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Spillovers from Russia to Neighboring Countries: Transmission Channels and Policy Options

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Spillovers from Russia to Neighboring Countries: Transmission Channels and Policy Options

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ABSTRACT: This paper studies how output fluctuations in Russia are transmitted internationally. Using vector autoregression (VAR) and dynamic panel models, the paper finds that Russia's output fluctuations are an important driver of output fluctuations of countries in the region, especially for oil importers, and are transmitted increasingly via trade and market confidence channels. The magnitude of cross-border spillovers is larger for countries with relatively high bilateral trade concentration, low export diversification, and weak external buffers. The paper also finds evidence that stronger public institutional quality- especially in the fiscal area- may help insulate countries from volatility in the Russian sovereign debt market.

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WORKING PAPERS

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Executive Summary

This paper studies how output fluctuations in Russia are transmitted internationally. Using vector autoregression (VAR) and dynamic panel models, the paper finds that Russia's output fluctuations are an important driver of output fluctuations of countries in the region, especially for oil importers, and are transmitted increasingly via trade and market confidence channels. The magnitude of cross-border spillovers is larger for countries with relatively high bilateral trade concentration, low export diversification, and weak external buffers. The paper also finds evidence that stronger public institutional quality- especially in the fiscal area- may help insulate countries from volatility in the Russian sovereign debt market.

1. Introduction

How do recessions in Russia affect neighboring countries? And how can policies dampen their effects? Russia's invasion of Ukraine and international sanctions against Russia have renewed interest in these questions. Since Russia's economy is subject to increased uncertainty, understanding how economic shocks from Russia are transmitted internationally and how their impact can be contained have become central to the policy agenda of neighboring countries, such as Commonwealth of Independent States (CIS) countries.

CIS countries were part of the Soviet Union and have had historically strong economic ties with Russia (Alturki et al., 2009, Stepanyan et al., 2015 and Poghosyan, 2020). As such, sanctions against Russia were expected to affect them heavily. However, Russia's slowdown in 2022 did not lead to negative spillovers to the region. In fact, several countries have benefitted in the short term from changes in real and financial cross-border flows. For instance, sanctions have restricted Russia's ability to import goods from the EU and the US, leading to higher trade with neighboring countries (IMF 2023b). Nevertheless, CIS countries are exposed to several downside risks, including a sharper contraction of Russia's economy and deeper international sanctions.

Against this background, this paper analyzes the economic relationship between CIS countries[1] and Russia prior to the war in Ukraine and aims to identify key structural factors that explain it. Using quarterly data on 8 neighboring countries, evidence from VAR models suggest that spillovers from Russia's output fluctuations are sizable, especially for oil importers (section 4.1). Panel regressions complement the VAR approach by assessing the main transmission channels. The results imply that trade, remittance, and market confidence channels are important in transmitting economic contractions in Russia to the region, with a declining role of the remittance channel in recent years, and an increase in the trade and market confidence channels.

The results also shed light on how structural and policy factors can influence these spillovers. Using quarterly GDP data on 32 advanced and emerging market countries (including CIS countries) from 2004-19, country-specific regressions show a large heterogeneity of spillovers across countries, owing largely to differences in the size and patterns of trade (section 6). Higher trade concentration with Russia, particularly in commodities, is associated with larger spillovers. The magnitude of spillovers is also higher for countries with relatively large current account deficits, high shares of foreign currency-denominated debt, and weak public institutions.

The study contributes to the literature on international business cycle transmission by systematically measuring spillovers from Russia's output fluctuations, analyzing the channels through which these spillovers are transmitted to neighboring countries, and assessing how structural factors influence their magnitude. The results underscore the need for CIS countries to diversify trade and product markets, including through stronger regional integration, while continuing efforts to reduce liability dollarization and strengthen public institutions.

The rest of the paper is structured as follows. Section 2 reviews the relevant literature. Section 3 documents the economic linkages between Russia and CIS countries. Sections 4 and 5 quantify the impact of spillovers from Russia to the region and assess the key transmission channels, respectively. Section 6 reviews how factors such as trade patterns, economic fundamentals, and institutional quality, influence such impact.

[1] CIS countries covered in the sample are Armenia, Azerbaijan, Belarus, Kazakhstan, Moldova, and Tajikistan. Georgia and Ukraine are not members of the CIS but are included in the sample due to their geographic proximity and large economic ties to Russia.

2. Literature

Countries with larger economic ties tend to have more synchronized business cycles. Over the past two decades, a growing body of literature has highlighted that countries with larger bilateral trade have stronger business cycle co-movements (Frankel and Rose (1998), Wincoop (2001), Baxter and Koupiratsas (2004), and Imbs (2004, 2006)). One key reason is that when an economy enters a recession, its demand for foreign goods declines, resulting in output contractions in trading partners. Trade integration can also induce output co-movement among countries if trade is characterized by similar industries. For instance, two metal producing countries would experience synchronized output movements during a global metal price shock.

Patterns of trade and specialization can influence the degree to which higher trade integration results in higher output synchronization. If trade integration results in economic specialization, sector specific shocks in one country can lead to asymmetric output movements across countries. In other words, the impact of bilateral trade integration on output co-movement is weaker for countries with different economic structures and patterns of specialization. This is illustrated by Calderón et al. (2007), who find that trade integration has a positive impact on output synchronization, and that this relationship is stronger for industrial countries compared to developing countries. The authors suggest that the differential impact of trade integration on synchronization between the two groups is explained by differences in the structure of trade.

Financial integration is also found to be a synchronizing factor but remains unresolved in the literature. One body of literature finds that countries with stronger financial ties have more synchronized business cycles (Kose et al. (2003), Imbs (2006) and Morgan et al. (2004). Another body suggests that stronger financial integration creates diverging patterns of economic activity, and thus reduces synchronization. For instance, Kalemli-Ozcan et al. (2013a) find that higher cross-border banking integration leads to lower business cycle synchronization, but that it increases synchronization during periods of financial turmoil. According to the authors, if there is a real sector shock (a recession) which weakens the health of nonfinancial companies, global banks will slow their lending to the affected country and increase lending to non-affected countries. This results in divergent output fluctuations. On the contrary, if the shock is to the banking sector, banks with cross-border footprint would pull funding out of both countries, and by doing so, induce synchronized output fluctuations.

Similarly, Foreign Direct Investment (FDI) is found to be an important synchronizing factor (Hsu et. al 2011). One reason is that if the economy of the foreign investor deteriorates and weakens the financial health of parent companies, it will result in wage and investment cutbacks in the receiving country. Thus, the cross-border presence of multinational companies helps transmit local macroeconomic shocks. These findings are nuanced by Stiblarova (2021), who decomposes FDI into existing and new FDI, and assesses how both types of FDI impact output synchronization of EU member countries. The author finds that existing FDI increases output synchronization, whereas new FDI reduces synchronization by promoting economic specialization.

Other factors are found to impact the degree of international business cycle co-movement, such as industrial similarity between countries (Imbs, 2004), convergence in monetary and fiscal policies (Antonakakis and Tondl, 2014), level of development (Calderon et. al, 2007), and currency union membership ((Frankel and Rose (1997, 1998), Cerqueira and Martins, 2009)[2].

[2] A comprehensive review of the impact of currency union membership on business cycle co-movement between EU and Central and Eastern Europe can be found in Fidrmuc and Korhonen (2006).

This paper lends evidence in support of the trade-synchronization nexus. The empirical results highlight a positive association between bilateral trade integration and output spillovers, in line with previous scholarship (Wincoop (2001), Baxter and Koupiratsas (2004), and Imbs (2004, 2006)). Evidence from event studies support this finding and suggest that countries with more concentrated trade linkages with Russia experience larger deteriorations in bilateral exports during economic downturns in Russia, as well as larger increases during upswings.

The structure of trade also matters. Evidence from cross-sectional regressions highlights that higher commodities trade with Russia contributes positively to cross-border spillovers. One potential reason is that commodities may be relatively more sensitive to Russian aggregate demand fluctuations than other goods, given they exhibit supply price inelasticity (Davutyan and Roberts, 1991, Grilli and Yang, 1981, Labys et al., 1998, Slade, 1981).

While there is a large literature on the transmission of business cycles in advanced and emerging market economies, less is understood about the dynamics of Russia's business cycle and how it is propagated to neighboring countries. Some studies document large trade, financial, and remittance linkages between Russia and the region and argue that these linkages are important in channeling spillovers (Alturki et al., 2009, Stepanyan et al., 2015, IMF 2022a). More specifically, Alturki et al., 2009 find that remittances are the most important transmission channel for oil importing CIS countries.

Remittances between Russia and the region have been the focus of more recent literature (Poghosyan, 2020, IMF 2022b). According to such literature, remittances play an important role in channeling spillovers from Russia to its neighbors, although this role is nuanced. On the one hand, outward remittances from Russia are procyclical with the Russian economy and thus exacerbate the local impact of Russia's business cycle (Poghosyan 2020). When Russia's economy contracts, migrant workers send fewer remittances abroad, leading to a decline in disposable income in remittance receiving countries. In fact, such declines can increase poverty and inequality in receiving countries (IMF 2022b). On the other hand, remittances can act as shock absorbers, increasing during periods of currency depreciation and high inflation in receiving countries to sustain their purchasing power (Poghosyan, 2020).

This paper builds on the analysis of Alturki et al., 2009 and Stepanyan et al., 2015 using more recent and higher frequency data that has been available since 2009. Using quarterly GDP data on 8 neighboring countries over the 2004-2021 period, VAR and panel regressions are used to quantify the magnitude of spillovers from Russia and to assess the main transmission channels- following the methodologies of Alturki et al., 2009 and Dabla-Norris et al., 2012.

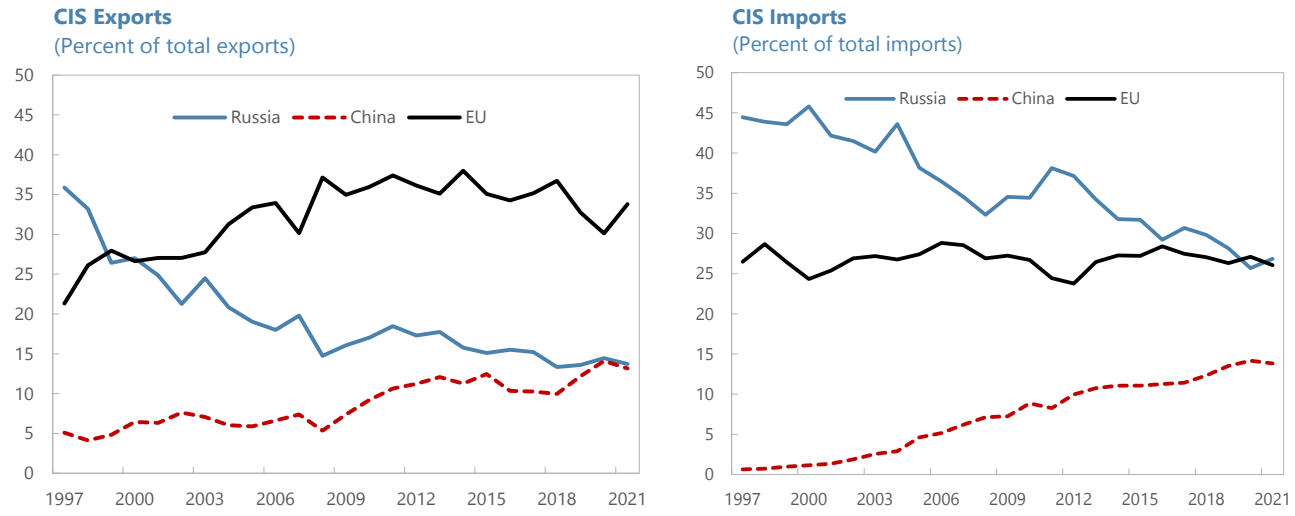
These results highlight two main factors. First, spillovers from Russia's output fluctuations to the region are large, including compared to output fluctuations in the EU and China. The magnitude of spillovers from Russia is also larger for oil importers, in line with previous scholarship. Second, evidence from panel regressions highlights that trade and remittances play a role in transmitting spillovers, and that market confidence factors- such as risk-premia convergence- may amplify them. The results point to a shift, however, in the main transmission channels over time. Whereas remittances seemed to play an important role in transmitting spillovers from 2010-2014, the size of the remittance channel has declined over the 2015-2021 period, while the size of the trade channel has risen.

3. Stylized Facts

3.1 Trade Linkages

The economic linkages between Russia and CIS (Commonwealth of independent states) countries have undergone substantial changes over the past three decades. Trade between Russia and the region has declined drastically since the 1998 Russian default, and despite a brief pickup following the Global Financial Crisis, it has continued to fall. Exports to Russia fell from over a third of total exports in 1997- to 15 percent as of 2021, while imports fell from 40 to 30 percent (Figure 1). Meanwhile, China has become an increasingly important trade destination for CIS countries, comprising 15% of the region's total exports and 12% of its imports as of 2021 (Figure 1). The EU is the region's largest export market and second-largest import market.

Figure 1. Trade Linkages with Russia



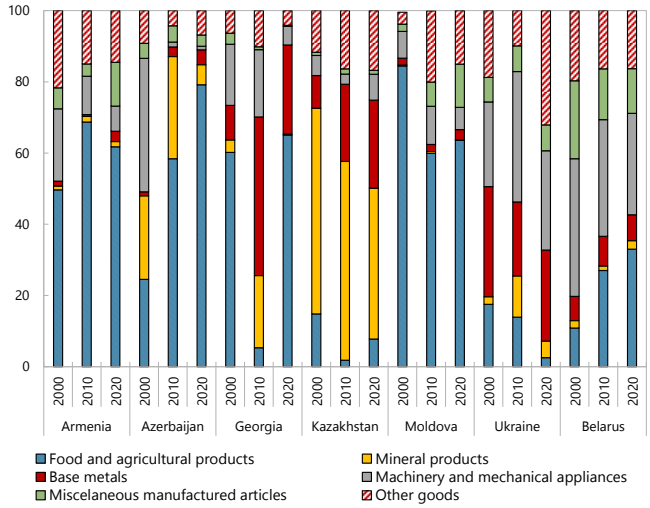
Sources: IMF Direction of Trade Statistics (DOTS) database.

Note: Exports and imports are calculated as the region's total bilateral exports/imports as a share of its total exports/imports with the world.

The decline in trade with Russia has been accompanied by a shift from non-commodity goods toward commodities in bilateral trade for several countries in the region. Since the early 2000s, the share of machinery and mechanical goods in bilateral exports has fallen for Armenia, Azerbaijan, and Georgia, while the share of food, agricultural, and base metals has risen. For Kazakhstan the share of base metals in bilateral exports rose from 9 percent of bilateral exports in 2000 to 24 percent as of 2020 (Figure 2). Belarus has followed a similar pattern: the share of manufactured goods and machinery in bilateral exports has fallen, while the share of food and agricultural products has grown.

