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POSITION PAPER

# Is interest rate hiking a recipe for missing several goals of monetary policy—beating inflation, preserving financial stability, and keeping up output growth?

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**Abstract**
After the corona crisis, and even more so when the war in Ukraine struck, the price levels of all goods in the US and Europe rose surprisingly quickly and persistently. The FED began in March 2022 and the ECB in July 2022 with historically unique interest rate increases to combat the wage-price spiral that had not yet begun. In this article we show that energy, commodities and food were the main drivers of inflation. For this reason, central banks' goal of weakening demand for labor through historically large interest rate hikes seems unwise. We argue that the current measures cannot achieve all of their objectives: slowing inflation, stabilizing financial markets and sustaining growth. If interest rates remain high, but external forces emerge with a lasting effect and keep inflation rates high, especially in smaller emerging countries, it will be difficult to counteract this on a country or regional basis through high interest rate policy and national control of the price- and wage-Phillips curve. Significant negative side effects of interest rate hikes increase the risk of not making the necessary investments and, in particular, weaken the bargaining power of particularly vulnerable employment groups. Other tools are needed to curb inflation and keep it under control, for example more investment in sectors with supply disruptions and a massive expansion of investment in renewable energy.

**Keywords** Interest rate hike · Inflation · Banking crisis · Labor market · Central banks · Energy crisis · Corona crisis

**JEL Classification** E00 · E42 · E43 · E44 · E50 · E51 · E52 · G01 · H00

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## 1 Introduction

Since the recovery from the corona crisis, the inflation rate rose slowly in 2021 and then more rapidly in 2022. A number of observers were quick to come up with the demand theory of inflation to explain the rise. The government aid and spending programs, which were intended to cushion or prevent the impending slump in production and employment due to the pandemic crisis, were blamed just as much as the policy of the central banks of keeping interest rates close to zero and buying securities, especially government bonds to reduce risk premia. It is undeniable that the fiscal and monetary rescue measures have created enormous liquidity for companies, households and financial institutions. However, liquidity is often kept in bank accounts and does not affect demand. It is therefore disputed whether this liquidity led to excessive demand and thus more inflation persistently.

Because of the rescue operations during the corona crisis, which were similar in the USA and Europe, some economists have identified liquidity and demand effects as drivers of the acceleration in the rise in inflation rates. However, many economists also see the main upward forces coming from the shocks on the supply side. Corona-related bottlenecks in production and distribution, for example, affected the transport system in general and ship and container capacities in particular, causing supply on the goods markets to collapse. Inflation rates could therefore also have risen due to shortages of goods and sectoral bottlenecks (Benigno et al., 2023; Korinek & Stiglitz, 2022). After the pandemic crisis there were indeed temporary spending spikes and supply side disruptions but can this explain the high and persistence of inflation rates? And what is the role of monetary policy and the interest rate in these dynamics?

Figure 1 shows the monthly data (annual rate of change) of the harmonized index of consumer prices (HICP) for the euro area broken down into sub-indices. The sub-indices show very different movements. While in the second half of 2022 inflation for natural gas and town gas, for electricity, gas, solid fuels and heat energy and for energy in general rose sharply, the index for non-energy industrial goods developed rather subduedly (long-dashed line). The price increases there have always remained below the overall HICP (solid line). The price increases in the transport sector were also disproportionately high around the turn of the year from 2021 to 2022 with a maximum of around 15% compared to the same month of the previous year, but the increases in transport prices were far overshadowed by the price movement on the energy markets. For example, natural gas prices were over 80% higher in October 2022 than in October 2021.

Food and non-alcoholic beverage prices also moved sharply upwards from the middle of the year 2021 onwards, as shown in Fig. 2. However, double-digit increases in food prices in the Euro area did not occur until the start of the war in Ukraine (Fig. 2).

