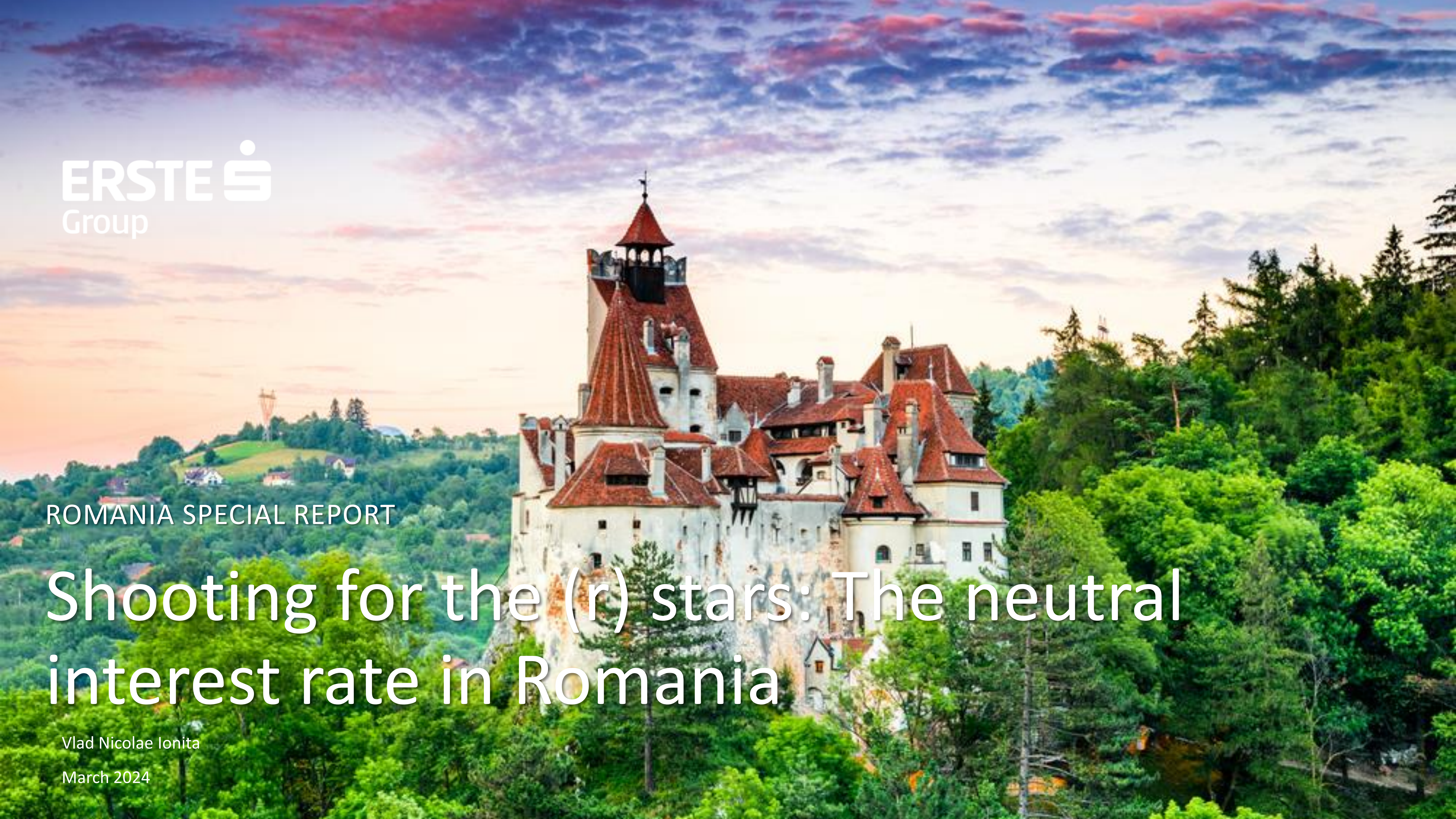

ROMANIA SPECIAL REPORT

Shooting for the (r) stars: The neutral interest rate in Romania

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March 2024

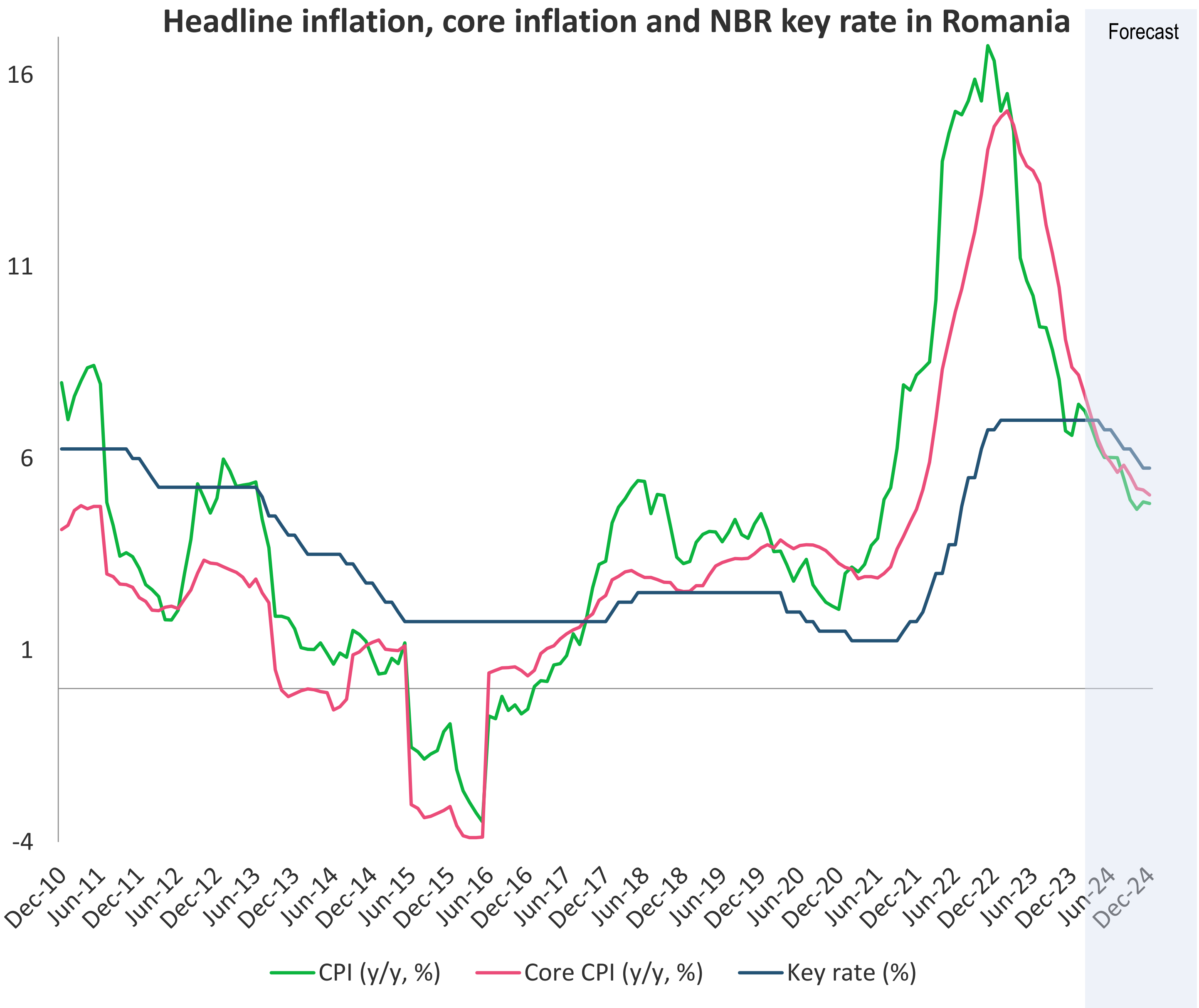
Key findings and market implications (1):