Figure 2. Exports to Russia by Product

(Percent of total exports to Russia)

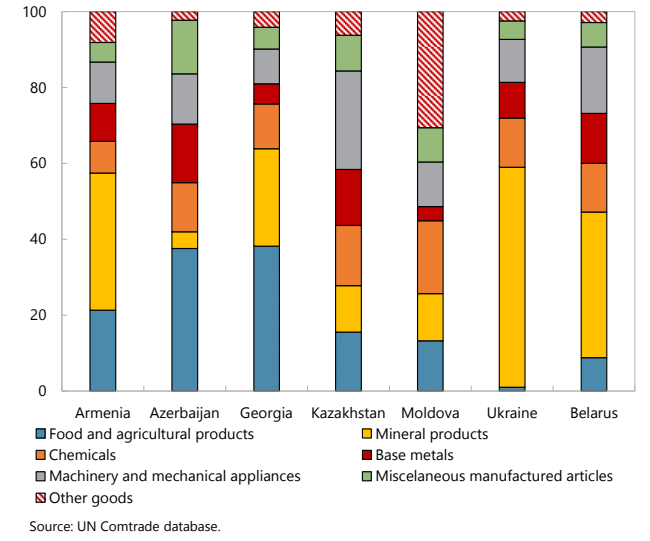


Source: UN Comtrade database.

Imports from Russia are largely concentrated in fuels, metals, and food, but vary across countries. For Armenia, Georgia, Ukraine, and Belarus, imports of minerals and fuels from Russia comprise a large share of bilateral imports. This dependence on fuel could induce spillovers, if, for instance, oil prices were to increase in Russia. By contrast Kazakhstan, Azerbaijan, and Moldova have relatively more dispersed import linkages with Russia as of 2020 (Figure 3).

Figure 3. Imports from Russia by Product

(Percent of total imports from Russia, 2020)



Source: UN Comtrade database.

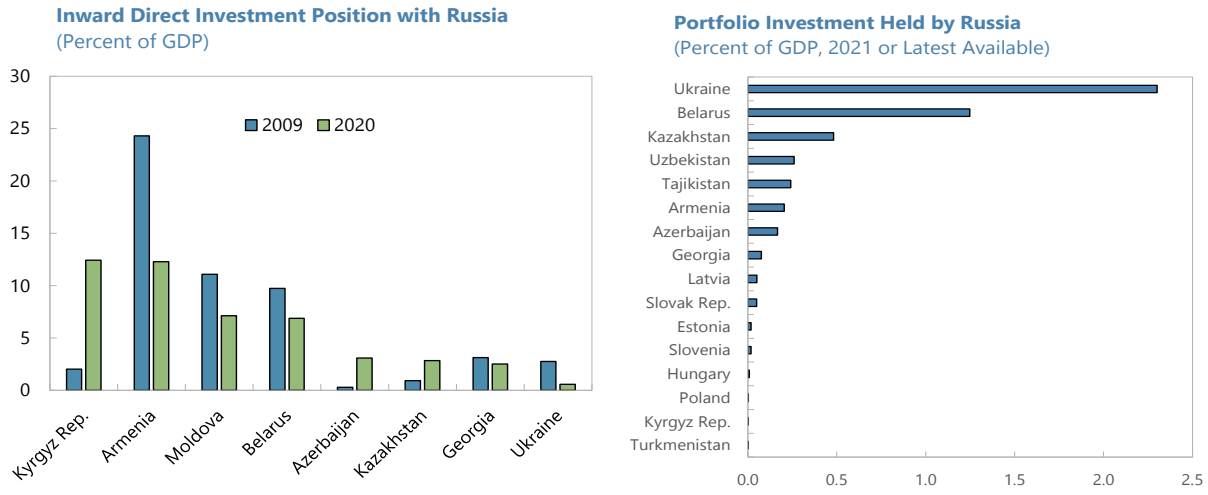
3.2 Financial Linkages

Russia is a large source of Foreign Direct Investment (FDI) for several CIS countries. For most countries, however, FDI from Russia has fallen since the Global Financial Crisis (GFC). The largest recipients of Russian FDI are Armenia (12.4 percent of GDP), Kyrgyz Republic (12.3 percent of GDP), Moldova (7.1 percent of GDP), and Belarus (6.9 percent of GDP), according to the latest available data (Figure 4). On the other hand, Azerbaijan, Kazakhstan, Georgia, and Ukraine receive less than 4 percent of GDP of Russian FDI. Data on outward FDI flows to Russia are limited, but existing data suggest it is small- accounting for under 2 percent of GDP for countries with available data.

In contrast to FDI, portfolio investment in CIS countries held by Russian residents is small. The largest recipient of Russian portfolio investment was Ukraine, comprising 2.3 percent of GDP as of 2014, followed by Belarus and Kazakhstan (Figure 4). Other CIS countries receive under 0.5% of GDP of Russian portfolio investment.

Given that FDI plays an increasingly important role in driving business cycle synchronization globally (Hsu et. al 2011), Russia's large FDI ties with the region may play a role in channeling spillovers.

Figure 4. Cross-Border Financial Linkages

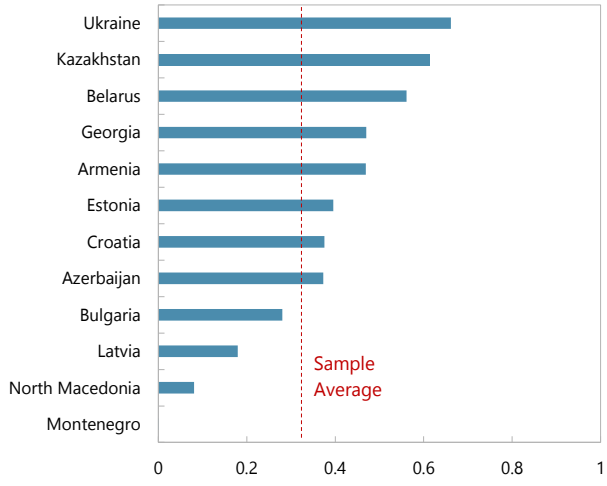


Sources: IMF CPIS database, CDIS database, World Economic Outlook, and IMF staff estimates.

Note: The latest bilateral portfolio investment data for Ukraine is as of 2014. For other countries, the data are as of 2021.

Other financial linkages between Russia and the former Soviet republics remain large. For instance, sovereign bond spreads, an indicator that captures perceived government default risk, moves closely between Russia and the region (Figure 5). This likely reflects the importance of common exposures between Russia and countries in the region, such as geopolitical events, commodity price movements, and global uncertainty. The strong convergence of sovereign risk premia might also reflect the fact that investors anticipate spillovers to the region from adverse shocks affecting Russia. For instance, during the 2015 oil price collapse, currencies of CIS countries depreciated against the dollar following the depreciation of the Ruble against the dollar, reflecting investors' anticipation of adverse spillovers from Russia (Stepanyan et al., 2015). Ukraine, Kazakhstan, and Belarus exhibit the largest convergence in sovereign risk premia, followed by Georgia and Armenia.

Figure 5. Correlation Between Russian and Domestic Sovereign Bond Spreads (2012-2021)



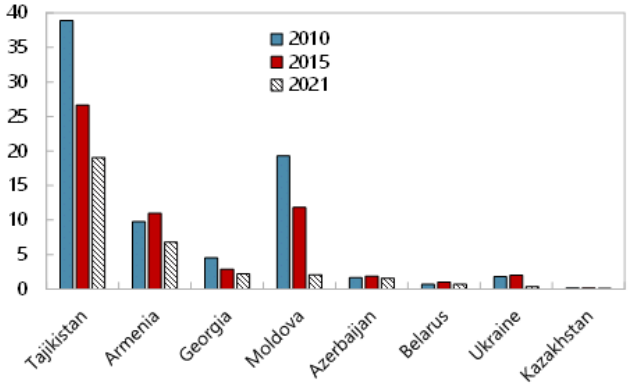
Sources: IMF Sovereign Debt Monitor, and staff estimates.
Note: Correlations are computed using monthly data from 2012-2021.

3.3 Remittances

Remittances from migrant workers are a large source of external financing and income for several CIS countries. Russia accounts for the vast majority of these remittances, comprising 19 percent of GDP for Tajikistan, 7 percent for Armenia, and 2 percent for Georgia and Moldova as of 2021 (Figure 6). Remittance flows from Russia tend to be procyclical with Russia's non-tradable sector, where migrant workers from the region tend to work (Stepanyan et al., 2015). This is a potential source of vulnerability for remittance receiving countries, as contractions in Russia are propagated via declines in cross-border remittance flows.

Figure 6. Remittances from Russia

(Percent of GDP)

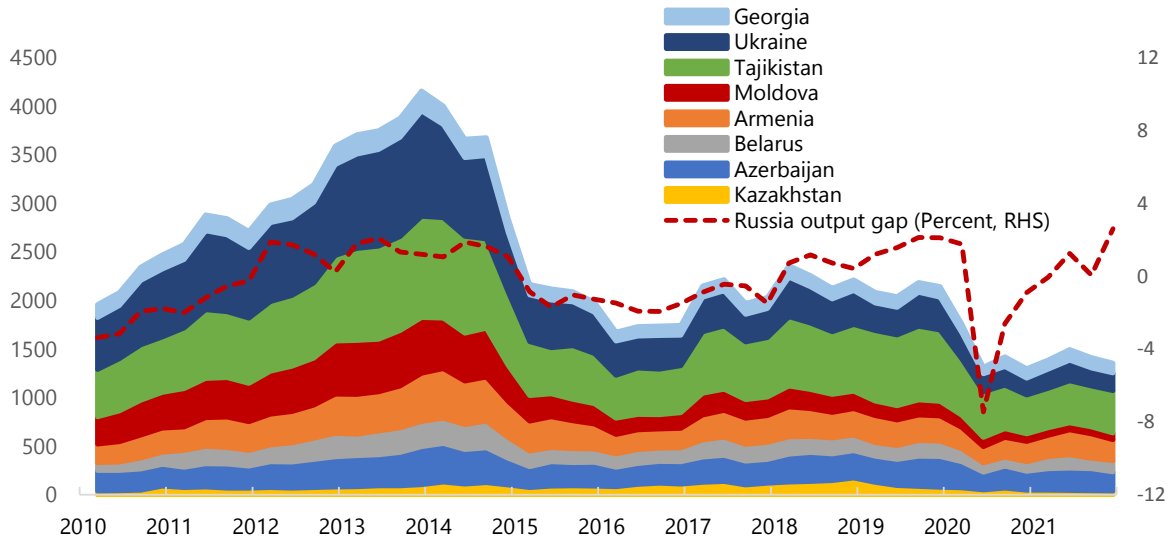


Source: Central Bank of Russia, National Bank of Georgia, IMF WEO, and staff estimates.
Note: Data for Georgia reflect money transfers.

Figure 7 shows that indeed, remittances from Russia to neighboring countries vary with the Russian business cycle- where contractions in Russia's output lead to a decline in outward remittances. The figure also highlights that remittances to the region declined substantially after 2014 and remain well below the levels during the first half of the decade as of 2021.

Figure 7. Personal Remittance Flows from Russia

(Millions of USD)



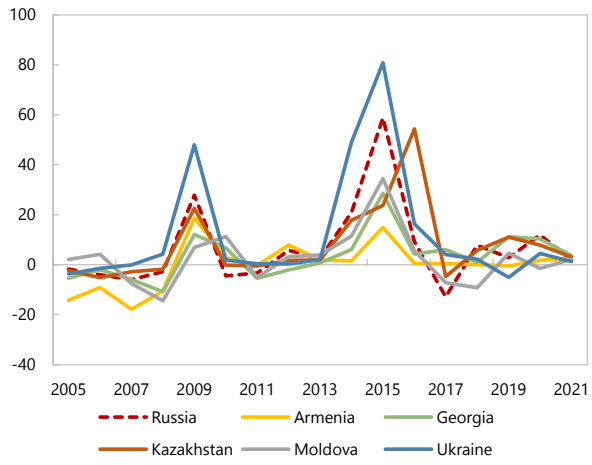
Sources: Central Bank of Russia; National Bank of Georgia, IMF WEO database, and staff estimates.
Note: Data for Georgia reflect money transfers.
Note: Data are seasonally adjusted.

3.4 Exchange Rates

The Ruble/Dollar exchange rate has important implications for exchange rates of CIS countries. During periods of ruble depreciation against the US dollar, currencies of countries in the region also depreciate against the dollar (Figure 8). Like the region's risk-premia co-movements, exchange rate co-movements might reflect exposure to common shocks and confidence effects related to expectations of spillovers. For example, during the 2015 oil price shock, the ruble's depreciation against the dollar was an important transmission channel to CIS countries (Stepanyan et al., 2015). During this period, countries with larger remittance and trade linkages with Russia experienced more severe depreciation against the dollar, reflecting expected deterioration in current account balances (Stepanyan et al., 2015). Synchronized currency depreciation can amplify the impact of output contractions in Russia since depreciation vis-à-vis the dollar increases debt servicing costs and can fuel inflationary pressures.

Figure 8. National Currency per USD

(Year-on-year percent, period avg)



Source: IMF WEO database.

4. Overall Business Cycle Co-movements

Russia maintains a large economic footprint in the region, via trade, FDI, and remittance linkages. These linkages may propagate spillovers from Russia to the region. According to Figure 9, CIS countries and Russia tend to have synchronized output fluctuations, especially during recessions. Synchronized output contractions occurred most drastically during the Global Financial Crisis (GFC), as global growth slowdown weighed heavily on economic activity in the region.

Of the 8 CIS countries, Armenia, Georgia, and Ukraine experienced the deepest recessions during that period, and Azerbaijan, Belarus, and Kazakhstan the mildest. After Russia's annexation of Crimea in 2014 and the accompanying international sanctions, Russia's economic activity slowed but was associated with mild output declines in the region. The accompanying oil price decline in 2015 exacerbated such slowdown, especially for oil exporters Azerbaijan and Kazakhstan. Importantly, the 2015 oil price shock was accompanied by output contractions in oil importers as well, such as Armenia, Belarus, and Ukraine. Kazakhstan and Russia have particularly strongly correlated business cycles, likely due to their common exposure to oil price fluctuations.

Figure 9. Output Gap in Russia and CIS Countries
(Percent)

Source: IMF World Economic Outlook, and staff estimates.

Note: Output gaps are calculated using the HP Filter, with a lambda parameter of 1600.

