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HUNGARY

SELECTED ISSUES

February 2023

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January 17, 2023

Approved By
European Department

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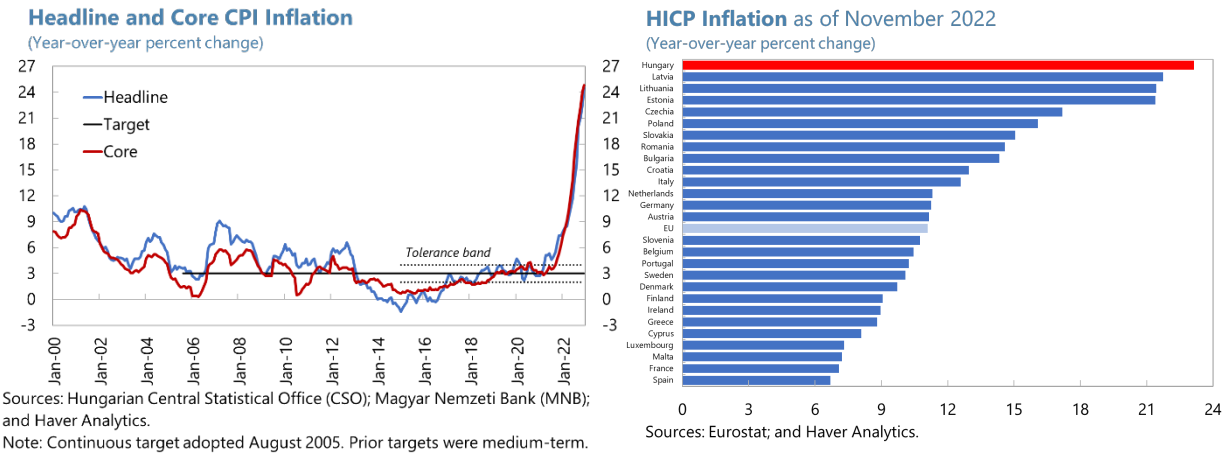
CONTENTS

DRIVERS OF INFLATION[1]

A rapid recovery from the COVID-19 crisis, a series of shocks, and too loose a policy mix have fueled inflation in Hungary to its highest level in decades. Though high and rising inflation has been a challenge for most economies across Europe in 2022 and into 2023, it has accelerated in Hungary to the highest level in Europe. Though monetary and fiscal policies are now tightening, inflation expectations are de-anchored and core inflation dynamics remain strong, reflecting a tight labor market and the lag-effect of loose policies that have boosted domestic demand. Going forward, a consistently and persistently tight overall policy mix is needed to drive inflation back to the central bank's target.

1. Inflation has accelerated to its highest level in decades. It has been rapidly accelerating beyond the central bank's (MNB) target since early 2021, rising from 2.7 percent y/y in January 2021 to 24.5 percent in December 2022. Common external shocks including COVID-related supply chain disruptions and the surge in commodity prices, primarily energy and food, further amplified by Russia's war in Ukraine, have lifted inflation rates across Europe. However, inflation in Hungary has risen to notably higher levels than all other European countries, prompting questions over why inflationary pressures have been stronger in Hungary than in its peers.

Figure 1. Hungary: Inflation in Hungary and Europe



Sources: Hungarian Central Statistical Office (CSO); Magyar Nemzeti Bank (MNB); and Haver Analytics.
Note: Continuous target adopted August 2005. Prior targets were medium-term.

Sources: Eurostat; and Haver Analytics.

[1] Prepared by Estefania Cohn Bech, Karim Foda, and Agustin Roitman. All inflation charts are based on CPI data through December 2022 and cross-country HICP data through November 2022, as available at time of issuance on January 17, 2023. The authors would like to thank authors of Chapter 2 of the IMF Regional Economic Outlook for Europe, October 2022 (Chikako Baba, Philipp Engler, Ting Lan, Svitlana Maslova, Jorge Salas, and Magnus Saxegaard) for analysis that this paper draws on, and counterparts at the central bank (MNB) for helpful comments during a staff presentation.

2. This paper examines how and why Hungary reached historically high inflation. Particular attention is placed on cross-country comparisons to understand where Hungary may stand out, and on domestic drivers that could help explain stronger inflationary pressure in Hungary. Following an overview of inflation developments over the last two years, the paper draws on an augmented Phillips Curve to estimate the impact of common drivers of inflation, examines the role of labor market tightness and policy stances, and analyzes possible changes to the degree of exchange rate passthrough in recent years. Based on the findings, the paper then explores risks to the inflation outlook and draws policy recommendations.

A. Shocks and Recent Developments

3. Multiple shocks and events have fueled inflation since 2020. In response to the COVID-19 pandemic in 2020, an extraordinary loosening of fiscal and monetary policies, globally and in Hungary, took place to protect against short- and long-term economic and human losses. Central banks lowered rates and expanded their balance sheets, and governments loosened fiscal policy with a range of liquidity and solvency measures to support households and firms and preserve employment. This policy support helped foster a stronger-than-expected economic recovery, leading to a tightening of labor markets, rising food and energy prices (exacerbated by Russia's war in Ukraine), drought, and supply bottlenecks. As a result, inflationary pressures intensified worldwide, including in Hungary (IMF 2022). In Hungary, an additional round of fiscal stimulus ahead of the April 2022 elections further compounded inflationary pressures. In addition, a widening external deficit led by high energy prices and sustained demand, tightening global financial conditions, and disputes with the European Union (EU) that added to risk perceptions intensified pressure on the exchange rate and imported inflation.

Figure 2. Hungary: Inflationary Shocks and Events

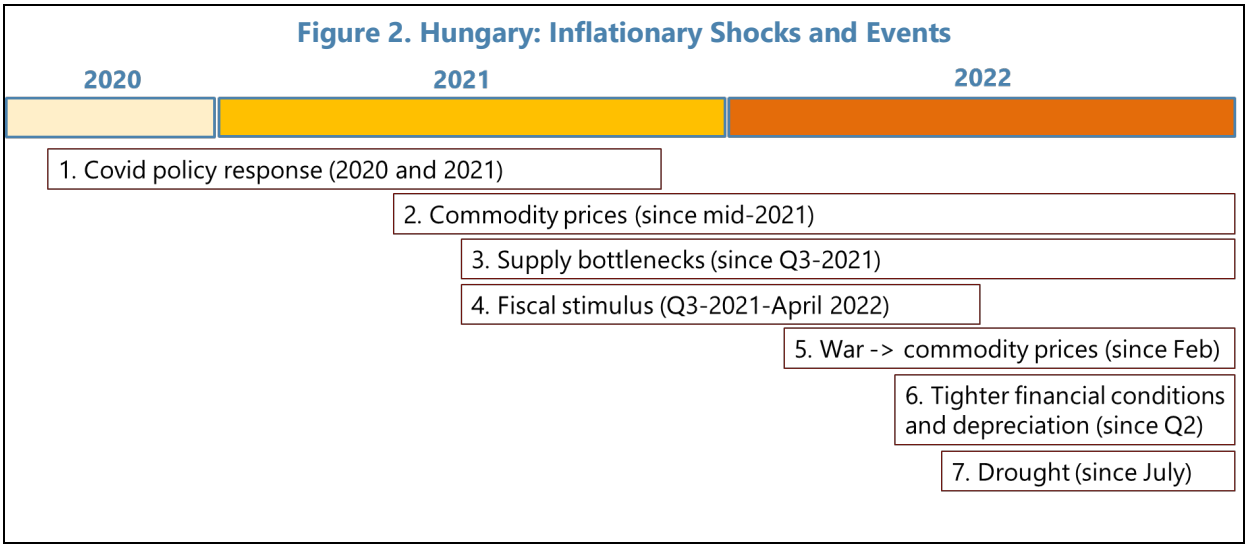
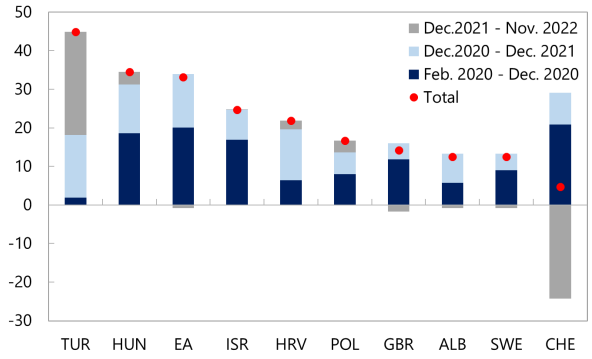


Figure 3. Hungary: Policy and External Shocks

Balance Sheet Expansion by Central Banks

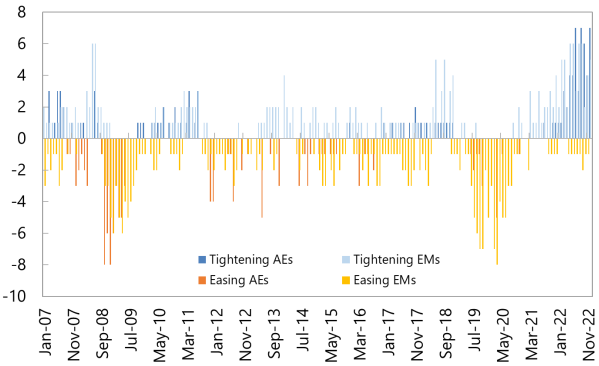
(Percent of 2020 GDP)



Sources: Central Banks; Haver Analytics; and IMF, World Economic Outlook.
Note: Expansion is calculated as difference between CB's assets value.

G20: Monetary Policy

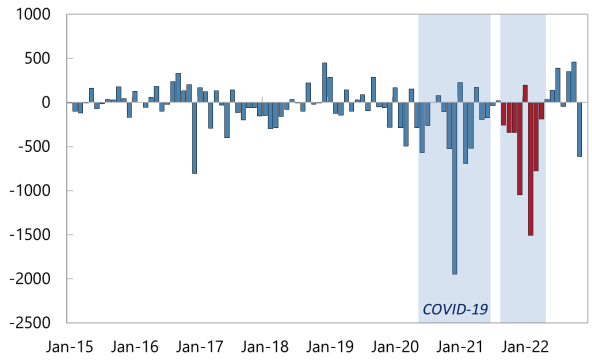
(Number of changes in policy rates)



Sources: National Central Banks; and IMF staff calculations.

General Government Primary Balance, Cash

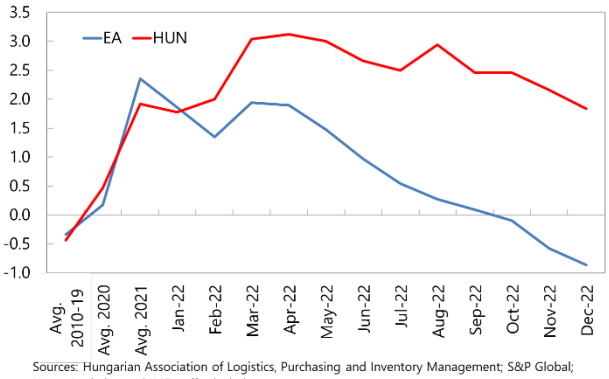
(Billion HUF)



Sources: Ministry for National Economy; Haver Analytics; and IMF staff calculations.

Suppliers Delivery Times

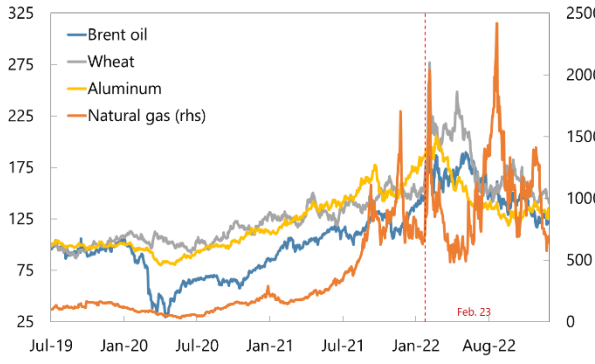
(Normalized; positive denotes increase)



Sources: Hungarian Association of Logistics, Purchasing and Inventory Management; S&P Global; Haver Analytics; and IMF staff calculations.

Global Food and Energy Prices

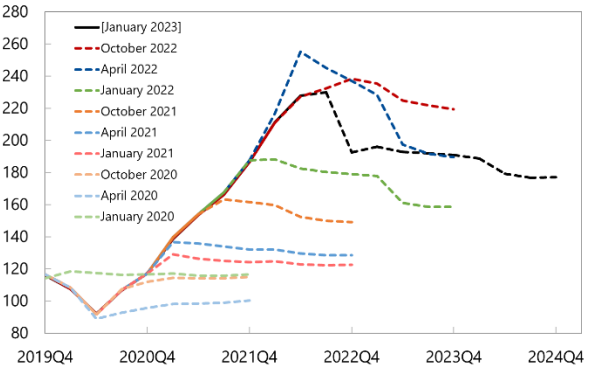
(Index, July 1, 2019=100)



Source: Bloomberg Finance L.P.

Commodity Price Index

(Vintages of WEO Global Assumptions, 2016=100)

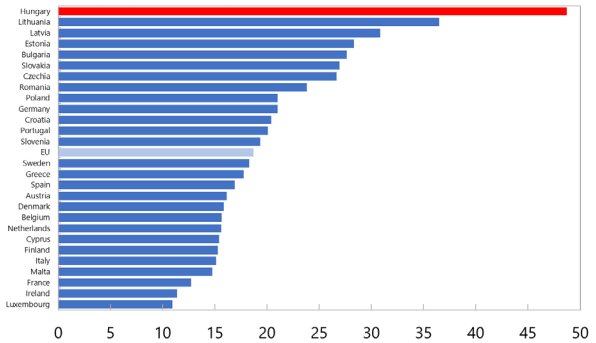


Source: IMF, Global Assumptions.

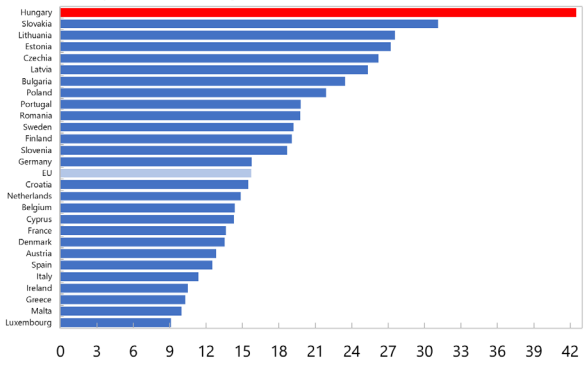
Composition of Inflation

4. Food inflation in Hungary is the highest in the EU. Food prices have risen significantly faster in Hungary than in other EU countries. Domestically, a drought significantly curtailed agriculture production in Hungary in 2022, adding extra pressure of unprocessed food prices (Hungary is a net exporter of food). Further, a relatively high degree of passthrough from unprocessed to processed foods, driven in part by stronger bargaining power of food producers than retailers and by low productivity in the food processing sector (MNB 2022), led to exceptionally high processed food inflation. In response, the government introduced in February 2022 price caps on six specific food products (granulated sugar, wheat flour, sunflower oil, pork leg, some chicken breast and backs, and 2.8% cow milk) at their October 15, 2021 levels. The cap was extended several times and expanded to two additional food products (eggs and potatoes). It is now set to expire in April 2023. These caps have been ineffective in slowing food inflation as distributors and retailers raised prices on other products to preserve their margins and food inflation continued to surge.

