідність є ключовим чинником, що визначає масштаб і напрям монетарної*



трансмисії, формує умови для стійкості банківської системи, регулює доступ до капіталу та впливає на циклічність фінансових ринків. Водночас відсутність уніфікованого індикатора, розбіжності в методології обрахунку та фрагментарність доступних даних ускладнюють проведення якісного макроекономічного аналізу.

Метою статті є систематизація підходів до вимірювання глобальної ліквідності, виявлення методичних особливостей провідних індикаторів, а також апробація практичного прикладу – індексу глобальної ліквідності від Банку міжнародних розрахунків (BIS) у розрізі агрегованих кредитів у доларах США до небанківського сектору.

Методи. У дослідженні використано методи структурно-логічного аналізу, контент-аналізу аналітичних та статистичних джерел, а також елементи порівняння індикаторів на основі відомостей BIS. Особливу увагу зосереджено на серії Q.USD.3P.NAIDUSD, яка відображає обсяг транскордонного та локального кредитування в доларах США, наданого небанківським організаціям у великому масштабі.

Результати. Встановлено, що найбільш релевантним джерелом для оцінювання глобальної фінансової ліквідності є комбіновані індикатори, які поєднують дані щодо банківського кредитування та боргових інструментів. На прикладі обраної серії BIS продемонстровано динаміку нарощення міжнародної USD-ліквідності у 2020–2022 роках, що супроводжувалась надмірною м'якістю монетарної політики, та її згортання у 2023–2024 роках на фоні циклу підвищення процентних ставок провідними центральними банками.

Зроблено **висновок**, що поточна методологічна база глобальної ліквідності потребує подальшої гармонізації, зокрема через інтеграцію індикаторів грошово-кредитної та фінансової ліквідності, охоплення цифрових активів та врахування фіскального контексту. Подальші



дослідження доцільно спрямовувати на розроблення синтетичного глобального індексу ліквідності з високим ступенем чутливості до фінансових шоків.

Ключові слова: макрофінансові параметри ліквідності, показники фінансової ліквідності, BIS, грошово-кредитна політика, фінансова стабільність, міжнародні резерви, монетарна трансмісія, кредитування в іноземній валюті.

Problem statement. In the current conditions of tightening monetary policy of leading central banks, high volatility of financial markets and growing geopolitical tensions, the issue of global liquidity is gaining particular importance. Global liquidity is no longer just a macro indicator of capital adequacy. Still, it is becoming an indicator of the transmission of crisis signals, changes in the debt structure and financial vulnerability of entire regions [1]. Its imbalances can cause rapid capital outflows, deepening debt issues, currency fluctuations and disruption of the stability of financial systems, especially in emerging market countries.

Despite the presence of several indicative approaches, the assessment of global liquidity is still characterized by methodological fragmentation and the absence of a single unified monitoring model. Existing models developed by international institutions such as the Bank for International Settlements (BIS), the International Monetary Fund (IMF), and the Organization for Economic Co-operation and Development (OECD) are often limited to national or aggregated money supply indicators, not fully covering cross-border flows in key currencies – the US dollar (USD), the euro (EUR), and the yuan (CNY) [2; 3]. It reduces the ability of think tanks and regulators to detect liquidity shocks promptly and predict systemic risks on a global scale.

Against this background, the task of improving the system for assessing global liquidity with an emphasis on cross-currency, institutional, and geographical



differentiation, as well as developing practical indicative tools for early warning of liquidity crises, becomes relevant.