These stylized facts show that Russian output fluctuations tend to move in line with those of the region, both during global shocks such as the GFC and Covid-19 pandemic, and during Russia-specific shocks such as the 2014 Crimea annexation. To what extent are these co-movements driven by Russia as opposed to other global factors? To tackle this question, vector autoregressive (VAR) and dynamic panel models are used. VAR models allow for analysis of the dynamic relationship between macroeconomic variables. This is crucial when there is endogeneity between the variables under study. In the context of the CIS region, external factors that drive domestic growth fluctuations may be endogenous with each other (EU growth, oil prices, Russian growth). It is crucial, therefore, to account for these complex interactions. The VAR has the following specification:

$$x_t = d_t + A_1(x_{t-1}) + A_1(x_{t-2}) + \cdots + A_h(x_{t-h}) + \epsilon_t \quad (1)$$

Where: x_{t-i} is the vector of endogenous variables under consideration, which includes quarterly real GDP growth for the EU, oil price growth, real GDP growth for Russia, and real GDP growth for each CIS country (in this order, i.e., assuming that EU growth is the most exogenous variable, followed by oil prices, and then Russian growth – in line with Dabla-Norris et al., 2012. The ordering is predicated on the relative weight of the EU, Russia, and CIS countries in the global economy. This model specification assumes that oil price fluctuations do not affect EU growth contemporaneously, which is questionable, since oil is a key intermediate good for the region and can impact output through supply-side channels. To address this, the IRFs are also computed with an alternative variable ordering in which oil prices precede EU GDP growth.

All variables are in quarter-on-quarter growth rates. Real GDP growth in the EU and in each CIS country is seasonally adjusted. A_i (i = 1, …, h) is the matrix of parameters, where h is the number of lags in the model, d_t is a constant, and ϵ_t is the vector of error terms[3]. The VARs are run using quarterly data from 2004 to 2019.

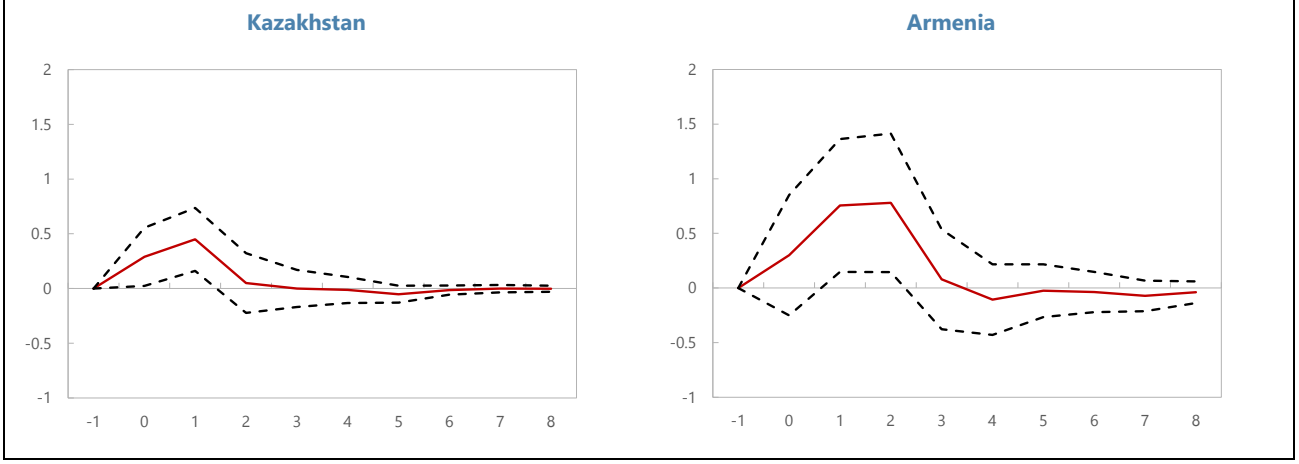
[3] The VAR uses two lags based on the Akaike and Schwarz lag-selection test. The identification of shocks is based on a Cholesky decomposition. To test the null hypothesis of a unit root on each of the four variables, an augmented Dickey-Fuller (ADF) test is employed. The results suggest that all variables log form are stationary in first differences (delta-log).

4.1 VAR Results

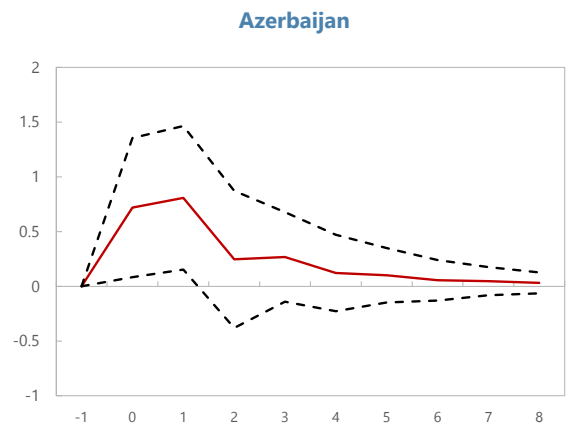
Country-specific impulse response functions show the dynamic association between a one standard-deviation (SD) orthogonalized shock to Russia and EU growth and regional growth fluctuations. The results imply that spillovers from Russia to the region are large but vary across countries. A 1 standard deviation positive shock to growth in Russia (1.8 percentage point increase) is associated with an increase in quarter-on-quarter growth in Kazakhstan of 0.2 percentage points in the first quarter and 0.4 percentage points in the subsequent quarter (Figure 10). While the association between Russia's growth and Kazakhstan's growth is sizable, it is larger for peers: in Armenia and Belarus, the spillover effects peak at 3 quarters after the initial shock, reaching a coefficient of 0.8 and 0.6 percentage points, respectively. The coefficient on shocks to Russian growth is even larger for Ukraine- reaching 1 percentage point in the first quarter and 0.7 percentage points in the second quarter[4].

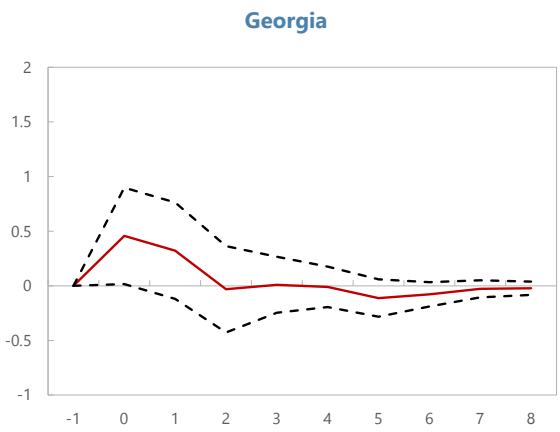
The association between a 1 standard deviation shock to EU GDP growth and regional growth is displayed in Figure 11. The results imply that for several countries, spillovers from the EU are milder than those from Russia. For oil exporters, the impact of shocks to EU growth on local growth are small. In Kazakhstan, the coefficient on EU growth is smaller than that of Russia, peaking at 0.26 percentage points. One potential reason is that trade between regional oil exporters and the EU is largely oil dominated, and that accounting for oil price fluctuations dampens the size of the EU shock coefficient. The estimated spillovers from EU growth to Georgia is also smaller than those stemming from Russia but persist for longer- peaking after 2 quarters at 0.46 percentage points and lasting up to 7 quarters. For Armenia and Ukraine, spillovers from EU are both larger and longer lasting than those from Russia- peaking at 1 and 0.86 percentage points, respectively, and lasting up to 9 quarters.

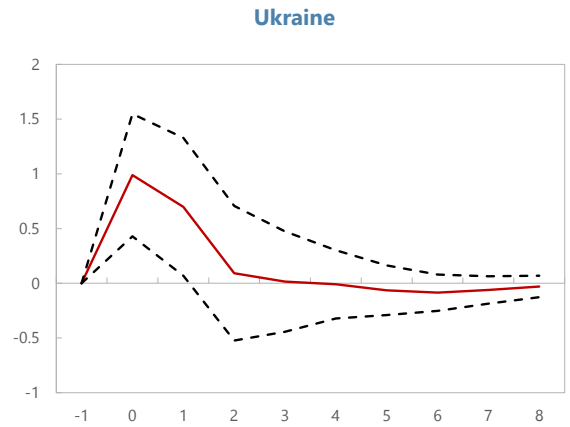
Figure 10. Impact of Shocks to Russian Growth on CIS Economies

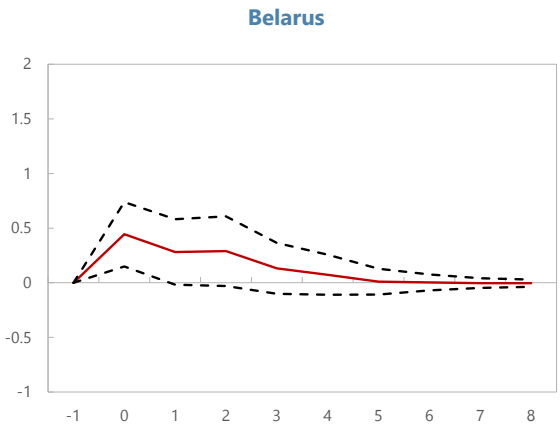


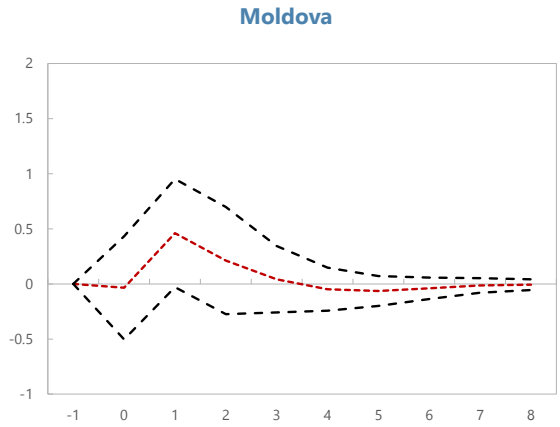
[4] In an alternative specification, the impulse response functions are calculated using a different ordering of variables in the VAR- where oil prices and growth in Russia precede EU growth and local growth. The results are consistent with those shown in figure 10 (see Annex I).







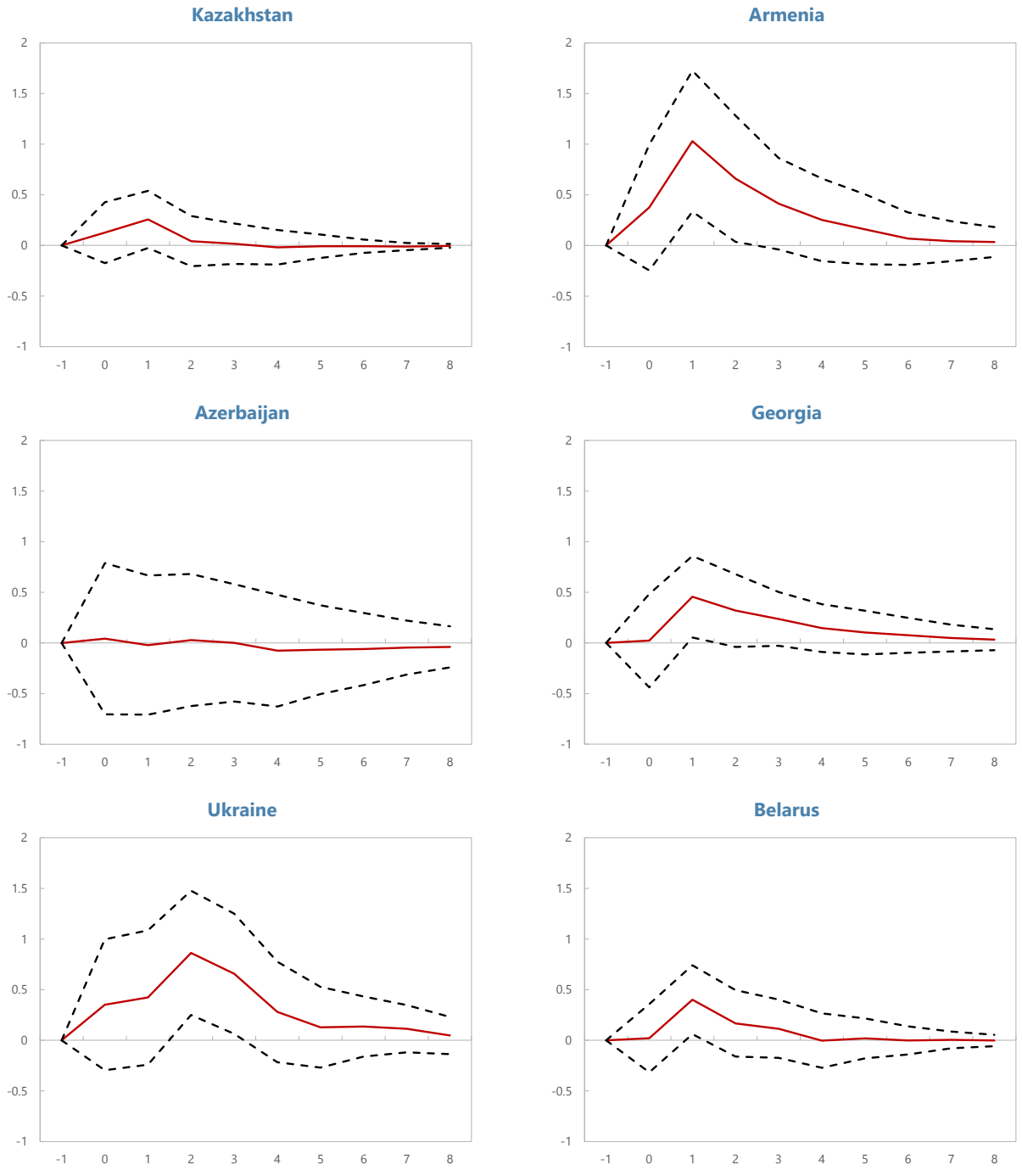


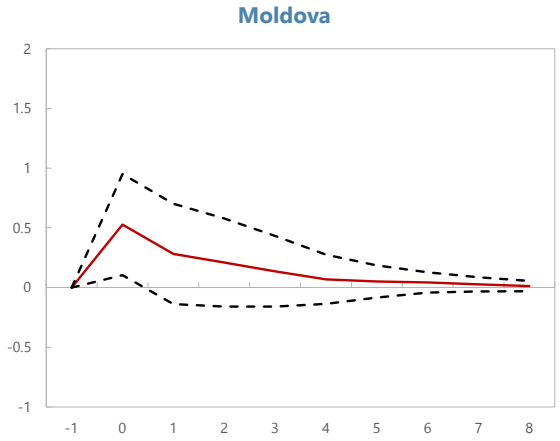


Source: IMF staff estimates.