- A traditional Taylor Rule model shows that monetary policy response to inflation in Romania as well as output gap shocks are moderate and equally powerful.
- The FX component of the Taylor Rule is significant and with the correct sign, showing that national currency stability is an important factor in the NBR's reaction function.
- The neutral nominal rate in Romania has been falling since the start of inflation targeting in 2005. The Taylor Rule clearly shows that interest rates peaked in 2022 and have been on a clear downward path ever since. Furthermore, the model estimates a long-term neutral nominal rate of around 3.9%, which is the equivalent of approx. 1.4% real.
- Using a more sophisticated model (i.e. New York FED'S HLW model), the real neutral interest rate in Romania is estimated currently at around 1.5% (1.7% 2023 average) and the historical mean at 1.2%. This implies a neutral nominal rate between 4.00% and 4.50%. In the past decade, the NBR real effective rate was below the neutral rate and only over the past year climbed above the neutral mark.

Key findings and market implications (2):

- The relevant monetary policy rate in Romania is currently the 6.00% deposit facility in the context of the abundant liquidity surplus in the banking market, and short-term rates are all aligned to it, with short-term yields posting a very tight spread historically speaking.
- Monetary policy effects can be measured though broad money (M3); our analysis indicates that, due to recent monetary policy tightening, the annual rate of change of M3 slowed down significantly in 2H22 and 1H23, but began to gain momentum in subsequent quarters, mainly driven by a rise in term deposits (both corporate and households). Looking at counterparts, net external assets have been the make-or-break factor for the M3 development in the past 1-2 years, coupled with a slowdown in lending. The evolution of M3 is closely related with inflation, as Milton Friedman once said: ‘inflation is a monetary phenomenon.’
- The expected continuation of the disinflation process in 2024 should support rate cuts this year and we can already see markets pricing in this expectation.
- We expect the first NBR rate cut in May-24 of 25bp, and we see gradual cuts of 25bp each throughout the year, bringing the key rate to 5.75% by year-end, from 7.00% currently. Nevertheless, NBR decisions should be highly dependent on the pace of the disinflation process.

Monetary policy response to inflation



Source: NBR, NIS, BCR Research forecasts

Looking at the key rate evolution throughout the recent high inflationary environment, we see that the NBR preferred to raise the key interest rate gradually in small incremental steps. The key interest rate peaked at 7.00% in Jan-23 and remains at this level to this day. This represents a 450bp hike since the outbreak of the war in Ukraine. Moving forward, we expect the first interest rate cut to take place in May-24 of 25bp and we expect gradual 25bp cuts throughout 2024, bringing the key rate to 5.75% by the end of the year. This is supported by a disinflation process, which has been ongoing for several months now (exept the anticipated temporary uptick in January, driven by higher indirect taxes), as well as similar expected developments from peer banks and major central banks.