Analysis of recent research and publications. A review of scientific sources indicates a deepening of analytical tools for studying global liquidity, its spatial effects, systemic impact on financial markets and the connection with risks. The study by C. Lu, L. Liu, F. Yu, J. Li, and G. Zheng demonstrates that the spatial distribution of dollar liquidity varies significantly depending on the chosen space model. In a multidimensional environment, the liquidity transmission effect weakens, which indicates the complexity of the interaction of financial channels on a global scale [4]. In the context of the market value of companies, scientists M. Yucel, G. Yanik, F. Dayi, and A. Benek prove that the combination of ESG assessments with national corporate governance indices contributes to the growth of business capitalization, especially in the environment of emerging markets [5]. The analysis of the consequences of the COVID-19 pandemic by O. Nicolis, J. P. Maidana, F. Contreras, and D. Leal showed a significant dependence of macroeconomic stability on government decisions, in particular policies to increase liquidity through pension funds [6]. V. Bruno, H. S. Shin highlight the role of bank lending cycles in the cross-border transfer of global liquidity, emphasizing the importance of exchange rates as factors of financial stability [7]. The article by S. Miranda-Agrippino and H. Rey proves that the tight monetary policy of the USA causes global waves of credit reduction and tightening of financial conditions, regardless of the exchange rate regimes of other countries [8]. S. Gunay found that TED and OIS spreads are more sensitive indicators for detecting liquidity risks compared to CDS indices, which increases their value as early warning tools [9]. F. Guillaume proposed a model – the independent liquidity index LIX, which allows assessing liquidity risk at market prices without the need to use specific models [10]. F. Zúñiga, R. Pincheira, J. Walker, and M. Turner confirmed that the transparency of integrated reporting correlates with increased market liquidity and the accuracy



of analysts' financial forecasts, especially during regulatory reporting requirements [11]. Finally, H. Pysanko revealed the effectiveness of flexible organizational practices in forming high-performance small business teams, which indirectly improves their ability to adapt to changes in liquidity and financial risks [12].

Thus, a review of scientific sources confirms the complex multidimensional nature of global liquidity, its close relationship with currency regimes, ESG parameters, macrofinancial imbalances and the quality of reporting, which requires a deeper analysis of the mechanisms of its spatial distribution and systemic impact on financial stability.

Identification of previously unresolved parts of the general problem. Despite significant progress in the theoretical and empirical study of global liquidity, the issues of harmonizing approaches to its measurement, integrating currency and sectoral factors within a single analytical platform, and the practical suitability of existing indicators for preventing crisis phenomena in a transnational context remain unresolved. The presented study is aimed at forming a unified logic for interpreting global liquidity indicators with an emphasis on dollar cross-border flows, which are crucial for monitoring risks in the international financial space.

The practical value of the work lies in deepening the analytical tools for assessing the vulnerability of national economies to external liquidity shocks, as well as in building a conceptual framework for implementing adaptive financial policy mechanisms in the environment of globalized monetary relationships.

Formulation of the article's objectives (task statement). The purpose of the article is to substantiate theoretical and methodological approaches to assessing global liquidity in modern conditions of financial turbulence and to develop the author's model of early warning of liquidity crises based on key cross-border indicators.

Presentation of the primary research material. The concept of global liquidity is multifaceted; it is constantly transformed under the influence of



institutional changes, the evolution of financial markets and international monetary policy. In modern scientific and analytical practice, it is interpreted not only as an aggregated mass of monetary resources in the world economy, but as a system of financial flows capable of rapidly changing the geographical, currency and institutional structure of access to capital.

Leading international institutions, BIS, IMF, and OECD, have developed several approaches to measuring global liquidity, which reflect both the monetary and financial-institutional parts of this phenomenon [2; 3]. In particular, the BIS, in its concept of «Global Liquidity Indicators» (GLI), proposes a distinction between domestic liquidity indicators, such as monetary aggregates M2 and M3, and global dollar liquidity, which is formed through cross-border bank lending, issuance of debt obligations in international currencies, and inter-branch operations of global banking groups.

Several models of liquidity assessment are distinguished [1; 13]: an aggregate approach based on monetary aggregates (M1, M2, M3), which is mainly used in domestic monetary analysis; a sectoral approach, which distinguishes liquidity by type of entity (banks, non-bank financial institutions, the public sector, households) and allows determining the specifics of resource allocation between sectors; cross-border, which outlines global financial flows, in particular in terms of currencies, residency, geographical direction of capital movement, which is crucial for analyzing the vulnerability of economies with a high share of external debt.

A comparison of methods for calculating global liquidity indicators indicates differences in the conceptual basis and analytical focus. Thus, approaches focused on monetary aggregates, as a rule, reflect only the potential of the domestic monetary supply. At the same time, methods based on bank flows and open market operations make it possible to determine the actual circulation of liquidity through transnational financing channels.

