ТЕМПЕРИЛОДЖИСТИКСЕООД
TEMPERI LOGISTICS LTD

Ukrainian domestic loan bonds

2024

Bonds of internal government loans of Ukraine

МІНІСТЕРСТВО ФІНАНСІВ УКРАЇНИ

Domestic government loan bonds of Ukraine (DGLBU) are government debt securities issued by the Ministry of Finance of Ukraine to finance government debt.

***Government bonds,** due to their high liquidity, low level of risks, and a wide range of available applications, are a very attractive instrument for investors (both residents and non-residents) in the markets of many countries around the world.*

Government bonds are placed on the domestic market and confirm Ukraine's obligations to reimburse the bearers of these bonds for their nominal value with the payment of income in accordance with the terms of the bond placement.

Національний банк України

The depositary of government bonds, which maintains their centralized accounting in book-entry form, is the **National Bank of Ukraine (NBU).**

Categories of government securities of Ukraine

Government bonds of Ukraine are divided into bonds of internal government loans of Ukraine, bonds of external government loans of Ukraine, treasury bonds and targeted bonds of internal government loans of Ukraine.

Domestic government loan bonds of Ukraine (DGLBU) are government securities that are placed exclusively on the domestic stock market and confirm Ukraine's obligations to reimburse the bearers of these bonds at their face value with the payment of income in accordance with the terms of the bond placement.

Government bonds of Ukraine differ in terms of circulation and types of repayment and can be:

- ***long-term –*** *more than five years;*
- ***medium-term –*** *from one to five years;*
- ***short-term –*** *up to one year*.

According to the type of repayment, bonds are divided into:

- standard – repayment is carried out at the end of the circulation period,
- with early repayment – can be presented early for repayment,
- depreciation – repayment is carried out after 18 months of circulation in equal parts on the dates of coupon payments.

The nominal value of government bonds is 1000 UAH, and can also be determined in foreign currency.

Placement of government bonds

The Ministry of Finance, in accordance with the resolution of the Cabinet of Ministers of Ukraine dated January 31, 2001 No. 80 “On the issue of bonds of internal government loans”, carries out the placement of government bonds in the form of an auction sale through the NBU, which carries out operations on servicing public debt related to the placement of government bonds, their repayment and payment income on them, and the implementation of depository activities on these securities.

In accordance with its powers, the Ministry of Finance:

- develops and publishes indicative schedules for the placement of government bonds, determines the time and volumes of the placement of bonds (the approved schedule, as well as changes to it, are periodically posted on the official website of the Ministry);
- determines the forms and ways of placement of government bonds, establishes the terms of circulation of government bonds, dates of redemption and payment of coupon income (for coupon bonds);
- sets the maximum level of profitability of government bonds;
- publishes information on the results of the placement of government bonds;
- issues government bonds with global certificates;
- ensures timely repayment of government bonds and payment of income on them.

The placement of government bonds is carried out based on the current financing needs of the State Budget of Ukraine.

The government bonds placement schedule is published in the auction calendar on the ministry’s website quarterly and monthly: https://mof.gov.ua/uk/kalendar-aukcioniv

Auction procedure

Government bonds are placed at auctions held by the National Bank on the initiative of the Ministry of Finance. Participants in the bond placement are primary dealers and the National Bank. Primary dealer banks that meet certain conditions and have undertaken certain obligations are allowed to participate in auctions. According to the terms of the concluded agreement on cooperation in the government securities market, primary dealer banks cooperate with the Ministry of Finance, which includes providing bilateral DGLBU quotes and purchasing DGLBUs during their initial placement, and the Ministry of Finance provides dealers with the exclusive right to purchase DGLBUs during their placement. To purchase government bonds, investors turn to primary dealers who buy government bonds for them.

The placement of bonds is carried out according to the profitability criterion and has the following forms:

- auction sale of bonds;
- sale of bonds at a fixed yield level.

Government bonds are distributed through primary placement and additional placement. New bonds are distributed through the primary placement, which, due to the terms of issue and the scope of rights granted to their owners, have not yet been circulated. By additional placement, bonds are distributed that, in terms of maturity, the amount of coupon payments, if any, and the scope of rights granted to their owners, meet the conditions for issuing bonds already in circulation.

Redemption of government bonds and payment of coupon income is carried out on the terms and conditions provided for during their initial placement.

If necessary, government bond owners can sell the bonds due to them on the secondary market.

Announcements on the placement of domestic government loan bonds and auction results are published on the ministry's website page weekly: https://mof.gov.ua/uk/ogoloshennja-ta-rezultati-aukcioniv

DGLBU appeal

The circulation of bonds in Ukraine is carried out exclusively in electronic form. They are reflected in the securities account.

Partnership for development of the government bonds market with the World Bank

WORLD BANK GROUP
Five Institutions, One Group

Ukraine, among the post-Soviet states, joined the World Bank Group on January 1, 1992.
Since that time, the Group's assistance program has provided the basis for realizing Ukraine's enormous economic potential, intensifying fundamental reforms and emerging from stagnation and economic crisis, providing tools and levels of financial injections in the developed Country Partnership Strategies.
At the time of the landmark year 2014, according to the estimates of the government commissioner for public debt management of Ukraine, Yuriy Buts, political volatility combined with devastating economic shocks led to a cumulative drop in real GDP of 16%. inflation rose to 43.3% (versus 0.5% two years earlier), and the national currency - the hryvnia (UAH) - lost about 70% of its value.
The depreciation of the hryvnia led to a loss of confidence in the national currency and the rapid growth of dollarization of the economy. By the end of 2015, public and government-guaranteed debt, from around 40% two years earlier, had soared to 79% of GDP, both due to the need to finance defense and due to a debt shock, as 70% of existing debt was denominated in foreign currency.

To stabilize the economy, Ukraine had to restructure its external debt and ask the IMF for cooperation under a $17.5 billion stand-by program, supported by additional financial support provided by the World Bank Group, the EU and other partners. Funding was provided against reform commitments, including a requirement to strengthen public finances and bring public debt to more sustainable levels.

In January 2016, after a nine-month break, the issuance of domestic government bonds in hryvnia began and 240 auctions were held to place them, but 60% of these auctions were unsuccessful due to a lack of applications or due to rejection of applications at too low prices.

Ukraine, together with the World Bank, was looking for approaches to solving the problem of unsuccessful auctions for placement of bonds in the national currency.

The government, which preferred to issue small volumes of bonds with different maturities, thought more about the inflow and outflow of funds rather than about building the foundations of the government bond market. In 2016, the market was so fragmented that 75% of all outstanding OVDP issues had a maturity period of less than 35 days, and some issue sizes were below UAH 100 million (USD 20,000). This approach brought to market a huge number of securities that could compete with each other, making it impossible for market participants to trade these securities on the secondary market.

The absence of pension funds and insurance companies among investors, which entails a lack of demand for medium-term and long-term securities, interest risks due to the imbalance in the maturities of short-term liabilities and medium-term assets, the homogeneity of investors consisting of state and commercial banks with a focus on short-term deposits - all this resulted in less than 3% of government securities being purchased in 2016.

By holding regular meetings with primary dealers and receiving feedback, the public debt management office was able to reduce the number of unsuccessful auctions for placement of government bonds in national currency from 63% in the first half of 2016 to 19% at the end of 2017.

The office began to reopen individual OVDP issues until they reached a critical mass of UAH 3 billion, gradually pushing the market towards securities that were supposed to become benchmarks for individual maturities underlying the yield curve.

Ukraine has expanded the contingent of investors in the hryvnia, attracting non-residents to it through the issuance of debt instruments potentially suitable for trading on the global market.

In 2018, the Group's team began exploring opportunities to expand its foreign investor base by allowing foreign banks present in the domestic market to issue Credit Notes (CLNs) and Global Depositary Notes (GDNs). This allowed non-resident investors to buy securities in national currency without taking on the risk of inconvertibility of the currency behind them and allowed them to be traded outside of Ukraine.

Ukrainian authorities have begun negotiations with the securities after-sales organization Clearstream to provide access to Ukrainian government securities.

As a result, the portfolio of local currency bonds purchased by non-residents increased from almost zero in July 2017 to 12% as of July 2019. And although a significant share of incoming capital was invested in short-term securities in 2018, and in medium- and long-term instruments in 2019 (3.2 billion out of 4 billion US dollars).

The World Bank Group, including partners (Great Britain, the Netherlands, Sweden, USA, Norway, Denmark, Austria, Latvia, Lithuania, Iceland, Japan, Germany, etc.) mobilized its efforts in financial support for Ukraine on February 24, 2022 in the amount of $ 42 ,049 billion, of which nearly $35.715 billion has been paid to date (June 2, 2024). 95% of this funding was provided by development partners.

The war has caused catastrophic damage to the country's economy, Ukraine's GDP has fallen by 29% in 2022 and the World Bank is taking a focused approach to reviving Ukraine's economy, recommending critical areas of immediate action to provide the basis for income restoration and poverty reduction, outlining priorities to support sustainable, inclusive recovery and reconstruction in the future, addressing inflation and macro-financial stability issues, strengthening fiduciary processes to manage large inflows of resources for their optimal use. In the medium term, Ukraine will have the opportunity to finally shake off some of the legacies of the past and make the leap to a more productive, sustainable and inclusive society, which will require a fundamental, forward-thinking overhaul of not only housing and infrastructure, but also economic institutions that will build a vibrant economy.

A multi-donor trust fund (MDTF) established at the World Bank that quickly, efficiently and cost-effectively directs resources to the Ukrainian budget (complementing the World Bank's support to the Ukrainian budget).

As the war drags on, the road to recovery is long. Donor support has been impressive so far as development partners continue to join forces to support Ukraine's recovery, but Ukraine's current and future funding needs are enormous. Private sector investment and reforms that improve the investment climate will be critical. The World Bank and international partners will continue to provide support to help the Ukrainian people recover and rebuild their country and economy.

