

INTERNATIONAL MONETARY FUND

MIDDLE EAST AND CENTRAL ASIA DEPARTMENT

Strengthening Monetary Policy Frameworks in the Caucasus and Central Asia

Prepared by Tigran Poghosyan, Klakow Akepanidaworn, Maria Atamanchuk, Ezequiel Cabezon, and Selim Cakir, with research assistance from Vahid Khatami and input from Filiz D. Unsal, Mariarosaria Comunale, Marina Conesa Martinez, and Omer Faruk Akbal

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Acronyms and Abbreviations

AE	Advanced economy
AML/CFT	Anti-money laundering/countering the financing of terrorism
AREAER	Annual report on exchange arrangements and exchange restrictions
EE	Emerging economy
EMDE	Emerging market and developing economy
EU	European Union
FPAS	Forecasting and policy analysis system
FX	Foreign exchange
FXI	Foreign exchange intervention
GDP	Gross domestic product
CPI	Consumer price index
CCA	Caucasus and Central Asia
IAPOC	Index of central bank independence and accountability, policy and operational strategy, and communications
IFS	International Financial Statistics
IMF	International Monetary Fund
IPF	Integrated policy framework
IT	Inflation targeting
LAC	Latin American countries
LIC	Low-income country
MNO	Mobile network operator
REER	Real effective exchange rate
SWIFT	The Society for Worldwide Interbank Financial Telecommunications
VAR	Vector autoregression
WEO	<i>World Economic Outlook</i>

Executive Summary

Amid a global backdrop of persistent post-COVID-19 inflation and spillovers from Russia's war in Ukraine, the countries of the Caucasus and Central Asia (CCA) region have faced strong price pressures in recent years. Inflation is estimated to have peaked in early 2023 but still exceeds central bank targets. In particular, core inflation remains stubbornly high reflecting a combination of second-round effects, surges in global energy and food prices, and domestic demand pressures. More broadly, uncertainty and downside risks also weigh on the economic outlook, including due to regional tensions, financial turmoil related to international monetary policy normalization, and a growth slowdown in key trading partners. In this context, CCA countries' ability to contain inflationary pressures and anchor inflation expectations hinges on the credibility and effectiveness of their monetary policy frameworks.

Since gaining independence in the 1990s, countries in the CCA region have made considerable progress in modernizing their monetary policy frameworks. CCA central banks have strengthened their legal frameworks and established broad de jure independence. Armenia, Georgia, Kazakhstan, the Kyrgyz Republic, and Uzbekistan are transitioning to inflation-targeting regimes, while the central banks of Azerbaijan, Tajikistan, and Turkmenistan rely on the exchange rate as an operational target. However, the post-COVID surge in inflation has highlighted the limitations of current frameworks and triggered a fresh policy debate on the need to strengthen monetary policy effectiveness in the CCA.

This paper reviews the CCA region's monetary policy landscape, highlights challenges in monetary policy design and implementation, and identifies areas that warrant strengthening. It draws on original surveys of country authorities, IMF country teams, and the work by Unsal, Papageorgiou, and Garbers (2022). It uses novel empirical work to analyze monetary policy transmission, the link between foreign exchange interventions and exchange rate dynamics, the drivers of financial de-dollarization, and the effects of central bank communication in the CCA.

The paper documents that inflation rates are volatile in most CCA economies, mainly due to the large share of food and imported products in the consumption basket and high exchange rate pass-through. The 2022 surge in international food and energy prices—coupled with persistent supply-chain bottlenecks—underscored the region's vulnerability. Most CCA central banks place price stability as the primary objective of monetary policy and have numerical inflation targets. Nevertheless, despite ongoing improvements to monetary policy frameworks anchoring inflation expectations remains challenging for CCA central banks. The paper finds that the following four key challenges hamper monetary policy design and implementation in the CCA.

- First, structural weaknesses impair monetary policy transmission. These include weak bank competition, the absence of a well-established benchmark yield curve, high dollarization, small and illiquid capital markets, and limited cross-border capital mobility. As a result, transmission from the interest rate to inflation is relatively weak in outer years. In contrast, transmission from the exchange rate to inflation remains relatively strong, reflecting the high import content of the consumption basket and balance sheet mismatches. Strengthening traditional transmission channels will require fostering the development of financial markets, deepening financial inclusion, expanding the role of financial markets (including developing a benchmark yield curve), and reducing dollarization.
- Second, CCA countries face challenges with adopting (de facto) fully floating exchange rate regimes. In some countries that have adopted a (de jure) flexible exchange rate regime and announced a transition to inflation targeting, central banks frequently intervene in the FX market to smooth exchange rate fluctuations. An empirical analysis of foreign exchange interventions (FXIs) in three CCA countries with de jure

floating exchange rate regimes (Armenia, Georgia, and the Kyrgyz Republic) suggests that central banks “lean against the wind” by selling (purchasing) foreign currency in periods of exchange rate depreciation (appreciation). This “leaning against the wind” is asymmetric, leaning more against depreciation, but it does not deplete FX reserves below prudent levels. While this experience is similar to other emerging market and developing economies (EMDEs), more symmetry in FXIs would help bolster FX reserves; allow exchange rates to move in both directions; and, in turn, help deepen FX markets.

- Third, financial dollarization in the CCA remains high despite a downward trend in recent years due to prudent macroeconomic policies, macroprudential measures, and the move to floating exchange rates. Survey responses from country authorities suggest that most CCA countries have an official de-dollarization policy. All countries apply higher reserve requirement ratios and additional capital requirements for FX-denominated liabilities relative to domestic currency liabilities. However, significant scope remains to further reduce dollarization through stronger macroeconomic policy frameworks, macroprudential measures, and central bank credibility, together with the development of financial markets and institutions, which would increase monetary policy effectiveness.
- Finally, central banks face credibility challenges despite improvements in communication and transparency. Beyond standard channels (announcements and press releases), CCA central banks increasingly communicate through social media. Press releases discuss topics consistent with central bank objectives and have become more detailed, predictable, and transparent. Further efforts to share more and better information would help anchor inflation expectations.

The next steps in modernizing monetary frameworks in the CCA should be tailored to country-specific circumstances and guided by best practices:

- While a de jure legal mandate is in place, in some countries, progress is still needed to expand the operational independence of central banks to pursue their objectives. Efforts need to focus on ensuring that the majority of board directors are nonexecutive and setting stricter rules for subsidized lending and other quasi-fiscal mandates.
- There is scope to strengthen the operational framework by improving liquidity forecasting, coordinating better cash-flow projections with the government, removing interest rate caps for policy instruments, and introducing intraday and overdraft credit facilities.
- Most central banks would benefit from further efforts to disclose more and better information on policy measures (including FX operations) and improved financial literacy among the public. In addition, stepping up communication efforts and adopting a forward-looking strategy, in which central banks explain monetary and FX policy decisions based on projected changes in inflation and their consistency with the medium-term target, would also help achieve price stability.

Addressing these challenges and modernizing monetary policy frameworks is particularly critical as CCA central banks work to mitigate the impact of high food prices, supply chain disruptions, and excess aggregate demand on inflation in the wake of the COVID-19 pandemic and the war in Ukraine. In addressing difficult policy trade-offs, central banks need to carefully assess the use of available tools and calibrate policies depending on the nature of the shocks, country characteristics, and initial conditions. Importantly, central banks alone cannot address deficiencies associated with the economy’s broader institutional environment and structural characteristics, and their efforts should be coordinated with, and complemented by, other government policies. Stronger governance and credibility of public institutions, and greater economic diversification, also help improve monetary transmission and achieve price stability. The sequencing and prioritization of structural reforms should reflect their positive externalities for monetary policy effectiveness.

1. Introduction

The post-COVID-19 surge in inflation has sparked a renewed focus on strengthening monetary policy frameworks in the Caucasus and Central Asia (CCA). External factors—food and energy commodity prices and disruptions to global supply chains—pushed up headline inflation, which then spilled over to core inflation. Expansionary demand-side policies to support the economic recovery from the pandemic also contributed to inflationary pressures. Annual consumer price index (CPI) inflation may have peaked in some CCA countries, but its level ranging between 8.3 percent in Armenia to 20.7 percent in Kazakhstan as of January 2023 is still relatively high compared to pre-pandemic levels and country-specific inflation targets.¹

Policymakers in the CCA are now facing difficult choices on how to bring inflation back to target levels while preserving the economic recovery. Amid persistent uncertainty and risks of spillovers from financial turmoil related to international monetary policy normalization and Russia's war in Ukraine, they face multiple challenges in designing and implementing effective monetary policy: weak monetary transmission, foreign exchange interventions (FXIs) and exchange rate management, high dollarization, and nascent central bank communication and credibility. A lack of consistency between monetary and fiscal policies and growing evidence of fiscal dominance also make monetary policy making more challenging (IMF 2023).

Substantial progress has already been made in strengthening monetary policy frameworks in the CCA since independence in the 1990s. The monetary and exchange rate targeting frameworks adopted early on helped stabilize the macroeconomic environment and tackle high inflation. CCA countries amended their legal frameworks to establish broad de jure independence. In the mid-2000s, some of them began transitioning to inflation-targeting regimes. Today, progress in strengthening monetary policy frameworks remains uneven, while CCA central banks need to grapple with high inflation pressures.

This paper takes stock of where individual CCA countries stand in modernizing their monetary policy frameworks (Chapter 2), drawing on the methodology of Unsal, Papageorgiou, and Garbers (2022). It also presents empirical evidence on the challenges associated with modernization (Chapter 3) and provides policy recommendations to overcome them (Chapter 4).

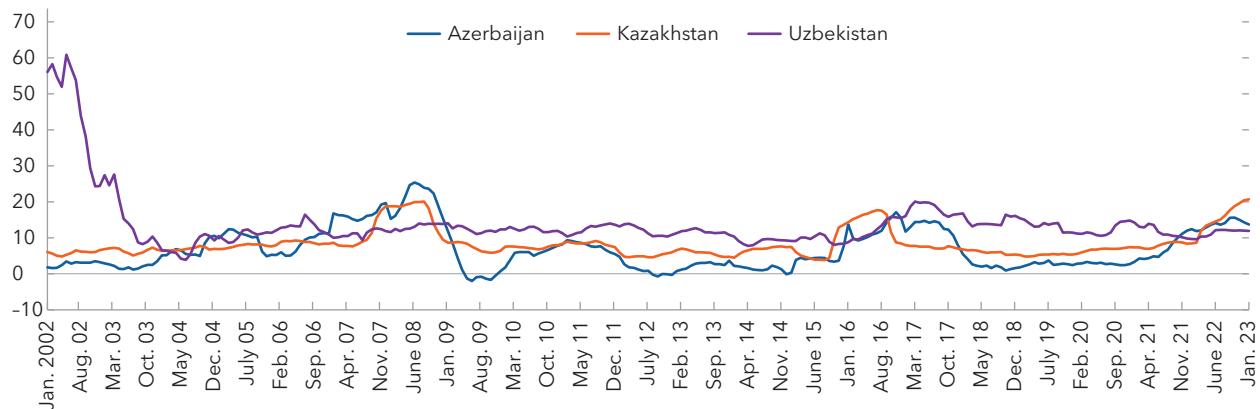
¹ See IMF (2023) for more detailed discussion on recent inflationary developments in the CCA.

2. The Monetary Policy Landscape in the CCA

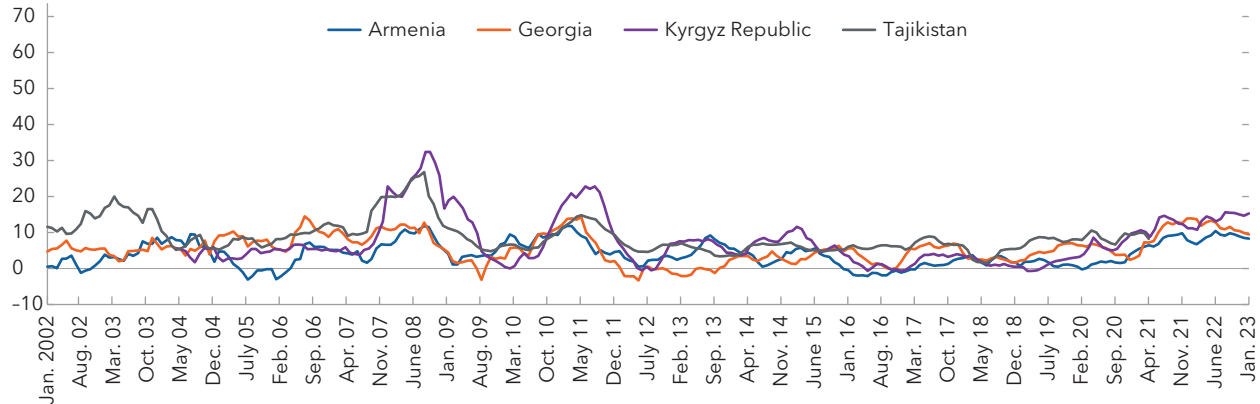
CCA countries have made substantial progress in achieving price and macroeconomic stability since independence. Over the past decade, inflation has been brought down to single digits from the double and triple digits previously (Figure 1). Authorities have also made progress in stabilizing their fiscal and external positions, and some countries have moved to inflation-targeting regimes supported by a flexible exchange rate.

Figure 1. CPI Inflation
(Year-over-year percentage change)

1. Energy Exporters



2. Energy Importers



Sources: IMF, International Financial Statistics; and IMF staff calculations.

A. The Evolution of Monetary Policy Frameworks

CCA monetary policy frameworks have evolved consistent with mainstream thinking and prevailing practices in advanced economies. These emphasize the advantages of a framework focused on inflation that maintains a flexible exchange rate. Since the mid-2000s, Armenia, Georgia, Kazakhstan, the Kyrgyz Republic, and most recently Uzbekistan have announced their transition to inflation-targeting regimes in response to structural shifts in money demand and the destructive impact of stepwise devaluations (Box 1).

Box 1. Why Transition to Inflation Targeting?

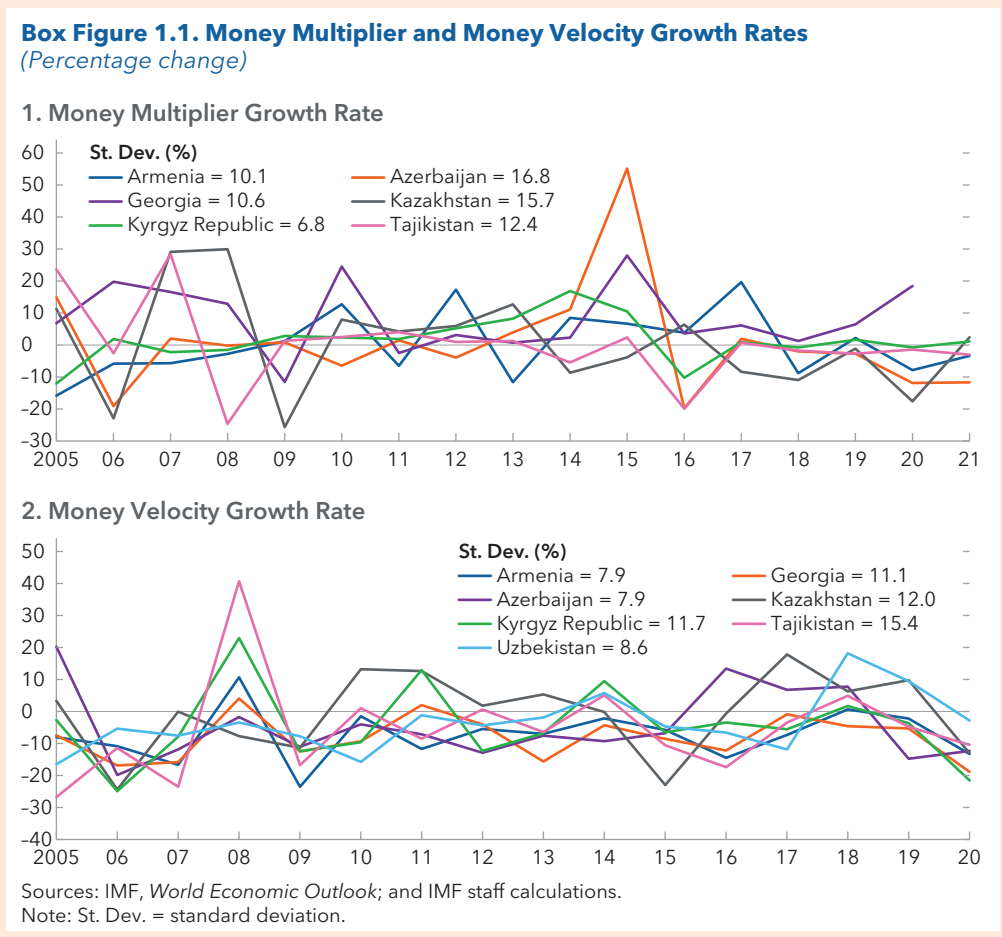
After independence in the early 1990s, CCA countries adopted exchange rate and monetary targeting frameworks to stabilize high inflation.

- *Monetary targeting framework.* This framework is rooted in the quantity theory of money, which states that broad money times its velocity is equal to nominal GDP. Under this framework, the central bank's operational target is the growth rate of reserve money, the intermediate target is the growth rate of broad money, and the monetary policy instrument is open market operations. Countries adopting this framework typically face constraints related to limited financial market development and fiscal dominance (for example, political pressure to keep interest rates low and increase the money supply to accommodate fiscal expansion). Also, this approach is typically transitory to tackle high inflation rates. However, as financial markets develop and money multipliers and velocity become unstable, the framework can lose effectiveness.
- *Managed exchange rate framework.* Under this framework, the central bank's operational target is the exchange rate of the local currency vis-à-vis the US dollar or a basket of currencies. A band is sometimes established around the target exchange rate to allow for some fluctuation in response to changes in economic fundamentals. The main instrument of monetary policy is FXIs. This framework is particularly attractive in the presence of a large share of imported goods in the consumption basket. Successful implementation of this framework hinges on ample FX reserves, prudent fiscal policy, relatively subdued shocks to capital flows, and alignment of business cycles with the country against which the currency is pegged. However, in a globalized world, countries cannot shield their economies completely from external shocks and changes to macroeconomic fundamentals; attempts to do so can lead to deviations of the peg from the equilibrium exchange rate and step devaluations.

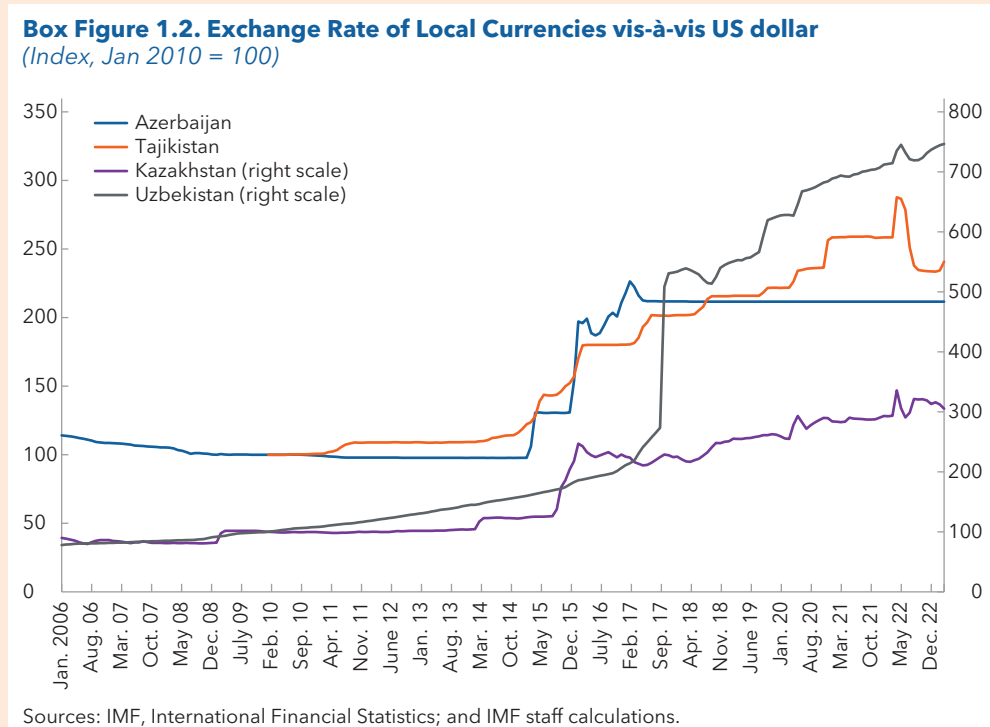
Both frameworks have drawbacks in the context of the CCA. Monetary-targeting frameworks are prone to structural shifts in money demand, while exchange rate frameworks are prone to step devaluations. In the case of the CCA, money multipliers and velocity have fluctuated widely over the last two decades (Box Figure 1.1). For example, the standard deviation of the money multiplier growth rate has ranged from 6.8 percent in the Kyrgyz Republic to 16.8 percent in Azerbaijan, while the standard deviation of the money velocity growth rate has ranged from 7.9 percent in Armenia and Azerbaijan to 15.4 percent in Tajikistan. Similarly, although CCA countries have tried to maintain exchange rate stability for set periods, this was often followed by sudden devaluations (Box Figure 1.2). Stable exchange rates helped these countries to maintain macroeconomic and price stability, but sudden devaluations due to external shocks have destabilized the macroeconomic environment.

