

What do strong labour markets tell us about monetary tightening in the euro area, US and UK?

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7 November 2023

Abstract

Despite significant interest rate hikes by the Bank of England, the European Central Bank, and the Federal Reserve since the post-pandemic inflation surge, and other global shocks like the war in Ukraine and China's slowdown, the euro area, UK and US economies proved to be surprisingly resilient. Recessions have been avoided, and labour markets are at historical highs. In this paper, we document the similarities and differences between the current monetary tightening episode with earlier episodes and analyse the developments of actual and equilibrium interest rates. We argue that a possible explanation for the anomaly of resilient economies despite monetary tightening and global shocks can be the extent of monetary tightening: moving from a highly accommodative monetary policy stance to a broadly neutral (but not contractionary) monetary policy stance. Our findings imply that (1) unless central banks will significantly tighten further, monetary policy is unlikely to exert a significantly negative effect on the economy, (2) the reduction of core inflation might prove to be challenging, while headline inflation falls along with a decline in energy prices, and (3) high nominal interest rates might persist for long.

This paper was prepared for the Nomura Foundation's Macro Economy Research Conference 2023 on 'Monetary Policy and its Impact during Inflation', Tokyo, 19 October 2023. The authors thank the Nomura Foundations for support, conference participants for useful comments and suggestions, and Conor McCaffrey and Lennard Welslau for their help with Bloomberg data.

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1. Introduction

Inflation increased to close to 10% in advanced countries in 2022, far exceeding the 2% inflation target. Following an era which was labelled as “low for long”, referring to various explanatory factors that can keep real interest rates and inflation low, the huge inflation shock came as a surprise.

Among advanced countries, inflation pressures emerged first in the United States in the spring of 2021. This initial inflation surge was related to the recovery of the US economy from the COVID-19 pandemic recession, the Federal Reserve’s monetary stimulus, and the massive fiscal stimulus that initially President Trump, and then President Biden, implemented. At the same time, supply disruptions due to the pandemic resulted in shortages of key inputs, while US consumption shifted from services to goods, but goods demand was not matched by the supply. Global commodity prices started to surge in early 2021, up from the lows observed during the 2020 pandemic recession. The increase in energy prices accelerated with Russia’s threat to invade Ukraine in the second half of 2021, and further escalated after the invasion actually happened in February 2022. The latter energy price increase proved to be temporary since, by the end of 2022, energy prices fell below values observed before the invasion.

Despite rising inflation in 2021, all forecasters foresaw only a small and temporary rise in inflation. For example, in November 2021, the European Commission forecast suggested 3.3% inflation in the United States, 3.2% inflation in the United Kingdom and 2.2% inflation in the euro area in 2022, followed by lower inflation in 2023 – 2.2% in the US and UK, and 1.4% in the euro area. Other multilateral institutions like the IMF and OECD, central banks, and private professional forecasters did no better in predicting the 2022 huge inflation surge.

Perhaps related to this forecasting failure, major central banks kept highly expansionary monetary policy stances until inflation had already increased to high levels. Interest rate hikes started belatedly. The Bank of England opened the line of interest rate hikes in December 2021, when inflation was already 5.4%. The Federal Reserve started interest rate hikes in March 2022, when inflation was 5.8% in terms of the price deflator of private consumption expenditures (PCE) and 7.0% in terms of the consumer price index (CPI)¹. The first rate increase of the European Central Bank was implemented in July 2022, when inflation had reached 8.9%. Net asset purchases were terminated a month earlier than the first interest rate hike in the case of the Bank of England, and in the same month as the first interest rate hike in the cases of the Federal Reserve and ECB. The reduction of central bank asset holding started three months later in the cases of the Bank of England and the Federal Reserve.

Beyond the forecasting failure, the reasons for the 2021 complacency about inflation could have been fuelled by three factors. The first is the difficulty in leaving behind the narrative of “*low for long*”, when central banks achieved limited success in increasing inflation from below-target levels. Since the Federal Reserve switched to average inflation targeting in August 2020 (implying that below-target inflation should be compensated by above-target inflation) and the ECB replaced its ambiguous “*close to but below 2% over the medium-term*” objective with a symmetric 2% inflation target in July 2021, some inflation above 2% inflation must have been welcomed by central bankers². Secondly, monetary policy can best address excess demand surges, but there were important supply-side bottlenecks which contributed to inflation. Due to the pandemic, global trade flows were

¹ The Federal Reserve inflation target indicator is the price deflator of private consumption expenditures (PCE), not the CPI. The US CPI data is more comparable to euro area HICP and UK CPI data than the PCE data.

² See Darvas and Martins (2021) for an evaluation of the ECB’s new inflation target.

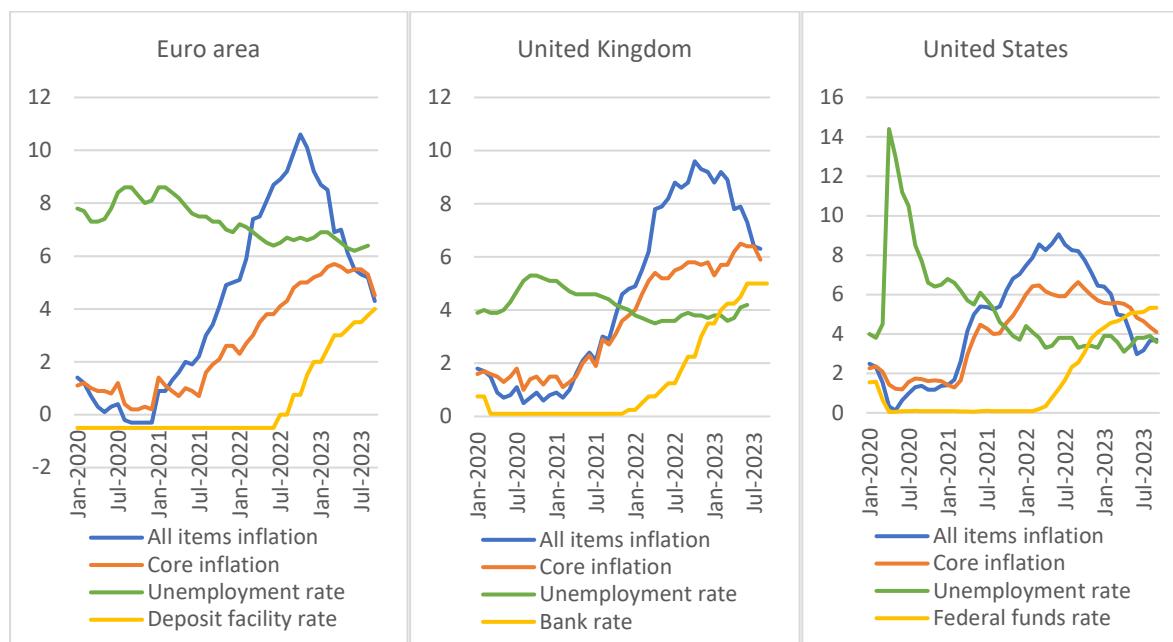
impaired, shipping costs skyrocketed, and there were shortages of various materials. In Europe, Russia started to cut back its gas supply to the EU several months before the full-scale invasion started. The drought in the summer of 2021 compromised hydropower generation and factories needing large volumes of cooling water, while corrosion problems resulted in the temporary shutdown of some French nuclear power plants. All these factors resulted in an increased use of natural gas in electricity generation in Europe, at a time when less Russian gas arrived in the continent. The uncertainty about the demand-side and supply-side drivers of inflation might have urged central bankers to be cautious. Thirdly, long-term inflation expectations (measured by market-based indicators and the views of professional forecasters) seemed to remain anchored, giving comfort to central bankers that a somewhat higher temporary inflation might not lead to persistently high inflation.