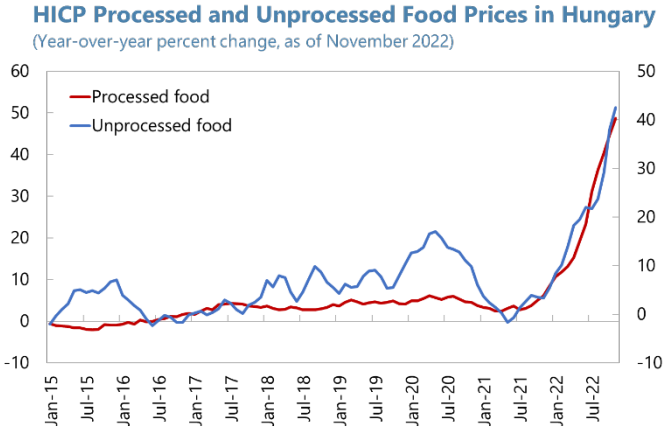
Figure 4. Hungary: Food Inflation



Sources: Eurostat; and Haver Analytics.
Note: Processed food excludes alcohol and tobacco.



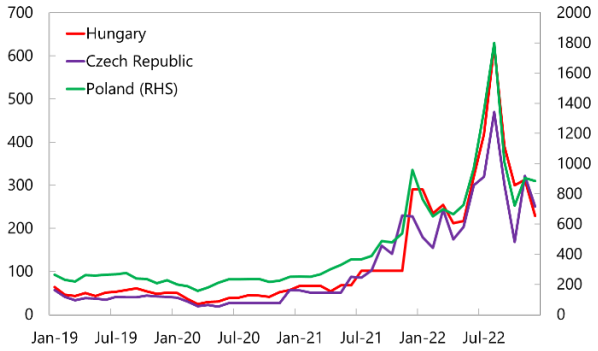
Sources: Eurostat; and Haver Analytics.



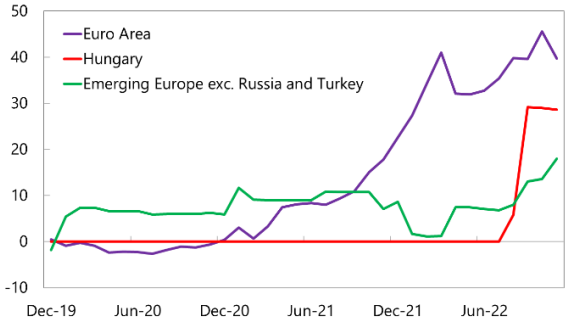
Sources: Eurostat, and Haver Analytics.
Note: Processed food excludes alcohol and tobacco.

5. Meanwhile, high energy price inflation was only allowed to pass through to consumer prices in 2022:H2. The household energy utility price caps in place since 2014 initially fully shielded households from soaring wholesale electricity and gas prices. In August 2022, the cap was increased for consumption above the national average to price levels closer to market rates, resulting in increased energy utility prices for around one quarter of households, according to government estimates.[2] Following the change, electricity and gas consumer price inflation jumped from zero to nearly around 30 and 115 percent y/y, respectively, in September and together contributed close to 3 percentage points to overall CPI headline inflation that month, and remaining around similar levels through December. Still, price levels remain among the lowest in Europe, and consumption below the national average is still priced at the original capped level. Furthermore, the government capped the motor fuels price between November 15, 2021 and December 6, 2022 well below market prices, further preventing passthrough of wholesale energy prices onto consumer retail prices. After the motor fuels price cap was lifted in December, fuel prices jumped by 27 percent y/y and contributed close to 2 percentage points to headline CPI inflation y/y that month.

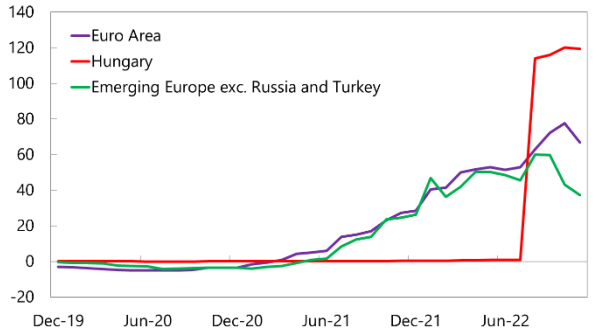
Figure 5. Hungary: Consumer and Household Energy Prices



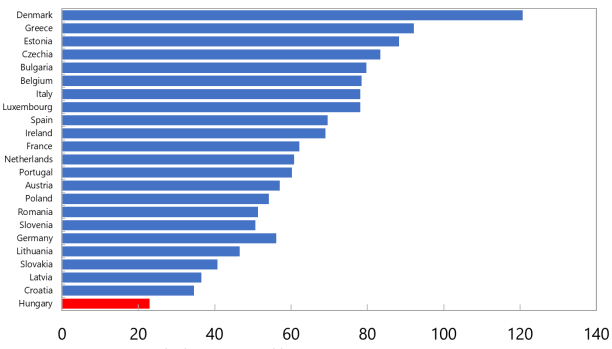
Source: Bloomberg Finance L.P.



Sources: Eurostat; Haver Analytics; and IMF staff calculations.
Note: Emerging Europe includes Bulgaria, Croatia, Hungary, North Macedonia, Poland, Romania and Serbia. HICP indicators for Belarus, Moldova and Montenegro are not available.



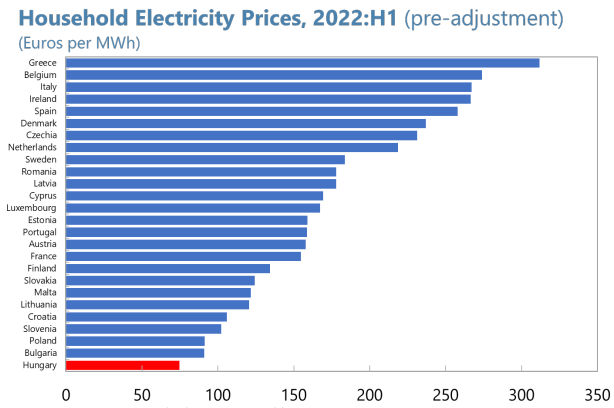
Sources: Eurostat; Haver Analytics; and IMF staff calculations.
Note: Emerging Europe includes Bulgaria, Croatia, Hungary, North Macedonia, Poland, Romania and Serbia. HICP indicators for Belarus, Moldova and Montenegro are not available.



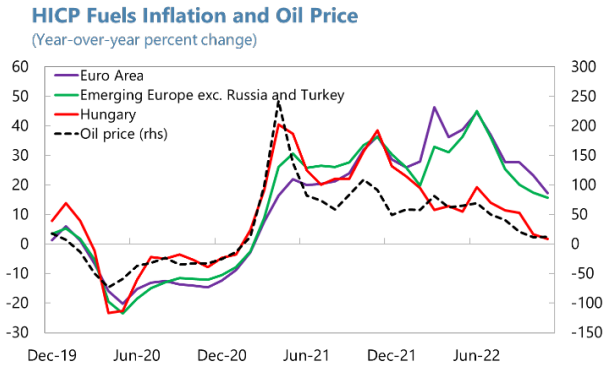
Source: Eurostat (excludes taxes and levies).
Note: Prevailing prices prior to addition of a higher-tiered tariff in August 2022.

[2] The price level for consumption above average remains administered, but it is calculated in references to market prices and set to be adjusted quarterly. The consumption level is per meter (as opposed to per households).

Figure 5. Hungary: Consumer and Household Energy Prices (concluded)



Source: Eurostat (excludes taxes and levies).
Note: Prevailing prices prior to addition of higher-tiered tariff in August 2022.

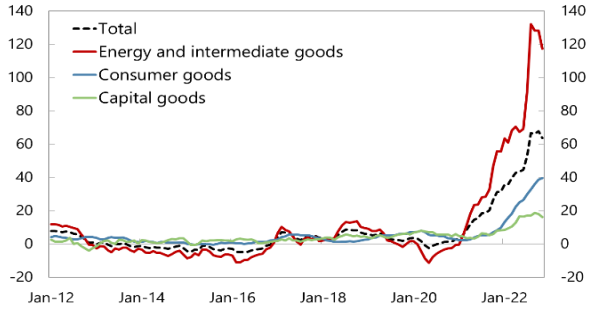


Sources: Eurostat; Haver Analytics; and IMF staff calculations.
Note: Fuels include liquid fuels and lubricants for personal transport equipment.
Emerging Europe includes Bulgaria, Croatia, Hungary, North Macedonia, Poland, Romania and Serbia. HICP indicators for Belarus, Moldova and Montenegro are not available.

6. Producer prices have risen rapidly with soaring energy prices. Domestic producer price inflation reached a high of nearly 68 percent y/y in October 2022 before slightly declining to 63.7 percent in November 2022, led by energy and intermediate good prices. A historically high correlation between producer and consumer prices suggests that the passthrough of high production costs from energy prices has mostly already occurred (MNB 2022).

Figure 6. Hungary: Domestic Producer Price Inflation

(Year-over-year percent change)

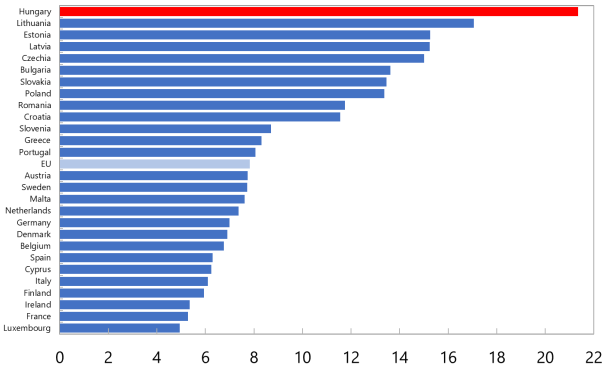


Sources: CSO and Haver Analytics.

7. Core inflation is the highest in the EU and is broad-based. Measures of core inflation that exclude unprocessed food or both unprocessed and processed foods are higher in Hungary than all other EU countries. Underlying inflation has been accelerating, with services and nonenergy, nonfood goods inflation contributing around 40 percent of headline CPI inflation through December 2022. Second round effects of high energy producer prices have led nonenergy, nonfood goods inflation to rise faster than peers in Emerging Europe. In parallel, services inflation has also surged into double-digit territory, accelerating at a faster pace than peers since mid-2022.

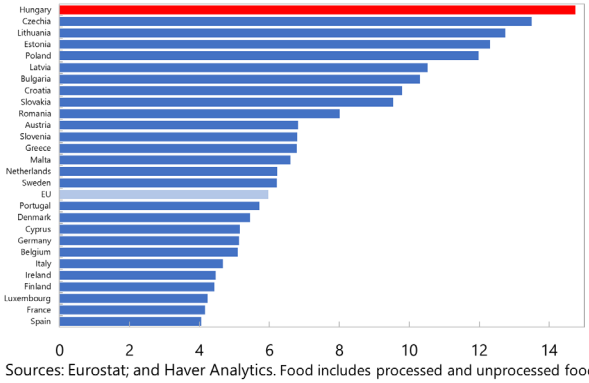
Figure 7. Hungary: Decomposition of Core Inflation

HICP Core Inflation (excl. energy and unprocessed food)
(Year-over-year percent change, as of November 2022)



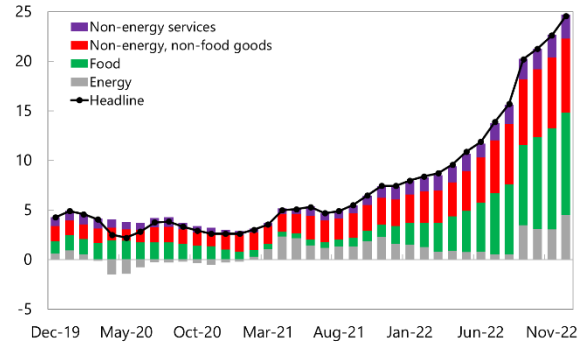
Sources: Eurostat; and Haver Analytics.

HICP Core Inflation (excl. energy, food, alcohol and tobacco)
(Year-over-year percent change, as of November 2022)



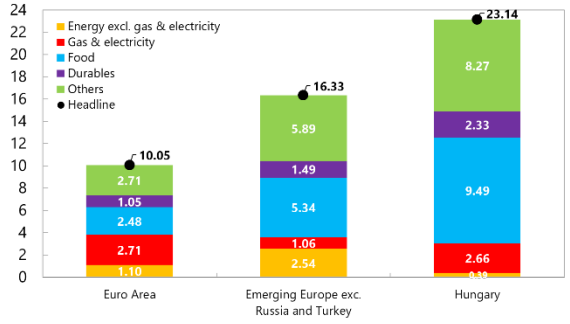
Sources: Eurostat; and Haver Analytics. Food includes processed and unprocessed food.

CPI Inflation Decomposition for Hungary
(Year-over-year percent change, as of December 2022)



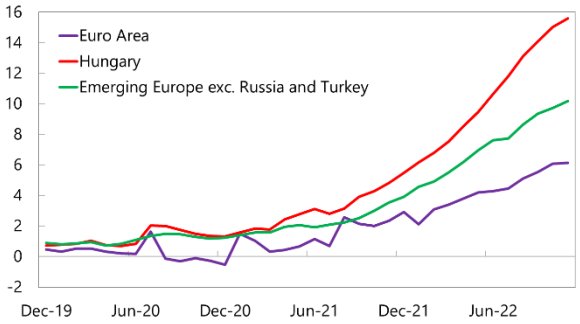
Sources: Central Statistical Office; Haver Analytics; and IMF staff calculations.

HICP Inflation Decomposition, Nov. 2022
(Year-over-year percent change, end of period)



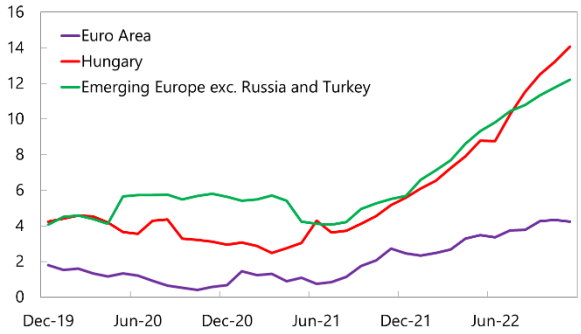
Sources: Eurostat; National Authorities; Haver Analytics; and IMF staff calculations.
Note: Emerging Europe includes Bulgaria, Croatia, Hungary, North Macedonia, Poland, Romania and Serbia. HICP indicators for Belarus, Moldova and Montenegro are not available.

HICP Non-Energy, Non-Food Goods Inflation
(Year-over-year percent change)



Sources: Eurostat; Haver Analytics; and IMF staff calculations.
Note: Non-energy, non-food goods includes durable, semidurable and non-durable goods. Emerging Europe includes Bulgaria, Croatia, Hungary, North Macedonia, Poland, Romania and Serbia. HICP indicators for Belarus, Moldova and Montenegro are not available.