The Multilateral Investment Guarantee Agency (MIGA), a branch of the World Bank Group, has taken an active part in the fate of the country, is a provider of insurance services in Ukraine, and has issued PRI guarantees worth more than $185 million Availability of insurance from various providers, be it property insurance, insurance marine cargo, personal travel insurance or crop and livestock insurance, is critical to mobilizing private sector capital.

Political risk insurance (PRI) is especially important during times of conflict because it protects investments against non-commercial risks such as war damage. MIGA guarantees serve as a key risk mitigation tool, ensuring the continuity of private sector operations and investments in the country's recovery and reconstruction.

In the context of the ongoing war, most investors consider having a PRI a must, even if they invest with multilateral or international financial institutions in Ukraine. According to the Rapid Damage and Needs Assessment (RDNA2), Ukraine will require approximately US$514 million in support from IFIs and donors for PRI guarantees and reinsurance in 2023.

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The World Bank Group forecasts that Ukraine's economic recovery will slow to 3.2% this year from 4.8% in 2023, reflecting a smaller harvest and ongoing labor shortages. The country's economic prospects remain dependent on donor support and the duration of hostilities.

Ukraine in world credit ratings

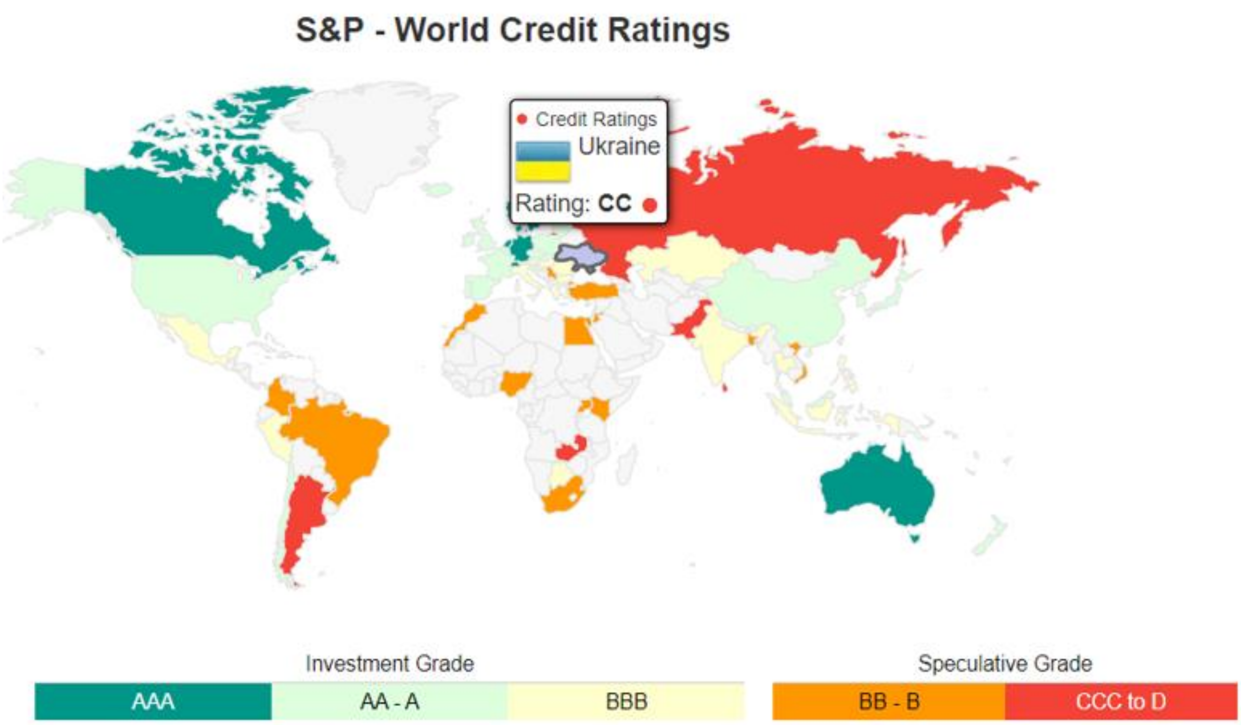
S&P Ratings, the creator and editor of the American stock index S&P 500, at the beginning of the year lowered the long-term sovereign credit and issue ratings of Ukraine in foreign currency from "CCC" to "CC", according to the FC issue rating - to negative and expects that Ukraine will begin official debt restructuring talks with its private creditors in the short term and will complete the process by the middle of this year.

The Agency considers it almost inevitable that Ukraine will not fulfill its external commercial obligations.

At the same time, the agency confirmed the short-term national scale ratings of “C”, “CCC+/C” in national currency (LC) and the sovereign national scale rating of “uaBB”, understanding that Ukraine’s public debt, denominated in hryvnia, is not included in the plan debt restructuring.

The national scale rating remains at “uaBB”, and the transfer and convertibility rating remains at “CCC+”.

The outlook for the FC rating is negative, for the LC rating it is stable.



The negative outlook on the FC's long-term rating reflects the risks to servicing Ukraine's commercial debt, given the government's debt restructuring plan.

The stable outlook on LK's long-term ratings balances significant financial pressure and government incentives to service hryvnia debt to avoid problems with domestic banks, which are the main holders of LK bonds issued by the government.

The rating action reflects S&P's belief that the inclusion of commercial creditors (Eurobond holders) in ongoing efforts to relieve Ukraine's public debt is virtually inevitable. These efforts are aimed at easing pressure on external debt servicing and restoring public debt sustainability under the existing Extended Fund Facility (EFF) agreement with the IMF.

A group of Ukraine's creditors has already extended the deferment of payments on official bilateral debt until the end of the IMF program in 2027. But their participation in additional debt restructuring is possible subject to the consent of private external creditors to the debt restructuring, which will be at least favorable. To this end, the government plans to seek debt relief for Eurobond holders before the existing debt moratorium expires in August 2024. The agency expects greater awareness of the details of external commercial debt restructuring in the coming months following the publication of the IMF's Debt Sustainability Assessment (DSA), which should set broad parameters for debt relief. Without restructuring, the government faces debt service payments on Eurobonds of $4.5 billion in 2024 and about $3 billion on average annually in 2025-2027.

S&P* ratings reflect an opinion on an issuer's ability and willingness to meet its commercial informal financial obligations in full and on time. If the restructuring of commercial debt takes place, then in light of the protracted balance of payments and budgetary problems, the rating will be considered as problematic.

**Source:*[*https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/type/HTML/id/3136282*](https://disclosure.spglobal.com/ratings/en/regulatory/article/-/view/type/HTML/id/3136282)

Current Ukrainian government bond spreads

The yield spread, often referred to simply as the "spread," is the difference between the yields of two different bonds. When comparing government bonds of different countries, the yield spread is also known as the credit spread. This spread provides important information about the relative creditworthiness and economic stability of the issuing countries.

World Government Bonds, publishes inverted yield curves for different countries.

The table below provides a detailed summary of the latest government bond spreads, highlighting the differences in yields across countries as of June 9, 2024.

TOP 10 leaders

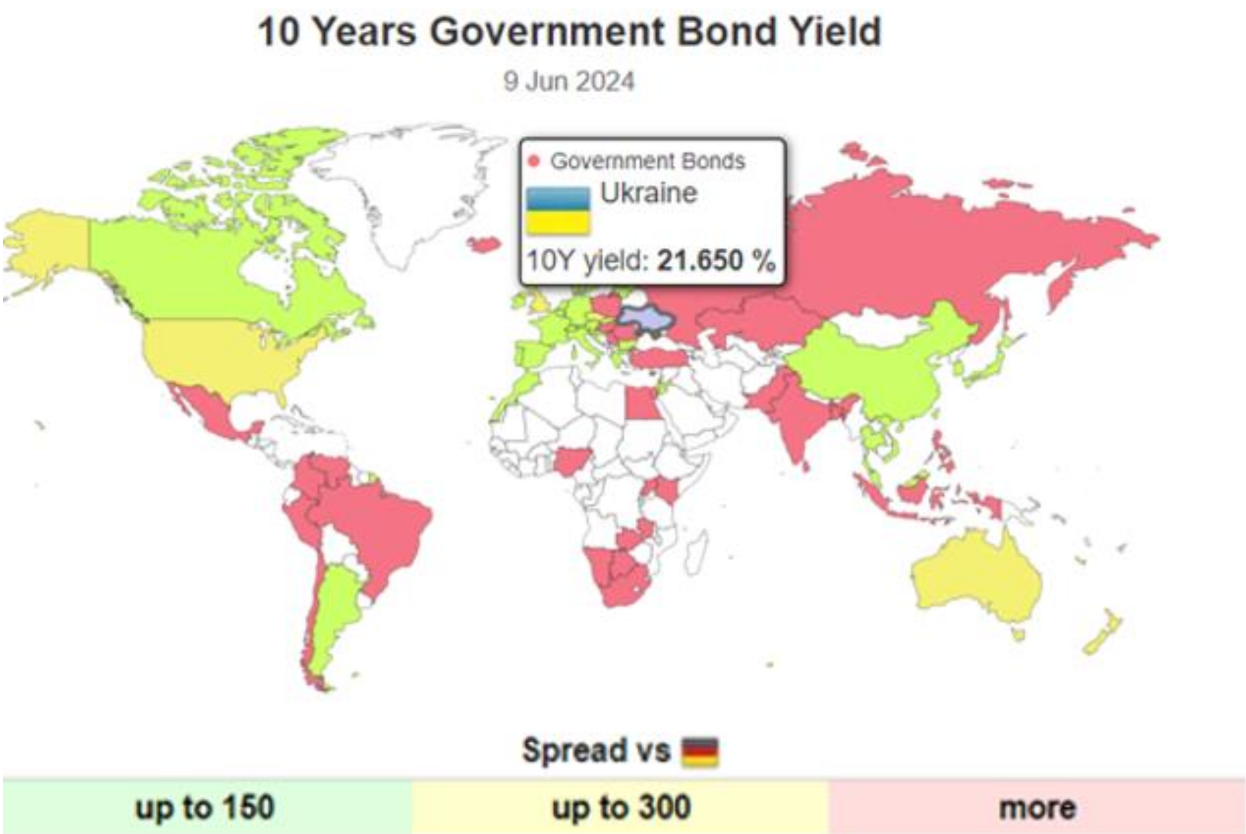
		Spread vs			
Country	10Y Yield	Germany	USA	China	Australia
Switzerland	0.859%	-176.5 bp	-357.4 bp	-146.0 bp	-347.0 bp
Japan	0.966%	-165.8 bp	-346.7 bp	-135.3 bp	-336.3 bp
Taiwan	1.575%	-104.9 bp	-285.8 bp	-74.4 bp	-275.4 bp
China	2.319%	-30.5 bp	-211.4 bp	0 bp	-201.0 bp
Sweden	2.337%	-28.7 bp	-209.6 bp	1.8 bp	-199.2 bp
Germany	2.624%	0 bp	-180.9 bp	30.5 bp	-170.5 bp
Denmark	2.629%	0.5 bp	-180.4 bp	31.0 bp	-170.0 bp
Thailand	2.812%	18.8 bp	-162.1 bp	49.3 bp	-151.7 bp
Vietnam	2.833%	20.9 bp	-160.0 bp	51.4 bp	-149.6 bp
Netherlands	2.923%	29.9 bp	-151.0 bp	60.4 bp	-140.6 bp