In this context, most CCA countries have started the transition to inflation targeting, the effectiveness of which has been questioned following supply-side disruptions from the COVID-19 pandemic. IMF (2015) lists best practice principles of inflation targeting for effective monetary policymaking. First, central banks have a clear legal mandate and operational independence to pursue it. Second, price stability is the primary objective of monetary policy (at least in the medium term). Third, central banks have a numerical medium-term inflation objective to operationalize the price stability mandate and guide policy actions. Fourth, central banks also consider the implications of policy decisions on output and financial stability. Fifth, central banks have an effective operational framework, generally centered on the controlling short-term interest rates. Sixth, central banks adopt a forward-looking strategy that maps the price stability objective into policy decisions. Finally, clear communication is a central element of the monetary policy framework to explain policy decisions and outcomes and

Box 1. (continued)



provide guidance about the future. The recent COVID-19 pandemic and supply chain disruptions highlighted the limitations of the inflation-targeting regime in addressing supply-side inflationary pressures. Nevertheless, the principles highlighted in IMF (2015) are universal in modernizing monetary policy frameworks and also apply to nontargeting regimes.

Box 1. (continued)

Countries in the CCA have strengthened the legal framework governing their central banks by establishing de jure independence through reforms and adopting new central bank chapters. Many CCA central banks have de jure independence, and their independence ranking has improved over time. Central banks have full control of policy tools and set their own targets (in coordination with the government in some countries). In most cases, the law assigns this responsibility to a committee within the central bank or its executive board. Governments also grant central banks financial independence through profit distribution rules and recapitalization requirements. De facto independence can be compromised in cases where governments hold influence over board members or other governance issues. Unsal, Papageorgiou, and Garbers (2022) document the possible divergence between central banks' de facto and de jure independence.

Most CCA central banks view price stability as the primary objective of monetary policy and set numerical inflation targets (Table 1). In most countries, the inflation target is constant, with symmetric bands surrounding a medium-term value. However, in Kazakhstan and Uzbekistan, inflation targets decline gradually over time, reflecting the disinflationary objectives of central bank policy. Some central banks also have legal mandates to pursue other objectives. For example, the central banks of Armenia, Georgia, and Kazakhstan have a legal mandate to maintain financial stability.

Exchange rate management plays a central role in monetary policy frameworks, including in those CCA countries transitioning to inflation-targeting regimes. De jure flexible exchange rate arrangements frequently differ from de facto arrangements that show more rigidity. De facto, none of the CCA countries was classified as freely floating and not more than three CCA countries were classified as floating from 2007 onward (Figure 2). FXIs are relatively frequent. Central banks aim to build up their FX buffers to protect against sudden capital outflows and large devaluations, but they are more opaque regarding the role of FXI policy.

Table 1. Transition to Inflation-Targeting and Central Bank Objectives

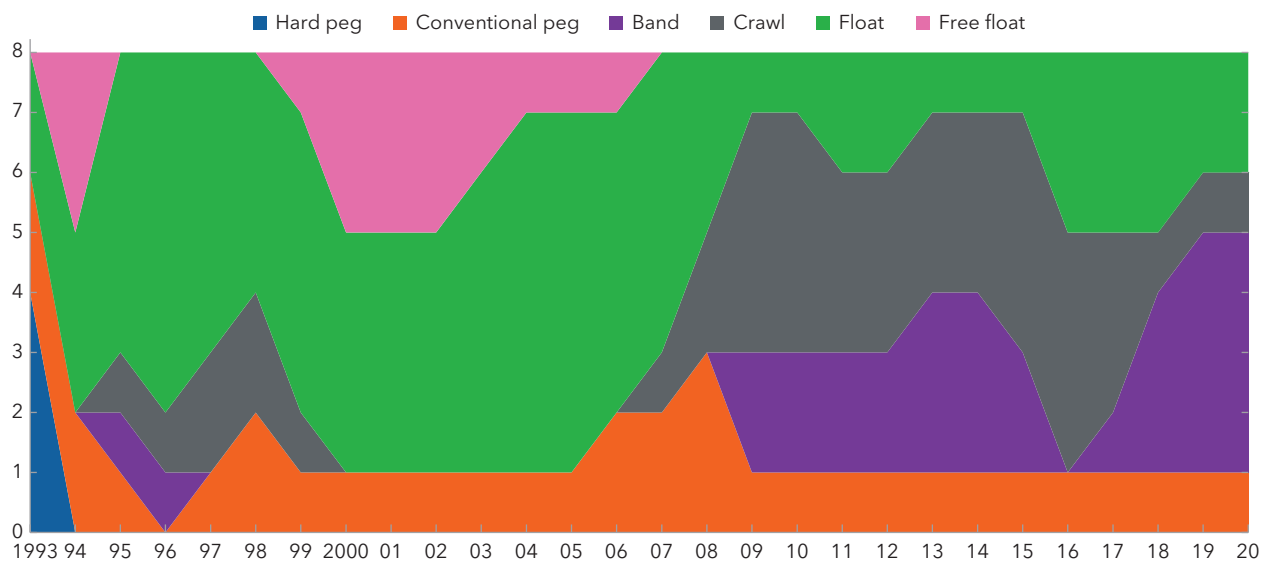
	ARM	AZE	GEO	KAZ	KGZ	TJK	UZB
Start of IT transition	Jan-2006	---	Dec-2009	Sep-2015	Mar-2014	---	Jan-2020
Inflation target	4 ± 1.5% (over 3 years)	4 ± 2% (medium term)	3% (medium term)	4 – 6% 2021-22 4 – 5% 2023-24 3 – 4% 2025+	5 – 7% (medium term)	6 ± 2% (medium term)	10% 2021 5% 2024+
Other objectives	Financial stability		Financial stability	Financial stability			Financial stability

Source: IMF staff based on country authorities’ websites.

Note: Country abbreviations use International Organization for Standardization country codes. IT = inflation targeting.

Figure 2. CCA: De Facto Exchange Rate Regime Classification

(Number of countries)



Source: IMF (2021).

Note: Exchange rate regimes are grouped as follows: hard peg (currency board), conventional peg, band peg (peg with horizontal bands and stabilized arrangements), crawl (crawling peg, crawl-like, and other managed arrangements), float, and free float.

In some cases, central bank FXI strategy objectives are not transparent. Only three CCA countries (Armenia, Georgia, and the Kyrgyz Republic) publish daily FXI data. Other CCA central banks disclose only monthly aggregate data on FXI, which can obscure the public’s understanding of FX policy.

CCA central banks also play an important role in enhancing financial stability through macroprudential measures. These measures aim to address systemic risks over the financial cycle, particularly as influenced by commodity prices and remittance flows (Khandelwal and others 2022). Macroprudential tools include capital and liquidity buffers, differentiated reserve requirements, loan-to-value and debt-to-service caps, and limits on open FX positions. CCA central banks have many of these tools at their disposal, and some central banks are legally mandated to maintain financial stability in addition to their primary objective of price stability. The IMF Integrated Policy Framework (IPF) suggests that, depending on country characteristics and initial conditions, combining monetary and macroprudential instruments, among other tools, can help central banks alleviate economic trade-offs amid certain external shocks (IMF 2020, Poirson and others 2020). An expansion of macroprudential instruments to nonbank financial institutions would help address data and supervisory gaps and increase their effectiveness by minimizing leakages (Khandelwal and others

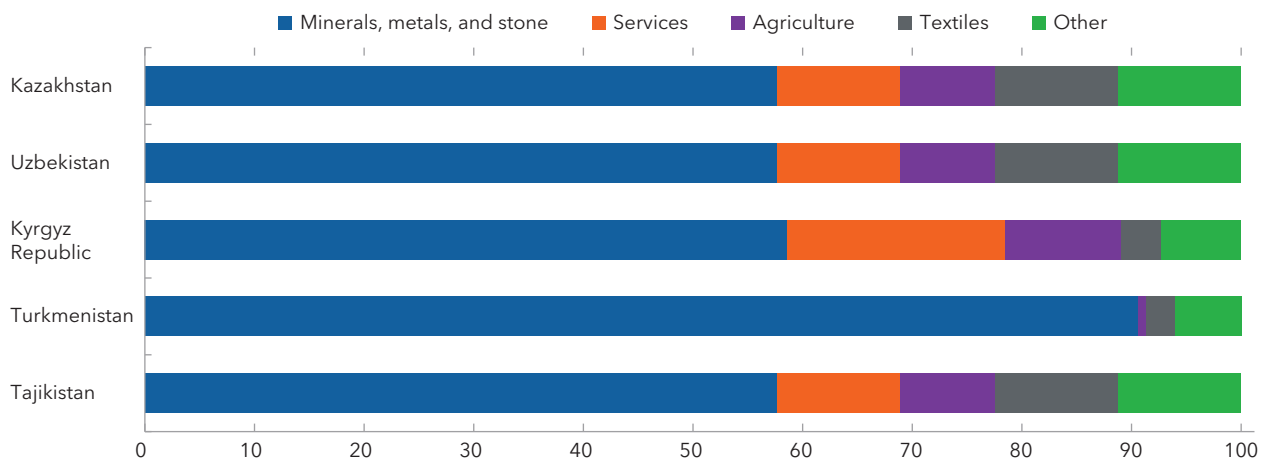
2022). Also, regulators should closely monitor risks associated with recent financial turmoil related to international monetary policy normalization and adjust macroprudential measures as needed to alleviate financial stability risks.

B. Macroeconomic and Financial Environment for Monetary Policy

CCA economies have specific characteristics and structural differences relative to the macroeconomic and financial environments of advanced economies that influence their conduct of monetary policy.² The design of standard macroeconomic frameworks mainly reflects the experience of advanced economies with developed market-based economies, stable institutions, and high-quality data. Recently, the analysis has been expanded to emerging and developing economies (see Unsal, Papageorgiou, and Garbers 2022). In contrast, CCA countries generally have a larger share of agriculture in value-added, a higher share of food and imported goods in their consumption baskets, low economic diversification, high dependence on commodity exports (Figure 3) or remittances (Figure 4), high share of foreign-currency denominated debt (Figure 5), and weak labor and capital productivity. Moreover, their economies face challenges from high dollarization, limited access to international markets, and procyclical current accounts. And CCA countries tend to be more vulnerable to real shocks—supply-side, policy, and external shocks—as inferred from a negative correlation between inflation and output, large standard deviations in government spending, and volatile terms of trade and real effective exchange rates. Concentration of spikes in sovereign spreads around same periods suggest that CCA countries are vulnerable to common regional and global shocks (Figure 6). The ability to smooth these shocks is limited by underdeveloped financial markets and limited access to international capital markets (Poghosyan 2022).

Inflation in the CCA is vulnerable to external shocks, high exchange rate pass-through, and nascent monetary policy credibility. As shown in Figure 1, inflation tends to spike during crises, particularly in oil-importing economies. These spikes have coincided with large exchange rate depreciations with high pass-through to CPI inflation via imported consumption goods and supply shocks (for example, food price shocks), which are more difficult for central banks to address using aggregate demand management instruments. When temporary, first-round effects are typically accommodated. However, second-round effects can make initial

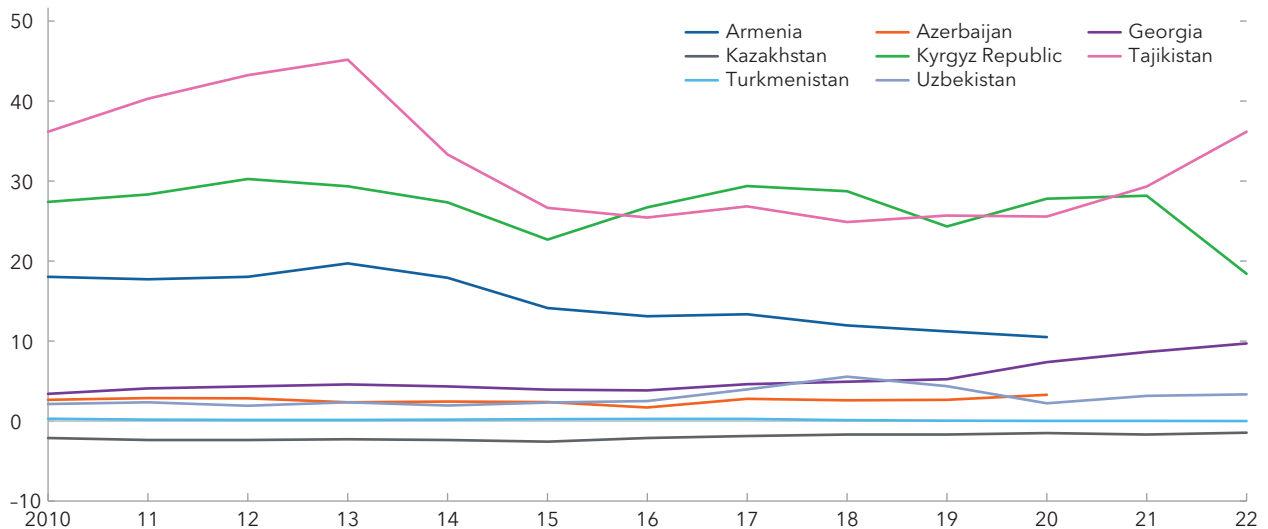
Figure 3. Export Composition
(Percent, 2020)



Sources: Harvard University, Atlas of Economic Complexity; and IMF staff calculations.

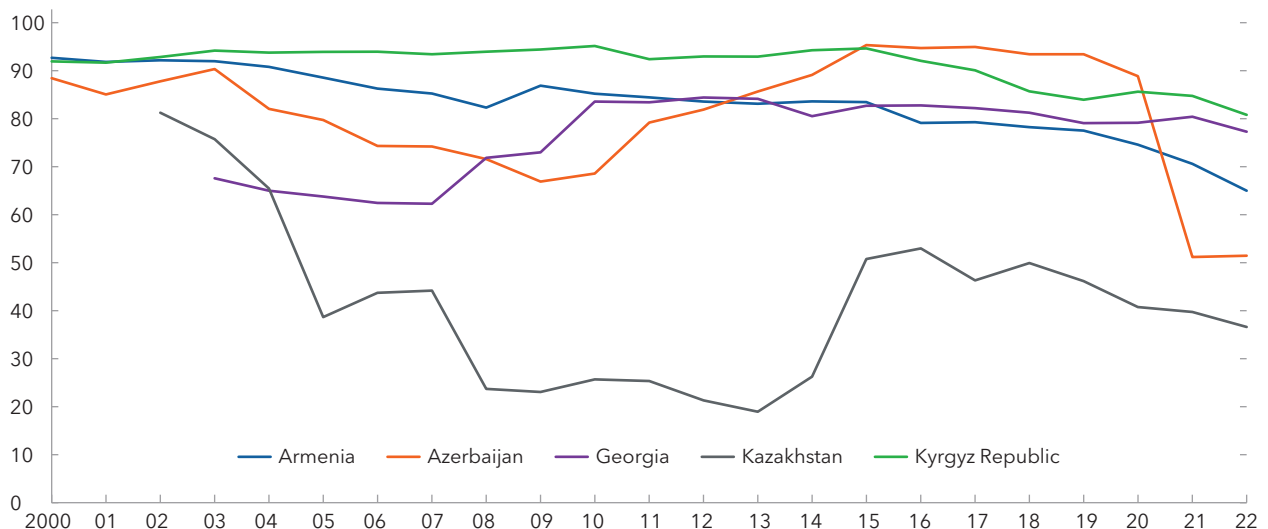
² Berg and Portillo (2018) document similar structural differences in economic fluctuations in sub-Saharan Africa relative to advanced economies.

Figure 4. Remittances
(Percent of GDP)



Sources: IMF, October 2022 *Regional Economic Outlook: Middle East and Central Asia*; and World Bank, World Development Indicators.

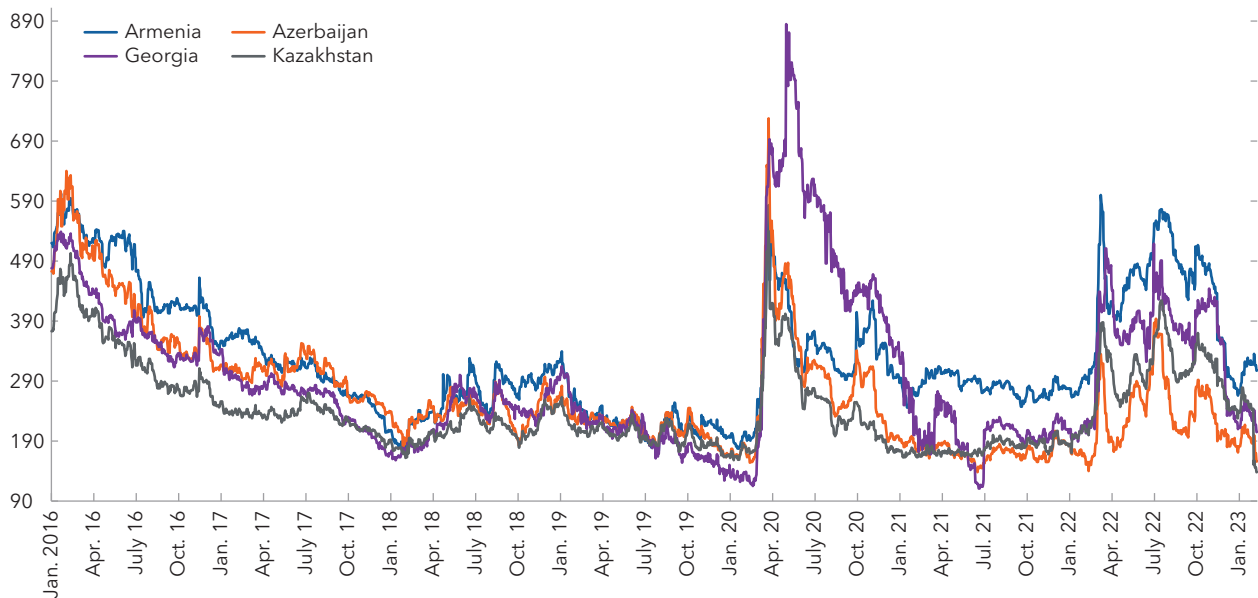
Figure 5. Public Debt Composition
(Foreign currency debt as percent of total debt)



Sources: IMF, *World Economic Outlook*; and IMF staff calculations.

shocks persistent and must be countered through tighter monetary policy. The extent of second-round effects depends on how well inflation expectations are anchored, which is underpinned by the credibility of the monetary policy framework and its ability to mitigate destabilizing exchange rate swings. This needs to be addressed, as noted below. Additionally, the dominance of supply shocks and frequent tax and administrative price adjustments make it difficult to identify a Phillips-curve-type relationship in the data because supply shocks tend to generate a negative correlation between the output gap and inflation. Supply shocks, often driven by external conditions, force the real exchange rate away from equilibrium. Therefore, countries with relatively more flexible exchange rates are likely to adjust better to these shocks due to the exchange

Figure 6. Sovereign Spreads
(Basis points)

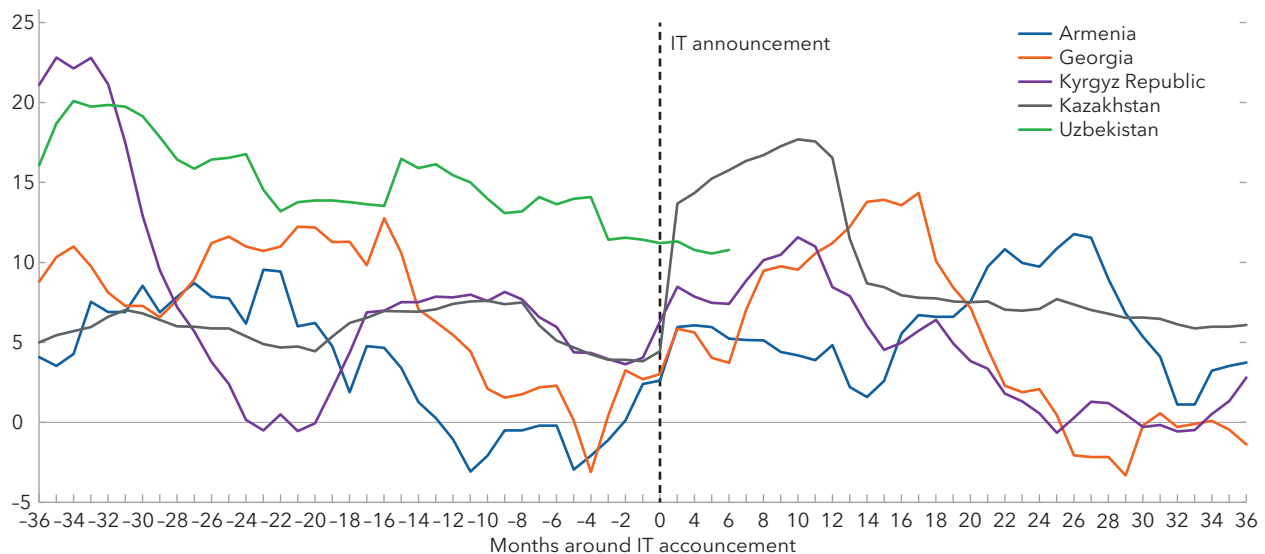


Source: Bloomberg Finance L.P.

rate's shock-absorbing role. Incidentally, the announced transition to inflation targeting by five CCA central banks has not led to a pronounced reduction in inflation rates (Figure 7). This could be due to shocks hitting the countries after the announcement of inflation targeting or an incomplete transition to inflation targeting.

