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COUNTRY-LEVEL INTEREST RATE RISK IMPACT ON DEBT AND FISCAL SUSTAINABILITY: POTENTIAL USE OF FLOATING-RATE AND INFLATION-INDEXED LIABILITIES

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Keywords: LIBOR, EURIBOR, floating-rate notes, inflation-linked bonds, GDP-linked bonds, inflation-indexed bond, debt sustainability, government debt, public and publicly guaranteed debt

JEL Codes: E43, E47, G12, H63, O38

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The joint Working Paper of the EFSD and the CAREC Institute contains an analysis of the risks and benefits associated with floating-rate debt and inflation-linked securities in the portfolio of sovereign obligations of the EFSD member states (Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russia, and Tajikistan), some of which also participate in the CAREC program (Kazakhstan, Kyrgyzstan, and Tajikistan). The study examines the following topics: 1) the role of increasing USD LIBOR (SOFR) and EURIBOR rates on debt and fiscal sustainability, as well as key trends that affect the use of external liabilities with interest rate risk during the 2018–2023 period; 2) cost-benefit analysis of issuing domestic government floating-rate notes (FRN) and inflation-linked bonds (ILB) in Kazakhstan and Russia; 3) opportunities to enhance the outcomes of issuing government securities by existing issuers using FRN and ILB; 4) potential to expand the issue of debt securities with floating service and repayment costs for both existing and new prospective issuers (Armenia and Kyrgyzstan).

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List of Abbreviations

€STR	Euro Short-Term Rate, designed to replace the Euro Overnight Index Average (EOIA)
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
APF	accumulative pension fund
bn	billion
BOFZ	federal zero coupon bond issued by the Government of the Russian Federation
bp	basis point
CAREC	Central Asia Regional Economic Co-operation
CBA	Central Bank of Armenia
CBR	Central Bank of Russia
COVID-19	respiratory infection caused by the SARS-CoV-2 coronavirus
CPI	consumer price index
EBRD	European Bank for Reconstruction and Development
ECB	European Central Bank
EFSD	Eurasian Fund for Stabilization and Development
EIB	European Investment Bank
EoY	end of year
EURIBOR	Euro Interbank Offered Rate (EURIBOR-3m: three-month rate)
FRL	floating-rate liability
FRN	floating-rate note
GDP	gross domestic product
GS	government security
HPP	hydroelectric power plant
IIB	inflation-indexed bond
IMF	International Monetary Fund
LIBOR	London Interbank Offered Rate
M, mln	million
METIKAM	long-term floating-rate treasury of the Republic of Kazakhstan, linked to TONIA
MEUZKAM	long-term floating-rate savings treasury of the Republic of Kazakhstan issued and redeemed at face value, with interest payments indexed to CPI
MinFin RA	Ministry of Finance of the Republic of Armenia
MinFin RF	Ministry of Finance of the Russian Federation
MinFin RK	Ministry of Finance of the Republic of Kazakhstan
MP	monetary policy
MUIKAM	long-term floating-rate treasury of the Republic of Kazakhstan issued and redeemed at face value, with interest payments indexed to CPI

NBKR	National Bank of the Kyrgyz Republic
NBRB	National Bank of the Republic of Belarus
NBRK	National Bank of the Republic of Kazakhstan
NSM	Nelson-Siegel model
OFZ	federal loan bond of the Russian Federation
OFZ-IN	inflation-indexed federal bond of the Russian Federation with face value indexed to CPI
OFZ-PK	floating-rate federal bond of the Russian Federation linked to RUONIA
OJSHC	open joint-stock holding company
pp	percentage point
RR	refinancing rate
RUONIA	Rouble Overnight Index Average
SOFR	The Secured Overnight Financing Rate; set as an alternative to USD LIBOR
SONIA	The Sterling Overnight Index Average; set as an alternative to British pound sterling LIBOR
T, trn	trillion
TONA	Tokyo Overnight Average Rate, set as an alternative to JPY LIBOR
TONIA	Tenge Overnight Index Average
UIF	unit investment fund
WB	World Bank
YtD	yield to date
YtM	yield to maturity

Introduction

A key goal of public debt risk management is to balance the debt portfolio, taking into consideration both the term structure of interest rates and their type (fixed vs floating). The use of floating-rate obligations tends to reduce related service costs, as some of the risks are offset, but those costs may be more volatile. Rapid interest rate growth may produce a significant fiscal gap and rising liquidity risk, which may in turn have an adverse impact on debt sustainability.

Throughout the 2010s, the key reference rates of developed countries used to calculate floating rates (USD LIBOR and EURIBOR) remained relatively low and with little variability. Accordingly, most governments and international financial institutions did not focus on the role played by floating rates in the assessment of risks to debt and fiscal sustainability. Applied research also focused primarily on the currency structure and maturity structure (Krishnamurthy and Vissing-Jorgensen, 2012; Diamond and He, 2014; Greenwood et al, 2015; He and Milbradt, 2016). Studies on public debt structure by type of rate were mainly devoted to the methodology of transition to new reference rates, such as SOFR, €STR, TONA, and SONIA (Schrimpf and Sushko, 2019; Held, 2019; Taylor-Brill, 2020; Saavedra and Victor, 2021; Jermann, 2023).

However, in 2022, the main reference rates grew by an order of magnitude due to a massive surge in the value of foreign obligations fueled by COVID-related fiscal support. That growth continued in 2023. Central bank rates in developing countries also increased exponentially, reducing the potential for issuing mid- and long-term fixed-rate government securities. In many countries, intensive use of central bank instruments to absorb excessive liquidity provoked an additional liquidity premium spike in the short-term government securities sector, raising further barriers in the way of new fixed-rate government security issues. As a result, the matter of floating-rate liabilities (FRLs) and their impact on debt and fiscal sustainability regained its relevance.

For countries with a large share of FRLs in their external debt portfolios, dramatic growth of hard-currency reference rates may translate into a significantly heavier debt service burden. In addition, if the rates remain high for a long time, this can severely weaken those countries' fiscal position, including their ability to finance long-term capital expenditures and protected social spending budget items.

The experience of countries with sophisticated domestic FRL markets (Argentina, Brazil, Mexico, Turkey, etc.) shows that it is during periods of high uncertainty and interest rate volatility that floating-rate instruments evoke an enthusiastic response in the investor community and even reverse the flight of non-residents from those markets. In some cases, such instruments have enabled issuer countries to secure manifold increases in their portfolio maturities while concurrently reducing borrowing costs.

In this Working Paper, we have reviewed the key trends affecting the use of obligations containing interest rate risk that have emerged in the EFSD member states (Armenia, Belarus, Kazakhstan, Kyrgyzstan, Russia, and Tajikistan), some of which also participate in the CAREC program (Kazakhstan, Kyrgyzstan, and Tajikistan). We have considered the potential inclusion of obligations with floating debt service and repayment expenses in domestic debt portfolios of the countries under review.

This Working Paper has the following structure:

- Section 1 provides an overview of the ways in which obligations with floating debt service and repayment expenses are used by the countries under review, and of related general trends that have emerged over the last five years. The section presents an analysis of the impact that interest rate risk may have on domestic and external debt portfolios and quasi-fiscal obligations. It also looks at the role of interest rate risk in public debt management strategies, and provides scenario-based estimates of the impact that the possible growth of hard-currency reference rates (USD LIBOR (SOFR), EURIBOR and others) may have on the fiscal performance of individual countries.
- Section 2 is dedicated to potential uses of obligations with floating debt service and repayment expenses by the countries under review. Our recommendations are based on both actual historical FRL issuance data and relevant international best practices.
- The Annex provides in-depth country-specific information on interest rate risk components and their changes over time, including the approaches employed to interest rate risk management.

1. Debt Structure and Interest Rate Risk in the Countries Under Review

External Debt Portfolio

Throughout most of the 2010s and the early 2020s, the main indicators used to calculate the floating rates for external sovereign bonds and the related borrowing cost estimates varied little, if at all (Figures 1 and 2). However, in 2022 the key hard-currency reference rates increased by an order of magnitude, regaining in 2023 the highs they had reached over the last two decades.

Figure 1. Changes in USD LIBOR-3m, %

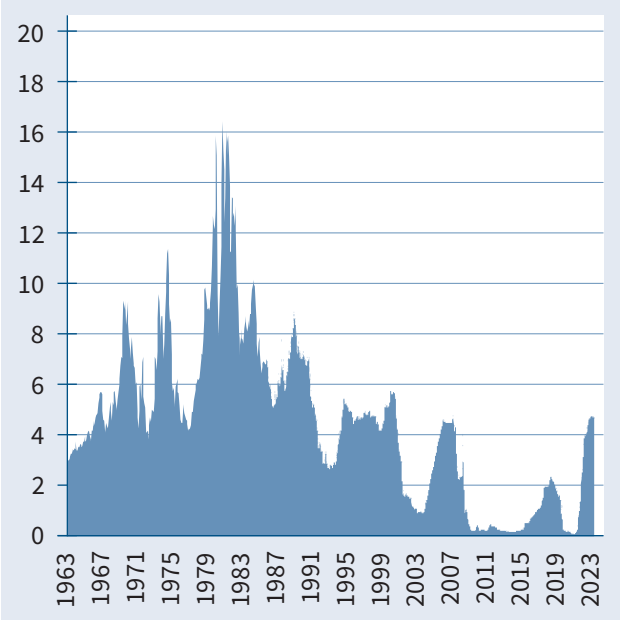
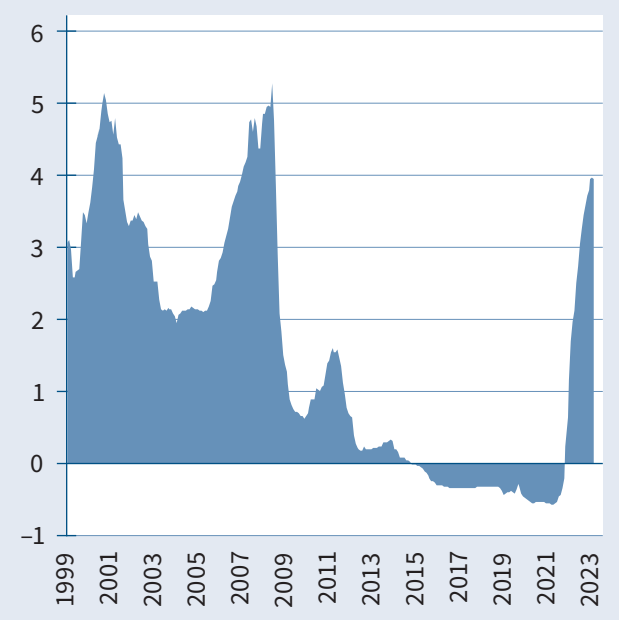


Figure 2. Changes in EURIBOR-3m, %



Source: ECB.

Nevertheless, by the end of 2023, the countries under review demonstrated moderate or low vulnerability to potential further growth of hard-currency reference rates (Table 1).

The largest share of floating-rate liabilities (FRLs) was reported in Kazakhstan (38–41%); it was, however, offset by low external public debt. The share of FRLs in total external debt in Armenia and Belarus was rather significant (33.1% and 24.5–37.5%[1], respectively), but Belarus has almost halved it in recent years, while Armenia has reported a structural shift towards domestic fixed-rate debt. Recipients of foreign soft financing (Kyrgyzstan and Tajikistan) also had some FRLs in their portfolios.

[1] No official 2023 data for Belarus are available. Estimates are used here and below.

Table 1. Interest Rate Risk Indicators of External Sovereign Debt of the Countries Under Review, 2023 EoY

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia	Tajikistan
External Public Debt, % of GDP	28	24.9	5.9	33.7	1.8	26.0
Floating-Rate Liabilities (FRLs), % of External Public Debt	33.1	24.5[2]	37.9[3]	11.9	0–4[4]	9.8
FRLs Linked to USD LIBOR (SOFR), % of External FRLs	78	46	45	50[1]	N/A	66
Short-Term Obligations, % of External Public Debt	0	0	0.8	0	0	0

Source: authors' calculations

USD LIBOR (SOFR) was the dominant reference rate for the countries under review, accounting for 45–78% of total external FRLs. EURIBOR had a more modest share of 22–50% of total external FRLs. In addition, in Belarus more than half of total FRLs were linked to Russian capital market indicators.

Over the last five years, changes in the external public debt structure in terms of rate types were mixed. The most significant growth of the share of FRLs was observed in those countries which had access to concessional facilities — Kyrgyzstan (up from 1.4% to 11.9%) and Tajikistan (up from 1.6% to 9.8%) — despite the manifold cost difference compared with soft financing. Armenia also reported an increase (from 21.9% to 33.1%) following the receipt of IMF and ADB fiscal/BoP support loans. In the larger economies, including Kazakhstan and Belarus, the share of FRLs decreased.

We estimate that the possible future growth of reference rates will have an insignificant effect on fiscal performance of the countries under review, although the risks faced by the countries receiving loans on concessional terms are beginning to increase at a brisk pace.

If USD LIBOR (SOFR) rose by 100 bp, the maximum increase in debt servicing costs in 2023 would have been observed in Armenia (0.07% of GDP) and Belarus (0.06% of GDP, Table 2). Even though the increase in expenses incurred by Kyrgyzstan and Tajikistan (current recipients of soft financing) is far less, their average rates are rather modest (Tajikistan: 1.2%[5]; Kyrgyzstan: 1.3%); therefore, even with small FRL portfolios their external public debt service expenses may double (Box 1).

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2 Estimated minimum value; maximum value = 37.5% (if all new external obligations assumed in 2022–2023 have floating interest rates). The latest official 2021 EoY figure = 30.2%.

3 Estimated minimum value (calculated on the basis of data published by the NBRK); maximum value = 41% (calculated on the basis of data published by the Ministry of Finance).

4 There are no official data on the external debt structure with a breakdown by rate type. At the end of 2023, the shares of fixed-rate Eurobonds and bilateral/multilateral loans in Russia's external public debt portfolio (excluding guarantees) stood at 96% and 4%, respectively.