Therefore, the most relevant for the analysis of global financial stability are



indicators of cross-border liquidity, which integrate the currency, institutional and spatial components of capital flows. They help to predict the assessment of liquidity deficit risks, identify the structure of the debt burden and respond promptly to changes in global monetary trends.

Given this, it is advisable to study in depth several key indicators that most fully represent the nature of modern cross-border liquidity. One of them is the indicator with the code Q.USD.4T.N.A.I.B.USD (fig. 1), which reproduces the volume of dollar assets provided by international banking groups to non-bank institutions in all countries, except for the jurisdictions of their registration. It covers all types of financial instruments (loans, deposits) and shows the cross-border movement of dollar liquidity, which forms the basis for the functioning of the international financial market. Analysis of the dynamics of the global liquidity indicator (Q.USD.4T.N.A.I.B.USD) in 2015–2024 allows us to distinguish three main phases.

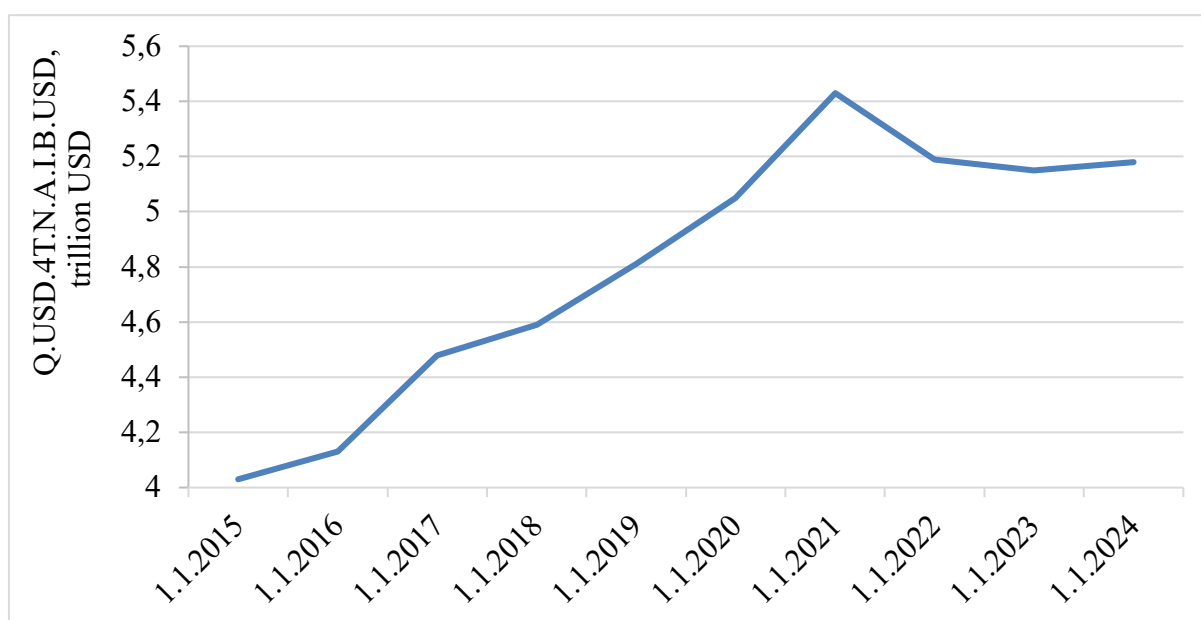


Fig. 1. Dynamics of the global liquidity indicator Q.USD.4T.N.A.I.B.USD

Source: constructed according to [14]

The first is the growth phase (2015–2021), during which the volume of cross-



border bank financing in USD increased from 4.03 trillion (at the end of 2015) to 5.43 trillion (at the end of 2021). The highest growth rates were recorded in 2017 (+8.4%) and in the period 2020–2021, which coincides with the soft monetary policy implemented during the COVID-19 pandemic. The second is the correction phase (2022–2023), characterized by a reduction in global liquidity to USD 5.19 trillion (2022, -4.4% y/y) and USD 5.15 trillion (2023). The main factors in this were tightening monetary policy, increasing key rates, and winding down quantitative easing programs. The third is the stabilization phase (2024), manifested by a slight recovery to USD 5.18 trillion (+0.06% y/y), indicating partial adaptation of the banking sector to new conditions or the accumulation of hidden risks in the field of external financing.