Note: the error band reflects a 95% confidence interval.

Figure 11. Impact of Shocks to EU Growth on CIS Economies





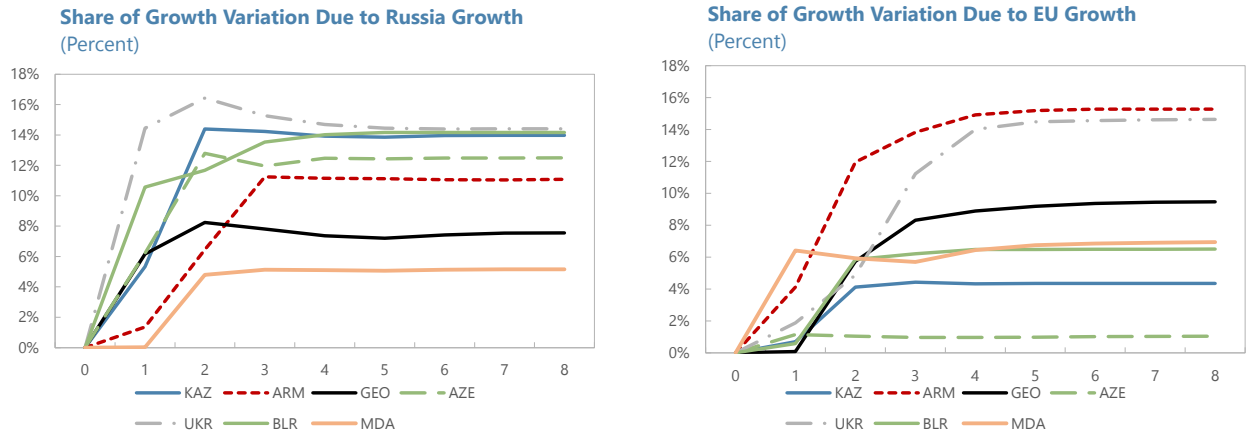
Source: IMF staff estimates.

Note: the error band reflects a 95% confidence interval.

To better understand the relative contribution of Russia and EU growth to domestic growth fluctuations, Forecast Error Variance Decompositions (FEVD) are computed. This exercise helps analyze the relative importance of the Russian economy, controlling for European growth, in accounting for forecast error variance of GDP growth in individual CIS countries. Variance decomposition indicates the percentage of the forecast error variance in one variable that is due to errors in forecasting itself and each of the other variables.

Among the sample of countries, variances of growth in Russia seem to be more important in Kazakhstan, Ukraine, Azerbaijan, and Belarus than variances of growth in the EU (Figure 12). The variance of EU growth, however, seems to be more important for Armenia, Georgia, and Moldova.

Figure 12. Forecast Error Variance Decomposition of Growth in CIS Countries



Source: IMF staff estimates.

4.2 Panel Results

The VARs present an overall picture of the relative size of spillovers from Russia and the EU. However, there may be additional external and domestic factors that drive local growth fluctuations. To address this concern, the paper builds on the previous VAR analysis with a panel approach, following the methodologies of Alturki et al., 2009 and Dabla-Norris et al., 2012.[5] The empirical approach is a panel OLS growth regression using quarterly data over the 2004-2021 period for 8 CIS countries. The baseline specification is as follows:

$$Y_{i,t} = c_i + \beta_1(Y_{i,t-1}) + \beta_2(GRussia_t) + \beta_3(X_{i,t}) + \epsilon_{i,t} \quad (2)$$

Where the dependent variable, $Y_{i,t}$, is quarter-on-quarter real GDP growth in each CIS country. To account for potential autocorrelation in real GDP data, $Y_{i,t-1}$ is added on the right side. The constant, c varies across countries, *X* is a matrix of explanatory variables, and ϵ is the error term. The panel regressions also complement the VAR approach by expanding the range of non-Russia variables ($X_{i,t}$) to include global factors such as EU real GDP growth, China real GDP growth, oil price fluctuations, and the US 10-year treasury rate, as well as domestic factors such as headline CPI and the real effective exchange rate (REER). Real GDP growth rates and inflation are seasonally adjusted.

Table 1 shows the impact of GDP growth in systemically important partner countries on CIS countries' real GDP growth. Consistent with the VAR analysis, spillovers from Russia to the region are large, including compared to output in partner economies. The results imply that historically, a 1 percentage point increase in Russia's real GDP growth is associated with, on average, a 0.67 percentage point increase in real GDP growth in CIS countries. Column 8 shows that this association is stronger for oil importers[6] , with a coefficient of 0.79 percentage points. These results are in line with Alturki et al., 2009, who find that spillovers from Russia are generally larger for oil importers.

Spillovers from the EU and China have a smaller impact than those from Russia but are independently large and statistically significant. The results imply that a 1 percentage point increase in EU and China real GDP growth is associated with, on average, a 0.43 and 0.49 percentage point increase in CIS countries' growth, respectively. Although the EU is the region's largest trading partner, the coefficient on EU GDP growth is not significant when controlling for GDP growth in Russia and China (Columns 4 and 8 of Table 1).[7] One potential reason is that since the EU is a large block of countries, the economic linkages between CIS countries and the EU are more dispersed. A second reason, particularly for oil exporters, is that trade with the EU is oil-dominated, and so controlling for the oil price dampens the size of the coefficient. A third potential reason why the coefficient on EU is smaller than that of Russia is that output fluctuations in the EU might affect CIS countries indirectly via their impact on Russia.

[5] As opposed to using annual real GDP growth data as in Alturki et al., 2009 and Dabla-Norris et al., 2012, this paper uses quarterly data.

[6] Oil importers consist of Armenia, Belarus, Georgia, Moldova, Tajikistan, and Ukraine.

[7] Running the same panel regressions with standardized real GDP growth variables yields similar results (see Annex IV in the appendix). The results are also robust to the inclusion of country fixed effects (see Annex III).

Table 1. Drivers of Short-term Growth—Overall: 2004–2021

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CIS countries (excluding Russia)				CIS oil importers			
Own Growth (t-1)	0.0125	0.103	0.0907	0.0270	-0.0240	0.0776	0.0605	-0.00151
Russia Real GDP Growth	**0.788*** **			**0.673*** **	**0.916*** **			**0.788*** **
EU Real GDP Growth		**0.466*** **		**-0.0590**		**0.573*** **		**0.0912**
China Real GDP Growth (t-1)			**0.531*** **	**0.210***			**0.590*** **	**0.0735**
Headline CPI Inflation	-0.0621***	-0.0127	-0.0308	-0.0603***	-0.0730***	-0.0220	-0.0440**	-0.0655**
REER Growth	0.0269	0.0444	0.0535*	0.0317	0.00793	0.0314	0.0516	0.0107
Oil Price Growth	0.00922	0.0404***	0.0335***	0.00749	0.00704	0.0414***	0.0375***	0.00616
Δ US 10-year Treasury Yield	0.131	-0.333	-0.0595	0.193	-0.0297	-0.527	-0.261	-0.0314
Constant	0.739***	0.879***	0.00267	0.388**	0.630**	0.806***	-0.147	0.496**
Observations	601	601	601	601	449	449	449	449
Number of ifs_code	8	8	8	8	6	6	6	6

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

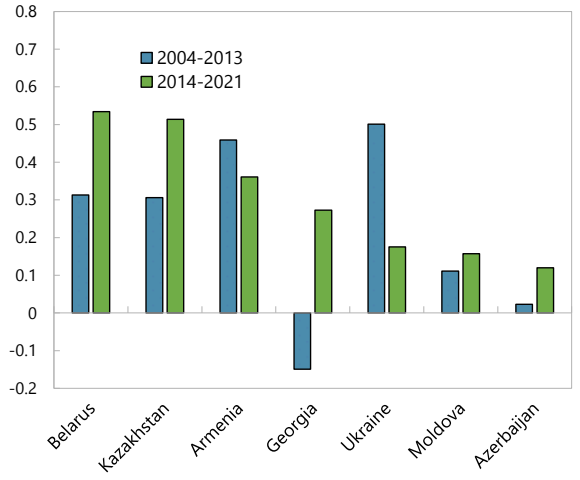
Oil prices also matter for growth. The empirical results show that oil price movements are positively associated with growth in CIS countries, including for oil importers. Notably, the positive sign on the oil price coefficient is smaller after controlling for GDP growth in Russia. This suggests that upward oil price movements could have a positive effect on regional output indirectly via their positive impact on Russia (columns 1 and 5).

5. Transmission Channels

5.1 Trade Channel

The VAR and panel exercises suggest that Russia still plays an important role in driving regional output fluctuations. This raises questions about the channels through which it does so. Historically, trade has been one such channel. Exports with Russia tend to be procyclical with the Russian economy: when the Russian economy contracts, its imports from the region decline, leading to contractions in regional output. In fact, the correlation between bilateral exports and growth in Russia has increased in recent years for most countries in the sample (Figure 13). To test the extent to which trade with Russia is a channel of growth transmission, following Alturki et al., 2009, GDP growth in Russia and partner countries is replaced with bilateral exports (in q-o-q growth rates) in the regressions presented in Table 2. The regressions are split into two periods (2004-2013 and 2014-2021) to examine whether there has been a change in parameter over time.

Figure 13. Correlation Between GDP Growth in Russia and Bilateral Exports (Between -1 and 1)



Source: IMF DOT database, WEO, and staff estimates.

The results imply that there is a strong relationship between exports to Russia and CIS real GDP growth, and that this relationship may have strengthened in recent years – A 10-percentage point increase in bilateral export growth was associated with a 0.23 percentage point increase in CIS real GDP growth over the 2004-2013 period, compared to 0.53 percentage points over the 2014-2021 period (Table 2, columns 4 and 8). It is possible that the association between exports and local output fluctuations is driven by regional, non-Russia trade. For example, if a contraction in Russia's output leads to a decline in imports from Armenia, such a decline may also lead to contractions in trade between Armenia and Georgia, thereby amplifying the impact of spillovers.

Exports to the EU are insignificant after controlling for the oil price, likely due to the oil-dominated trade linkages between the EU and CIS oil exporters. During the more recent period (2014-2021), exports to the EU are significantly associated with local growth, but this significance disappears when controlling for trade with Russia (column 8). Trade with China is not associated with GDP growth in the region, likely due to China's historically small trade ties.[8] The empirical results support the evidence that trade with Russia is an important channel of regional business cycle transmission, and that this channel may have risen in recent years. The increase in the association between bilateral exports and regional output might be driven by the shift in the share of non-commodities toward commodities in bilateral exports, as commodity goods tend to be more sensitive to shocks.

Table 2. Drivers of Short-term Growth—Trade Channel: 2004–2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	2004-2013				2014-2021			
Own Growth (t-1)	0.129*	0.139*	0.137*	0.128*	-0.136**	-0.130*	-0.115	-0.142***
Export to Russia Growth	**0.0231****			**0.0229****	**0.0631*****			**0.0534*****
Export to EU Growth		0.00261		0.000836		0.0396***		0.0190
Export to China Growth			-0.00129	-0.00123			-0.00124	-0.00161
Headline CPI Inflation	-0.0271	-0.0163	-0.0115	-0.0259	-0.0708	-0.0916	-0.0768	-0.0786
REER Growth	0.0880**	0.0737*	0.0709*	0.0873**	0.0605**	0.0564*	0.0375	0.0666**
Oil Price Growth	0.0571***	0.0584***	0.0598***	0.0570***	0.0681***	0.0699***	0.0728***	0.0677***
Δ US 10-year Treasury Yield	-0.700	-0.687	-0.726	-0.701	-0.188	-0.128	0.140	-0.300
Constant	1.066***	1.098***	1.105***	1.069***	0.604***	0.667***	0.773***	0.589***
Observations	280	280	280	280	223	223	223	223
Number of ifs_code	7	7	7	7	7	7	7	7

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.2 Financial Channel

Aside from trade, several CIS countries maintain large financial ties with Russia, particularly in FDI. According to the literature, countries with larger FDI links tend to have more synchronized business cycles. One reason is

[8] However, China's growth dynamics are likely relevant for growth in Russia, as well as for commodity prices. Therefore, there may be indirect effects of China's output fluctuations on the region via their impact on Russia or on commodity prices.

that if the economy of the foreign investor deteriorates and weakens the financial health of parent companies, it could result in wage and investment cutbacks in the receiving country. The large and illiquid FDI linkages between Russia and CIS countries may play a role in transmitting local macroeconomic shocks.

The co-movement of sovereign risk premia is an important, but indirect, financial linkage. The stylized facts show that CIS countries' sovereign credit spreads move in line with those of Russia. Increases in local sovereign credit spreads can negatively impact growth either directly- through constraining fiscal space and leading to cutbacks in government spending and borrowing- or indirectly- via negative balance sheet effects on domestic bondholders.

To test whether these cross border financial linkages act as channels of business cycle transmission, bilateral exports are replaced by several variables that capture movements in Russian financial markets. Table 3 shows the estimated impact of movements in Russian equity prices, sovereign spreads, and central bank policy rate on output fluctuations in CIS countries.

The results imply that an increase in Russian equity prices is positively associated with local GDP growth, while increases in government bond spreads are negatively associated with local GDP growth. The positive association between Russian equity prices and local GDP growth lends evidence in support of the argument that FDI linkages propagate shocks from Russia. Given that FDI from Russia to the region is largely illiquid, declines in earnings of Russian multinational companies could spread to the region via contractions in employment and wages of their host companies. However, this association might instead reflect other channels, as well as confounding factors such as global risk sentiment.

Table 3. Drivers of Short-term Growth—Financial Channel: 2004-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	CIS countries (excluding Russia)				CIS oil importers			
Own Growth (t-1)	0.0197	0.0183	0.0329	0.0168	-0.0365	-0.0396	-0.0247	-0.0406
Δ log Russia Equity Price (t-1)	**0.0262*** **			**0.00691**	**0.0324** **			**0.00976**
Δ log Russia EMBIG Spread (t-1)		**-0.0181*** **		**-0.0158*** **		**-0.0220*** **		**-0.0184*** **
Δ Russia Policy Rate (t-1)			**-0.0561**	**0.0339**			**-0.0779**	**0.0278**
EU Real GDP Growth (t-1)	0.0324	0.0282	0.0645	0.0235	0.0416	0.0386	0.0833	0.0328
Headline CPI Inflation	-0.0392	-0.0229	-0.0315	-0.0274	-0.0597**	-0.0398**	-0.0531**	-0.0449**
REER Growth	0.0585**	0.0579**	0.0588**	0.0586**	0.0538**	0.0506**	0.0532**	0.0522**
Oil Price Growth	0.0674***	0.0707***	0.0716***	0.0703***	0.0742***	0.0782***	0.0792***	0.0773***
Δ US 10-year Treasury Yield	-0.757	-0.825*	-0.683	-0.819*	-1.076*	-1.157*	-0.982	-1.152*
Constant	0.994***	1.022***	1.021***	1.021***	0.964***	0.998***	1.007***	0.991***
Observations	571	571	571	571	427	427	427	427
Number of ifs_code	8	8	8	8	6	6	6	6

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Movements in Russia's government bond spreads have the strongest association with local GDP growth. This likely reflects market confidence factors, such as the strong co-movement of Russian and domestic government bond spreads. During past shocks to Russia, sovereign spreads and capital flows played an important role in amplifying spillovers to the region. One potential reason is that institutional investors

anticipated spillovers from Russia to the region, and thus priced regional sovereign debt in line with developments in Russia. The oil price collapse in 2015 highlights this, as expectations of spillovers led to currency pressures and sovereign spread widening in several countries in the region. Movements in the Central Bank of Russia's policy rate does not seem to be associated with local output fluctuations.