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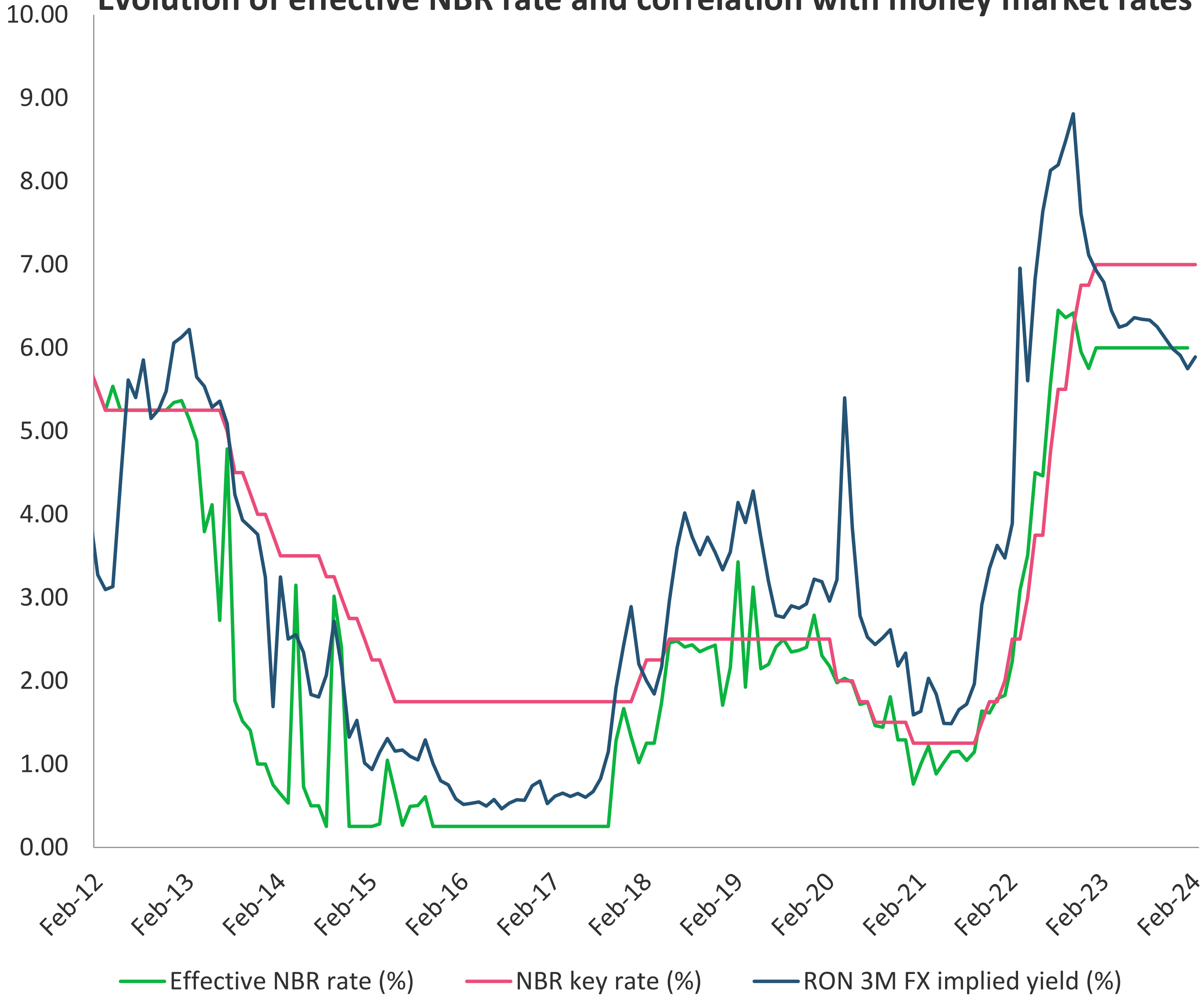
Evolution of effective NBR rate and correlation with money market rates

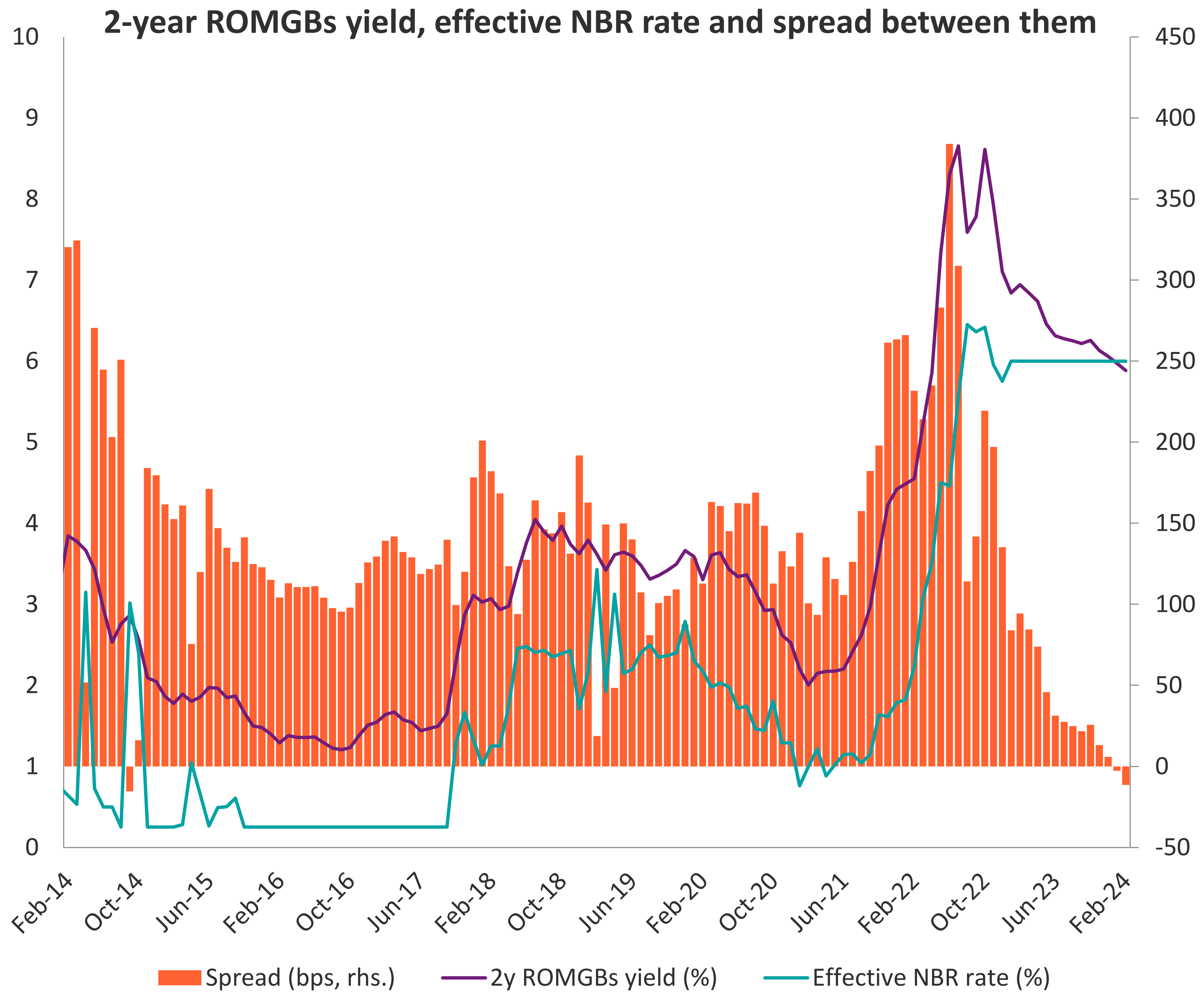


Source: NBR, Bloomberg, BCR Research

What is the relevant rate currently?