From the perspective of financial analytics, a decrease in global liquidity generated by international banking groups may be an early marker of financial shocks, especially for emerging market countries.

Among the key indicators of global liquidity based on BIS data, the Q.USD.3P.N.B.I.G.USD indicator occupies an essential place in measuring the total volume of dollar lending to non-bank institutions by banks in the world (Fig. 2). It covers all countries, taking into account both cross-border and local transactions in USD, and all non-bank sectors, including non-financial corporations, households, insurance companies, pension funds and other institutions. The indicator allows for examining the intensity of dollar financial expansion outside the banking sector and assessing the level of systemic dependence of the global economy on dollar funding.

The dynamics of the Q.USD.3P.N.B.I.G.USD indicator in 2015–2024 indicate a high sensitivity of the volume of global lending to non-bank sectors to changes in the monetary environment. During 2015–2021, steady growth was observed: the volume of lending in US dollars increased from 5.16 trillion to 6.16 trillion, which corresponds to the accumulation of liquidity against the background of the stimulating policy of central banks. In particular, in 2020–2021, the growth



was due to the implementation of anti-crisis measures, lowering interest rates, easing regulatory requirements, and expanding the balance sheet of the Federal Reserve System.

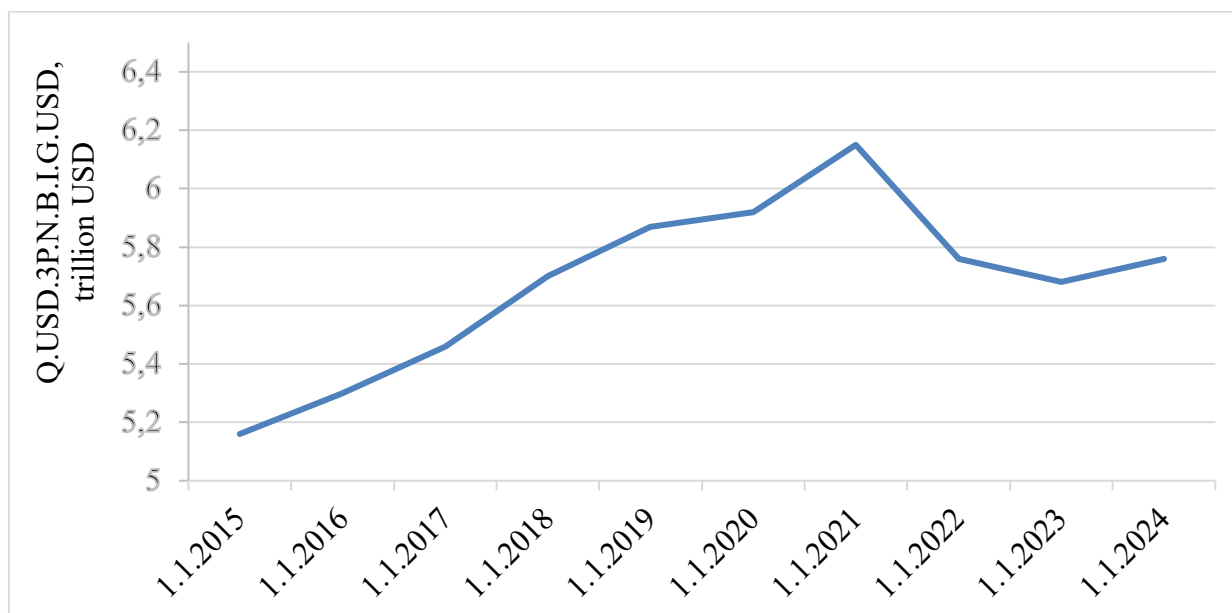


Fig. 2. Dynamics of the global liquidity indicator Q.USD.3P.N.B.I.G.USD

Source: constructed according to [15]