A further important reason for the delayed monetary tightening by the ECB is related to its flawed forward guidance. One of the self-set conditions for an interest rate increase was the termination of asset purchase programme (APP) net purchases, yet the December 2021 ECB Governing Council meeting increased monthly APP net purchase volumes for the second and third quarters of 2022 and specified a return to the monthly pace of EUR 20 billion *“from October 2022 onwards [...] for as long as necessary to reinforce the accommodative impact of our policy rates”*. This implied that the APP would continue after October 2022, and thus interest rates could be increased even later. Eventually, the ECB could not keep these self-imposed deadlines and started to lift its interest rates in July 2022³.

From the start of the current monetary policy tightening cycle up to the time of writing, October 2023, the Federal Reserve increased its main interest rate by 5.25 percentage points, the Bank of England by 5.15 percentage points, and the ECB by 4.5 percentage points (Figure 1). These are relatively large increases in nominal interest rates from a historical perspective. Yet monetary policy was highly accommodative before the rate increases started, and the current tightening cycle has two unique, potentially interrelated, features that differ from earlier tightening cycles. First, peak interest rates have not even neared peak inflation rates. Second, labour markets remained strong, reflected in the historically low unemployment rates, in which no noticeable deterioration can be observed by the time of writing (Figure 1). Other labour market indicators, such as the growth rate of jobs, and vacancy rates, suggest similarly strong labour markets. In this paper, we examine these two salient features and draw implications for the course of monetary policy.

³ See Darvas and Martins (2022) for an analysis of the ECB’s forward guidance.

Figure 1: Central bank interest rate, inflation and unemployment during the recent monetary tightening episode of the Euro area, the United States and the United Kingdom, January 2020-September 2023



Sources: OECD main economic indicators for All items inflation, Core inflation and Unemployment rate (the September 2023 values for the euro-area inflation are from Eurostat and for the US from the Bureau of Labor Statistics); national central bank websites for interest rates.

2. Monetary tightening: then and now

The 2022 inflation in advanced countries was similar to inflation observed in the 1970s and 1980s. There was a less pronounced inflation surge in the 1950s. We compare the developments of main macroeconomic indicators before and after the peak inflation during these four inflationary episodes, for the United States, United Kingdom, Germany and France (Figure 2). From the euro area, we report values for Germany and France, and not for the euro area as a whole, because the euro did not exist before 1999, and national developments were diverse then. The definition and interpretation of the variables, which are plotted in Figure 2, are presented in Box 1.

Box 1: Definition of macroeconomic variables plotted in Figure 2

CPI_Headline: Consumer Price Index – All items Total, growth rate compared to the same period the previous year, percent; source: OECD.

CPI_Core: Consumer Price Index – All items non-food non-energy, growth rate compared to the same period the previous year, percent; source: OECD.

CBrate: central bank main policy rate; source: collected from the websites of the respective central banks.

GDP_ConstantPrices: GDP by expenditure – Total GDP, at constant prices (index 2015=100), growth rate same period of the previous year, seasonally adjusted; source: OECD national accounts

Activity_rate: Active population (employed plus unemployed) divided by the working-age population, All persons aged 15 and over, seasonally adjusted, percent; source: OECD.

Employment_rateSA: ratio of people employed to working-age population; working-age population refers to people aged 15 to 64; percent, seasonally adjusted; source: OECD.

HUnemployment_rateSA: harmonised unemployment rate; the unemployed are people of working age who are without work, are available for work, and have taken specific steps to find work; the ratio of the number of unemployed people as a percentage of the labour force, which is defined as the total number of unemployed people plus those in employment; all persons aged 15 and over; percent, seasonally adjusted; source: OECD.

Inactivity_rateSA: Those are considered inactive in the working-age population (people neither in employment or defined as unemployed) divided by the working-age population; all persons aged 15 and over, percent, seasonally adjusted; source: OECD.

Unfilled_vacanciesSA: Unfilled vacancies divided by the labour force (number of unemployed people plus those employed), ratio, percentage, seasonally adjusted; source: OECD.

All_pctGDP: Credit to the private non-financial sector from all sectors at market value, percent of GDP - adjusted for breaks; source: BIS.

Banks_pctGDP: Credit to private non-financial sector from banks, total at market value, percent of GDP - adjusted for breaks; source: BIS.

In the United States, both headline and core inflation in 2022 remained somewhat below the inflation peaks in 1970s and 1980s, but were considerably higher than in the 1950s. After the inflation peak in 2022, headline inflation was falling at more or less the same pace as in the 1970s and 1980s, but core inflation remained much more persistent now. The nominal interest rate (the Federal Funds rate) remains much lower now than in the 1970s and 1980s, when rates were above 10%. The US economy entered a recession in the 1970s and 1980s, but not now. In line with better growth performance, the labour market performance is also much better now than in the 1970s and 1980s. The employment rate is higher now than then, and this rate went up further after the inflation peak in 2022, while it fell significantly in the 1970s and 1980s. On the other side of this development, the unemployment rate is at historical lows in the US now, and the rate has remained stable after inflation peaked in 2022. In contrast, the unemployment rate went up significantly in the 1970s and 1980s. The reason for the low unemployment is not a reduction in activity, in fact, the inactivity rate has fallen somewhat in 2022-2023. Data on unfilled vacancies is unfortunately not available for the earlier monetary tightening episodes, so a comparison cannot be made. In 2022-2023, vacancies declined somewhat, but were not reduced to zero. Total credit has been falling in 2022-2023, but from a much higher level (note that total credit for episode 4 is plotted on the right axis on the last but one panel). Bank credit changed a little and, in fact, started to recover marginally (again, bank credit for episode 4 is plotted on the right axis of the last panel).

Similar tendencies characterize the United Kingdom: lower central bank rate now than in the 1970s and 1980s, core inflation remains steady now, GDP has not contracted (at least so far), the

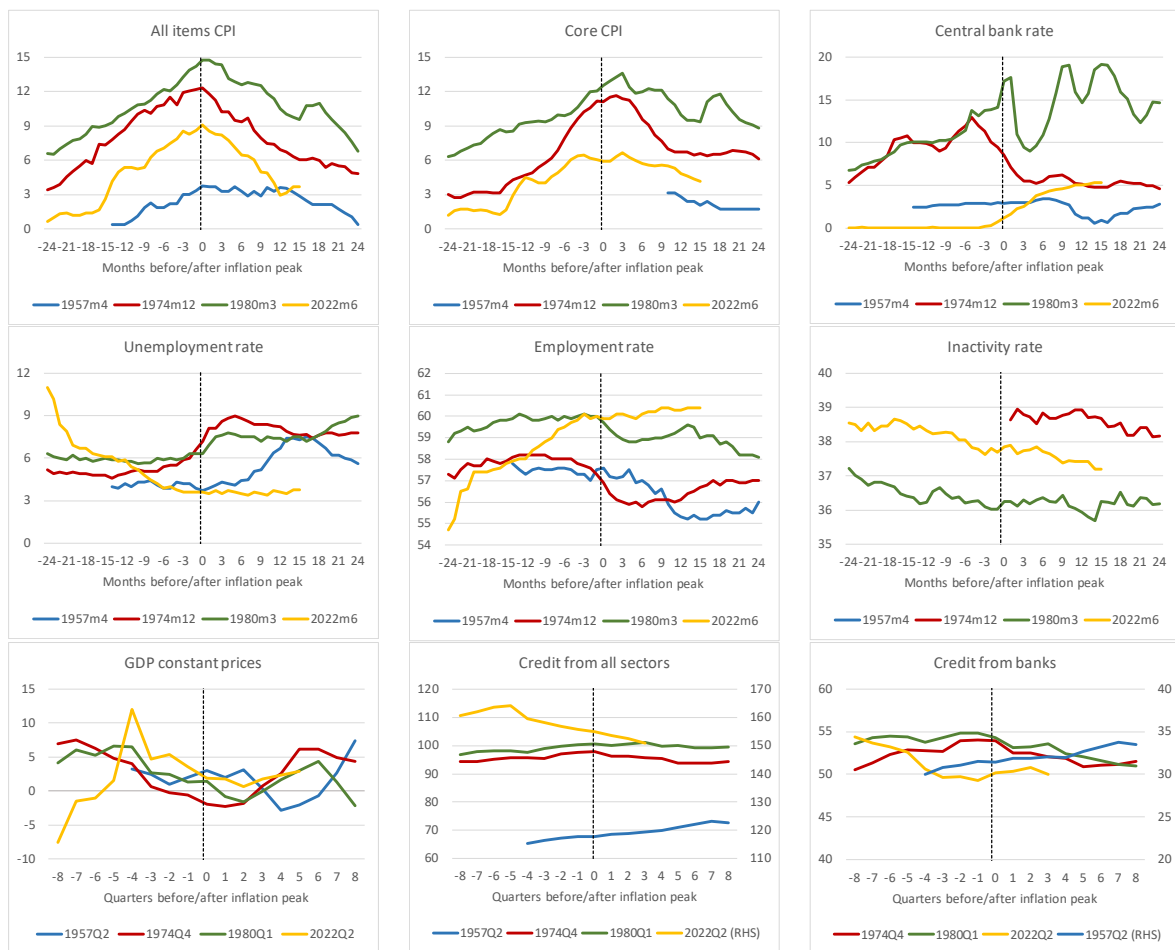
unemployment rate remains low, unfilled vacancies remain high, while both total credit and bank credit have been falling, but from higher initial levels than in the 1970s and 1980s.