5 Excluding Eurobonds.

Table 2. Potential Impact of USD LIBOR (SOFR) Changes on Fiscal Performance of the Countries Under Review[6]

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia	Tajikistan
Scenario 1. USD LIBOR (SOFR) Increase by 100 bp						
Increase in Interest Expenses, % of GDP	0.07%	0.06%	0.01%	0.02%	0.00%	0.02%
Increase in Interest Expenses, % of Budget Revenues[7]	0.30%	0.14%	0.05%	0.05%	0.00%	0.06%
Scenario 2. USD LIBOR (SOFR) Increase to All-Time Highs (1980: 19.595%)						
Increase in Interest Expenses, % of GDP	1.09%	0.86%	0.15%	0.30%	0.00%	0.25%
Increase in Interest Expenses, % of Budget Revenues[3]	4.48%	2.06%	0.72%	0.81%	0.00%	0.85%

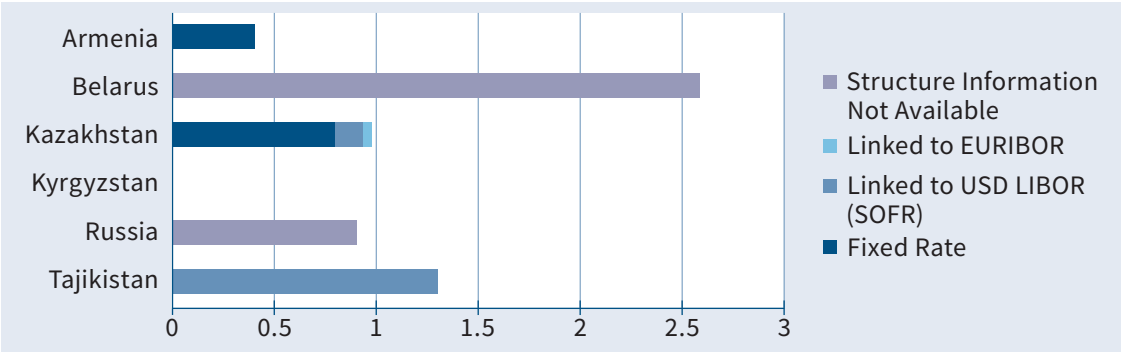
Source: authors' calculations based on data published by national ministries of finance.

Under the extreme scenario where USD LIBOR (SOFR) reaches the all-time highs registered in the 1980s (Figure 1), the increase in interest expenses would be 1.1% of GDP (4.5% of total 2023 budget revenues) in Armenia, and 0.9% of GDP (2.1% of total 2023 budget revenues) in Belarus. Even under that extreme scenario, gross public financing needs would remain safely below the threshold levels set by the IMF for its debt sustainability analysis[8].

EURIBOR movements are even less relevant for the EFSD member states. Had EURIBOR risen by 100 bp, expenses would have increased the most in Armenia (0.02% of GDP) and Kyrgyzstan (0.02% of GDP).

No major risks are associated with government guarantee obligations either. At the end of 2023, total external guarantees in the four countries under review did not exceed 1% of their GDP (Figure 3), with most such guarantees extended under fixed-rate loans. Only in Tajikistan were the bulk of guarantee obligations linked to USD LIBOR (SOFR).

Figure 3. Government-Guaranteed External Obligations, 2023 EoY, % of GDP



Source: ministries of finance of the countries under review.

6 Minimum impact indicated for Belarus, Kazakhstan, and Russia.
7 2023 consolidated budget revenues.
8 In developing countries with access to international capital markets, the threshold for gross external public financing needs is no more than 20% of GDP (IMF, 2013). In other developing countries, the threshold for gross external public financing needs has been revised to no more than 23% of budget revenues (IMF, 2018).

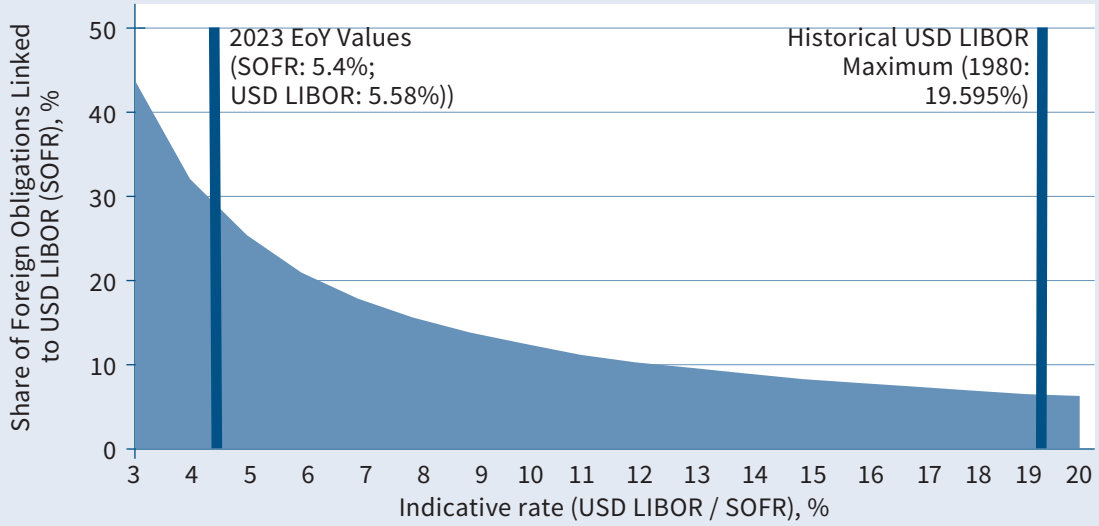
Box 1. External Floating-Rate Obligations in the Countries Receiving IMF & WB Loans on Concessional Terms.

For a number of reasons, it would be preferable for the countries receiving soft financing (Kyrgyzstan and Tajikistan) to reduce, to the extent possible, the share of FRLs in their foreign portfolios.

First, even a small share of FRLs may be sufficient to provoke manifold growth of the average interest rate of the foreign debt portfolio. By way of example, several combinations of the FRL share and the reference interest rate that would double the interest expenses on Tajikistan's external public debt[9] are shown in the Figure below. At current USD LIBOR (SOFR)[10] levels, the average rate will double (from 1.2% to 2.4%) if the share of FRLs in the country's external public debt reaches even 23%. In the event of a subsequent increase in the SOFR rate to the USD LIBOR highs reported in 1980, Tajikistan, with its current external public debt structure, will be paying 2.5 times more than in the scenario where it has no FRLs.

Second, during large-scale crises, it is advisable to maintain a fiscal buffer to offset a possible unforeseen increase in the share of FRLs. Such a buffer is required both to mitigate operational risks associated with large-scale investment projects (e.g., Rogun HPP) and deal with potential changes in the lending terms offered by major IFIs. In particular, based on the findings of its review of sufficiency of special-purpose funds available to the poorer countries, the IMF came to the conclusion that all such funds extending grants and loans to the most vulnerable low-income countries are experiencing an acute shortage of funding due to the pressure generated by a significant increase in the demand for loans and rapid growth of interest rates (IMF, 2023).

Figure. Combinations of the Shares of Foreign Obligations Linked to USD LIBOR (SOFR) and the Values of USD LIBOR (SOFR) Leading to Doubling of the Interest Rate on Tajikistan's External Public Debt (relative to 100% soft loans)



Source: authors' calculations.

[9] In Tajikistan, the average interest rate on soft loans was about 1.2% (excluding Eurobonds).

[10] For the sake of simplicity, we assumed that all FRLs are 100% linked to USD LIBOR (SOFR). The quoted margin on the reference rate remains at the historical average of 95 basis points.

Domestic Debt Portfolio

As regards domestic public debt, floating-rate instruments have so far been used only in three[11] of the countries under review, namely, Belarus, Kazakhstan, and Russia (Table 3). In most cases, the rates are pegged to national money market indicators (NBRB RR in Belarus, TONIA in Kazakhstan, and RUONIA in Russia). Only in Belarus are there several domestic floating-rate treasuries linked to EURIBOR.

Table 3. Interest Rate Risk Indicators of Domestic Sovereign Debt, 2023 EoY

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia	Tajikistan
Domestic Public Debt, % of GDP	22.0	8.3	14.8	11.8	11.8	3.3
T-Bills, % of Domestic Public Debt	6.2	3.1	3.5	0.5	0	1.2
Floating-Rate Notes (FRNs), % of Domestic Public Debt	0	4.9	9.4	0	38.4	0
Obligations with Inflation-Indexed Principal (IIBs), % of Domestic Public Debt	0	0	0	0	5.8	0
Structure of the Rates Used (% of Domestic FRNs)	N/A	NBRB RR (51%), EURIBOR (49%)	TONIA (56%), CPI (44%)	N/A	RUONIA (100%)	N/A

Source: authors' calculations.

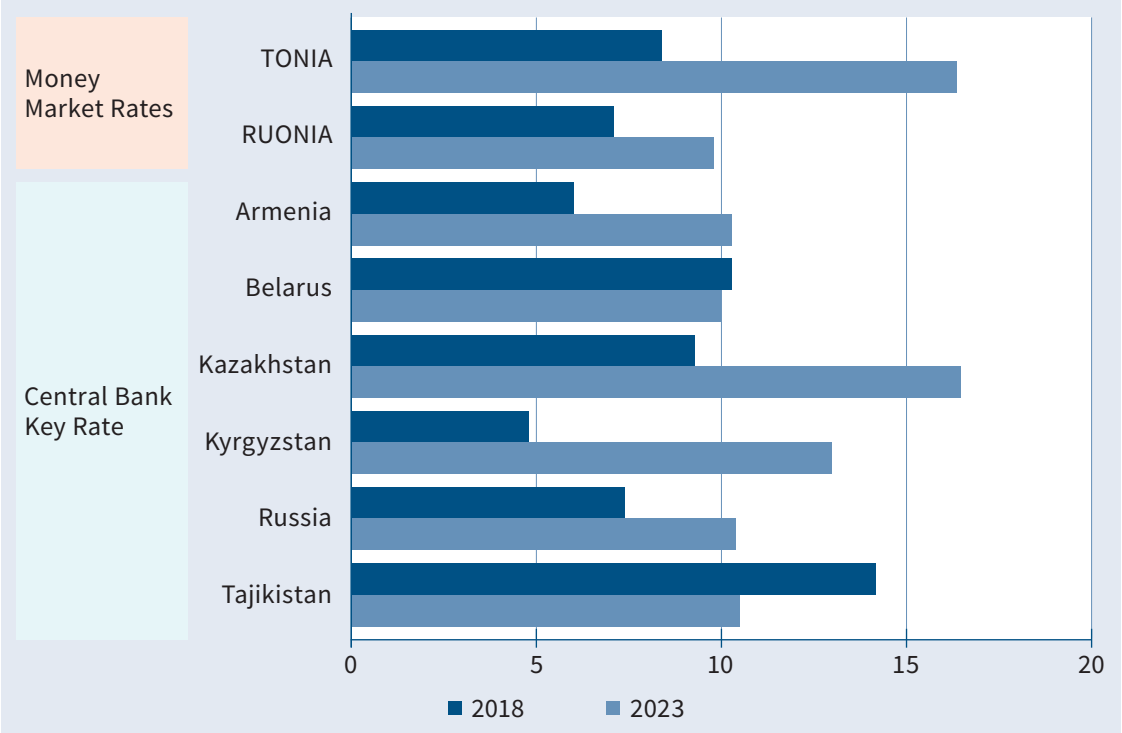
Among money market indicators (Figure 4), the largest increase was reported for TONIA (from 9.4% to 15.1% in 2018–2023), while RUONIA's growth was more constrained (from 7.1% to 9.8%). Over the last few years, the refinancing rates (key rates) in national currencies of the countries under review have moved in mixed directions. The key rates set by central banks have been cut only in Belarus and Tajikistan, while in the other countries, especially in Kazakhstan and Kyrgyzstan, they have been hiked.

In recent years, the EFSD member states have seen a decline in the share of obligations with floating charges in domestic public debt. For example, Belarus discontinued the issue of EURIBOR-linked domestic debt obligations at the end of 2016, and renewed the issue of BYN-denominated fixed-income obligations in 2022. In Kazakhstan, most MEUZKAMs[12] have been replaced with long-term fixed-rate obligations. At the same time, in 2022 Kazakhstan completed a debut issue of TONIA-linked debt obligations (METIKAMs). Tajikistan's only FRN issue was redeemed in 2021. Russia was the only EFSD member state to report a significant increase in the share of both floating rate and inflation-indexed obligations (from 25.6% to 44.2% of domestic public debt in 2018–2023).

[11] With the exception of Tajikistan, which in 2021 repaid the only FRNs whose coupon rate was linked to the inflation rate (about 2% of domestic national debt).

[12] Liabilities with fixed principal and an inflation-indexed floating rate.

Figure 4. Changes in the Key National Currency Reference and Base Rates in the Countries Under Review, annual averages, %



Source: CBR, NBRB, Kazakhstan Stock Exchange.

Inflation-indexed bonds were found only in Russia, accounting for 5.8% of the total public debt portfolio (2018 — 3.3%).

Table 4. Potential Impact of Changes in the Key Domestic Reference Rate on Budget Metrics, rate increase by 100 basis points

	Armenia	Belarus	Kazakhstan	Kyrgyzstan	Russia	Tajikistan
Key Reference Rate for FRNs	N/A	NBRB RR	TONIA	N/A	RUONIA	N/A
Increase in Interest Expenses, % of GDP	N/A	0.003	0.008	N/A	0.045	N/A
Increase in Interest Expenses, % of Budget Revenues[13]	N/A	0.006	0.038	N/A	0.131	N/A

Source: authors' calculations based on data published by national ministries of finance.

According to our estimates, the possible future growth of local reference rates will not have any significant effect on the fiscal performance of the EFSD member states (Table 4). In Russia, the effect of a potential RUONIA increase will be limited due to the generally low level of public debt: if the three-month indicator goes up by 100 bp, expenses will increase by a mere 0.05% of GDP. In Kazakhstan, domestic FRNs were implemented only in 2022 and, accordingly, if TONIA goes up by 100 bp, the increase in expenses will be limited to 0.01% of GDP. The least possible

[13] 2023 consolidated budget revenues.

impact is observed in Belarus due to the prevalence of foreign obligations, with a 100 bp NBRB RR increase boosting expenses by 0.003% of GDP.