As Korinek and Stiglitz (2022) do, Blanchard also emphasizes the so-called sectoral theory of inflation (Blanchard, 2022). Thereafter, inflation rates in some key sectors continue to spill over into other sectors, not only raising the overall price level but also causing broad and sustained inflationary pressures. In this

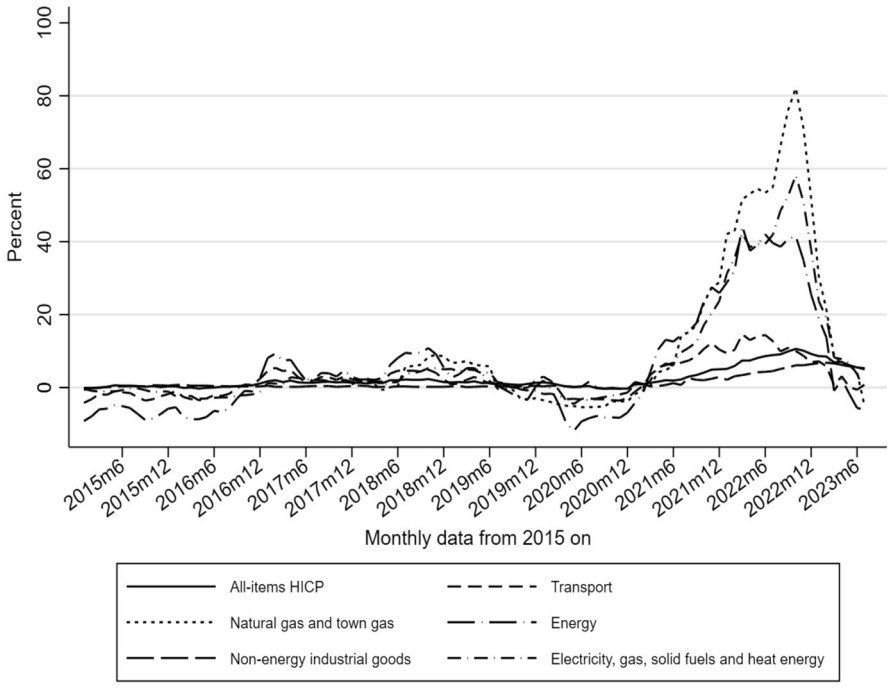


**Fig. 1** HICP and selected sub-inflation indices from January 2015 to August 2023, year-to-year comparison—Euro area. Source: Eurostat https://ec.europa.eu/eurostat/databrowser/view/prc_hicp_manr/default/table?lang=en, own calculations

case, the headline inflation rate would be driven primarily by the extreme price developments in some areas and less by a surge in demand caused by excess liquidity. Yet it can be generally admitted that also the piled-up liquidity during the corona time and the public rescue programs have given rise to the sudden price rise. But what explains the persistence of inflation rate?

The central banks initially indeed classified the rising inflation rate as temporary and expected a return to normality soon. However, when the governments of the EU states began to discuss fiscal and legislative options and some even launched measures to curb price increases in the energy sector, the FED and the ECB undertook a radical turn. Like the FED, where the rethinking had started earlier, the ECB adopted the view that prices will rise faster and higher than originally forecast. The central banks then also assumed that the upward pressure on prices will last for a while.

On March 16, 2022, the FED began the historically steep increase in the key interest rate, starting from the historically low level of 0–0.25 percentage points (Fig. 3). In the wake of the FED, on July 27, 2022, the ECB raised their deposit facility rate from − 0.5 percentage points until then to 0 (Fig. 3). With this move, the ECB left the area of negative interest rates for the first time since June 2014. At that time, the ECB had lowered the deposit rate from 0 to − 0.1 percentage