Central banks can face a trade-off between price and financial stability, which can weigh on their credibility. For instance, the need to support weak banks through liquidity injections may arise in periods of high inflation, putting additional pressure on the local currency and accelerating inflation. The share of

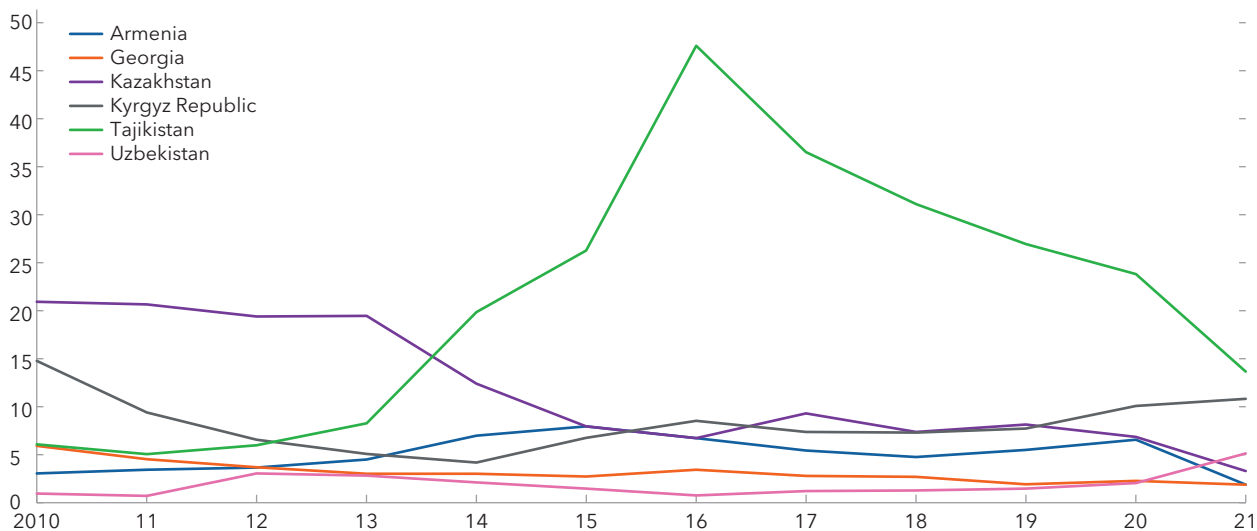
Figure 7. CPI Inflation Around Inflation-Targeting Announcements
(Year-over-year percentage change)



Sources: IMF, International Financial Statistics; and IMF staff calculations.

Note: Reported are year-over-year percentage changes of monthly CPI inflation around inflation targeting announcements. IT = inflation targeting.

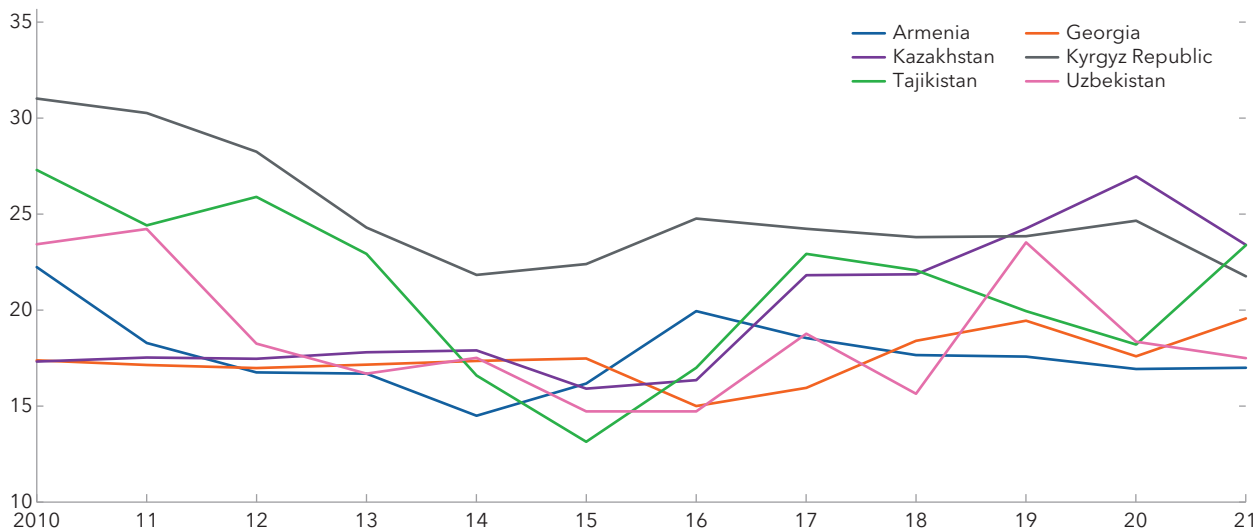
Figure 8. Nonperforming Loans
(Percent of total gross loans)



Source: IMF, Financial Stability Indicators.

nonperforming loans in total loans has been reasonably contained in most CCA countries over the last decade, but some countries have experienced spikes (Figure 8). Financial stability risks in the CCA have been addressed through micro- and macroprudential instruments (Khandelwal and others 2022) and conservative capital adequacy ratios (Figure 9). Still, governments may pressure central banks to step in via monetary policy instruments, leading to additional costs and damaging their credibility and commitment to inflation targeting. Therefore, strengthening macroprudential frameworks and ensuring consistency between macroprudential and monetary policies is needed to increase the effectiveness of monetary policy in keeping inflation within target while preserving financial stability.

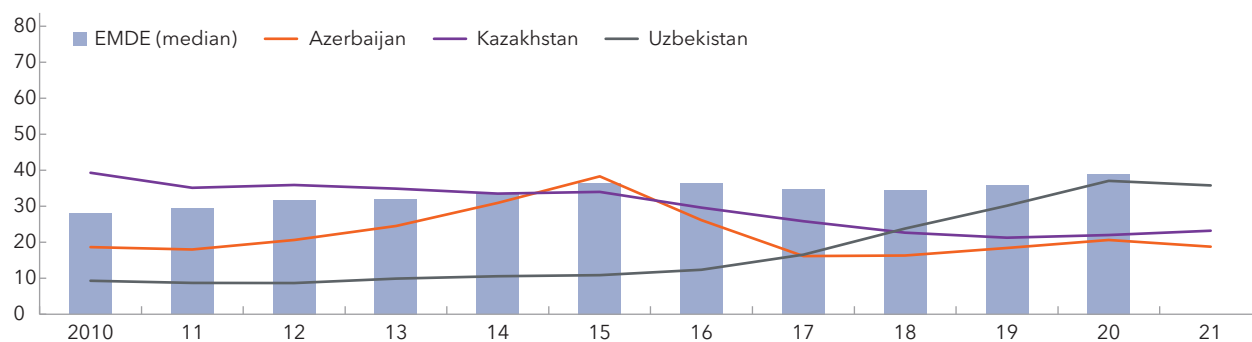
Figure 9. Capital Adequacy Ratio
(Capital in percent of risk-weighted assets)



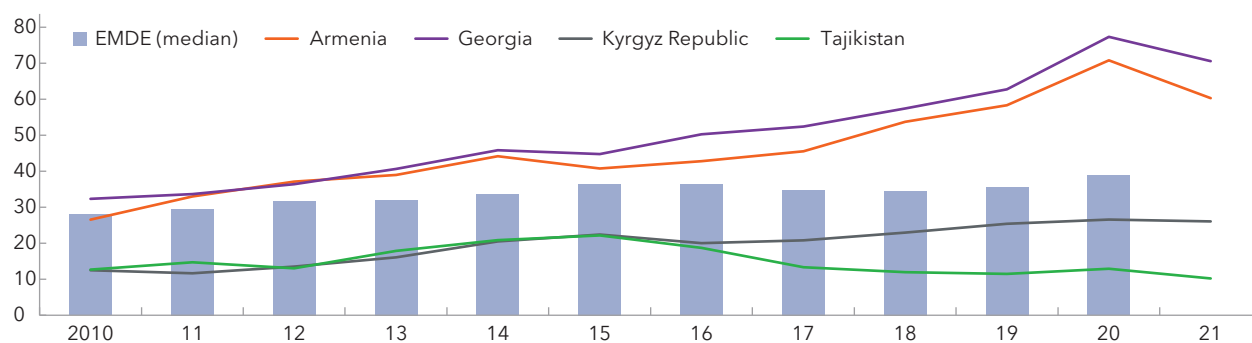
Source: IMF, Financial Stability Indicators.

Figure 10. Financial Deepening in the CCA
(Domestic credit-to-GDP ratio, percent)

1. Energy Exporters



2. Energy Importers



Sources: World Bank, World Development Indicators; and IMF staff calculations.

Note: EMDE refers to 154 emerging market and developing economies according to the World Bank classification.

CCA financial markets have deepened but remain relatively shallow. Despite improving financial depth indicators—the credit-to-GDP ratio, for example (Figure 10)—the region’s relatively weak financial development impairs monetary policy transmission and undermines growth prospects (Poghosyan 2022). In some countries, financial access is impaired by governance-related structural factors, high share of informality, and poor accounting practices (Atamanchuk and Tokuoka 2023). Yield curves on government securities are not well-established, making asset pricing difficult. In addition, some CCA countries do not have access to international capital markets, hindering their ability to smooth shocks and limiting domestic financial market competition.

The increasing use of mobile money services in the CCA is deepening financial inclusion and contributing to a structural decline in demand for cash (IMF 2017; Armas and Singh 2022). Mobile network operators (MNOs) typically offer these services, whereby customers deposit cash into digital wallets and make financial transactions using their mobile phones. Mobile money services are more attractive to some consumers than mobile banking services because they do not require customers to open a bank account. Mobile money expands financial inclusion, especially in rural areas where access to bank branches and ATMs is limited (Sahay and others 2020, Poghosyan 2023). Switching from cash to mobile money services can lead to a structural shift in the composition of monetary aggregates (Shirono and others 2021). The further expansion of mobile money services in the CCA is expected to weigh on central bank seigniorage revenues and increase the velocity of money.

The relatively low level of financial literacy in the region hampers the formation of expectations, complicates communication, and hinders central bank credibility. As in other emerging market and developing economies, households in the CCA view the exchange rate as the main indicator of financial stability and

central bank credibility. The absence of well-established inflation expectation surveys makes it difficult for central banks to assess policy effectiveness and communicate the appropriate monetary policy stance. Building credibility in this environment is challenging for an inflation-targeting central bank.

Fiscal considerations also complicate the task of monetary policy. Some central banks are pressured to provide subsidized lending or conduct other quasi-fiscal activities. The high share of FX-denominated government debt leaves the fiscal accounts vulnerable to exchange rate depreciations, imposing constraints on executing monetary policy and the FXI strategy. Higher market rates resulting from tighter monetary policy increase the public debt service burden, putting pressure on central banks to undertake less tightening than is appropriate. Also, a lack of consistency between monetary and fiscal policies complicates the task of achieving price stability. Until authorities address these constraints, they will continue to hamper monetary policy effectiveness.

Capital flows and capital account openness have substantial benefits, but they can also increase vulnerabilities to external shocks and complicate the conduct of monetary policy. Capital inflows can boost development and competition in CCA financial markets. However, tightening international financial conditions can lead to capital outflows and put pressure on the local currency, prompting central banks to raise policy rates irrespective of inflation rates and risking procyclical tightening. The IPF provides an analytical framework to consider the use of FXIs and capital flow management measures to help monetary authorities achieve their objectives in the presence of frictions, such as shallow markets and currency mismatches, provided they do not substitute for warranted macroeconomic policy adjustments or support a misaligned exchange rate to gain unfair competitive advantage (IMF 2020).³ However, the constant use of FXIs and macroprudential instruments may perpetuate the same frictions that justify their deployment. For instance, policies that aim to stabilize the exchange rate can encourage the accumulation of unhedged FX liabilities and discourage FX market development. Hence, policymakers should weigh the short-term benefits of FXIs and macroprudential instruments against their potential costs and side effects.

High dollarization creates trade-offs between price and financial stability, weakening monetary transmission. CCA countries have a structurally high reliance on foreign currency borrowing by the private and public sectors. Some CCA countries issue Eurobonds and can access international capital markets, but others rely on concessional financing from international development institutions. This leaves them vulnerable to destabilizing swings in the exchange rate. Amid large currency mismatches, a significant share of the domestic financial system becomes less sensitive to domestic monetary policy, weakening monetary transmission. Capital inflows can exacerbate currency mismatches, leaving recipient countries susceptible to local currency depreciations and imposing additional constraints on monetary policy (Poirson and others 2020, Khandelwal and others 2022). Financial stability considerations constrain central banks from letting the exchange rate fully cushion external shocks.

Additional challenges complicate monetary policy in the CCA's energy exporters. These countries have ample FX reserves and tend to rely on managed exchange rate regimes, making them vulnerable to large changes in the equilibrium exchange rate following terms of trade shocks. This creates difficult trade-offs between price and exchange rate stability since restoring equilibrium requires large movements in the nominal exchange rate. Moreover, because governments are direct and indirect recipients of energy export revenues, terms of trade shocks also affect fiscal positions and require increased efforts to ensure consistency between fiscal and monetary policy actions.

³ For instance, several CCA countries have introduced measures to counter volatile capital flows following the war in Ukraine. The National Bank of Georgia has put a limit on cash withdrawals from instant transfers and strengthened anti-money laundering/countering the financing of terrorism requirements. The Kyrgyz Republic has put a limit on cash exports by residents and nonresidents and requested commercial banks to stop providing cash (USD, EUR, GBP) to transportation companies or financial institutions other than those in the European Union, United Kingdom, or United States.

3. Challenges in Monetary Policy Design and Implementation

CCA central banks continue to modernize their monetary policy frameworks. Five CCA countries—Armenia, Georgia, Kazakhstan, the Kyrgyz Republic, and Uzbekistan—have announced their transition to inflation targeting. Although progress has been mixed to date, this move has helped to facilitate modernization efforts (see Table 1). Even those central banks that rely on the exchange rate as an operational target have announced inflation targets and have a legal mandate to ensure price stability. Progress has also been made, including through IMF capacity development, with rolling out Forecasting and Policy Analysis System (FPAS) to develop a toolkit to support the forward-looking formulation of monetary policy based on economic data and analysis (Mæhle and others 2021).

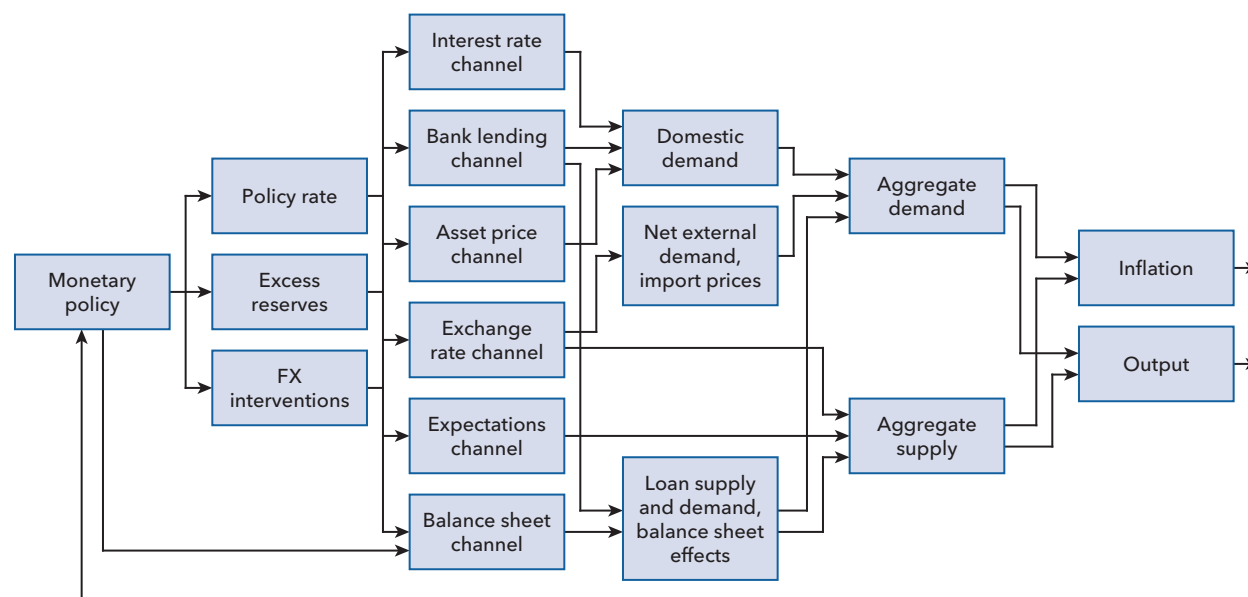
Various challenges complicate the efforts of CCA countries to modernize monetary policy. These include structural factors that hamper effective monetary policy conduct. For example, due to frequent missed targets, noisy data, volatile interest and exchange rates, and poor communication, it can be challenging for financial market participants to understand central bank intentions and their macroeconomic implications. In these circumstances, standard models produce poor forecasts, and monetary policy actions may have a smaller impact on key macroeconomic variables even when the announced intention is to achieve macroeconomic stabilization.

A. Weak Monetary Policy Transmission

Well-functioning transmission from monetary policy instruments to the ultimate objective of monetary policy (price stability) is crucial to gauge its effectiveness. Central banks can influence inflation through changes in monetary instruments (policy rate) and, consequently, monetary and financial conditions in the economy (retail interest rates, exchange rates), which in turn affect aggregate demand and, ultimately, inflation (Figure 11).

Monetary policy can affect price stability through the following channels:

- *Interest rate channel.* The central bank can influence the cost of borrowing by setting the policy rate. Given price rigidities, changes in the nominal rate affect the real rate, which influences consumption and investment.
- *Bank lending channel.* The central bank can use its instruments to change the volume of excess reserves in the banking system. In turn, this can influence the decision of banks to provide loans and ultimately affect investment.
- *Balance sheet channel.* Changes in financial conditions can influence the net worth of individuals and firms and, therefore, the value of the collateral they can post to obtain loans. Due to moral hazard, this can affect the external finance premium and the volume of lending.
- *Asset price channel.* Monetary policy shocks can affect asset prices and firm decisions to issue new capital to finance investment (Tobin's q theory). Similarly, monetary shocks can influence housing wealth and household consumption.

Figure 11. Monetary Policy Transmission Mechanism

Source: IMF staff.

Note: FX = foreign exchange.

- *Exchange rate channel.* In small, open economies, changes in the domestic interest rate relative to the foreign rate can affect the exchange rate via the interest parity condition. In countries with limited capital mobility and high dollarization, central banks can influence the exchange rate by changing the volume of excess reserves or intervening in the FX market. Changes in the exchange rate can then affect inflation directly (through imported goods in the CPI basket) and indirectly (through changes in net exports and, hence, aggregate demand).
- *Expectations channel.* Changes to the monetary policy stance can influence public expectations about future developments in the economy, including inflation dynamics. In response, economic agents can adjust wage- and price-setting behavior, which will feed through to inflation. Monetary policy can also influence expectations about medium- and long-term borrowing costs, which will affect investment plans. Monetary policy credibility is key for the effectiveness of this channel.

As previously noted, some characteristics of CCA countries impair monetary transmission. Financial structures in low-income and emerging economies differ widely from those in advanced economies, influencing the monetary transmission mechanism (Mishra, Montiel, and Spilimbergo 2012; Mishra and Montiel 2013). These differences include:

- *Structural excess liquidity.* Mutual distrust among commercial banks coupled with regulatory and institutional shortcomings depress interbank market activity. Banks prefer to park excess liquidity at the central bank at submarket rates rather than lend to each other. Structural excess liquidity is particularly large in remittance receiving CCA countries, where banks regularly receive cheap liquidity inflows from migrants (Poghosyan 2020a). Irregular cash flows from budgetary operations also contribute to volatile liquidity flows. Mopping up large volumes of excess liquidity is too costly for central banks, resulting in structural excess liquidity. In the presence of surplus liquidity, changes in the central bank policy rate or liquidity management instruments have a limited impact on banks' willingness to adjust their lending volumes.

- *Weak bank competition.* CCA banking sectors are characterized by a relatively small number of banks, and government-owned banks play an important role in some CCA countries. Assets are heavily concentrated in a small number of banks (Teodoru and Akepanidaworn 2022). The nonbank financial sector is relatively shallow, and banks do not face strong competition from nonbanks, resulting in relatively large interest margins (Poghosyan 2022). Some central banks provide direct subsidized lending to the real sector, interfering in competition between banks and distorting market rates. Imperfect bank competition weakens the connection between changes in policy rates and market rates since imperfectly competitive banks may not pass on policy rate changes to their market rates.
- *Absence of a well-established benchmark yield curve.* The secondary market for government securities in the CCA tends to be illiquid and not very active. Securities markets are relatively shallow and unsophisticated. Government securities are mostly held until maturity and used for repo operations. This hampers the establishment of a benchmark yield curve that could be used to price other assets. It also complicates the transmission of monetary policy adjustments from short-term policy rates to medium- and long-term rates.
- *Small and illiquid stock and derivatives markets.* A small number of listed firms and low market turnover characterize domestic stock markets in the CCA. The implication is that the value of physical capital is not easily marked to market, and the illiquidity of physical capital may hamper the asset price channel working through equity prices. In addition, the derivatives market is almost nonexistent, limiting the ability of economic agents to hedge risks, including FX risks, and hampering the transmission process.
- *Imperfect capital mobility.* Not all CCA countries issue Eurobonds. Moreover, private sector access to international capital markets is limited due to various constraints (high risks, small market size, weak institutions, imperfect regulations). Weak integration with international capital markets makes it difficult for the interest parity condition to hold. Consequently, changes in policy rates do not have a sizeable impact on the exchange rate, and central banks frequently resort to FXIs to operationalize the exchange rate channel (Poghosyan 2020c).
- *Fear of floating.* Central banks in the CCA tend to restrain exchange rate flexibility more than advanced economies due to the relatively high exchange rate pass-through to inflation and relatively high dollarization. In some countries, exchange rate fluctuations can dramatically impact debt service costs due to the high share of foreign-denominated public debt. As a result, central banks frequently intervene in the FX market and, in some cases, may face difficult trade-offs between achieving price stability and letting the exchange rate adjust to its equilibrium level.
- *Importance of supply-side shocks for inflation.* Headline inflation is relatively more volatile in the CCA than advanced economies due to the high share of imported goods and foods in the CPI basket. The prevalence of supply-side shocks increases the volatility of inflation and reduces the ability of monetary policy to influence inflation in the short run, which is highly affected by the first-round effects of supply-side shocks. However, it also underscores the importance of targeting medium-term inflation, which is also affected by second-round effects.