Other interest rate components do not pose any significant threat to debt sustainability of the EFSD member states either. The share of short-term liabilities (a close equivalent of floating-rate liabilities) does not exceed 1% of the total public debt portfolio in any EFSD member state, with the exception of Armenia (2.7% of total public debt or 6.2% of domestic public debt). In Armenia, the share of short-term obligations has increased manifold, among other reasons due to high sensitivity of the country's term rates structure to changes in macroeconomic variables (for details, see Box 5 in Section 2).

So far, interest rate risk coverage in public debt management strategies of the EFSD member states has been limited. Quantitative targets related to external or domestic FRLs are set in three countries, namely, Armenia, Belarus, and Tajikistan (starting with the latest version of the strategy), while targets related to short-term obligations are set in Armenia and Kyrgyzstan.

Armenia's public debt management strategy has the most comprehensive of all possible covenant systems. Tajikistan's strategy implies having the ability to ensure almost twofold growth of the FRL portfolio despite the fact that its current costs are several times higher than those associated with soft financing facilities. Kyrgyzstan's strategy restricts the minimum grant element due to access to concessional facilities, but FRL buildup continues.

More detailed information on each country under review is presented in the Annex.

2. Potential Uses of Floating-Rate and Inflation-Indexed Liabilities

Based on the information and analyses presented in Section 1 and in the Annex, we conclude that, in the EFSD member states, the interest rate risk associated with external and domestic debt obligations with floating servicing costs is at a level which makes it possible to preserve public debt sustainability even under the most unfavourable scenario.

On the one hand, this testifies to the existence of a potential for further accumulation of foreign FRLs over the medium term. On the other hand, most EFSD member states are subject to various restrictions on access to international markets for foreign public borrowings (anticipated long-term persistence of high interest rates on FX loans, sanctions-related constraints, high risk premiums, etc.). As a result, the governments of the EFSD member states seek to actively expand their domestic financial markets and introduce new instruments, including those with floating debt servicing costs. In particular, Kazakhstan and Russia generally regard their domestic markets as the main target markets for the placement of public debt.

Based on our review of international best practices as well as our historical analysis of the features of government securities issued by the countries under review and of their public debt management policies, we have identified several possible financial market development paths for those countries.

The countries which already issue obligations with floating debt service and repayment expenses may increase their issuance volumes and security inventories with a view to expanding their domestic financial markets and meeting the needs of individual domestic investor groups.

In particular, the benefits of using FRNs linked to money market indicators have already been demonstrated by Russia and Kazakhstan.[14] In Russia, all five repaid OFZ-PK issues, especially those with the longest maturities, had lower yields[15] than similar fixed-rate instruments (Box 2).

Box 2. Yields of Russian Instruments with Floating Interest Rates and Indexed Principals

By the end of 2023, Russia had five redeemed RUONIA-linked FRN issues (OFZ-PK) and one redeemed IIB issue with a CPI-indexed principal (OFZ-IN). All six issues were characterised by lower funding costs than similar fixed-rate treasuries (Table 2.1).

[14] It is not possible to make a comparative analysis in Belarus, as fixed-rate instruments denominated in the local currency are underrepresented.

[15] Effective yield to maturity (subject to reinvestment of received coupon payments).

Of the OFZ-PK issues, the largest savings (64–193 basis points) were demonstrated by securities with the longest maturities (5–7 years), while three-year issues had narrow spreads vs estimated yields of comparable fixed-rate government securities.[16] In terms of real effective yield,[17] the only repaid OFZ-IN issue (3.07%) also offered significant savings (109 bp) relative to a theoretical GS issue with a fixed coupon rate and a similar term to maturity (4.16%).

Table 2.1. Characteristics of Redeemed OFZ-PK and OFZ-IN Issues

GS	Date of Issue	Maturity, years	Price at Issue,[18] %	Quoted Margin, pp	Effective Yield to Maturity, % (A)	Estimated Effective YtM of a Fixed-Rate GS, % (B)	Yield Spread, pp (A-B)
OFZ-PK							
OFZ 24018	28.01.15	3	94.05	0.74	15.09	15.41	–0.32
OFZ 24019	30.11.16	3	101.66	0.3	8.35	8.84	–0.49
OFZ 29011	28.01.15	5	93.59	0.97	12.91	14.84	–1.93
OFZ 24020	21.08.19	3	100.18	0	6.83	6.96	–0.13
OFZ 29012	30.11.16	7	100.02	0.4	8.22	8.86	–0.64
OFZ-IN							
OFZ 52001	17.07.15 [19]	10	97.91	N/A	8.75	N/A[20]	N/A

Source: MinFin RF, MOEX, authors' calculations.

It should be noted that, prior to 2019, OFZ-PK issues were characterised by an additional quoted margin to RUONIA, which varied by maturity (ranging from 0.4 pp to 1.6 pp), and a semiannual coupon rate that was calculated with a six-months lag.[21] After 2019, the additional premium was canceled, while coupon payments were made instead on a quarterly basis, and coupon income was calculated with a minimum lag. As a result, estimated quoted margins turned out to be far lower than actual quoted margins on past issues, in some cases coming close to zero (Table 2.2).

16 Par yield measured on the basis of the MOEX zero coupon yield curve.

17 The nominal effective yield on OFZ-INs was also lower, and amounted to 9.06% (fixed-rate OFZ: 9.96%). Due to the higher duration, a par value comparison with a fixed-rate government security will produce biased estimates.

18 The average-weighted auction price during the first post-issue month is shown here. In reality, the average-weighted price for all auctions held in 2015 was considerably higher (OFZ 24018: 98.45%; OFZ 29011: 97.53%), but the additional issuance period could last for more than one year.

19 The date of issue and the date of the first successful auction (14.10.2015) for OFZ-INs are different; the date of the first successful issue is used in yield calculations as the agreement date.

20 Due to higher duration, a par value comparison with a fixed-rate government security will produce biased estimates. The text shows real yield differences.

21 Example: with a coupon accrued in December 2023, the RUONIA calculation period could be January–June 2023.

Table 2.2. OFZ-PK Premiums

OFZ	Repayment Date	Market Price as of 29.12.2023	Actual Quoted Margin to RUONIA	Estimated Quoted Margin to RUONIA[22]
OFZ 24021	24.04.2024	99.9	0	0.31
OFZ 29013	18.09.2030	98.6	0	0.21
OFZ 29014	25.03.2026	100.036	0	–0.02
OFZ 29015	18.10.2028	99.818	0	0.04
OFZ 29016	23.12.2026	100.23	0	–0.08
OFZ 29017	25.08.2032	99.292	0	0.08
OFZ 29018	26.11.2031	99.34	0	0.08
OFZ 29019	18.07.2029	99.538	0	0.08
OFZ 29020	22.09.2027	99.94	0	0.02
OFZ 29006	29.01.2025	100.392	1.2	0.84
OFZ 29007	03.03.2027	100.24	1.3	1.22
OFZ 29008	03.10.2029	101.917	1.4	1.07
OFZ 29009	05.05.2032	103.305	1.5	1.10
OFZ 29010	06.12.2034	104.206	1.6	1.22

Source: MinFin RF, MOEX, authors' calculations.

Kazakhstan also demonstrated that it is possible to reduce borrowing costs for government securities with relatively long maturities by issuing METIKAMs, although the costs associated with outstanding medium-term maturity METIKAMs will probably prove to be higher than those for comparable fixed-rate instruments (Box 3).

Box 3. Yields of Floating-Rate Instruments in the Republic of Kazakhstan

The portfolio of Kazakhstan's outstanding domestic obligations contains two floating-rate instruments: (1) METIKAMs with the rate linked to the TONIA money market indicator; and (2) MEUZKAMs with the rate linked to CPI.

METIKAMs were first issued in August 2022. At the end of 2023, there were six outstanding issues with maturities ranging from three to eight years. A comparative analysis of the six outstanding METIKAM issues shows that only the issues with the shortest maturities will most probably be more expensive than comparable fixed-rate government securities[23] (Table 3.1). The three-year METIKAM issue will require a reduction of TONIA to approximately 4.7% in 2025, while for the four-year issue TONIA will need to be reduced to the 2018–2019 average values. Taking into consideration historical TONIA values and the NBRK's 5% mid-term inflation target, it is more likely that long-term issues will have yields below those of comparable fixed-rate government securities (see Figure below).

[22] Estimated discount margin to reduce the market price to par value.

[23] With similar dates of issue and maturities. In the absence of a comparable GS, we used a GS with a similar date of issue, and adjusted its effective yield to account for the difference in maturity by using forward rates obtained with the Nelson-Siegel parametric model (with Kazakhstan Stock Exchange data used as design parameters).

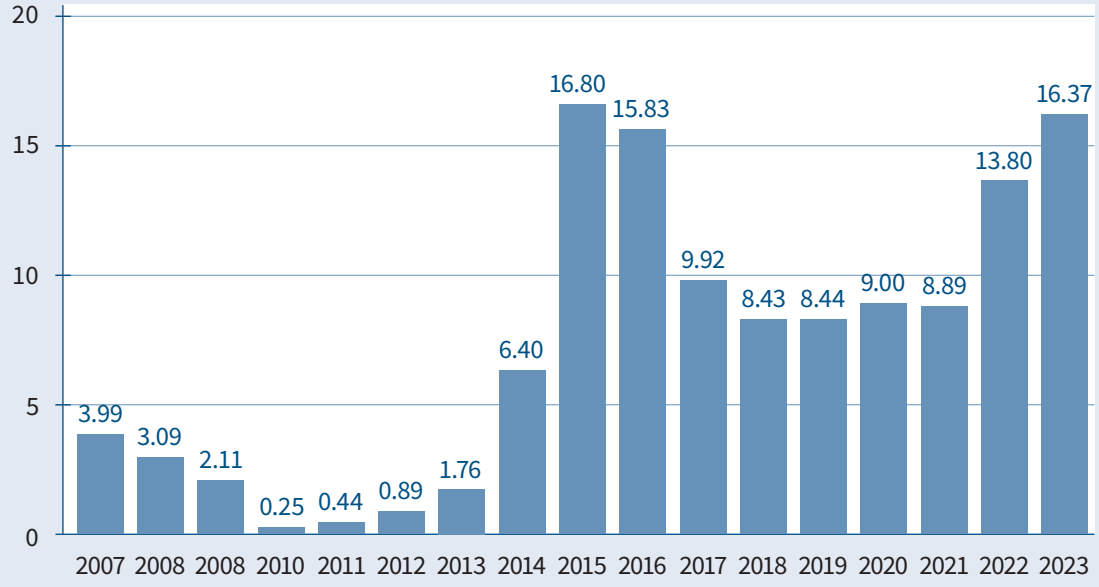
Table 3.1. Estimated METIKAM Yields to Maturity[24]

GS	Date of Issue	Maturity, years	Price at Issue, %	Quoted Margin, pp	Estimated Effective Yield to Date,[25] %	Estimated Effective YtM of a Fixed-Rate GS, %	Estimated Forward TONIA, % (excl. margin)
MTM036_0001	05.08.22	3	99.99	0.75	17.4	13.9 (A)	4.7
MTM048_0001	09.09.22	4	N/A[26]	0.85	17.5	14.4 (A)	8.4
MTM060_0001	14.10.22	5	N/A	1.0	17.7	13.6 (A)	8.6
MTM072_0001	18.11.22	6	99.97	1.2	17.9	13.2 (NSM)	8.4
MTM084_0001	04.03.23	7	N/A	1.3	18.1	13.4 (A)	9.4
MTM096_0001	13.01.23	8	N/A	1.4	18.0	12.4 (NSM)	8.9

Note: A = actual data for the fixed-rate issue, NSM = estimated data adjusted for the term rate structure (Nelson-Siegel model)

Source: NBRK, Kazakhstan Stock Exchange, authors' calculations.

Figure. Average Annual TONIA Values, %



Source: Kazakhstan Stock Exchange.

[24] The following GS issues were used for comparison: MTM036_0001 — MOM036_0092, MTM048_0001 — MOM048_0054, MTM060_0001 — MOM060_0054, and MTM084_0001 — MUM096_0014.

[25] Effective yield to date (at the time of the latest actual coupon payment in 2023–2024), assuming that the GS was purchased during primary placement at the average-weighted issue price.

[26] Assumed to be equal to 99.9%.

The outcomes of the latest fixed-income GS issues[27] also demonstrate potential savings from the use of METIKAMs. We selected seven issues with objectively inflated yields, namely, issues with the largest deviation of actual yields from the GS yield curve (Table 3.2). For three issues with maturities of 8–10 years, we observed the opportunity to reduce the effective yield by substituting a fixed rate with a floating rate. In particular, the substitution of nine-year GSs with METIKAMs may be an efficient solution if average annual TONIA values in 2025–2032 are expected to remain below 11.7% (which is equivalent to an annual reduction of 0.9 pp).

Table 3.2. Potential Substitution of Fixed-Rate Government Securities with FRNs (METIKAMs)

GS	Date of Issue	Maturity, years	Price at Issue, %	Rate, %	Effective Yield to Maturity, %	Deviation from Par Yield Curve[28], pp	Estimated Forward TONIA, % (excl. quoted margin)
MUM108_0014	19.05.23	9	101.55	14	13.7	2.45	11.7
MUM096_0013	04.02.22	8	90.0	11	13.1	2.51	9.3
MUM096_0012	28.07.21	8	90.48	10.55	12.5	2.27	8.1
MUM072_0013	19.05.21	6	90.65	10.4	12.7	2.34	7.2
MUM084_0018	12.04.21	7	90.94	10.4	12.4	2.33	7.7
MUM120_0019	17.03.21	10	87.4	10.3	12.6	2.4	9.1

Source: NBRK, Kazakhstan Stock Exchange, authors' calculations.