The results come with constraints. The first is a lack of quarterly bilateral FDI flows data. It is difficult to estimate the direct effect of bilateral FDI flows given that data are available only at an annual frequency and start in 2009. To the extent that equity prices in Russia capture the effect of FDI linkages, it is only partial. The second is that the coefficients may be subject to omitted variable bias: other global risk factors could drive output in both Russia and the region. The exclusion of such variables would lead to an overestimation of Russia-specific coefficients. The third constraint is an absence of comparable data on cross-border banking claims. The BIS publishes data on cross-border bank claims for advanced economies and selected emerging market economies, but not for CIS countries. This makes it difficult to assess the degree of cross-border bank integration and whether such integration propagates shocks stemming from Russia.

5.3 Remittance Channel

Panel regression results support the evidence that remittances are an important channel through which the Russian business cycle is propagated to the region. To quantify the extent of a remittance channel, real GDP growth in Russia is replaced with quarterly bilateral remittance flows to each CIS country.[9]

The results in Table 4 imply that a 10-percentage point increase in growth of remittances from Russia is associated with a 0.2 – 0.6 percentage point increase in regional GDP growth. The coefficient on remittances is slightly larger for oil importers- ranging from 0.3 to 0.8 percentage points.[10] Controlling for EU real GDP growth dampens the coefficient on remittances, since EU growth can impact both regional growth and remittances via its impact on Russia. Similarly, controlling for global oil prices dampens the size of the remittance coefficient (columns 2 and 5). This is likely because a large share of migrant workers from the region works in Russia's non-tradable sector, which is sensitive to oil price fluctuations. One limitation of these results is that quarterly real GDP data are not available for some large remittance receivers, such as Kyrgyz Republic and Uzbekistan. It is possible, therefore, that the size of the remittance channel is underestimated.

[9] The sample consists of Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Moldova, Tajikistan, and Ukraine.

Note: Data for Georgia reflect money transfers, as remittance data are not published.

[10] These results are in line with IMF 2009, who argue that remittances are the largest spillover channel for oil importers.

Table 4. Drivers of Short-term Growth—Remittance Channel: 2010-2021

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	CIS countries (excluding Russia)			CIS oil importers		
Own Growth (t-1)	-0.0660	-0.0412	0.0307	-0.0718	-0.0548	0.0451
Bilateral Remittances Growth	**0.0594*** **	**0.0337** **	**0.0219***	**0.0849*** **	**0.0484** **	**0.0328*** **
EU Real GDP Growth (t-1)			0.389***			0.485***
Headline CPI Inflation	-0.110***	-0.0807***	-0.0608*	-0.126***	-0.0925***	-0.0613*
REER Growth	0.0428	0.0298	0.0311	0.0472	0.0324	0.0284
Oil Price Growth		0.0643***	0.0334***		0.0725***	0.0336***
Δ US 10-year Treasury Yield	0.459	-0.892	-0.627	0.402	-1.068	-0.710
Constant	0.972***	0.910***	0.681***	1.051***	0.990***	0.675***
Observations	371	371	371	277	277	277
Number of ifs_code	8	8	8	6	6	6

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.4 Combined

The empirical results highlight that the trade, financial, and remittance channels independently play a role in transmitting spillovers from Russia. To gauge the relative importance of each channel, I combine the trade, remittance, and financial variables on the right-hand side of equation 2, using the same control variables from the previous panel regressions. To further examine whether certain channels have shifted over time, the regressions are separated into two separate periods (2010-2016 and 2016-2021).

Table 5 summarizes the estimated impact of trade, remittances, and market confidence on regional output fluctuations. The results point to a shift in the channel of spillovers over time. Both trade and remittances are positively associated with regional output fluctuations during the 2010-2016 period. However, in the subsequent period (2016-2021), the coefficient on remittances becomes insignificant, whereas the coefficients on trade and sovereign risk premia are large and significant. The same pattern is observed for both the overall sample and for the oil importers.

The results imply that while the remittance channel played an important role during the first half of the decade, the trade and market confidence channels have become more important during the second half. The narrowing role of the remittance channel is likely driven by the large decline in the level of remittances from Russia after 2014, while the emergence of the trade channel may be driven by the shift from non-commodity toward commodity goods in trade, as commodity goods are subject to greater volatility. These results, again, may be biased by the exclusion of Tajikistan, Kyrgyz Republic, and Uzbekistan, which are among the largest remittance recipients.

It is also possible that the results are driven by differences in the volatility of the independent and dependent variables. To examine whether there is such bias, table 5 is replicated using standardized growth rates (see

Annex V).[11] The results are similar and point to the decline in the size of the remittance channel and the corresponding increase in trade and market confidence channels over time.

Table 5. Drivers of Short-term Growth—Combined: 2010-2021

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CIS countries (excluding Russia)				CIS oil importers			
VARIABLES	2010-2016		2016-2021		2010-2016		2016-2021	
Own Growth (t-1)	0.0795	0.0838	-0.214***	-0.139**	0.130**	0.133**	-0.243***	-0.132*
	(0.0997)	(0.0961)	(0.0482)	(0.0562)	(0.0624)	(0.0520)	(0.0339)	(0.0699)
Export to Russia Growth	**0.0181****	**0.0185****	**0.0742*****	**0.0598*****	**0.0279*****	**0.0280*****	**0.0549****	**0.0363**
	(0.00811)	(0.00768)	(0.0200)	(0.0213)	(0.00799)	(0.00788)	(0.0273)	(0.0288)
Bilateral Remittances Growth	**0.0208****	**0.0203****	**0.0112**	**-0.00615**	**0.0170****	**0.0165****	**0.0275**	**0.00305**
	(0.00927)	(0.00901)	(0.0201)	(0.0138)	(0.00843)	(0.00792)	(0.0358)	(0.0235)
Δ log Russia EMBIG Spread (t-1)	**-0.00751**	**-0.00748**	**-0.0494*****	**-0.0493*****	**-0.00983**	**-0.00984**	**-0.0602*****	**-0.0569*****
	(0.00853)	(0.00857)	(0.0180)	(0.0146)	(0.0106)	(0.0106)	(0.0228)	(0.0177)
EU Real GDP Growth		-0.199		0.359***		-0.0958		0.473***
		(0.373)		(0.115)		(0.498)		(0.123)
Headline CPI Inflation	-0.102***	-0.101***	0.0490	0.0545	-0.0870***	-0.0865***	0.165	0.226
	(0.0301)	(0.0293)	(0.138)	(0.148)	(0.0175)	(0.0174)	(0.137)	(0.138)
REER Growth	0.0599**	0.0598**	0.0389	0.0597	0.0777*	0.0776*	0.00653	-0.0256
	(0.0286)	(0.0287)	(0.0473)	(0.0507)	(0.0457)	(0.0463)	(0.0392)	(0.0476)
Oil Price Growth	0.0215***	0.0207**	0.0948***	0.0513***	0.0237**	0.0233**	0.115***	0.0581***
	(0.00829)	(0.00912)	(0.0226)	(0.0135)	(0.0101)	(0.0110)	(0.0237)	(0.0132)
Δ US 10-year Treasury Yield	-1.047	-1.001	-0.955	-0.276	-1.184	-1.160	-1.523*	-0.600
	(0.939)	(1.007)	(0.630)	(0.483)	(1.302)	(1.412)	(0.813)	(0.658)
Constant	0.690***	0.752***	0.0474	-0.0629	0.561**	0.591*	0.0210	-0.189
	(0.215)	(0.273)	(0.142)	(0.150)	(0.250)	(0.319)	(0.129)	(0.123)
Observations	189	189	167	167	135	135	119	119
Number of ifs_code	7	7	7	7	5	5	5	5

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6. The Role of Diversification, Integration, and Institutions

Given that the region is vulnerable to spillovers via several channels, understanding how to contain these channels is a key challenge faced by policymakers. This section sheds light on how country-specific factors influence the cross-border transmission of Russian output fluctuations. The economic literature highlights that partner diversification and economic fundamentals can be important determinants of such transmission, and that public governance can influence a country's ability to weather economic crises (IMF 2018). To understand the role of these factors in the case of CIS countries, coefficient β_2 from equation 2 is first estimated for a sample of CIS and EU economies for which quarterly data are available;[12] then, using cross-sectional data, country-specific beta coefficients are regressed on a 14-year average of country-specific variables. The cross-sectional regressions in Figure 15 provide the following results:

[11] Standardizing each variable consists of subtracting the mean from each observation and dividing by the standard deviation.

[12] This parameter captures the effect of a 1 pp increase in real GDP growth in Russia on domestic real GDP growth for each country, controlling for non-Russian factors.

Countries with stronger bilateral trade with Russia experience larger spillover effects. This is consistent with the literature that finds that bilateral trade increases business cycle synchronization (Frankel and Rose (1998), Wincoop (2001), Baxter and Koupiratsas (2004), and Imbs (2004, 2006)). Similarly, countries with more dispersed economic ties experience smaller spillovers from Russia. Higher partner diversification, proxied by the Global Connectedness-Breadth Index, is negatively associated with spillovers. The index captures the dispersion of trade, financial, technological, and migration flows between a country and the rest of the world. A higher index is associated with weaker spillovers from Russia.

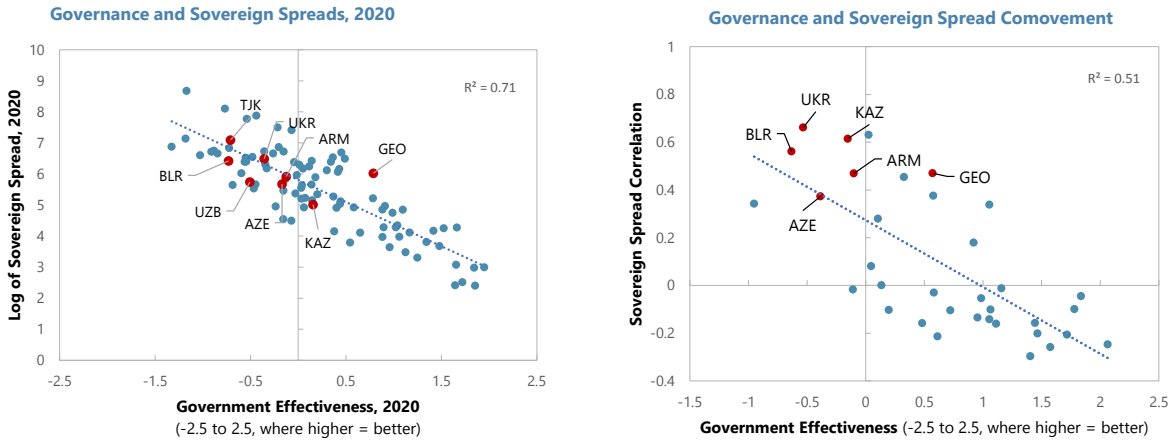
***Higher economic diversification is associated with smaller spillovers from Russia*.** This empirical result is consistent with findings that industrial similarity increases business cycle synchronization. In theory, countries with similar industrial structures are exposed to common macroeconomic shocks, and thus have more strongly correlated business cycles (Imbs, 2004). Similarly, countries with more diversified economies are less likely to face exposure to common shocks and should therefore be less vulnerable to spillovers from partner countries. The relationship between economic diversification and spillovers is larger when the two oil exporters (Azerbaijan and Kazakhstan) are removed from the sample, as the large oil abundance in these countries may help increase resilience to spillovers.

Higher commodities trade is associated with larger spillovers from Russia. On the export side, commodities might be more susceptible to global demand shocks than non-commodities, as well as to demand shocks from Russia. A higher share of commodity exports to Russia may therefore result in a higher sensitivity of trade to Russia's output fluctuations. There are import-side implications as well. Countries with high commodity imports from Russia may be vulnerable to supply disruptions and price shocks.

***Macroeconomic buffers can help limit spillovers from Russia*.** The effect of Russian output fluctuations is larger in countries that finance larger current account deficits. In general, countries with large current account deficits rely on financial inflows to finance their deficits, and as a result are more vulnerable to external shocks. Additionally, during past shocks, anticipation of deteriorating current account balances during contractions in Russia's output exacerbated spillovers effects (Stepanyan et. al, 2015). Similarly, countries with higher shares of sovereign debt denominated in foreign currency exhibit larger spillovers from Russia. A large share of FX sovereign debt may amplify market confidence channels, as synchronized currency depreciations become more costly. This finding is one potential reason why oil importers are more vulnerable to spillovers from Russia. Historically, OIs such as Ukraine, Moldova, Armenia, and Georgia ran large current account deficits and borrowed largely in foreign currency.