The 6.00% deposit facility has been the relevant monetary policy instrument for quite a while now. With an abundant liquidity surplus in the banking system parked at the NBR deposit facility, the short-term rates have aligned to the 6.00% deposit facility level and currently gravitate around this value. The surplus liquidity reached an all-time high in Jan-24 of about RON 60.7bn (daily average stock) and has been at historically high levels since the start of 2023. The effective NBR rate is computed as the weighted average rate of monetary operations and standing facilities based on daily average stocks. Its value has been at 6.00% since Jan-23.

Short end of curve anticipating rate cuts



Source: NBR, Bloomberg, BCR Research

Historically speaking, the spread between the 2Y ROMGBs yield and the effective NBR rate has been above 100bp. However, recently, the situation changed quite a bit and the spread is now negative, after gravitating for a while around low double-digit values. What that might imply is that markets are expecting rate cuts in the near future, which will bring the effective NBR rate lower. In general, all short-term rates seem to be aligned at the 6.00% deposit facility, influenced to a large extent by the abundant liquidity in the banking system.

We expect the spread to move toward the historical mean value in the future.

Taylor Rule: From theory to practice

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Two model specifications for estimating Taylor Rule

- The classical Taylor Rule as proposed by John Taylor in 1993 says that interest rates can be explained essentially by four factors: core inflation deviation from the target, the output gap, the nominal effective exchange rate and a constant term representing the neutral nominal rate (the sum of the neutral real rate and inflation target).
- Estimating the model for Romania using data from 1Q05 to 4Q23, the neutral nominal rate (the constant term) stands at 4.8, which is the equivalent of a real rate of around 2.3% (minus the 2.5% inflation target rate).
- Worth mentioning is that the NEER is significant and with the correct sign, indicating that the exchange rate does matter in the NBR reaction function.

$$i_t = r^* + \pi^* + \beta_1(\pi_t - \pi^*) + \beta_2(y_t - y_t^*) + \beta_3 NEERyoy_t + \epsilon_t$$

Variable	Coefficient
Long term nominal rate (constant)	4.82***
Core inflation deviations from target	0.33***
Output Gap	0.39***
NEER y/y growth rate	-0.16***
R Squared	0.36

The stars show significance at the 10% (*), 5% (**) and 1% (***) level

- The classical specification of the Taylor Rule has ceased to work as a descriptive analysis of monetary policy for over two decades. One of the main problems with the original specification is that lagged interest rates usually enter with a significant and large coefficient in the equation. This suggest that interest rate smoothing plays an important role in central bank policy.
- In the more recent literature, the Taylor Rule is estimated including a lag of the interest rate as a regressor. This model specification does a much better job of fitting the observed data.

$$i_t = \rho i_{t-1} + r^* + \pi^* + \beta_1(\pi_t - \pi^*) + \beta_2(y_t - y_t^*) + \beta_3 NEERyoy_t + \epsilon_t$$

Variable	Coefficient
Long term nominal rate (constant)	0.83***
Lagged Rate	0.79***
Core inflation deviations from target	0.12***
Output Gap	0.13***
NEER y/y growth rate	-0.10***
R Squared	0.92

The stars show significance at the 10% (*), 5% (**) and 1% (***) level

Note: The methodology used closely follows: Kevin Daly (2023), “Taylor Made — What Drives Monetary Policy in the CEE-4?”, Goldman Sachs research papers

NBR seems to respond in equal amplitude to deviations of inflation and output gap

- The Taylor Rule principle states that the nominal interest rate should be raised more than one for one when inflation rises. In this regard, our results for Romania indicate that the relation is less than one to one, which indicates a more prudent monetary policy approach employed by the NBR. This is in line with empirical evidence.
- The response to the deviations in output gap based on our results is in line with theory, as the original Taylor Rule for the US had a coefficient at around 0.5 and our results show a sensitivity of around 0.6.
- The monetary policy response to fluctuations of exchange rate in Romania is also significant. In theory, central banks increase their interest rates following a depreciation, limiting the inflationary pressure coming from imported inflation.
- The constant term provides an estimate of the long-term neutral nominal rate. Our results for Romania indicate a neutral rate of around 3.9% in nominal terms, which is about 1.4% in real terms (minus the 2.5% inflation target rate).
- The Taylor Rule is particularly sensitive to the output gap used in the model. In our case, we used an average between the EC output gap and the output gap obtained with a Kalman filter following the model introduced by Clark (1987).

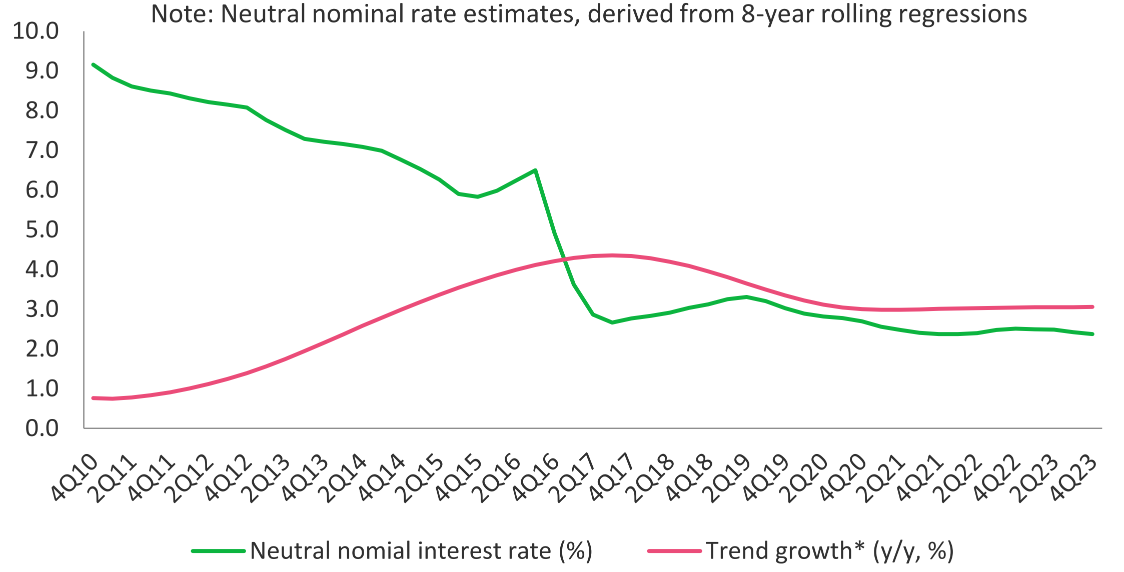
Long-run responses	
Long Term Nominal Rate - Constant	3.9
Core Inflation Deviations From Target	0.6
Output Gap	0.6
NEER y/y growth rate	-0.5

