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CHANGING WORLD, CHANGING IMPACT – THE MACROECONOMIC IMPACT OF THE EXCHANGE RATE¹

Just as the structure of the economy is in constant flux, macroeconomic correlations are in a constant state of change, too. From time to time, it is therefore worth reviewing, or even revising, earlier rules of thumb, because if they change, that can sway economic policy decisions. In all open economies, the relationship between the exchange rate and sustainable economic growth is a top priority. The exchange rate affects economic performance through numerous channels. The most important, one might even say fundamental, change of the 2020s is that the global inflation environment has been transformed considerably, when the world went from a low-inflation age into a decade characterised by massive price hikes. Consequently, companies' pricing has become much more flexible. As a result, the impact of the exchange rate on inflation has increased substantially, it almost doubled, and the effects can be felt twice as fast as in the 2010s. The temporary competitiveness advantage of the foreign trade channel is lower and its duration shorter than before, and domestic demand is being eroded more than earlier due to the greater inflationary impact. As regards the balance sheet channel, Hungarian actors' net foreign currency position was improved significantly by the forint conversion of FX loans and the Self-financing Programme in the 2010s, however, corporate and public FX debt started to grow again in recent years. Overall, exchange rate depreciation has a major inflationary impact, while its moderate positive effect on GDP typical in the second half of the past decade turned neutral or even slightly negative by the 2020s.

1. Why is the exchange rate important, and which are the channels where it impacts the economy?

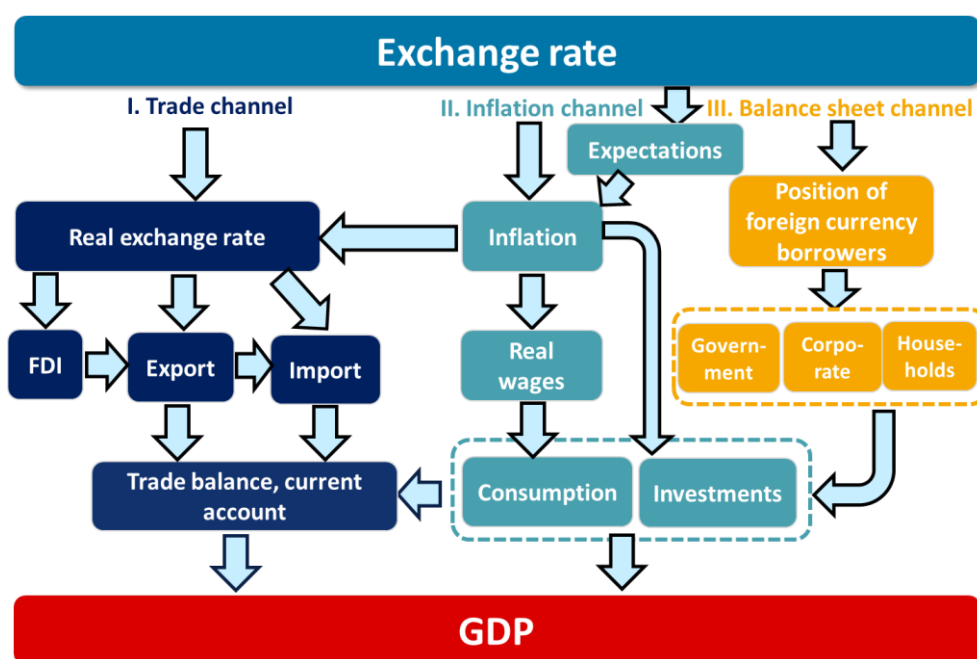
Hungary is a small and open economy, so the evolution of the exchange rate profoundly affects real economic developments. Hungary is in the top third within the EU when it comes to exports and imports relative to GDP: according to data from 2022, the country was ranked 9th in the EU in exports (90 percent of GDP) and 6th in imports (94 percent of GDP). In the CEE region, only Slovakia surpasses Hungary, with exports amounting to 99 percent of GDP and imports amounting to 105 percent

¹ The analysis is based on the underlying analysis discussed at the meeting of the Monetary Council on 4 July 2023.

of GDP. In the case of the countries similar to Hungary, with economies deeply integrated into world trade, the evolution of the exchange rate is crucial. But what are the channels where exchange rate fluctuations may influence real economic output?

The exchange rate affects macroeconomic developments through the foreign trade, inflation and balance sheet channel (Chart 1). The importance of these channels can vary widely, and they play different roles in the different eras of economic history. The foreign trade channel is the best-known and most commonly cited one of the three, but it is important to take into account the inflation and balance sheet channels, too, when estimating the real economic impact.

Chart 1: Three channels: the macroeconomic impact of the exchange rate



Source: MNB.

The structural factors that determine much of the exchange rate's impact are the structure of the economy (cost structure, import intensity, import substitutability), pricing processes and the open foreign currency position of the individual sectors. The increasing import intensity of the economy and the euroisation of contracts definitely reduce the temporary advantages arising from exchange rate depreciation, and so does limited import substitutability (in Hungary, energy is an imported commodity with limited substitutability). Shifts in pricing patterns also have a huge impact on the real economic effect of the exchange rate. A more flexible