The authors' empirical analysis points to the significance of the interest rate and exchange rate transmission channels (see Annex 1). A 1 percent shock to the real policy rate results in a 0.5 percent decline in the rate of inflation in the first year.⁴ This impact is significant, in line with the interest rate channel. The impact dissipates and becomes insignificant in the outer years. By contrast, the shock to the policy rate does not have a

⁴ Surveys find mixed results on the impact of interest rates on inflation in low-income countries and emerging market economies (see Mishra and Montiel 2013). In some countries the impact is even counterintuitive, with positive interest rate innovations leading to higher inflation. Nevertheless, the authors' estimate of the response of inflation to an interest rate shock is quantitatively similar to those reported in Dabla-Norris and Floerkemeier (2016) for Armenia, Samkharadze (2008) for Georgia, and Brandao-Marques and others (2020) for 40 emerging market economies.

significant impact on output at a 95 percent confidence level,⁵ which could be driven by the financial intermediation challenges highlighted above. A 1 percent exchange rate depreciation results in a 0.3 percent increase in the rate of inflation in the first year, providing support to the exchange rate channel.⁶ The relatively high exchange rate pass-through to inflation (30 percent) is consistent with the high share of imported goods in the CPI basket. By contrast, the money supply does not have a significant impact on inflation and output growth, which could be due to a highly volatile money velocity and multiplier.⁷

The exchange rate amplifies transmission from the policy rate to inflation. To assess the role of the exchange rate in transmitting the policy rate shocks to inflation, the authors run another panel vector autoregression (VAR) with the exchange rate as the exogenous variable. This allows us to “switch off” the endogenous amplification of the interest rate shock to inflation via the exchange rate channel. The response of inflation to the interest rate shock from this panel VAR is only 0.22 percent, which is less than half of the response in the baseline model. This is consistent with the results of Brandao-Marques and others (2020) and IMF (2023) and suggests that exchange rate appreciation plays an important role in amplifying the impact of an interest rate hike on inflation.⁸ The response of output growth to the policy rate and money supply shocks remains insignificant when the exchange rate is set as exogenous.

Compared to advanced economies, the monetary transmission mechanism is relatively muted in the CCA. The transmission from policy instruments to output is insignificant. The transmission from the interest rate to inflation is short-lived. The exchange rate channel plays a greater role than other channels due to the direct impact of exchange rate fluctuations on inflation. Some transmission channels, such as the asset price channel, are not working well due to shallow financial markets (IMF 2023).

B. Exchange Rate Management and FXIs

All CCA countries intervene in the FX market and manage exchange rate movements to varying degrees and in different periods. Some CCA countries have adopted a (de jure) floating regime, while others still heavily manage the exchange rate.⁹ Nevertheless, FXIs continue playing an important role as a monetary policy instrument in all CCA countries, even those that adopted inflation-targeting-like frameworks. More recently, the exchange rate of local currencies vis-à-vis the Russian ruble started playing an important role in the decisions to intervene in some countries. CCA countries have accumulated sizeable amount of precautionary FX reserves that helps insure against capital flow movements and external shocks. However, carrying large FX reserves is costly and reduction of exchange rate volatility may encourage currency mismatches, increasing vulnerability to external shocks.

CCA countries face challenges with adopting a (de facto) fully floating exchange rate regime. They use a mix of the policy rate, FXIs, and macroprudential instruments to achieve their objectives. Under the inflation-targeting regime, the main monetary policy instrument is the central bank policy rate, and the ultimate goal is price stability. Central banks are not expected to react to exchange rate movements unless they jeopardize price stability. However, the interest rate transmission channel in CCA countries is typically weaker than the exchange rate channel due to the various reasons discussed earlier. Therefore, even in countries that have adopted a (de jure) flexible exchange rate regime and announced a transition to inflation targeting, central banks frequently intervene in the FX market to smooth fluctuations.

⁵ The impact is negative and significant at 90 percent confidence level.

⁶ This estimate is quantitatively comparable to the exchange rate pass-through coefficient estimated for the Caucasus and Central Asia in Poghosyan (2020b).

⁷ The standard deviation of the money velocity growth is ranging between 6.9 percent in Azerbaijan and 15.6 percent in Tajikistan, and the money multiplier growth is ranging between 8.9 percent in Armenia and 17 percent in Azerbaijan from 2005-20.

⁸ A similar exercise was applied to check whether the reserve money amplifies the impact of the interest rate. The results reject this hypothesis, as interest rate transmission remains unchanged when monetary base is set as exogenous variable.

⁹ De jure, only Turkmenistan has a pegged exchange rate regime.

CCA countries manage exchange rate fluctuations for several reasons. The transmission mechanism from the policy rate to aggregate demand is weak due to various structural factors (see above). Policymakers are concerned about the inflationary effects of exchange rate fluctuations due to relatively high exchange rate pass-through on the back of the sizeable share of imported goods in the CPI basket (Poghosyan 2020b). The “fear of floating” and significant balance sheet currency mismatches also put a premium on a relatively stable exchange rate. Large movements of the exchange rate vis-à-vis the Russian ruble can influence the purchasing power of ruble remittances from Russia, which are significant in some CCA countries. Central banks lack credibility to ensure price stability due to frequent supply shocks, opting instead for the exchange rate as a clear and visible anchor to bolster their credibility as the public tends to focus more on the exchange rate. There are also political economy considerations: importers tend to have a stronger lobby than exporters and remittance recipients, and importers prefer a stable exchange rate to reduce exchange rate risks and facilitate imports (Epstein and others 2016). Finally, amid frictions such as shallow markets and currency mismatches, the IPF suggests that a combination of monetary policy instruments (policy rate) and FXIs in non-reserve issuing emerging economies can be more effective than a single instrument response to certain external shocks (IMF 2020, Poirson and others 2020) and tighter macroprudential regulation in emerging markets can allow monetary policy to respond more countercyclically to global financial shocks (Bergant and others 2020).

The authors’ empirical analysis of FXIs in three CCA countries with de jure floating exchange rate regimes (Armenia, Georgia, and the Kyrgyz Republic) suggests that these countries mainly use FXIs to smooth fluctuations. The following conclusions are elaborated further in Annex 2¹⁰:

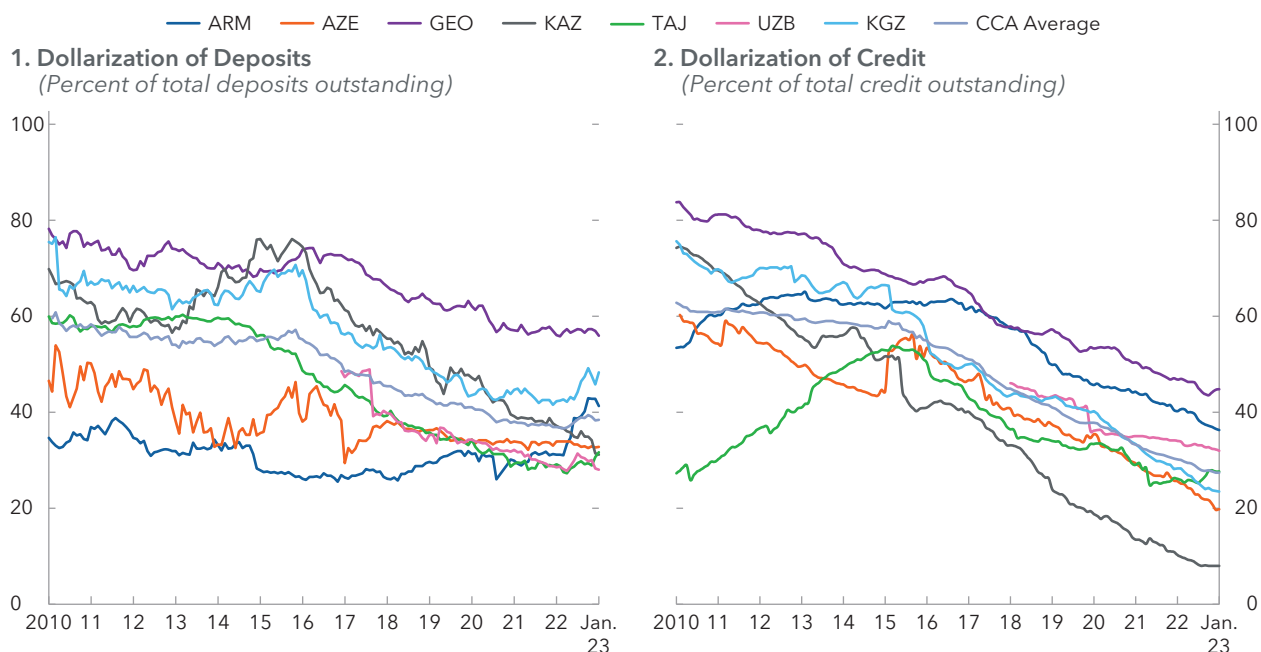
- FXIs are common even in countries that announced a transition to inflation targeting and adopted a floating exchange rate regime. FX sales (purchases) took place for 23 (30) percent of weeks in the sample for Armenia, 17 (19) percent of weeks for Georgia, and 29 (10) percent of weeks for the Kyrgyz Republic.
- FXIs take place in response to movements in the exchange rate and its volatility. FX sales (purchases) are more (less) likely when the exchange rate depreciates against its 12-week moving average. FX sales (purchases) are less (more) likely in periods of high exchange rate volatility.
- Central banks “lean against the wind” by selling (purchasing) foreign currency in periods of exchange rate depreciation (appreciation). FX sales happen in weeks when the exchange rate depreciates relative to normal periods, and the relative depreciation comes down following FX sales. Similarly, FX purchases happen in weeks during which the exchange rate appreciates relative to normal periods, and the relative appreciation comes down following FX purchases.
- This “leaning against the wind” is asymmetric toward leaning against depreciation. Nevertheless, this asymmetry has not led to a deterioration of reserve adequacy metrics in any of these countries, suggesting that interventions aim to smooth exchange rate fluctuations rather than target the exchange rate at an overvalued level.
- The level of exchange rate management is relatively modest and consistent with the announced floating regime, even though there were some spikes in the degree of exchange rate management observed recently.

C. High Dollarization

Dollarization poses significant challenges for policymakers in the CCA. High dollarization rates affect macroeconomic stability, monetary policy transmission, and financial sector development. Dollarization in the CCA stems from a history of instability, hyperinflation, and large exchange rate depreciations, mostly in

¹⁰ Similar findings are observed in other emerging market and developing economies (Adler, Chang, and Wang 2020).

Figure 12. Financial Dollarization in the CCA



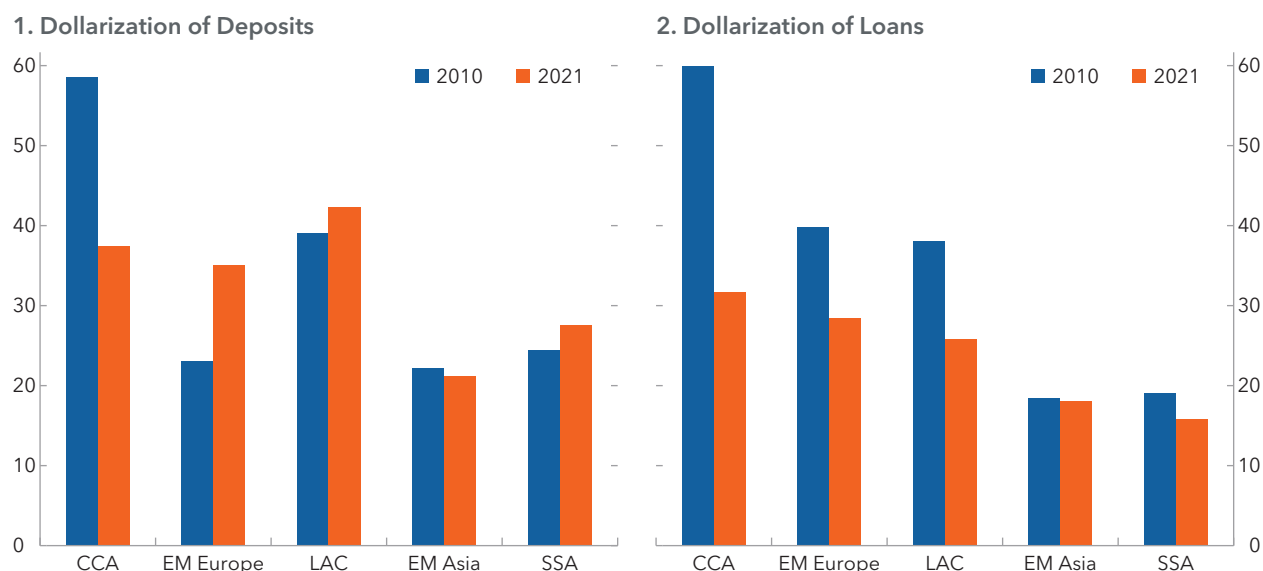
Sources: National authorities; and IMF staff calculations.

Note: Deposit and credit dollarization is computed at constant exchange rates, that is, by dividing foreign exchange deposit/credit (the end of month stock) by the same day exchange rate and then multiplying it by the exchange rate as of May 31, 2021. Deposit/credit dollarization is a ratio of foreign exchange-denominated deposit/credit counted in local currency to total deposit/credit, multiplied by 100. Country abbreviations use International Organization for Standardization country codes. CCA = Caucasus and Central Asia.

the 1990s, leading households to prefer holding dollars as a safe store of value. When balance sheets are highly dollarized, economic agents prefer hard currency to maintain the real value of their consumption in the face of macroeconomic uncertainty (Ize and Levy Yeyati 2005). Armenia, Georgia, the Kyrgyz Republic, and Tajikistan have negative net international investment positions above 70 percent of GDP, exacerbating the contractionary impact of currency depreciation on balance sheets.

Although financial dollarization remains relatively high in the CCA, it has declined in recent years due to prudent macroeconomic policies, macroprudential measures, and the move to floating exchange rate regimes. A decade ago, the share of FX deposits in total deposits averaged 60 percent (measured at constant exchange rates) across the CCA, and deposit dollarization rates varied significantly among countries, from 34 percent in Armenia to about 80 percent in Georgia (Figure 12). Deposit dollarization in the CCA had fallen to 38 percent in 2022, with Georgia still the highest in the region at 57 percent. Credit de-dollarization in the CCA has been even more pronounced. The share of FX loans in total loans declined from 62 percent in 2010 to 28 percent in 2022, similar to the average for European emerging market economies. Kazakhstan has had the fastest rate of credit de-dollarization, falling from 74 percent of all credit in 2010 to single digits in 2022. The gap between the dollarization of deposits and credit has narrowed on account of the introduction of regulatory limits on banks’ net open foreign exchange positions. Over the last decade, CCA’s dollarization rates declined significantly and converged to those in other EMDEs (Figure 13). Other EMDEs also experienced a decline in loan dollarization but witnessed slight increases in their deposit dollarization rates. Loan dollarization fell by 12 percentage points in Latin American countries (LAC), 11 percentage points in

Figure 13. Financial Dollarization in the CCA and Other EMDEs
(Percent, average)



Sources: IMF, Financial Soundness Indicators; and IMF staff calculations.

Note: The exchange rate used for the conversion of deposit and loans denominated in foreign currency into the unit of account is the exchange closing rate at the date of the financial statement position. The sample of CCA countries includes Armenia, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, and Tajikistan. The other EMDEs include EE Europe (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, North Macedonia, Montenegro, Poland, Romania, and Türkiye), LAC (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, and Uruguay) and EE Asia (Brunei Darussalam, Cambodia, Fiji, Indonesia, Malaysia, Papua New Guinea, Philippines, Tonga, and Vietnam). CCA = Caucasus and Central Asia; EE = emerging economy; EMDE = emerging market and developing economy; LAC = Latin American countries.

emerging Europe, and about 1 percentage points in EM Asia, while deposit dollarization increased by 12 percentage points in emerging Europe, 13 percentage points in LAC, and 1 percentage point in emerging Asia.¹¹

A qualitative survey of macroprudential and administrative measures to reduce dollarization in the CCA provides useful insights (Table 2). Most CCA countries have an official de-dollarization policy in place. All countries apply higher reserve requirement ratios and additional capital requirements for FX-denominated liabilities versus domestic currency liabilities. Azerbaijan has a reserve requirement differential of 0.5 percent; on the other extreme, Georgia's is close to 20 percent. All countries have introduced macroprudential and administrative measures to reflect and evaluate the risks associated with foreign currency assets. Some countries have outright bans on FX lending to specific segments, such as mortgages, whereas Georgia introduced a floor on FX loans. Measures such as differentiated loan-to-value and payment-to-income ratios are less common and more recent.

After introducing limits on open FX positions, the gap between loan and deposit dollarization has narrowed considerably since 2010. In Azerbaijan, Georgia, and Kazakhstan, credit dollarization has dropped significantly more than deposit dollarization, mainly due to regulatory restrictions on FX lending. CCA countries have made significant progress in developing their capital markets during the last decade. All CCA countries issue long-term government securities in local currency, Uzbekistan being the latest. Still, local currency debt accounts for a small share of total public debt in the CCA. A systematic approach toward developing money markets, primary and secondary markets, an investor base, financial market infrastructure, and the

¹¹ Sample of countries included in the regional average: EM Europe (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, North Macedonia, Montenegro, Poland, Romania, and Türkiye), LAC (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, and Uruguay), and EM Asia (Brunei Darussalam, Cambodia, Fiji, Indonesia, Malaysia, Papua New Guinea, Philippines, Tonga, and Vietnam).

Table 2. Survey of Dollarization Measures

	ARM	AZE	GEO	KAZ	KGZ	TJK	UZB
Is there a dedollarization policy in place?	√	x	√	√	√	√	x
Microprudential measures							
Price incentives/risk mitigation	√	√	√	√	√	√	√
Additional capital requirements for unhedged FX exposures	√	x	√	√	x	√	x
Additional/separate liquidity requirements for FX liabilities	√	x	√	√	x	x	√
Open currency position limit	√	√	√	√	√	√	√
Administrative measures							
Bans on FX lending	√	√	√	x	√	√	√
Stricter debt-service-to-income & loan-to-value limits for FX loans	x	x	√	x	x	x	x
Nonfinancial sector (for example, ban on payments, contracts, ads in FX)	√	x	√	x	√	x	√
Did the authorities put sustained efforts to create the conditions for long-term domestic capital market development?	√	x	√	√	√	x	√
Did the authorities introduce any other dedollarization measures?	√	√	√	√	√	√	√

Sources: National authorities; and IMF staff.

Note: Country abbreviations use International Organization for Standardization country codes. FX = foreign exchange.

legal and regulatory framework would help build an effective domestic bond market and increase the share of domestic debt in public debt stock over time (Mæhle and others 2021). Similarly, the negative net international investment position of several countries in the CCA (above 70 percent of GDP) exacerbates the contractionary impact of FX depreciation on balance sheets. There is room for further regulatory measures to mitigate risks arising from FX lending, particularly in countries where credit dollarization exceeds deposit dollarization, but some countries (for example, Georgia) already apply nearly all available regulatory tools.

Exploring the short-term drivers of financial de-dollarization in the CCA¹² suggests that (1) increasing the spread between reserve requirement ratios on foreign currency and the local currency has contributed to deposit and credit de-dollarization in several countries; (2) various prudential measures—discouraging bank lending in foreign currency to unhedged borrowers, raising provisions on foreign currency-denominated loans, introducing differentiated capital risk weights on foreign currency loans, tightening capital requirements against foreign exchange positions—have contributed to credit dollarization in several countries; (3) countries' concerted efforts to extend the yield curve and develop the domestic debt market have not been associated with sufficient de-dollarization, possibly due to these markets' low level of development; and (4) the effects of exchange rate volatility and inflation on financial dollarization are mixed. Furthermore, deposit dollarization is driving credit dollarization, not the other way around.

¹² A standard recursive VAR was used to examine the role of different factors such as macro-variables, prudential measures, and the development of financial capital markets on both credit and deposit de-dollarization in the CCA. The authors estimate impulse response functions and forecast error variance decompositions to quantify the impact of each shock on deposit and credit dollarization (Cakir and others 2022).

D. Nascent Central Bank Communication and Credibility¹³

CCA countries have made notable progress with central bank communication and transparency, but central banks still face credibility challenges. Most central banks continue to have difficulty anchoring inflation expectations, and there are instances of sizeable gaps between inflation expectations and targets, suggesting credibility issues.

Further strengthening central bank communication can help anchor inflation expectations (IMF 2023). Improved communication can persuade economic agents that policy formulation and implementation are oriented toward achieving the inflation target. Successful central bank communication implies a more predictable policy (Blinder 2009). Predictability enhances the pass-through of monetary transmission and reduces deviation of inflation expectations from the target.¹⁴ Communication can enhance credibility, especially when the public views central bank messages as informative and persuasive. Good communication facilitates the management of monetary policy trade-offs (IMF 2018). It also interacts with the monetary policy framework by supplementing a robust framework or amplifying inconsistencies of a weak one (Stankova 2019).