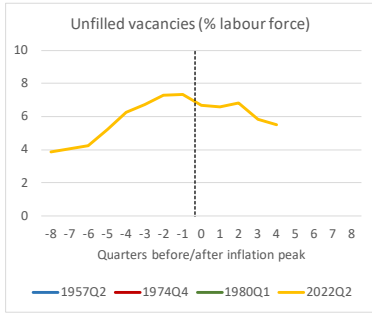
German developments are also similar, with two notable differences. First, the level of inflation was at record levels in 2022, above the inflation peaks in the 1980s, 1970s and 1950s. Second, GDP growth fell below zero. Nevertheless, the unemployment rate has not increased this time, unlike in previous episodes, and unfilled vacancies are much higher now than before. Similarly to the US and UK, credit to the non-financial private sector has been falling this time, but from much higher levels than at earlier inflation episodes.

And finally for France, the level of inflation is lower now than in previous episodes, possibly due to French domestic energy regulation, which resulted in much lower energy price increases in 2022 than on average in the euro area. France is the only country in our sample for which the inflation peak in the 1950s was the highest. While GDP growth fell, it did not turn negative. The unemployment rate has been decreasing; unfortunately, data gaps do not allow comparison with earlier episodes.

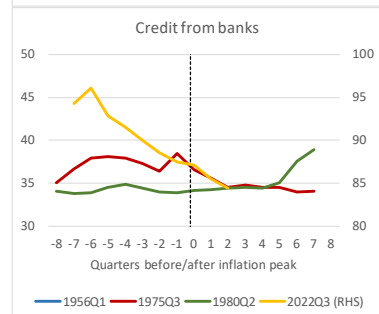
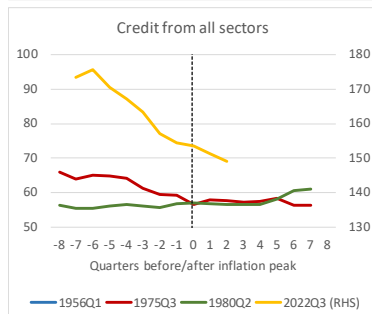
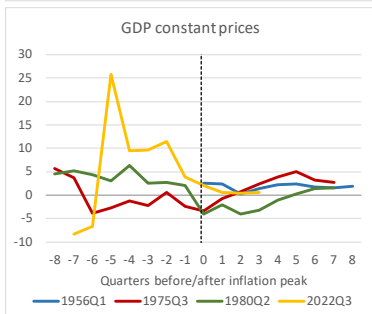
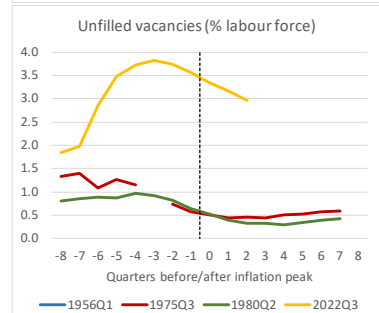
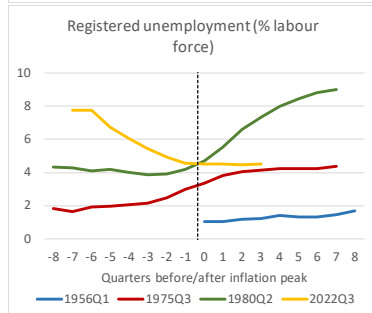
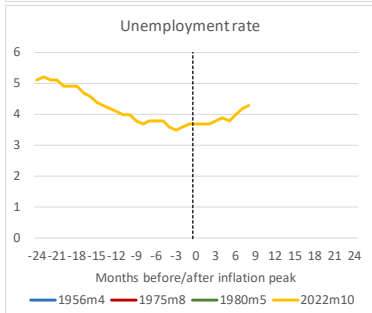
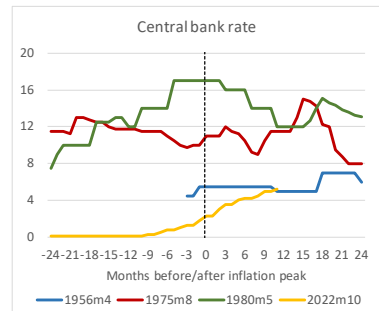
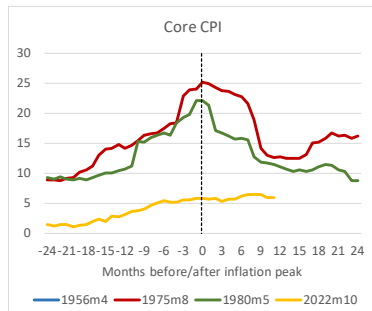
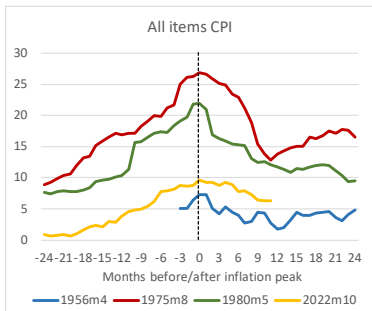
Figure 2: Comparing current and earlier monetary tightening episodes