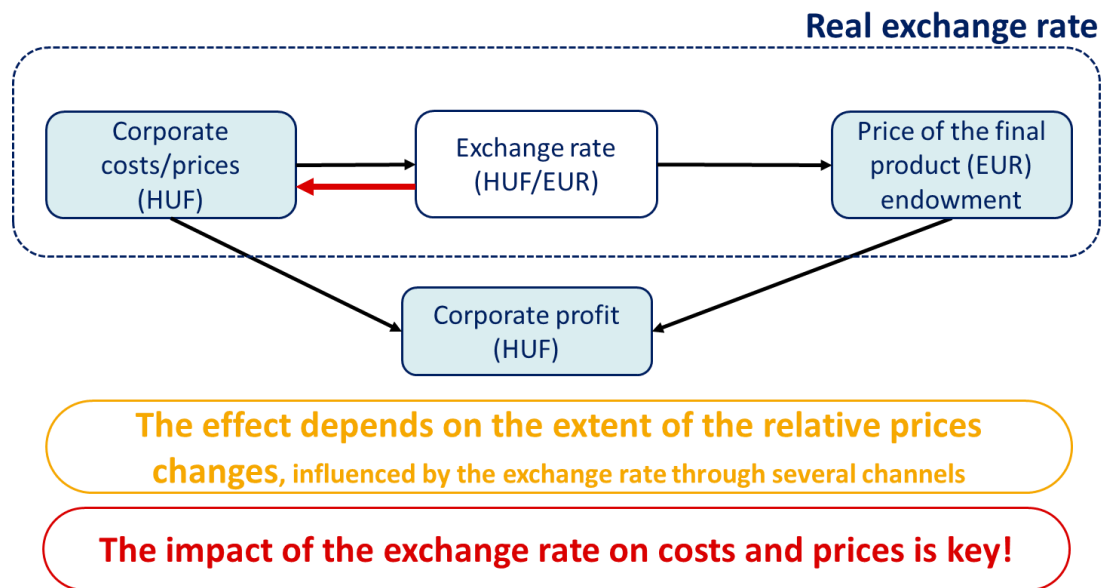
price system means that the impact of the exchange rate is reflected in prices quicker and to a greater extent, entailing lower quantity adjustment and weaker effects in the real economy and the labour market. The open foreign currency position of the individual sectors (households, state, corporations) can either strengthen or weaken the real economic impact through the wealth and income effects of revaluation.

2. Weakening foreign trade channel

From the perspective of price competitiveness and export impact, the so-called real exchange rate is much more important than the nominal exchange rate (Chart 2). The following schematic chart illustrates the effect of the nominal exchange rate on relative prices. If the exchange rate depreciates, and at least a part of the costs of Hungarian companies is incurred in forint, then exporting companies can temporarily realise larger profits from exports. This can be spent on investment, which facilitates growth, or the companies can enter export markets with lower prices in the long run, which increases their market share.

The strength of the channel is fundamentally influenced by how much the exchange rate drives the costs and prices of the exporting businesses. The first main dimension here is the import intensity of exports. The lower the share of the costs denominated in forint, the smaller the competitive advantage in the corporate sector. The competitive edge offered by the exchange rate is also lowered by the so-called euroisation, where contracts even between domestic parties are denominated in foreign currency. And last but not least, how much and how fast prices and costs adjust to the weaker exchange rate is also crucial. The strengthening of the connection between the exchange rate and the prices and costs, and/or the acceleration of the process means that the favourable relative price changes arising from the shifts in the nominal exchange rate are [neutralised by the higher costs and prices](#). Therefore any analysis of this topic should not look at the nominal exchange rate alone, because ultimately the macroeconomic impact is determined by the real exchange rate.

2: Schematic chart of the impact of the real exchange rate



Source: MNB.

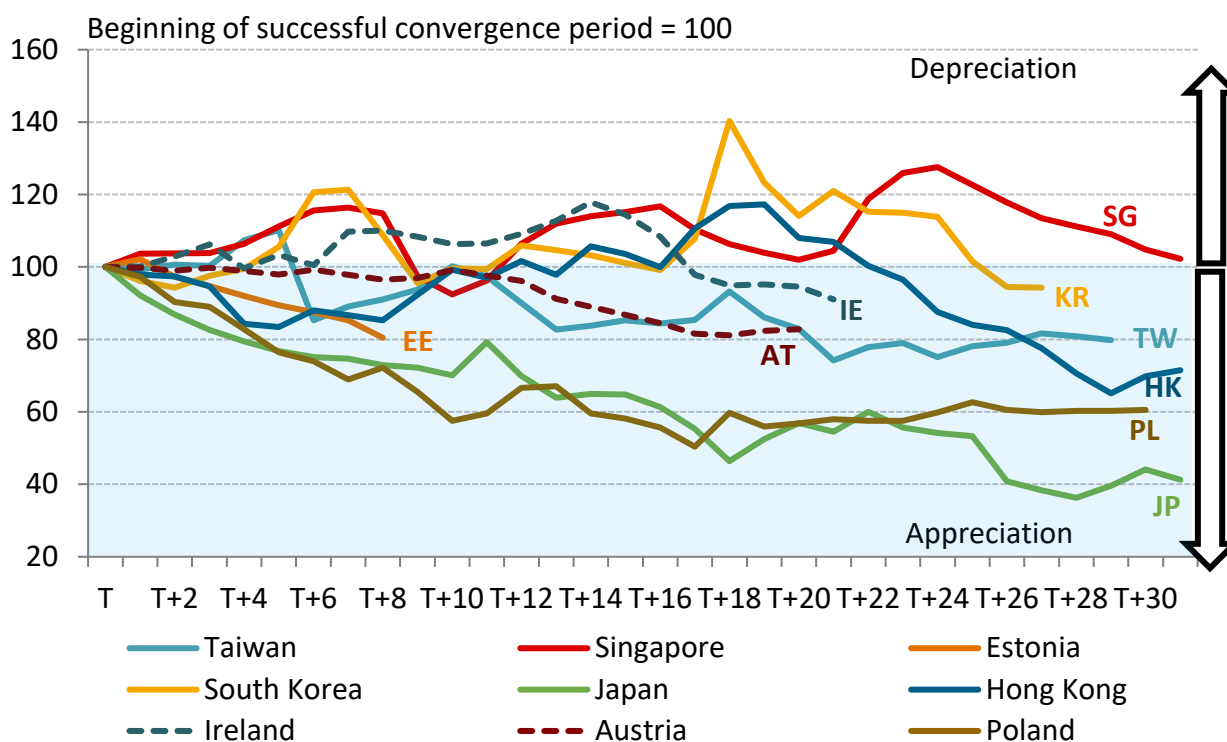
2.1 International experiences – Economic convergence entails real appreciation

Successfully converging economies typically exhibit real exchange rate appreciation. [Identifying](#) converging countries in the modern history of economics and understanding their success can help find the appropriate responses to the challenges faced by the Hungarian economy. It is a common observation that the currency of a converging economy appreciates in real terms, which leads to a convergence in price levels (Chart 3). This process is referred to as the Penn effect (a detailed analysis can be found [here](#)).