Communication frameworks in the CCA are broadly in line with those of developing economies, based on the methodology of Unsal, Papageorgiou, and Garbers (2022). The index of Independence and Accountability, Policy, and Operational Strategy, and Communications (IAPOC) developed by Unsal, Papageorgiou, and Garbers (2022) measures a broad set of practices on communications. This index shows that communication frameworks in the CCA do not substantially differ from the average of developing economies (Figure 14). Nevertheless, CCA central banks could benefit from upgrading their communication practices to align with best practices. In particular, more emphasis is needed on disclosing forecasts, inflation expectations surveys, and reporting information from press conferences on central bank websites.

In addition to standard monetary policy communication tools, CCA central banks utilize some novel channels. Central banks communicate more information through monetary policy reports, policy press releases and conferences, and social media (Table 3).¹⁵ Most central banks have monetary policy guidelines that state policy objectives and tools. They also use press releases to communicate the decision on the main instrument (interest rates) and monetary policy reports that disclose inflation and economic activity forecasts. A survey of CCA central banks (see Box 2) suggests that while CCA countries that are more advanced in their transition to inflation targeting (for example, Armenia and Georgia) use monetary policy reports as their main communication tool, other countries report press releases as their primary communication tool.

Monetary policy reports have been the main tool to communicate detailed analyses of economic and monetary developments, as well as key forecasts. Many CCA central banks—Armenia, Georgia, Kazakhstan, the Kyrgyz Republic, and Uzbekistan—operate forecasting systems developed in partnership with IMF FPAS technical assistance.¹⁶ As a result, many publish GDP growth and inflation forecasts on a three-year horizon (Table 4) as well as their underlying forecast assumptions. However, in many cases, the forecast disclosure is limited to GDP growth and inflation indicators. Armenia releases forecast figures in a downloadable format that facilitates further research and scrutiny.

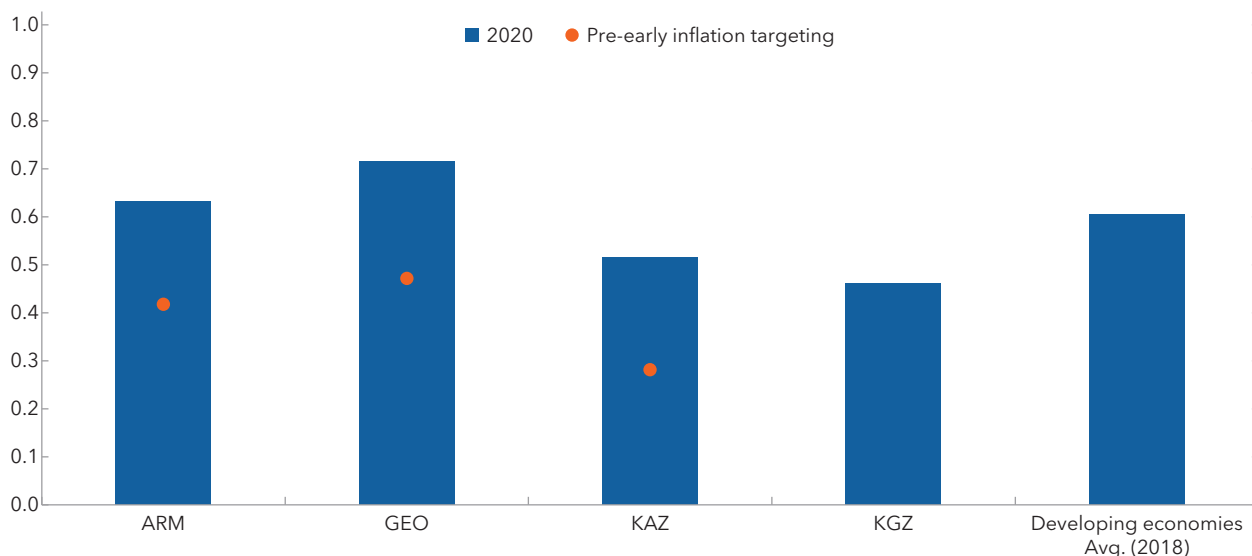
¹³ This section draws on the conceptual discussion in Unsal, Papageorgiou, and Garbers (2022) and related assessments, particularly on central bank communications, for four CCA countries (Armenia, Georgia, Kazakhstan, and the Kyrgyz Republic) covering the period 2007–20.

¹⁴ De Haan and Sturm (2019) extensively discuss how communication enhances monetary policy.

¹⁵ Tables 3, 4, and 5 emphasize different aspects of monetary policy communication based on the methodology of Unsal, Papageorgiou, and Garbers (2022). Communication via social media can help access wider audiences, but the caveat is that it is more vulnerable to manipulation and can lead to polarization and fragmentation of audiences (Chen, Pacheco, and Yang 2021).

¹⁶ A forecasting and policy analysis system (FPAS) is a system of tools and related processes designed to support forward-looking monetary policy formulation based on economic data and analysis. It also includes processes for preparing internal and external monetary policy reports and structured monetary policy advice and presentations to the policymakers.

Figure 14. IAPOC Index–Communications, 2020
(Index ranges between 0 (minimum) and 1 (maximum))



Source: Unsal, Papageorgiou, and Garbers (2022).

Note: Pre- or early inflation targeting: 2007 for Armenia, 2010 for Georgia, and 2013 for Kazakhstan. Country abbreviations use International Organization for Standardization country codes. IAPOC = Independence and Accountability, Policy, and Operational Strategy, and Communications

Table 3. Monetary Policy Frameworks and Communication Tools in the CCA

		ARM	AZE	GEO	KAZ	KGZ	TJK	UZB
Objectives	Monetary policy guideline or strategy	√	√ (Annually)	√ (Annually)	√ (Annually)	√	√	√ (Annually)
	Press release	√	√	√	√	√	√	√
Policy decisions	Committee minutes	√						
	Monetary policy report (F: incl. forecast)	√ (F)	√ (No F)	√ (F)	√ (F)	√ (F)	√ (F)	√ (F)
Accountability	Annual report	√	√	√	√	√	√	√
	Audited financial statements	√	√	√	√	√	√	
Active in social media		Facebook Youtube	Twitter Facebook Youtube	Facebook Youtube	Facebook Youtube Telegram	Facebook Youtube		Facebook Youtube Telegram

Sources: National authorities; and Unsal, Papageorgiou, and Garbers (2022).

Note: Reported information is as of 2022. F means that forecast for inflation is included. Country abbreviations use International Organization for Standardization country codes.

Table 4. Forecast included in Monetary Policy Reports

		ARM	GEO	KAZ	KGZ	TJK	UZB
Inflation	Years ahead	3	3	2	2	3	3
	Frequency	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly
Real GDP growth	Years ahead	3	3	1	2		3
	Frequency	Quarterly	Quarterly	Annual	Quarterly		Quarterly
Forecast data in downloadable format		√					

Sources: National authorities' websites; and Unsal, Papageorgiou, and Garbers (2022).

Note: Reported information is as of 2022. Country abbreviations use International Organization for Standardization country codes.

Central banks across the region have improved their press releases, increasing their length and focusing the discussion on topics consistent with central bank objectives.¹⁷ Some key developments observed include¹⁸:

- *Central bank press releases have become longer, but not necessarily more readable.* The number of words in press releases has increased in each CCA country, especially since central banks started the transition to inflation targeting and during times of uncertainty (Figure 15). However, clarity indicators—approximated by the Flesch readability index (which penalizes long words or sentences)—generally show irregular patterns and have deteriorated since the COVID-19 pandemic, suggesting that longer length does not necessarily mean clearer communication.¹⁹ In addition, press releases of CCA central banks tend to be longer compared to those of advanced economies and emerging market economies (Figure 16), but cross-country comparisons may be imperfect due to differences in language structures and should be interpreted with caution.
- *Press releases' wording is focused on the central banks' inflation-targeting mandates.* Press releases have been consistent with central banks' forward-looking inflation-targeting mandate, with the terms "inflation" or "price" mentioned most frequently (Figure 17).²⁰ The inflation discussions have revolved around monetary policy, financial markets, and growth and have been generally forward-looking, as suggested by the frequency of terms such as "expect" or "forecast."
- *Press releases frequently lack information about central banks' numerical targets, monetary stance, and direction of (conditional) future policy.* Providing such information—to complement the discussion provided on current developments, outlook, and risks (Table 5)—would help anchor expectations and build credibility.
- *Press releases are recycled and contain words with a negative tone.* More than 50 percent of the text of press releases in some CCA countries is similar to previous press releases in terms of word choice and word frequency. This recycled wording increases predictability.²¹ Press releases also contain more

¹⁷ The authors' analysis documents the evolution of monetary policy decision press releases in detail, performing topical analysis into key areas inspired by Unsal, Papageorgiou, and Garbers (2022). The analysis covers press releases available for the period January 2006 to August 2021.

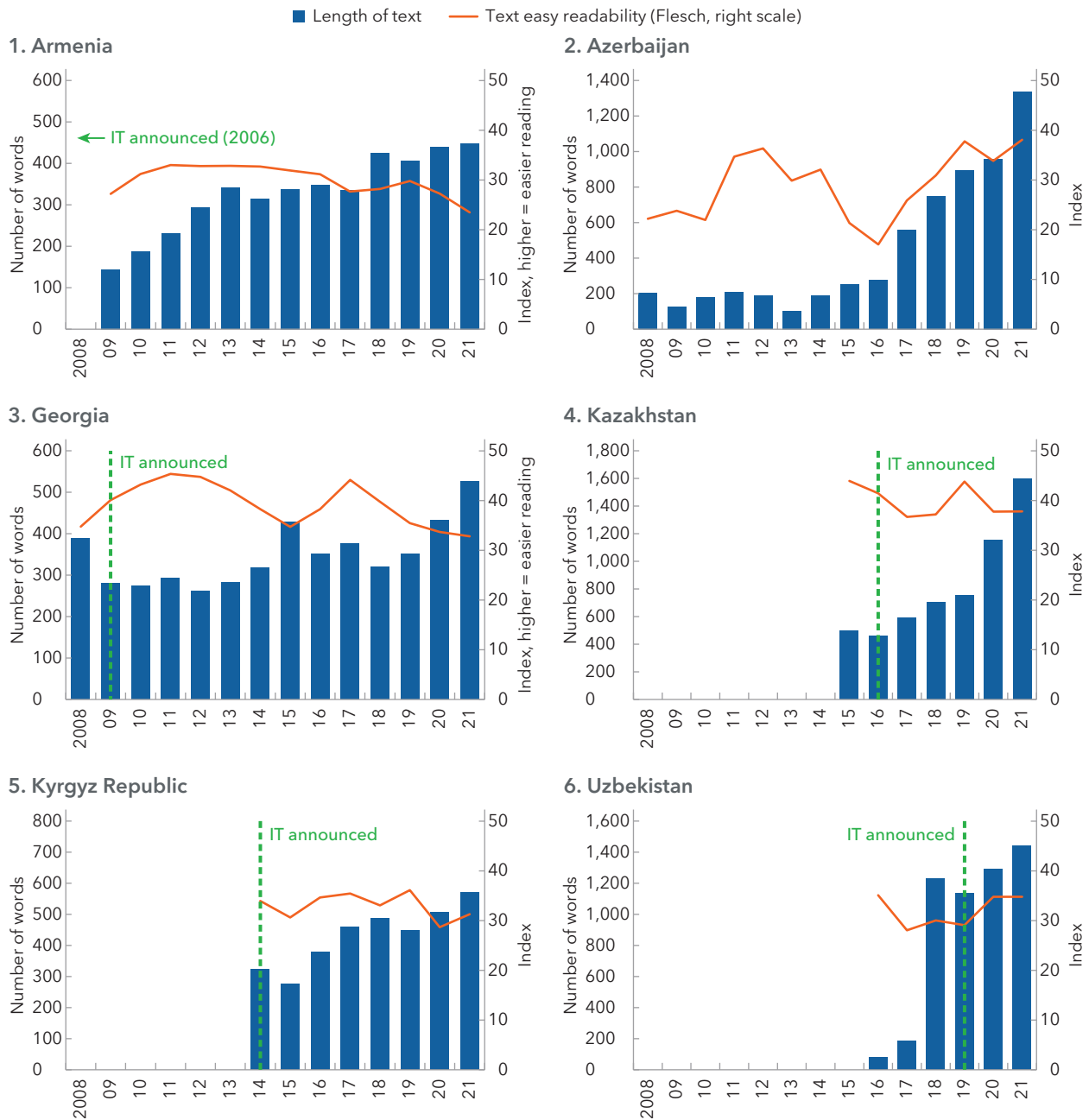
¹⁸ The authors' textual analysis omits Tajikistan and Turkmenistan due to the lack of press releases in English.

¹⁹ IMF (2018) finds a similar result for Latin American countries.

²⁰ The size of a word in a word cloud reflects the relative frequency of that term in documents. Heimerl and others (2014) provides a detailed explanation of the word cloud construction.

²¹ Similarity indexes are computed using (1) sine-cosine measure and (2) Jaccard measure, as in Hanley and Hoberg (2010) and Cohen, Malloy, and Nguyen (2019).

Figure 15. Press Releases: Length and Readability

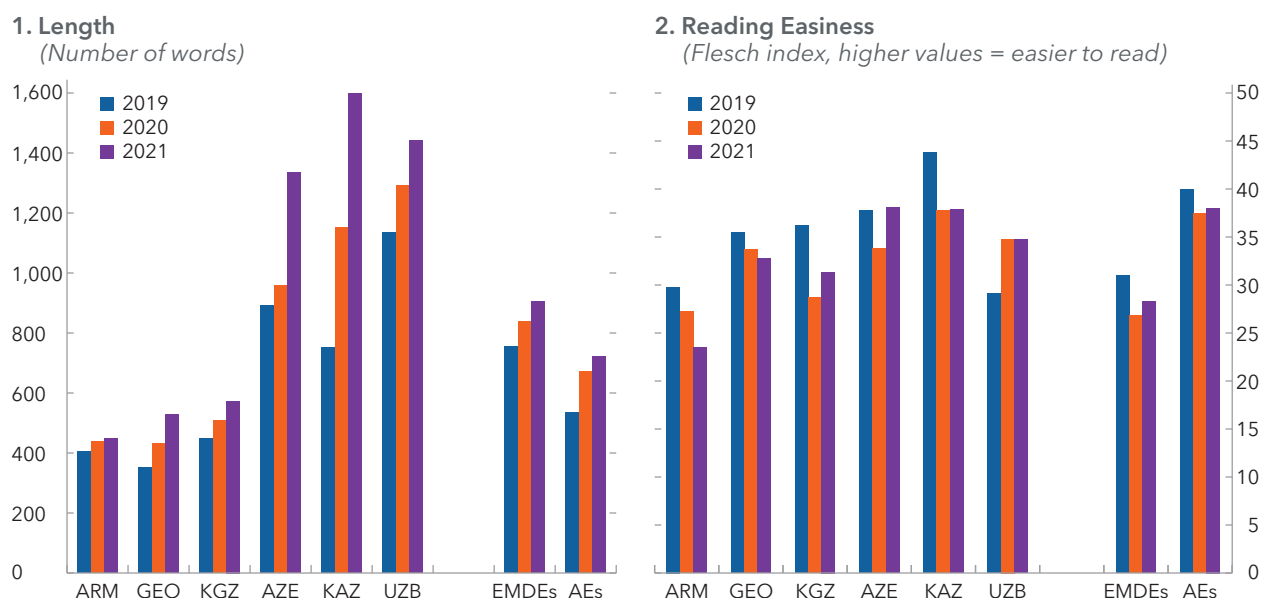


Source: IMF staff estimates.

Note: The analysis is performed using English versions of press releases. Flesch index = $206.835 - 1.015 \times \text{average words per sentence} - 84.6 \times \text{average syllables per word}$. IT = inflation targeting.

negative than positive words, resulting in a negative sentiment score (Figure 18), but comparison across countries is complicated due to differences in language structure that could affect calculations of the sentiment score.²²

²² Sentiment is calculated using Loughran and McDonald (2011)'s Master Dictionary as the difference between the number of positive and negative words, scaled by the total number of positive and negative words.

Figure 16. Press Releases: Selected Indicators, 2019-21

Source: IMF staff estimates.

Note: The analysis is performed using English versions of press releases. AEs: Australia, Canada, euro area, Iceland, Israel, New Zealand, Norway, and Sweden. EMDEs include Albania, Brazil, Chile, Colombia, Czech Republic, Hungary, Indonesia, Mexico, Moldova, Mongolia, Peru, Philippines, Poland, Romania, Russian Federation, South Africa, Serbia, Thailand, Türkiye, and Ukraine. Country abbreviations use International Organization for Standardization country codes. AEs = advanced economies; EMDEs = emerging market and developing economies. Flesch index = $206.835 - 1.015 \times \text{average words per sentence} - 84.6 \times \text{average syllables per word}$.

Table 5. Selected Content Included in Press Releases, 2020-21

(Percent of press releases)

	Reasons for the decision	Monetary policy stance	Current state of the economy	Short-term outlook	Risks	Direction of future policy	Mentioning numerical target
ARM	93	67	100	100	87	13	60
GEO	100	100	100	93	87	67	7
KGZ	100	7	100	100	53	0	40
KAZ	94	12	100	94	100	29	65
AZE	80	47	100	80	93	7	33
UZB	100	53	100	87	100	33	40
TJK	100	10	100	20	100	0	10

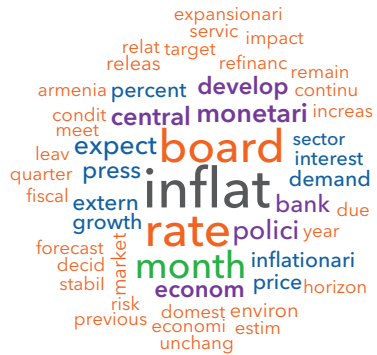
Sources: Country authorities' press releases; and IMF staff calculations based on Unsal, Papageorgiou, and Garbers (2022).

Note: Country abbreviations use International Organization for Standardization country codes.

Press release length and clarity can contribute to anchoring inflation expectations. A random effect model suggests that longer or more readable press releases are associated with smaller deviations from inflation targets. However, their statistical significance is weak, which can be explained by several reasons. First, frameworks are still in transition, so the impact of communication is limited. Second, the transition to improved monetary frameworks is usually triggered by a failure of previous regimes, so communication improvements tend to occur during crisis periods when inflation is higher.

Figure 17. Press Releases: Focus by Country

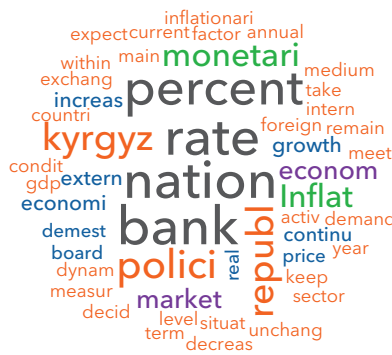
1. Armenia–Focus on Inflation



2. Georgia–Focus on Inflation



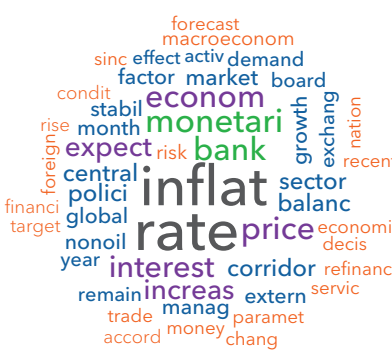
3. Kyrgyz Republic–Focus on Growth



4. Kazakhstan–Focus on Inflation



5. Azerbaijan–Focus on Inflation



6. Uzbekistan–Focus on Inflation

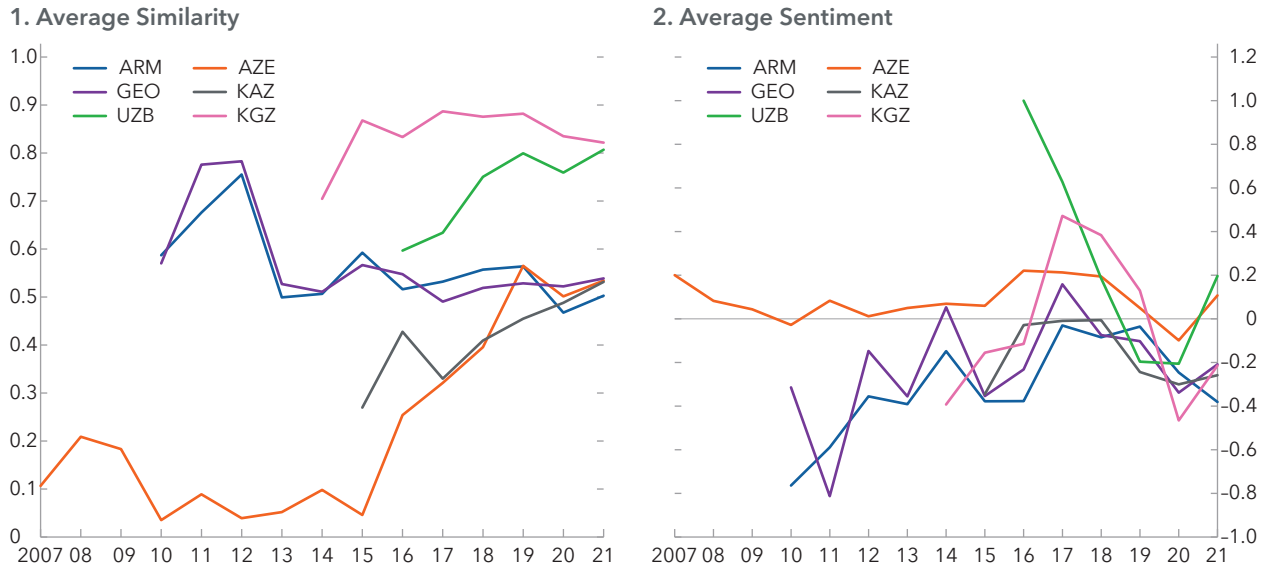


Sources: IMF staff estimates.