A comparative analysis of yields of several MEUZKAM issues (Table 3.3) shows that most of them were significantly more costly than government securities with a fixed coupon rate and similar maturity. Only for the 2009 issues (with CPI reaching its peak value of 17.1% in 2008), were effective yields to maturity (8.01–8.07%) comparable to YTM values reported for 15-year fixed-rate GSs (7.81%). Despite their higher yields, most investors have limited access to primary placements, and more than 95% of all MEUZKAMs are owned by JSC Integrated Accumulative Pension Fund of Kazakhstan. In other words, higher yields were offset by a reduction in budget transfers to the state pension fund.

[27] We examined issues starting from 2020 due to the introduction of a new TONIA measurement methodology in 2020 and the publication of parameters used to analyze the term structure of interest rates since 2020.
[28] In the month of primary placement.

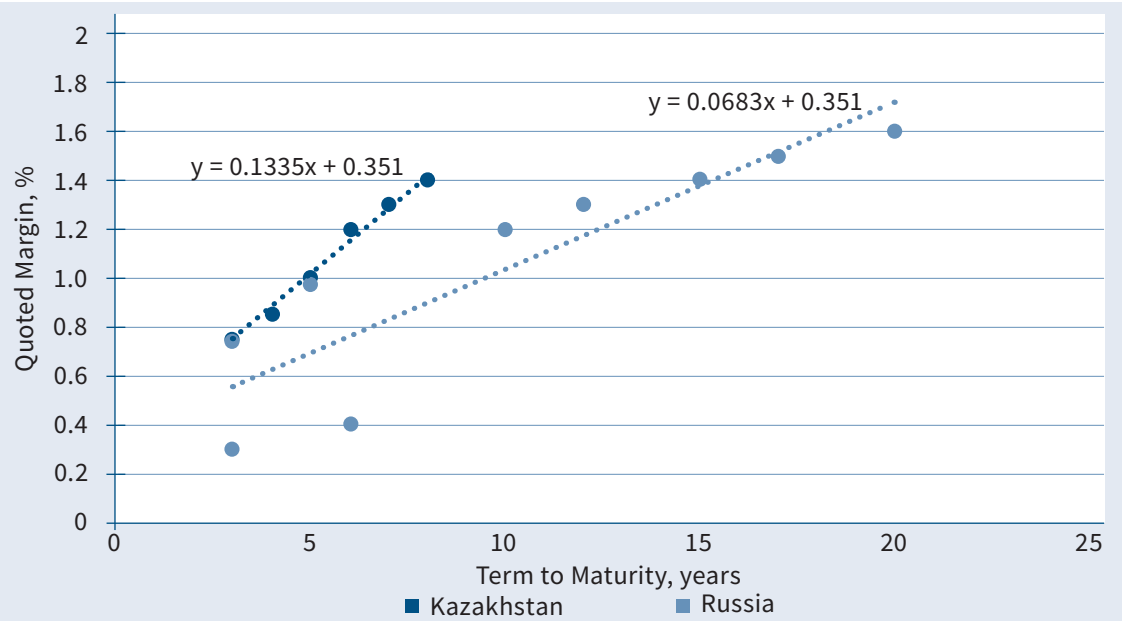
Table 3.3. Indicators of Selected MEUZKAM Issues[29]

GS	Date of Issue	Maturity, years	Price at Issue, %	Effective Yield to Maturity (A)	Effective Yield of Comparable Fixed-Rate GSs (B)	Yield Spread (A–B)
MUJ192_0001	30.03.09	16	100.6	8.01	N/A	N/A
MUJ204_0002	30.07.09	17	99.7	8.07	N/A	N/A
MUJ192_0003	28.05.10	16	102.3	7.88	5.6	2.28
MUJ180_0007	28.10.10	15	99.5	8.22	5.6	2.62
MUJ168_0004	29.03.12	14	103.3	8.11	5.5	2.61
MUJ156_0003	27.04.12	13	97.8	8.73	N/A	N/A
MUJ168_0005	28.08.12	14	101.4	8.30	6.61	1.69
MUJ156_0004	30.09.13	13	99.0	8.98	6.56	2.42

Source: NBRK, Kazakhstan Stock Exchange, authors' calculations.

As regards the pricing of 3–5-year FRNs, Kazakhstan could consider the possibility of discontinuing the use of the additional quoted margin (especially during those years when TONIA reaches local highs), including through a transition to setting quarterly (currently semiannual) coupon rates. The example of Russia shows that such a transition, combined with the cancelation of the quoted margin, produced no adverse impact on OFZ-PK yields regardless of maturity (Box 2). Kazakhstan could also modify the procedure it uses to set premiums for long-term METIKAMs, taking into consideration the extensive gap between the differentials of Russia's and Kazakhstan's premium/maturity function (Figure 5).

Figure 5. Quoted Margin to the Reference Rate Depending on the Floating-Rate Issue Maturity

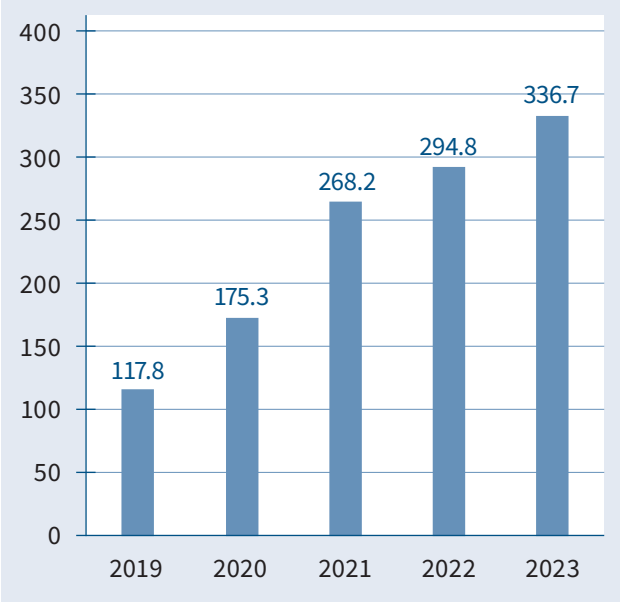


Source: MinFin RK, MinFin RF, authors' calculations.

[29] Issues were selected subject to the availability of primary offer pricing data required to measure effective yields.

Alongside the more extensive use of long-term FRNs, one more relevant option for Russia and Kazakhstan is to issue half-year and one-year treasuries with a floating rate. Such short-term FRNs will be sought primarily by money market funds investing their unitholders' money in short-term assets with superior liquidity.[30] Over the last few years, the value of assets managed by unit investment funds (UIFs) in Russia and Kazakhstan has increased exponentially (Figures 6 and 7). In addition, during tight monetary policy periods, differentiation of short-term instruments may reduce the yield curve inversion by cutting T-bill liquidity premiums.

Figure 6. Net Assets of Kazakhstan's UIFs, KZT billions

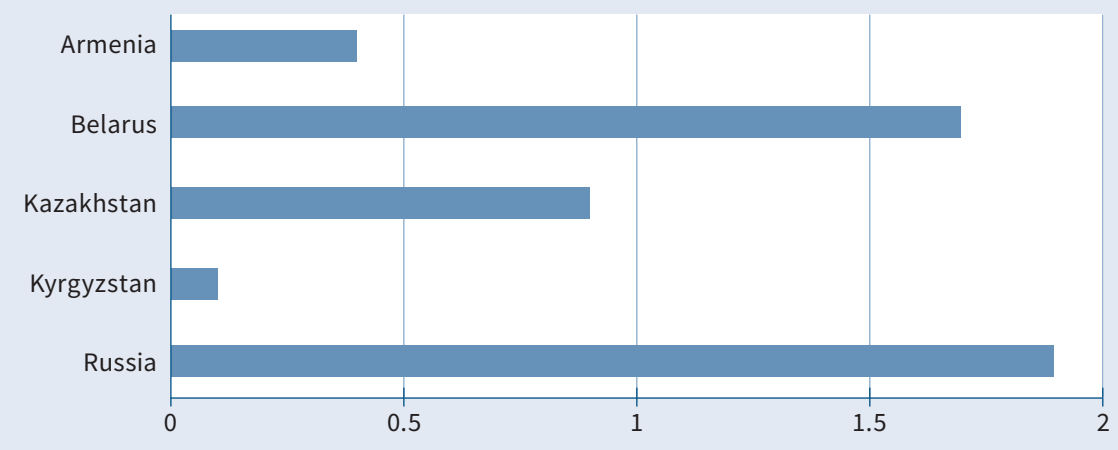


Source: NBRK.

Figure 7. Net Assets of Russia's UIFs, RUB trillions

Source: CBR.

Figure 8. Insurance Reserves in 2023, % of GDP



Source: authors' calculations.

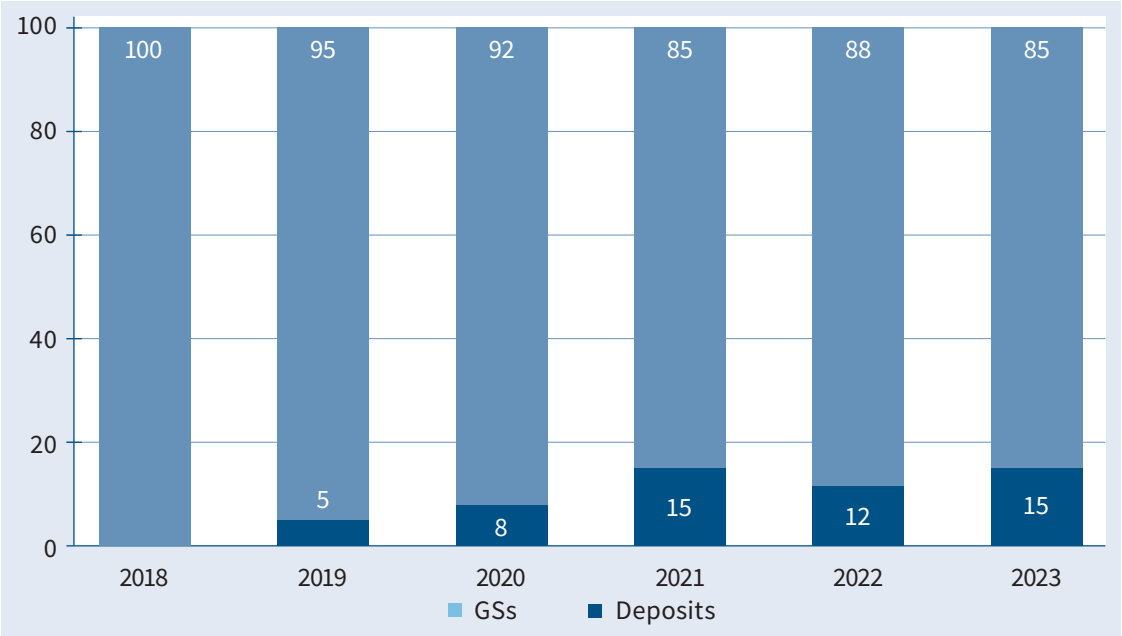
[30] According to a series of surveys conducted by the US Government Accountability Office (GAO, 2014).

In addition to UIFs, considerable demand may be generated by insurance companies, in particular in Russia, Belarus, and Kazakhstan, taking into consideration the scope of their reserves (Figure 8). Currently, insurance companies are scaling down their investments in government securities because of mark-to-market accounting requirements, and increasingly often resort to floating-rate deposit auctions, whereas FRN prices are not sensitive to money market rate fluctuations due to their virtually zero duration.

In addition to the larger economies, ample opportunities to reduce borrowing costs and extend domestic portfolio maturities are available for Kyrgyzstan and Armenia. In Kyrgyzstan, the use of FRNs could result in a substantial reduction of borrowing costs (Box 4), including through massive cuts of the discounts currently offered at the time of the GS placement.

Besides, a substantial portion of FRNs could be acquired by the Social Fund of the Kyrgyz Republic, which over the last few years has been increasing its participation in deposit auctions due to the negative current real yield of GSs (Figure 9).

Figure 9. Structure of Invested Assets of the Social Fund of the Kyrgyz Republic , %



Source: National Bank of the Kyrgyz Republic.

Box 4. Potential Savings from the Issue of Domestic FRNs by the Kyrgyz Republic in 2021–2023.

One of the salient features of Kyrgyzstan's treasury bonds is that they have a significantly higher duration due to the fact that many payments are postponed until the redemption date. The coupon rate offered on medium- and long-term government treasury bonds has remained unchanged over a long period of time, even during shock periods, and, accordingly, the bonds are initially issued with a discount of 10–30%, sometimes more. For example, the interest rate on 10-year bonds has remained at 8% p.a. since 2019 (Table 4.1), even though the average-weighted price at initial placement has been characterised by high volatility (64–80% of the face value).

The substantial discount during the initial placement of fixed-yield government treasury bonds makes them similar to bonds with an inflation-indexed principal. As a result, the government treasury bond yield includes an additional liquidity premium, as most investors, constrained by their own portfolio limits, cannot acquire too many assets with long durations and interest payments at rates below the key rate.

Table 4.1. Indicators of 10y Treasury Bond Issues

Year of Issue	Rate, %	Price at Issue, %	Yield to Maturity (weighed average), %
2023	8.0	64	15.3
2022	8.0	64	15.3
2021	8.0	80	11.4
2020	8.0	80	11.5
2019	8.0	70	13.5
2018	10.7	75	15.6
2017	12.0	71	18.5

Source: National Bank of the Kyrgyz Republic, authors' calculations.

In March 2022, the key rate hit a 15-year high at 14% (2010–2020 average: 6.4%; 2021: 8%). With the key rate reaching record-breaking levels in 2021–2022, the government preferred to issue long-term fixed-yield securities. 15-year and 20-year securities with average-weighted yields of 13–14% (government treasury bills: 7.2%) were issued for the first time in 2021. In 2022, 7-year (29%) and 10-year (38%) securities with yields of 15%+ (government treasury bills: 8.3%) accounted for more than 2/3 of the total offerings.

Taking into consideration the possibility of the key rate returning to the levels recorded in the 2010s, one of the ways to save on future expenses may have been the issue in 2021–2022 of floating-rate liabilities, including liabilities with reduced liquidity premiums.

Historical data for 5-year government treasury bonds demonstrate that fixed-yield government securities were characterised not only by high real yields (Table 4.2), but also by significant yield volatility (from 2014 to 2017). To get similar yields on liabilities with floating rates (linked to NBKR rates), it would be necessary to maintain the quoted margin at an extremely low level of 9–14% (no such precedents were found anywhere in the world).