In the long run, the factor with the greatest impact on export performance is competitiveness. In the economies that completed export-driven convergence, the continued improvement in competitiveness and productivity proved to be crucial, as it offset the rise in relative prices and thus the convergence of their price levels.

According to international experiences from European Union countries, no positive correlation can be identified in the long run between the change in the real effective exchange rate and the rise in the volume of exports. Similarly, no link can be established between the change in the real exchange rate and foreign direct investments (FDI), as CEE countries were able to attract capital even in the context of appreciation and/or a stable exchange rate. Examples include the Czech Republic, Bulgaria, Croatia and Estonia, where net FDI amounted to over 50 percent of GDP, and they lead the EU in this respect.

3: The evolution of the real effective exchange rate in successfully converging economies



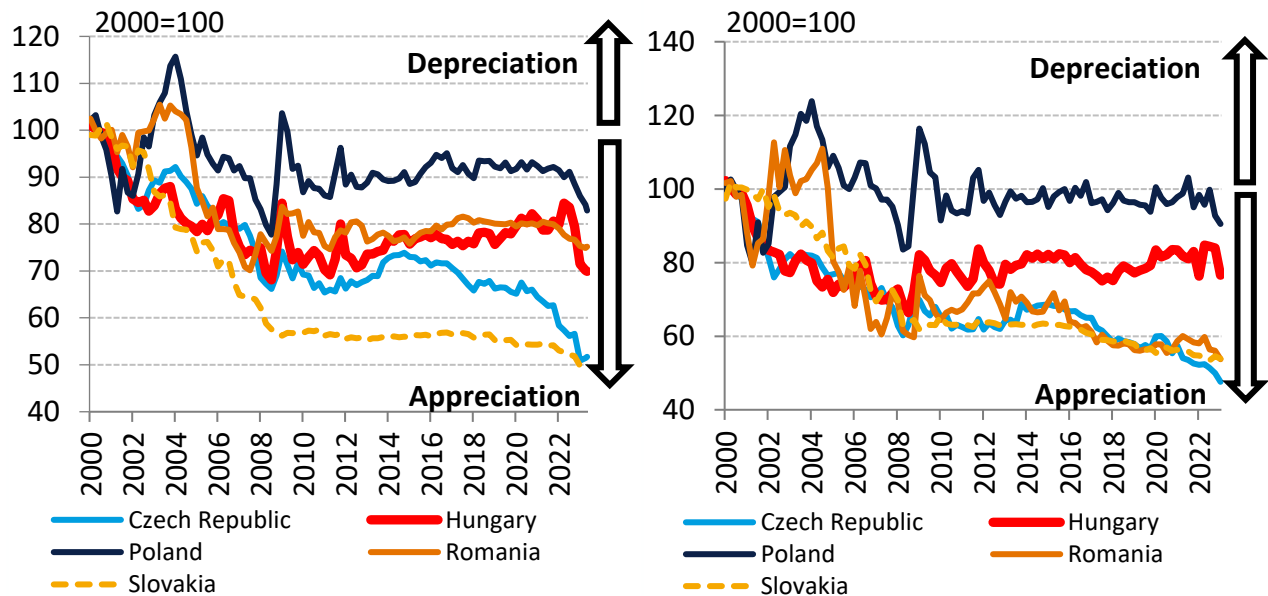
Note: T=start of the successful convergence period. Singapore=1964; Taiwan=1968; South Korea=1980; Ireland=1986; Poland=1991; Estonia=1999. Japan, Austria=1960; Hong Kong=1969. In the last three countries, the successful convergence period started before that, but they are shown in the chart from this point due to the lack of data.

Source: Bruegel, MNB calculation

2.2 The evolution of Hungary's real exchange rate is in line with CEE patterns

Hungary's real exchange rate calculated on the basis of consumer prices and unit labour costs appreciated along with the CEE average in the past 20 years (Chart 4). Within this, a quicker real appreciation was seen in the first 10 years, followed by relative stability between 2010 and 2021. The waves of inflation in the past three years had a particularly strong impact in the CEE region, entailing a general real appreciation in the V4 countries and Romania. But it has to be underlined that the Hungarian real exchange rate is in line with the CEE patterns, and the real exchange rate based on unit labour costs puts the forint among the more depreciated currencies in the region.

4: Real exchange rate (against the euro) based on consumer prices (left panel) and unit labour costs (right panel) in the CEE region