Bonds issued by countries with higher credit ratings are generally considered less risky and therefore offer lower returns. Conversely, bonds from countries with lower credit ratings are perceived as riskier and must offer higher yields to attract investors. The spread between these yields is a direct indicator of the market's assessment of the relative risk of the two countries.

Ten outsiders:

Country	10Y Yield	Spread vs Germany	USA	China	Australia
Turkey	28.005%	2538.1 bp	2357.2 bp	2568.6 bp	2367.6 bp
Egypt	25.817%	2319.3 bp	2138.4 bp	2349.8 bp	2148.8 bp
Zambia	25.030%	2240.6 bp	2059.7 bp	2271.1 bp	2070.1 bp
Ukraine (*)	21.650%	1902.6 bp	1721.7 bp	1933.1 bp	1732.1 bp
Nigeria	19.539%	1691.5 bp	1510.6 bp	1722.0 bp	1521.0 bp
Kenya	18.008%	1538.4 bp	1357.5 bp	1568.9 bp	1367.9 bp
Uganda	17.184%	1456.0 bp	1275.1 bp	1486.5 bp	1285.5 bp
Russia	14.820%	1219.6 bp	1038.7 bp	1250.1 bp	1049.1 bp
Pakistan	14.555%	1193.1 bp	1012.2 bp	1223.6 bp	1022.6 bp
Sri Lanka	13.090%	1046.6 bp	865.7 bp	1077.1 bp	876.1 bp

(*) The 10Y Bond Yield is not derived from the market. Its value is calculated according to the yields of other available durations.



The yield spread between government bonds of different countries is an important indicator of relative credit risk, economic conditions and investor sentiment. It provides valuable information to both investors making portfolio decisions and policymakers shaping economic strategies. By closely monitoring yield spreads, stakeholders can better understand and navigate the complexities of the global bond market.

Thus, the yield on 10-year Ukrainian government bonds is estimated at 21.650% and is not determined on the market, but is calculated in accordance with the yield of other available durations. Government bond yields are a key indicator of economic confidence and investor sentiment.

The rate of the Central Bank of Ukraine is 13.50% after the last adjustment in April 2024.

Текущая котировка украинского 5-летнего кредитно-дефолтного свопа составляет 550,90 базисных пунктов, а подразумеваемая вероятность дефолта составляет **9,18%.**

Fair value of bonds and adjustment factors

When an investor makes an investment in an asset, the main indicator he pays attention to is the return on the investment. At the same time, he compares this return with the returns of alternative investments. One of the benchmarks for such analysis can be the yield on government bonds.

There are two important aspects to consider when calculating bond yields:

1) Yield depends on maturity: the yield on a bond with a maturity of one month can differ significantly from the yield on a bond with a maturity of five years.

2) Payments on a bond include not only the payment of the principal amount (face value) at maturity, but also a series of intermediate payments called coupons.

Coupon bonds are commonly viewed as a portfolio consisting of "zero-coupon bonds" that include coupon and par payments and mature at various points in time.

In this view, the price of a bond is based on the yields of zero-coupon bonds with corresponding maturities.

The dependence of the yield of a zero-coupon bond Y on the maturity m can be represented as an imaginary zero-coupon yield curve, i.e. functions Y(m). This curve reflects the market cost of borrowing funds over various time horizons. Therefore, the zero-coupon yield curve can be considered as a general indicator of the term structure of interest rates.

At the moment, there are no methods that would simultaneously satisfy all of the specified requirements: to be simple for calculations, take into account changes in volatility in interest rates, work well for low-liquid markets such as Ukrainian, adapt to the changing situation in financial markets, etc.

The NBU Depository uses the static Nelson-Siegel model, which displays the static nonlinear regression of hryvnia government bonds.

The Nelson–Siegel method is based on the following form of constructing a zero-coupon yield curve:

$$s_p = \beta_0 + \beta_1\left(\frac{1-e^{-p/\tau}}{(p/\tau)}\right) + \beta_2\left(\frac{1-e^{-p/\tau}}{(p/\tau)} - e^{-p/\tau}\right)$$

Here and below, S p is the spot rate for term p, which is the result of calculations according to the model, p is the period for which the spot rate is calculated, in years;

β 0 is the long-term factor of the zero-coupon yield curve, which determines the general level of the curve (that is, interest rates), an increase in which leads to a general increase in interest rates (upward movement of the curve on the graph) and vice versa;

β 1 – short-term factor of the zero-coupon yield curve, which determines the slope of the curve, the growth of which leads to a more rapid increase in short-term interest rates relative to long-term ones and vice versa;

β 2, β 3 – medium-term factors of the zero-coupon yield curve that determine the shape (or curvature) of the curve;

τ, τ 1 – calculated parameters that influence the shape and level of the zero-coupon yield curve, reflecting the dynamics and direction of movement of medium-term interest rates and are responsible for the position of the convexities of the zero-coupon yield curve;

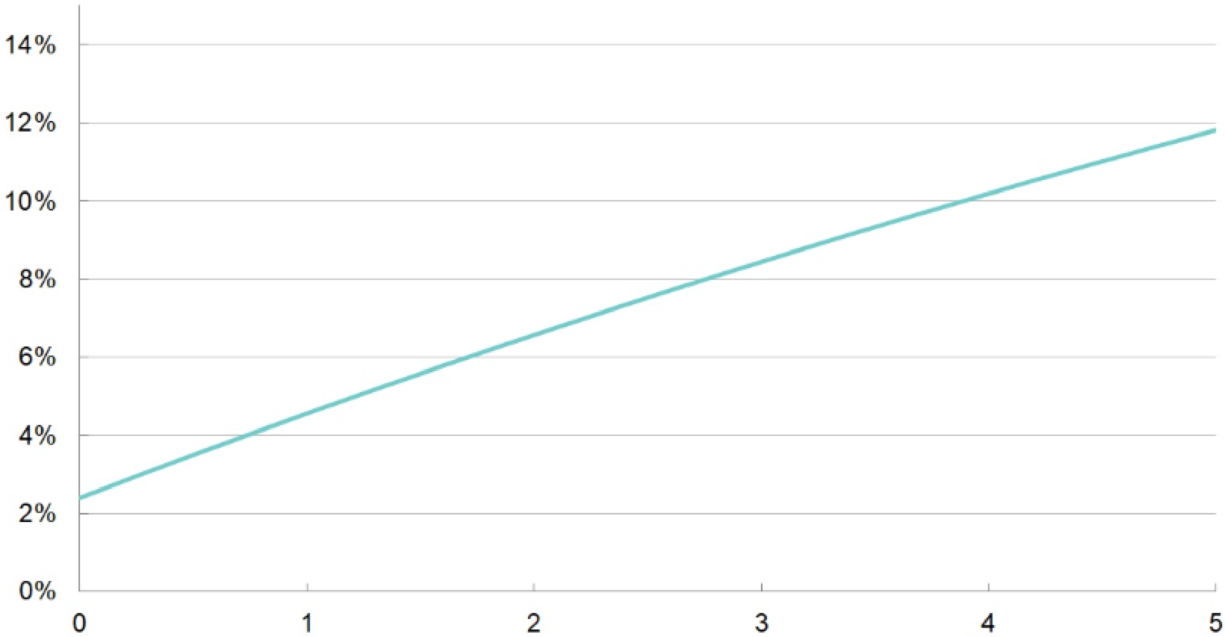
e – mathematical constant, which is the basis of natural logarithms, e ≈ 2.718281828459045.

The fair value of bonds is determined to minimize losses from the realization of interest rate risk, currency risk and liquidity risk and by applying adjustment factors to those taking bonds as collateral. The NBU determines the fair value of bonds using a methodology that meets the requirements of the International Financial Reporting Standard, the basis of which is the construction of zero-coupon yield curves for groups of government bonds: a graphical interpretation of the yield of homogeneous zero-coupon debt securities with different periods to maturity. Basic zero-coupon yield curves are constructed by the National Bank for government bonds.

Coefficients of the zero-coupon yield curve constructed using foreign currency government bonds denominated in dollars. USA.