A stronger tone in press releases is found to foster monetary policy transmission in the CCA. Given an overall negative sentiment of press releases, a more negative tone increases interest rate pass-through due to the signaling channel of communication—that is, higher surprise or stronger policy stance—which prompts market participants to act.

Overall, transparency has increased in the region in sync with global trends (Figure 19). Transparency is the first premise underlying communication as it increases accountability and strengthens the framework and its credibility (Blinder and others 2008, Dincer and Eichengreen 2014, Unsal and Garbers 2021). Transparency indexes suggest upgrades in transparency consistent with the improvements in monetary frameworks triggered by the transition to inflation targeting. Although the index covers different dimensions (central

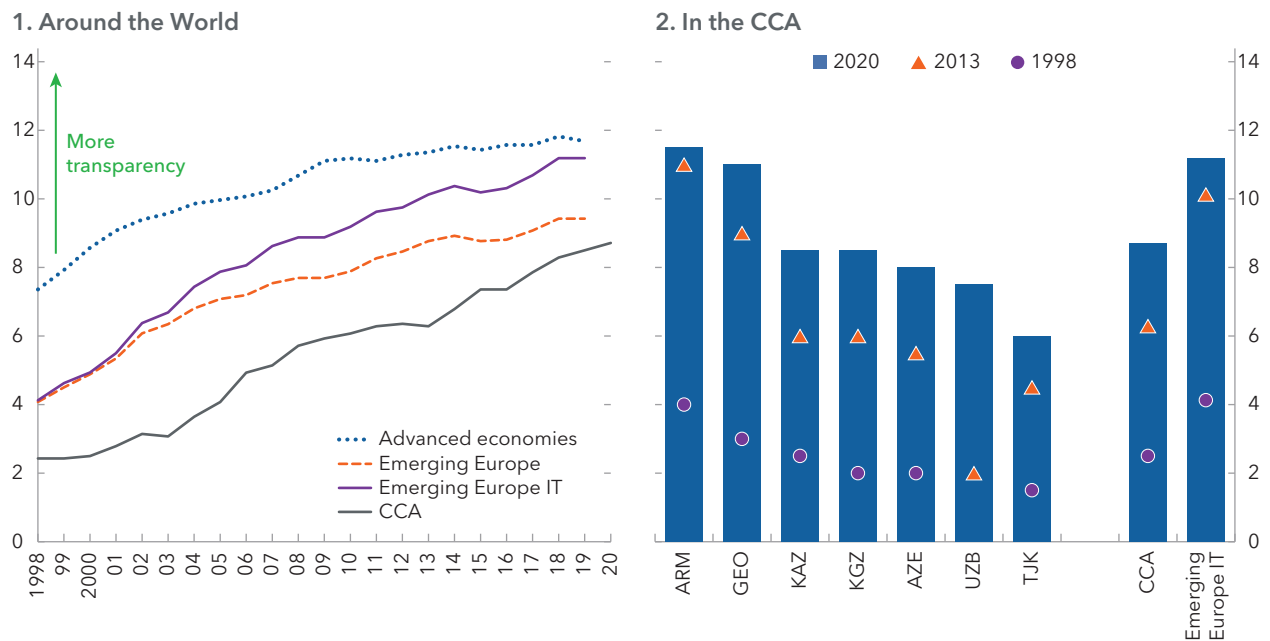
Figure 18. Tone and Similarity of Press Releases



Source: IMF staff estimates.
 Note: Country abbreviations use International Organization for Standardization country codes.

bank institutional frameworks, political and economic data, policy formulation, and operations), a key factor driving upgrades in the CCA was an improvement in policy transparency resulting from greater disclosure of policy decisions and their motivation.

Figure 19. Central Bank Transparency
 (Index 0-15; 0 = minimum and 15 = maximum)



Sources: Dincer and Eichengreen (2020); and IMF staff estimates.
 Note: Country abbreviations use International Organization for Standardization country codes. CCA = Caucasus and Central Asia; IT = inflation targeting.

Box 2. Views from CCA Central Bankers

A survey¹ of CCA central banks indicates that officials view monetary policy reports and press releases as the most relevant communication tools for monetary policy (Box Table 2.1). Social media postings rank significantly lower, suggesting that although central banks are trying to reach wider audiences directly, social platforms play a minor role.

Box Table 2.1. What Are the Main Central Bank Communication Tools in Your Country?

	ARM	AZE	GEO	KAZ	KGZ	UZB
Inflation/monetary policy reports	Dark Green	Dark Green	Dark Green	Dark Green	Dark Green	Dark Green
Press releases	Dark Green	Dark Green	Dark Green	Dark Green	Dark Green	Dark Green
Press conferences	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green
Social media postings	Light Green	Light Green	Light Green	Light Green	Light Green	Light Green

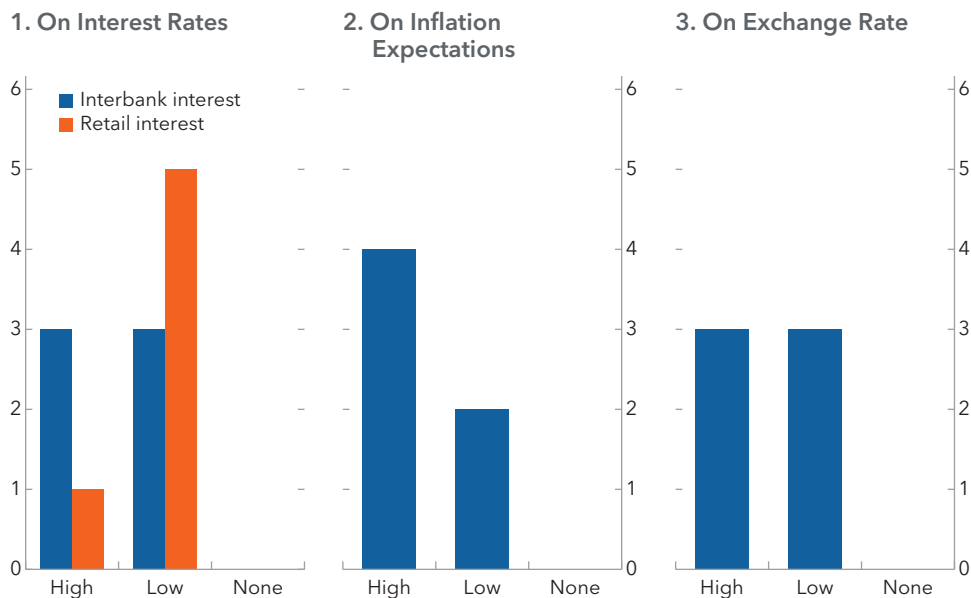
Source: IMF staff, based on Joint Vienna Institute survey (June 2021).

Note: Darker shading denotes more relevance. Country abbreviations use International Organization for Standardization country codes.

The views of officials on the impact of communications on key economic variables were diverse. When asked to assess whether the impact of communications on three economic variables was high, low, or none, all officials reported that central bank communications have an impact (either low or high) on interest rates, inflation expectations, and exchange rate. All respondents rejected the idea that communications have no impact. The distribution between high or low impact showed even views: four of six central banks consider the impact of communications on inflation expectations as high, and five of six central banks consider the impact of communication on retail interest rates as low (Box Figure 2.1).

Box Figure 2.1. What is the Impact Of Central Bank Communication on the Following Variable and Its Volatility?

(Number of answers)



Source: IMF staff, based on Joint Vienna Institute survey (June 2021).

¹ The survey of CCA central bank officials was conducted as part of the Joint Vienna Institute initiative.

4. Policies to Strengthen Monetary Policy Frameworks

The recent surge in inflationary pressures has reignited policy discussions on strengthening monetary policy frameworks in the CCA. Further improvements in CCA monetary policy frameworks should continue to be guided by best practice principles. Previous work (IMF 2015, Unsal, Papageorgiou, and Garbers 2022) identifies best practice principles for effective monetary policy frameworks. While these principles are consistent with an inflation-targeting regime, they can also be implemented as part of alternative monetary policy frameworks. CCA countries have made considerable progress on some of these principles, but further action is needed (Figure 20).

- *Central banks should have a clear legal mandate and the operational independence to pursue it.* All CCA central banks have a legal mandate to pursue monetary policy objectives. The laws also enshrine the governance and organizational structures of central banks. Many central banks established monetary policy committees to make independent decisions on monetary policy, including setting the policy rate. However, in several CCA countries, the laws leave gaps in terms of the selection and dismissal of board members and their qualifications. In addition, operational independence is not always feasible in practice, and fiscal dominance can become binding, especially in crisis times (IMF 2023). Practices also vary in terms of accountability, with some central banks accountable to the Parliament and others to the central government. Nevertheless, de facto independence can be compromised in some cases through the government's influence over Board members and other governance issues. The possible divergence between the de facto and de jure independence of central banks has been documented in Unsal, Papageorgiou, and Garbers (2022).
- *Price stability should be the primary objective of monetary policy (at least in the medium term).* Most central banks pursue price stability as their main objective and recognize that monetary policy has a limited ability to influence real variables in the medium term. Turkmenistan is the only country with a fixed exchange rate regime, but capital controls provide some discretion over monetary policy. In Azerbaijan, the de jure exchange rate arrangement is a free float but de facto stabilized relative to the US dollar.
- *Central banks should have a numerical medium-term inflation objective to operationalize the price stability mandate and guide policy actions.* Except for Turkmenistan, all CCA central banks have a numerical inflation objective. Some central banks target point inflation, while others target a range. Some central banks target a declining inflationary path to ensure a smooth transition to lower inflation levels (for example, the National Bank of Kazakhstan has the target range for 2021-22 at 4-6 percent, for 2023-24 at 4-5 percent, and from 2025 onwards at 3-4 percent).
- *Central banks should also consider the implications of policy decisions on output and financial stability.* In addition to price stability, some CCA central banks are mandated by law to ensure financial stability and contribute to financial development. This requires deploying macro- and micro-prudential policies to address pockets of financial vulnerability, while addressing data and supervisory gaps, including in the growing non-bank financial sector. More broadly, financial stability objectives can lead to difficult trade-offs in certain periods, including by complicating the task of monetary policy.
- *Central banks should have an effective operational framework centered on controlling short-term interest rates.* Further work is needed in this area. While most CCA central banks have policy rates in their toolkit, transmission mechanisms from the policy rates to short-term market rates—and, ultimately, aggregate demand—is relatively weak. For instance, while transmission from policy to money market rates has

Figure 20. CCA: Progress on Best Practice Principles for Modernizing Monetary Policy Frameworks

	ARM	AZE	GEO	KAZ	KGZ	TJK	TKM	UZB
1. Central banks should have a clear legal mandate and operational independence to pursue it	Green	Light Orange	Green	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange
2. Price stability should be the primary objective of monetary policy (at least in the medium-term)	Green	Green	Green	Green	Green	Light Orange	Orange	Green
3. Central banks should have a numerical medium-term inflation objective to operationalize the price stability mandate and guide policy actions	Green	Green	Green	Green	Green	Green	Orange	Green
4. Central banks should also consider the implications of policy decisions on output and financial stability	Green	Green	Green	Green	Green	Green	Light Orange	Green
5. Central banks should have an effective operational framework, generally centered on the control of short-term interest rates	Light Orange	Light Orange	Green	Light Orange	Light Orange	Light Orange	Orange	Light Orange
6. Central banks should adopt a forward-looking strategy that maps the price stability objective into policy decisions	Light Orange	Green	Green	Green	Orange	Light Orange	Orange	Green
7. Clear communication is a central element of the monetary policy framework to explain policy decisions and outcomes and provide guidance about future	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Orange	Light Orange

Source: IMF staff.

Note: Principles for modernizing monetary policy frameworks are taken from IMF (2015). Traffic lights reflect views of CCA country teams on progress made by individual countries with respect to each principle. Colors signify: green = no action needed; light orange = some progress needed; orange = significant progress needed. Country abbreviations use International Organization for Standardization country codes.

improved in the Kyrgyz Republic, transmission to deposit and lending rates has deteriorated. A large volume of subsidized loans undermines the transmission from money market to retail rates in Kazakhstan. In addition, CCA central banks frequently use other policy instruments (reserve requirement ratios, FXIs, subsidized lending, and so on) and, in some cases, in opposite directions, making it difficult to assess the monetary policy stance (IMF 2023). In some cases, structural excess liquidity further complicates the use of policy rates to signal monetary policy stance. Improving the accuracy of liquidity forecasting, including forecasts of government transactions, would enhance transmission efficacy in several CCA countries.

- Central banks should adopt a forward-looking strategy that maps the price stability objective into policy decisions. This requires having a well-established FPAS system. Some CCA central banks (Armenia, Georgia, and Kazakhstan) have made good progress setting up FPAS systems with IMF technical assistance, while others are still in the initial stages. Institutional bottlenecks, capacity constraints, and lack of technical expertise complicate progress in this area.
- Clear communication is a central element of the monetary policy framework to explain policy decisions and outcomes and provide guidance about the future. Some progress has been made in this area, but additional work is needed. For example, Armenia introduced regular press conferences featuring the governor, the Kyrgyz Republic improved its monetary reports significantly, and most CCA countries now have well-organized external websites. Still, there are gaps with international good practice. In particular, more transparency is needed on monetary operations and FXIs, including through the publication of timely information, which is currently available from only a few CCA central banks (IMF 2023). In addition,

some countries could streamline their press releases to be more explicit on the monetary policy stance and mention the numerical values of inflation targets to help anchor inflation expectations. For example, the Central Bank of Azerbaijan's unresolved tensions around the policy framework—encompassing both a stabilized exchange rate and annual inflation target—undermine its communication efforts.

Weak monetary policy transmission mechanisms should not discourage the modernization process. Modernization involves assessing the state of the economy, adjusting monetary policy in response to changes in the outlook, and gaining confidence in the effect of monetary policy. Uncertainty about the transmission mechanism is not unique to CCA countries; it also arises in advanced economies, especially during financial crises and periods of structural change. The best way to improve the understanding of the transmission mechanism is learning by doing, even if the inflation target's confidence bands are broad due to transmission uncertainty. Strengthening traditional transmission channels requires fostering the development of financial markets, deepening financial inclusion, and expanding the role of financial markets, including developing a benchmark yield curve and reducing dollarization (Armenia, Azerbaijan, Kazakhstan, and the Kyrgyz Republic). Measures should be tailored to the individual circumstances of CCA countries to account for their heterogeneity. Some, like de-dollarization, will require prolonged and sustained stabilization efforts.

The gradual transition to greater exchange rate flexibility is essential to the modernization process (IMF 2023). As small open economies, CCA countries are subject to frequent external shocks. Exchange rate flexibility allows for the cushioning of these shocks, facilitating adjustment of relative prices, preserving export competitiveness, and limiting current account imbalances while protecting FX reserves. In the absence of exchange rate flexibility, the adjustment must come from changes in domestic prices and fiscal measures, which are more challenging to implement. When coupled with credible monetary policy and exchange rate frameworks, greater exchange rate flexibility can also help reduce dollarization and strengthen monetary transmission. Greater flexibility does not imply complete abandonment of FXIs, which can be used sparingly to smooth the real effective exchange rate's transition to its new equilibrium following the external shock and prevent disorderly exchange rate movements (especially in thin markets), consistent with the IPF. However, effective FXIs require greater clarity on monetary and exchange rate policy frameworks, transparency, and communication to explain central bank actions and gain public trust.

Central banks face difficult policy trade-offs in the presence of external shocks and market frictions and should carefully consider the benefits of the tools at their disposal in line with the IPF (IMF 2020). Monetary policy is one of the tools that CCA central banks deploy, together with FXI and macroprudential regulation. The IPF aims to provide a systematic analytical approach to selecting the appropriate policy mix for achieving macroeconomic and financial stability. According to the IPF, policymakers should consider these tools jointly in the presence of disruptive capital flows and market frictions, such as limited liquidity in the FX market, balance sheet mismatches, and limited market access. In these circumstances, FXI or macroprudential regulation can enhance monetary autonomy by allowing monetary instruments to focus on domestic objectives. However, the persistent use of FXIs and macroprudential instruments may lead to adverse side effects, such as a buildup of unhedged FX liabilities or an erosion of market discipline. Hence, policymakers should balance the short-term benefits of FXIs and macroprudential instruments against the potential costs and side effects.

De-dollarization is a gradual process that requires low and stable inflation for an extended period. To further promote de-dollarization in the CCA, a successful strategy should include credible monetary and exchange rate frameworks, the absence of fiscal dominance, and deep domestic financial markets that can provide long-term investment vehicles. Further regulatory measures could mitigate the risks arising from FX lending, particularly in countries where credit dollarization exceeds deposit dollarization. Overall, dollarization is difficult to reverse and requires prolonged and sustained stabilization policy efforts. Various prudential measures and higher spread between reserve requirement ratios on foreign and local currencies have

contributed to de-dollarization in several countries (Cakir and others 2022). CCA countries need to make their domestic currency appealing and enhance central bank communication, among the other measures identified earlier.

The modernization process also requires the continuous improvement of communication efforts to enhance central bank credibility, tailoring it to the needs of country-specific audiences (IMF 2023). In the CCA, central bank credibility is typically linked to exchange rate stability and achieving the inflation target rather than managing macroeconomic volatility or uncertainty. Central banks usually operate in environments of low trust in state institutions, poor financial literacy, and limited expert debate, complicating communication efforts. Some central banks have improved their communications (Armenia, Georgia, Kazakhstan, the Kyrgyz Republic, and Uzbekistan). Nevertheless, central bank communications tend to focus on providing statistical information at the expense of analytical discussion. Lack of capacity and journalists' limited economic training also complicate communication. More transparency on central bank operations and FXIs through greater data availability would help the public to better understand policy responses and strengthen credibility. Press releases could be more streamlined and more explicit on the monetary policy stance, including through explicitly citing numerical monetary targets, to help anchor inflation expectations. Central banks should be able to explain their views on current and future economic conditions, the rationale for their policy measures, and the outcomes of monetary policy actions, which would help strengthen central bank credibility (Unsal, Papageorgiou, and Garbers 2022). Overall, CCA central banks are progressing along this challenging path, but need more time to refine their frameworks.

Annex 1. Empirical Analysis of the Monetary Policy Transmission Mechanism in the CCA

The authors examine the monetary transmission mechanism in the CCA using a VAR methodology. The baseline specification applies a panel VAR on annual data on real GDP growth (y), CPI inflation (p), changes in real central bank policy rate (r), real base money growth (m), and nominal local currency per US dollar exchange rate growth (e) for seven CCA countries (Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan) for the period 2000–20.¹ The authors use two lags in the VAR given the short time series.² Country and time fixed effects are included to control for country-specific heterogeneity and common shocks hitting all CCA countries simultaneously (for example, an oil price shock).

The identification of shocks is based on the Cholesky decomposition. The recursive ordering of variables is as listed in vector $Y=[y, p, r, m, e]$. This implies that real GDP growth is the most exogenous variable contemporaneously affected by its structural innovation, nominal US dollar exchange rate growth is the most endogenous variable contemporaneously affected by all structural innovations in the model. y and p are considered non-policy variables, while r , m , and e are considered policy variables. Following Bernanke and Blinder (1992), the above ordering implies that endogenous non-policy variables are observed contemporaneously by policymakers, while policy variables would tend to affect the endogenous non-policy variables with a lag.

Granger causality tests show that policy variables have a significant joint Granger effect on inflation and output (Annex Table 1.1). Despite joint significance, the bivariate tests indicate that only the policy rate and the exchange rate Granger-cause inflation, while none of the policy variables Granger-causes output individually. This implies that individual monetary policy instruments tend to affect nominal (rather than real) variables, supporting the notion that monetary policy should focus on targeting nominal variables.

Annex Table 1.1. Granger Causality Test Results

(Explanatory power of lagged policy variables for future macroeconomic variables)

Effect on output growth (y)	p -values	Effect on inflation (p)	p -values
Policy rate (r)	0.306	Policy rate (r)	0.000***
Money supply (m)	0.374	Money supply (m)	0.771
Exchange rate (e)	0.151	Exchange rate (e)	0.017**
Jointly (p, r, m, e)	0.005***	Jointly (y, r, m, e)	0.000***

Sources: IMF, International Financial Statistics; IMF, *World Economic Outlook*; and IMF staff calculations.

Note: Reported are Granger causality test results from a 5-variable (y, p, r, m, e) panel VAR with country and time fixed effects. The null hypothesis is that a respective variable (or a group of variables in a block) does not Granger-cause the dependent variable. ***, **, and * denote significance and 10, 5, and 1 percent levels, respectively.

Variance decomposition confirms the importance of the exchange rate in explaining inflation variation (Annex Table 1.2). The share of inflation variation explained by the exchange rate reaches 12 percent in the fifth year, which is more than two times higher than the variation explained by the policy rate (5 percent).

¹ All variables in differences are $I(0)$.

² The eigenvalue stability conditions support the stability of estimated VAR (modulus of eigenvalues is less than 1).

Annex Table 1.2. Variance Decomposition of Monetary Policy Transmission

(Forecast error variation in the response variable explained by the exogenous shocks in impulse variables, percent)

	Impulse variable:				
	Output growth (y)	Inflation (p)	Policy rate (r)	Money supply (m)	Exchange rate (e)
Response variable: output growth (y)					
1 year	0.974	0.013	0.000	0.004	0.008
2 years	0.963	0.012	0.002	0.006	0.017
3 years	0.932	0.041	0.002	0.007	0.018
4 years	0.921	0.052	0.003	0.006	0.018
5 years	0.917	0.054	0.003	0.007	0.019
Response variable: inflation (p)					
1 year	0.002	0.893	0.031	0.002	0.072
2 years	0.002	0.832	0.036	0.017	0.114
3 years	0.003	0.817	0.044	0.017	0.119
4 years	0.003	0.817	0.045	0.016	0.118
5 years	0.004	0.813	0.048	0.017	0.118

Sources: IMF, International Financial Statistics; IMF, World Economic Outlook; and IMF staff calculations.