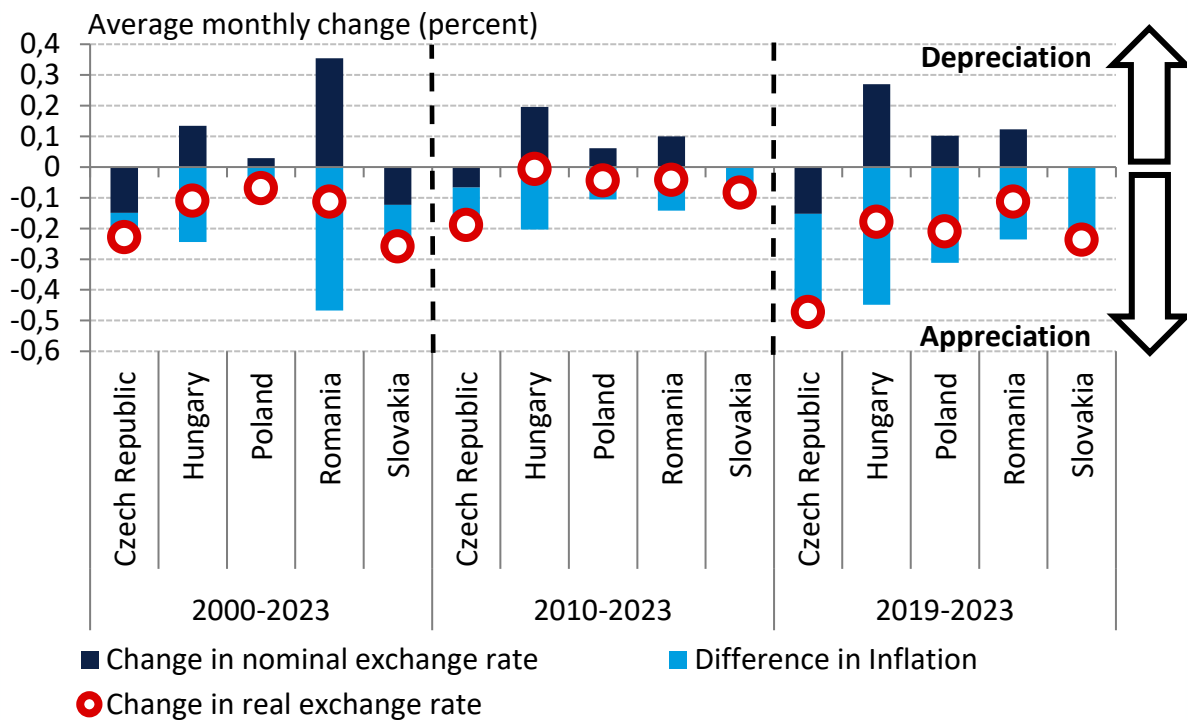


Note: The charts show data from 2000 Q1–2023 Q2 for the real exchange rate based on the price level and from 2000 Q1–2023 Q1 for the real exchange rate based on unit labour costs.

Source: MNB, Eurostat.

In the past 20 years or so, real exchange rates in the CEE region have appreciated, but the nominal path varies across countries (Chart 5). The Czech Republic and Slovakia recorded the highest real exchange rate appreciation in the past 20 years, and the strengthening of the nominal exchange rate played a major part in this, while the excess inflation compared to the euro area only had a moderate effect. Hungary and Romania had a more muted real appreciation in this period, although excess inflation was much higher than in the euro area, but this was somewhat offset by the depreciation of the nominal exchange rate. Poland exhibited very limited nominal depreciation in the past two decades, but the country had the smallest excess inflation compared to the euro area, making the overall real exchange rate appreciation the lowest in the CEE region. The country only had a higher inflation differential in recent years, but that has been a common trend in the CEE region.

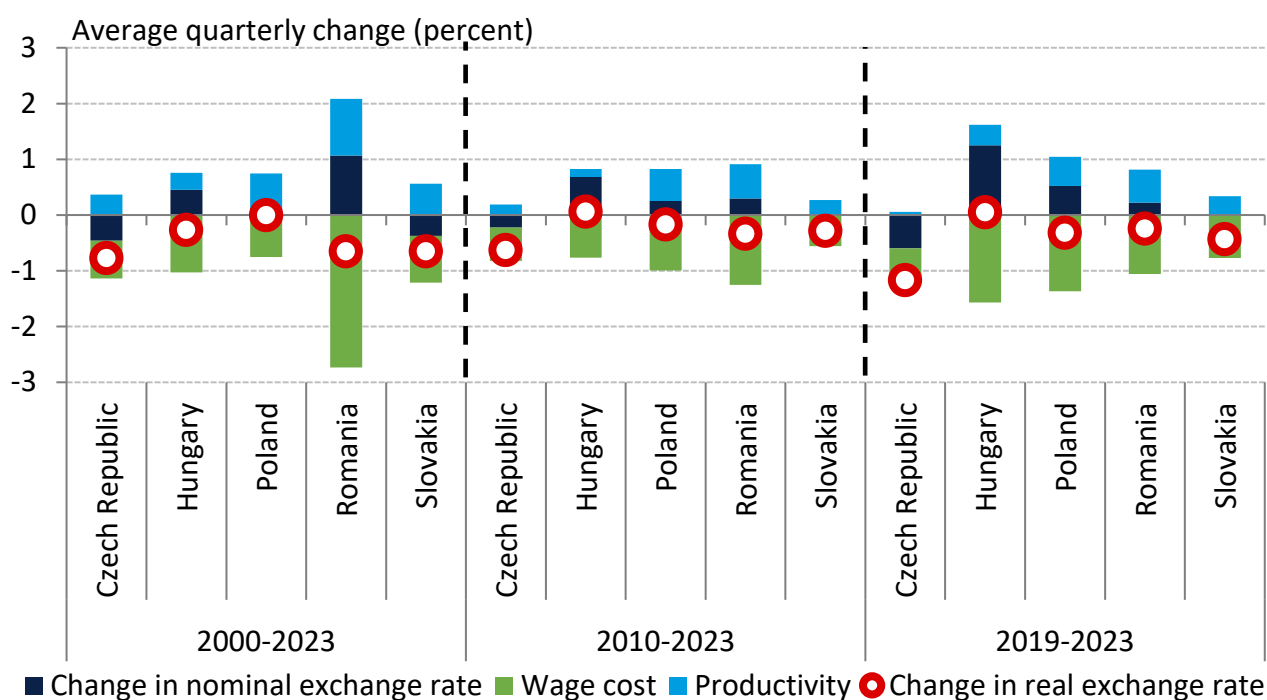
5: Decomposition of the real exchange rate (against the euro) based on consumer prices in the CEE region (until May 2023)



Note: Real exchange rate based on price levels, using HICP data.
Source: MNB, Eurostat.