United States

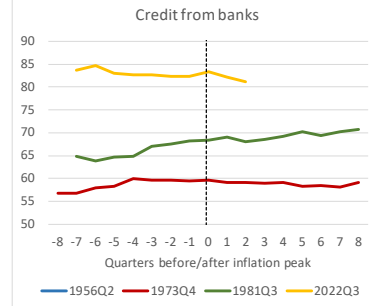
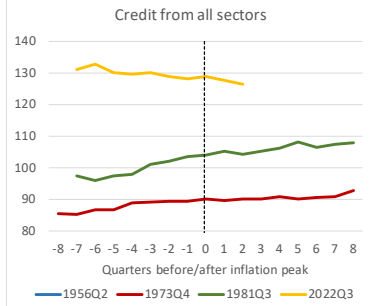
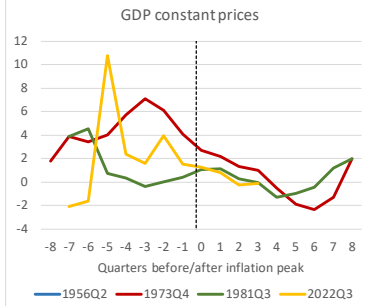
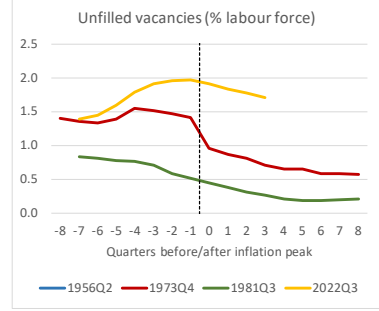
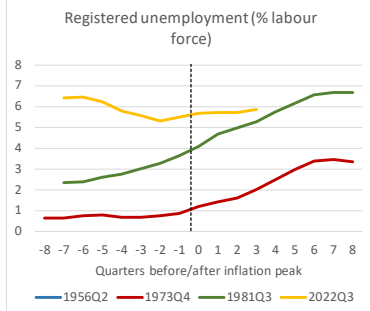
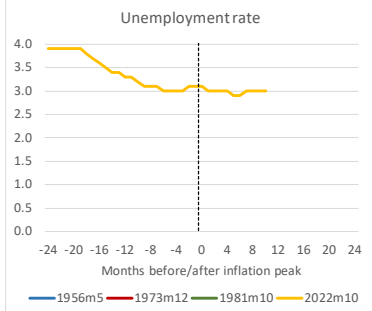
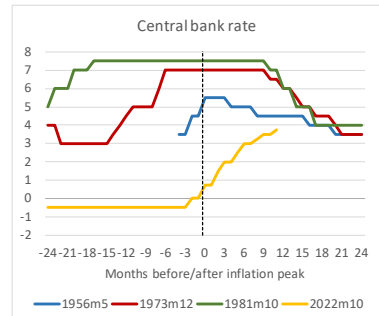
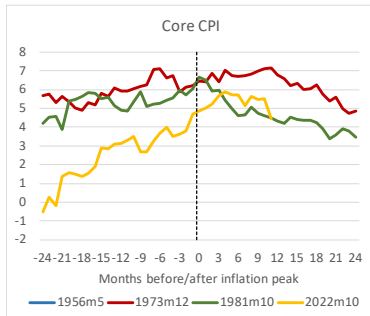
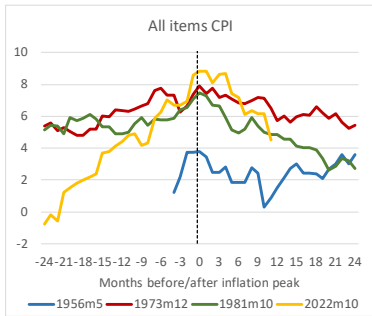




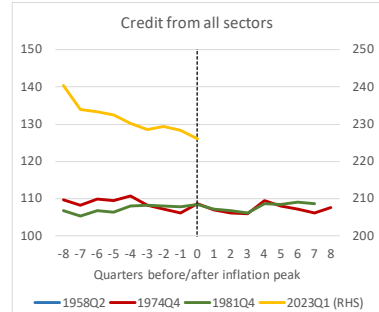
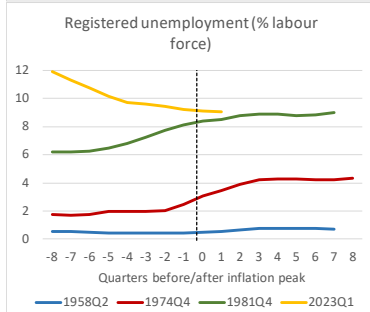
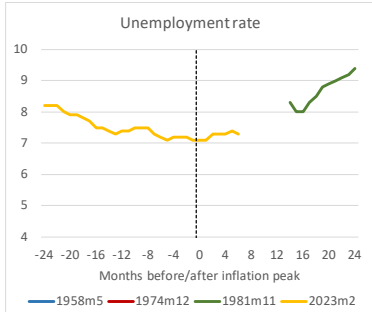
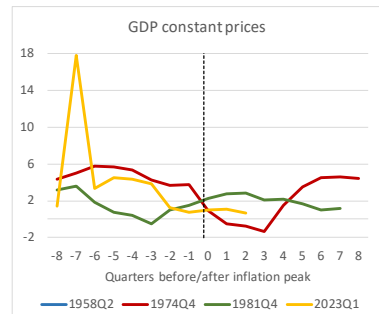
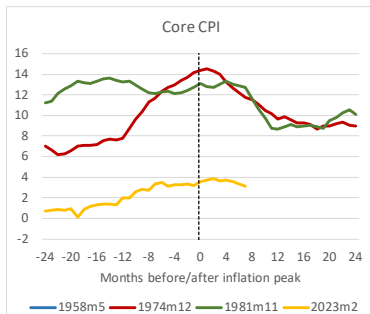
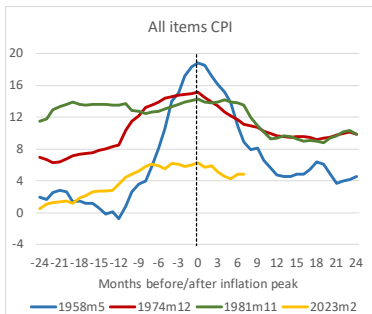
United Kingdom

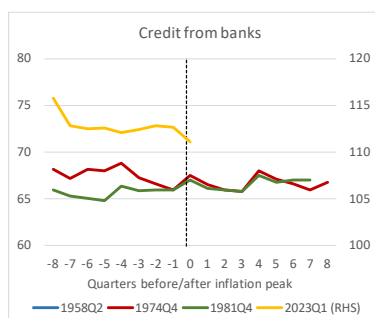


Germany



France





Source/note: see Box 1.