Note: The long-run responses are based on the coefficient of the lagged interest rate of the second specification of the Taylor Rule:

Long-term response to $\boldsymbol{X_i} = \frac{\boldsymbol{\beta_i}}{\boldsymbol{1-\rho}}$; where X is the regressor

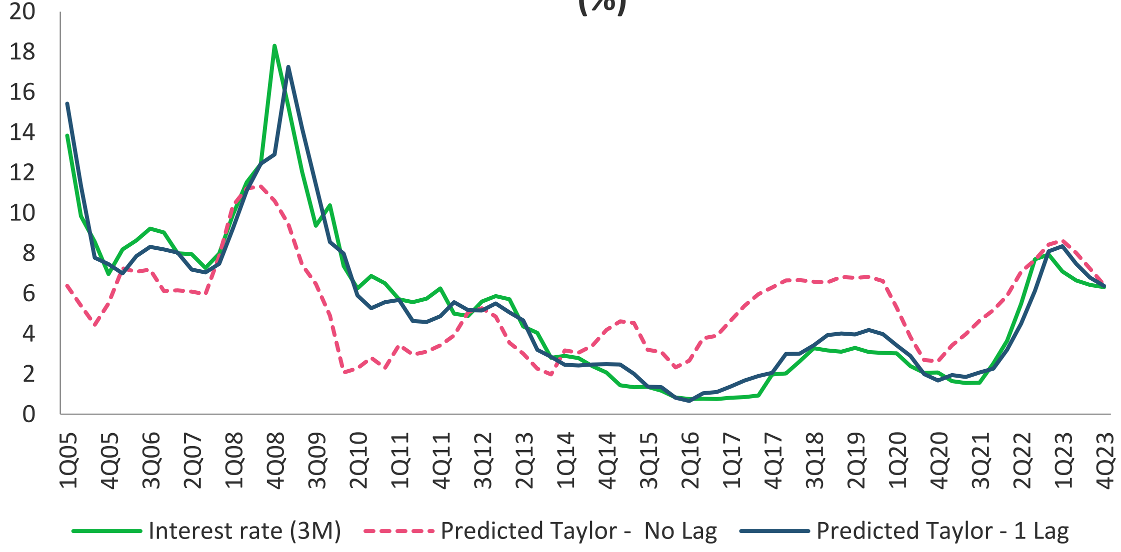
Monetary policy through Taylor Rule: What can we learn?

Neutral nominal rate estimates in Romania vs. trend growth (%)



Source: BCR Research estimates based on NBR and Eurostat data *) obtained using HP filter

Actual vs. Taylor Rule estimates for Romanian 3-month interest rate (%)



The constant term of the Taylor Rule provides an estimate of the long-term neutral nominal rate (sum of the neutral real rate and inflation target). Estimating an 8-year rolling regression based on the classical Taylor Rule equation, we find that the neutral rate has declined over the years, but has stabilized in the past five years. With trend growth estimated between 3% and 4%, the neutral nominal rate has been slightly below the trend growth starting from 2017.

Both model specifications fit the data relatively well, but the lagged model does a much better job at explaining policy developments. By nature, the Taylor Rule estimation is a backward-looking exercise with limited capabilities to determine where rates should be in the present, but one conclusion can be drawn: rates in Romania peaked at the end of 2022 and are now on a downward path. This is shown by both model specifications.

Estimating R*: Holston-Laubach-Williams (HLW) Model

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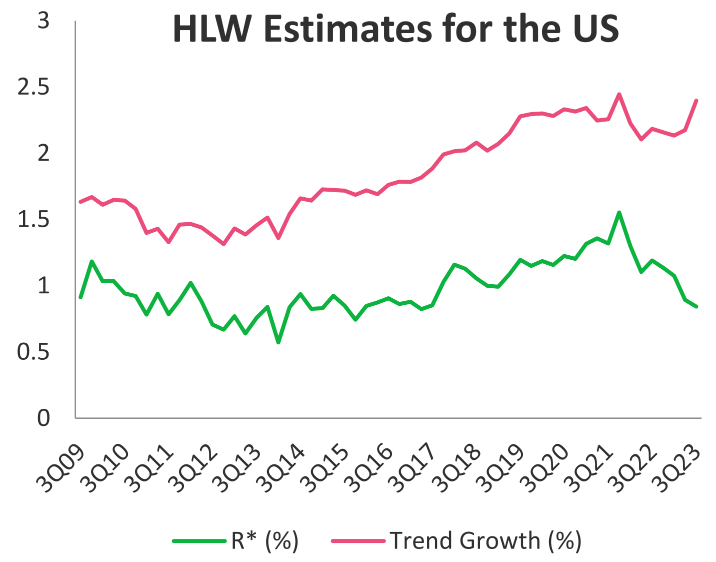
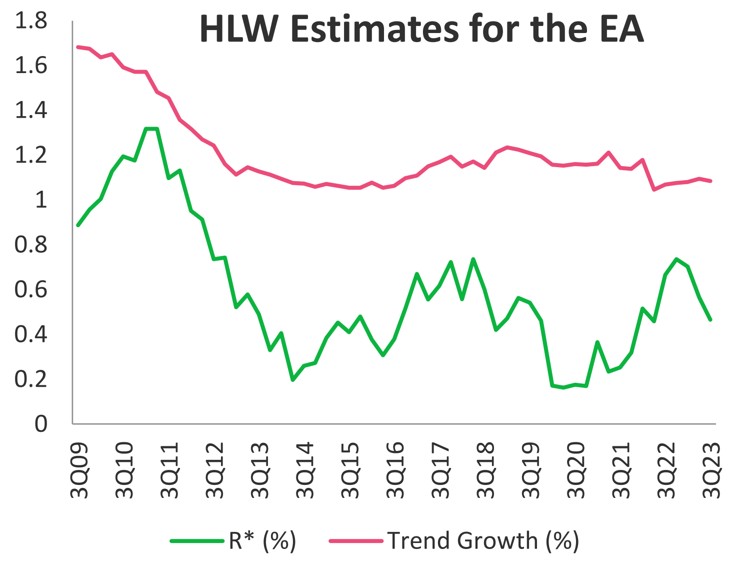
Neutral real interest rate (r*) estimated at 1.5% in Romania based on HLW model