Experiences from the CEE region show that increasing labour productivity can offset the negative effect of quicker wage growth on (price) competitiveness (Chart 6). A notable example in the region is Poland, where the unit labour cost-based real exchange rate against the euro did not appreciate over the long run because productivity growth compensated for higher wage growth. In Hungary, this figure has been stable since 2010, but this was mainly influenced by weaker productivity growth and a more depreciated nominal exchange rate. Boosting productivity is crucial because if it rises considerably, then nominal or price-based real exchange rate appreciation does not undermine the competitiveness of a country's export sector. This is supported by the fact that no long-run correlation can be established between export growth and price-based real exchange rate fluctuations.

6: Decomposition of the real exchange rate (against the euro) based on unit labour costs in the CEE region (until 2023 Q1)



Source: MNB, Eurostat.

2.3 The changing relationship between the exchange rate and costs/prices

The Hungarian economy is highly import intensive by CEE standards, which reduces the impact of nominal exchange rate fluctuations on competitiveness. In Hungary, the cost structure of large exporters includes a sizeable chunk of FX costs, because the greatest exporters also generate considerable import demand. The import share of Hungary's manufacturing output (52.3 percent) is the highest in the CEE region, with the same figure standing at 47.1 percent in Slovakia, 36.4 percent in the Czech Republic, 25.6 percent in Poland and 17.3 percent in Romania. The high proportion of imports by international standards definitely reduces the effects of the Hungarian exchange rate registered through the (price) competitiveness and trade channels.

The cost structure of SMEs includes a greater proportion of elements denominated in forint, attributable to the higher share of wage and such businesses' deeper integration into the Hungarian economy. In the 2010s, depreciation had a positive effect on SME exports, as a 10 percent nominal exchange rate depreciation is estimated to have increased the likelihood of SMEs entering the export market by

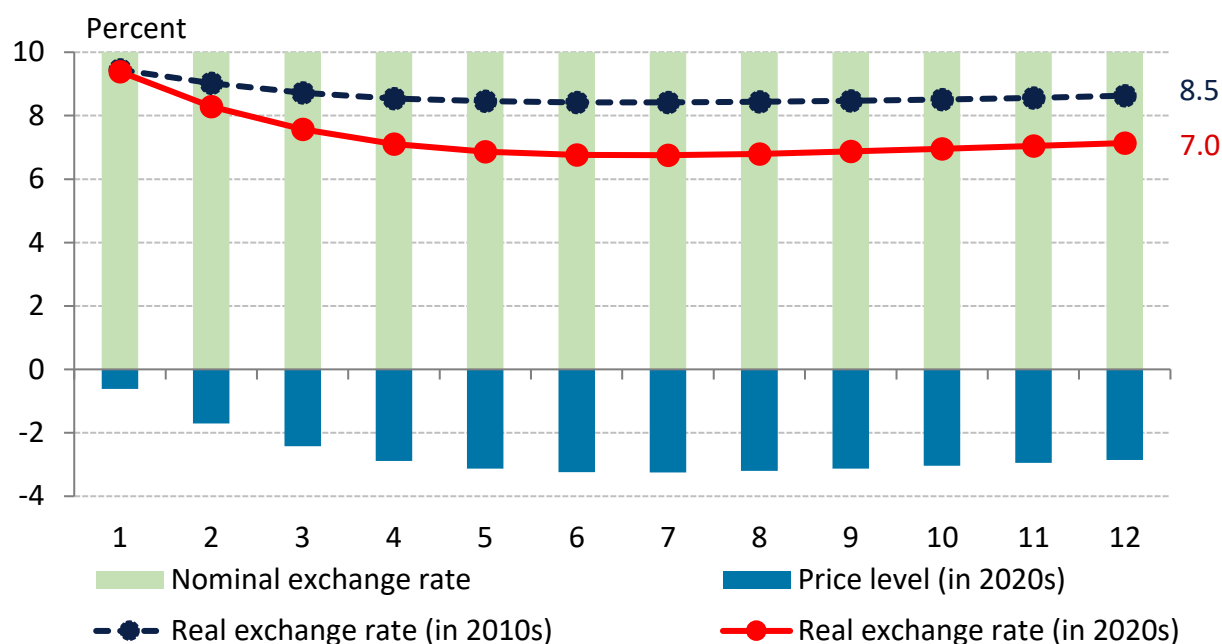
almost 30 percent. *Ceteris paribus*, the 10 percent depreciation of the nominal exchange rate between 2010 and 2019 boosted the sales of exporting small and medium-sized enterprises by 7–8 percent.

However, the pass-through of the exchange rate into prices has changed, which moderates export effects. Exchange rate fluctuations were reflected in companies' prices earlier and to a greater extent than before. This greater pass-through was influenced by several factors, including the high costs seen recently across the world economy as a whole and the marked change in pricing behaviour. Currently, an exchange rate depreciation of 1 percent lifts consumer prices by 0.25–0.35 percent over the course of a year. Earlier, the same figure was 0.1–0.2 percent, so the impact of the exchange rate on prices has doubled, and the speed of the effect is now twice as high, too.

Due to the stronger exchange rate pass-through, the nominal exchange rate has a more muted impact on the real exchange rate, in other words (price) competitiveness (Chart 7). In the 2010s, a 10 percent nominal exchange rate depreciation changed the real exchange rate by 8.5 percent, as Hungarian prices increased by 1.5 percent as the exchange rate weakened. By contrast, in the 2020s the inflationary impact was larger, and a 10 percent nominal depreciation now translates into a real exchange rate depreciation of only 7 percent. As a result, the positive effects on exports are also more moderate.

Due to the greater exchange rate pass-through, the favourable effects seen at SMEs moderated in the 2020s. A 10 percent depreciation increases SME exports by only around 6 percent, so although the positive impact on exports can still be seen, it is now more limited than in the previous decade.