3. The real interest rate and its equilibrium value

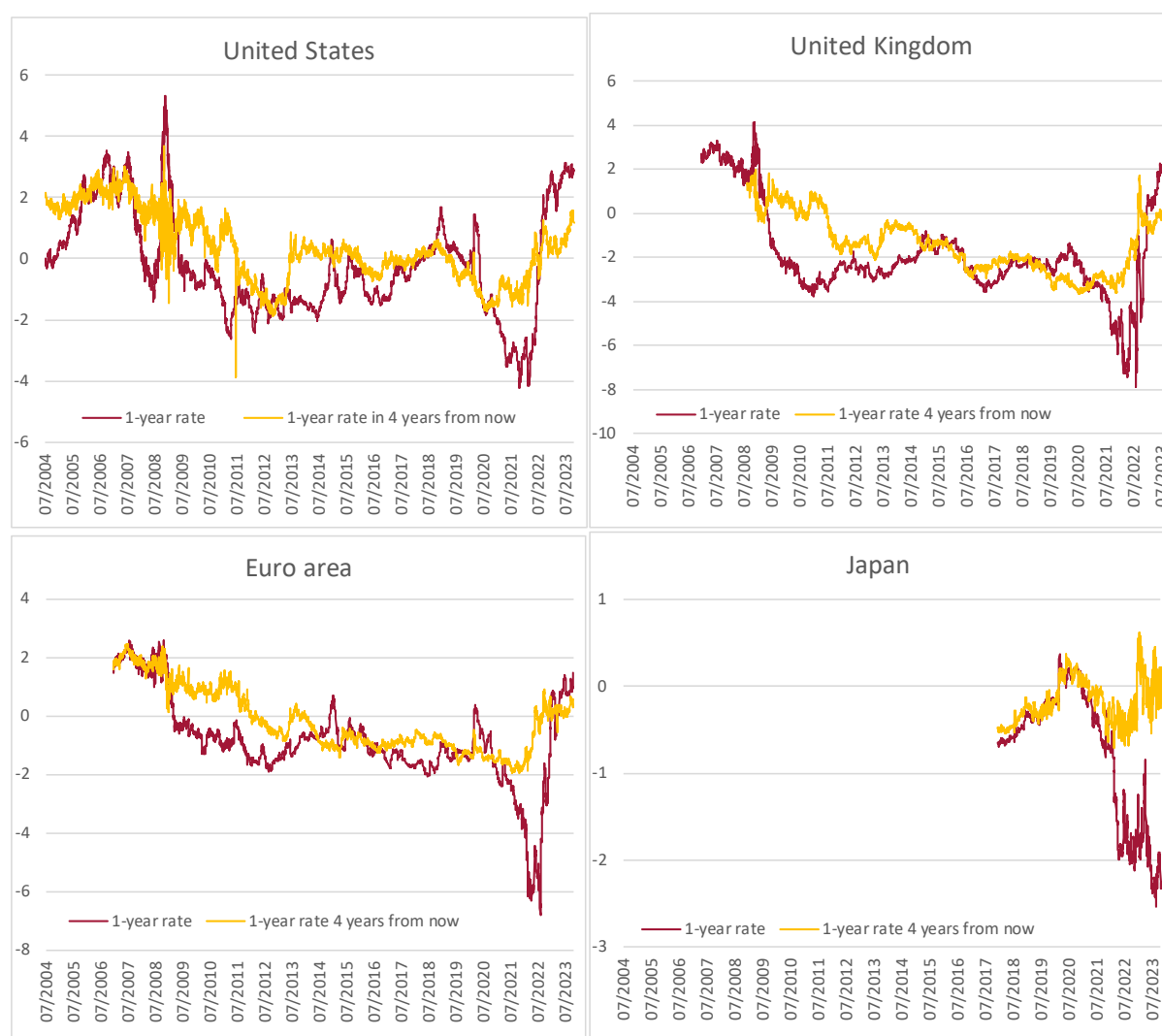
What role could have recent monetary tightening played in the above-discussed macroeconomic developments? To answer this question, we scrutinise real interest rate developments compared to the equilibrium value of real interest rates.

Conceptually, the real interest rate determines the savings and investment decisions of economic actors, like households and companies. The real interest rate is defined as the nominal interest rate adjusted for expected inflation. Inflation expectations are unobserved variables and can be heterogeneous across agents. Often, inflation expectations are measured by financial market indicators, like inflation swaps, and from various surveys (professional forecasters, households, corporates) – approaches that we also follow. Unfortunately, such time series typically start in the 2000s, not allowing the comparison of the current monetary tightening cycle with earlier episodes.

3.1 Market-based real interest rates

Between the global financial crisis and the COVID-19 pandemic, the 1-year real interest rates were generally negative in the euro area, the UK and US (Figure 3). Japan is also included in the figure, but data is available only from 2017. The lowest real interest rates were observed in the United Kingdom, due to the highest inflationary expectations, which were above 3% from October 2016 until the pandemic. Real interest rates were moving up steadily before the pandemic in the United States and also in Japan, while there was a more sudden upward shift in the euro area, which resulted from a fall in inflationary expectations, while nominal interest rates stayed at negative levels, close to the ECB's deposit facility rate. With the surge in inflation from 2021, real interest rates fell dramatically, especially at the 1-year horizon, nearing minus 8 percent in the United Kingdom, minus 6 percent in the euro area, and minus 4 percent in the United States. More recently, with the increase in nominal interest rates due to central bank tightening and the fall in expected inflation, real rates increased to positive territories. The 1-year real interest reached 3 percent in the United States, 1.5 percent in the euro area, and 2 percent in the United Kingdom, though more recently fell back to about half percent. The 1-year real rate expected in 4 years from now, by when short-run shocks fade out and the impacts of monetary policy are materialised, is around 1.5 percent in the United States, half percent in the euro area, and close to zero in the United Kingdom (in the UK, inflation expectations are at 4% both in the short term and in 4 years from now). Thus, real interest rates increased to levels seen in the pre-global financial crisis period, which was also characterised by monetary tightening in several countries.

Figure 3: Financial market-based real interest rates (percent per year)



Source: Bloomberg.

Note: the last observation is 7 November 2023.

3.2 The natural rate of interest

The level and the changes in real interest rates should be best compared to the level and changes in equilibrium real interest rates. The equilibrium rate is an unobserved variable, and thus various econometric models, based on different assumptions, have been used to estimate such rates. These estimates are characterised by uncertainties, and only a few estimates are available for more recent periods.

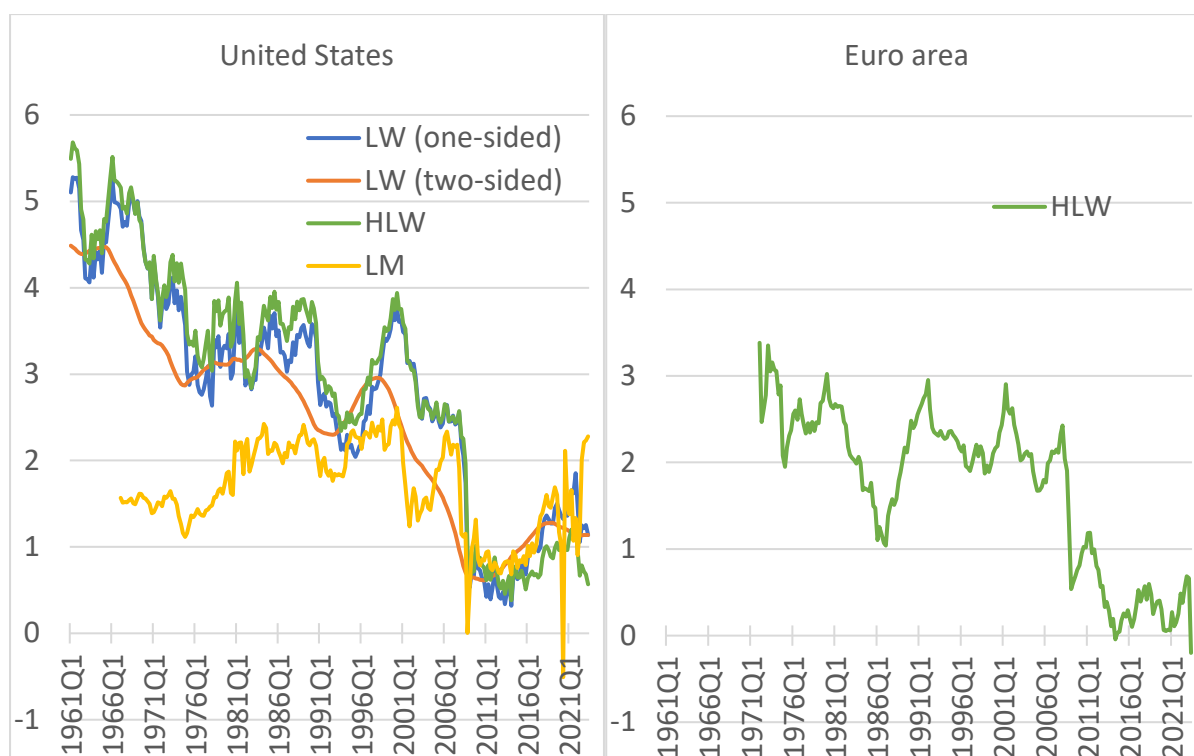
A popular concept is the natural rate of interest, which is often denoted as r^* . This indicator aims to measure the equilibrium value of the short-term real interest rate that is expected to prevail when the economy is operating at its full sustainable level. Chapter 2 of IMF (2023a) estimated such rates for six advanced countries (Canada, France, Germany, Japan, United Kingdom, United States), using the method of Holston, Laubach, and Williams (2017) – hereafter HLW. The full-sample estimates presented in Figure 2.4 of IMF (2023a) suggest virtually unchanged r^* from 2019 to the third quarter

of 2022. The level of r^* is estimated to be slightly above 1% for Canada, France, the UK and the US, somewhat above zero for Germany and below zero for Japan.