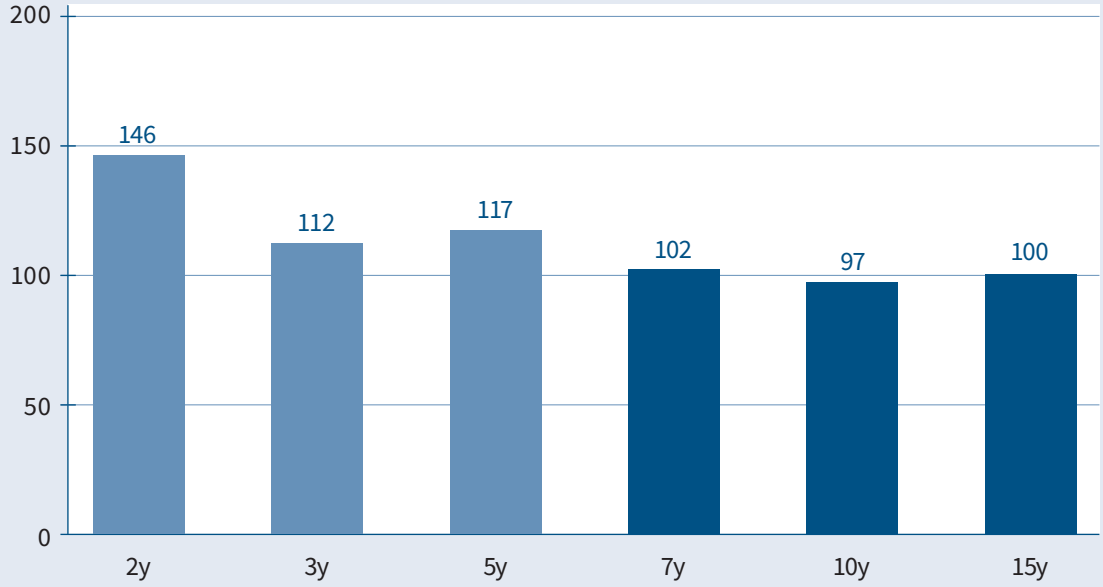
Besides, increasing the share of FRLs would reduce public debt, as the absence of a discount would decrease the amount of borrowings. FRLs are usually issued at a price that is very close to the face value. In Kyrgyzstan, the issue can have an extra margin considering the existing demand and supply imbalances (see Figure below). The highest demand was observed for two-year bonds which produce smaller cash flow imbalances than high-yield long-term issues.

Table 4.2. Yields on 5-Year Government Treasury Bonds at Initial Placement

		2014	2015	2016	2017
Fixed-Rate Securities (Actuals)	Price at Issue, %	82.4	88	84.6	88.1
	Average Nominal Coupon Rate, %	14	14	14	11.5
	Average Nominal Yield (A), %	19.9	17.8	18.9	15.1
	Average Real Yield (B), %	16.6	15.3	14.2	8.6
Floating-Rate Securities (Estimates), linked to NBKR rate[31]	Price at Issue, %	100	100	100	100
	NBKR policy rate per placement year, %	10.5	10	5	5
	Quoted Margin to Obtain Nominal Yield (A), pp	13.6	13	13.8	8.6
	Quoted Margin to Obtain Real Yield (B), pp	13.7	13	13.7	8.6

Source: National Bank of the Kyrgyz Republic, authors' calculations.

Figure. Average-Weighted Demand/Supply Ratio at Initial Placement in 2022, % (>100% = demand exceeded supply)



Source: National Bank of the Kyrgyz Republic, authors' calculations.

In Armenia, the term structure of interest rates is also highly sensitive to even minute changes in macroeconomic parameters, enabling the country to achieve significant savings, including through the use of mid-term FRNs issued during the years marked by local money market rate highs.

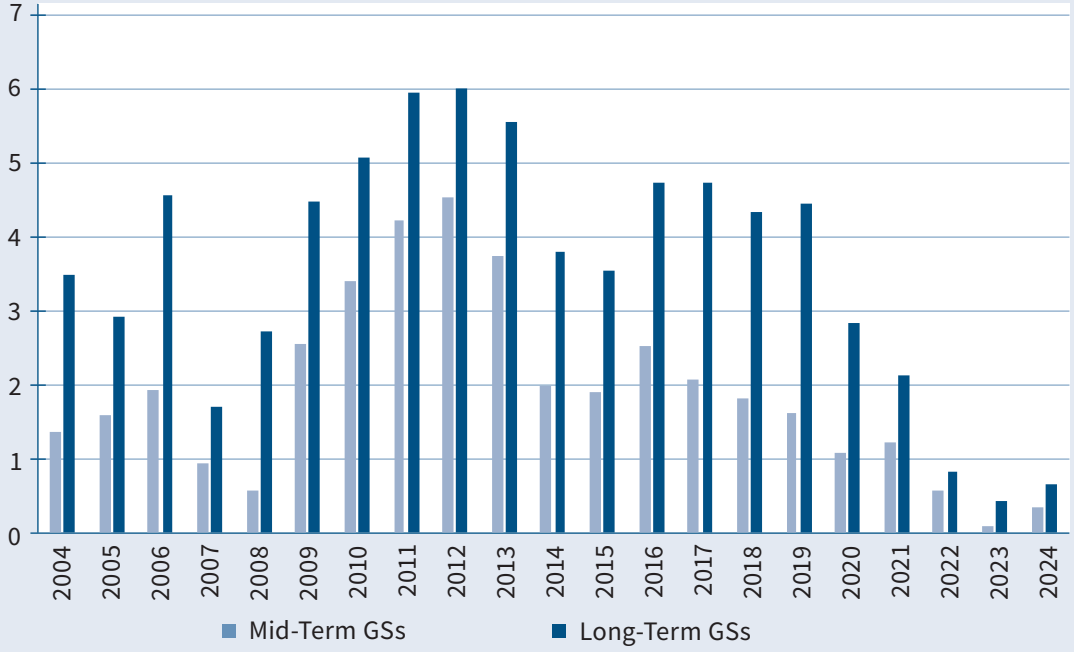
[31] Interbank lending in the national currency is not widespread, only 7 transactions were conducted in 2018-2023.

Box 5. Potential FRN Uses in the Republic of Armenia

Over the last few years Armenia has been expanding its domestic debt portfolio at a very high rate (just like Kyrgyzstan). One of the reasons for that is limited access to external soft loans resulting from the country's transition to the upper middle-income group. With interest rates on foreign commercial loans remaining at two-decade highs, we can expect Armenia to expand its domestic GS portfolio in the medium term.

Such an expansion will necessitate an increase in the portfolio's overall maturity to mitigate refinancing and liquidity risks; that increase, however, will be hampered by the extremely high volatility of mid- and long-term GS yields.[32] Even the slightest changes in the monetary environment or key macroeconomic variables often lead to a massive widening of spreads between yields of securities with different maturities. For example, two dramatic depreciations of the national currency that occurred in 2009 and 2016 provoked an exponential growth of yield spreads between government securities with different maturities (Figure 5.1).

Figure 5.1. Yield Spreads to Short-Term Government Securities at Initial Placement, p.p.

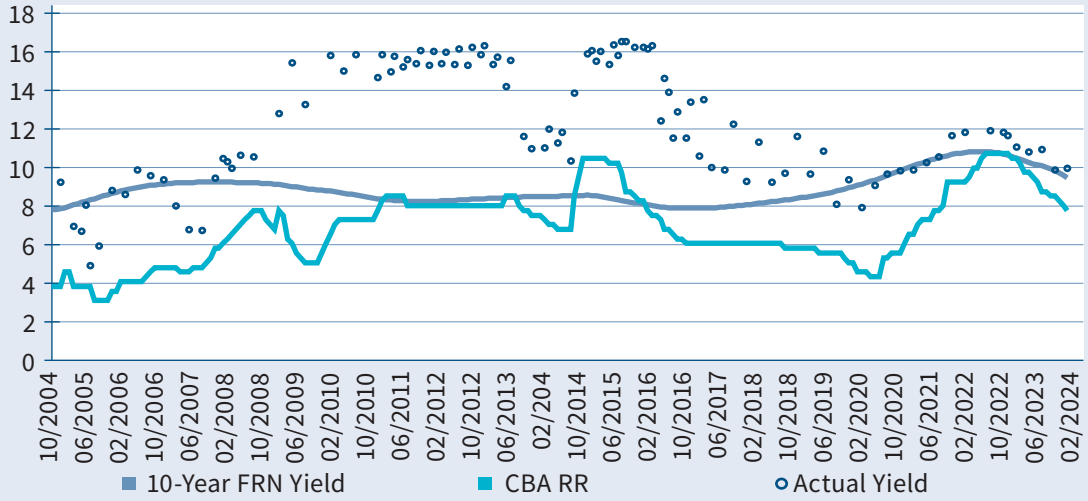


Source: CBA, authors' calculations.

An analysis of previous GS issues shows that Armenia enjoys higher potential for reducing yields and cost volatility during periods of mounting uncertainty in the financial markets than the other countries under review. In addition to possible savings on long-term FRNs (Figure 5.2) during tight monetary policy periods, Armenia has demonstrated an ability to reduce the funding costs of mid-term government securities issued even during those years when the key rate reached local highs. Thus, assuming there is no quoted margin, FRN holding costs for 77% of mid-term government securities issued in 2000–2019 would be lower by 3.7 pp on average, while yields on the remaining 23% of such issues would increase by 1.3 pp on average (Figure 5.3).

[32] Among those countries which have access to capital markets (Armenia, Belarus, Kazakhstan, and Russia).

Figure 5.2. Actual Yields of Long-Term Issues at Initial Placement and Estimated Average FRN Yields, %

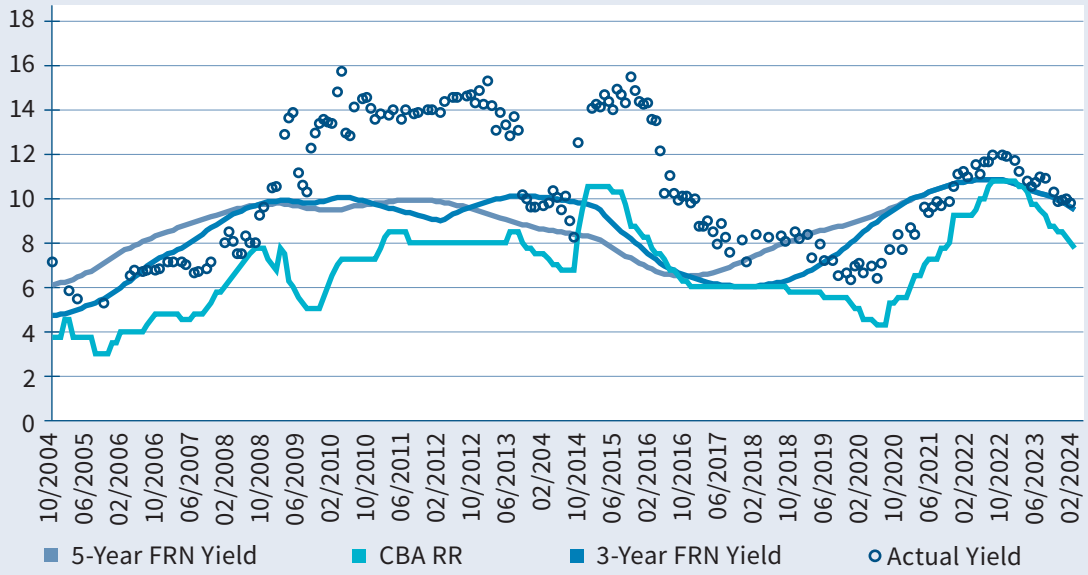


Note: the 10-year FRN yield is defined as the estimated monthly average internal rate of return on 10-year FRNs linked to 364-day T-bills, assuming no premiums or discounts and a six-month coupon rate calculation period.

Source: MinFin RA, CBA, authors' calculations.

The issue of domestic FRNs could potentially not only decrease GS holding costs and their volatility, but also reduce the need for buy-backs carried out at fixed-yield instrument auctions to boost liquidity,[33] as well as subsequently producing a more sustainable interest rate curve for term instruments.

Figure 5.3. Actual Yields of Mid-Term Issues at Initial Placement and Estimated Average FRN Yields, %



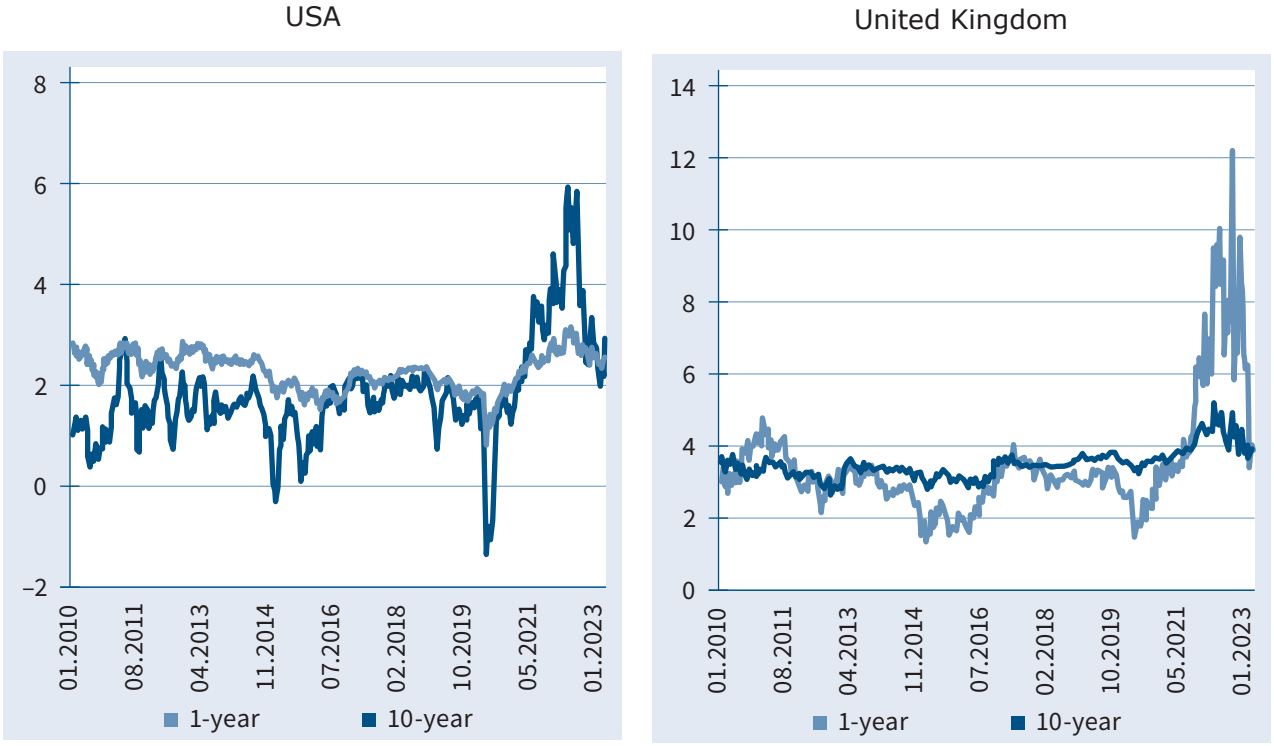
Note: the 5-year FRN yield is defined as the estimated monthly average internal rate of return on 5-year FRNs linked to 364-day T-bills, assuming no premiums or discounts and a six-month coupon rate calculation period.