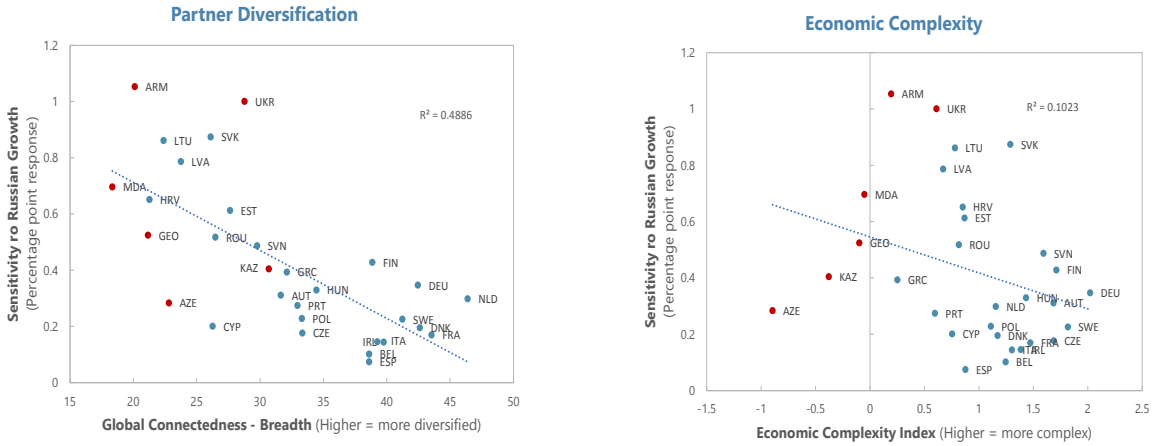
Stronger public governance is associated with lower spillovers from Russia. Countries with higher government effectiveness and rule of law experience milder spillovers from Russia. Government effectiveness captures the perceived quality of public services and the extent to which policymakers are independent from political pressures and is negatively associated with business-cycle transmission (Figure 15). One reason is that more effective governments may be better positioned to address the economic impact of external shocks and reduce vulnerability to spillovers via market confidence. Indeed, there is a strong relationship between fiscal governance and sovereign risk premia (Figure 14), and this relationship strengthens when economic conditions worsen, as markets become less tolerant of institutional risk (Jeanneret, 2018). Correlations also show that the sovereign spreads of countries with weaker public governance are more sensitive to Russian spreads, suggesting that contagion effects from Russian financial markets are then amplified (Figure 14).

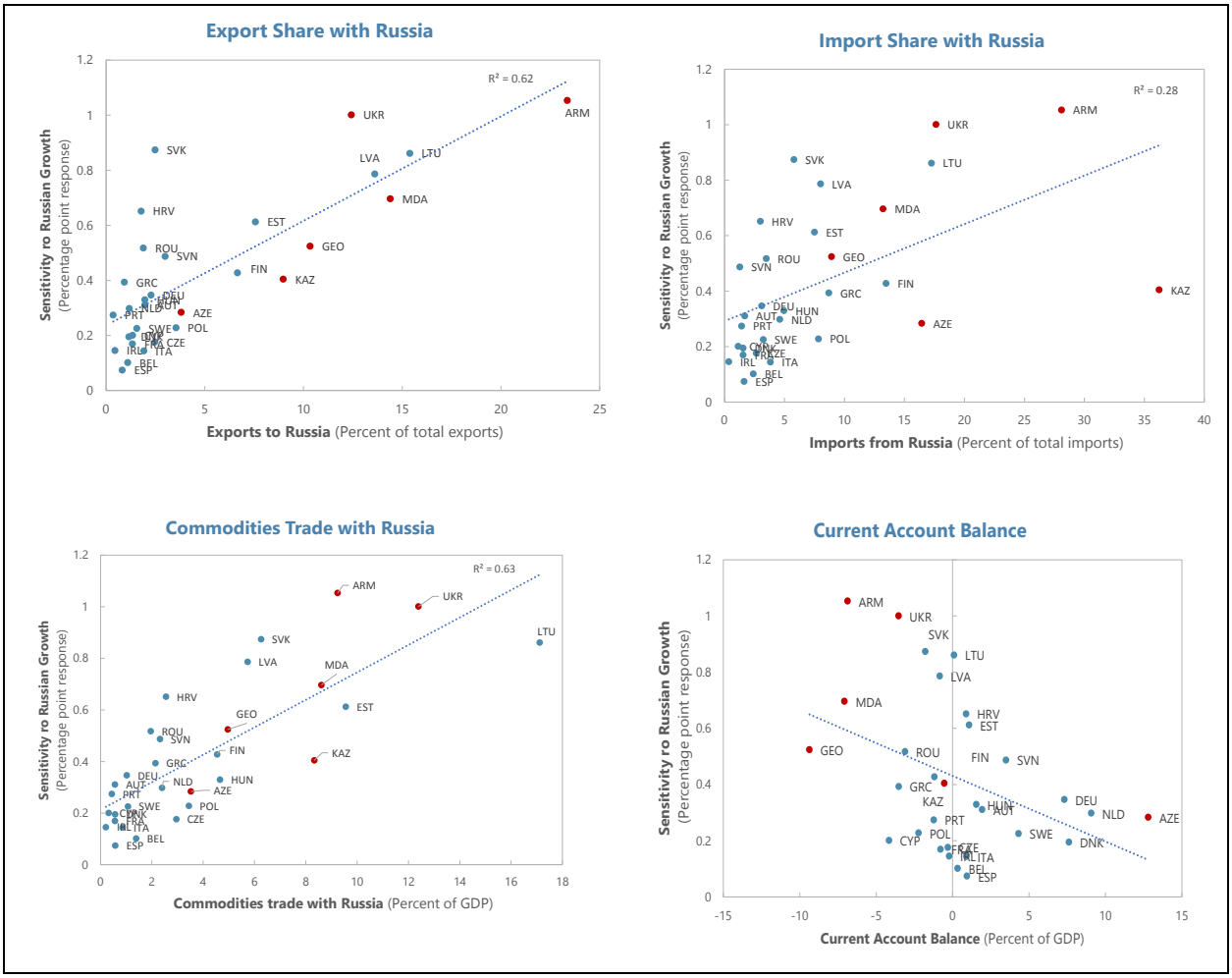
Figure 14. Public Governance and Sovereign Credit Spreads

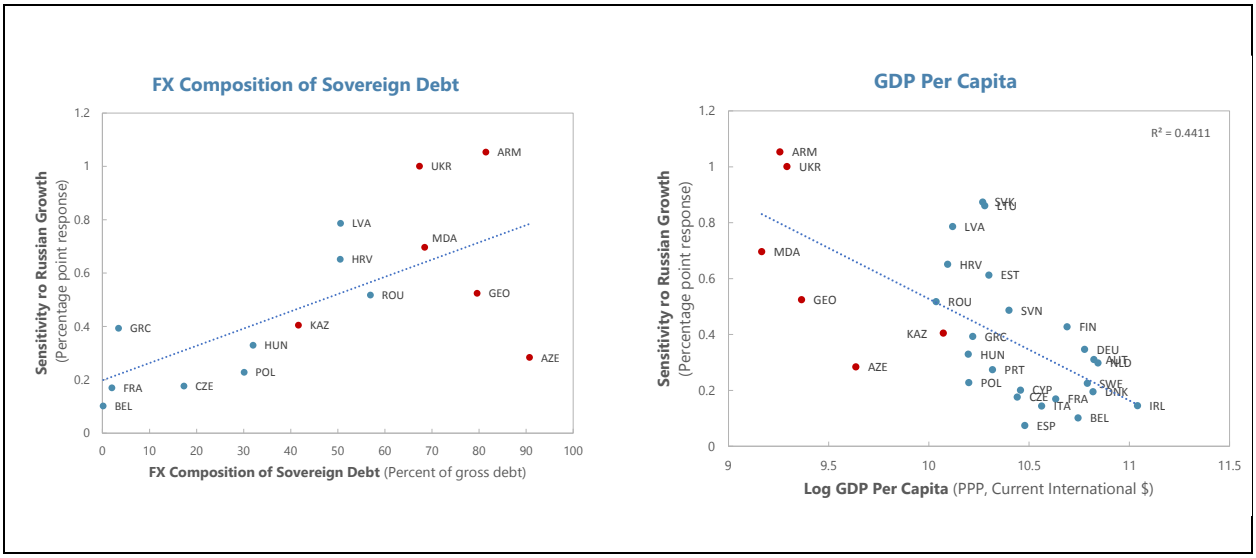


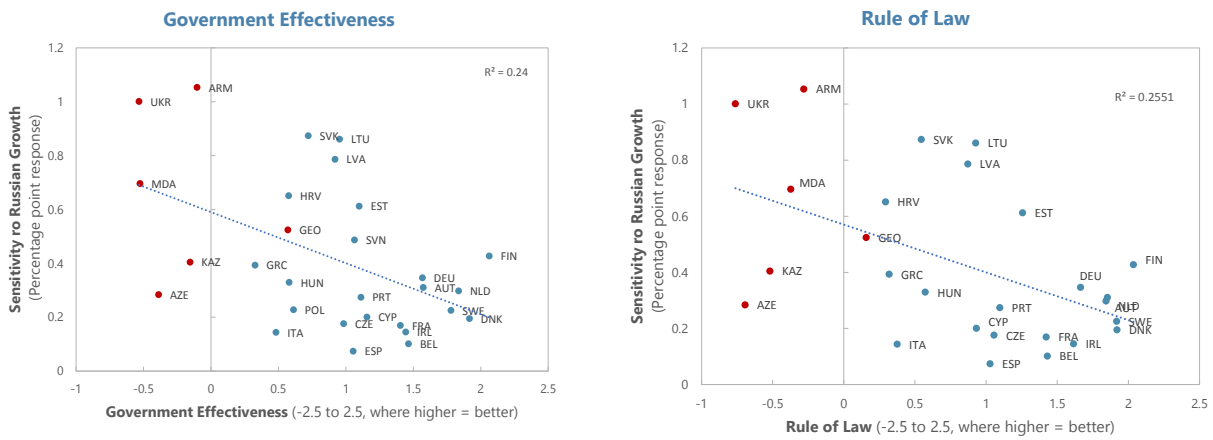
Source: World Bank WGI, IMF Sovereign Debt Monitor, and staff estimates.

Figure 15. Role of Diversification, Integration, and Institutions




Export Share with Russia
Sensitivity ro Russian Growth (Percentage point response)
Exports to Russia (Percent of total exports)
R² = 0.62
Import Share with Russia
Sensitivity ro Russian Growth (Percentage point response)
Imports from Russia (Percent of total imports)
R² = 0.28
Commodities Trade with Russia
Sensitivity ro Russian Growth (Percentage point response)
Commodities trade with Russia (Percent of GDP)
R² = 0.63
Current Account Balance
Sensitivity ro Russian Growth (Percentage point response)
Current Account Balance (Percent of GDP)


FX Composition of Sovereign Debt
Sensitivity ro Russian Growth (Percentage point response)
FX Composition of Sovereign Debt (Percent of gross debt)
GDP Per Capita
Sensitivity ro Russian Growth (Percentage point response)
Log GDP Per Capita (PPP, Current International $)
R² = 0.4411



Source: IMF staff estimates.

Figure 15 highlights that several factors are associated with the magnitude of spillovers from Russia. However, the country-specific factors that influence cross border spillovers may be correlated with each other. For example, the positive link between trade concentration and spillovers might be explained instead by other factors, such as the quality of public institutions or macroeconomic fundamentals. This requires comparing the association of each factor with such confounding variables.

To do so, I use cross-sectional OLS regressions. The country-specific spillover coefficients highlighted in Figure 15 are regressed on factors such as trade concentration and structure, economic and partner diversification, institutional quality, and economic fundamentals. When all country factors are combined, partner diversification and trade intensity with Russia appear as the strongest determinants of business cycle passthrough. The cross-sectional model specification takes the following form:

$$\beta_2^i = \theta_1(\alpha^i) + \epsilon^i \qquad (3)$$

Where $\beta_2^i$is the country-specific coefficient from equation 2 that captures the impact of a one-pp increase in Russia's real GDP growth on domestic growth, controlling for non-Russia factors[13]. It is regressed on α^i, which is a matrix of country-specific factors. Now θ_1 captures the effect of an increase in each country variable on the short-term growth elasticity. ϵ^i is the error term.

Table 6 reports these cross-sectional results. A negative sign implies that an increase in the independent variable contributes to a lower spillover magnitude. As expected, regressions in which all country variables are introduced one by one reveals that higher export and partner diversification, stronger public institutional quality, and stronger external positions are associated with smaller cross-border spillovers. Bilateral trade concentration has the expected positive sign, suggesting that higher trade with Russia contributes to larger spillovers. Similarly, partner diversification, (proxied by the global connectedness index) has a negative sign, implying that higher partner diversification is associated with weaker spillover effects.

[13] The country-specific regressions follow equation 2.

Commodities trade has the expected positive sign, implying that a higher share of commodities trade with Russia contributes to larger spillovers. Similarly, economic diversification, proxied by the economic complexity index, has a negative sign but is insignificant. However, when the two oil exporters in the sample are removed (Kazakhstan and Azerbaijan), the association between economic diversification and spillovers is negative and significant, implying that higher economic diversification contributes to a lower spillover magnitude.

Governance factors have the expected negative sign, implying that a stronger quality of public governance contributes to smaller spillovers. However, the coefficient on governance variables becomes insignificant after controlling for the size and structure of bilateral trade. This highlights that while governance may play a role in influencing the size of cross-border spillovers, the size and patterns of international trade have a stronger role.

Table 6. Determinants of Business Cycle Transmission

	VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
		Sensitivity to Russian Cyclical Output Fluctuations										
Diversification	Partner Diversification	-0.757***								**-0.600****		
		(0.134)								(0.272)		
	Trade with Russia (% of total trade)		0.0309***								**0.0257*****	
			(0.00585)								(0.00780)	
	Commodities trade with Russia (% of GDP)			0.0530***								**0.0449*****
				(0.00925)								(0.00912)
	Economic Diversification				-0.318							
					(0.227)							
Institutions	Government Effectiveness					-0.585***				0.161	0.303	0.226
						(0.195)				(0.341)	(0.307)	(0.239)
	Rule of Law						-0.500**					
							(0.183)					
Fundamentals	Current Account Balance (% of GDP)							-0.0240**[1]				
								(0.00799)				
	GDP Per Capita								-0.316***	-0.154	-0.214	-0.194
									(0.0763)	(0.170)	(0.160)	(0.135)
	Observations	32	32	32	30	31	31	32	32	31	31	31
	R-squared	0.509	0.526	0.628	0.072	0.247	0.246	0.170	0.397	0.525	0.582	0.685

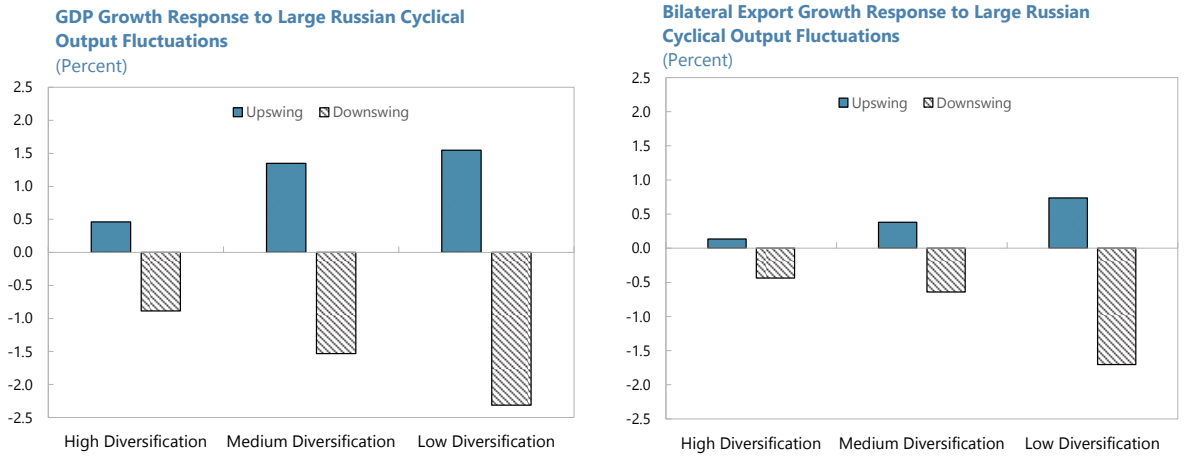
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: IMF staff estimates.