HICP Non-Energy Services Inflation
(Year-over-year percent change)



Sources: Eurostat; Haver Analytics; and IMF staff calculations.
Note: Emerging Europe includes Bulgaria, Croatia, Hungary, North Macedonia, Poland, Romania and Serbia. HICP indicators for Belarus, Moldova and Montenegro are not available.

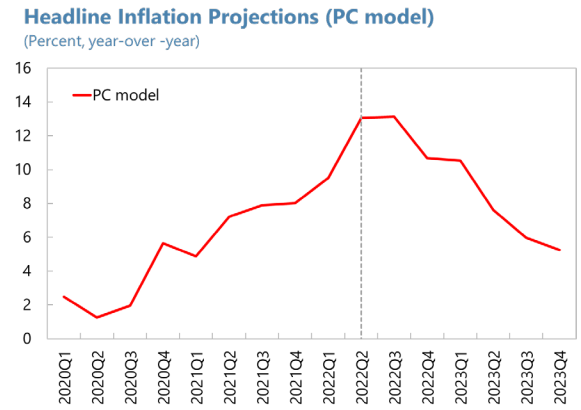
B. Inflation Drivers

8. Model estimates and stylized facts suggest that, in addition to external supply shocks, domestic demand, boosted by policy, has added to inflationary pressures. Workhorse inflation models such as the Phillips Curve that draw on historical data are subject to greater-than-usual residuals when inflation dynamics are analyzed at times of large exogenous shocks. Complementing model-based analysis with stylized facts provide suggestive evidence of specific relationships that may not be well captured by model estimates. In this section, a standard augmented Phillips Curve is estimated to identify structural features of inflation dynamics in respective European economies. In addition, stylized facts on recent labor market dynamics and on the evolution of the fiscal and monetary policy stances are used to understand additional sources of inflationary pressure that may not be well-captured by the Phillips Curve analysis. In addition, model estimates of exchange rate passthrough for emerging markets, including Hungary, are analyzed to assess non-linearities during episodes of large exchange rate movements.

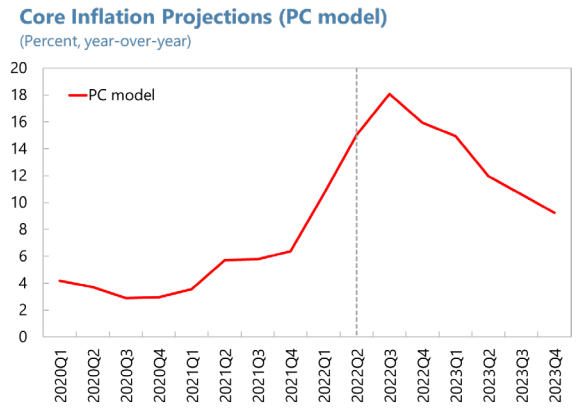
9. A Phillips Curve estimation suggests that past core inflation and inflation expectations are important inflation drivers. A Phillips Curve is estimated for each of 21 advanced and 5 emerging European economies with comprehensive data over 2000Q1-2022Q2.[3] Headline and core inflation are regressed against lagged inflation, three-year ahead inflation expectations based on consensus forecasts, unemployment gap estimates based on trend unemployment, and measures of external prices including commodity food and energy prices, foreign producer prices and exchange rates (IMF 2022). The results for Hungary suggest that past core inflation and medium-term inflation expectations are important drivers in explaining the prevailing levels of core and headline inflation (Appendix I). External price pressures are also statistically significant. Based on the model results, average quarterly inflation is expected to decelerate but remain elevated through 2023. However, the coefficient for the unemployment gap based on historical trends is statistically insignificant for Hungary (as for peer countries including Bulgaria, Croatia, and Poland), likely due to the sample being a period of price stability as labor market slack remained while unemployment was declining from high levels. More recent labor market data suggests that this relationship may have changed over the last two years (see below).

[3] Emerging European economies include Bulgaria, Croatia, Hungary, Poland, and Romania. Advanced European economies include Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Lithuania, Latvia, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the UK.

Figure 8. Hungary: Model Projections



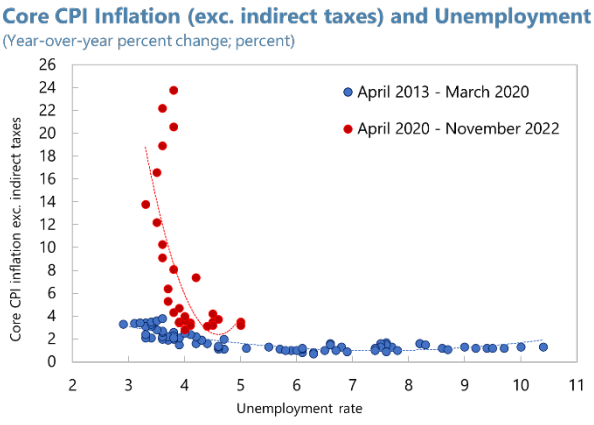
Sources: IMF, REO, October 2022; IMF, World Economic Outlook; and IMF staff calculations.



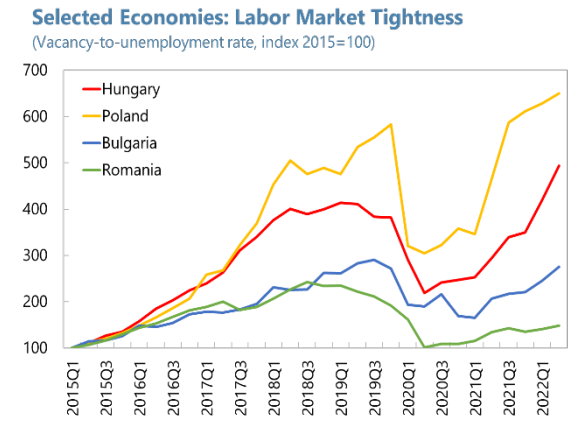
Sources: IMF, REO, October 2022; IMF, World Economic Outlook; and IMF staff calculations.

10. Tight labor markets appear to be adding pressure on wages as core inflation rises. Since the COVID-shock in 2020:Q2, core inflation rates have been notably more correlated with the unemployment rate than pre-COVID (Figure 9 and MNB 2022). During this time, labor market tightness, measured as the ratio of job vacancies to the unemployment rate, have rapidly increased to historically high levels, suggesting historically low labor market slack. At the same time, private sector wages were growing in double digits (faster than most EU countries but in line with some peers in Emerging Europe at similar or higher positive output gaps), outpacing productivity growth which has also lagged peers in recent years.

Figure 9. Hungary: Labor Market Indicators



Sources: CSO; MNB; and Haver Analytics.

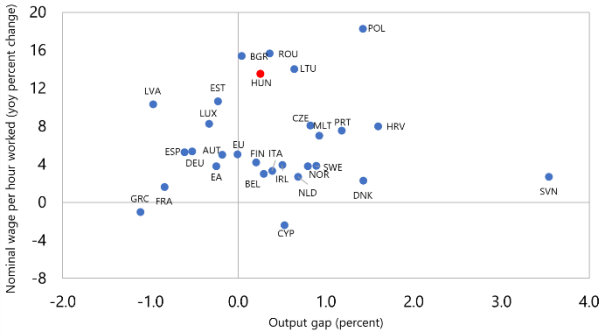


Sources: Eurostat; Haver Analytics; and IMF staff calculations.

Figure 9. Labor Market Indicators (concluded)

Nominal Wage per Hour Worked Growth in Private sector and Output Gap

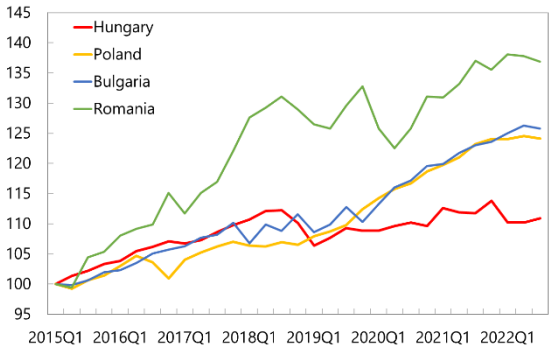
(Year-over-year percent change 2022Q2; percent 2022)



Sources: IMF World Economic Outlook; Eurostat; National Authorities; Haver Analytics; and IMF staff calculations.

Real Labor Productivity (Output per hour worked)

(Index 2015Q1=100)

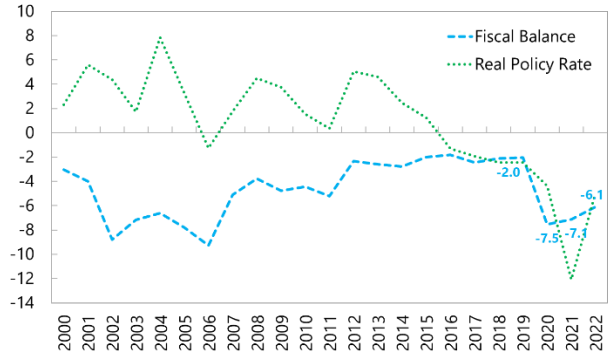


Sources: Eurostat; Haver Analytics and IMF staff calculations.

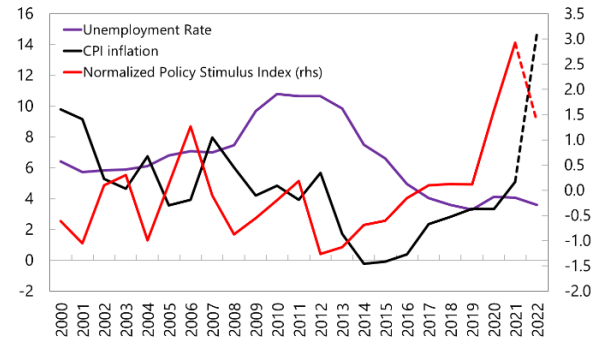
11. Macroeconomic policies in recent years were among the most expansionary in the EU and persisted to be so even as the unemployment rate became very low. Fiscal policy loosened in 2020 in response to the COVID crisis and then again in late 2021-early 2022 when another round of fiscal stimulus was provided despite a strong-than-expected economic recovery from the COVID crisis was. Monetary policy also significantly loosened in 2020 and, although the MNB began to increase policy rates in mid-2021, inflation was becoming one of the highest in the region. As a result, over 2020-22, both the fiscal and monetary stances were among the most expansionary across the EU, with cyclically-adjusted fiscal balances and real interest rates below most other countries with similar or more negative output gaps. Using a simple normalized policy stance index that combines the fiscal balance and the real policy rate (measured as the average policy rate minus projected inflation one year ahead) in a simple average, the overall policy mix between 2020 and 2022 was the loosest in over two decades and persisted to be loose even as unemployment was close to record lows and inflation accelerated to historical highs.[4] Though the MNB began to raise its policy rates in mid-2021, it continued adding liquidity through its asset purchase program until end-2021. By mid-2022, the fiscal-monetary policy mix in Hungary tightened as fiscal policy reversed course and began to pull in the same direction as monetary policy.

[4] For the average policy rate in 2022, we used the average base rate between January and September and 18 percent for October. For inflation, we used our current one year ahead average CPI inflation forecast.

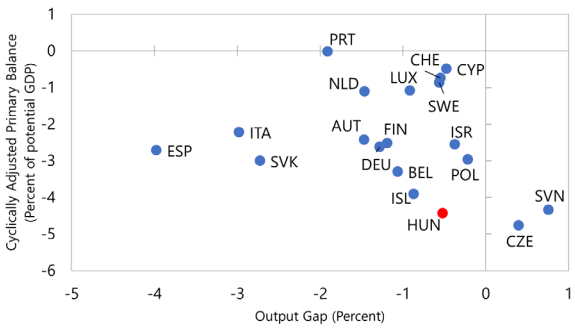
Figure 10. Hungary: Policy Stance Indicators



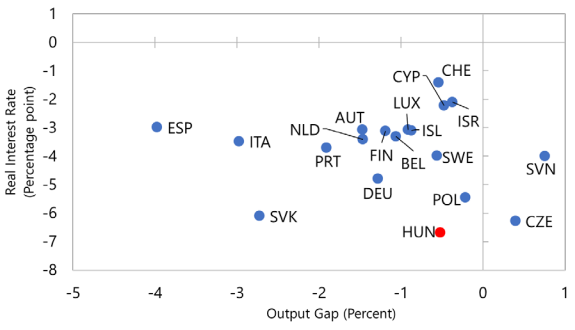
Sources: IMF, World Economic Outlook; Hungarian Central Statistical Office; Haver Analytics; and IMF staff calculations.



Sources: IMF, World Economic Outlook; Hungarian Central Statistical Office; Haver Analytics; and IMF staff calculations.



Sources: IMF, World Economic Outlook; Hungarian Central Statistical Office; Haver Analytics; and IMF staff calculations.

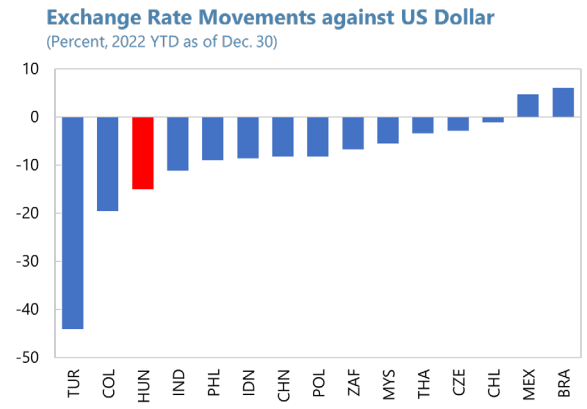


Sources: IMF, World Economic Outlook; Hungarian Central Statistical Office; Haver Analytics; and IMF staff calculations.

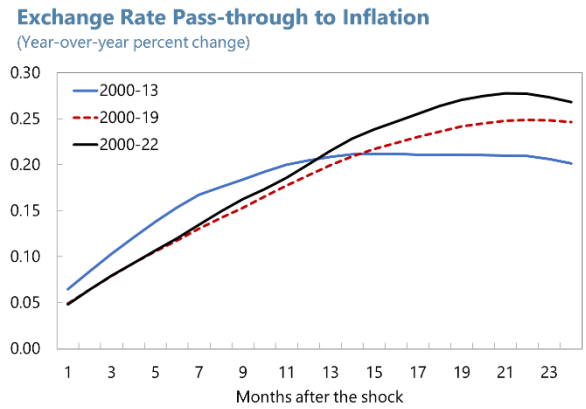
12. Exchange rate depreciation has also added to domestic inflation. During 2022, the forint depreciated against the US dollar by more than most emerging markets' currencies globally. As a benchmark, past estimates of the exchange rate passthrough to inflation in emerging markets ranged from around 6 percent in the first month after a shock to around 20 percent after about one year.[5] Updating this analysis using longer time series until 2019 and 2022 suggest that the exchange rate pass through to inflation has increased (Figure 10). Estimates for Hungary in the literature are broadly similar—Hajnal 2015 estimated a passthrough of up to 30 percent after two years and Vonnák 2010 estimated a passthrough of 10 to 20 percent after two years. However, non-linearities (including asymmetries related to depreciation vs. appreciation, and more than proportional impacts on inflation, the larger the depreciation shocks) have been documented in the literature and may have been amplified by the recent multiple shocks that have hit the global economy, emerging markets, and Hungary.