7: The impact of a 10 percent exchange rate depreciation on Hungarian prices and the real exchange rate



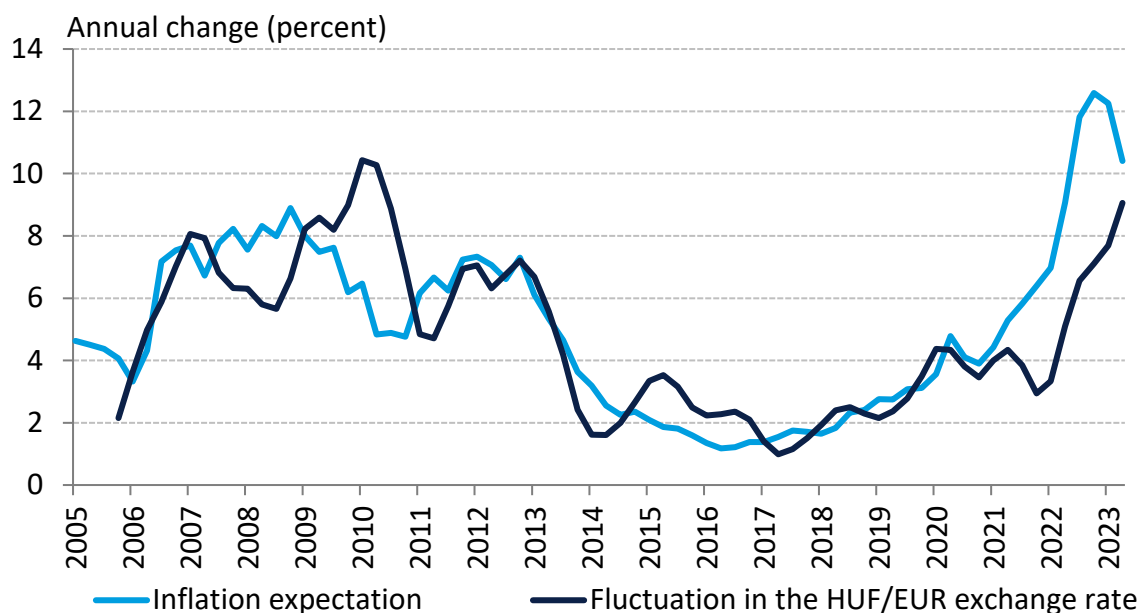
Source: MNB calculation.

3. As the inflation channel strengthens, the negative effects of depreciation on domestic demand are becoming increasingly pronounced

As shown above, the correlation between the exchange rate and prices strengthened once again in Hungary. This also means that the exchange rate depreciation raises inflation and reduces real wages more than in the 2010s, which translates into a greater contraction in domestic demand. Household consumption and investments have a high import content in Hungary, so a depreciation can make products and services from abroad considerably more expensive. Higher prices eat into households' real wages, and companies also need to spend more on imported capital goods. Depreciation mitigates domestic demand through these channels, which is detrimental to growth. **The strengthening of the exchange rate pass-through further heightened these negative effects in the past years.**

Expectations play a crucial role in the inflation channel. Greater exchange rate volatility lifts inflation expectations (Chart 8). In the past roughly 20 years, a clear correlation could be identified between households' inflation expectations and exchange rate volatility. Households' inflation expectations were higher when the exchange rate fluctuated widely. Exchange rate fluctuations affect inflation expectations and thus also the evolution of inflation itself.

8: Hungary's inflation expectations and the fluctuations in the HUF/EUR exchange rate (2005 Q1 – 2023 Q2)



Note: The chart shows a smoothed time series quantified by the standard deviation of the changes in the exchange rate in the 1 year preceding the exchange rate fluctuation at a given point.

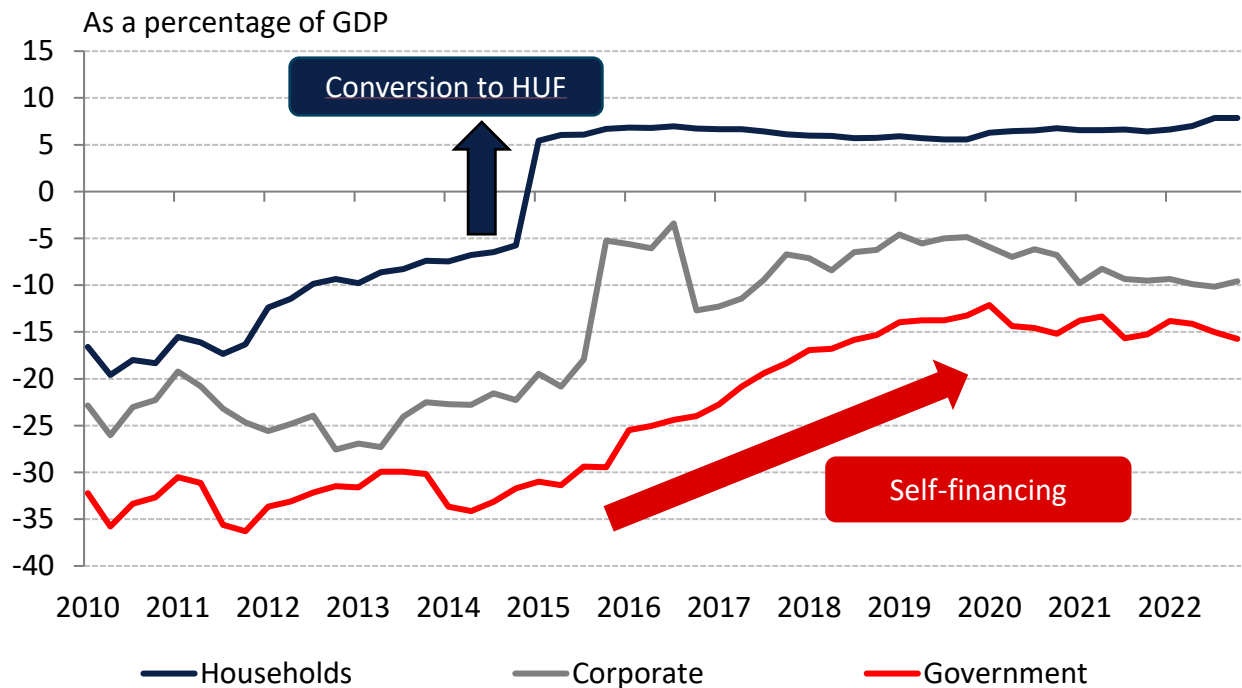
Source: MNB, European Commission.