Note: Reported are forecast error variance decomposition results from a 5-variable (y, p, r, m, e) panel VAR with country and time fixed effects, where y = real GDP growth, p = CPI inflation, r = changes in real central bank policy rate, m = real base money growth, and e = nominal local currency per US dollar exchange rate growth. The numbers reflect the share of the forecast error variation in the response variable explained by the exogenous shocks in respective impulse variables.

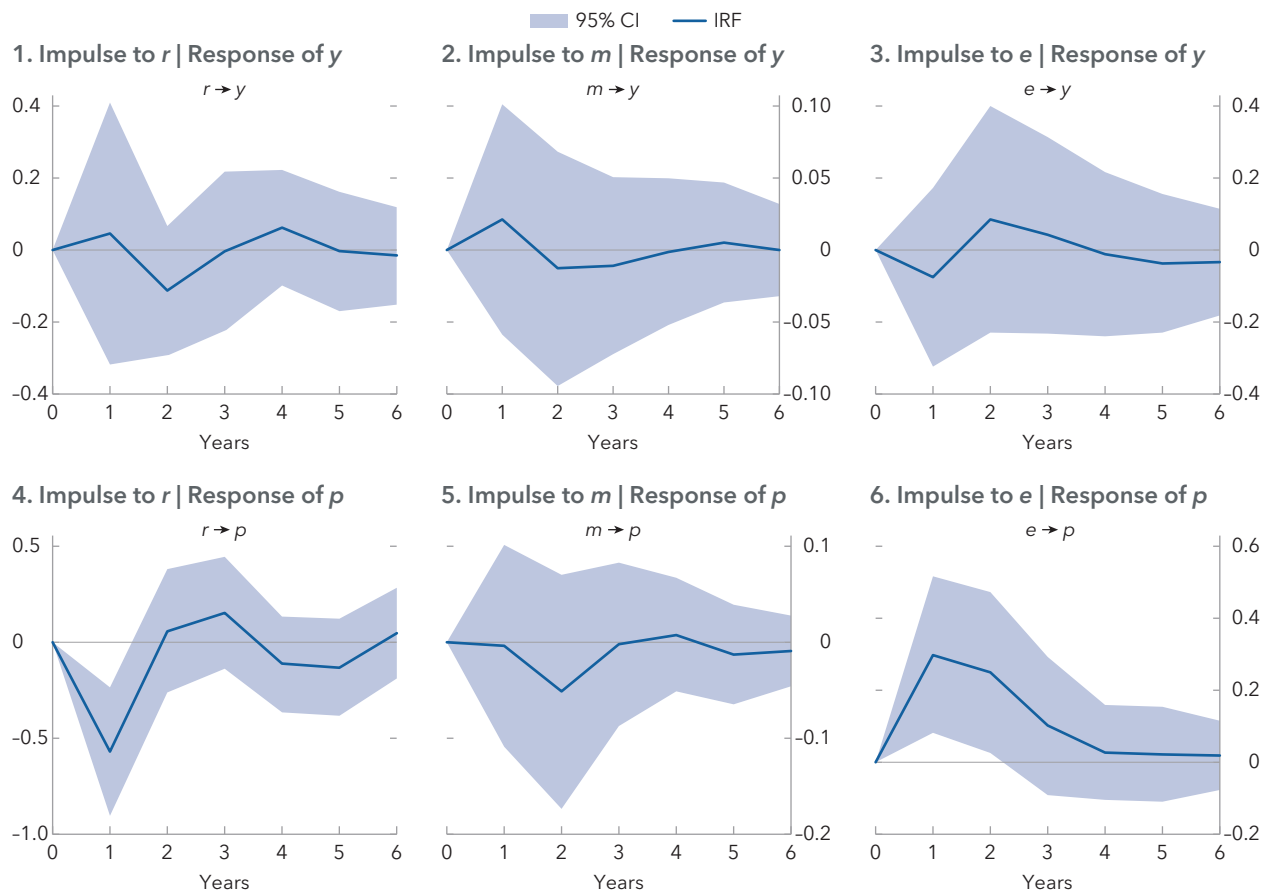
Only 2 percent of inflation variation is explained by monetary base. As for output growth, the policy variables explain only a small fraction of its variation, ranging from 0.3 percent (policy rate) to 2 percent (exchange rate).

The authors also run country-specific VARs using monthly data. In the absence of monthly information on output growth, the authors exclude it from the list of endogenous variables in country-specific VARs.³ Exogenous variables include changes in global oil prices and U.S. 3-month T Bill rates to capture global financial conditions. All variables are measured as 12-month changes to remove seasonality and ensure stationarity. Dummy variables are added to reflect structural shifts in certain variables (for example, the exchange rate in Uzbekistan in 2017). The number of lags for each country is selected based on the Schwartz-Bayes information criterion. The country-specific VARs using monthly data show support to the exchange rate channel in most countries, while the interest rate and monetary shocks have a largely insignificant effect on inflation.

The results suggest that the exchange rate channel dominates other transmission channels. In the panel VAR (Annex Figure 1.1), the authors find that monetary policy shocks mostly affect nominal variables (inflation) rather than real variables (real GDP growth), supporting the notion that monetary policy should aim at

³ The authors also use the growth in monthly industrial production index as a substitute for GDP growth. However, the definitions of industrial production differ across countries, the series is relatively short and highly volatile, and some countries report industrial production only with quarterly frequency. Nevertheless, the results remain qualitatively unchanged when industrial production is included for those CCA countries where relatively longer time series exist.

Annex Figure 1.1. Impulse Responses of Monetary Policy Transmission
(Responses of macroeconomic variables to changes in monetary policy instruments, percent)

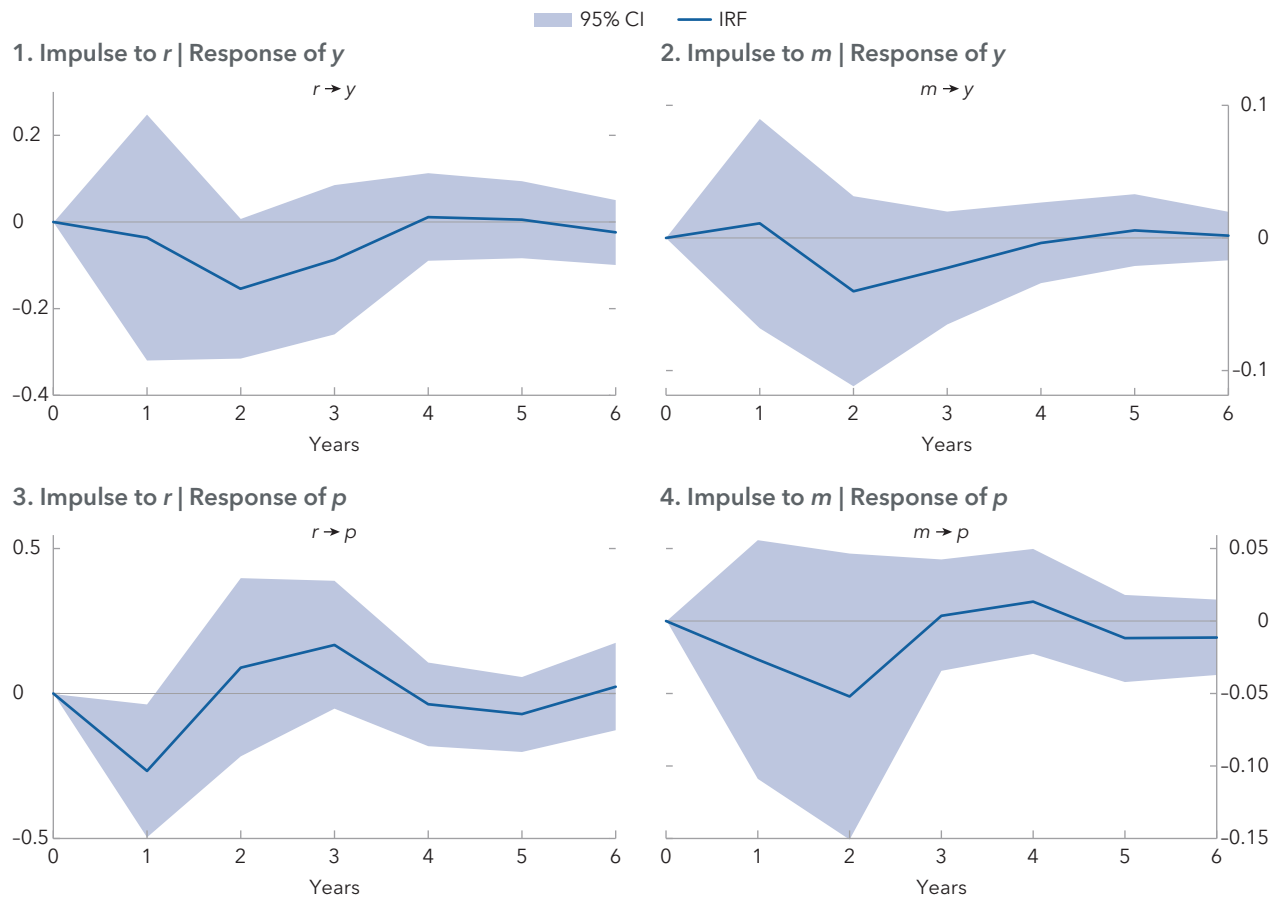


Sources: IMF, International Financial Statistics; IMF, *World Economic Outlook*; and IMF staff calculations.

Note: Reported are IRFs with 95 percent CIs from a 5-variable (y , p , r , m , e) panel VAR with country and time fixed effects, where y = real GDP growth, p = CPI inflation, r = changes in real central bank policy rate, m = real base money growth, and e = nominal local currency per US dollar exchange rate growth. CI = confidence interval; IRF = impulse response function; VAR = vector autoregression.

stabilizing nominal variables. A 1 percent shock to the real policy rate reduces inflation by 0.5 percent in the first year, while a 1 percent shock to the exchange rate depreciation increases inflation by 0.3 percent in the first year. Moreover, the exchange rate channel amplifies the interest rate channel (Annex Figure 1.2). Money supply shocks do not have a significant impact on inflation. The monthly VARs on individual CCA countries support the importance of the exchange rate channel. These findings are consistent with shallow financial markets in the CCA countries, which make the transmission from the exchange rate channel stronger at the expense of other traditional channels.

Annex Figure 1.2. Impulse Responses of Monetary Policy Transmission with Exogenous Exchange Rate
(Responses of macroeconomic variables to changes in monetary policy instruments, percent)



Sources: IMF, International Financial Statistics; IMF, *World Economic Outlook*; and IMF staff calculations.
 Note: Reported are IRFs with 95 percent CIs from a 4-variable (y, p, r, m) panel VAR with country and time fixed effects, where y = real GDP growth, p = CPI inflation, r = changes in real central bank policy rate, and m = real base money growth. The nominal local currency per US dollar exchange rate growth (e) is set as exogenous variable. CI = confidence interval; IRF = impulse response function; VAR = vector autoregression.

Annex 2. Empirical Analysis of FXIs in the CCA

The authors analyze the association between FXIs and exchange rate dynamics in three CCA countries—Armenia, Georgia, and the Kyrgyz Republic—with de jure floating exchange rate regimes. The authors use data on daily FXIs (FX sales and purchases) and official exchange rates of local currencies vis-à-vis the US dollar. The respective sample periods are January 1, 2006–July 17, 2020, for Armenia; March 10, 2009–July 16, 2020, for Georgia; and January 1, 2010–July 1, 2020, for the Kyrgyz Republic. The authors convert the data into weekly frequency by taking the sum of FXIs and averaging exchange rates.

All countries actively used FXIs during the period under consideration. FX sales (purchases) took place for 23 (30) percent of weeks in the sample for Armenia, 17 (19) percent of weeks for Georgia, and 29 (10) percent of weeks for the Kyrgyz Republic. The average volume of FX sales (purchases) is \$15.4 million (\$9.6 million) in Armenia, \$20.6 million (\$20.6 million) in Georgia, and \$14.3 million (\$8.2 million) in the Kyrgyz Republic. The volume of FXIs as a share of interbank market transactions is about 8 percent in Armenia, 59 percent in Georgia, and 25 percent in the Kyrgyz Republic.

FX sales tend to take place in periods of exchange rate depreciation, while FX purchases take place in periods of exchange rate appreciation. In all three countries, central banks intervened to arrest the rapid depreciation of the currency following the oil price shock and depreciation of the Russian ruble in 2014–15 and the COVID-19 shock in March–April 2020. In the meantime, central banks were building up reserves to maintain prudent reserve adequacy metrics through FX purchases in periods of exchange rate appreciation.

Periods of large exchange rate depreciation tend to follow by appreciation, in line with the floating regime (Annex Figure 2.1). Average exchange rate changes fluctuated between –1.0 and 1.7 percent in Armenia, –1.2 and 1.5 percent in Georgia, and –1.0 and 1.7 percent in the Kyrgyz Republic. The percentage rate of depreciation tends to be larger on average than the percentage rate of appreciation in all countries, leading to a gradual depreciation of the local currency over time.

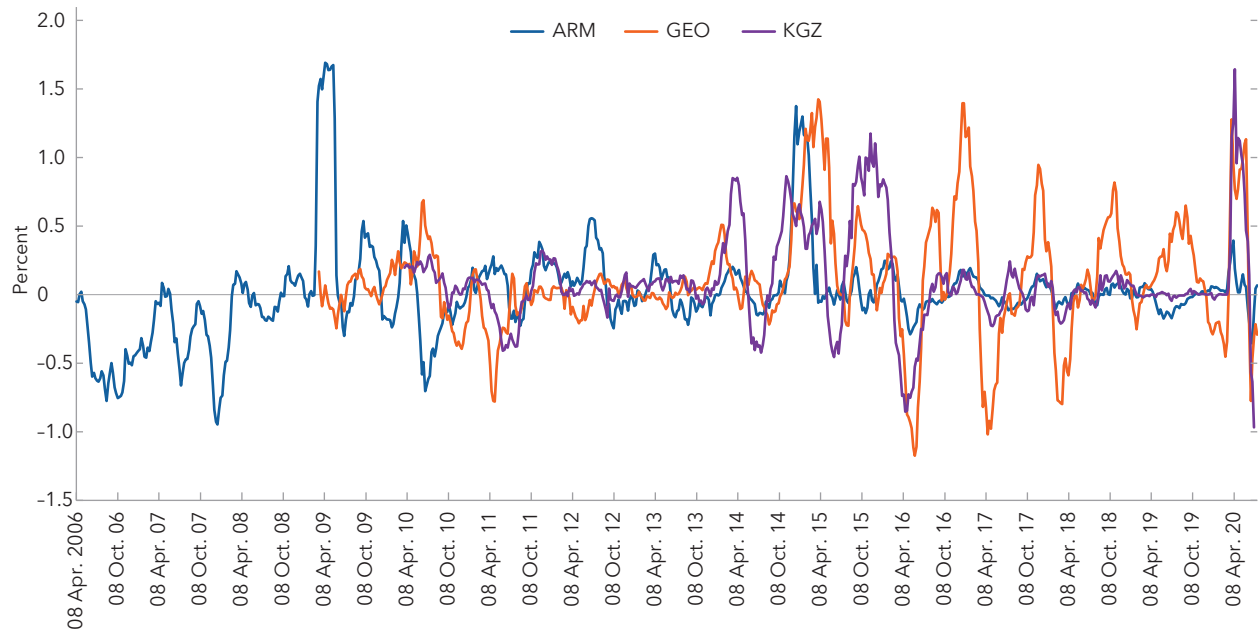
Exchange rate volatility is clustered around periods of external shocks (Annex Figure 2.2). The dynamics of average standard deviation suggest that exchange rate changes have displayed pockets of volatility during the global financial crisis, oil price shock in 2014–15 and subsequent depreciation of the Russian ruble, and the COVID-19 shock. Both the average level of FX rate changes and their volatility have fluctuated widely and could be potential factors in the decision of central banks to intervene in the FX market.

Even though FXI took place in both directions (sales and purchases), they asymmetrically lean against the depreciation of the domestic currency. Following Adler, Chang, and Wang (2020), the authors construct an index of symmetry of FXI:

$$IS_t = \frac{\sum_{i=1}^M \left[\frac{FXI_{t-i+1}}{GDP_{t-i+1}} \right]}{\sum_{i=1}^M \text{abs} \left[\frac{FXI_{t-i+1}}{GDP_{t-i+1}} \right]}$$

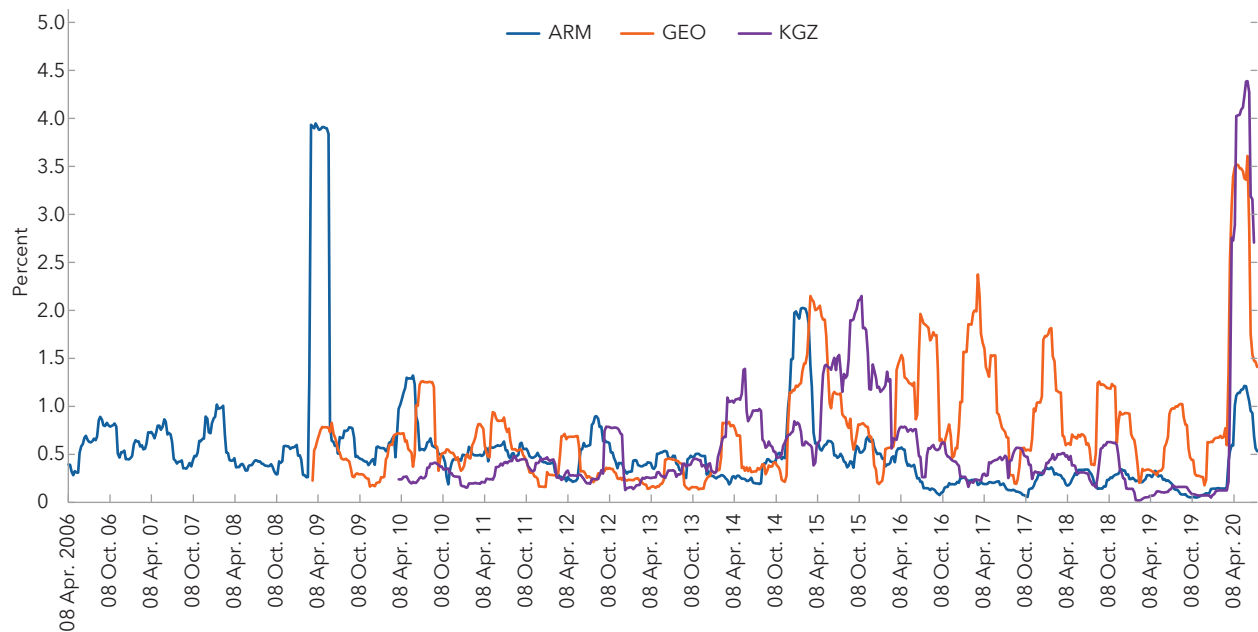
where M is the rolling-window interval (90 days), FXI is the volume of net FXI in US dollars (FX purchases minus FX sales), and GDP is the annual GDP in US dollars. The index of symmetry (IS) is plotted in Annex Figure 2.3. It takes the value 0 if interventions are fully symmetric, and 1 (–1) if they have asymmetry toward purchases (sales). The figure shows that there is an asymmetry in all countries toward FX sales. Nevertheless, this asymmetry has not led to a deterioration of reserve adequacy metrics in any of these countries, suggesting that interventions aim at smoothing exchange rate fluctuations rather than targeting the exchange rate at an overvalued level.

Annex Figure 2.1. Moving Average of Exchange Rate Changes
 (Local currency vis-à-vis US dollars, 12-week moving average of exchange rate changes)



Sources: Central Bank of Armenia; Central Bank of Georgia; National Bank of the Kyrgyz Republic; and IMF staff calculations.
 Note: Reported is a 12-week rolling-window average of local currency/US dollar exchange rate changes (percent). ARM = Armenia; GEO = Georgia; KGZ = Kyrgyz Republic.

Annex Figure 2.2. Moving Average of Volatility of Exchange Rate Changes
 (Local currency vis-à-vis US dollar, 12-week standard deviation of exchange rate changes)

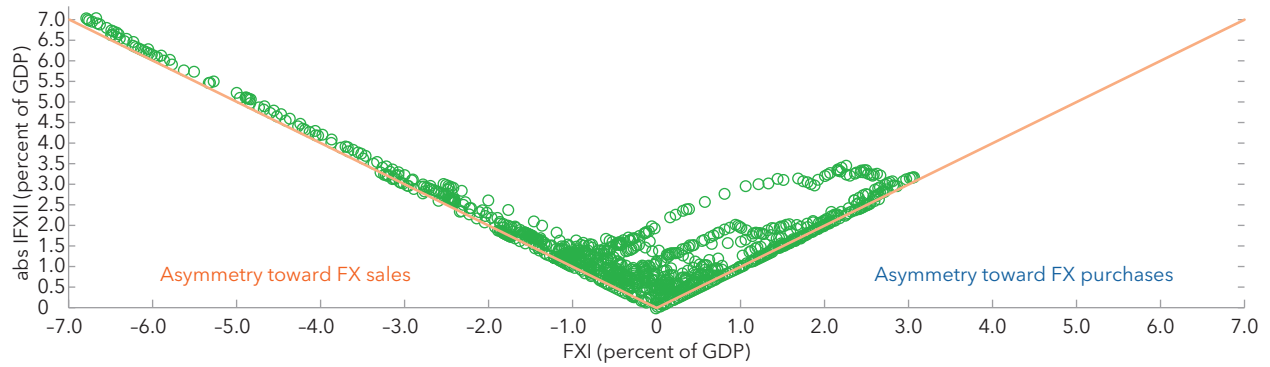


Sources: Central Bank of Armenia; Central Bank of Georgia; National Bank of the Kyrgyz Republic; and IMF staff calculations.
 Note: Reported is a 12-week rolling-window average of standard deviation of local currency/US dollar exchange rate changes (percent). ARM = Armenia; GEO = Georgia; KGZ = Kyrgyz Republic.