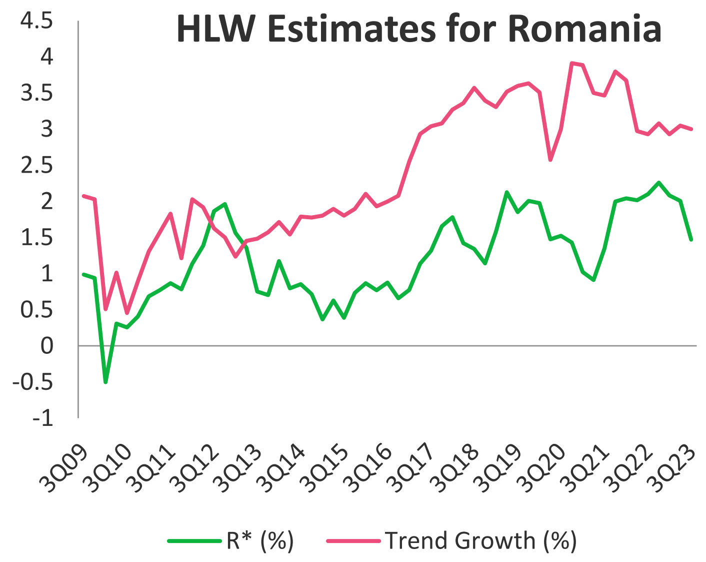
Source: NY FED

The Neutral Rate in the United States is estimated at around +0.8% and the trend growth at around +2.4% in the second half of 2023. The neutral rate reached the peak in post-Covid, reopening at around +1.5% in 4Q21, and has been declining in recent quarters.



Source: NY FED

The Neutral Rate in the Euro Area is estimated at +0.5% in 3Q23. Since the start of the war in 1Q22, the neutral rate has been rising and peaked at +0.7% in 4Q22. It has been gradually falling ever since, with the historical average standing at around +0.7%. The trend growth is estimated at around +1.1%.



Source: BCR Research Estimates

R star in Romania estimated at around +1.5% currently. The historical mean stands at around +1.2%. This implies a nominal interest rate of around 4.0%, which gives an idea regarding how much room the NBR has to cut rates before the monetary policy becomes procyclical. The trend growth is estimated between 3% and 4%.

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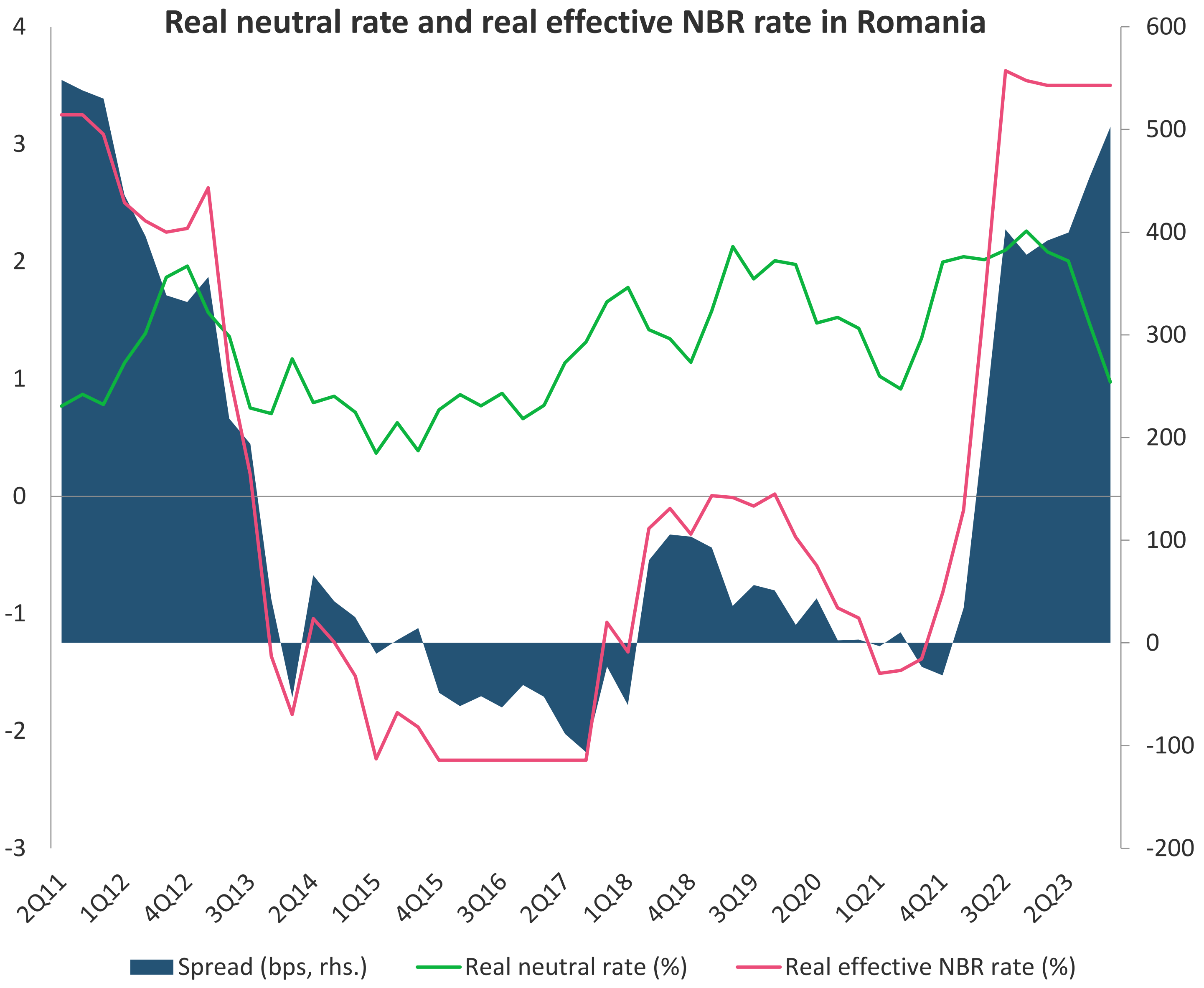
The models as well as the estimates for US and EA can be found here.