More recent estimates, using data up to the second quarter of 2023, are provided by the Federal Reserve Bank of New York⁴ using two versions of the Laubach and Williams (2003) model (hereafter LW) for the United States, and the HLW model for the United States, euro area, and Canada. The Federal Reserve Bank of Richmond⁵ presents estimates for the United States using the method of Lubik and Matthes (2023) – hereafter LM.

The results from the four alternative methods available for the United States display a large diversity, both in terms of long-run trends and the level of the latest estimates. LW and HLW suggest a long-term decline from 1961, though with occasional increases, while LM suggest a much lower starting level in 1967 and some increases in the 1980s, before drops after the dot-com bubble burst in 2000 and the global financial crisis in 2008. The latest estimate for the second quarter of 2023 ranges from 0.6% (HLW) to 2.3% (LM), which is a relatively wide discrepancy. Moreover, each of these estimates is characterised by considerable uncertainty.

Figure 4: Alternative estimates for the natural rate of interest (percent per year), 1961Q1-2023Q2



Sources: Federal Reserve Bank of New York and Federal Reserve Bank of Richmond.

Bäcker-Peral et al. (2023) highlighted the uncertainty of HLW estimates, using data from the United States and the United Kingdom as an example. When post-2020 data is included, the HLW methodology is destabilised by the steep decline in GDP in the second quarter of 2020 and the

⁴ <https://www.newyorkfed.org/research/policy/rstar>

⁵ https://www.richmondfed.org/research/national_economy/natural_rate_interest

authors could not estimate the model for the United States. For the United Kingdom, implausible estimates were made, ranging from -32.2% in the third quarter of 2020 to 25.9% in the second quarter of 1975. The 95 percent confidence band ranges from about -70% to +70% for the most recent observation. Bäcker-Peral et al. (2023) argue that data from the pandemic era not only affects the estimates for the pandemic period, but also propagates to previous decades.

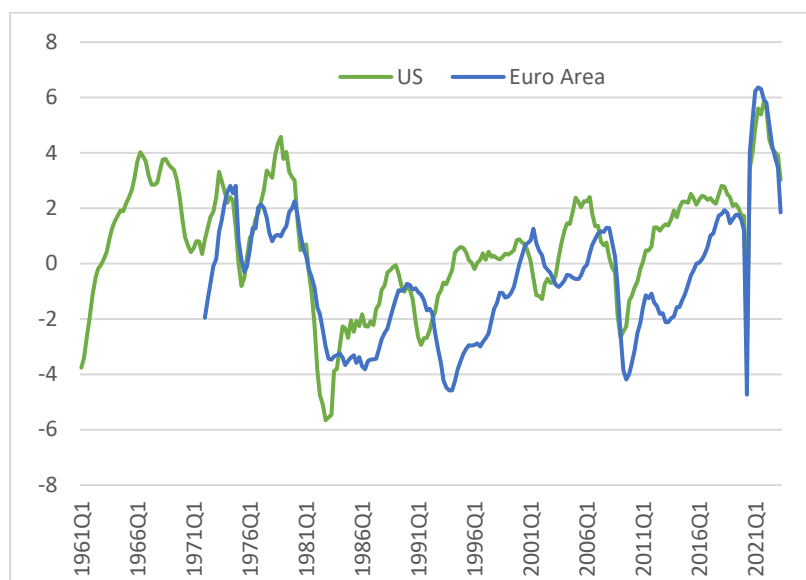
Most likely, Bäcker-Peral et al. (2023) used the pre-pandemic specification of the HLW model. The update of LW and HLW estimates was suspended from the start of the pandemic until May 2023 and only the pre-pandemic replication code was available on the NY Fed website. With the re-launch of the calculations in May 2023, two main changes were made to the model (Williams, 2023; Holston, Laubach and Williams, 2023). First, an additional persistent supply shock related to the pandemic was added, which is based on the Oxford COVID-19 Government Response Stringency Index for each economy⁶. Since the calculation of this stringency index was suspended in mid-2022, it is assumed that in each country, it declines smoothly to zero over 2023-24 (Figure 5 of Holston, Laubach and Williams, 2023). Yet whether this stringency index well approximates the possible shock to potential output is not unquestionable, and in most countries, no more restrictions are in place at the time of writing, so the assumption of a smooth decline over 2023-2024 likely exaggerates the impact of the pandemic in 2023-2024. The second modification was the introduction of a statistical procedure to reduce the weight of periods when there are very large outliers in 2020-2022, based on a time-varying process for the variance of the shocks hitting the economy. The necessity of introducing these pandemic-related modifications to the model underlines that the estimated natural rates during and after the pandemic are burdened with even greater uncertainty than pre-pandemic estimates.

For the euro area, the only available up-to-date HLW estimate suggests that the natural rate increased somewhat to 0.7% by 2023Q1 and then fell to -0.2% by 2023Q2. The previous vintage of the estimate, which used data up to 2023Q1, indicated that the euro area natural rate was 0.9% in 2023Q1. Thus, a new quarterly data point lowered past estimates and suggested a major reduction of the natural rate in 2023Q2.

The econometric model for the natural rate also estimates the output gap, which is defined as the deviation of actual output from potential output. For the pandemic period, the new estimates suggest a negative output gap for a single quarter, 2020Q2, amounting to -3.0% of potential output in the United States and -4.7% in the euro area (Figure 5). The magnitude of this negative output gap is broadly similar to model estimates for 1982 and 2009 for both the US and euro area, and for 1993 in the case of the euro area, implying that from the perspective of demand shortages, the pandemic recession was broadly similar to some earlier recessions. From 2020Q3, the estimates show rather large positive output gaps both for the United States and the euro area, well above estimates for earlier periods. This also implies that on average in 2020, the output gap was positive both in the United States and the euro area. While the output gap is an unobserved variable, and its definition and estimation are model-dependent, it is notable that the 2020-2023 HLW output gap estimates differ substantially from other output gap estimates. For example, the annual output gap estimates from the IMF's October 2023 World Economic Outlook for the years 2020-2023 are -2.5%, 1.5%, 1.4%, and 1.4% for the United States and -4.8%, -2.0%, 0.2%, and -0.4% for the euro area (IMF, 2023b). It thus seems that the way the pandemic shock is introduced in the HLW model resulted in a major reduction of potential output in 2020-2023, far larger than in other estimates.

⁶ <https://www.bsg.ox.ac.uk/research/covid-19-government-response-tracker>

Figure 5: Output gap estimates from the HLW model (percent of potential output), 1961Q1-2023Q2



Source: Federal Reserve Bank of New York.

The wide range of natural rate estimates and their large uncertainty, the difficulties in extending the econometric model to the pandemic era, and major differences of natural rate model-implied output gaps from other output gap estimates all suggest that the econometric estimates of the natural rate should be assessed cautiously.

3.3 The drivers of equilibrium real interest rates

The literature identified several factors that contributed to low real interest rates in the pre-pandemic era⁷. Ultimately, the real interest rate balances savings and investments, and thus higher savings and lower investments can result in a fall in the real interest rate. Higher savings resulted from:

- higher income levels;
- higher life expectancy, which encourages workers to save more of their income in anticipation of their longer retirement (Ferrero et al, 2017; Blanchard, 2023);
- higher inequality in advanced countries, which increased the income of the rich – who are characterised by higher savings and a lower propensity to consume – and reduced at least the relative income (but in some cases even the absolute value of real income) of the middle and poorer segments of the society – which have a greater propensity to consume;
- the ‘global savings glut’, that is, huge current-account surpluses accumulated by some emerging country governments (Bernanke, 2005).