A decline phase began in 2022: the volume decreased to 5.76 trillion USD (– 6.5%), and in 2023 the downward trend persisted (to 5.68 trillion USD), although the rate of losses slowed down somewhat. In 2024, a slight increase was recorded, to 5.76 trillion USD, which may indicate a stabilization of the situation against the background of the adaptation of the banking system to the new monetary paradigm and a more balanced demand for dollar funding. In general, the reduction of the indicator in 2022–2023 is an indicator of financial cooling and a potential signal of increased risks for countries that are highly dependent on external lending in USD. In this context, it is advisable to take into account the share of leading economies in global gross domestic product (GDP) and world trade as factors that determine their influence on the formation of regional and global liquidity parameters (fig. 3).

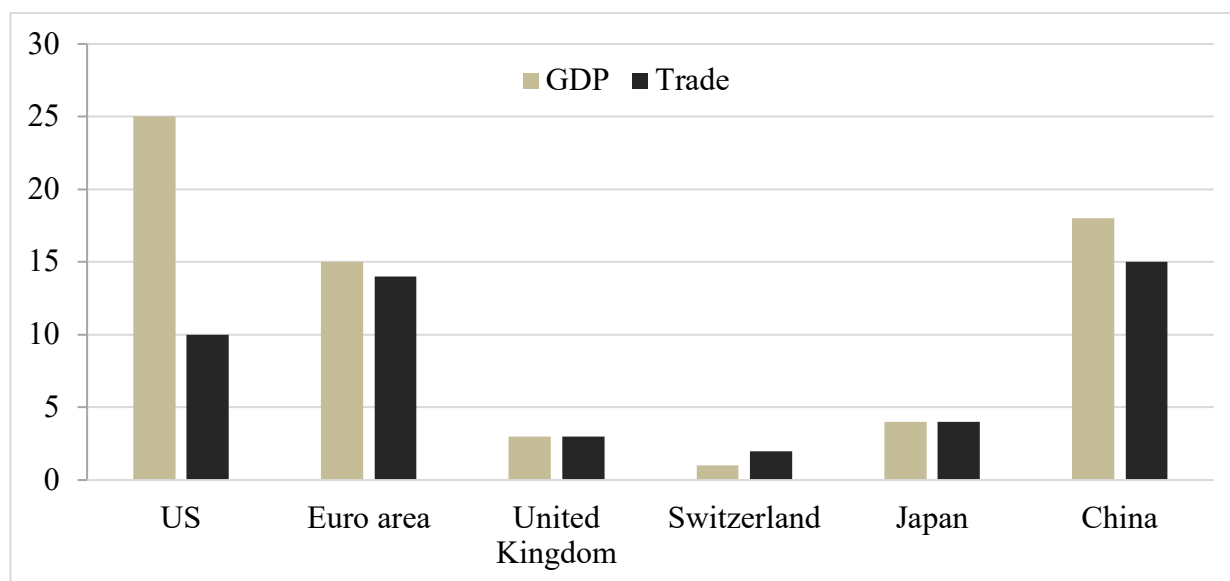


Fig. 3. Shares of the world's major economies in global GDP and world trade (in %)

Source: constructed according to [16; 17]

Despite the increasing availability of statistical resources and the emergence of extended indicators (GLI) from institutions such as the BIS, IMF and the European Central Bank (ECB), the monitoring process remains vulnerable to several challenges. First of all, this concerns the fragmentation of data, which makes it difficult to fully reflect liquidity flows within shadow banking, off-balance-sheet structures, and financial innovations. A significant share of financial transactions, especially in the derivatives and securitization segment, goes beyond the standard reporting coverage.

A second significant barrier is the currency asymmetry, under which most global lending procedures are denominated in US dollars, which increases the vulnerability of national financial systems to the foreign policy of the Fed and exchange rate fluctuations. The dominance of US dollars in global liquidity flows creates risks of the so-called reverse shock, when even domestic decisions of US regulators have a cross-border effect and negatively affect the cost of capital and the volume of financing in other regions.