Source: NBR, Bloomberg, BCR Research

Note: the neutral rate is estimated using HLW model and the real effective NBR interest rate is calculated as nominal EFFECTIVE rate minus inflation target

Finding interest rate balance

In the last decade, the real effective rate of the NBR has been well below the neutral rate, suggesting that monetary policy was supportive for economic growth. This has been the case around the world, as interest rates after the Great Financial Crises were set at particularly low levels in order to support the recovery and boost potential growth. The recent inflationary episode caused a sudden change and the NBR real effective rate went well above the neutral rate. Looking into the future, it seems that the era of low interest rates is most likely behind – as stated numerous times by prominent figures of the financial world - and probably the most important thing at the moment is assessing how much room the central banks have to cut rates. Based on our estimates, the neutral nominal rate for the NBR should be between 4.00% and 4.50%.

Broad Money (M3) and monetary policy

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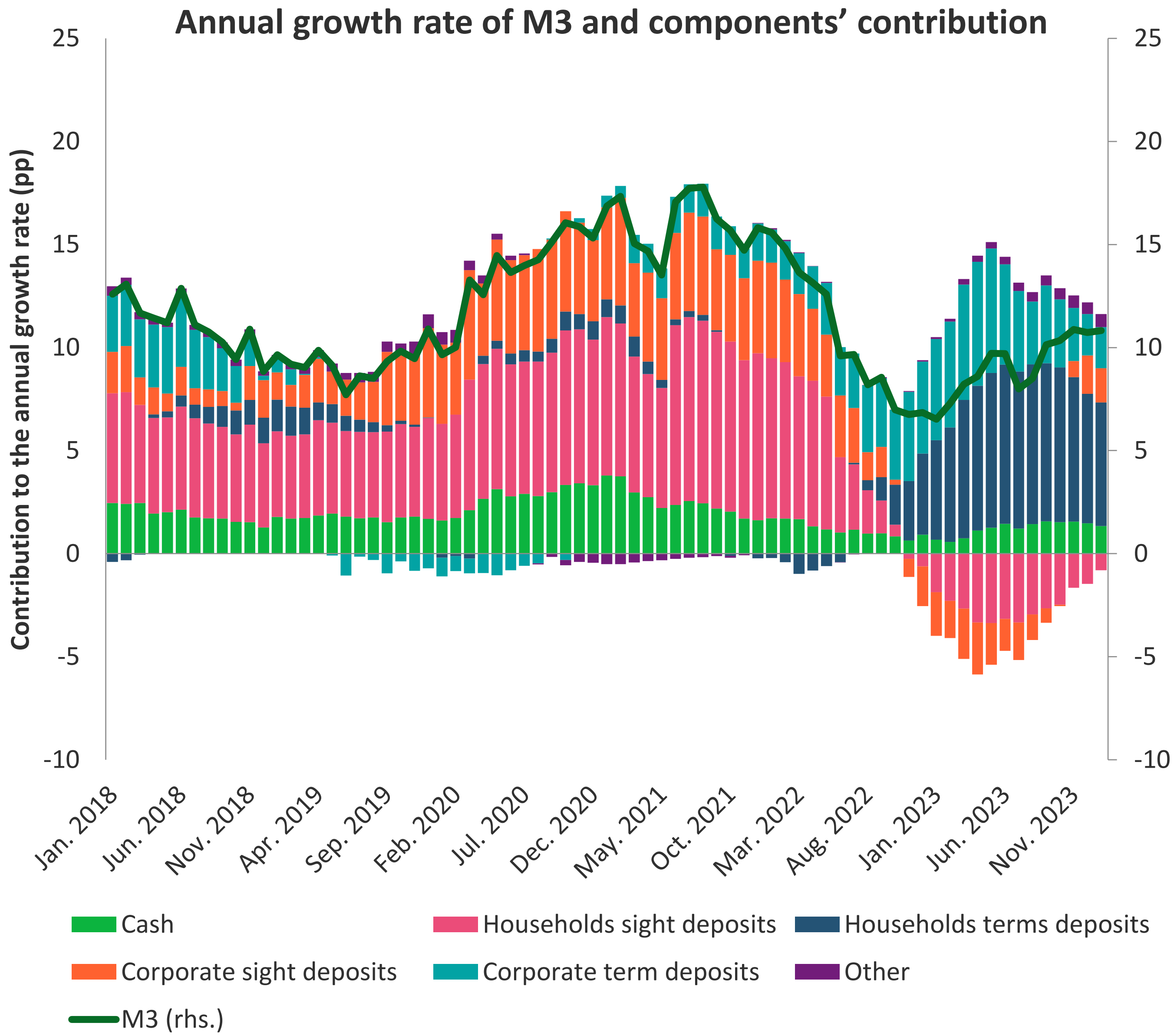

Source: NBR, BCR Research

Broad money (M3) under microscope

As has been the case around the world, M3 registered a sharp increase during the COVID-19 pandemic, which is attributed mainly to the large growth of both corporate and retail sight deposits. Once the energy shock kicked in at the start of 2022 and monetary conditions tightened, due to a surge in inflation, the annual growth rate of M3 slowed down significantly. In the following months, M3 reentered into an expansionary trajectory, but this time the growth is attributed to a rise in term deposits, while sight deposits had a negative contribution. This was to be expected, as higher interest rates made this type of financial product more attractive for clients.