Low investment in advanced countries could have resulted from:

- low population growth, which could translate into low future demand for goods and services;

⁷ See a summary in Zettelmeyer et al. (2023).

- slow productivity growth;
- fall in the relative price of durable equipment;
- a financial sector which does not properly incentivise investments;
- monopoly positions in some industries leading to huge rents and disincentives to increase production;
- the reduced capital intensity of leading industries;
- the decline in public investment after the global financial crisis and the euro crisis.

Greater demand for safe assets issued in advanced countries could also have exerted downward pressure on real interest rates:

- tighter prudential regulations adopted after the global financial crisis required financial institutions to hold safer and more liquid assets;
- the global savings glut resulted in a large increase in the international reserves held by emerging market countries, which were overwhelmingly invested in sovereign bonds from advanced countries.

Some of these factors might keep real interest rates low once the current inflation-induced central bank tightening ends, as argued by Blanchard (2023). However, some interest rate-reducing developments might be reversed, and some new considerations might suggest permanently higher real interest rates in the future. In particular:

- reserve accumulation by emerging markets, most notably by China, has declined;
- the retirement age is gradually increased in many countries, which could dampen the increase in savings;
- increased bargaining power of low-income workers in advanced countries could reduce income inequality in favour of households with a lower propensity to save;
- investment demand could pick up due to:
 - reshoring in the aftermath of the pandemic and amid geopolitical tensions;
 - development of new technologies;
 - climate change mitigation;
 - public investment increases to meet new challenges, such as defence, digital and green transition.

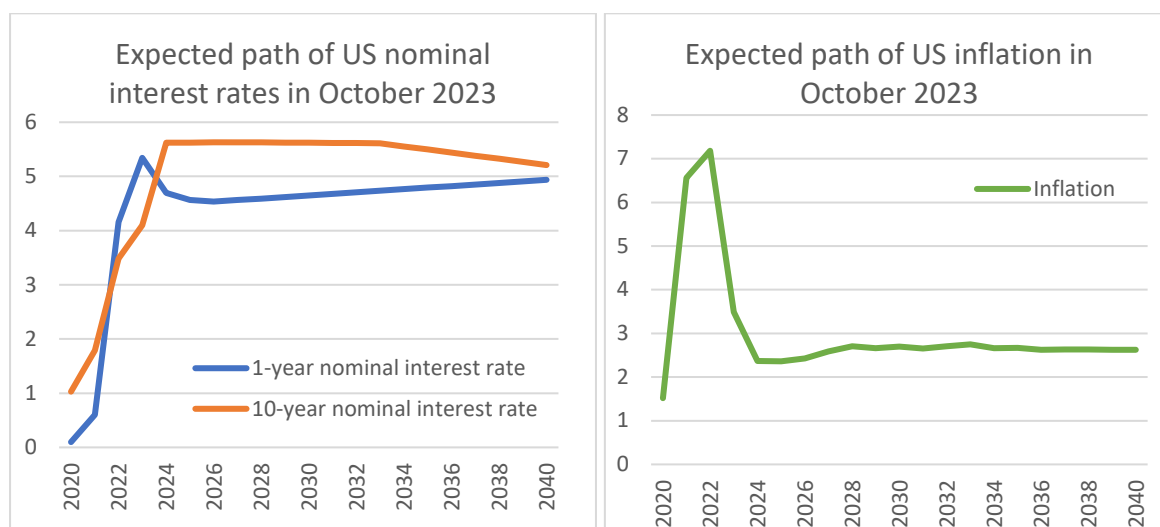
Thus, conceptually, it is difficult to conclude whether the era of low real interest rates will return, or whether real interest rates will be significantly higher than before the pandemic. To get a market-based view of this issue, we look at real interest rate expectations in the next section.

3.4 The expected path of short-run and long-run real interest rates

An alternative to econometric estimation of the equilibrium real interest rate is an analysis of market expectations of future real interest rates. Presumably, markets do not expect specific cyclical fluctuations in the economy many years ahead. If market expectations many years ahead are consistent with a balanced development of the economy, then real interest rates expected for the future can be indicative of the equilibrium level of interest rates. A caveat is that some of the long-term drivers of the real interest rate, such as potential growth, demography, inequality, and savings by oil exporting countries, as reviewed in the previous section, could change over several years, in which case the current equilibrium real rate could be different from the equilibrium real rate, say, ten years from now.

To illustrate our calculations, we start by depicting the expected path of the 1-year and 10-year nominal interest rates in the United States, as well as expected annual inflation in the years to come (Figure 6). The 1-year nominal interest rate was close to zero in 2020 and increased above 5% by 2023. Market expectations suggest a fall in the 1-year nominal interest rate in 2024, and also marginally in 2025, but after that, the 1-year nominal interest rate is expected to increase gradually. In contrast, the 10-year nominal interest rate is expected to peak in 2024 at 5.6% and decline only marginally in later years. Meanwhile, after the peak inflation in 2022, annual inflation is expected to fall in the range of 2-3% in the years to come (panel B of Figure 6).

Figure 6: The expected path of 1-year and 10-year nominal interest rates and inflation (percent per year)



Source: Bruegel calculations based on Bloomberg data.

Note: average daily data from 2-10 October 2023 is used for the calculations.

To calculate the real interest rate, we subtract the expected future inflation from the expected future nominal interest rate. For example, to calculate the expected 1-year real interest rate in 2025, we subtract from the expected 2025 value of the 1-year nominal interest rate the expected 2026 value of annual inflation (because the 2026 inflation expresses the increase in prices from 2025 to 2026, so this should be compared to the 2025 nominal interest rate). To calculate the expected 10-year real interest rate in 2025, we subtract from the expected 2025 value of the 10-year nominal interest rate the average of expected annual inflation between 2026 and 2035 (because this average corresponds to the expected inflation over the duration of a 10-year government bond issued in 2025).

A simple visual comparison of the two panels of Figure 6 suggests that markets expect a real interest rate of over 2% in the United States in the years to come.

In order to document the changes in market real interest rate expectations from the period before monetary tightening started to today, we do the calculations by collecting market expectations from two dates: the average of 1-30 June 2021 and the average of 2-10 October 2023. In June 2021, inflation in the US was 4.0% in terms of PCE and 5.4% in terms of CPI; in the euro area, it was 1.9% in terms of HICP; and in the UK, it was 2.5% in terms of CPI. These values were between 2 and 3 percentage points higher than half a year earlier. Thus, inflation had already started to increase by

June 2021, but not particularly severely, and just limited central bank rate hikes were expected in June 2021.