[5] See Caselli and Roitman (2019). A passthrough of 6 percent indicates that a 1 percent shock to the exchange rate translates in a 0.06 percentage point increase in inflation.

Figure 11. Hungary: Exchange Rate Developments and Passthrough



Sources: Bank for International Settlements; Haver Analytics and IMF staff calculations



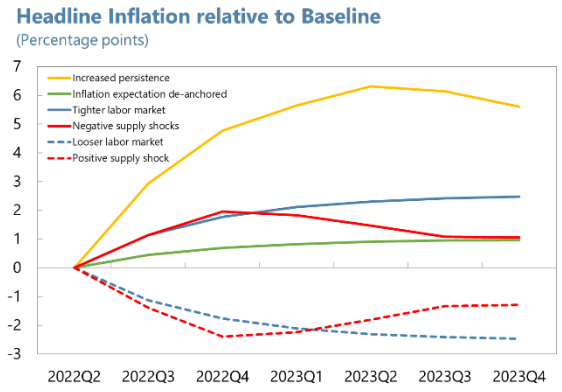
Sources: Caselli, F., Roitman, A., 2019; IMF, Information Notice System (INS) from Statistics Department; and IMF staff calculations.

Inflation Outlook and Risks

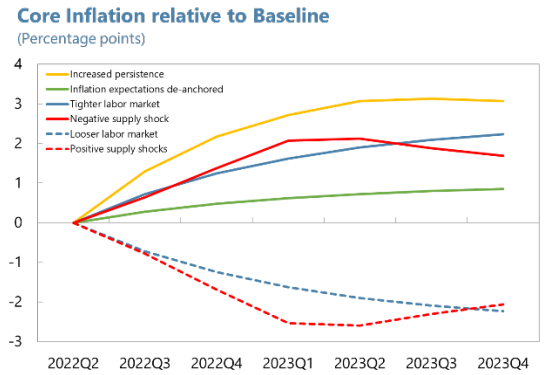
13. Under IMF staff's baseline, headline and core inflation are expected to peak in early 2023. They then slow as commodity prices retreat, domestic demand cools because the policy mix tightens, and high inflation erodes households purchasing power (Companion Staff Report). However, with persistent core inflation and tight labor market, inflation is expected to remain elevated and above the MNB's target until end-2025.

14. Labor market developments and increased persistence present the largest risks to the outlook. A high degree of uncertainty surrounds the outlook, as many risks can affect the inflation path, including renewed supply-side shocks notably from higher commodity prices, smaller-than-expected slack, or more entrenched inflation persistence. Simulating the impact of these possible shocks using the estimated Phillips Curve model suggests that the largest risks to inflation come from larger-than-expected persistence and tighter labor markets (see Appendix II for a description of shocks). Greater persistence could add up to 3 percentage points to core inflation in 2023. It could result from more backward or less forward-looking expectations and the pressure that this would put on wages, potentially resulting in a wage-price spiral. Tighter labor markets could add up to 2 percentage points over the same period. The model suggests that de-anchored inflation expectations present also a clear risk to inflation, but less potent possibly because past inflation expectations have been relatively well-anchored around the central bank's target, suggesting stronger risks from other factors.

Figure 12. Hungary: Inflation Risks



Source: IMF, REO, October 2022; Consensus Economics; IMF, World Economic Outlook database; and IMF staff calculations.



Source: IMF, REO, October 2022; Consensus Economics; IMF, World Economic Outlook database; and IMF staff calculations.

C. Policy Implications

15. Expansionary policies and external shocks boosted Hungary's inflation. Hungary's high inflation rates have been driven by both supply and demand-side factors. On the supply side, unprecedented spikes in commodity prices significantly affected food prices. On the demand side, significant fiscal policy stimulus, strong domestic demand, tight labor markets, and rapid wage growth contributed to increasing core inflation, which was further fueled by second-round effects from energy prices. In turn, core inflation's own persistence reinforced its strong dynamics. Meanwhile, energy retail inflation, which was repressed until recently, has begun to pass through and will soon create additional inflation pressures.

16. Credible, persistent, and consistently tight economic policies are needed to reduce inflation and drive it towards its target. Fiscal and monetary policies need to remain consistently tight and complement each other in dampening demand and reining in inflation. The exchange rate should remain free to adjust as needed while fiscal and monetary policies should remain persistently tight over time. Changes in the policy stance should depend on actual data on underlying inflationary pressures and the nature of any future shocks. Supply shocks that increase inflation would call for tighter monetary policies and for fiscal policies to remain tight while making space to support vulnerable groups impacted by higher costs of living. Demand shocks that lower both output and inflation may prompt a less tight stance to support economic activity while allowing inflation to fall towards the target range. Due to the persistence of core inflation and to lags between policy actions and an ultimate impact on inflation, maintaining a tight and consistent policy stance, with flexibility in responding to future shocks, is important to ensure that inflationary pressures consistently and sustainably ease.

17. Price and interest rate caps are costly, ineffective, and undermine monetary and fiscal policy's efforts to reduce inflation. In response to rising inflation and costs of living, the government relied on a series of caps on energy and food prices and selected retail interest rates. These regulatory measures have been counterproductive, working at cross purposes with the fiscal

and monetary policy tightening. First, sustaining artificially low prices prevents the demand adjustment that is needed to cool underlying pressures. Second, they have not been effective in fighting inflation. For example, price caps on selected food produces have resulted in higher prices on other products to compensate losses, and energy price caps have prevented demand adjustment and led to wider external deficits and greater exchange rate depreciation which, in turn, increased inflationary pressure. Third, because they are not sustainable, they will eventually need to be removed, as was the case for the motor fuel price cap, which was abruptly terminated on December 6, 2022 after it had led to widespread fuel shortages. By delaying the inevitable inflationary impact, price caps risk ultimately entrenching expectations higher, for longer. Moreover, the interest rate caps undermine the effectiveness of monetary policy by disconnecting key channels of transmission, eventually requiring greater tightening to achieve the same outcome.

18. In assessing policy trade-offs under high uncertainty, the costs of under-tightening exceed those of over-tightening. The potential costs of under-tightening (including entrenched high inflation and a higher eventual cost of controlling it) outweigh the risks of excessively lowering output through over-tightening. On balance, it seems better to over- than under-tighten to stabilize inflation, re-anchor inflation expectations, and enable a stable environment for recovery. To best complement monetary policy in its efforts to support the inflation target, the consistency of fiscal policy is crucial while administrative measures should not undermine policy tightening.

Appendix I. Model Results

Table A.I. Hungary: Phillips Curve Model Results

Variables	Europe	Emerging Europe	Advanced Europe	BGR	HRV	HUN	POL	ROU
Unemployment Gap	-0.374***	-0.676***	-0.337***	-0.259	-0.207	-0.361	-0.139	-0.477
	(0.078)	(0.179)	(0.097)	(0.246)	(0.170)	(0.415)	(0.089)	(0.376)
Lag of Core Inflation	0.431***	0.581***	0.287*	0.807***	0.786***	0.723***	0.920***	0.426***
	(0.127)	(0.105)	(0.161)	(0.094)	(0.121)	(0.128)	(0.056)	(0.106)
Inflation Expectations: 3 Years Ahead	0.569***	0.419***	0.713***	0.193**	0.214*	0.277**	0.080	0.574***
	(0.127)	(0.105)	(0.161)	(0.094)	(0.121)	(0.128)	(0.056)	(0.106)
Lag of External Price Pressure	0.020***	0.037**	0.009*	0.016	0.054	0.061***	0.010	-0.023
	(0.006)	(0.015)	(0.005)	(0.017)	(0.044)	(0.020)	(0.012)	(0.018)
Food price	0.127***	0.181***	0.065***	-0.003	0.028	-0.042	0.042**	0.109***
	(0.034)	(0.054)	(0.015)	(0.042)	(0.066)	(0.046)	(0.018)	(0.035)
Lag of Food Price	0.078***	0.075***	0.054***	0.031	0.088	0.132***	0.018	-0.009
	(0.020)	(0.027)	(0.020)	(0.046)	(0.056)	(0.045)	(0.021)	(0.033)
L2 of Food Price	0.032	-0.001	0.045***	-0.004	-0.060	0.049	0.034**	0.001
	(0.022)	(0.030)	(0.015)	(0.048)	(0.053)	(0.032)	(0.015)	(0.035)
L3 of Food Price	0.070***	0.065**	0.077***	0.023	0.107*	0.003	0.010	0.009
	(0.021)	(0.032)	(0.018)	(0.049)	(0.054)	(0.032)	(0.017)	(0.029)
L4 of Food Price	0.042**	0.053**	0.040**	0.061	-0.003	0.056	0.027	0.061*
	(0.017)	(0.026)	(0.019)	(0.047)	(0.045)	(0.038)	(0.017)	(0.035)
Energy Price	0.016	0.021	0.032***	0.058	0.048	0.053*	0.028*	-0.035
	(0.011)	(0.022)	(0.008)	(0.050)	(0.036)	(0.028)	(0.015)	(0.036)
Observations	2,210	503	1,707	60	60	86	86	86
Country FE	Yes	Yes	Yes	No	No	No	No	No
Time FE	No	No	No	No	No	No	No	No

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: IMF Regional Economic Outlook for Europe, October 2022.

Note: Emerging Europe includes Bulgaria, Croatia, Hungary, Poland, Romania, Russia and Türkiye. Advanced Europe includes Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Israel, Italy, Lithuania, Latvia, the Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom. Europe includes Emerging Europe and Advanced Europe.

Appendix II. Risk Scenarios

Table A.II. Hungary: Illustrative Inflation Risk Scenarios

	Shocks	Phillips Curve Simulations 1/	DSGE Model Simulations
0	Baseline (WEO)	July WEO GAS (energy inflation 69% in 2022, -14.1% in 2023; food inflation 19% in 2022, 2.8% in 2023)	Cost shock raises inflation to WEO baseline in 2022Q2
1	Negative supply shocks	20 percent rise in energy and food prices	Additional inflationary cost shock matching initial shock in Phillips curve simulation
2	Positive supply shocks	20 percent fall in energy and food prices	Deflationary cost shock matching initial shock in Phillips curve simulation
3	Looser labor market (More slack than estimated)	2 percentage points lower unemployment gap	2 percentage points lower output gap than assumed by in monetary policy rule
4	Tighter labor market (Less slack than estimated)	2 percentage points higher unemployment gap	2 percentage points higher output gap than assumed in monetary policy rule
5	Inflation expectations de-anchored	1 percentage point higher expected inflation	Inflation expectations increase inflation in the first period by 1 percentage point
6	Increased persistence (Wage-price spiral)	A rise in the coefficient on lagged inflation to 0.95	A rise in the coefficient on lagged inflation to 0.8

Sources: IMF, Regional Economic Outlook for Europe, October 2022; IMF, World Economic Outlook database; and IMF staff.
Note: DSGE = dynamic stochastic general equilibrium.
1/ All shocks persist throughout the simulation periods of 6 quarters in the Phillips curve simulation exercise.

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MONETARY OPERATIONS IN HUNGARY BEFORE, DURING, AND AFTER THE PANDEMIC[1]

1. The Magyar Nemzeti Bank (MNB, Hungarian Central Bank) has frequently adjusted its monetary operations within its inflation-targeting framework, triggering questions about the multiplicity, and sometimes "unorthodoxy," of its instruments. The key question is whether simple and less activistic monetary operations would be more effective in achieving the MNB's primary objective, namely medium-term price stability. The recent pickup in inflation also probes whether the current monetary instruments are efficient.

2. We look at the MNB's complex monetary operations from an agnostic point of view. The paper does not take an a priori stance between two opposing views: (i) the extent that a central bank is privy to better information, is transparently communicating the purpose of its operations within its de jure authority, and has established a good track record, complex and more frequent operations may well be suitable; and (ii) if excess interventions instead amplify the noise and blur signals, they can be counterproductive. This is a balancing act, and a definitive conclusion cannot be drawn absent a counterfactual.

3. The paper reviews the main changes of the MNB's monetary instruments in the last decade, the ever-changing transmission channels, and draws lessons for future monetary operations. It is organized as follows. The next section lays out the main phases of the MNB's recent monetary operations, as background for the discussion. The following section reviews the objectives of the MNB and how they influence the monetary toolbox. The subsequent section provides an overview of the many changes of conventional and unconventional monetary operations since October 2013, when a new central bank law gave the MNB responsibility for financial sector supervision and broadened the scope of macroprudential policies and resolution of the financial intermediation system, thereby significantly broadening the scope and powers of the MNB. [2,3,4] The penultimate section briefly surveys the ever-changing transmission channels, which influenced the design of monetary operations. The final section offers a few general takeaways.

A. Main Phases of Hungarian Monetary Operations Since 2013

4. The MNB became an inflation-targeter in 2001. The exchange rate became free floating only in 2008. Since 2005, the MNB has pursued a medium-term headline inflation target of 3 percent, complemented by an inflation-tolerance band of 2–4 percent since March 2015, to

[1] Prepared by Tonny Lybek, who would like to thank counterparts at the MNB for helpful comments during a staff presentation.

[2] For a comprehensive description of the changes of monetary operations, see MNB (2017), and MNB (2020 and 2021) on pandemic crisis measures, as well as the Annual Reports of the MNB.

[3] The framework of the MNB's resolution powers was established in Act XXXVII in 2014.

[4] Hungary became an EU member on May 1, 2004, and thus transposes the EU acquis, including the *Statutes of the European System of Central Banks (ESCB) and the European Central Bank (ECB)*.

augment flexibility and better anchor expectations. As headline inflation increased and temporally exceeded the band, MNB communication emphasized core inflation excluding indirect taxes. Recently, communication has again focused on headline. Core inflation has exceeded headline since March 2022. The MNB, which is governed by a modern central bank law, believes that price stability is the best monetary policy can do to support sustainable real growth.

5. Since 2013, when the new central bank law came into force, monetary operation can be categorized into five broad phases. These phases become evident when gaging inflation, credit growth, exchange rate, country-risk premia, and inflation expectations (Figure 1).

- **The period from 2013 to February 2016 was characterized by low inflation, monetary easing, and efforts to reduce vulnerabilities and re-leverage the economy.** Inflation decelerated during the first part of this period and even briefly became negative. Although it increased during the second part of this period, it was still below the tolerance band. Accordingly, there was space to focus on a healthier financial system and stimulate the economy (Gór-Holecz et al., 2016, footnote 3). As described below, external vulnerabilities of the government were reduced by the so-called *Self-Financing Program*, the SME credit-crunch was mitigated by the *Funding for Growth Scheme* (FGS), household vulnerabilities were reduced by conversion of FX loans to local currency, and policy rates were gradually reduced.