Date	beta 0	beta 1	beta 2	tau
02.01.2024	0,014041	0,015664	0,155386	3,636475
09.01.2024	0,014236	0,016348	0,149478	3,675049
16.01.2024	0,013528	0,012417	0,175601	3,391846
23.01.2024	0,029531	0,004805	0,055381	1,387695
30.01.2024	0,029688	0,008896	0,057578	2,718750
31.01.2024	0,029473	0,005220	0,058828	1,640137
06.02.2024	0,029609	0,007100	0,050967	1,625000
13.02.2024	0,029746	0,007275	0,050361	1,633789
20.02.2024	0,029648	0,006240	0,052139	1,480469
27.02.2024	0,029375	0,004082	0,061260	1,511719
29.02.2024	0,029141	0,007236	0,057412	1,909180
12.03.2024	0,028418	0,004482	0,067686	1,725586
19.03.2024	0,013601	0,015957	0,155972	3,660889
26.03.2024	0,013137	0,012368	0,180044	3,425537
29.03.2024	0,011257	0,011495	0,195168	3,335083
02.04.2024	0,029150	-0,008428	0,089932	1,216309
09.04.2024	0,013088	0,012026	0,182290	3,419678
16.04.2024	0,013552	0,013760	0,169741	3,521240
23.04.2024	0,010870	0,010000	0,981191	19,075073
30.04.2024	0,010107	0,010000	0,508871	9,115692
07.05.2024	0,010839	0,010000	1,952139	38,678711
14.05.2024	0,013220	0,010000	0,898550	19,257080
21.05.2024	0,012335	0,010000	1,843008	38,829590
28.05.2024	0,011782	0,011587	0,191519	3,307861
31.05.2024	0,011328	0,012258	0,454183	9,380585
04.06.2024	0,013922	0,010000	0,873647	19,298828

Zero-coupon yield curve constructed using foreign currency government bonds denominated in US dollars (Nelson-Siegel model)



The X axis displays years, the Y axis shows spot rates with continuous interest accrual.

The X axis displays years, the Y axis shows spot rates with continuous interest accrual

Date	beta 0	beta 1	beta 2	tau
23.01.2024	0,023710	0,108747	0,302328	1,818726
30.01.2024	0,023565	0,114454	0,289655	1,858757
31.01.2024	0,023596	0,114446	0,290914	1,850586
06.02.2024	0,023718	0,113054	0,295339	1,829987
13.02.2024	0,023641	0,111921	0,296522	1,833855
20.02.2024	0,023344	0,111288	0,298849	1,838623
27.02.2024	0,023245	0,114858	0,288061	1,879547
29.02.2024	0,023191	0,116842	0,283376	1,895508
05.03.2024	0,023260	0,119543	0,276586	1,913422
12.03.2024	0,023306	0,116247	0,279699	1,914368
19.03.2024	0,023519	0,110853	0,298078	1,837364
26.03.2024	0,023428	0,109632	0,291731	1,882835
29.03.2024	0,023077	0,116319	0,269232	1,986053
02.04.2024	0,023054	0,114691	0,273184	1,974213
09.04.2024	0,023329	0,114149	0,274641	1,955864
16.04.2024	0,023000	0,117742	0,261709	2,026123
23.04.2024	0,023092	0,114279	0,271322	1,986328
30.04.2024	0,023000	0,112371	0,272955	1,993896
07.05.2024	0,023062	0,109197	0,263403	2,073730
14.05.2024	0,022848	0,105718	0,272680	2,049805
21.05.2024	0,022718	0,109854	0,255750	2,138680
28.05.2024	0,022909	0,104719	0,257269	2,158447
31.05.2024	0,022367	0,114271	0,228277	2,326996

The yield curve, which is used in assessing interest rate risk and making decisions by participants in the debt securities market, characterizes the state of the debt market and the country’s economy as a whole.

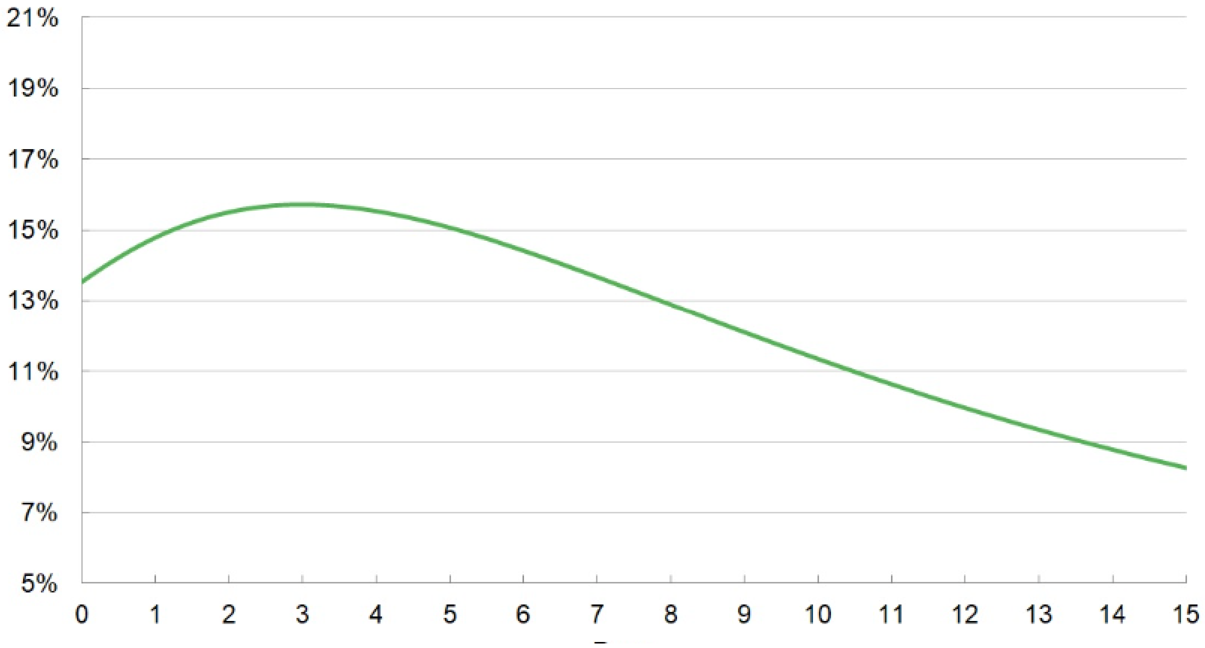
Zero-coupon yield curve constructed using hryvnia government bonds (Svensson model)

Swenson's model has 6 parameters. The forward rate differs from the Nelson-Siegel model by an additional term, which contains two additional parameters:

$$s_p = \beta_0 + \beta_1\left(\frac{1-e^{-p/\tau}}{(p/\tau)}\right) + \beta_2\left(\frac{1-e^{-p/\tau}}{(p/\tau)} - e^{-p/\tau}\right) + \beta_3\left(\frac{1-e^{-p/\tau_1}}{(p/\tau_1)} - e^{-p/\tau_1}\right)$$

The Svensson model has been used by the NBU since April 1, 2019 and has shown the smallest deviations of the model yield on the yield determined on the basis of transactions with the most liquid securities on the secondary market, in particular, with government bonds with a remaining maturity of up to 6 months and medium-term government bonds with maturities repayments from 3 to 5 years.

Zero-coupon yield curve plotted using hryvnia government bonds



The X axis displays years, the Y axis shows spot rates with continuous interest accrual.

The yield curve can be of a normal shape, when the rates increase with increasing maturity (and often the curve is also convex upward), or an inverted shape, when the rates decrease with increasing maturity (often the curve in this case is convex downward), other more complex shapes are also possible curve by changes in the direction of the convexity. The shape of the curve reflects market participants' expectations regarding future rate dynamics.

Using the risk-free yield curve, you can determine the fair value of various financial instruments.

Fair value is the expected price that would be received to sell a bond at the valuation date in an orderly transaction between knowledgeable market participants in an arm's length transaction.

The National Bank determines the fair value of bonds:

- to display bonds at fair value in accounting in accordance with IFRS;
- to disclose information about the fair value of bonds in financial statements;
- to assess the sufficiency of collateral for transactions with Ukrainian banks and the Deposit Guarantee Fund of Individuals;
- as a guide when making transactions for the purchase and sale of bonds.

The National Bank accepts bonds as collateral for transactions:

- refinancing;
- direct repo;
- under agreements on storage of cash reserves;
- to maintain the liquidity of the Deposit Guarantee Fund of Individuals