Source: MinFin RA, CBA, authors' calculations.

[33] About 20–30% of buy-backs are carried out by the government to boost market liquidity (Ministry of Finance of Armenia, 2023).

Over the longer-term, Armenia may consider one-off FRN issues linked to real sector reference rates (similar, for example, to the Italian BTP Futura[34]) taking into account the impressive rates of economic growth achieved by the country over the last few years (in 2019–2023, Armenia on three occasions was among the world's top 10 countries by GDP growth rate[35]). The main advantage of such an instrument is its ability to mitigate the risk to the country's debt sustainability due to the smaller difference between budget revenue and expenditure flows.

Figure 10. Inflation Swap Prices, p.p.



Source: Bahaj et al., 2023.

The countries under review also have the potential to increase their portfolio maturities and reduce real domestic portfolio yields through the issue of government securities with inflation-indexed principal amounts. In 2020–2022, CPI volatility should have encouraged demand for instruments used to hedge inflation risks, as occurred in developed countries (Figure 10). In such conditions, investors would normally agree to lower real yields in exchange for protection from inflation.[36] Besides, the example of Russia demonstrated that IIBs can produce savings in terms not only of real yields, but also of nominal effective yields (Box 2).

Inasmuch as IIBs are purchased primarily by pension funds seeking to preserve the value of their assets, the long-term potential for their issuance exists in Armenia, Belarus, Kazakhstan, and Russia (Figure 11). In particular, about 95% of previously issued METIKAMs (with CPI-linked interest rates) were held by Kazakhstan's state pension fund.

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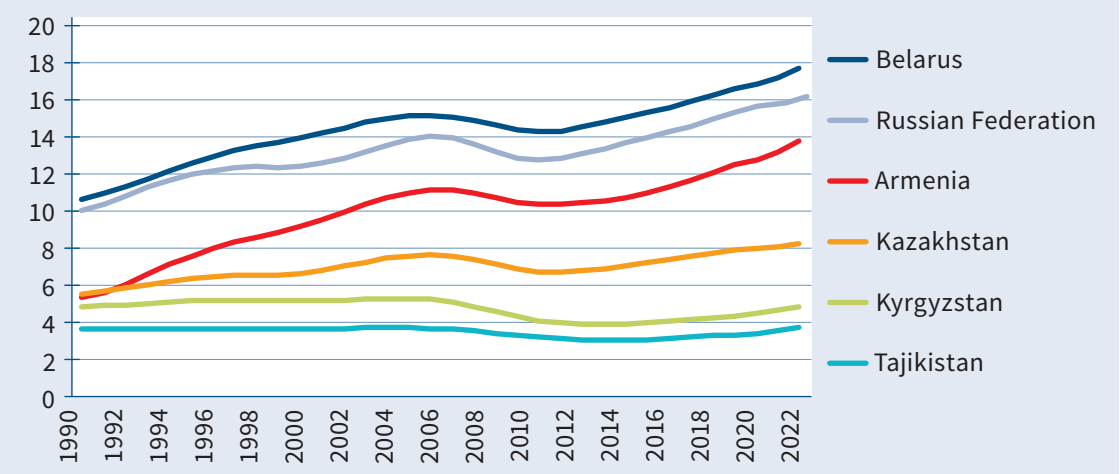
[34] https://www.dt.mef.gov.it/en/debito_pubblico/titoli_di_stato/quali_sono_titoli/btp_futura/

[35] In 2019 Armenia had the world's 8th highest economic growth rate, in 2022 and 2023 — the 8th and the 3rd highest rates, respectively (World Bank).

[36] Although in most countries initial issues may feature relatively high premiums due the absence of an established market.

For Russia, the IIB issuance potential is additionally supported by the demand (that started to emerge in 2022) for instruments preserving the dollar value of capital, as a continuation of replacement government securities.[37] For example, by the end of the 1990s, more than 90% of public debt securities in Brazil, a country that had survived several periods of hyperinflation, featured interest rates linked to exchange rate changes; however, by the end of 2010, the issuance of IIBs made it possible to replace almost all exchange rate-indexed obligations without losing foreign investors (Reinhart and Sbrancia, 2011). The main obstacle in the way of using IIBs as an exchange rate risk hedging instrument in Russia is the tax on principal amount adjustments[38], whereas no similar IIB taxation is applied in many other countries (example: Korean KTBi[39]). In the absence of similar derivative instruments in the Russian market, the real rate could be offered at a minimum value by designing correct instrument specifications.

Figure 11. Share of the Population Aged 65+, %



Source: CEIC.

To involve large investors in IIB purchases, it may be necessary to enable their accounting at par value. The simplest solution is to issue IIBs through banking intermediaries without listing those securities on stock exchanges (examples: Series I savings bonds in the USA[40] or Schuldschein in Germany[41]). In the longer term, changes to the local accounting system or financial engineering may be the solution, for example, an equivalent of STRIPS[42], an instrument where the principal of a government security is separated from coupon payments for trading and accounting purposes.

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37 Replacement government securities do not fully meet the requirements to preserve dollar capital, as the ruble (rather than the dollar) is used as the accounting currency for the difference between sale and purchase prices.

38 Pursuant to Letter of the Ministry of Finance of the Russian Federation No. 03-03-10/40395 dated July 14, 2015, income arising from the indexation of OFZ-IN to par value is recognised as interest income, and is subject to taxation (in particular, legal entities pay profit tax at the rate of 15%).

39 https://ktb.moef.go.kr/eng/abtKtbs.do

40 https://www.treasurydirect.gov/savings-bonds/i-bonds/

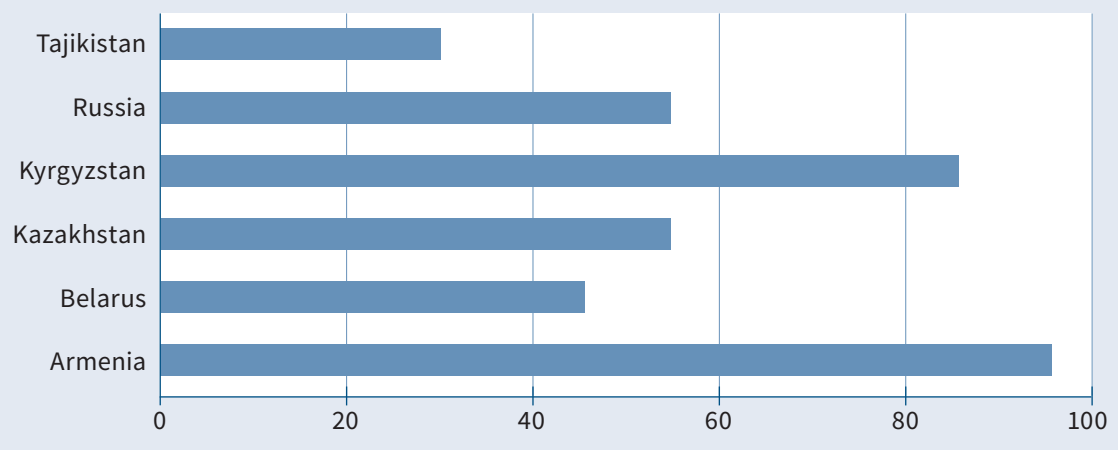
41 https://www.debtagency.be/en/productschuldscheineinfo

42 The instrument has a limited role in public debt management in Belgium, the Netherlands, and the USA, and is used by commercial entities in a number of developed countries (including Austria, France, Germany, Italy, Spain, and the Czech Republic).

Kazakhstan and Belarus could consider issuing IIBs to estimate the inflationary expectations of market players, as was previously done by Russia (Ministry of Finance of Russia, 2022).

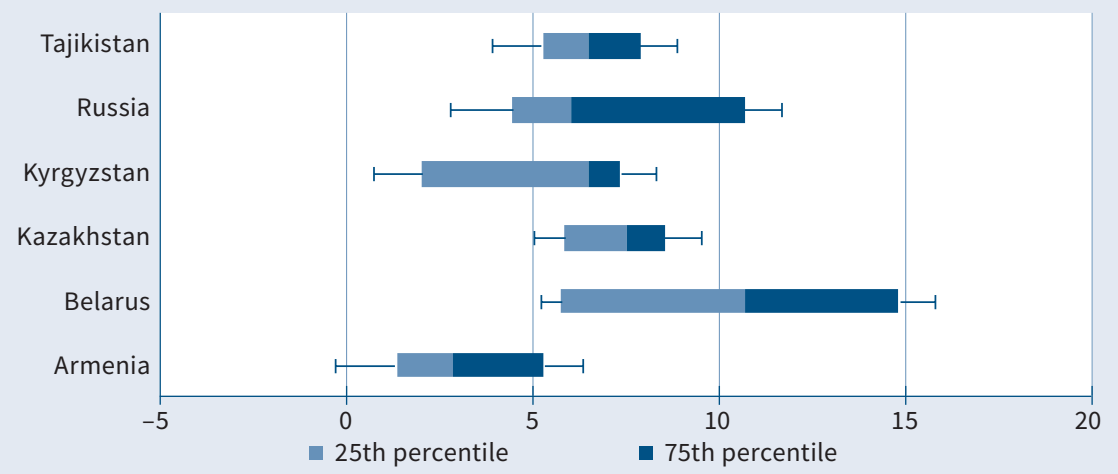
The issue of domestic IIBs can be relevant for Kyrgyzstan and Armenia due to high price volatility (Figure 12). Besides, the level of involvement of non-residents in initial placements in Armenia and Kyrgyzstan is low, whereas the issue of obligations with inflation-indexed principals creates an alternative to foreign exchange instruments capable of attracting foreign investors (National Treasury of Brazil, 2001; Danmarks Nationalbank, 2021). Despite Armenia's rather low average annual inflation rate (Figure 13), occasional and short-lived inflation surges give rise to hypothetical yields which are, on average, several times higher than those offered by large exchange-traded funds and indices specialising in sovereign inflation-indexed bonds in emerging markets (Figure 14).

Figure 12. CPI Variation in 2014–2023, % of the average



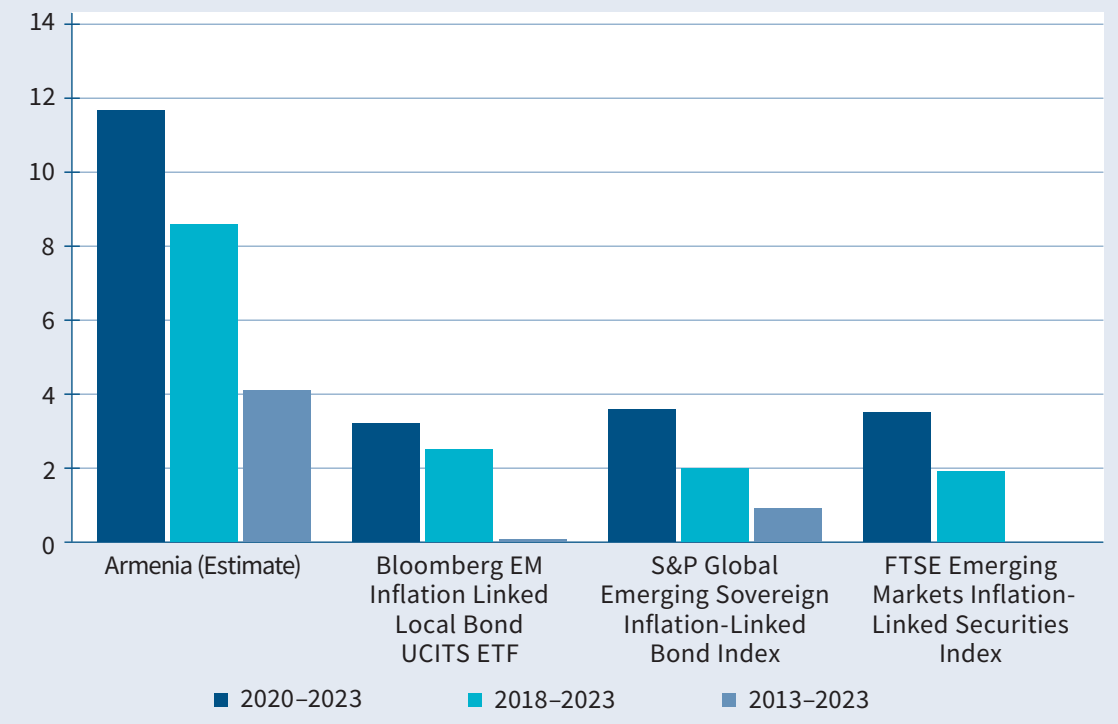
Source: CEIC, authors' calculations.