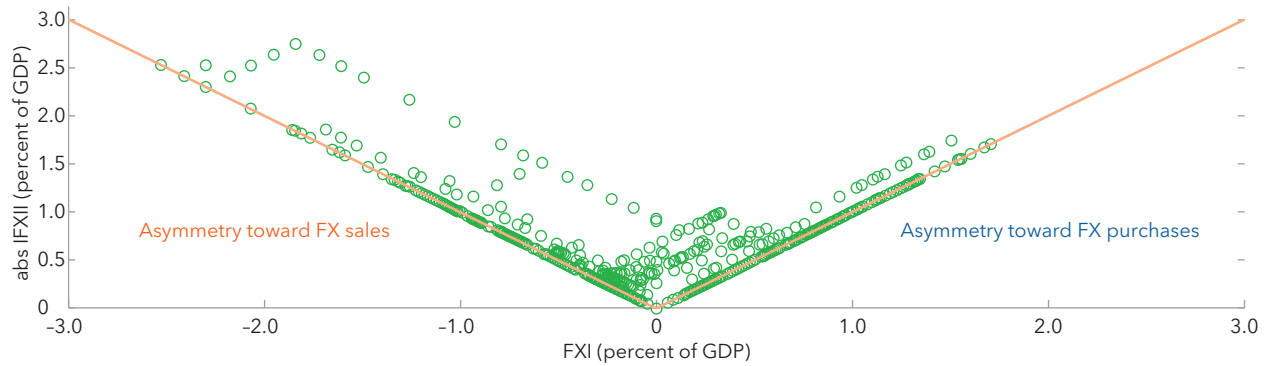
Annex Figure 2.3. Symmetry of FX Interventions

(Index showing symmetry of FXI interventions if clustered around 0, or asymmetry of FX interventions if clustered away from 0)

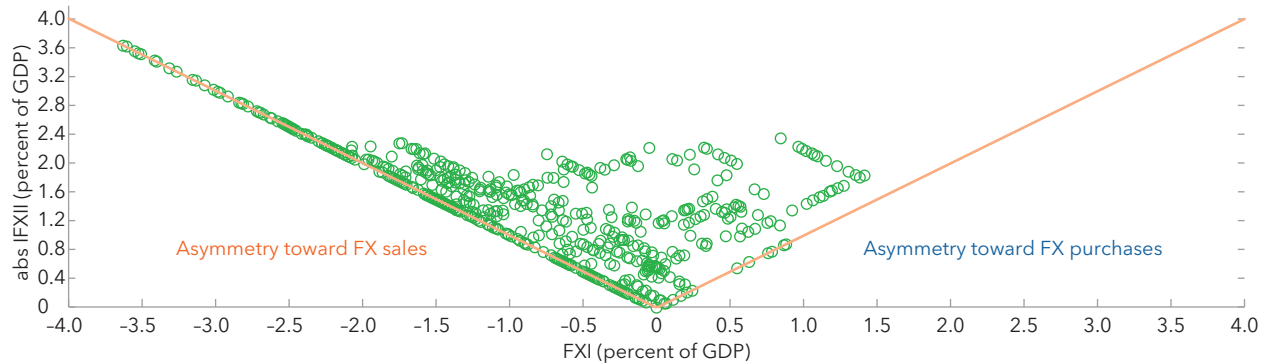
1. Armenia



2. Georgia

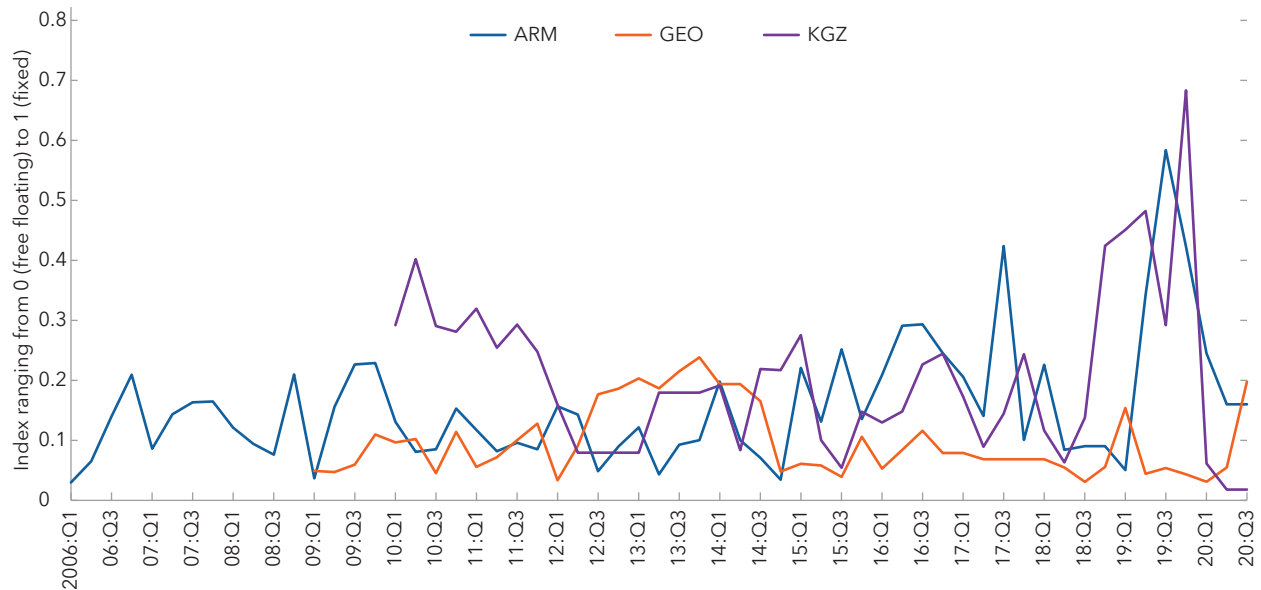


3. Kyrgyz Republic



Sources: Central Bank of Armenia; Central Bank of Georgia; National Bank of the Kyrgyz Republic; and IMF staff calculations.
 Note: FXI is the 90-day rolling-window sum of the share of net exchange rate interventions (purchase minus sale) in GDP. abs|FXI| is the 90-day rolling-window absolute sum of the share of net exchange rate interventions (purchase minus sale) in GDP. The index of symmetry is the ratio of FXI over abs|FXI|, ranging between -1 and 1. FX = foreign exchange.

Annex Figure 2.4. Exchange Rate Management Index
(Index ranging between 0 for floating regime and 1 for fixed regime)



Sources: Central Bank of Armenia; Central Bank of Georgia; National Bank of the Kyrgyz Republic; and IMF staff calculations.
Note: Exchange rate management index = $\sigma^{fxi}/(\sigma^e + \sigma^{fxi})$, where σ^e is the standard deviation of exchange rate changes and σ^{fxi} is the standard deviation of the share of net FXIs in GDP. Standard deviations are estimated for each quarter. ARM = Armenia; GEO = Georgia; KGZ = Kyrgyz Republic.

Despite the floating regime, the extent of exchange rate management has varied over time. Following Adler, Chang, and Wang (2020), the authors construct a metric to measure the degree of exchange rate management:

$$\rho_t = \frac{\sigma_t^{fxi}}{\sigma_t^e + \sigma_t^{fxi}}$$

where σ^e is the standard deviation of daily changes in the exchange rate vis-à-vis US dollars during the quarter and σ^{fxi} is the standard deviation of daily FXI/GDP ratio computed over the same quarter. This index varies between 0 (floating exchange rate) and 1 (fixed exchange rate), with the continuum between the two extremes reflecting the degree of exchange rate management. As shown in Annex Figure 2.4, most of the time the exchange rate management index was relatively low in all countries, which is consistent with the announced floating regime. Nevertheless, in all countries the exchange rate management index has increased in more recent periods, while the opposite would have been expected as countries transit to a fully-fledged inflation-targeting regime. The average level of the index for the whole sample is estimated at 0.16 in Armenia, 0.10 in Georgia, and 0.22 in the Kyrgyz Republic. Comparing these estimates to those reported by Adler, Chang, and Wang (2020) for a wider sample of country groups, the authors find that the exchange rate management index lower than the estimates for emerging economies (0.40-0.42). This confirms that the level of exchange rate management in CCA countries is relatively modest on average and consistent with the announced floating regime and transition to inflation targeting.

Exchange rate changes and their volatility have influenced the decisions of central banks to intervene. The authors use the ordered logit model to assess the determinants of FXIs (Gerlach 2007). The authors have three categorical values for the FXI variable (y): FX purchase = -1, no intervention = 0, and FX sale = 1. Following Chmelarova and Schnabl (2006), the factors affecting the decision to intervene are the percentage deviation of the level of the exchange rate relative to its 12-week moving average (er) and the 12-week standard deviation of exchange rate changes as a proxy for volatility (vol). The empirical specification takes the following form:

$$y_t^* = \alpha + \beta er_t + \gamma vol_t + \varepsilon_t$$

Annex Table 2.1. Determinants of FX Interventions: Ordered Logit Model*(Likelihood of FX purchases and sales taking place in response to changes and volatility of the exchange rate)*

	Armenia	Georgia	Kyrgyz Republic
Deviation of exchange rate from its 12-week moving average (percent)	0.399*** (0.063)	0.162*** (0.032)	0.280*** (0.058)
12-week st. dev. of exchange rate changes (percent)	-0.386** (0.164)	0.138 (0.145)	-0.282** (0.137)
Observations	743	579	534
Log-likelihood	-728.9	-485.5	-444.3
Pseudo Rsq	0.0587	0.0274	0.0439

Source: IMF staff calculations.

Note: The dependent variable is the ordered categorical variable for foreign exchange purchases (-1), no interventions (0), and foreign exchange sales (1). Estimations are performed using the maximum likelihood estimator. Robust standard errors are in parentheses. Pseudo Rsq = statistical measure used to assess the goodness of fit of the ordered logit model. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

where α , β , and γ are coefficients to be estimated, and ε is the residual. The predicted probabilities are estimated as: $P(y_t = \text{"FX purchase"}) = P(y_t^* \leq \tau_1)$, $P(y_t = \text{"no intervention"}) = P(\tau_1 \leq y_t^* \leq \tau_2)$, and $P(y_t = \text{"FX purchase"}) = P(\tau_2 \leq y_t^*)$.¹

Estimations suggest that both determinants of interventions are significant (Annex Table 2.1).² FX sales (purchases) are more (less) likely in periods when exchange rate depreciates against its 12-week moving average. FX sales (purchases) are less (more) likely in periods of high volatility of exchange rate changes. The latter could be explained by the precautionary motive and willingness to building up FX reserves in periods of exchange rate volatility triggered by external shocks, such as drop in oil prices, depreciation of the Russian ruble, decline in remittances (Poghosyan 2020a). In all countries, the average probability of no exchange interventions is the highest: 48 percent in Armenia, 67 percent in Georgia, and 64 percent in the Kyrgyz Republic (Annex Figure 2.5). The average probabilities of FX sales are lower compared to the average probabilities of FX purchases in Armenia (21 percent against 31 percent) and Georgia (14 percent against 19 percent), but the opposite holds for the Kyrgyz Republic (25 percent against 10 percent). The probability of FX sales has increased during 2014-15 period when oil prices have dropped, and Russian ruble has depreciated markedly. Most recently, the probability of sales has increased sharply in March-April 2020 following the COVID-19 shock.

There is evidence of "leaning against the wind" in FXIs. The authors use an event study approach to assess what happens with the exchange rate around FXIs (Gourinchas and Obstfeld 2012). The empirical specification takes the following form:

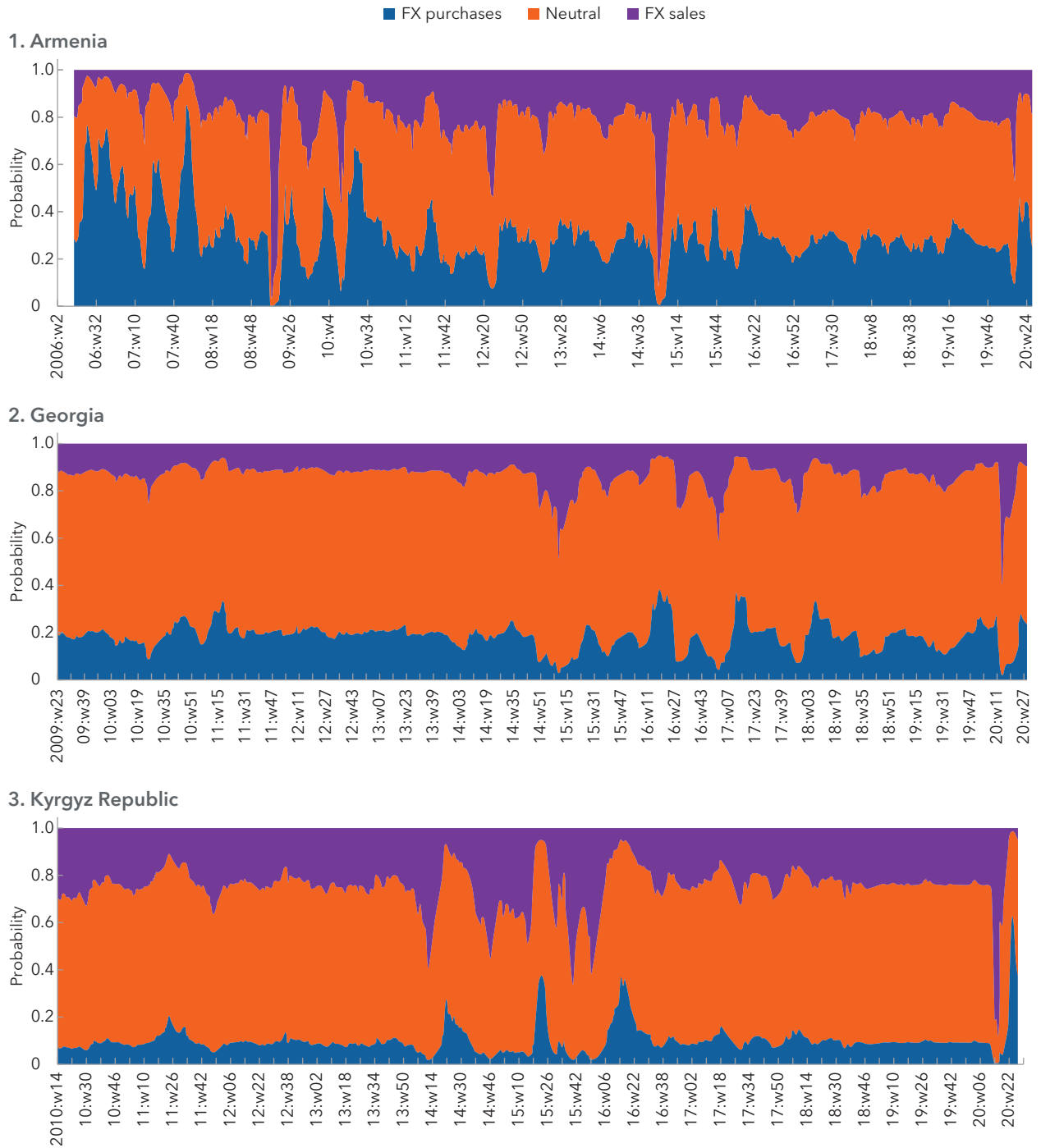
$$\Delta er_t = \alpha_0 + \sum_{j=-3}^3 \beta_j S_{t+j} + \sum_{j=-3}^3 \gamma_j P_{t+j} + \varepsilon_{i,t}$$

where t denotes time (weeks), Δer is the logarithmic difference of the KGS/USD exchange rate times 100, S is a dummy variable that takes the value 1 in periods of FX sales, P is a dummy variable that takes the value 1 in periods of FX purchases, and ε is the i.i.d. error term. Estimations are performed using the Newey-West estimator, that controls for heteroskedasticity and autocorrelation of up to three lags. Backward and forward lags $j=[-3; 3]$ allow measuring the association between FX sales (purchases) and exchange rate changes 3 weeks around the intervention episode. This association is measured by coefficients β_j and γ_j , respectively,

¹ τ_1 and τ_2 are the cut-off values of y^* associated with respective probabilities of FXIs that need to be estimated.

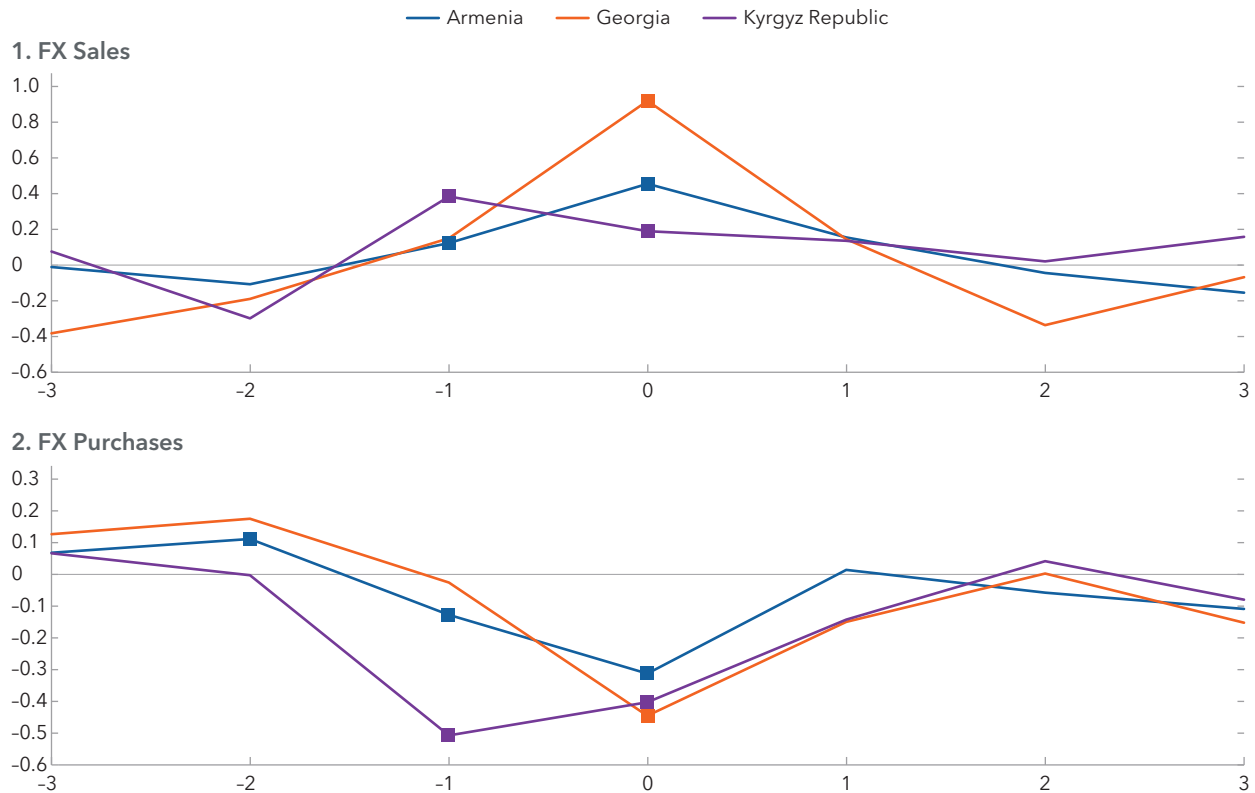
² Except Georgia, where the coefficient on standard deviation is insignificant.

Annex Figure 2.5. Estimated Probabilities of FX Interventions
(The likelihood of FX interventions in response to changes and volatility in the exchange rate)



Source: IMF staff calculations.
 Note: Reported are estimated probabilities of FX interventions from the ordered logit model. FX = foreign exchange.

Annex Figure 2.6. Event Study Analysis: Exchange Rate Changes Around FX Interventions
(Changes in the local currency vis-à-vis US dollar exchange rate around FX interventions, percent)



Sources: National Bank of the Kyrgyz Republic; and IMF staff calculations.

Note: Reported are results of the event study analysis. Time = 0 refers to the week of FX interventions. Filled squares indicate significance at 95 percent confidence level. FX = foreign exchange.

which quantify the conditional differences of exchange rate changes cover the $j=[-3,3]$ interval relative to the no-intervention (“normal”) periods beyond this interval. Estimation results provide evidence of “leaning against the wind” (Annex Figure 2.6):

- FX sales happen in weeks during which the exchange rate depreciates relative to normal periods by about 0.4 percent in Armenia, 1 percent in Georgia, and 0.2 percent in the Kyrgyz Republic. Following the sale, the relative depreciation comes down and becomes not significantly different from zero on the third week in all countries.
- FX purchases happen in weeks during which the exchange rate appreciates relative to normal periods by about 0.3 percent in Armenia, 0.45 percent in Georgia, and 0.4 percent in the Kyrgyz Republic. Following the purchase, the relative appreciation comes down and becomes not significantly different from zero on the third week in all countries.

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