Fair value of securities (as of 06/07/2024), UAH *

ISIN	Fair value of 1 cb taking into account accumulated coupon income	Yield to maturity, %	Central Bank exchange rate excluding accumulated coupon income, %	Adjustment factor for refinancing operations	Date of initial placement	Maturity date
UA4000186803	1 041,59	14,913353	100,199	0,92	01.10.2014	04.09.2024
UA4000186894	1 030,20	15,032358	100,252	0,92	22.10.2014	02.10.2024
UA4000187207	908,08	16,201461	89,125	0,75	31.10.2014	12.10.2029
UA4000187348	902,92	16,436066	89,090	0,76	14.11.2014	27.04.2029
UA4000187884	2 723,84	14,974398	271,082	0,92	05.12.2014	18.09.2024
UA4000188213	2 709,75	15,123457	270,250	0,92	05.12.2014	23.10.2024
UA4000188221	2 704,20	15,180055	269,925	0,92	05.12.2014	06.11.2024
UA4000188239	2 698,74	15,237761	269,610	0,92	05.12.2014	20.11.2024
UA4000188247	976,51	15,292556	97,599	0,92	30.12.2014	04.12.2024
UA4000188585	1 021,14	15,319364	97,494	0,90	30.12.2014	11.12.2024
UA4000188593	1 038,74	14,945707	100,212	0,92	24.09.2014	11.09.2024
UA4000189591	980,51	15,674910	95,989	0,90	01.04.2015	19.03.2025
UA4000189708	1 002,93	16,083251	96,172	0,85	14.04.2015	30.07.2025
UA4000189799	1 001,29	16,414510	94,518	0,85	28.04.2015	10.12.2025
UA4000189872	991,59	15,766345	97,482	0,90	06.05.2015	16.04.2025
UA4000189963	975,12	16,265518	95,616	0,85	26.05.2015	08.10.2025
UA4000190102	960,29	16,608770	93,695	0,85	09.06.2015	25.03.2026
UA4000190276	948,23	16,654762	93,398	0,85	16.06.2015	22.04.2026
UA4000190284	933,39	16,708100	93,048	0,85	23.06.2015	27.05.2026
UA4000190334	930,48	16,718311	92,983	0,85	30.06.2015	03.06.2026
UA4000190383	944,02	16,676118	93,422	0,85	07.07.2015	06.05.2026
UA4000190441	933,90	16,859930	91,732	0,83	14.07.2015	14.10.2026
UA4000190573	916,52	16,894014	91,360	0,83	28.07.2015	25.11.2026
UA4000190649	978,51	16,049517	94,145	0,85	29.07.2015	16.07.2025
UA4000190870	983,71	16,743800	93,024	0,83	04.08.2015	24.06.2026
UA4000190961	959,30	16,916723	91,071	0,83	11.08.2015	06.01.2027
UA4000191019	971,36	16,902884	91,359	0,83	18.08.2015	09.12.2026
UA4000191399	914,35	16,885161	87,586	0,79	29.09.2015	02.02.2028
UA4000191407	903,59	16,867149	87,403	0,79	29.09.2015	01.03.2028
UA4000192132	879,72	16,849201	85,988	0,79	24.11.2015	29.03.2028
UA4000192355	858,08	16,829951	84,719	0,79	15.12.2015	26.04.2028
UA4000192678	1 678,59	16,402364	167,711	0,85	29.01.2016	26.11.2025
UA4000192686	1 702,50	16,462985	167,563	0,85	29.01.2016	24.12.2025
UA4000192694	1 699,32	16,505841	167,591	0,85	29.01.2016	14.01.2026

ISIN	Fair value of 1 cb taking into account accumulated coupon income	Yield to maturity, %	Central Bank exchange rate excluding accumulated coupon income, %	Adjustment factor for refinancing operations	Date of initial placement	Maturity date
UA4000192702	1 684,39	16,335716	167,829	0,85	29.01.2016	29.10.2025
UA4000192710	1 684,06	16,369764	168,027	0,85	29.01.2016	12.11.2025
UA4000196216	823,71	15,943962	80,013	0,75	28.12.2016	06.03.2030
UA4000196224	804,96	15,839679	79,867	0,75	28.12.2016	08.05.2030
UA4000196232	827,58	15,683808	79,654	0,73	28.12.2016	07.08.2030
UA4000196265	822,50	15,351180	79,363	0,73	28.12.2016	12.02.2031
UA4000196273	808,95	15,263603	79,333	0,73	28.12.2016	02.04.2031
UA4000226385	905,99	12,434193	76,984	0,69	22.08.2022	06.08.2035
UA4000226401	901,11	11,868956	77,897	0,68	05.09.2022	18.08.2036
UA4000226443	896,54	11,852419	77,749	0,68	12.09.2022	25.08.2036
UA4000226633	877,53	11,805301	77,882	0,65	17.10.2022	29.09.2036
UA4000226690	874,47	11,791027	78,164	0,65	31.10.2022	13.10.2036
UA4000226799	885,49	10,812670	80,103	0,63	11.11.2022	22.10.2038
UA4000226872	842,83	12,872565	76,360	0,68	24.11.2022	09.11.2034
UA4000226930	883,83	10,359100	81,333	0,62	09.12.2022	18.11.2039
UA4000226989	895,81	9,968550	82,802	0,62	16.12.2022	23.11.2040
UA4000227011	1 150,47	16,878767	106,368	0,80	29.12.2022	23.12.2027
UA4000227045	1 071,27	14,788894	100,728	0,92	04.01.2023	07.08.2024
UA4000227094	1 023,54	15,292775	102,246	0,92	25.01.2023	04.12.2024
UA4000227102	1 047,14	15,870033	103,846	0,90	25.01.2023	21.05.2025
UA4000227185	1 067,81	15,710888	103,281	0,90	01.03.2023	02.04.2025
UA4000227193	1 108,64	16,084415	104,315	0,86	01.03.2023	06.08.2025
UA4000227201	1 066,15	16,310954	104,987	0,86	01.03.2023	05.11.2025
UA4000227490	1 113,66	16,516787	105,560	0,86	03.05.2023	18.02.2026
UA4000227656	1 101,68	15,443800	102,561	0,90	07.06.2023	15.01.2025
UA4000228043	1 137,17	16,739093	106,392	0,83	26.07.2023	22.07.2026
UA4000228381	1 074,22	16,841717	105,841	0,83	30.08.2023	04.11.2026
UA4000230213	1 051,26	15,642793	101,157	0,90	07.02.2024	12.03.2025
UA4000230262	1 086,26	16,486906	102,655	0,86	14.02.2024	28.01.2026
UA4000230270	1 128,98	16,926467	105,725	0,80	14.02.2024	07.07.2027
UA4000230635	1 024,59	15,808011	100,808	0,90	27.03.2024	30.04.2025
UA4000230809	1 052,70	16,574997	102,208	0,86	10.04.2024	18.03.2026
UA4000231187	1 000,46	15,920305	99,962	0,90	08.05.2024	04.06.2025
UA4000231195	1 078,51	16,924142	105,507	0,80	08.05.2024	25.08.2027

** Selectively by date of placement*

Fair value of securities (as of 06/07/2024), USD *

ISIN	Fair value of 1 cb taking into account accumulated coupon income	Yield to maturity, %	Central Bank exchange rate excluding accumulated coupon income, %	Adjustment factor for refinancing operations	Date of initial placement	Maturity date
UA4000227847	999,12	2,502661	99,912	0,95	29.06.2023	20.06.2024
UA4000228506	992,78	2,982340	99,278	0,95	14.09.2023	05.09.2024
UA4000228829	989,27	3,200231	98,927	0,95	12.10.2023	10.10.2024
UA4000228928	987,76	3,286793	98,776	0,95	26.10.2023	24.10.2024
UA4000229272	985,39	3,414493	98,539	0,95	23.11.2023	14.11.2024
UA4000229736	1 021,48	3,880620	100,522	0,95	28.12.2023	30.01.2025
UA4000230106	1 013,96	4,174492	100,400	0,95	25.01.2024	20.03.2025
UA4000230452	1 007,94	4,383916	100,248	0,95	07.03.2024	24.04.2025

** Selectively by date of placement*

Fair value of securities (на 07.06.2024г), EUR*

ISIN	Fair value of 1 cb taking into account accumulated coupon income	Yield to maturity, %	Central Bank exchange rate excluding accumulated coupon income, %	Adjustment factor for refinancing operations	Date of initial placement	Maturity date
UA4000228605	996,53	1,316584	99,653	0,95	21.09.2023	12.09.2024
UA4000229942	1 005,27	0,920329	99,511	0,94	11.01.2024	10.07.2025
UA4000230023	1 014,06	2,410783	100,647	0,95	18.01.2024	13.03.2025
UA4000230817	1 006,37	2,797389	100,441	0,95	11.04.2024	15.05.2025

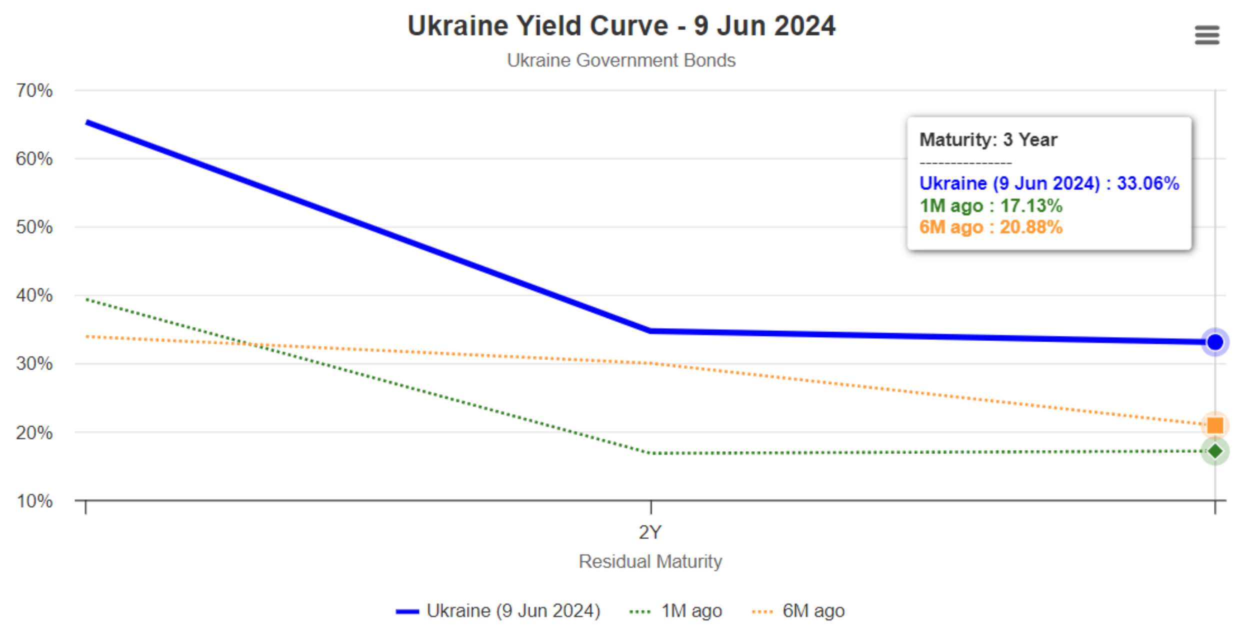
** Selectively by date of placement*

The NBU uses an indicative indicator of the fair value of government bonds when calculating the amount of collateral when providing refinancing loans to banks and under agreements for storing cash reserves. This indicator is also broadcast in the trading systems Bloomberg and Refinitiv (Reuters) and is a guide for investors when purchasing securities.