- **During March 2016-February 2020, inflation largely hovered in the inflation tolerance band, the exchange rate depreciated only moderately, and monetary policy remained accommodative.** Money market rates were kept slightly positive with absorption of excess liquidity being the operational target. The FGS was reduced and substituted by the *Market-Based Lending Scheme*. New unconventional tools were introduced, including to: (i) influence the long end of the yield curve (the MNB offered interest rate swaps); (ii) develop the mortgage bond market (MNB purchases of mortgage bonds, introduced new mortgage-bond indices at the Budapest Stock Exchange); and (iii) promoted the market for corporate bonds by the MNB's *Bond Funding for Growth Scheme* (BGS). The MNB considered it important to maintain "loose" monetary conditions (MNB 2018, page 7), but "prepared for the gradual and cautious normalization" of monetary policy in September 2018, by removing some of the unconventional tools (i and ii above were abolished by end-2018). Credit growth to the private sector further strengthened, while real interest rates remained negative.

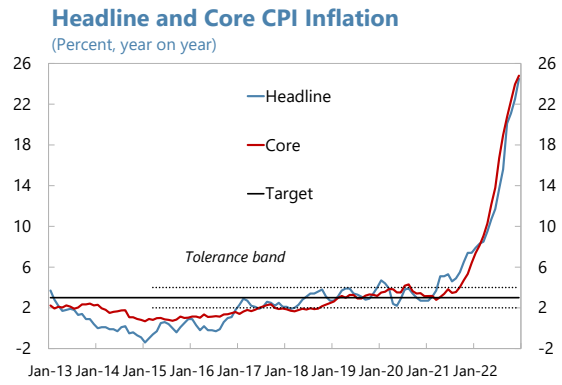
- **The COVID pandemic (March 2020 to May 2021) initially lowered inflation but caused market dysfunction.**[5] As in other countries, monetary and fiscal policies were significantly eased. The MNB overhauled its toolkit and adjusted its operational target from excess liquidity to interest rates. While it did reduce the policy rate, it effectively tightened the money market rates to support the exchange rate. Moreover, it provided ample long-term liquidity, temporarily suspended penalization for breach of reserve requirements, enhanced the FGS, introduced an asset purchase program (APP) of government securities in the secondary market, reactivated its

[5] The impact on inflation at the beginning of the Covid-pandemic could also be related to restricted data gathering.

APP of mortgage bonds, and eased conditions of its APP of corporate bonds. As elsewhere, various micro and macro-prudential rules were temporarily relaxed. After an initial depreciation, the exchange rate stabilized. The negative real interest rate remained relatively stable.

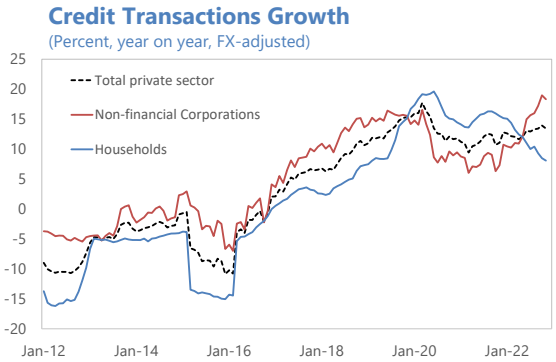
Figure 1. Hungary: Inflation and Monetary Policy Stance

Price stability has recently again become the chief concern.



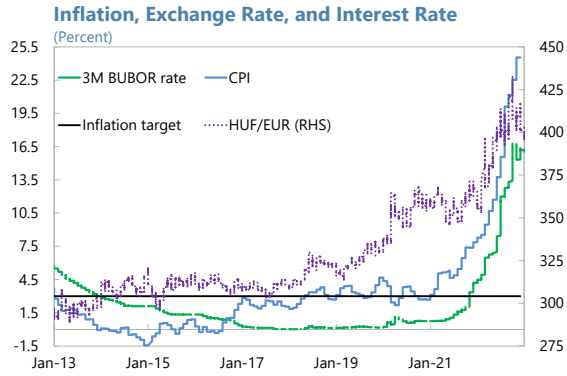
Sources: CSO and MNB. Data through November 2022.

Bank lending to the private sector recovered slowly after the GFC, then decelerated again during the pandemic.



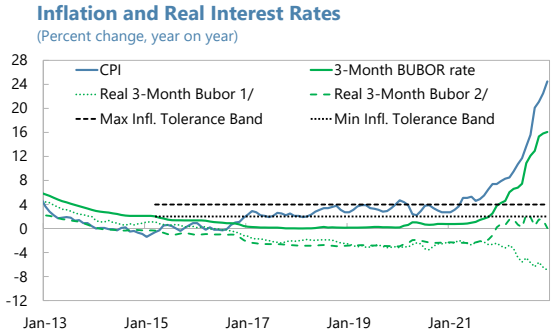
Source: MNB and IMF staff calculations. Data through October 2022.
Note: The drop in household transactions in 2015 is related to the FX conversion

The increase in inflation and money market rates were preceded by a depreciating exchange.



Sources: Magyar Nemzeti Bank (MNB); Haver Analytics, and IMF staff calculations.

The recent increase of policy rates means that real rates deflated by next-year infl. expectations are now positive.



Sources: Hungarian National Bank (MNB); Hungarian Central Statistical Office (HCSO); and IMF staff calculations.
1/ Deflated by actual core inflation.
2/ Deflated by Consensus inflation expectations for next year.

- **The recovery (June 2021 to February 2022) was stronger than expected, inflation began to accelerate, and monetary policy tightened.** This was due to external factors (increasing commodity prices, supply chain shortages, etc.) as well as strong domestic demand, fueled by an expansionary fiscal policy up to the April 2022 elections (see companion Selected Issue Paper on *Drivers of Inflation*). The MNB refocused its efforts on fighting inflation by raising policy rates and gradually phasing-out its unconventional tools, which was achieved by end-2021.

- **Spillovers from Russia's war in Ukraine (since February 2022) necessitated a further monetary policy tightening, including through absorption of liquidity by instruments with longer maturities to counter depreciation pressures.** This was due to increasing commodity prices, supply chain shortages, and concerns about the energy supply. However, still strong

domestic demand, widening economic imbalances, and disputes with the EU increased country risk premium and contributed to depreciation pressures. The sizable monetary tightening turned the real-interest rate (deflated by next-year inflation expectations) positive. To make it more costly to shorten the HUF, the MNB enhanced its liquidity-absorption tools through daily (instead of quarterly) FX swaps, higher reserve requirements, and longer MNB deposits. It also decided to temporarily sell FX directly to importing energy companies.

B. Competing Goals, Targets, and Instruments

Framing the Debate

6. The issue of how best instruments can serve targets has been extensively debated:

- **One instrument per target?** The idea that one only needs as many instruments as policy targets, is often attributed to Tinbergen (1952). He, however, was considering broader targets and instruments, like inflation and broad money. Moreover, he was using a linear static model to make his case. It has since been proven that in case of stochastic disturbances (Brainard, 1967) and marginally increasing adjustment costs of an instrument (Turnovsky, 1977), it may be optimal to use a combination of instruments to achieve a target. Finally, transaction costs or other rigidities can impede information efficiency in a system with fragmented submarkets. Several carefully calibrated operations and instruments may thus be more efficient in achieving one target—and certainly multiple targets.
- **Rule versus Discretion?** Buiter (1981), for instance, showed, assuming rational expectations, that discretion is the optimal choice, provided the central bank is credible. This may be interpreted, as if the central bank is altruistic, fully aware of its fiduciary responsibilities and, as often is the case, is privy to better information. Otherwise, a contingent rule is preferable provided it can be credibly monitored. If these conditions are not in place, a simple fixed rule may be preferable. While these deliberations also referred to targets in a broader sense, this strain of literature can also be extrapolated to favor discretion and thus the use of a variety of instruments to achieve a target.
- **Although a well-calibrated range of instruments may be optimal, there is still much to be said for simplicity.** Plainness facilitates communication. It becomes more difficult to question whether the central bank may have side-objectives, as complex externalities from a multiplicity of instruments are more challenging to decipher. Ultimately, the success of applying a range of instruments hinges on the credibility of the central bank. Since it is difficult to be right all the time, with a continuous flow of new information and shocks, more detailed micro-management likely implies larger credibility risk.

Competing Targets and Instruments within the MNB Statutory Objectives

7. The primary objective of the MNB is to achieve and maintain price stability. Without prejudice to its primary objective, the MNB preserves financial stability and supports the

government's economic policy, as well as its policy on environmental sustainability.[6] The Monetary Council, as the MNB's *supreme* decision-making body (Art. 9(1) of the MNB Law), arbitrates trade-offs among potentially competing objectives within the MNB mandate.

8. The MNB's institutional framework aims to resolve potential tradeoffs between price and financial sector stability. In practice, it is difficult to have one without the other. By delegating primacy to price stability, the MNB law ensures that financial sector challenges will not be "resolved" simply by providing ample liquidity, which would ultimately result in inflation. Another example is reducing the share of variable-rate mortgages, by encouraging longer interest rate fixation periods. While this enhances financial stability, it also impedes the transmission of monetary policy. The Monetary Council ultimately decides on this tradeoff together with the Financial Stability Council.

9. However, MNB objectives, including the support of government policies, may occasionally compete. The MNB is independent and cannot provide direct credit to the government,[7] but can still balance its objectives, without prejudice to price stability. A case in point was the period mid-2021 till May 2022. The MNB tightened policy rates, phased out unconventional tools, and advised against the expansionary fiscal policy, as recovery was stronger than expected. Compared to peers, however, the MNB was slower to stop purchases of government securities, which eased funding costs of the expansionary fiscal policy. At the time, the MNB was concerned about financial stability. Some market observers began to question the consistency of these policies. With the benefit of hindsight, the MNB now considers that a faster exit from the government security purchase program would likely have been beneficial but notes that the high degree of uncertainty around the post-covid recovery justified caution.

10. Well-intended initiatives to boost intermediation in priority sectors may have long-run implications for monetary policy transmission. The MNB has often explained such interventions with market failures, the implication being that MNB interventions are more effective and faster than the market. The MNB has influenced funding costs, and encouraged market segmentation to avoid arbitrage, with a view to direct resource allocation. Examples include various versions of the *Funding for Growth Scheme* (FGS). Another example is the purchase of mortgage bonds, which resulted in mortgage bonds occasionally carrying lower interest rates than comparable government bonds. Such initiatives, however well-intended, could leave the appearance of quasi-fiscal operations that would be better performed by state-owned development banks, public guarantee schemes, or direct fiscal operations.[8]

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[6] Unofficial English translation of the Law on the MNB: "Art. 3 (1): The primary objective of the MNB shall be to achieve and maintain price stability. Art. 3(2): Without prejudice to its primary objective, the MNB shall support the maintenance of the stability of the system of financial intermediation, the enhancement of its resilience, its sustainable contribution to economic growth; furthermore, the MNB shall support the government's economic policy and its policy related to environmental sustainability, using instruments at its disposal." Please note the translation of "shall" should not be understood as "must."

[7] According to the EU Treaty, and specifically Art. 21 in the Statutes of the ECB and ESCBs, EU central banks cannot provide direct credit to national governments and EU institutions.

[8] The state-owned Hungarian Development Bank (MFB), Exim Bank, and guarantee schemes (Garantiqa Hitelgarancia Zrt., owned by MFB) for bank credits.

Competing Operations and Targets of the MNB and the Government

11. Competing operations and targets of a central bank and the government are inherent. However, there is a traditional division of labor. The central bank anchors the short end of the yield curve, influences inflation expectations to shape its slope; and mitigate market dysfunction. The government shapes the risk along and within segments of the yield curve. Preferably, these operations are complementary but if contradictory, the institutional framework should ideally abet a resolution. To that effect, in Hungary for instance, the MNB Governor is member of the Fiscal Council. Transparent information is critical for the market to gauge the implications.

12. Over the years, MNB and government policies have occasionally been complementary or conflicted. A few examples of competing objectives or inconsistent policies follow.

- **The government offers various subsidized credit support to non-financial corporations (NFCs).** Subsidized bank lending—the MNB's FGS and various government schemes—amounted to 31 percent of total bank credit to NFC (even higher for SMEs at 44 percent) as of end-September 2022. The government's Széchenyi Program aims to assist liquidity and investment needs of SMEs and individual entrepreneurs. It began in 2002, and has since seen several versions, including during the pandemic, while Széchenyi Card Max was introduced in September 2022. The state-owned Hungarian Development Bank (MFB) and Exim Bank also offers various programs, which were enhanced during the pandemic. As of September 2022, about 21.5 percent of bank lending to NFCs are backed by a guarantee from a domestic institution with a counter guarantee from the government. These initiatives alleviate credit risk and should thus have a more limited impact on the direct transmission of the MNB's policy rates on corporate rates than subsidized lending.

- **The government introduced various housing support schemes, including to incentivize families to have more children, while the MNB was seeking to reduce risks from the real estate sector.** At end-2021, about a quarter of newly issued housing loans, were subsidized by the government (MNB's Financial Stability Report, May 2022). They included the housing benefit scheme introduced in 2016, which included both a grant and subsidized interest rates (conditions have been adjusted over time). A rural housing scheme was introduced in 2019. During 2016-19 and 2022-27, a preferential VAT rate of 5 percent instead of 27 percent was applied to sales of newly constructed residences not exceeding a certain size. Moreover, the prenatal "baby" loans, which was introduced in mid-2019 and has been extended to end-2024, became very popular owing to its low rates: the maximum loan of HUF 10 million (about €25,000) is interest free, if the family has one child within five years. The state will assume 30 percent of the remaining debt in case of two children, and the government will take over the whole remaining debt in case of three children. Finally, a program to refurnish housing was introduced in 2021 and extended in 2022. Meanwhile, the MNB introduced and gradually adjusted macro prudential policies for housing to contain risks, while aiding the fledgling market for long-term mortgage bonds to promote more efficient housing finance. Many of the government schemes have continued while the construction sector was overheating and real

estate prices rapidly accelerating, which likely counteracted higher interest rates needed to cushion demand.

- **The de facto segmentation of the domestic government securities market into a wholesale (also coined "institutional") and retail market affects monetary operations.** In 2019, a special retail bond, MAP+, was introduced, which initially offered above market yields (IMF, 2019).[9] The government's intention was to reduce external vulnerabilities by increasing domestic HUF funding. Following the recent increases in inflation, however, many households decided to change to inflation-indexed retail bonds or switched to the wholesale market. This was possible because MAP+ bonds can be redeemed before their 5-year maturity. Several countries have retail programs, but usually not with such sizable differences in yields and segmentation. The trade-off is between "tapping" the "consumer surplus" by segmenting the market versus facing a higher "liquidity premium" due to, all other things equal, a smaller issuance per type. This can affect both the slope and bumpiness of the yield curve and thus the transmission of monetary policy. Notably because MAP+ and other retail bonds are the main competitor to retail bank deposits. However, with a loan-to-deposit ratio well below 100, this never became a major issue.

- **Like other countries, Hungary introduced a debt-service moratorium following the pandemic.** But in contrast to its peers, it was extended several times, although it was changed from opt-out to opt-in in November 2021. The participation has declined further and expired at end-2022. However, the government recently announced a moratorium for agricultural loans due to rising energy and fertilizer prices and a drought, from September 2022 to end-2023. These measures ease repayment risks of the borrowers but should be truly temporary. Continued extensions even after the triggering situation has normalized affect perceived risks, may raise moral hazard and artificially increase the net interest margin for future financial intermediation, as banks want to compensate their risks.