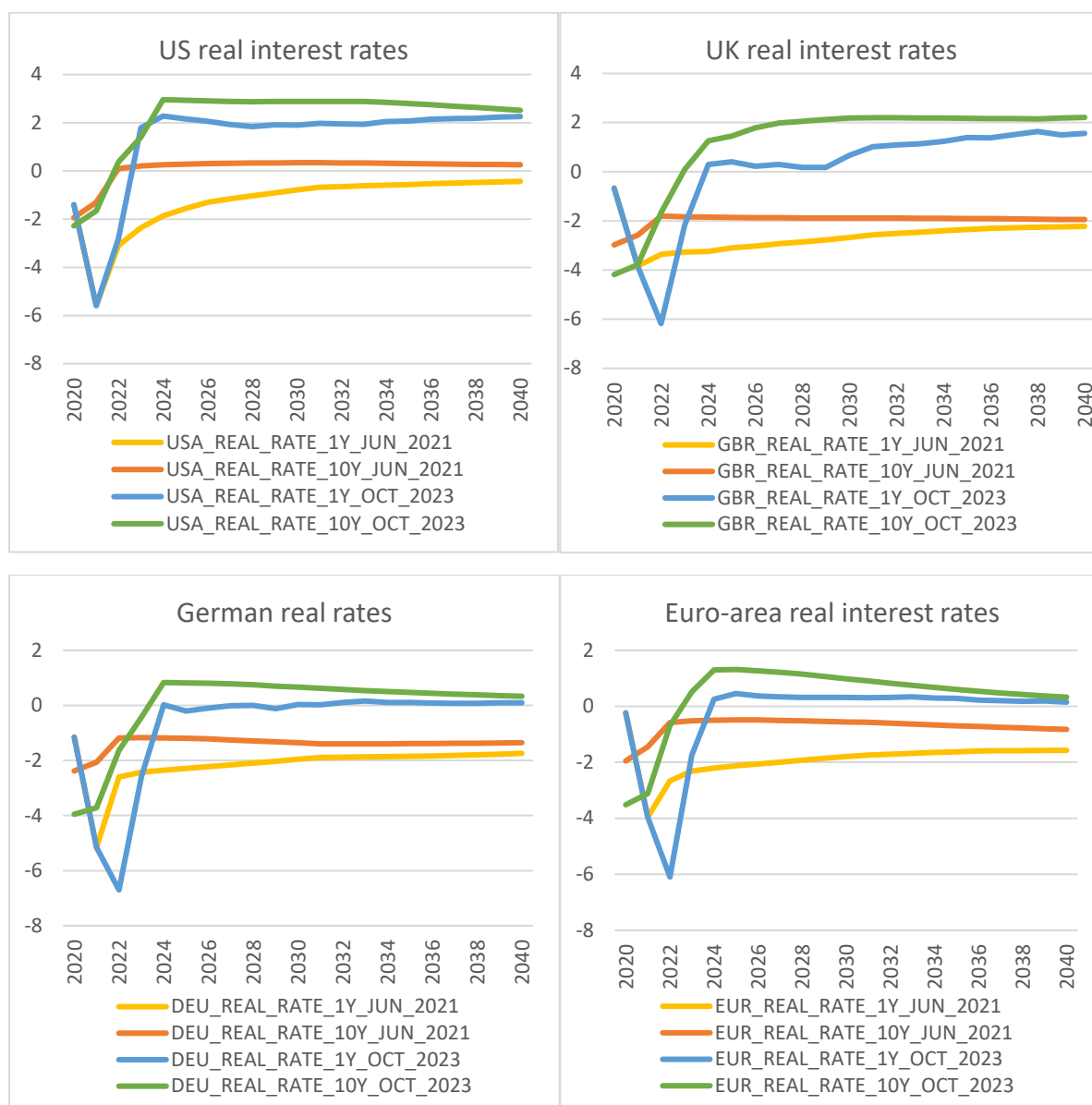
Following the low real interest rate during the pandemic, in June 2021, markets expected that the 1-year US real interest rate would gradually increase to about -0.5% in the 2030s (yellow line in Figure 7), while the 10-year real interest rate would just marginally exceed zero (orange line). These expectations were revised very significantly upwards by October 2023: the long-run value of the 1-year real interest rate is now seen close to 2% (blue line), while the 10-year real interest rate is expected to stay close to 3% by the early 2030s, after which a marginal decline to about 2.5% by 2040 is currently foreseen (green line). The close to 2% expected long-run 1-year real interest rate is reasonably close to the 2.3% natural rate estimate of Lubik and Matthes (2023) for the second quarter of 2023, but considerably higher than the 0.6% natural rate estimate of Holston, Laubach, and Williams (2017) for the same quarter.

If these market expectations indeed reflect the long-run equilibrium level of the real interest rate, then the cumulative 5.25 percentage point interest rate hikes of the Federal Reserve from March 2022 to October 2023 have just moved the real interest rate from an expansionary status to a neutral status, but the interest rate has (not yet) become contractionary. This could explain why the US economy and labour markets remained resilient to these interest rate hikes.

Real interest rates also increased considerably in the UK from June 2021 to October 2023. However, because of rather pessimistic inflationary expectations (over 4% inflation up to 2029, and still 3.3% inflation in 2040), the 1-year real interest rate is expected to remain just slightly above zero till 2029 and then gradually increase to 1.6% by 2040. The 10-year real interest rate, on the other hand, is expected to reach 2% in the second half of the 2030s and remain marginally above 2% in the 2030s. The conclusion about monetary tightening in the UK is similar to our conclusion for the US: the nominal rate hikes have just pushed real interest rates (Figure 3) close to values expected by the market in the long run (Figure 7), and thus monetary policy moved from being expansionary to broadly neutral. This, again, can explain why UK labour markets also remained resilient.

For the euro area, we report both the German real interest rate and the euro area average, though the differences between the two are not considerable, as expected. In June 2021, markets anticipated negative real interest rates to prevail in the next decades, with the German 1-year yield reaching -1.7% and 10-year yield -1.3% by 2040. For the euro area, these June 2021 real rate expectations were -1.6% and -0.8%, respectively. These expectations were revised upwards by October 2023, with both 1-year and 10-year real rates moving to positive territories – more so for the euro area on average than for Germany. For the euro area, the close to 1% current real interest rates (Figure 3) are just slightly above the expected longer-term real interest rate (Figure 7). Thus, it seems that the ECB reached a marginally contractionary level of the real interest rate, which might restrain economic growth and labour markets somewhat. Yet, during most of the period of monetary tightening, the monetary policy stance was still expansionary, which could explain why labour markets remained strong so far in the euro area too.

Figure 7: The expected path of 1-year and 10-year real interest rates in June 2021 and October 2023 (percent per year)



Source: Bruegel calculations based on Bloomberg data.

Note: average daily data from 2-10 October 2023 and average daily data from 1-30 June 2021 are used for the calculations.

4. Conclusions

Inflation in most advanced economies rose sharply along with the recovery from the COVID-19 pandemic recession, yet no forecaster foresaw that inflation could reach close to 10% values, well above the 2% inflation target of central banks. Both demand and supply factors contributed to the inflation surge. The Bank of England, the European Central Bank, and the Federal Reserve started to tighten monetary policy belatedly, not until inflation had reached values of several multiples of the inflation target. The belated start could be explained by the difficulty of leaving behind the “low for long” narrative, the uncertainty about the contributions of supply shocks to inflation, and the

apparently anchored long-term inflationary expectations. Flawed forward guidance by the European Central Bank also contributed to the belated start.

The interest rate increases by the Bank of England, the European Central Bank, and the Federal Reserve since the post-pandemic inflation surge were relatively large from a historical perspective. However, despite these large rate increases, labour markets remain strong, as reflected in historically low unemployment rates and continued job creation. Recessions have been avoided so far, in contrast to earlier episodes of monetary tightening. The good economic and labour market performance in light of significant interest rate increases is puzzling, and even more so if we take into account global shocks and uncertainties, such as the war in Ukraine and China's slowdown.

We argue that a possible explanation for this anomaly can be the extent of monetary tightening: moving from a highly accommodative monetary policy stance to a broadly neutral (but not contractionary) monetary policy stance by the time of writing. We document that the real interest rates were highly negative in the years before the pandemic, and real rates fell further during the pandemic. Since then, real interest rates increased substantially, but only to levels which can be close to an equilibrium level. We argue that various estimates for the natural rate of interest are unreliable, yet for the United States, the highest natural rate estimate is similar to the current actual real interest rate. By analysing market expectations for the future path of real interest rates, we document that markets expect the current level of real interest rates to persist for many years, suggesting that current rates could be close to their equilibrium values.

The main implications of our study are that (1) unless central banks will significantly tighten further, monetary policy is unlikely to exert a significantly negative effect on the economy, (2) the reduction of core inflation might prove to be challenging, while headline inflation falls along with a decline in energy prices, and (3) high nominal interest rates might persist for long.

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