The purpose of estimating the fair value of securities is to determine the price at which a normal transaction for the purchase and sale of securities between market participants would take place on the valuation date under current market conditions (hereinafter referred to as the market price).

The fair value measurement assumes that a transaction for the purchase and sale of securities occurs either in the main market or in the most favorable market for those securities.

Yield curve of government bonds of Ukraine for the period 2022-2024 .



Residual Maturity	Yield Last	Yield Chg 1M	Yield Chg 6M	ZC Price Last	ZC Price Chg 1M	ZC Price Chg 6M	Last Change
1 year	56,650%	+1848,0 bp	+2545,0 bp	63,84	-11,79%	-16,24%	31 May24
2 years	33,820%	+1632,0 bp	+434,0 bp	55,84	-22,90%	-6,39%	31 May24
3 years	33,275%	+1612,0 bp	+1334,5 bp	42,24	-32,08%	-27,13%	31 May24
6 years	18,235%	0,0 bp	0,0 bp	36,60	0,0%	0,0%	11 Sep23

Profitability analysis of Ukraine

Typically, long-term interest rates are higher than short-term interest rates. Thus, the yield curve typically slopes upward as duration increases. For this reason, the spread (i.e., the difference in yield) between the longer and shorter bond should be positive. Otherwise, the yield curve may be flat or inverted.

The convexity of the curve is measured using some key bond maturities (typically 2 years and 10 years, but other maturities as well).

Residual Maturity	Yield	Spread vs Bond 1 year	Spread vs Central Bank Rate (13.50%)
1 year	34,690%	-3 061,0 bp	+2 119,0 bp
2 year	65,300%		+5 180,0 bp

Focusing on 2-year government bonds/Ukraine 2 Years vs 1 Year Spread: As of the last update on June 9, 2024, the spread value for Ukraine 2-year/1-year government bonds is -3061.0 basis points. where 1 basis point equals 0.01%.

The yield curve inverts in short-term bonds. This means that the yield on 2-year Ukrainian government bonds is -30.610% lower than the yield on 1-year bonds. The current spread has reached its minimum value in 1 year.

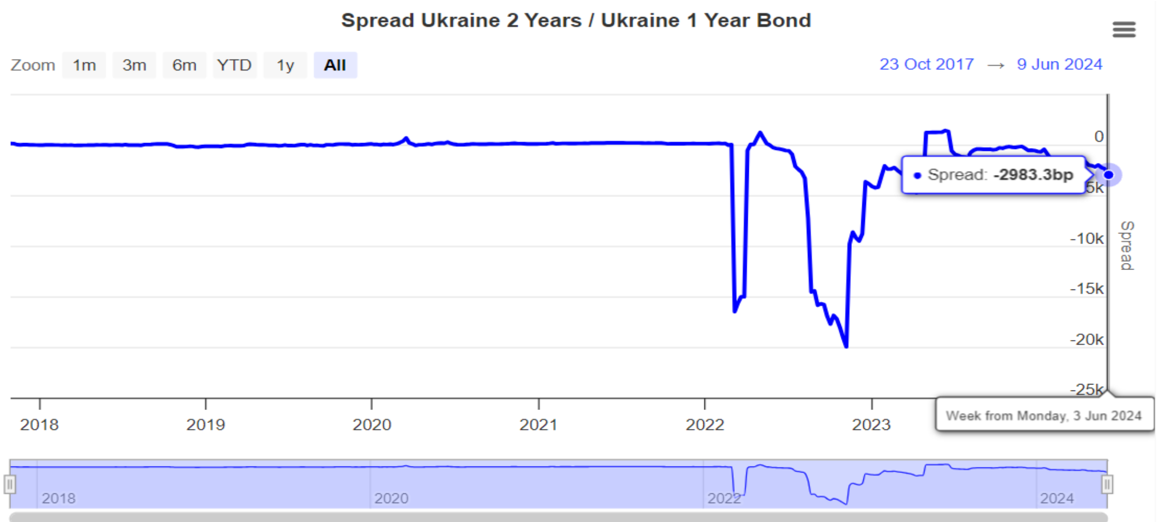
> *31 countries, including Ukraine, have an inverted yield curve. An inverted yield curve is an interest rate situation in which long-term bonds have lower yields than short-term bonds. An inverted yield curve is often considered a predictor of economic downturn.*

The spread changed to - 533.0 bp. for the last week - 809.0 bp. for the last month - 4,297.0 bp. for the last year.

Period	Change	Min	Max
1 Week	- 533,0 bp	- 3 061,0 bp Jun 7, 2024	- 2 528,0 bp Jun 2, 2024
1 Month	- 809,0 bp	- 3 061,0 bp Jun 7, 2024	- 1 794,0 bp May 16, 2024
6 Months	- 2 671,0 bp	- 3 061,0 bp Jun 7, 2024	- 318,0 bp Jan 17,, 2024
1 Year	- 4 297,0 bp	-3 061,0 bp Jun 7, 2024	1 425,0 bp Jun 20, 2023

Spread chart - historical data from October 26, 2017 to June 9, 2024.

The spread of Ukrainian government bonds for a period of 2 years and for a period of 1 year reached a maximum value of 1,425 bps. (June 20, 2023) and a low of -20,185 bps. (November 11, 2022).



Ukrainian credit default swaps

The term credit default swap (CDS) refers to a derivative financial instrument that allows an investor to exchange or offset its credit risk with that of another investor. To trade the risk of default, the lender buys a CDS from another investor, who agrees to reimburse the lender if the borrower defaults

Credit Default Swap	CDS Value	Var % 1W	Var % 1M	Var % 1Y	Implied PD(*)
5 Years CDS	550.90	+1.06 %	+1.84 %	+32.82 %	9.18 %

(*) Implied probability of default, calculated on the hypothesis of a 40% recovery rate.

Prices for government bonds of Ukraine

Price simulation: bonds with par value 100, with different coupon rates.

Residual Maturity	Yield	0%*	1%	3%	5%	7%	9%
1 year	33,060%	42.45	44.19	47.67	51.15	54.63	58.12
2 years	34,690%	55.12	56.42	59.00	61.59	64.18	66.77
3 years	65,300%	60.50	61.10	62.31	63.52	64.73	65.94
	Maturity Date	100.00	100.00	100.00	100.00	100.00	100.00

** Bond price – with different coupon rates, 0% refers to bonds with zero coupon.*

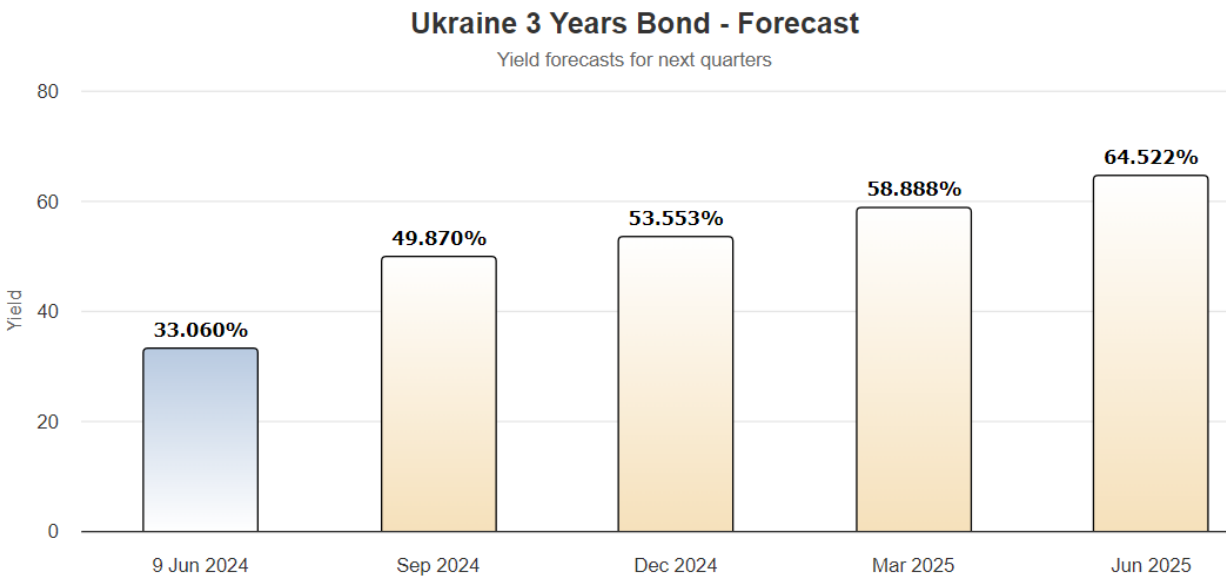
3-year bonds of Ukraine – forecast

It is expected that by the end of September 2024 the yield on 3-year government bonds of Ukraine will be 49.87%, which will mean an increase of 1,681 bps. compared to the last quote of 33.06% on June 9, 2024.

Forecast and difference vs last yield

Yield 9 Jun 2024	Sep2024	Dec 2024	Mar 2025	Jun 2025
33,06%	49.870%	53.553%	58.888%	64.522%
3 Years	+1 681.0 bp	+2 049.3 bp	+2 582.8 bp	+3 146.2 bp

The expected yield by December 2024 is 53.553% (+2,049.3 bps to the last quote). The further profitability forecast for June 2025 is 64.522% (+3,146.2 bps to the previous quote).