4. Balance sheet channel: FX debt on the rise again in recent years

The factors determining the impact of the balance sheet channel are also changing. Although the forint conversion and self-financing significantly reduced the foreign currency exposure, negative trends can now be seen among companies and the government (Chart 9). The forint conversion of household FX loans helped households in the mid-2010s, and the average net FX claims improved from between –15 and –20 percent of GDP to +5 percent of GDP in 2015. In the case of the government, self-financing went a long way to improve the balance of net FX claims, and the sector's position increased from roughly –35 percent in 2015 to around –10 percent. Nevertheless, the past few years brought about a slightly deteriorating trend, and the government's open foreign currency position increased once again. In the case of companies, although net FX claims were down from the first half of the 2010s, they went up from –5 percent of GDP in 2019 to around –10 percent currently. **All in all, the balance sheet channel has improved significantly from the early 2010s, but 2020 saw the return of negative trends in the government and**

corporate sectors, which reduces the real economic impact of exchange rate depreciation.

9: Average net FX claims



Note: In the case of positive figures claims exceed the debt, while the reverse is true for negative figures.

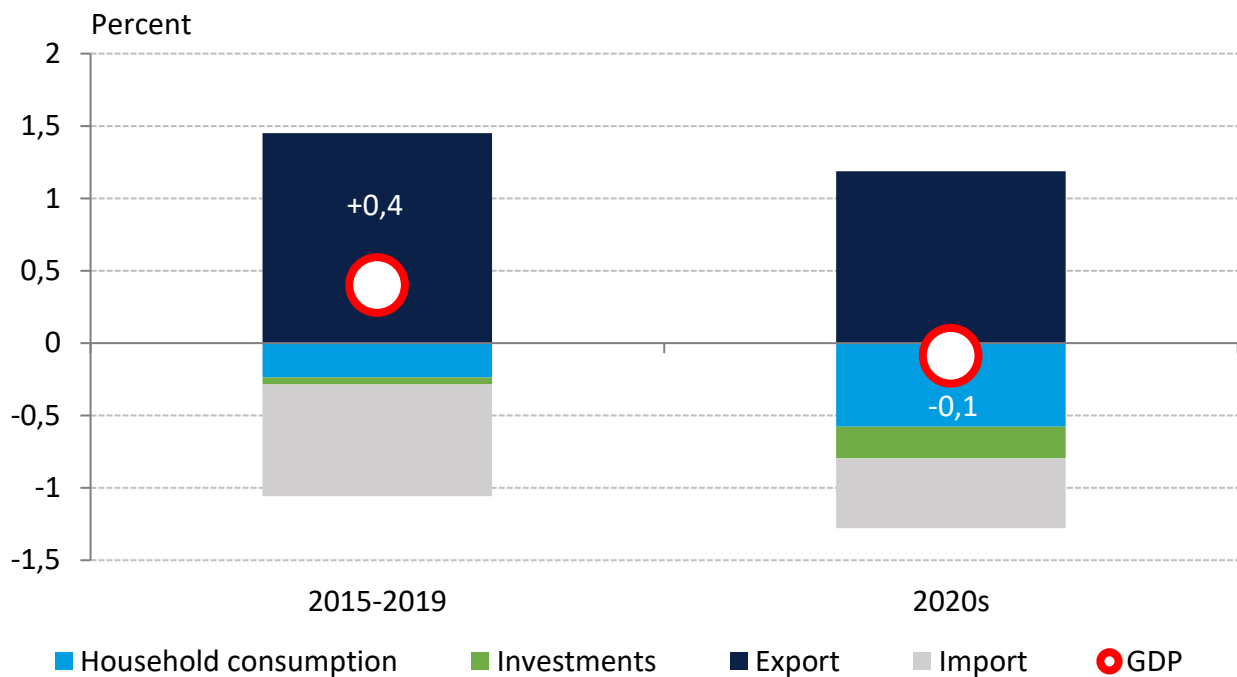
Source: MNB, Government Debt Management Agency (ÁKK), MNB calculation.

5. The overall real economic impact is neutral, or slightly negative

The exchange rate depreciation is estimated to have raised GDP in 2015–2019, but it currently has a neutral or slightly contractionary impact (Chart 10). The changing structural factors also changed the macroeconomic effects of the exchange rate. Hungarian prices and costs respond more and quicker to the weaker exchange rate, so the relative competitive advantage has been moderated compared to the previous decade, and the conducive effect on exports has also become weaker. The impact on inflation increased, therefore real wages are reduced more, which entails a greater drop in consumption. Moreover, a depreciated exchange rate makes purchasing imported capital goods more expensive, and this weighs on investment activity. Imports are rising much more moderately due to the smaller export effect and the greater contraction in domestic demand items. Based on estimations, the domestic substitutability of Hungarian imports is limited due to their structure as well as the low productivity and qualitative features of Hungarian sectors. **Taken**

together, the changing correlations entail a slightly reduced GDP due to the weaker exchange rate, while earlier this process stimulated growth.

10: Decomposition of the change in GDP levels in the case of a 10 percent exchange rate depreciation



Note: Average impact of a one-off but permanent 10 percent exchange rate depreciation on GDP and its components, in the first two years.

Source: MNB calculation.