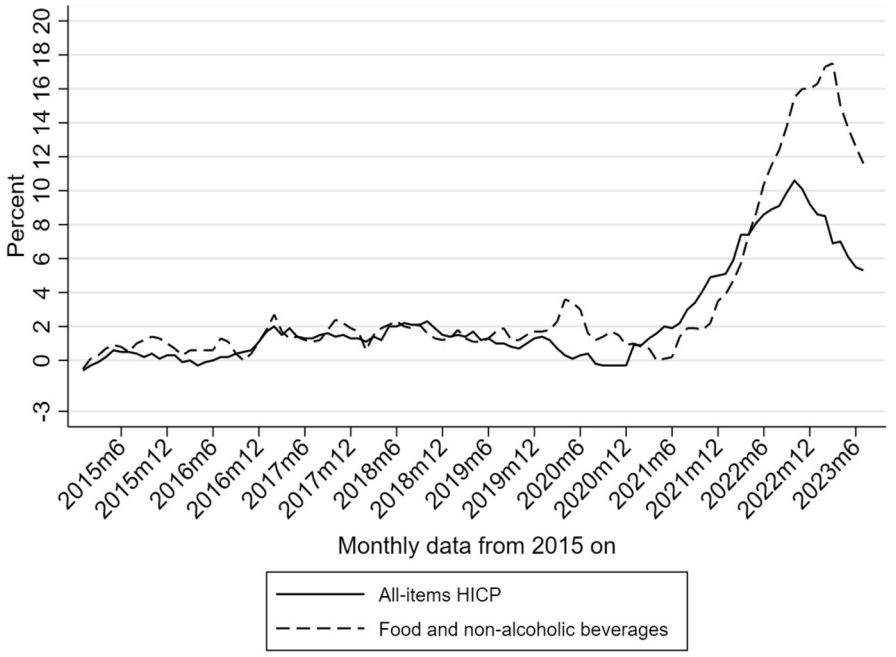


**Fig. 2** Headline inflation and food price increase from Jan 2015 to August 2023—Euro area. Source: Eurostat, own calculation

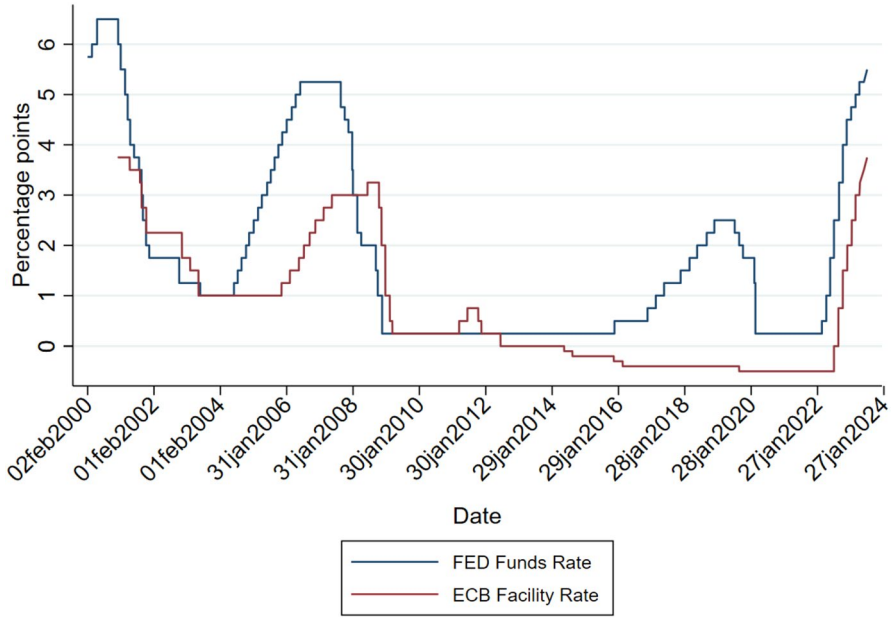


**Fig. 3** Movements of FED Funds Rate and ECB Facility Rate since 2000. Source: FRED Federal, ECB, own calculations

points. Further interest rate cuts had followed until the minimum level of − 0.5 percentage points was finally reached on September 18, 2019. In parallel with the deposit facility, on July 27, 2022, the ECB also increased interest rates for the main refinancing operations and the marginal lending facility. Since then, the ECB has taken historically unprecedented, rapid and large interest rate hikes for the Euro area, the end of which was not easily in sight.

On May 3, 2023, only the FED announced a temporary end to interest rate hikes. As expected, they then paused in June. In contrast, the ECB increased the three key interest rates by 0.25 basis points on May 4 and also on June 21, 2023. The ECB also announced further increases. On July 26, 2023, the Federal Reserve announced a rise of its key interest rate by 0.25% to the record high of 5.5% in 22 years. The ECB deposit facility rate reached the level of 3.75% in July 27th 2023.