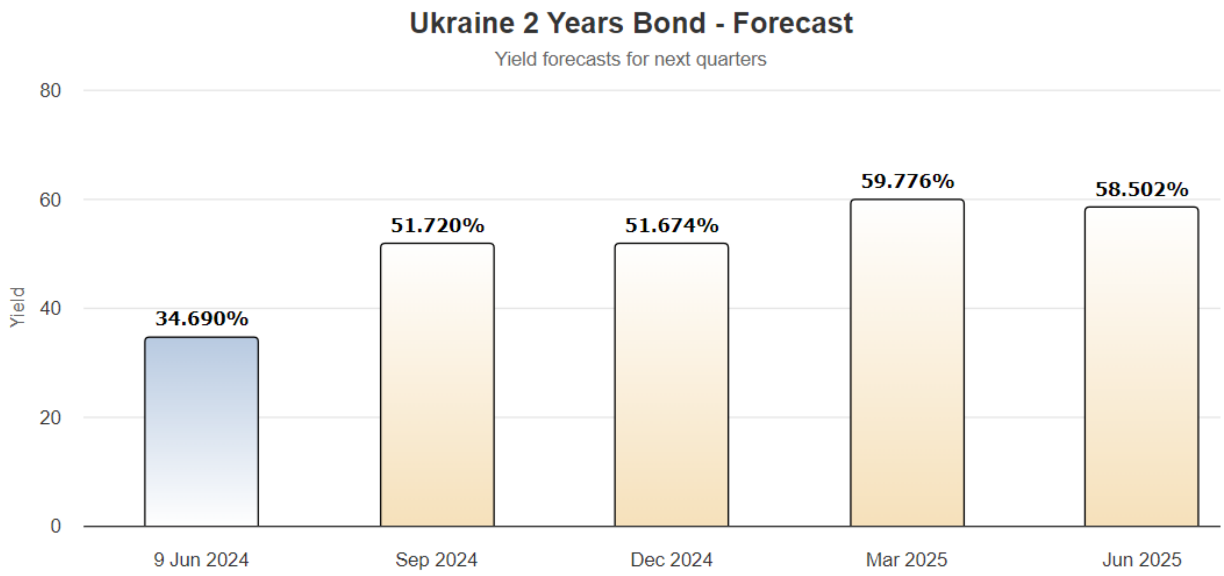
2-year bonds of Ukraine – forecast

It is expected that by the end of September 2024, the yield on 2-year government bonds of Ukraine will be 51.72%, which will be an increase of 1,703 bps. compared to the last quote 34.69%, as of June 9, 2024.

Forecast and difference vs last yield

Yield 9 Jun 2024	Sep2024	Dec 2024	Mar 2025	Jun 2025
34.69%	51.720%	51.674%	59.776%	58.502%
2 Years	+1703.0 bp	+1698.4 bp	+2508.6 bp	+2381.2 bp

The expected yield by December 2024 is 51.674% (+1,698.4 bps to the last quote). The further profitability forecast for June 2025 is 58.502% (+2,381.2 bps to the previous quote).



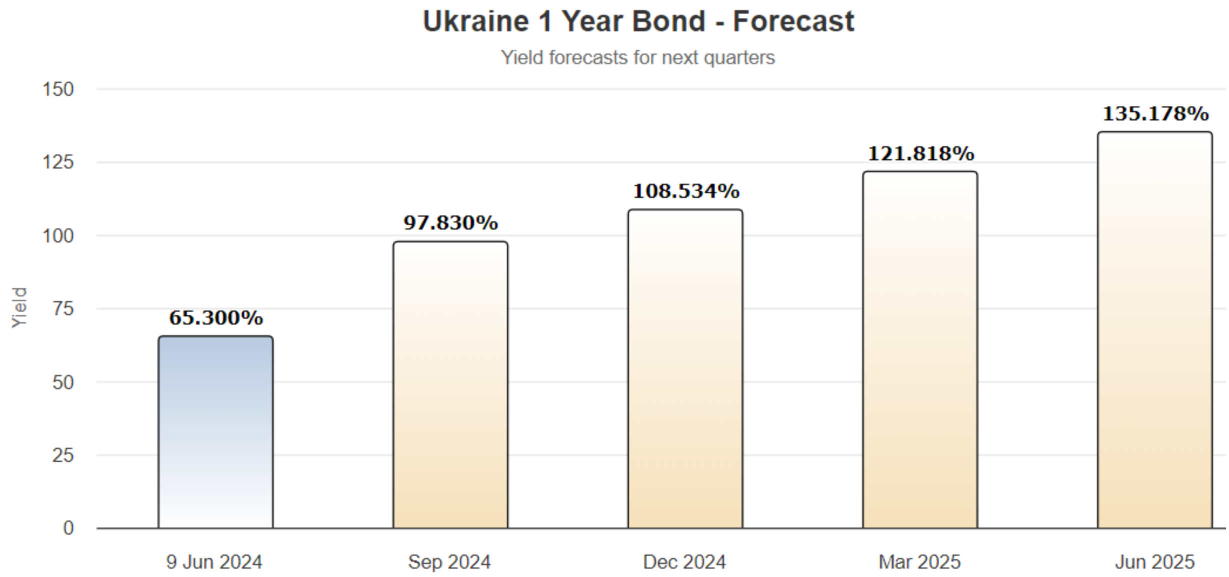
1-year bonds of Ukraine - forecast

It is expected that by the end of September 2024 the yield on 1-year government bonds of Ukraine will be 97.83%. This would represent an increase of 3,253 bps. compared to the last quote of 65.3% on June 9, 2024.

Forecast and difference vs last yield

Yield 9 Jun 2024	Sep2024	Dec 2024	Mar 2025	Jun 2025
65,30%	97.830%	108.534%	121.8185%	135.178%
1 Years	+3 253.0 bp	+4 323.4 bp	+5 651.8 bp	+6 987.8 bp

The expected return by December 2024 is 108.534% (+4323.4 bps to the last quote). The further profitability forecast for June 2025 is 135.178% (+6987.8 bps to the previous quote).



Forecasts are calculated using a trend following algorithm. They are not intended to constitute advice or encouragement to invest.

Source: *https://www.worldgovernmentbonds.com/country/ukraine/*

Statistics on the sale and redemption of OVZU

A dynamic domestic debt market is important for the macro-financial stability of the country, which is a fuse for emission financing of the budget deficit, and, at the same time, the most important tool for improving the urgency of funds in the banking system, minimizing risks for the foreign exchange market and price stability.

During the five months of 2024, the Government of Ukraine raised more than UAH 196 billion from the placement of government bonds at auctions in the equivalent of: UAH 139,062.5 million, USD 763.6 million. USA and 670.8 million euros. During this period, UAH 70,142.2 million and USD 810.9 million were allocated for repayment of domestic debt government securities. USA and 841.2 million euros.

During January - May 2024, borrowing by the Ministry of Finance of Ukraine on the domestic debt market by UAH 59,729.6 million in equivalent exceeded payments on domestic government loan bonds, although in May the volume of payments exceeded borrowing by UAH 15,191.6 million in equivalent.

The rollover* of investments in government bonds for January – May is 127% in all currencies at the current official rate.

* Rollover - the ratio of the par value of securities sold at auctions and redeemed in accordance with the terms of their issue

Information on the placement of government bonds in 2024

Period	Placement of government bonds on the primary market in hryvnia, ∑ million UAH.	Placement of government bonds on the primary market in hryvnia, avg. yield, %	Placement of government bonds on the primary market in USD, ∑ million USD.	Placement of government bonds on the primary market in USD, average/income, %	Placement of government bonds on the primary market in USD, average/income, %	Placement of government bonds on the primary market in euros, avg. yield,
January	3 513,39	18,59	254,70	4,65	235,52	2,64
February	2 604,87	18,50	222,63	4,66	278,71	3,25
March	6 446,10	18,35	286,25	4,64	-	-
April	9 551,69	18,29	-	-	42,92	3,25
May	14 740,59	17,13	-	-	113,63	3,24
Total in 2024	**36 856,64**	**17,88**	**763,57**	**4,65**	**670,78**	**3,04**

including by circulation period, in hryvnia

Period	Up to 1 year, ∑ million gr.	Up to 1 year, average/increasing yield, %	From 1 to 3 years, ∑ million gr.	From 1 to 3 years, average/increasing yield, %	From 3 to 5 years, ∑ million gr.	From 3 to 5 years, avg. yield, %
January	1 861,14	16,80	7 986,74	17,60	3 513,39	18,59
February	-	-	18 879,03	17,16	2 604,87	18,50
March	7 019,60	16,63	20 713,73	17,02	6 446,10	18,35
April	-	-	17 064,56	16,28	9 551,69	18,29
May	3 022,79	15,39	25 658,23	15,69	14 740,59	17,13
Total in 2024	**11 903,52**	**16,34**	**90 302,29**	**16,58**	**36 856,64**	**17,88**

including by maturity, in dollars

Period	Up to 1 year, ∑ million gr.	Up to 1 year, average/increasing yield, %	From 1 to 3 years, ∑ million gr.	From 1 to 3 years, average/increasing yield, %	From 3 to 5 years, ∑ million gr.	From 3 to 5 years, avg. yield, %
January	-	-	254,70	4,65	-	-
February	-	-	222,63	4,66	-	-
March	-	-	286,25	4,64	-	-
April	-	-	-	-	-	-
May	-	-	-	-	-	-
Total in 2024	-	-	**763,57**	**4,65**	-	-

including by circulation period, in euros

Period	Up to 1 year, ∑ million gr.	Up to 1 year, average/increasing yield, %	From 1 to 3 years, ∑ million gr.	From 1 to 3 years, average/increasing yield, %	From 3 to 5 years, ∑ million gr.	From 3 to 5 years, avg. yield, %
January	-	-	235,52	2,64	-	-
February	-	-	278,71	3,25	-	-
March	-	-	-	-	-	-
April	-	-	42,92	3,25	-	-
May	113,63	3,24	-	-	-	-
Total in 2024	**113,63**	**3,24**	**557,15**	**2,99**	-	-

In total, from the beginning of the war until May 31, 2024, the government raised more than UAH 1,014 billion in the equivalent at primary auctions: UAH 693,238.2 million, USD 6,380.9 million. USA and 2,383.9 million euros.