- **Both the government and the MNB have taken several initiatives to support climate change mitigation, but other regulations appear to have impeded those efforts**. The government has supported energy insolation, required stricter energy standards for new constructions since 2019 for public buildings and 2021 for other buildings, and provided incentives for solar and wind electricity production. The MNB has its own green initiative, including aiming to reduce the environmental risk costs of bank lending to green projects and support green mortgages, as part of its APP. These measures are well-intended and in line with ECB and EBA (2022) initiatives. In 2012/13, however, the government introduced significant subsidies of household utilities, which, according to Weiner and Szép (2022), likely delayed overdue investments in energy savings. Only in September 2022, was the utility subsidy reduced for above average consumption. These inconsistencies illustrate the difference between a partial and general analysis, which can undermine the effectiveness of the overall policy objectives.

[9] The simple average annual yield of the 5-year MAP+ was 4.95 percent, compared to about 1.6 percent (average during 2019) of a 5-year benchmark government bond in the market. Since February 2022, the yield of the 5-year benchmark has exceeded yield of MAP+.

13. Recently, interest rate caps have further undermined monetary policy transmission, working at cross-purposes with the needed policy tightening to reduce inflation.

- **The government introduced temporary interest rate caps on lending rates.** It first introduced a cap on eligible variable-rate mortgages now in place until end-June 2023. Eligible mortgages with interest rate repricing during November 2021 to end-June 2022, were frozen for the first half of 2022, at the October 2021 level. The cap was later extended to end-June 2023, and its scope broadened to mortgages with up to five years interest rate fixation periods. A temporary interest cap on SME loans till end-June 2023, was subsequently introduced.[10] These caps disconnect key channels of monetary policy transmission. Furthermore, they may also undermine financial stability, another key objective of the MNB, by raising moral hazard, thus incentivizing risky behaviors, and reducing bank profitability. Targeted assistance to the neediest borrower would likely be more efficient and less distortive.

- **The government also introduced interest rate caps on large deposits.** The interest rate on large retail and large institutional deposits (over €50,000, till end-March 2023) cannot exceed the average yield of 3-Month T-bills, which currently is just below 12 percent. Large depositors had been shopping around, while banks placed the funds with the MNB at up to 18 percent (the current effective marginal policy rate). This measure promptly reduced yields on treasuries and thus indirectly on mortgage bonds, undermining monetary policy tightening.

C. Hungarian Monetary Operations Since 2013

14. This section provides an overview of the many changes to the monetary operations since 2013, their motivation, refinement, and revocation. Table 1 lists various tools that were in force during part or the whole analyzed period. At the beginning of the period, the MNB used conventional tools for price stability, but then quickly introduced unconventional tools to address the consequences of the GFC, contain vulnerabilities, and re-leverage the economy—typically with the liquidity impact of these instruments largely sterilized. In the middle of the period, the MNB focused on liquidity management to maintain money market rates close to the floor of the interest rate corridor, and even tried to directly influence the longer end of the yield curve. At the beginning of the pandemic, additional long-term liquidity was provided, using a range of unconventional tools. Despite a gradual tightening since mid-2021, as the recovery proved stronger than expected, there was an "overhang" of liquidity, which was mainly absorbed by short-term instruments. With country-risks increasing and global financial conditions tightening, the MNB decided to tighten both price (policy rates) and quantity (using longer liquidity absorbing instruments) to make it more expensive to shorten the currency in October 2022.

[10] They were followed by a cap on interest rate on some student loans. However, this does not impact banks, as a government agency is providing these loans.

Table 1. Hungary: Overview of Selected Monetary Instruments Since 2013

Monetary conditions / liquidity management:	Market dysfunction and crisis tools	Market development / directed lending / transparency:
Base rate	Self-financing program	FGS: Funding for Growth Scheme
Overnight deposit rate	Interest Rate Swap Tenders (IRS)	FGS Pillar I
Overnight collateralized loan	FX sale tenders (incl. for conv. of FX HH loans)	FGS Pillar II
Collateralized long-term loans	FX prov. long-term swaps (conv. of FX HH loans)	FGS Second phase
Collateral pool for MNB facilities	Unconditional interest rate swaps (MIRS)	FGS Pillar III
HUF liquidity providing FX swaps	APP: Mortgage Bonds	FX swaps provided by MNB
Overnight quick tender	FX providing short-term quarterly swaps	Conditional interest rate swaps
1-week deposit rate	Daily FX providing swaps	FGS Plus
2-week MNB bill	APP: MNB purchase of gov. securities	Growth Supporting Program (GSP)
2-week deposit facility	APP: MNB purchase of gov. guaranteed bonds	FGS Third phase
3-month deposit facility		Market-Based Lending Scheme (MLS)
Longer deposit facility (initially 2-month)		Conditional interest rate swaps (IRS)
Preferential deposit rate (sterilize FGS and FGS Go)		FGS, various previous versions of FGS
Central bank discount bills		FGS Fix (more targeted lending to SMEs)
Reserve requirements		FGS Go (enhanced for the pandemic, SMEs)
		APP: Bond Funding Scheme (BGS)
		MNB Certified Consumer-Friendly Housing Loans
		MNB Certified Consumer-Friendly Personal Loans
		FGS: Green toolkit (HPS)
		APP: Green mortgage bond purchase program
		APP: Green corporate bond purchase program
		FGS GHP: Green home program

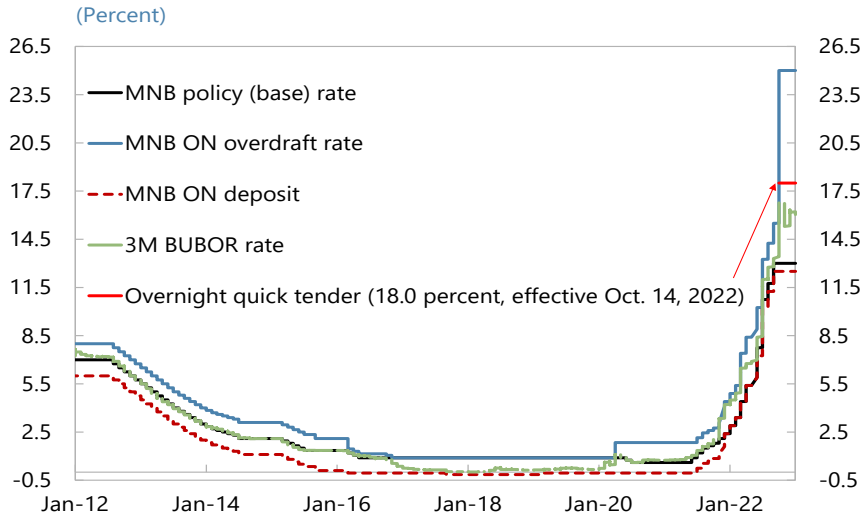
Policy and Money Market Rates

15. In Hungary, policy rates may not always be the best yardstick to gauge the monetary stance. Although the MNB has a standard setup with base rate within an interest corridor, the effective policy rate has been determined by different instruments through time with the base rate being mainly a signaling rate. At the beginning of the analyzed period, the MNB gradually reduced its policy rates, as inflation pressures waned (Figure 2). As the economy recovered, but inflation remained subdued and global financial conditions stayed lax, policy rates were kept low. The floor of the interest corridor even became slightly negative, while the ceiling was reduced to the level of the base rate. The MNB, to remain accommodative, pushed liquidity into the system. Excess liquidity became the intermediate operational target with a view to keeping short money market rates slightly positive and avoiding excess exchange rate and capital flow volatility. As the pandemic hit, the MNB refocused its operations on interest rates, while providing ample long liquidity. Although the MNB did reduce the base rate, it also increased the floor of the interest corridor, and effectively increased the money market rates.

16. The 3-month BUBOR (money market) rate is the "go-to" indicator to appraise the impact on inflation of interest rate changes. Although policy rates and open market operations are promptly visible in the very short BUBOR rates, they are quite volatile reflecting, for example, incorrect daily liquidity projections or unexpected treasury transactions. The 3-month BUBOR rate better accounts for expectations, structural liquidity changes, etc. and is thus a more reliable indicator of the de facto monetary stance. The MNB often uses this rate to estimate the impact on

inflation.[11] For instance, Horváth et al. (2006) found that the lags of the interest rate pass-through varied for lending and deposits to corporates (faster) and households (slower).

Figure 2. Hungary: Policy and Money Market Rates



Sources: Magyar Nemzeti Bank (MNB); Haver Analytics, and IMF staff calculations.

Liquidity Management

17. The MNB has used a variety of instruments to absorb and provide liquidity to influence behaviors. For instance, by providing long-term liquidity while absorbing excess liquidity by shorter instruments, it eased concerns about a future liquidity squeeze. Moreover, some instruments (e.g., preferential deposits with the MNB) were used to incentivize certain behaviors (discussed below). Additionally, the MNB has adjusted not just the rates but also the eligibility of collateral of its standing and emergency facilities, thus strengthening the guardrails for the banking system.

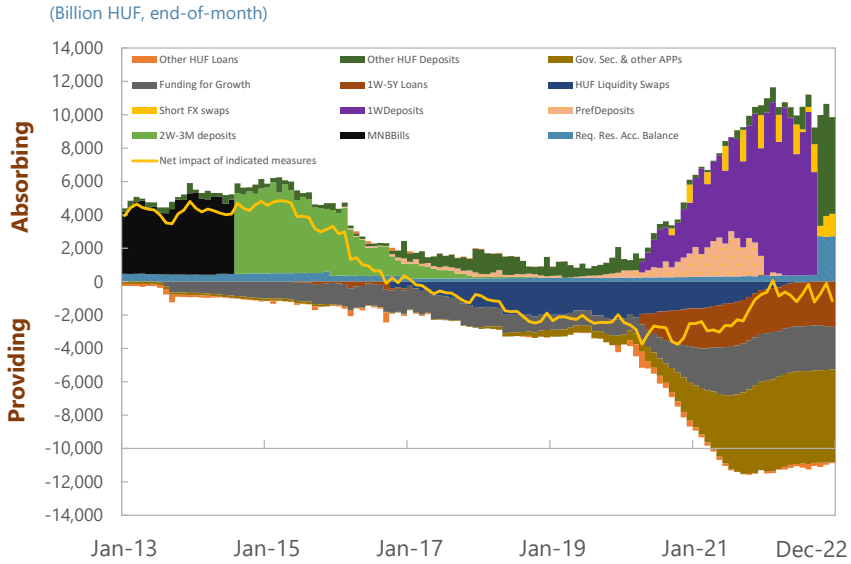
18. The net impact of various liquidity main measures varies overtime, responding to changing circumstances (Figure 3).[12] At the beginning of the analyzed period, the banking system had excess liquidity with the MNB. The middle of the period was characterized with subdued inflation and the pursuit of other objectives. The MNB thus provided more liquidity than it absorbed. During the pandemic, the MNB provided additional liquidity by increasing its liquidity providing FX swaps; introduced regular long-term collateralized loan tenders (maturities from 3 months to 5 years at the policy rate); broadening collateral eligibility (by almost 5.5 percent of GDP) to include performing corporate bank loans with a standard haircut of 30 percent, irrespective of maturity and

[11] For instance, the MNB Annual Reports regularly states, including the 2013 MNB Annual Report (page 23): "Three-month interbank yields – the yields most relevant for interest rate transmission …"

[12] Note that Figure 3 does not show the standard measure of excess liquidity. For instance, the treasury balance matters, not least conversion of EU funds, as does the available collateral banks can use to access MNB facilities.

currency; and temporarily suspending penalties of deficient reserve requirements. To absorb excess liquidity, regular auctions of 1-week deposits were introduced. The overnight overdraft rate was increased, so the interest corridor became symmetrical around the base rate. It was thus possible to increase the money market rates and contain exchange rate volatility, without initially changing the base rate (it was later slightly reduced), while ensuring adequate liquidity in the banking system. With a stronger-than-expected recovery from the pandemic, the MNB gradually tightened—both policy rates and its liquidity absorption, as it phased-out its crisis measures. After the beginning of Russia's war in Ukraine, it temporary renewed easing in response to heightened uncertainty, but accelerated its liquidity tightening again since October 2022.

Figure 3. Hungary: The MNB's Liquidity Absorbing and Providing Operations, 2013 – 2022



Sources: Magyar Nemzeti Bank (MNB) and IMF staff calculations.

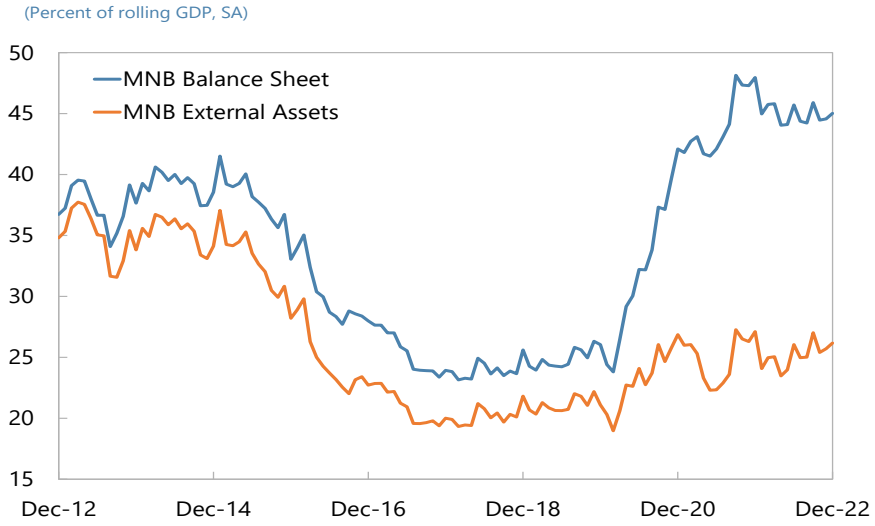
Unconventional Monetary Tools

19. The MNB has frequently complemented its conventional tools with "unorthodox" instruments to incentivize credit institutions and strengthen transmission when it deemed it impaired. The purpose has typically been to mitigate perceived risks and uncertainties along and within segments of the yield curve, for instance to mitigate alleged market failures or strengthen the lending channel (MNB, 2019, page 5). During the first part of the analyzed period, the MNB carefully sterilized the liquidity impact of its various programs. Following the pandemic, the MNB expanded the use of unconventional tools, based on experiences from large-advanced economies that found such tools effective, provided they were clearly explained, considered temporary, and did not reintroduce fiscal dominance.[13] The extent to which these tools is used is occasionally proxied by the size of the balance sheet of the central bank, although this measure is not comprehensive. For

[13] For instance, Ben Bernanke, considering advanced economies, said in 2014: "Well, the problem with QE is it works in practice, but it doesn't work in theory" In 2020, he noted: "… in retrospect it has become evident that the costs and risks attributed to the new tools, when first deployed, were overstated".

instance, it does not capture off-balance sheet items, such as interest rate swaps. Figure 4 shows how the MNB balance sheet declined at the beginning of the analyzed period, then stabilized, and grew rapidly during the pandemic. A few of the larger unconventional tools are briefly discussed below.

Figure 4. Hungary: Size of MNB Balance Sheet, Dec. 2012–Dec. 2022



Sources: Magyar Nemzeti Bank (MNB); and Hungarian Central Statistical Office (KSH).