Note: A negative sign indicates that an increase in the variable contributes to a smaller magnitude of spillovers.

Why does partner diversification dampen the impact of spillovers? An event analysis is used to further examine how partner diversification influences the way that economies respond to large Russian business cycle fluctuations. The event study reveals two key findings. First, large contractions in Russia's output are indeed associated with output and trade contractions in the region. Second, more diversified economies experience weaker output and bilateral trade fluctuations during large Russian output swings (Figure 16). The results suggest that partner diversification may dampen the impact of the Russian business cycle on domestic growth by mitigating contractions in bilateral trade flows.

Figure 16. Partner Diversification Dampens the Passthrough of the Russian Business Cycle



Sources: IMF DOT database, WEO, and staff estimates.

Note: Upswings and Downswings correspond to large Russian output fluctuations. Large fluctuations are identified as periods where Russian real q-o-q GDP growth is one-SD above or the below its 2001–19 average. Countries are then grouped by partner diversification scores into top (High), medium (Medium), and bottom (Low) third percentiles. Average responses are then calculated for Upswings and Downswings across the three groups.

Note: Bilateral exports are the q-o-q growth of exports to Russia in local currency. The growth rates are weighted by the share of Russia in total exports and are demeaned.

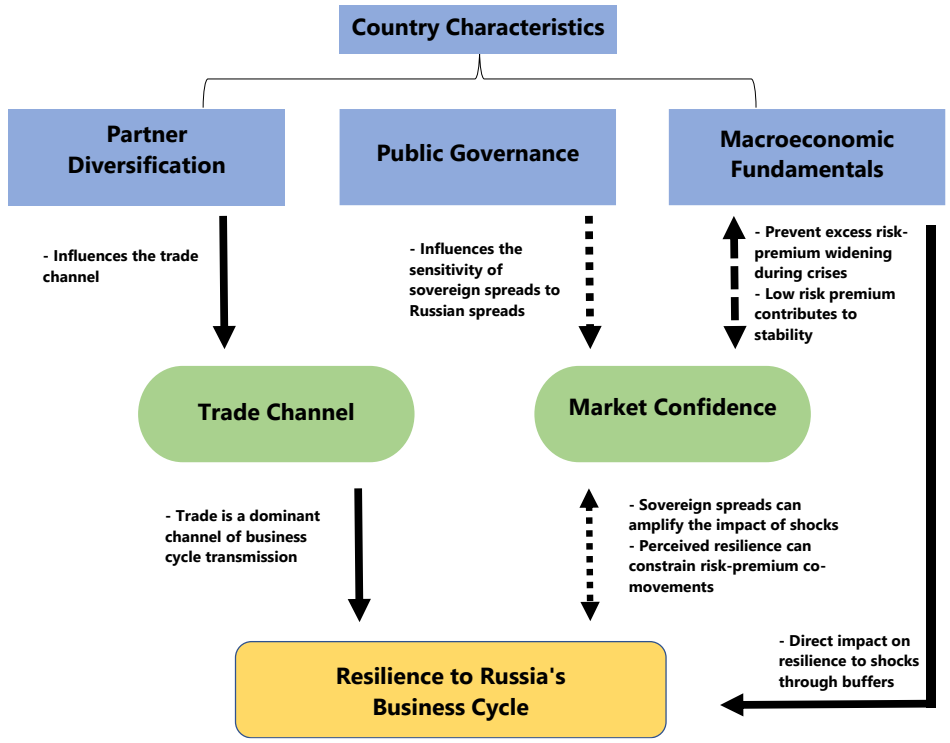
The large heterogeneity of spillovers across countries can be attributed to several factors. Results from cross-sectional regressions highlight that a higher degree of partner dispersion, especially in trade, contributes to lower spillovers. The event studies confirm this result and imply that such contribution occurs via constraining bilateral trade fluctuations over the Russian business cycle. Given that trade plays an important role in transmitting shocks from Russia to the CIS region, containing trade-induced spillovers would benefit the region.

Other factors play a role in determining the size of international spillovers, such as a country's macroeconomic buffers and the quality of its public institutions. Results from correlations and cross-sectional analysis imply that addressing gaps in public institutional quality, especially in the fiscal area, can help contain spillovers via market confidence channels. Stronger macroeconomic buffers also contribute to lower spillovers, as countries with smaller shares of FX sovereign liabilities and smaller current account deficits are less vulnerable to international spillovers.

Containing spillovers through a mix of policies could have positive feedback loops (Figure 17). For instance, to the extent that improving gaps in public institutional quality can mitigate spillovers, it could also lead to a more stable macroeconomic environment and foster stronger fundamentals. Stronger fundamentals, in turn, can help dampen the impact of external shocks.

Additionally, to the extent that higher partner dispersion reduces the size of spillovers, this could reduce spillovers via market confidence factors. For example, stronger market perceptions of resilience to spillovers could mitigate synchronized currency depreciations and risk-premia widening during shocks.

Figure 17. Improving Resilience to External Shocks



Note: Arrow dashes illustrate the relative importance of each channel, with fewer dashes indicating a stronger channel.

7. Conclusion

Russia's economic footprint in the CIS region has declined over the past three decades but remains large. This paper provides evidence that spillovers from Russia's output fluctuations to the region are substantial, especially for oil importers. The analyses also point to a shift in the main channels of transmission over time. Whereas remittances played an important role during the first half of the past decade, trade and market confidence factors have become more relevant since then. FDI linkages might also play a role in transmitting spillovers, but better data on bilateral FDI are needed to confirm this.

The paper also shows how trade patterns, economic fundamentals, and institutional quality can explain cross-country differences in the magnitude of spillovers from Russia. Higher trade concentration with Russia, especially in commodities, contributes to larger cross-border spillovers. Against the backdrop of recent developments, the results imply that a pickup in trade with Russia could heighten the region's vulnerability to future shocks. The results also suggest that reducing bilateral trade concentration and diversifying product markets, including through stronger regional integration, could bring about significant benefits.

Additionally, strong currency and risk-premia co-movements between Russia and the region are likely to amplify spillovers for countries with relatively high liability dollarization and large current account deficits, highlighting another benefit from further de-dollarization in the region. Meanwhile, addressing weaknesses in public institutions can mitigate adverse confidence effects during economic downturns in Russia. International investors factor institutional quality heavily into the pricing of sovereign bonds, especially when macroeconomic conditions deteriorate. The above analysis underscores that improving public governance may lower sovereign credit spreads in the region and reduce their synchronization with those of Russia, potentially helping protect fiscal space during external shocks.

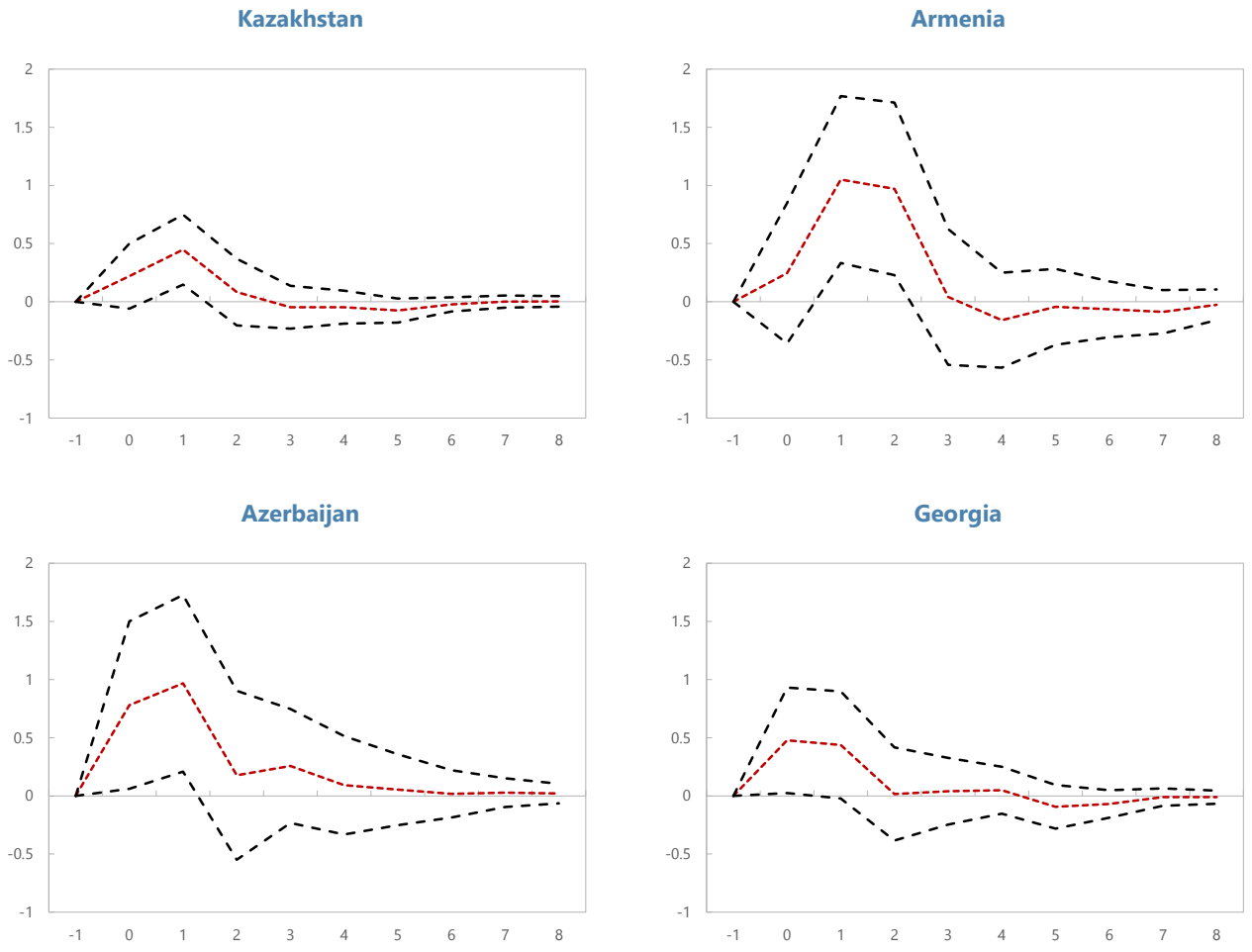
Annex I. Data Definitions and Sources

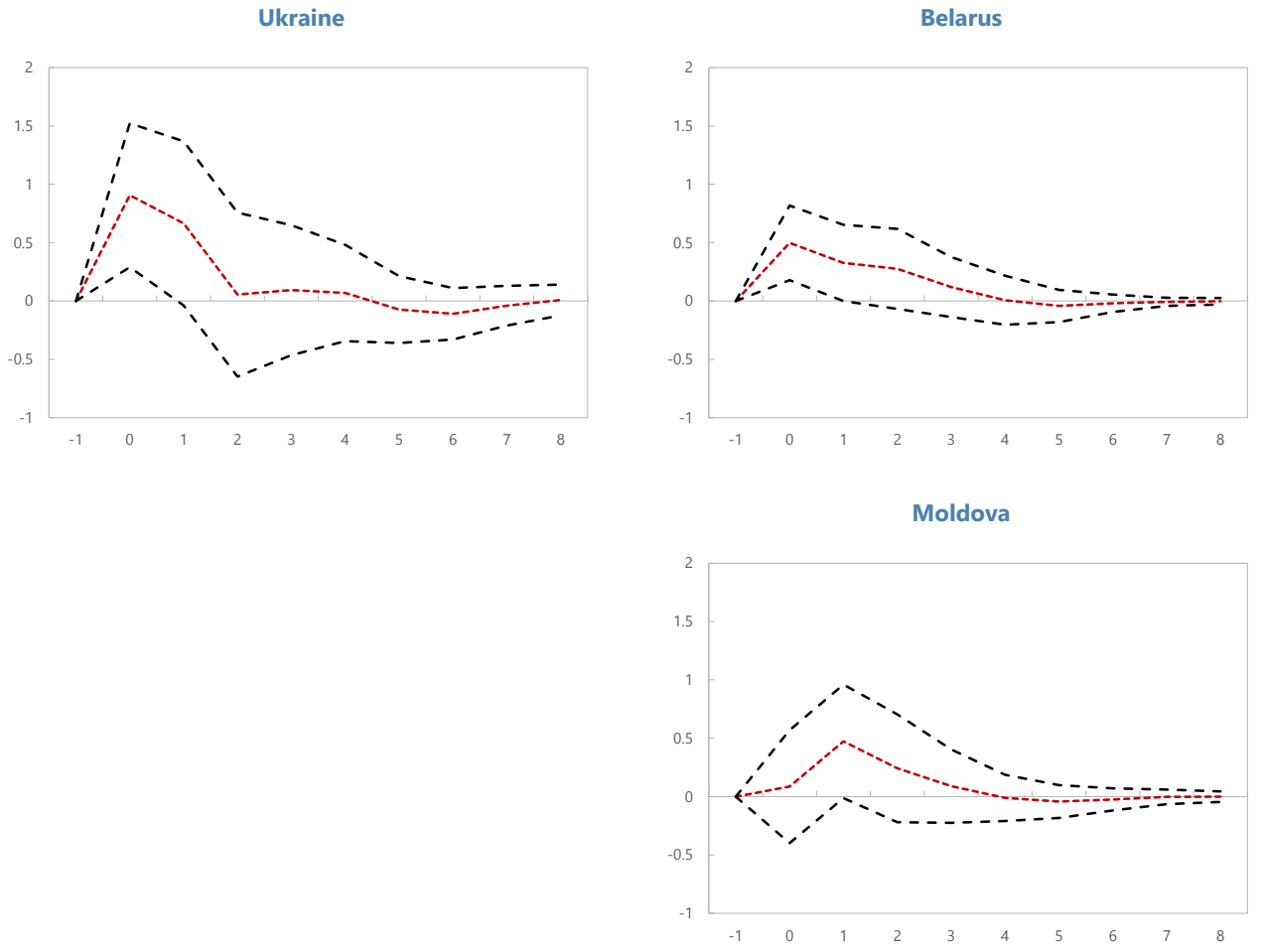
Series Name	Definition	Frequency	Source
Russia Real GDP Growth	Quarter-on-quarter real GDP growth in Russia (delta-log), seasonally adjusted	Quarterly	IMF World Economic Outlook
EU Real GDP Growth	Weighted average of Eurozone real GDP quarter-on-quarter growth, seasonally adjusted	Quarterly	Haver Analytics
Real GDP Growth, CIS countries	Quarter-on-quarter real GDP growth (delta-log), seasonally adjusted	Quarterly	IMF World Economic Outlook and national authorities
China Real GDP Growth	Quarter-on-quarter real GDP growth (delta-log), seasonally adjusted	Quarterly	IMF World Economic Outlook
Oil Price ($ per barrel)	Petroleum spot price (APSP; US$), quarter-on-quarter growth	Quarterly	IMF World Economic Outlook
Headline CPI	Consumer Price Index, quarter-on-quarter growth (delta-log), seasonally adjusted	Quarterly	IMF Information Notice System database
REER	Real effective exchange rate, quarter-on-quarter growth (delta-log)	Quarterly	IMF Information Notice System database
Export to Russia/EU/China	Exports are converted from US dollars into local currency and seasonally adjusted using X-12 ARIMA. Then, the data are converted to quarter-on-quarter growth rates (proxied by delta-log). For the event studies, exports are weighted by the share of Russia in total exports and are demeaned	Quarterly, Annual	IMF Direction of Trade Statistics
Russia Equity Price	MOEX Index. Ruble-denominated benchmark of the Russian stock market. The data are in quarter-on-quarter growth rates (delta-log)	Quarterly	Haver Analytics; National Authorities
Russia policy rate	Financial, Interest Rates, Monetary Policy-Related Interest Rate, Percent per annum (quarter-on-quarter change)	Quarterly	IMF International Financial Statistics database
US 10-year treasury yield	US 10-year treasury bond yield (quarter-on-quarter change)	Quarterly	Federal Reserve Bank of St. Louis
Remittances	Personal Remittances from Russia (delta-log)	Quarterly	Central Bank of Russia and National Bank of Georgia
Global Connectedness - Breadth	Index that refers to the breadth (dispersion) of a country's integration with the rest of the world, as manifested by its participation in international flows of products and services, capital,	Annual	NYU Stern School of Business; Center for the Future of Management; DHL Initiative on Globalization.