## 2 Triggers of inflation

In both the US and Europe, the rise in prices went hand in hand with a consistently high level of employment. Blanchard et al. (2022) have therefore made an attempt to fight inflation that starts with employment. The reduction in the inflation rate requires a labor market policy that will again bring about underemployment, as described by the beverage curve. "Fighting inflation will require a decrease in vacancies and an increase in unemployment. There is no magic tool" (Blanchard et al., 2022, page 2). The authors cite as the reason for the instrumentalization of the labor markets the fact that after the Second World War it was never possible to lower the inflation rate to a sufficiently low level without accepting higher unemployment. Since real wage developments in the USA have been lagging behind productivity for many years, the attempt to intentionally weaken the labor markets again met little understanding from the trade unions.

Does one kick the dog and mean the master? This suspicion arises. The actual cause of the rapidly rising inflation rates was, on the one hand, the pent-up demand fed by the tandem of corona aid and lockdown-related spending restrictions, which encountered a scarce supply in the recovery phase. Among other things, destroyed supply chains caused sectoral production bottlenecks and shortages on the markets for intermediate and end products. On the other hand, the extreme increase in energy, commodity and food prices (Figs. 1, 2) fueled inflation. Blanchard et al. (2022) aim to stop or delay the wage-price spiral as a precautionary measure, although this spiral has not yet started in the opinion of most economists. With this approach, entailing real wage losses, the costs of combating inflation would be imposed primarily on the employees. Typically, the wage-price spiral lags behind (Bluedorn, 2022), as shown below. Already Kaldor (1983) argued in this direction.

It were not wages and salaries that have risen rapidly and steeply, but resource and energy prices, as well as the prices for agricultural products. The latter was partly the result of climate catastrophes and the Russian invasion of Ukraine. Although the increase of prices for agricultural products was already observed internationally in 2021 (see Chen & Semmler, 2023 where persistent forces of inflation are shown to arise from shocks of permanent effects), the increase only accelerated rapidly in

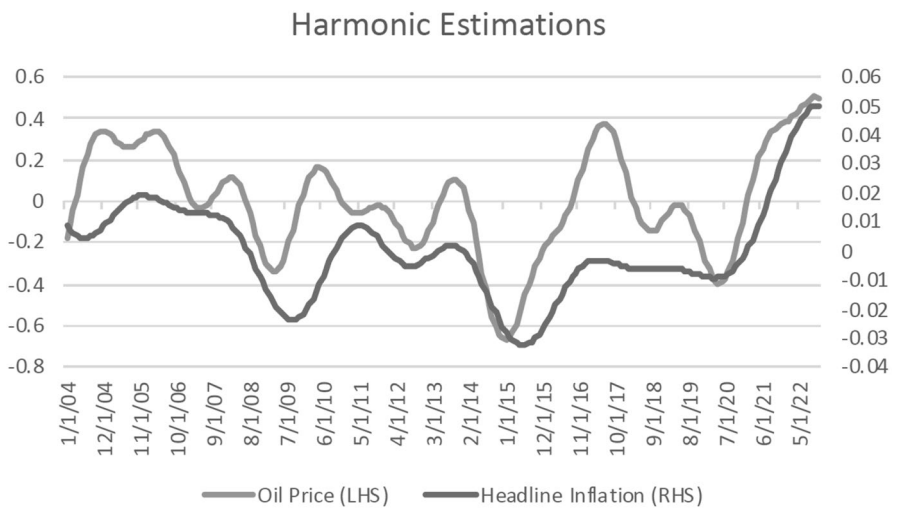


**Fig. 4** Parallel movement of oil price increase and US headline inflation rate. Source: Neves (2023). Rate of increase in oil prices (left axis: gray curve), US headline inflation rate (right axis: black curve)

2022. Figure 4 shows oil price dynamics (scale on the left) and headline inflation rate (scale on the right) in the US. The headline inflation rates in Fig. 5 also include energy and food price increases.

For Fig. 4 the method of harmonic estimation is used to construct the inflation rates, as suggested by Chiarella et al. (2016). The harmonic estimation method is based on the Fourier approach in statistics, according to which each time series can be decomposed into a linear combination of sine–cosine functions, and one, thus, can construct the internal oscillations of the time series. The price increase of the external drivers of the inflation rate, here the oil price, begins in mid-2020. Since then, the two curves have been highly correlated. For the first time, the headline inflation rate in the US moves practically parallel to the oil price. This parallel movement also exists with other resource prices.