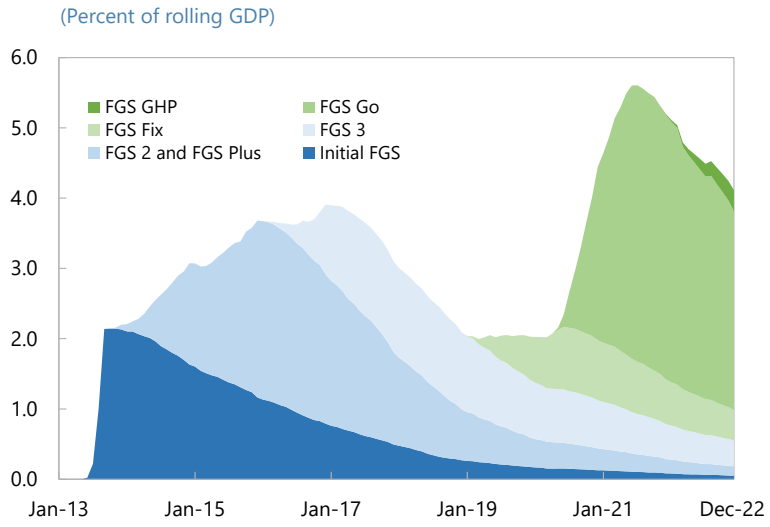
Funding For Growth Scheme

20. The *Funding for Growth Scheme (FGS)* was introduced to encourage inexpensive local-currency bank lending to credit-constrained SMEs as well as micro enterprises (e.g., Székely 2020, and MNB 2022). The initial FGS was announced in April 2013. The MNB provided zero interest funding to be on-lent against collateral at a maximum of 2.5 percent, with a maximum maturity of 10 years, to facilitate conversion of FX denominated loans, and to encourage banks to reduce their foreign funding. The liquidity impact was generally absorbed by allowing participating banks to place their excess liquidity with the MNB at preferential rates, thus effectively subsidizing the lending. Endresz et al. (2015) found that the FGS effectively supported investments that would not otherwise have happened. The MNB (2017, page 7) notes that the FGS, in its various forms during 2013 and 2016, may have added about 2 percentage points to GDP and enhanced employment by around 20,000. Several refinements were made during the period, mainly to further tailor the lending. As growth and leveraging recovered, the FGS was being phased out and complemented by the *Market-Based Lending Scheme* (MLS).[14] When the pandemic hit, the program was reshaped. Later, it was retailored to support the greening of the economy. Although the MNB deemed it effective, such tailored support could almost be perceived as a quasi-fiscal activity, particularly when

[14] The MLS included the MNB offering banks interest rate swaps (IRS)—the MNB accepted interest rate risk of long bonds against short yields—to help banks adjust their interest rate risk and thus to lower the longer interest rates. By mid-2016, the stock of various IRS amounted to almost 7 percent of GDP.

for a very short period the MNB accepted part of the credit risk. The size of the various FGSs likely explains why it was done by the MNB rather than though the state-owned development bank and guarantee schemes. The outstanding amount of various FGS loans amounted to about 4.2 percent of GDP at end-November 2022 (Figure 5).

Figure 5. Hungary: Outstanding Loans of Funding for Growth Schemes, Jan. 2013–Dec. 2022



Source: Magyar Nemzeti Bank (MNB, Central Bank of Hungary).

Self-Financing Program

21. The *Self-Financing Program* (SFP) incentivized banks to move their excess liquidity with the MNB into government securities. The main objective was to reduce external vulnerabilities of government debt.[15] It lasted from April 2014 to April 2016, whereupon it was phased out. Banks were encouraged by making the MNB liquidity absorbing instruments less liquid compared to government securities.[16,17] During this period, banks increased their portfolio of government securities by almost 6 percentage points of GDP. It coincided with a declining the spread vis-à-vis German bunds, although a range of factors were likely at play (Figure 6). Bodnár et al. (2016, page 38) noted that banks' purchases of government securities exceeded the AKK's net forint issuance. Moreover, it did lessen external vulnerabilities, as it helped reduce the externally

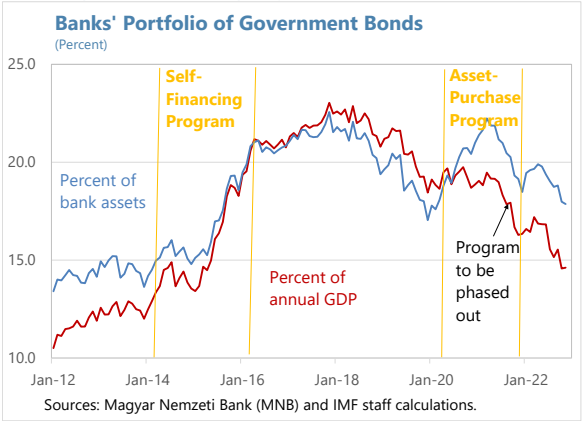
[15] For a comprehensive description of the SFP, its modalities and effectiveness, see e.g., MNB (2016).

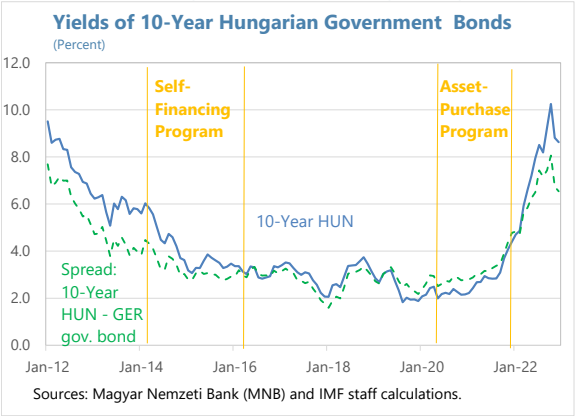
[16] The main liquidity absorbing instrument became gradually less liquid. It was no longer tradable and removed as eligible collateral for MNB facilities. Its maturity increased from 2-week to 3-month. The frequency of auctions was reduced, and the auctioned amounts gradually reduced.

[17] Concerns about day-to-day liquidity management and market turbulence were eased by adjusting the overdraft facilities and offering interest rate swaps (IRS). Around the time of the changes, the maximum use of the intraday credit line did increase for some banks, but it quickly adjusted to normal levels (Bodnár and Luspay, 2016, Chart 8). Moreover, the BUBOR (money market) system was reformed in May 2016 to enhance its transparency. The IRS program was shut down after demand moderated.

held public debt (by over €9 billion) and its share of FX denominated debt (from about 50 to below 30 percent). Furthermore, it contributed to a rating upgrade. Csávás and Kollarik (2016) found that it lowered the financing costs of the government. Given the ample liquidity in the banking system and moderate private credit demand, it did not crowd-out bank lending. To the extent the reduction of MNB liquidity absorption matched banks' purchases of government securities, the liquidity impact was neutralized. Finally, it facilitated a maturity extension of banks' bond portfolios and likely made this market more liquid.

Figure 6. Hungary: Government Bonds Development During Self-Financing Program

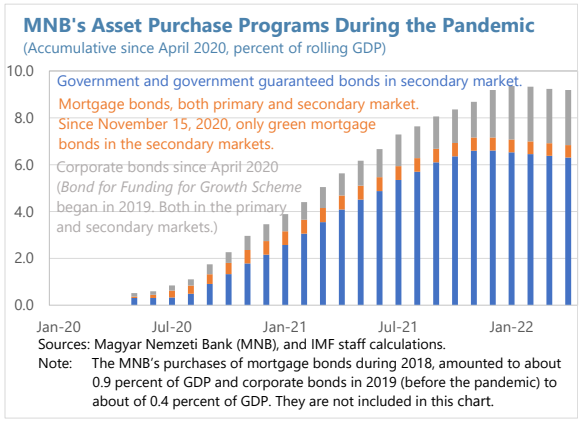


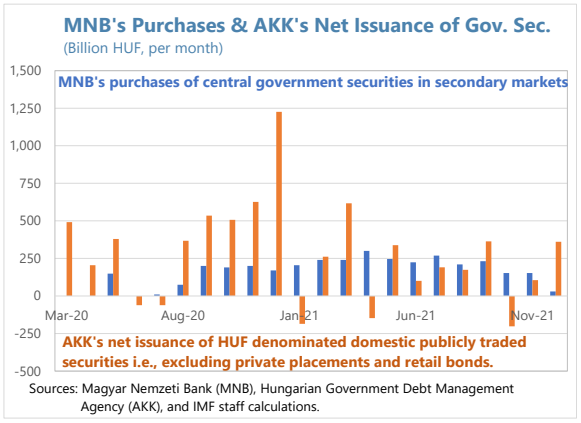


Asset Purchase Programs

22. The MNB introduced asset purchase programs (APPs) for mortgages in 2018, corporate bonds in 2019, and government securities in 2020. The MNB provided detailed information about the motivation for its APPs of government securities and mortgages as well as corporate bonds. Initially, the purpose was to spur the development of the mortgage and corporate bond markets. For instance, the liquidity impact of the purchased corporate bonds was sterilized by preferential deposits. Before the pandemic, the MNB had purchased securities for about 1.2 percent of GDP. During the pandemic till end-2021, when these programs expired, the MNB bought bonds for an additional 9.1 percent of GDP (Figure 7). The APPs were an important component of COVID-crisis measures to alleviate market dysfunction, ensure adequate liquidity support to mitigate the abiding tendency toward liquidity hoarding and shorter investments during a crisis, and later to also ease government funding costs. With the benefit of hindsight, the continuation of the APPs after mid-2021 appear not to have been consistent with the MNB's rate increases as inflation was taking off.

Figure 7. Hungary: MNB Asset Purchase Programs





23. The APP of government securities was the largest. Purchases were conducted only in the secondary market, and in longer maturities.[18] To ensure that the securities remained liquid, the purchases were initially limited to 33 percent per issuance,[19] but this limit was later increased to 50 percent and eventually abolished in March 2021. In late summer 2020, the scope was extended to include government guaranteed bonds, i.e., bonds issued by the state-owned Exim Bank and Hungarian Development Bank. Most government bonds (about 60 percent) were bought at the weekly tenders, while the rest as bilateral trades. The latter allowed the MNB to smooth the market daily. The program envelope was gradually increased. While the MNB was slower to initiate the purchases than its peers (Croatia, Poland, Romania), it continued for longer (Arena et al., 2021). In August 2021, the MNB began to announce targeted amounts and gradually reduced its purchases, until the program stopped in December 2021.[20] The MNB purchased a substantial part of new net issuances and was concerned that a rapid exit could trigger market volatility.[21] In total, the MNB bought government bonds for about 6.4 percent of (2021) GDP. At this time, the MNB has not expressed any intention to sell these bonds as part of quantitative tightening.

24. The MNB activated its mortgage bond APP in 2018 and at the beginning of the pandemic. The initial program was active from December 2017 to December 2018, with varying conditions. In addition to supporting this nascent market, one of the stated purposes was also to lower the long interest rates. Occasionally, the mortgage rates were even lower than comparable government bonds during this period (MNB, 2018, page 26). The MNB bought mortgage bonds in both the primary and secondary market. It was relaunched in April 2020 with the first purchases in May. Then the primary purpose was to alleviate market dysfunction and to protect the achieved

[18] The EU Treaty, specifically Art. 21 of the Statute of the ECB and European System of Central Banks, prohibits direct financing of the government by any EU central bank. Purchases in the secondary market, however, are permitted and government bonds are frequently used as collateral.

[19] This was in line with the ECB decision to increase the share limit to 33 percent (Draghi, 2015).

[20] In early 2022, however, the MNB has allegedly intervened a few times in the government securities market, but solely to temporarily to smooth volatility.

[21] The risk of a "taper tantrum", as in the USA in 2013, the Hungarian experience with the exit of one large foreign investor, and the heightened uncertainty following the pandemic likely influenced these concerns.

progress. Similar to the initial phase, the MNB announced that it intended to sterilize the liquidity impact. In mid-November 2020, the MNB stated that it would only buy green mortgages in the secondary market. During the pandemic, the MNB purchased mortgage bonds for about 0.6 percent of GDP. The program should be seen as complementing a range of other initiatives to develop the mortgage bond market.[22]

25. The APP of corporate bonds—*the Bond Funding for Growth Scheme (BGS)*—was intended to develop the corporate bond market and animate diversification of corporate funding. It was expected to spur competition among banks, enhance the transmission mechanism, and contribute to financial stability.[23] Most of the potential issuers also had access for foreign lenders. The BGS was akin to the ECB's corporate sector purchase program launched in 2016. The BGS was announced in April 2019, launched in July, and the first purchases took place in September. The MNB could buy HUF denominated bonds issued by Hungarian non-financial corporations with maturities of 3 to 10 years, which was doubled to 20 years at the beginning of the pandemic and the envelope gradually increased. To limit the credit risk, an issuer should be rated at least B+ and maximum exposure of the MNB to one business group was initially limited to HUF 20 billion (about €61.5 million at the time), which later was increased to HUF 50 billion (about €143 million). Most issuances were rated by Scope Rating. The MNB could buy up to 70 percent of an issuance in the primary and secondary markets, which later was limited of up to 50 percent in the secondary market. From early May 2020 to end-April 2021, the MNB bought corporate bonds for about 0.9 percent of GDP, of which almost 0.7 percent of GDP in the primary market. Although the BGS expired in December 2021, a few transactions were only finalized in April 2022.

D. The Ever-Challenging Transmission Mechanism

26. This section provides a brief overview of the implications for monetary operations of the ever-changing monetary transmission channels. The concept of transmission mechanism is subject to various interpretations, but there is general agreement that transmission changes over time and monetary operations need to adjust accordingly. Our prior remains that tighter monetary policy tends to contract output and to contain inflation (when driven by demand), and vice versa. Figure 8 shows the quarterly correlation of, respectively, the change of real growth and core inflation before and after a change in the 3-month BUBOR rate. The impact of an interest change seems to have become markedly weaker after the GFC. Until recently, this period was characterized by low and stable interest rates, as the economy recovered, as well as the introduction of several subsidized

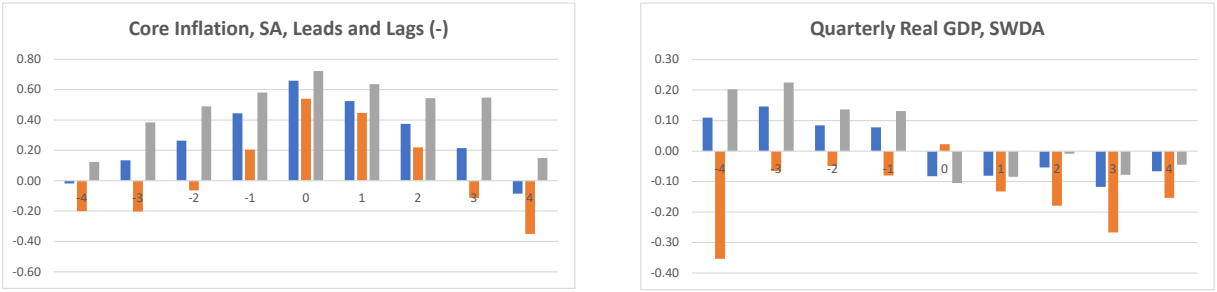
[22] The MNB has over time supported a more liquid market of longer fixed-term mortgage bonds. The legislative framework was amended to promote the establishment of special mortgage banks and covered mortgage bonds. The Mortgage Funding Adequacy Ratio (MFAR, a macroprudential tool) was introduced in June 2015. It has been gradually tightened to encourage longer mortgage financing. The MNB has also encouraged borrowers to borrow with longer interest-rate fixation periods. Transparent housing loans were promoted in terms of the MNB certified Consumer Friendly Housing Loans introduced in June 2017. The Budapest Stock Exchange, owned by the MNB, introduced three mortgage bond indices in December 2017 to stimulate more transparent pricing.