Another challenge is the slow response time of analytical systems to cyclical shifts. For the most part, existing indicators capture changes ex post facto, which reduces their effectiveness within the framework of preventive regulation. The lack of clear thresholds, stress markers and multi-level interpretation also reduces the applied value of global liquidity indices in the practice of macroprudential analysis.

No less important is the problem of regulatory asynchrony, when different jurisdictions demonstrate asymmetric approaches to capital controls, currency controls and disclosure standards. It creates barriers to the integration of national monitoring systems into the global context and also weakens the effectiveness of policy coordination between countries.

In general, these challenges create a need to improve the methods for assessing global liquidity, taking into account both quantitative and qualitative aspects, with particular emphasis on cross-border risks, the currency structure of assets and the role of non-bank financial intermediaries.

Given the identified problems in the field of monitoring global liquidity and the limitations of existing indicators in the context of forecasting crisis phenomena, this study proposes an author's methodology for assessing the level of financial instability risk based on the integration of key indicators of global dollar liquidity. It is based on the concept of early warning of a liquidity crisis, using sensitive but straightforward-to-fluctuate indicators with clearly defined threshold values.

The essence of the approach is to identify three critical signs of deterioration in global liquidity: a drop in the volume of cross-border loans in US dollars by more than 15% in annual terms is considered a critical signal that requires immediate response from regulators and a review of the reserve policy; exceeding the share of short-term debt in the structure of total liabilities by more than 50% is interpreted as an area of increased risk, which requires active management of maturity gaps; accelerated growth in the volume of issuance of debt instruments in US dollars (more than 8% of GDP per year) is a potential sign of instability, which indicates excessive



dependence of the economy on external funding.

For the convenience of implementation in analytical practice, a system of indicative markers with a visual gradation of risks is proposed, which guarantees the ranking of threats and the justification of management decisions (table 1). The proposed model has several advantages that ensure its practical suitability for monitoring: ease of integration into the tools of central banks and financial regulators; high sensitivity to short-term fluctuations in liquidity, especially in the segment of dollar flows; flexibility and versatility, which makes it possible to adapt the signal system to the characteristics of individual national economies, taking into account their structural vulnerabilities and the depth of financial markets.

Table 1

Criteria for assessing the level of global liquidity risk and corresponding management guidelines

Assessment criterion	Threshold value	Risk level	Recommended actions
Reduction in cross-border lending, USD	>15% drop	Red	Activation of reserve policy, restructuring of short-term liabilities
Share of short-term debt	>50%	Orange	Review of debt structure, stress testing of financial flows
Growth of debt instruments to GDP (Debt Securities Issuance to Gross Domestic Product, DSI to GDP)	>8% per year	Yellow	Strengthening the monitoring of capital inflows and control over the level of external debt

Source: author's development

Therefore, the author's methodology can be effectively used as a tool for early warning of liquidity crises, operational analytics and strategic planning in the context of increasing volatility in global financial markets.

Conclusions. The results of the study show that global liquidity, despite the formal availability of quantitative aggregates and analytical systems for its tracking, remains a category that is difficult to measure accurately, especially in conditions of



high volatility of financial flows and regulatory fragmentation. The analysis of key indicators (Q.USD.4T.N.A.I.B.USD, Q.USD.3P.N.B.I.G.USD) made it possible to identify changes in the dynamics of cross-border lending and the monetary and institutional asymmetry of liquidity, which increases during the tightening of monetary policy in the USA and the growth of the debt burden in the Eurozone.

The author's methodology for early warning of liquidity crises is proposed, which is based on a system of thresholds and a phased ranking of risk levels with appropriate management guidelines. This approach helps to identify critical trends in the reduction of cross-border financing volumes, the growth of short-term debt and excessive issuance of debt instruments in USD. Unlike classical monitoring models, the specified system is adaptive, sensitive to changes in the global structure of dollar financing and suitable for implementation in both macroprudential analytics and regulatory scenario modeling.

In further research, it is recommended to expand the range of global liquidity indicators, taking into account data on the Chinese yuan, Japanese yen and multi-currency off-balance sheet instruments. It will make it possible to increase the accuracy of diagnostics of global financial risks and ensure the comparative stability of financial systems in cross-currency terms.

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