During this period, 499,514.1 million UAH and 6,946.5 million dollars were allocated for repayment of government bonds. USA and 2,091.8 million euros.

The National Bank has provided banks with the opportunity to cover up to 50% of the total required reserves using benchmark government bonds from a list determined by the NBU, gradually expanding the corresponding list, as well as for non-residents to transfer abroad funds received from paying interest on government bonds after April 1, 2023, provided their compliance with the minimum continuous period of holding government bonds until they receive interest.

For its part, the government offers rates on government bonds at the market level. In May 2024, the maximum yield on government bonds placed at auctions was 17.50% per annum in hryvnia, and 3.25% per annum in euros. Government bonds denominated in US dollars were not placed in May.

Government bonds in circulation, by principal amount (as of 06/07/2024)

Bonds. which are owned

Type of securities	Total	NBU	Banks	Legal entities	Ter. commu nities	Induvud uals	Non-residents
Total	1 621 870,05	677 602,63	687 376,79	159 482,82	997,33	60 613,48	35 797,00
Government bonds, nominal in hryvnia, incl.	1 487 354,49	677 602,63	623 101,70	120 871,74	997,33	30 132,81	34 648,28
OVGZ-VAT	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Government bonds, nominal in foreign currency, incl.	134 515,56	0,00	64 275,09	38 611,08	0,00	30 480,66	1 148,72
in US dollars	102 203,94	0,00	37 627,01	34 929,03	0,00	28 503,79	1 144,10
In Euro	32 311,62	0,00	26 648,08	3 682,05	0,00	1 976,87	4,62

Thus, over the calendar year, the number of government bonds in circulation increased by 12.41% or 179,044 bonds. At the same time, the growth of government bonds in foreign currency accounted for 6.58% or 8,300 government bonds. The NBU lost 16,656 in value terms, which amounted to 2.4%, and banks increased the volume of government bonds by almost a third, which amounted to 145,750 or 26.91%.

Government bonds in circulation, by principal amount (as of 06/07/2023)

Bonds. which are owned

Type of securities	Total	NBU	Banks	Legal entities	Ter. communities	Induvuduals	Non-residents
Total	1 442 826,25	694 258,22	541 626,15	115 798,58	3 264,07	40 625,55	47 253,68
Government bonds, nominal in hryvnia, incl.	1 316 609,77	694 258,22	454 348,65	98 160,19	3 264,07	20 209,74	46 368,90
OVGZ-VAT	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Government bonds, nominal in foreign currency, incl.	126 216,48	0,00	87 277,50	17 638,39	0,00	20 415,81	884,78
in US dollars	92 248,58	0,00	55 918,87	16 145,02	0,00	19 299,91	884,78
In Euro	33 967,90	0,00	31 358,63	1 493,36	0,00	1 115,91	0,00

Conclusion

Government bonds are debt securities issued by the government to support government spending and obligations. In some cases, they offer a low-risk investment option for individuals and institutions.

These bonds are critical to financing government projects and services, ensuring economic stability and growth by providing governments with a reliable source of financing.

Investing in government bonds helps diversify portfolios, providing predictable returns and contributing to the overall stability of financial markets.

The Ukrainian economy continues to demonstrate resilience despite war-related headwinds, and the outlook remains subject to exceptionally high uncertainty. The country needs sustained reform momentum to protect macroeconomic stability, restore fiscal and debt sustainability, strengthen institutional reforms, and lay the foundation for recovery efforts and a path to European Union membership.

The economy emerged stronger than expected in 2023, with strong growth performance, sharp deflation continuing and adequate reserves remaining. However, headwinds will arise again in 2024, with growth expected to slow to 3-4% due to uncertainty about the ongoing war and supply constraints becoming tighter. The outlook remains subject to exceptionally high downside risks arising from war-related factors, potential external financing shortfalls and the socio-economic implications of policies that may be required should shocks materialize. Authorities must remain vigilant against these risks. It is also critical that external funding committed to Ukraine by all donors be delivered in a timely and predictable manner to protect Ukraine's hard-won macroeconomic stability.

The ongoing war continues to strain Ukraine's public finances, so continued efforts are needed to improve preparedness to strengthen financial security, oversight, governance and contingency planning systems.

A gradual approach to easing foreign exchange controls, consistent with the strategy of the National Bank of Ukraine, will be important to protect foreign exchange reserves. The authorities' efforts to avoid monetary financing must continue.

According to world agencies that form global financial ratings, the capabilities and medium-term incentives of the Ukrainian government to fulfill its financial obligations in LC are somewhat higher than in FC. Debt denominated in hryvnia is primarily held by the National Bank of Ukraine and domestic banks, half of which are state-owned. A default on these letter of credit obligations will add to the banking sector's problems, increasing the likelihood that the government will have to provide financial support to banks, limiting the benefits of debt relief.

The war-induced shock to the economy and tax base, coupled with increased defense and security spending, significantly undermined the government's fiscal position. Despite government efforts to contain spending beyond defense and social transfers, the general government deficit reached a high of 20% of GDP, including foreign grants, in 2023, following a deficit of 14% the year before.

The Ukrainian government is seeking external commercial debt relief from the IMF to preserve financial sector liquidity and restore debt sustainability.

Ukraine's economy is projected to grow by an average of about 4-5% in the medium term, but recovery to pre-war levels is unlikely in the foreseeable future. The government has largely restored the pre-war tax regime, but revenues remain weak while pressure on spending, including on defense-related items, remains exceptionally high. As a result, we forecast the general government deficit, including grants, to remain very high at 17% of GDP this year.

Assuming security risks and associated military spending decline, the overall fiscal deficit could fall to an average of 6–7% of GDP in 2025–2027. This deficit will be driven by only a partial economic recovery, high reconstruction costs and the need to support some state-owned enterprises, including in the energy sector.

Foreign grants and concessional loans are expected to continue to cover the majority of the Ukrainian government's financing needs this year and likely beyond. The international community has allocated $122 billion to Ukraine between 2023 and 2027, including assistance from donor countries and international financial institutions. An important catalyst for this support is the expectation that Ukraine will comply with the terms of the four-year EFF agreement with the IMF worth US$15.6 billion, concluded in March 2023. In 2023, Ukraine received $43 billion in foreign aid, mainly in the form of long-term concessional loans, but also grants. This represents an increase from $32 billion in 2022.

Net government debt as a share of GDP is projected to nearly double its pre-war level to approximately 93% of GDP by the end of 2027.

However, the share of long-term concessional loans from multilateral and official creditors in total government debt is expected to continue to increase from the current high level of 51%.

The budget forecasts do not reflect ongoing efforts to restructure external commercial debt as its parameters have not yet been determined. Debt restructuring plans exclude multilateral and domestic government debt (in both

LC and FC). These obligations represent more than 70% of the current total debt and debt service in the coming years. Although Ukraine's direct and state-guaranteed Eurobonds account for a much smaller share of total debt (17%), their debt service payments will amount to a significant $4.5 billion in 2024 and about $3 billion on average annually in 2025-2027. In 2022, the government postponed payments on Eurobonds until August 2024.

S&P forecasts that Ukraine's current account balance will remain in significant deficit, averaging around 7%-8% of GDP over our forecast horizon to 2027. This is largely due to the deterioration of the trade balance associated with the slow recovery of exports and high imports associated with reconstruction

An extremely important role for assessing the situation in the borrowing market can be the online modification of government bond quotes, which would allow one to obtain estimates of the yield curve and, as a consequence, government bond prices in real time.

These indicators are extremely necessary for assessing the current market situation and obtaining reliable and timely information by market participants, for making forecasts for the prices of bonds traded in different periods of time.

One source of information for analyzing the profitability of investments can be the yield on government bonds with different maturities. However, the direct use of these yields is hampered by the fact that bonds are rarely zero-coupon. Since payments on a bond are made at different times, the price of the bond is the sum of nonlinear terms with rates related to different periods to maturity. The problem of obtaining zero-coupon yields from bond price data is most acute for markets like the Ukrainian one, where trading volumes are not so large and transactions do not occur very often.

Government bond yields vary depending on changes in interest rates, inflation expectations and economic conditions. When interest rates rise, bond prices fall, causing yields to rise. During periods of economic uncertainty, such as the one Ukraine is currently experiencing, investors flock to government bonds, causing prices to rise and yields to fall.

Such fluctuations in yield have a significant impact on both investors and the country. For investors, higher yields mean higher returns on investments, but can also lead to higher bond prices. For the government, lower yields reduce the cost of debt financing, making it easier to manage the government budget. Conversely, higher yields increase borrowing costs, putting pressure on government finances.

Glossary

A zero-coupon yield curve is a graphical interpretation of the yields of similar zero-coupon debt securities with different periods to maturity. The basic zero-coupon yield curve is constructed for government bonds. The purpose of constructing a zero-coupon yield curve is to provide a simple tool for valuing debt securities.

Security rate is the fair value of a security expressed as a percentage of its face value.

Government bonds are domestic government bonds.

Risk premium is the compensation that risk-averse market participants seek to receive for taking on the uncertainty inherent in the cash flows of an asset or liability.

The market approach is a valuation technique that uses prices and other relevant information generated by market transactions for identical or similar securities.

Spot rate is the theoretical yield of homogeneous zero-coupon bonds at the current date, expressed as an interest rate.

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

Forward rate is a theoretical yield that reflects the spot rate at a specific date in the future.