Figure 13. Distribution of Average Annual Inflation in 2014–2023, %



Source: CEIC, authors' calculations.

Figure 14. Average Annual USD Yields of Major ETFs and Indices Specialising in Sovereign Inflation-Indexed GSs in Emerging Markets, %



Source: Bloomberg, S&P, FTSE Russell, authors' calculations.

Conclusion

An analysis of interest rate risk in the countries under review shows that the risk associated with external floating-rate obligations is at a level that makes it possible to preserve public debt sustainability even under the most adverse scenario. The risk that extensive use of floating-rate loans and borrowings will trigger exponential growth of the effective interest rate of external debt portfolios was noted only in countries with access to concessional facilities, namely, Kyrgyzstan and Tajikistan. External publicly guaranteed debt carries no significant rate structure risks either.

An examination of domestic debt portfolios has shown that most countries under review (with the exception of Tajikistan[43]) can significantly reduce their debt service expenses and mitigate debt sustainability risks by using domestic FRNs and IIBs with varying maturities. In addition, extensive application of FRNs and IIBs could facilitate the implementation of plans to enhance and diversify the inventory of instruments used in the domestic financial market.

Considering the benefits associated with the issue of various domestic instruments with floating debt servicing costs, it would be advisable for the bodies responsible for the development and implementation of debt management policies to (1) undertake an in-depth review of such instruments (potential savings and costs, emerging opportunities and risks), and of their compliance with current government and central bank policies, and (2) conduct a survey among domestic market players to measure their interest and willingness to participate in setting the key parameters of such instruments.

Taking into consideration the recent trends, the EFSD member states need to implement a robust interest rate risk monitoring and management system to maintain their debt sustainability in an environment characterised by high FX interest rates and further accumulation of floating-charge liabilities (including in the domestic market). The key principles governing interest rate risk management need to be embedded in public debt management strategies. It is also important to ensure that the interest rate risk monitoring and management system is fully automated, and employs a model-based approach, minimising human error to determine the optimal portfolio structure and select the best available sovereign debt financing instruments.

[43] It is recommended that Tajikistan retain its focus on offering arm's-length T-bond terms.

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Annex. Country-Specific Information on Debt Obligations with Floating Service and Repayment Expenses

Republic of Armenia

Over the last five years, the Republic of Armenia has demonstrated the fastest increase in the share of FRLs in its external debt portfolio, and it now has one of the largest external FRL portfolios among the countries under review (Table A1).

Table A1. Interest Rate Risk Indicators of the Sovereign Debt of the Republic of Armenia, EoY

	2018	2023
Share of Short-Term Liabilities (by initial maturity), % (including in external debt)	0.9 (0)	2.7 (0)
Share of Floating-Rate Liabilities (w/o IIBs), % (including in external debt)	17.5 (21.9)	18.2 (33.1)
Share of Liabilities with Inflation-Indexed Principal (IIBs), % (including in external debt)	0 (0)	0 (0)
Direct Public Debt[44], % of GDP (including external debt[45])	54.4 (45.2)	50.0[46] (28.0)

Source: Ministry of Finance of the Republic of Armenia, authors' calculations.

Almost one-third of the country's external debt has consisted of floating-rate liabilities, of which 3/4 have been linked to USD LIBOR (SOFR), and the remaining 1/4 has been linked to EURIBOR. Domestic public debt has no liabilities with floating debt servicing costs. Short-term bills account for less than 3% of total public debt (6.2% of total domestic debt).

Over the last five years, the FRL share in external public debt has increased by about 50%, but the general structure of the debt has remained almost unchanged. As a result of the emerging domestic market bias, the FRL share in total public debt has increased by only 0.7 pp to 18.2%.

[44] Including Central Bank obligations (since the Central Bank obtains loans that are separate from balance of payments support), without taking into account the obligations of local authorities and government-guaranteed debt.

[45] Armenia's public debt obligations are assigned to domestic debt and external debt depending on the resident status of the holder. For example, some Eurobonds are classified as domestic debt because they were redeemed by Armenian residents or organisations. The breakdown by currency is applied accordingly.

[46] In the process of preparing this Working Paper, a second estimate of GDP was published, and as a result, the level of public debt by the end of 2023 changed from 50.0% to 50.7%.

The country's quasi-fiscal obligations consist mostly of sub-lending agreements already included in public debt. Guarantee obligations are less significant at 0.4% of GDP, and include no floating-rate liabilities.

In accordance with the Public Debt Management Strategy for 2024–2026 (Ministry of Finance of Armenia, 2023), the government has stipulated three interest rate risk covenants: (1) the minimum share of fixed-rate liabilities in the total debt portfolio; (2) the share of debt to be refinanced during the current year; and (3) the average time to refinancing. The minimum share of fixed-rate liabilities in total public debt was set at 80%, close to its actual value.

Republic of Belarus

Belarus is one of the three countries under review with the highest share of external FRLs, simultaneously demonstrating the most significant reduction of that indicator over the last few years (Table A2).

Table A2. Interest Rate Risk Indicators of the Sovereign Debt of the Republic of Belarus, EoY

	2018	2023
Share of Short-Term Liabilities (by initial maturity), % (including in external debt)	0 (0)	0.8 (0)
Share of Floating-Rate Liabilities (w/o IIBs), % (including in external debt)	46.3 (44.4)	19.6–29.4[47] (24.5–37.5)
Share of Liabilities with Inflation-Indexed Principal (IIBs), % (including in external debt)	0 (0)	0 (0)
Direct Public Debt[48], % of GDP (including external debt)	38.0 (30.8)	33.2 (24.9)

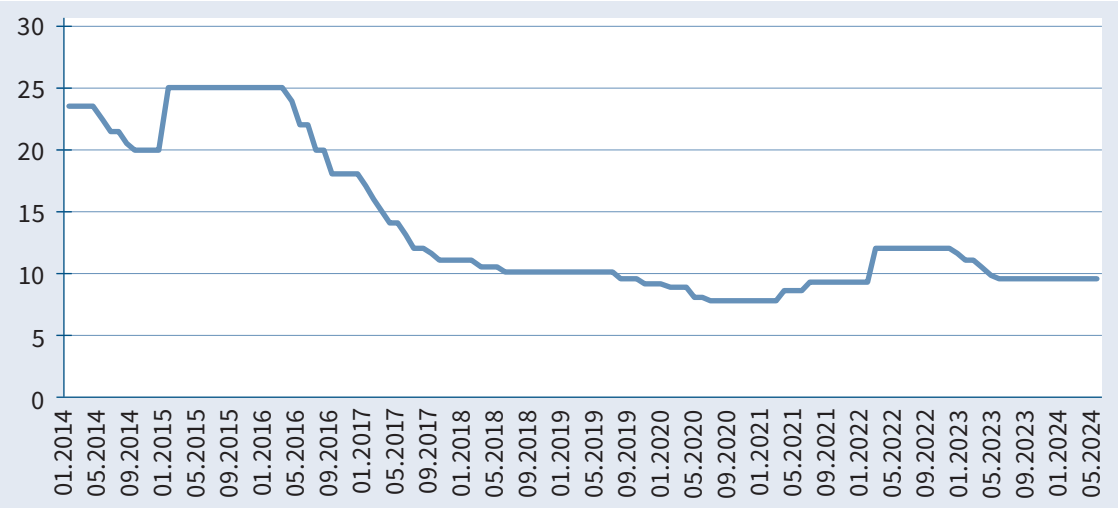
Source: Ministry of Finance of the Republic of Belarus, authors' calculations.

The FRL shares in the country's domestic and external public debt are about 5% and 24–38%, respectively. Inasmuch as external obligations account for a prevailing portfolio share, about one-quarter of the government's debt portfolio is linked to floating indicators. The share of short-term debt does not exceed 1% of the portfolio.

The authors estimate that the government's floating-rate liabilities included in external public debt are characterised by a high concentration of soft currencies, with more than half of total external FRLs linked to Russian OFZ yields, while the remaining FRLs are linked to USD LIBOR (SOFR). All loans linked to USD LIBOR (SOFR) were extended by China; however, over the last few years, borrowing from China has all but stopped. Due to sanctions-related restrictions on foreign borrowing in hard currencies, obligations linked to USD LIBOR (SOFR) are not expected to continue to accumulate over the medium term.

[47] Estimate.
[48] Excluding the obligations of local authorities, the National Bank of the Republic of Belarus and state-guaranteed debt.

Figure A1. NBRB RR, %



Source: National Bank of the Republic of Belarus.

In the domestic portfolio, there are FRNs with reference rates linked to the domestic (51%) and foreign (49%) currencies. Domestic FX-denominated FRNs were issued in 2015–2016, and are mostly linked to EURIBOR-3m (plus a quoted margin of 4.9%), although there are also obligations linked to the Russian market (Mosprime-3m, CBR key rate). Domestic liabilities in the national currency are linked to the NBRB RR, which over the last five years has been characterised by low volatility (Figure A1).

Over the last five years, the share of FRLs in Belarus' public debt has decreased by almost half, from 46.3% in 2018 to 20–29% at the end of 2023. It is mostly attributable to the increase in the share of external fixed-rate liabilities (following the placement of several Eurobond issues), and the fact that placement of EURIBOR-linked domestic liabilities was discontinued.

At the end of 2023, total government guarantees under external loans amounted to $1.5–2 billion[49] (2–2.7% of GDP). Chinese tied loans extended under long-term investment projects accounted for about 90% of external guarantees, implying a significant share of loans linked to USD LIBOR (SOFR).

Pursuant to the Public Debt Management Strategy for 2022–2025 (Ministry of Finance of Belarus, 2020), special attention is paid to the need to reduce interest rate risks related to external liabilities. The government has stipulated a covenant according to which the share of fixed-rate liabilities in the total amount of credit agreements (issued government bonds) during any given year should stay within the range from 50% in 2020 to 65% in 2025.

[49] Estimate. The latest official data are as of end May 2022.

Republic of Kazakhstan

The Republic of Kazakhstan uses a broader range of instruments that potentially pose interest rate risk. At the end of 2023, floating-charge liabilities were present in both domestic (38–41%) and external (9.4%) public debt. Despite the large FRL share in external debt, foreign obligations account for only one-third of the government's portfolio. As a result, FRLs account for one-fifth of total government obligations (Table A3). The share of short-term obligations is almost 3%.

Based on indirect data on the currency structure of the external portfolio, most obligations are linked to USD LIBOR (SOFR).

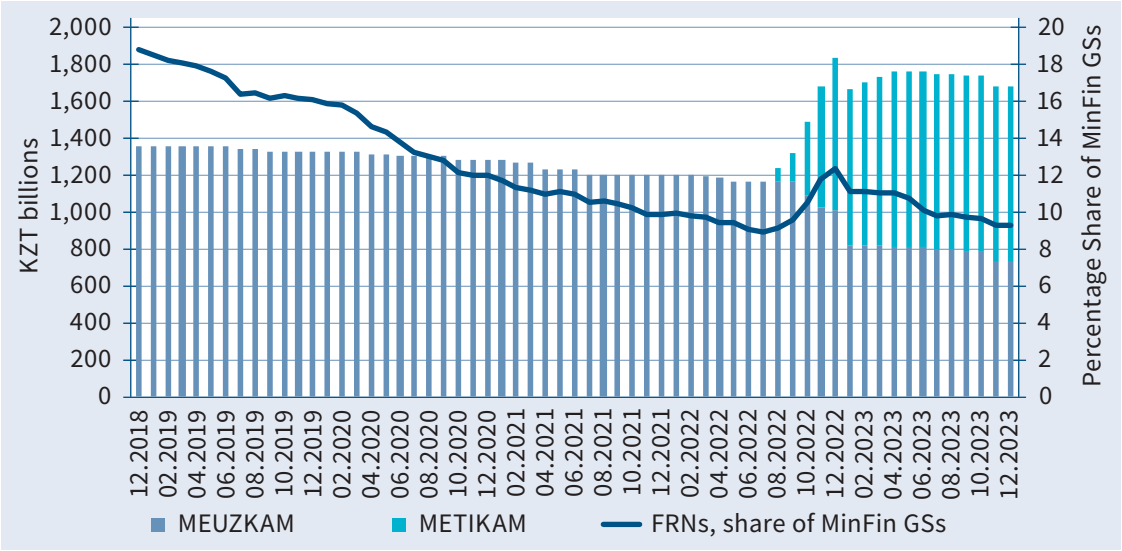
Table A3. Interest Rate Risk Indicators of the Sovereign Debt of the Republic of Kazakhstan, EoY

	2018	2023
Share of Short-Term Liabilities (by initial maturity), % (including in external debt)	0.1 (0.2)	2.7 (0.8)
Share of Floating-Rate Liabilities (w/o IIBs), % (including in external debt)	32 (42–44.4)	17.5 (37.9–41)
Share of Liabilities with Inflation-Indexed Principal (IIBs), % (including in external debt)	0 (0)	0 (0)
Direct Public Debt, % of GDP (including external debt) [50]	18.9 (9.1)	20.7 (5.9)

Source: Ministry of Finance of Kazakhstan.

The domestic portfolio contains two outstanding floating-rate instruments: (1) METIKAMs with the rate linked to money market indicators; and (2) MEUZKAMs[51] with the rate linked to CPI (Figure A2).