This development was similar in many countries, as data from the IMF show. Headline inflation (including energy and food prices) and core inflation (excluding energy and food prices) in the US and Euro zone (Fig. 5) increased from the second half of 2020 on. The same applies to emerging countries of which Brazil can be viewed as a representative. The increase in headline inflation fell more sharply than that in core inflation and weakened earlier (Fig. 5) in line with the decline in the rates of increase in commodity (Fig. 6) and energy prices (Fig. 1) at the current end. The monthly data on annual growth of commodity prices in Fig. 6[1] also illustrates that the commodity prices were already rising sharply before the Russian invasion of Ukraine. At the beginning of the war the increase in the commodity price index

[1] For the commodity price index, see https://data.imf.org/?sk=471DDDF8-D8A7-499A-81BA-5B332C01F8B9. For the US inflation data, see https://www.imf.org/en/Publications/WEO/Issues/2023/01/31/world-economic-outlook-update-january-2023.

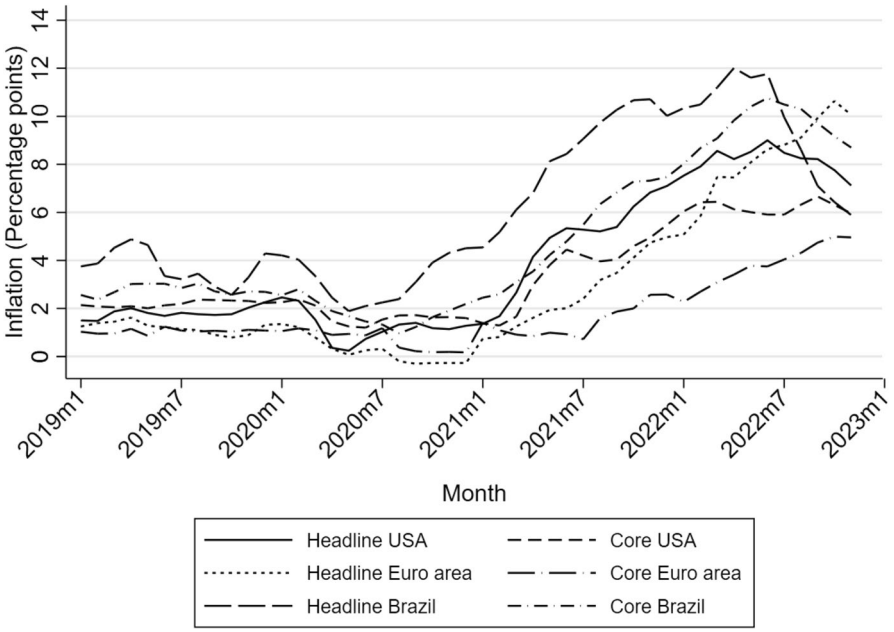


**Fig. 5** Headline inflation and core inflation in the US, the Euro area and Brazil in percent (2019–2023). Source: IMF (2023a)