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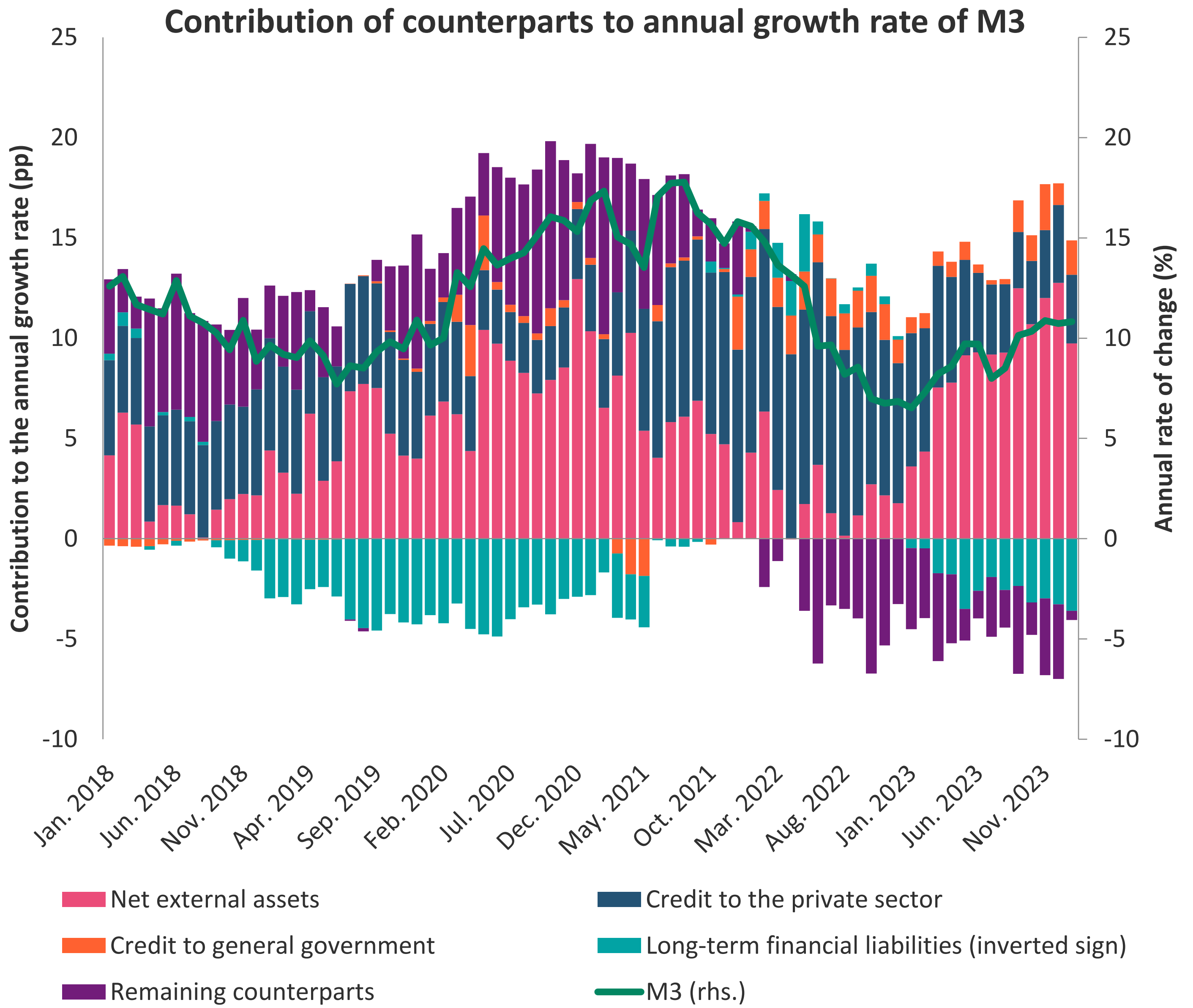

Source: NBR, BCR Research

Note: remaining counterparts include among other fixed assets and securities

But what about counterparts?

Looking at broad money (M3) through the lens of its counterparts, we can analyze the evolution through the asset's perspective. The following conclusions can be drawn: i) during the pandemic, the annual growth of M3 can be attributed mostly to a surge in net external assets; ii) the remaining counterpart component (which is mostly composed of fixed assets and securities) took a hit, due to monetary tightening, which, along with a significant lower growth rate from net external assets were mainly responsible for the drop in M3 growth toward the end of 2022; iii) lending slowed down significantly in 2023 and the contribution to the annual growth rate of M3 was about half of what it was in the past 2-3 years.

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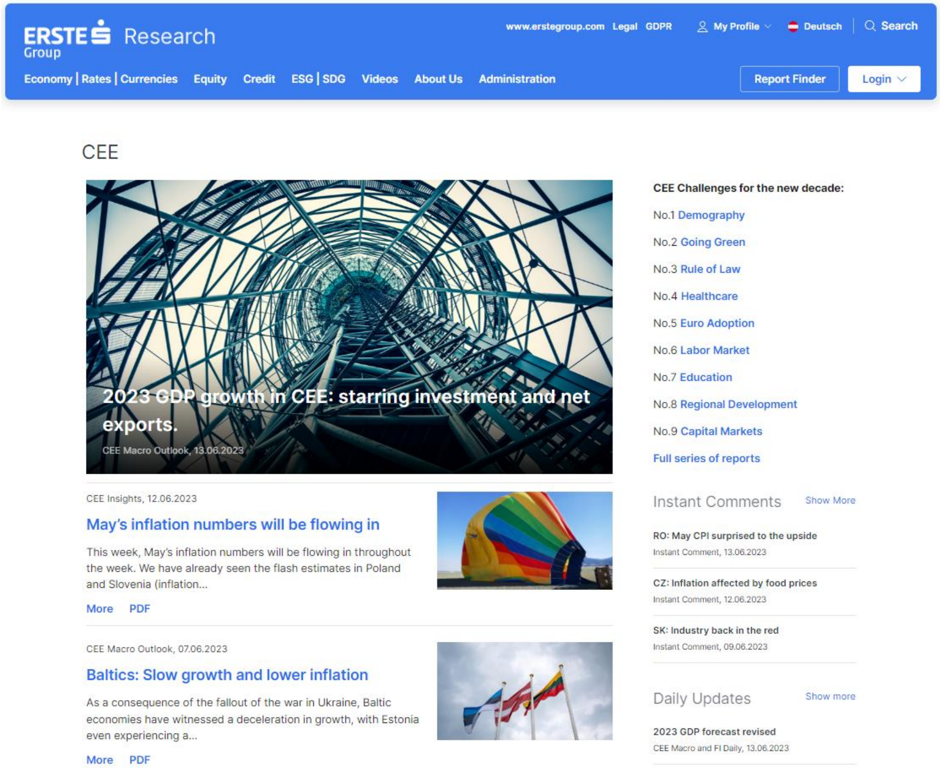

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Head Office: Wien
Commercial Register No: FN 33209m
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