Figure A2. Floating Rate Obligations in the Structure of the Government Securities Portfolio of the Ministry of Finance of Kazakhstan



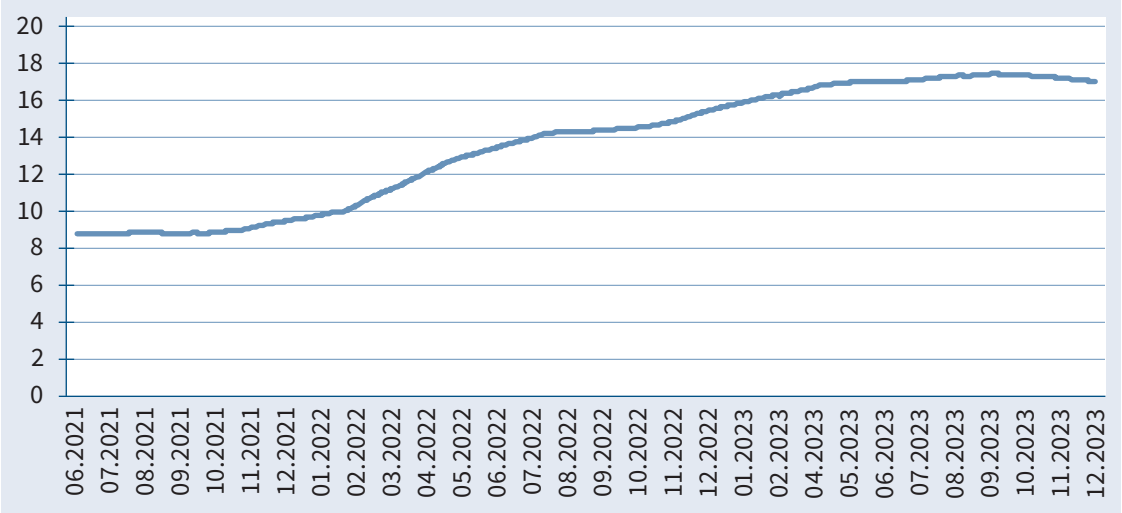
Source: Ministry of Finance of Kazakhstan.

[50] Excluding the obligations of local authorities, the National Bank of the Republic of Kazakhstan and state-guaranteed debt.

[51] A similar security (MUIKAM) was issued in 2007–2008. The last MUIKAM redemptions took place in 2015.

METIKAMs were first issued in August 2022. Their interest expenses are linked to TONIA-6m (Figure A3), an indicator reflecting yields on overnight repo transactions with instruments included in the government securities basket. MEUZKAMs also have fixed principals, but the inflation index[52] is used to recalculate the interest rate. It should be noted that the last MEUZKAM issue was placed in 2016, and that access to primary acquisition of MEUZKAMs was granted only to the members of a pool of accumulative pension funds and insurance companies.[53]

Figure A3. TONIA-6m, %



Source: National Bank of the Republic of Kazakhstan.

In 2018–2023, the FRL share declined substantially, primarily because of the expansion of the domestic debt portfolio and changes in its structure. The share of MEUZKAMs declined from 22.7% of the domestic portfolio to 4.3%, as those instruments were replaced with METIKAMs and, to an even larger extent, with long-term obligations which have generated the highest yields over the last 20 years. The share of FRLs in external public debt also declined slightly (from 42–44% to 38–41%).

At the end of 2023, total publicly guaranteed external debt amounted to $2.77 billion (1% of GDP). Information about the rate structure of those obligations is not publicly available, but indirect data[54] indicate that floating-rate guarantees account for about 24% of the total, with three-quarters of those guarantees linked to USD LIBOR (SOFR).

The Public Debt Management Strategy of the Republic of Kazakhstan to 2030 stipulates no interest rate risk mitigation covenants (Ministry of Finance of Kazakhstan, 2022).

[52] Plus a 0.1% quoted margin.

[53] Upon expiry of the first half of the period of circulation of the securities, they are freely traded in the secondary market.

[54] Based on the structure of creditors under guarantee obligations (China — 67%, Russia — 14%, IFIs — 19%) and IMF data on the overall structure of the debt portfolio with a breakdown by creditors and borrowers (China — 0%, Russia — 0%, IFIs — 100%).

Kyrgyz Republic

Over the last few years, the FRL share in external public debt has increased exponentially (Table A4). Given that Kyrgyzstan has ready access to soft financing under official development aid programmes (loans from the EBRD and Denmark), the share of floating-charge liabilities in total external public debt has for a long time remained insignificant, around 1%.

However, by the end of 2023, the share of FRLs in external public debt had increased to 11.9%. About half of foreign FRLs are EBRD and IMF loans linked to USD LIBOR (SOFR), the other half being EIB and IMF loans linked to EURIBOR.

Table A4. Interest Rate Risk Indicators of the Sovereign Debt of the Kyrgyz Republic, EoY

	2018	2023
Share of Short-Term Liabilities (by initial maturity), % (including in external debt)	0.8 (0)	0.2 (0)
Share of Floating-Rate Liabilities (w/o IIBs), % (including in external debt)	1.2 (1.4)	8.8 (11.9)
Share of Liabilities with Inflation-Indexed Principal (IIBs), % (including in external debt)	0 (0)	0 (0)
Direct Public Debt[55], % of GDP (including external debt)	54.8 (46.9)	45.5 (33.7)

Source: Ministry of Finance of the Kyrgyz Republic, authors' calculations.

There are no floating-charge liabilities in domestic public debt, although the issue of domestic floating-rate liabilities could probably reduce debt servicing costs. Over the last five years, the share of short-term obligations has decreased drastically, and at the end of 2023 they accounted for a mere 0.5% of domestic public debt (KGS 260.6 million).

Quasi-fiscal obligations are exclusively sub-loans extended to state-owned enterprises (Vinokurov, 2021). The sub-loans are included in direct public debt.[56] They are provided by IFIs on preferential terms, and there are no floating-charge liabilities.

Unlike the governments of other countries under review, the government of the Kyrgyz Republic at this time does not grant direct external guarantees.[57]

The Public Debt Management Strategy for 2022–2024 stipulates no direct covenants related to interest rate risk management (Ministry of Finance of Kyrgyzstan, 2022). There is a limit on the average period allocated for the repayment of domestic debt. A minimum grant element restriction is imposed on external commercial financing due to access to concessional facilities.

[55] Excluding the obligations of local authorities, the National Bank of the Kyrgyz Republic and state-guaranteed debt.

[56] If the borrower fails to service government-guaranteed debt, the debt burden on the budget will increase. In the case of sub-loans, the public debt volume remains the same, but financing needs may increase considerably.

[57] As far as domestic guarantees are concerned, the country has established a Government Guarantees Fund enabling small and medium-sized businesses to gain access to financial resources. The average annual volume of extended guarantees is 0.3% of GDP.

Russian Federation

The Russian Federation employs a broad range of debt instruments, including domestic instruments with floating debt servicing costs. In 2023, the share of FRNs and IIBs in domestic public debt amounted to 44.2%, while the share of floating-rate obligations in external public debt was insignificant (0–4%[58]). Due to the unusually high share of domestic public debt (86.6% of total public debt), the share of floating-charge liabilities in total public debt was close to their share in domestic public debt (2023 EoY: 38–39%, Table A5). There are no outstanding treasury bills, while the first and last issue of short-term zero coupon bonds (BOFZs) was placed in 2014.

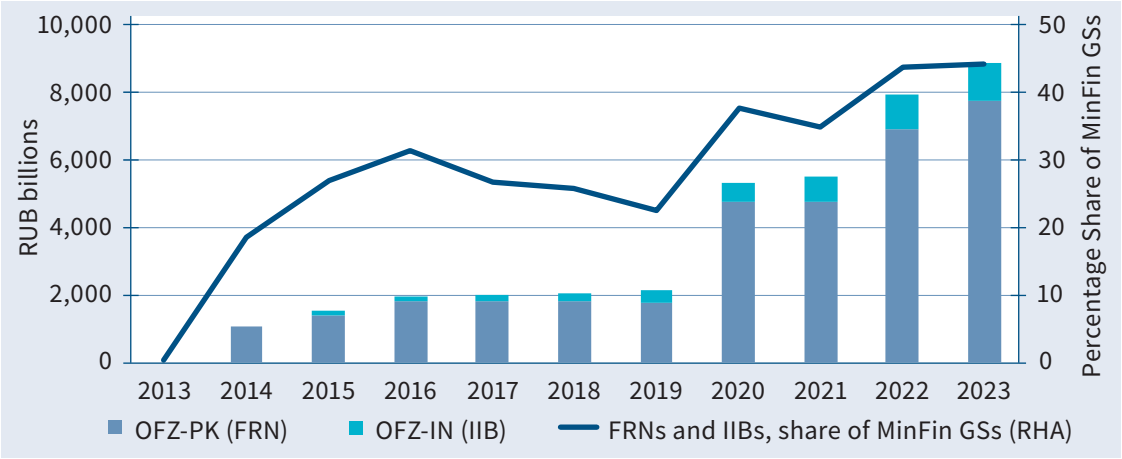
Table A5. Interest Rate Risk Indicators of the Sovereign Debt of the Russian Federation, EoY

	2018	2023
Share of Short-Term Liabilities (by initial maturity), % (including in external debt)	0 (0)	0 (0)
Share of Floating-Rate Liabilities (w/o IIBs), % (including in external debt)	19–20 (0–3)	33–34 (0–4)
Share of Liabilities with Inflation-Indexed Principal (IIBs), % (including in external debt)	2.4 (0)	5.0 (0)
Direct Public Debt[59], % of GDP (including external debt)	10.0 (2.5)	13.6 (1.8)

Source: Ministry of Finance of the Russian Federation, Rosstat.

Domestic floating-charge liabilities (Figure A4) consist of two instruments: (1) OFZ-PKs (a variable coupon linked to RUONIA[60]) first issued in 2014;[61] and (2) OFZ-INs (inflation-indexed principal and a fixed coupon) first issued in 2015. At the end of 2023, OFZ-PKs and OFZ-INs accounted for 38.4% and 5.8% of total domestic public debt, respectively.

Figure A4. Structure of Domestic Public Debt of the Russian Federation



Source: Ministry of Finance of the Russian Federation.

[58] There are no official data on the external debt structure with a breakdown by rate type. At the end of 2023, the shares of fixed-rate Eurobonds and bilateral/multilateral loans in Russia's external public debt portfolio (excluding guarantees) stood at 96% and 4%, respectively.

[59] Excluding the obligations of local authorities, the Central Bank of Russia and state-guaranteed debt.

[60] Average-weighted interest rates on unsecured interbank overnight ruble-denominated loans.

[61] Excluding small 1996–2006 issues.

Over the last five years, the share of floating-charge liabilities in total public debt of Russia has increased from 21–22% to 38–39%, mostly due to the issue of OFZ-PKs in 2020 and 2022. Despite the considerable increase in the share of FRNs and IIBs in domestic public debt, the low amount of total public debt (13.6% of GDP[62] at the end of 2023) ensures that growth of reference rates has little impact on the country's fiscal performance and debt sustainability. According to our estimates, each 100 bp RUONIA[63] increase will result in an increase in OFZ-PK servicing costs of a mere 0.045% of GDP. It should also be noted that almost half of all OFZ-PKs are held by government institutions and organisations (Ministry of Finance of Russia, 2017) and, therefore, the net increase in expenses will be far lower.

At the end of 2023, the amount of external liabilities in the form of government guarantees was equivalent to $18.7 billion (1% of GDP). Information on the rate or currency structure of guarantees is not publicly available.

The Public Debt Management Strategy of Russia for 2023–2025 stipulates no covenants on interest rate risk management or the share of floating-charge liabilities (Ministry of Finance of Russia, 2022). Pursuant to the strategy, preference will be given to long-term fixed-rate loans, but at the same time efforts will be made to diversify the supply of debt instruments by type or maturity to satisfy, to the maximum extent possible, the demand on the part of various categories of investors, and improve debt market liquidity.

Republic of Tajikistan

The Republic of Tajikistan borrows mostly on preferential terms from development institutions, including Chinese development institutions. However, over the last few years there has been a steep increase in the FRL share in total foreign obligations (Table A6).

At the end of 2023, the FRL share in public external debt (which accounts for 89% of the government's total direct obligations) was 9.8%, having more than doubled over the course of the year (2022 EoY: 4.4%). About 2/3 of total floating-rate loans were linked to USD LIBOR (SOFR) (EBRD and AIIB loans, margin: 0.9–1%), while the remaining 1/3 was linked to EURIBOR (EIB loans, margin: 0.95–1.1%).

Table A6. Interest Rate Risk Indicators of Sovereign Debt of the Republic of Tajikistan, EoY

	2018	2023
Share of Short-Term Obligations, % (including in external debt)	0.5 (0)	0.1 (0)
Share of Floating-Rate Obligations (w/o IIBs), % (including in external debt)	1.5 (1.6)	8.7 (9.8)
Share of Obligations with Inflation-Indexed Principal (IIBs), % (including in external debt)	0 (0)	0 (0)
Public Debt[64] as a Percentage of GDP (including external debt)	48.5 (38.8)	29.3 (26.0)

Source: Ministry of Finance of the Republic of Tajikistan, authors' calculations.

[62] Excluding guarantees.
[63] Refers to the average RUONIA value for the previous 90 days.
[64] Government debt data exclude obligations of local governments and the NBT, as well as government-guaranteed debt obligations.

There are no FRNs or IIBs in the domestic public debt portfolio. In 2021, the country discharged liabilities with an inflation-linked coupon rate which accounted for about 2% of total domestic public debt. Short-term T-bills accounted for less than 1% of total domestic public debt. It is expected that, over the medium term, Tajikistan will switch to arm's-length domestic lending, which should increase the share of domestic debt instruments in total financing (Ministry of Finance of Tajikistan, 2023). We believe that development of the national market for government securities will take a long time, and will initially focus on conservative fixed-yield instruments.

Quasi-fiscal liabilities mostly consist of sub-loan agreements. Sub-lending programmes (included in direct public debt) are the key mechanism used by state-owned enterprises to raise financing (Vinokurov, 2021).

At the end of 2023, outstanding external government guarantees amounted to a mere 1.1% of GDP ($0.14 billion). The EBRD is the creditor under all guarantee agreements. There are no official data on the rate structure of the guarantee portfolio, but corporate financial statements (primarily those filed by OJSHC Barqi Tojik [Open Joint Stock Holding Company]) indicate that absolutely all of the loans received by state-owned enterprises were linked to USD LIBOR (SOFR) (plus a 100 bp quoted margin).

The Public Debt Management Strategy for 2024–2026 (Ministry of Finance of Tajikistan, 2023) sets a covenant stipulating a minimum share of fixed-rate debt obligations in the total portfolio of 85%, which implies room for almost twofold growth of the FRL portfolio. All scenarios described in the strategy assume that the FRL share in the total portfolio will increase to 12.8% (meaning that their share in the foreign portfolio will increase to 14.5%).

Your comments and suggestions regarding this Working Paper are welcome at:
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