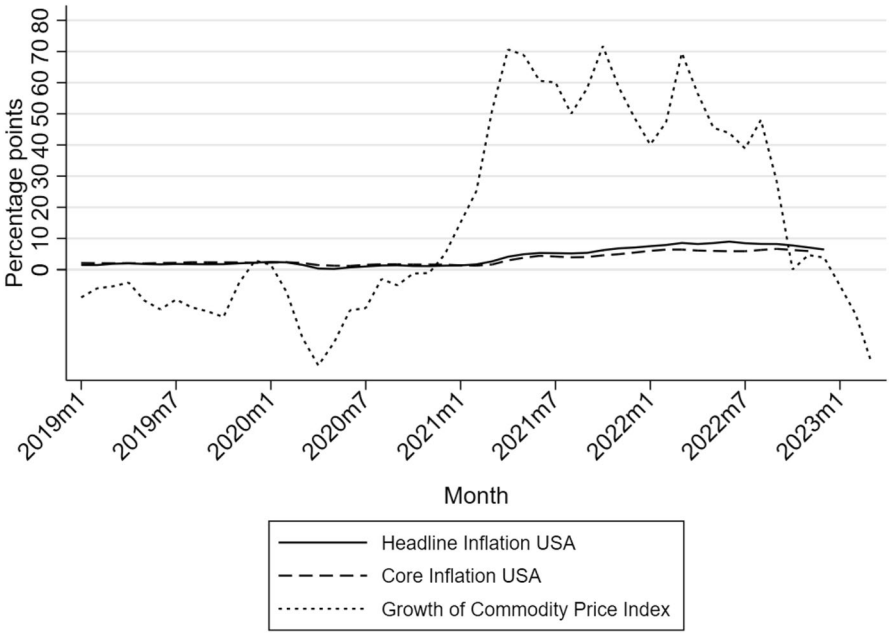


**Fig. 6** Annual increase in the commodity price index and inflation rates in the USA in percent. Source: IMF (2023a)

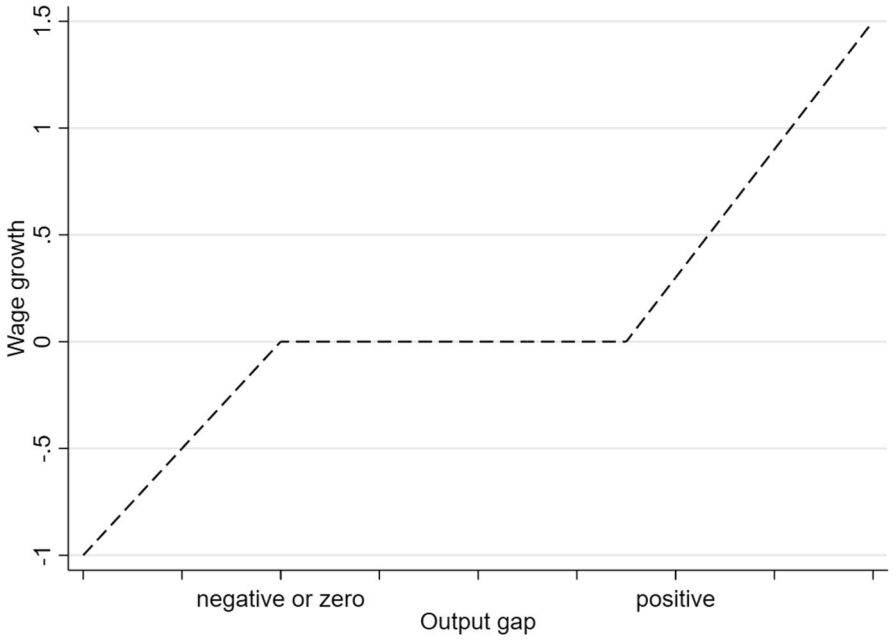


**Fig. 7** Non-linear Phillips curve. Source: For example, Chen and Semmler (2023), Gross and Semmler (2019) and Flaschel et al. (2004)

climbed to another peak reaching again almost 70%. A comparison with the inflation rate in the USA leads to the conclusion that it will take around 6–9 months for the increased commodity prices to affect inflation rates. There are delay effects and there are sometimes false correlation made with contemporaneous forces, see Chen et al. (2022) and Chen and Semmler (2023).

## 3 Nonlinear Phillips curve

The Phillips curve (PC) consists in fact of two curves (Phillips, 1958)—a price PC and a wage PC. The wage PC is driven by the labor markets, the price PC by the product markets. This distinction was also made explicitly in the work of Flaschel et al. (2004). The situation in the labor markets determines wage negotiations. The phase of the business cycle, represented by a positive or negative output gap, is decisive for the price PC (Chen & Semmler, 2023; Flaschel et al., 2004; Gross & Semmler, 2019). The output gap measures the difference between an economy's actual output and its potential output. Potential output is the maximum amount of goods and services that an economy can produce when producing at full capacity. When both curves, the wage PC and the price PC, are combined a non-linear Philips-Curve NLPC results, and the wage dynamics can be made dependent on the

output gap dynamics. This is shown in Fig. 7. The vertical axis shows the growth rate of wage income. The horizontal axis measures the output gap.

As Gross and Semmler (2019) show, the NLPC has different segments: a flat segment in the middle, where the growth rate of wage income is zero even with a negative output gap (underutilized capacity), a segment in which the PC can rise steeply with a positive output gap due to increasing capacity utilization, and a segment in which the PC falls. With larger and longer lasting slack (and a high unemployment rate), employment income falls and the growth rate of wage income becomes negative (as shown in the left segment of the NLPC).