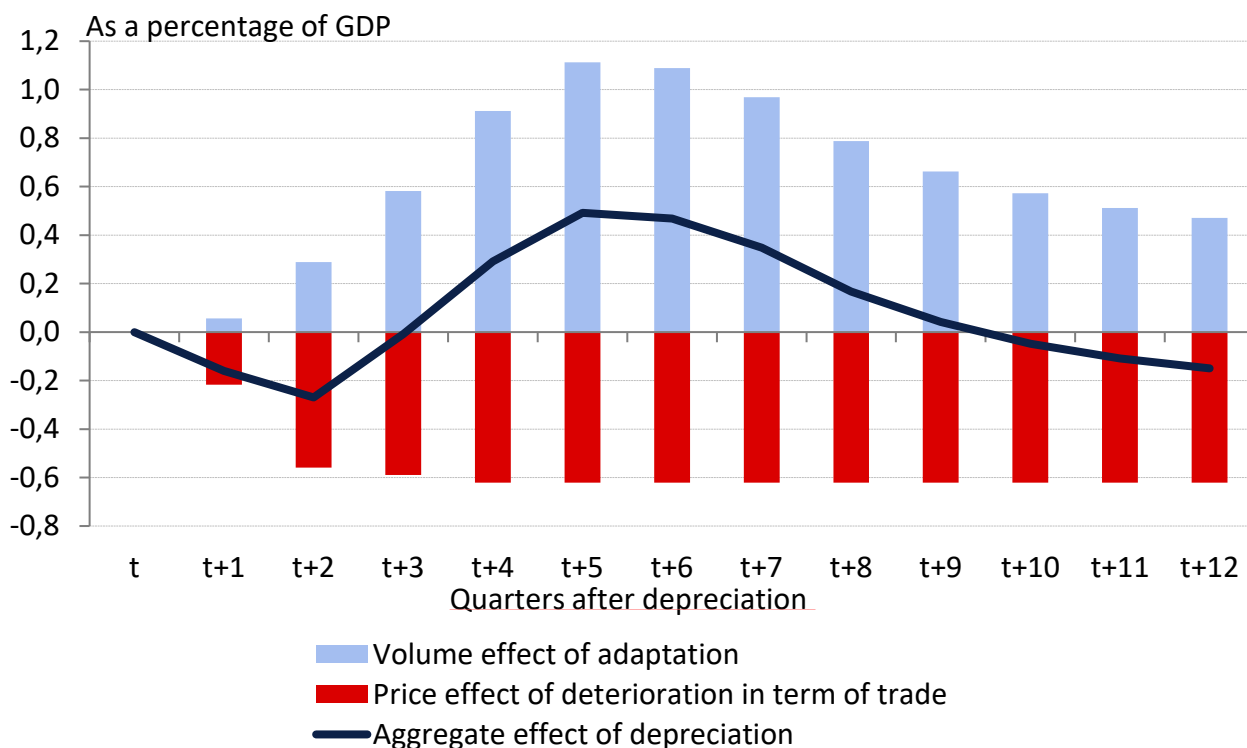
6. Depreciation has a negative budgetary impact, and it further erodes the current account

Exchange rate depreciation raises the current income of the general government due to the rise in nominal paths, but it is estimated that this is exceeded by the growth in expenditure. Although tax revenues increase on account of the higher prices, the contracting volume of consumption reduces this effect. Expenditure items also increase: besides the energy bill expressed in forint, pension expenditure grows due to pension indexation, while the government’s interest expenditure rises mainly on account of the higher interest payments on the papers tied to inflation. It should also be noted that depreciation also makes government investments and consumption more expensive, because these expenditure items also have a large import component. **Overall, the depreciating exchange rate raises the budget**

deficit. Due to the higher deficit and the revaluation of FX debt, government debt will also be greater.

The impact of exchange rate changes on the current account arises from two opposing forces. First, volumes improve the external balance because exports increase (albeit less than earlier), and domestic demand contracts, which hampers imports. At the same time, the terms of trade are estimated to be worsened by depreciation in the short run, because it is reflected sooner and to a greater extent in import prices than in the export price index. Consequently, the volume effect improves the current account balance, while the price effect undermines it.

11: Impact of a 10 percent depreciation on the current account balance



Source: MNB calculation.

The so-called J curve effect holds true for the current account: the terms of trade effect is stronger in the short run than the volume effect (Chart 11). A 10 percent exchange rate depreciation undermines the current account balance in the short run, as the adjustment in trade volumes takes longer than the price effect arising from the deterioration in the terms of trade. After a few quarters, the volume effect starts to dominate, and the current account balance starts to improve slightly over a one- or two-year horizon.

7. Summary

The structure of the economy is in constant flux, and macroeconomic correlations are in a constant state of change, too, which can influence economic policy decisions. Therefore it was examined how the impact of the exchange rate on real economic performance, as exerted through the main structural factors and channels, changed in the 2020s. As inflation returned to the world as a whole, companies' pricing has become much more flexible, and the impact of the exchange rate on inflation has increased substantially, it almost doubled, and the effects can now be felt twice as fast as in the 2010s. The temporary competitiveness advantage of the foreign trade channel is lower and its duration shorter than before, while domestic demand is being eroded more than earlier due to the greater inflationary impact. As regards the balance sheet channel, Hungarian actors' net foreign currency position was improved significantly by the forint conversion of FX loans and the Self-financing Programme in the 2010s, however, corporate and public FX debt started to grow again in recent years. Overall, exchange rate depreciation has a major inflationary impact, while its moderate positive effect on GDP typical in the second half of the past decade turned neutral or even slightly negative by the 2020s.

All economic actors need to take a new approach to the exchange rate: a stable and predictable exchange rate path helps restore and maintain low inflation and facilitates sustainable economic convergence. This is especially true in light of the fact that in the new decade preserving the results of the earlier extensive growth period and continuing sustainable convergence requires importing knowledge and talent along with modern technologies. Moreover, any significant increase in domestic actors' income calls for outbound investment. The 2020s are characterised by different factors than previous years, and this requires a new approach to the exchange rate, too.