[23] The MNB (2019) provides details as well as data about its purchases.

lending programs. The bottom line is that the dynamics are very complex and still not fully understood.

Figure 8. Hungary: Correlation Coefficients of Change of 3-Month BUBOR, Real Growth and Inflation

Selected periods: 2000 Q1 – 2022 Q3; 2000 Q1 – 2008 Q3; 2008 Q4 – 2022 Q3

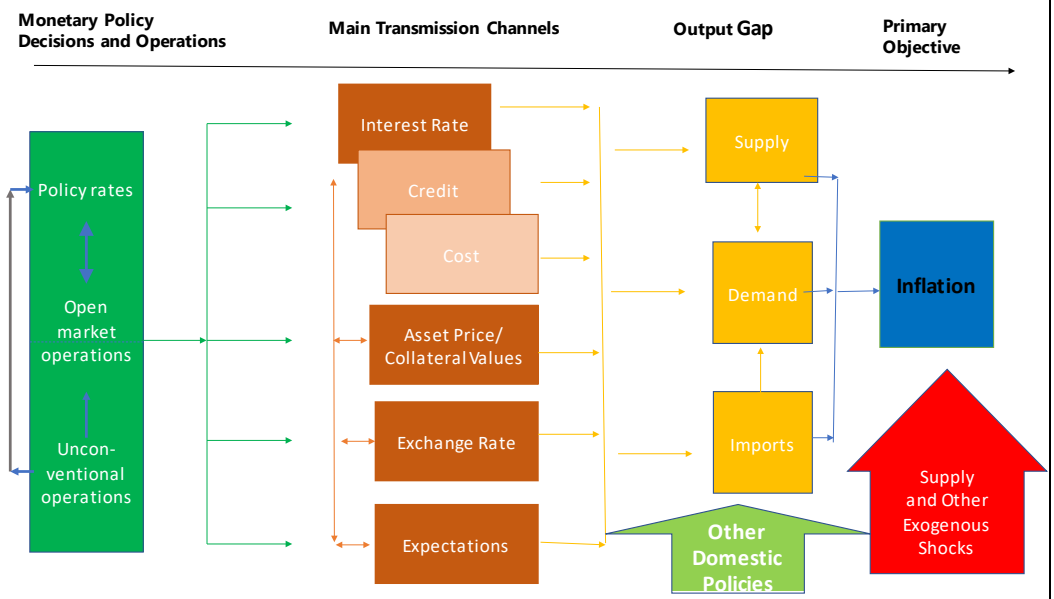


Sources: Haver and IMF staff calculations.

Note: Quarterly change of monthly average of 3-Month BUBOR and quarterly change of selected variable.

27. The literature refers to a handful of transmission channels of conventional monetary policy tools, while views the transmission of unconventional tools are still evolving.[24] Although overlapping and not mutually exclusive (Figure 9), a distinction is frequently made between the: (i) interest rate channel, with additional effects related to the (a) credit and (b) cost channels; (ii) asset price or balance sheet channel; (iii) exchange rate channel; and, (iv) expectation channel (e.g., Mishkin, 1995, 1996; Ireland, 2006; and Boivin et al. 2010).

Figure 9. Hungary: Main Conventional Transmission Channels

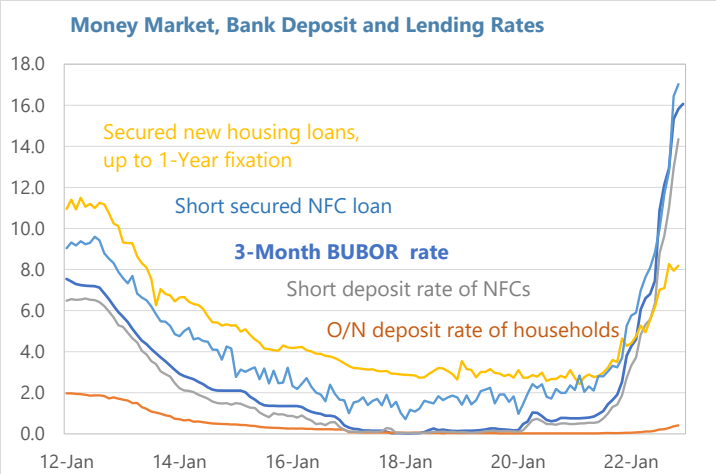


Sources: Inspired by, among others, Kuttner and Mosser (2002), ECB, the Reserve Bank of Australia.

[24] MNB papers on the transmission mechanism in Hungary are summarized by Vonnák (2006 and 2007).

Interest Rate Channel

28. The interest rate channel is a standard feature of textbook Keynesian IS/LM models. The interest rate—the *price* on time preferences—affects the intertemporal choices of investment and consumption, thus economic activity and ultimately price levels. This channel hinges on short-term price and nominal wage stickiness rather than price illusion. Economic agents, even with rational expectation, are presumed to focus on the *real* interest rate. Close to the zero lower bound, further lowering of interest rate may still be expansionary, as it contributes to inflation and thus lowers the real interest rate.



Sources: Haver Analytics, Magyar Nemzeti Bank (MNB), and IMF staff calculations.

29. The recent policy rate increases in Hungary have affected banks' lending rates with a lag, but much less deposit rates, particularly demand deposits of households (chart). This is because of the still ample liquidity in the banking system (loan-to-deposit rate about 83.4 percent in September 2022) and rigidity of small depositors. Competition for large depositors, however, has intensified. The previously discussed interest rate caps will further impede the interest channel, which may already be affected by various subsidy schemes. Monetary operations may thus need to be tightened even further than would otherwise have been the case.

Credit Channel

30. The credit channel is attributed to frictions—agency costs and asymmetric information—in credit markets. The FGS, BGS as well as the long-term collateralized lending facilities were aimed at reinstating the credit channel (MNB, 2019), which had suffered during the deleveraging following the GFC.

- ***The narrow credit-channel is focused on influencing the supply of deposits and demand of loans***. Attracting deposits was a constraint before the GFC, but this is no longer the case. The loan-to-deposit rate has declined from 147 in October 2009, to 113 in January 2013, to 83 in September 2022.

- ***The cost channel refers to the cost of working capital***. This cost may be higher in less competitive banking systems in countries with poorer governance practices (Jarmuzek and Lybek, 2020), particularly for newly established SMEs without "relationship banking." While risk premia were an issue right after the GFC, the FGS and government subsidized credit and guarantee schemes, combined with a strong economic recovery, mitigated this factor.

- ***The broader credit-channel refers to the importance of collateral to further lending, akin to financial accelerator (part of the balance-sheet channel).*** Right after the GFC, it was a dampening factor, but recently likely an accelerating factor, although contained by prudential regulation. Bank lending (transactions) to both NFCs and households have in recent years been double-digit until the global risks increased in 2022 and credit to households decelerated (Figure 1).

Asset Price Channel

31. Asset prices—real estate and financial assets—are swayed by monetary operations, which affect wealth and thus the ability and willingness to consume and invest. Real estate is the most important household asset in Hungary with residential ownership at about 91.3 percent in 2020, compared to 70.0 percent for the EU-27 average (Eurostat). Kiss and Vadas (2007) noted that Hungarian mortgages often constitute the largest debt of most households and that, given their long maturities, they can have a profound and persistent impact on savings and consumption decisions.[25] However, household debt is relatively low in Hungary compared to peers. Currently, only about half of residential real estate transactions in Hungary are financed by bank credit. This in part due to foreign demand but it also reflects the relatively large saving of wealthier Hungarian households. The MNB's sophisticated housing model found that an increase of the policy rate of about 465 bp would likely decrease housing prices by about 2 percentage points in the Budapest area and 4 percentage points in the rural areas.[26]

32. Like its peers, Hungary's capital markets are still developing. The stock market capitalization of listed companies was about 17.8 percent of GDP in 2020. The blue-chip stock market index (BUX) is dominated by three large companies (bank, energy, and pharma), which alone currently account for 87.6 percent of the BUX. Rezessy (2005), using both event studies and the heteroscedasticity method, found that a monetary tightening did have a negative impact on the stock market, but that it was not significant.

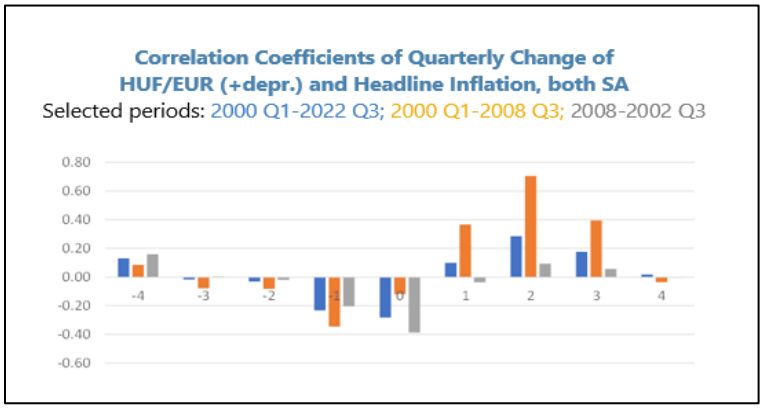
Exchange Rate Channel

33. The exchange rate is an asset price with great importance for small open economies, like Hungary. The typical real sector impact of an exchange rate *depreciation* is that it makes exports more competitive for foreign demand and imports more expensive for domestic residents. It thus boosts domestic activity, although the immediate impact on the current account could

[25] Kiss and Vadas (2005) found that a one percent increase of mortgage rates resulted in, respectively, about 1.0 and less than 0.3 percentage point decline of housing investments and private consumption compared to the baseline.

[26] Box 3 in the MNB's May 2022 *Housing Market Report* describes the simulation. Details of the model—which comprises a complete mapping of the about 4 million heterogenous Hungarian households—are available in the following video and Méró et al. (2022). The model captures the interest rate, credit, and wealth channels. The two main drivers are that higher interest rates increase the debt service and reduces the creditworthiness of the households, which curbs housing investment. In contrast, higher interest rates also tend to lower inflation, hence boosting purchasing power of households, and the accompanying stronger exchange rate tends to ease construction costs. The former driver dominates and has a more immediate impact on the housing market, while the latter smaller counteracting factors gradually reduce the impact in the following years.

temporarily be negative due to rapid price but slower quantity effects (the J-curve effect). As economic activity accelerates and import prices increase, inflation will increase, particularly if capacity constraints are breached.



34. A clear understanding of the pass-through of exchange rate changes to inflation is essential for calibrating monetary operations to achieve price stability. Generally, the pass-through varies over time, is non-linear, depends on whether a depreciation or an appreciation, and the credibility of the central bank (Ha at al., 2019). Empirical studies suggest that the exchange rate channel is strong in Hungary. Vonnák (2005) found that an unanticipated 25 pb increase of the interest rate promptly triggered a 1 percent appreciation of the nominal exchange rate, accompanied by 0.3 percent lower real GDP the first three years and about 0.1 to 0.15 percent lower consumer prices the following three years. Hajnal et al. (2015), applying different methods, found that a depreciation of one percent let to an increase of inflation by about 0.30 percent after two years, which is in line with earlier studies (e.g., Vonnák, 2010), but that it declined to about 0.10 to 0.20 percent after the GFC. These results are broadly in line with regional studies.[27] A simple analysis of correlations coefficients confirms that depreciations are correlated with higher inflation, particularly after 2-3 quarters, but also that the impact appears to have faded after the GFC (Chart).

E. Conclusion and Takeaways

35. The many changes of monetary operations by the MNB since 2013 have been within its statutory mandate. Preferences and binding constraints have evolved over time. The transmission channels have developed accordingly. As such, the frequent modifications of monetary operations have been driven by concerns about market failures and changing transmission channels. The introduction, adjustment, and revocation of monetary tools, when they no longer served their purpose, have been clearly communicated and generally smoothly implemented. The paper did not intend to assess the success of the measures, which is only possible with a counterfactual. Nonetheless, a few general lessons can be drawn.

[27] For instance, *María-Dolores* (2009), analyzing 11 Central Eastern European countries, noted that there appeared to be lower inflation and long-run exchange rate pass-through in inflation-targeting countries, like Hungary. *Jašová et al.* (2016) found that the exchange rate pass-through had declined in emerging markets, including Hungary, after the GFC, which was likely associated with generally declining inflation. *Ortega and Osbat* (2020) analyzing EU countries found that one percent depreciation typically resulted in headline inflation increasing on average by around 0.3 percent within a year; while somewhat higher impact on import prices (0.4–0.8 percent) for non-euro EU members.

- ***Simplicity and transparency come with a premium.*** Temporary correctly calibrated unconventional tools can be helpful, but excessive modifications and over-complex set of tools risk blurring the signaling of monetary policy and, ultimately, negatively impacting central bank credibility. Thus, clear and candid communication is critical for credible monetary operations. Then there is less need for complicated explanations, which are more likely to be misunderstood, and result in blurred signals.

- ***The case for addressing market failure needs to be weighed carefully.*** The benefits of tailored and frequent interventions to address perceived market failures, should be carefully weighed against the risk of public sector failure. Admittedly, this also hinges on one's prior about how much the "invisible hand" needs guidance. Albeit typically privy to better information, policymaking is not immune to mistakes that can durably affect the credibility of monetary operations. This demands consideration in the case for and design of new tools but should not be an excuse for not acting when monetary operations have a comparative advantage to other policies.

- ***Prompt intervention to solve immediate challenges can have long-term consequences that should be considered at the time.*** A case in point is the ample provision of long-term liquidity during the pandemic. Well-intended at the time, it entailed negative externalities that became visible during the recovery. In addition to hiking rates in October 2022, it also became necessary to lengthen the maturity of liquidity-absorbing instruments to make it more costly to speculate against the currency. Perhaps earlier tighter liquidity management (together with actions that would have helped reduce the risk premium) would have contained the pressures at an earlier stage?

- ***Continue to complement partial views with more general analysis.*** The MNB is independent and provides comprehensive explanations of its monetary operations. Occasionally, the MNB and government operations reinforce one another—for instance, the MNB's Self-Financing Program—or are contradictory—such as the government's recent temporary interest rate caps, which clearly impedes monetary policy transmission. The partial vs. general analysis is perhaps even more visible comparing the well-intended measures to green the economy with the overdue removal of the utility subsidies for households. While policy coordination is ideal, the two institutions may have different genuine objectives. The MNB should continue to point to the positive and negative externalities of the policy mix, as it has recently done in its various publications, so that the market can make informed decisions.

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