	information, and people. A higher score indicates a higher breadth		
Capital Connectedness Score	Subcomponent of the Global Connectedness Index. It captures each country's depth and breadth of inward and outward FDI stock and flows. A higher score indicates higher connectedness	Annual	NYU Stern School of Business; Center for the Future of Management; DHL Initiative on Globalization
Economic Complexity Index	Measures the complexity of export products. A higher score indicates a higher export complexity	Annual	Atlas of Economic Complexity; Harvard Growth Lab
Current Account Balance	Overall Current Account Balance as a share of GDP	Annual	World Bank World Development Indicators database
Foreign Currency Share of Sovereign Debt	General government gross debt in foreign currency as a share of total gross debt	Annual	IMF World Economic Outlook
Government Effectiveness Score	Captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. A higher score indicates better government effectiveness	Annual	World Bank World Governance Indicators database
Export and import share with Russia	Exports and imports with Russia, as a share of total exports and imports	Annual	IMF Direction of Trade Statistics
GDP Per Capita	GDP per capita, PPP (current international $)	Annual	World Bank World Development Indicators database

Annex II. Impact of Shocks to Russia and EU Growth on CIS Economies (Alternative Variable Ordering)

Table A.1. Impact of Shocks to Russia Growth

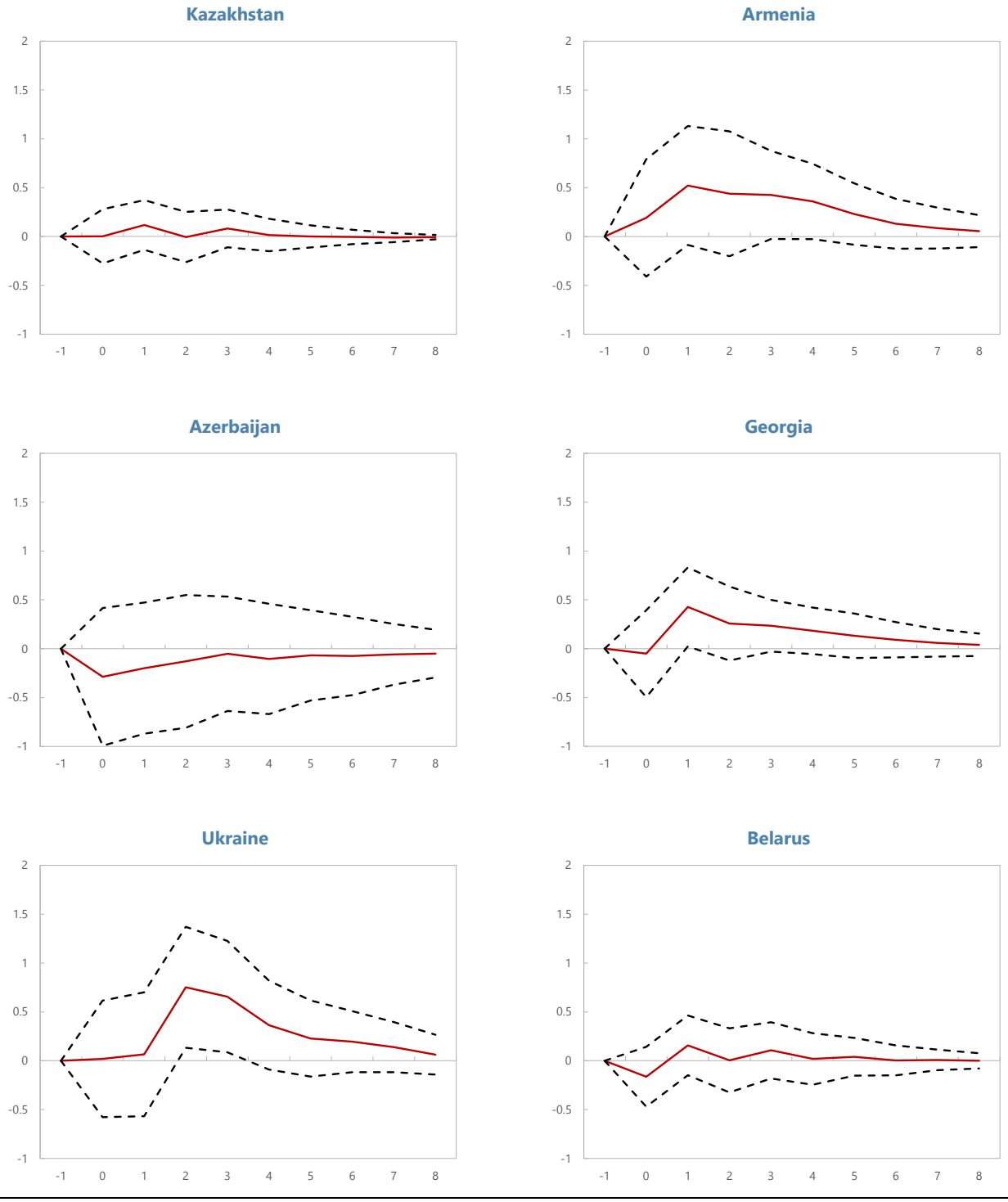


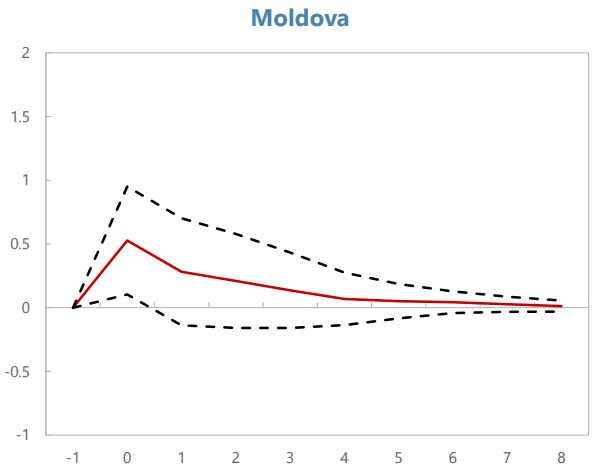


Source: IMF staff estimates.

Note: The VAR follows a Cholesky decomposition, where the ordering of the variables is as follows- Oil price growth, Russia real GDP growth, EU real GDP growth, and local real GDP growth. This variable ordering yields results similar to those in the baseline specification where EU real GDP growth precedes Russia real GDP growth.

Table A.2. Impact of Shocks to EU Growth





Source: IMF staff estimates.

Note: The VAR follows a Cholesky decomposition, where the ordering of the variables is as follows- Oil price growth, Russia real GDP growth, EU real GDP growth, and local real GDP growth. This variable ordering yields results similar to those in the baseline specification where EU real GDP growth precedes oil price growth.

Annex III. Alternative Panel Specifications

Table A.3. Overall Panel Specification with Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	CIS countries (excluding Russia)				CIS oil importers			
Russia Real GDP Growth	**0.790*** **			**0.691*** **	**0.913*** **			**0.787*** **
EU Real GDP Growth		**0.439** **		**-0.0664**		**0.550** **		**0.100**
China Real GDP Growth (t-1)			**0.513*** **	**0.201**			**0.574** **	**0.0672**
Headline CPI Inflation	-0.0483	0.00159	-0.0170	-0.0477*	-0.0603**	-0.0119	-0.0350	-0.0530**
REER Growth	0.0311	0.0598*	0.0673*	0.0372	0.00966	0.0483	0.0661	0.0155
Oil Price Growth	0.00898	0.0423***	0.0350***	0.00725	0.00700	0.0430**	0.0388**	0.00604
Δ US 10-year Treasury Yield	0.142	-0.318	-0.0518	0.208	-0.0185	-0.543	-0.278	-0.0252
Constant	0.727***	0.986***	0.123	0.406*	0.582***	0.883***	-0.0634	0.483**
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	602	602	602	602	450	450	450	450
R-squared	0.296	0.213	0.233	0.301	0.352	0.264	0.266	0.357
Number of ifs_code	8	8	8	8	6	6	6	6

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.4. Overall Panel Specification with Standardized Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	CIS countries (excluding Russia)				CIS oil importers			
Own Growth (t-1)	0.00167	0.105**	0.0877	0.0151	-0.0252	0.0842	0.0594	-0.00277
Russia Real GDP Growth	**0.533*** **			**0.461*** **	**0.587*** **			**0.507*** **
EU Real GDP Growth		**0.340*** **		**-0.0500**		**0.398*** **		**0.0622**
China Real GDP Growth (t-1)			**0.378*** **	**0.150***			**0.397*** **	**0.0469**
Headline CPI Inflation	-0.0705***	-0.0163	-0.0321	-0.0684***	-0.0697***	-0.0115	-0.0333	-0.0621***
REER Growth	0.0261	0.0489	0.0640*	0.0328	0.00747	0.0330	0.0624*	0.00961
Oil Price Growth	0.0668*	0.255***	0.218***	0.0568	0.0535	0.248***	0.234***	0.0481
Δ US 10-year Treasury Yield	0.0200	-0.0354	-0.00369	0.0278	-0.00212	-0.0570	-0.0287	-0.00180
Constant	-0.00178	-0.00574	-0.00680	-0.00305	-0.00363	-0.00794	-0.00892	-0.00472
Observations	594	594	594	594	444	444	444	444
Number of ifs_code	8	8	8	8	6	6	6	6

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A.5. Combined Panel Specification with Standardized Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CIS countries (excluding Russia)				CIS oil importers			
VARIABLES	2010-2016		2016-2021		2010-2016		2016-2021	
Own Growth (t-1)	0.0258	0.0292	-0.116	-0.0309	0.110	0.113*	-0.208***	-0.0812
	(0.110)	(0.109)	(0.0714)	(0.0629)	(0.0702)	(0.0633)	(0.0464)	(0.0707)
Export to Russia Growth	**0.0625**	**0.0645**	**0.345*** **	**0.274** **	**0.0960** **	**0.0967** **	**0.175***	**0.0896**
	(0.0401)	(0.0399)	(0.123)	(0.125)	(0.0450)	(0.0453)	(0.102)	(0.113)
Bilateral Remittances Growth	**0.150***	**0.146***	**0.0917**	**-0.00107**	**0.115**	**0.113**	**0.119**	**0.0119**
	(0.0782)	(0.0767)	(0.0877)	(0.0738)	(0.0849)	(0.0827)	(0.102)	(0.0651)
Δ log Russia EMBIG Spread (t-1)	**-0.0596**	**-0.0596**	**-0.247*** **	**-0.250*** **	**-0.0728**	**-0.0729**	**-0.267** **	**-0.251*** **
	(0.0573)	(0.0574)	(0.0815)	(0.0649)	(0.0634)	(0.0634)	(0.109)	(0.0854)
EU Real GDP Growth		-0.162		0.322***		-0.0651		0.383***
		(0.285)		(0.106)		(0.332)		(0.0674)
Headline CPI Inflation	-0.0992*	-0.0975*	-0.0662	-0.0615	-0.0786***	-0.0780***	0.119	0.178*
	(0.0580)	(0.0581)	(0.113)	(0.128)	(0.0203)	(0.0197)	(0.102)	(0.0980)
REER Growth	0.105**	0.105**	0.0796*	0.0975	0.108	0.108	-0.0184	-0.0639
	(0.0531)	(0.0526)	(0.0454)	(0.0667)	(0.0828)	(0.0829)	(0.0447)	(0.0556)
Oil Price Growth	0.126*	0.123*	0.493***	0.256***	0.127*	0.125*	0.554***	0.268***
	(0.0648)	(0.0660)	(0.0629)	(0.0494)	(0.0711)	(0.0731)	(0.0622)	(0.0456)
Δ US 10-year Treasury Yield	-0.108	-0.104	-0.0889	-0.00708	-0.118	-0.116	-0.149**	-0.0511
	(0.103)	(0.108)	(0.0572)	(0.0537)	(0.137)	(0.145)	(0.0643)	(0.0578)
Constant	0.00261	-1.44e-05	-0.138***	-0.137***	-0.0341	-0.0351	-0.0859*	-0.0722*
	(0.0315)	(0.0313)	(0.0453)	(0.0418)	(0.0247)	(0.0272)	(0.0444)	(0.0403)
Observations	189	189	167	167	135	135	119	119
Number of ifs_code	7	7	7	7	5	5	5	5

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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