In an open economy, exchange rates must also be taken into account for the NLPC. If the domestic currency depreciates (gains) against the foreign currency, but the imported goods are denominated in this foreign currency, the import prices rise (fall). The import prices can, thus, trigger a price surge (fall) and let the price PC rise (fall), ceteris paribus—and all this is likely to happen with delays.

Such an NLPC can also be integrated into a dynamic macro model with price and financial market dynamics as well as central bank policy and can also be tested econometrically. As Gross and Semmler (2019) demonstrate in an extensive econometric study using data of 27 Euro countries, and as is also confirmed by a large number of other studies, this is also empirically verified. In addition, with reference to Kaldor (1983), it can be argued that the wage PC has a delayed effect, since companies only increase employment when they observe larger profits from increasing sales. The Kaldor observation can also be implemented in dynamic macro models and tested econometrically (see Chen & Semmler, 2023).

These considerations are equally relevant to the current post-corona economic phase for the US and Europe (see also Figs. 8, 9). As was the case after the 2008–9 Global Financial Crisis, governments during and after the 2020–21 corona crisis have supported goods markets with government stimulus packages. The stimulus, combined with a shortage of supply and the exogenous price drivers, fossil energy and agricultural goods, has led to a higher rate of inflation, but initially only in the product markets. Only after the inflation rate had risen did wages also move upwards. As a result, the wage PC only got going with a delay after the corona crisis. This is also clearly shown in the research. For example, the ECB expects average wage growth of 5.3% and 4.4% in 2023 and 2024, respectively. Real wages are projected to return to 2% real wage growth by 2025.

Figure 8 illustrates the delay for the Euro area. Although the annual growth rate of the nominal wage rose sharply in early 2021, wages were already unable to keep up with the rapidly rising inflation in the course of 2021, so that real wage losses occurred from the third quarter of 2021 on (Fig. 9). Similarly to the situation in the USA, workers throughout the Euro area had to accept real wage losses from 2021 on (Fig. 9) despite a high nominal wage growth (Fig. 8) (see also Bodnár et al., 2023).

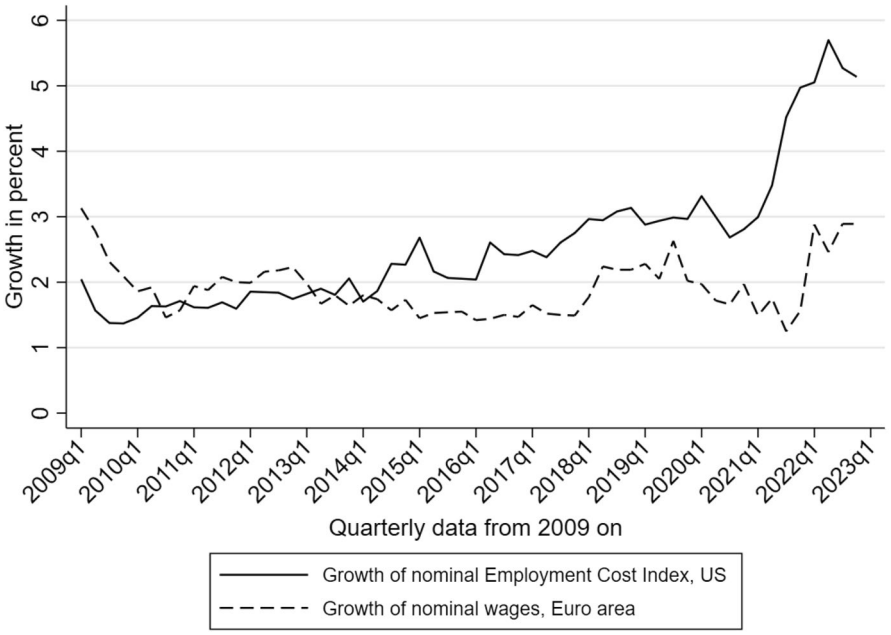


**Fig. 8** Growth of nominal employment cost and wages in the US and the Euro zone. Source: FRED Federal

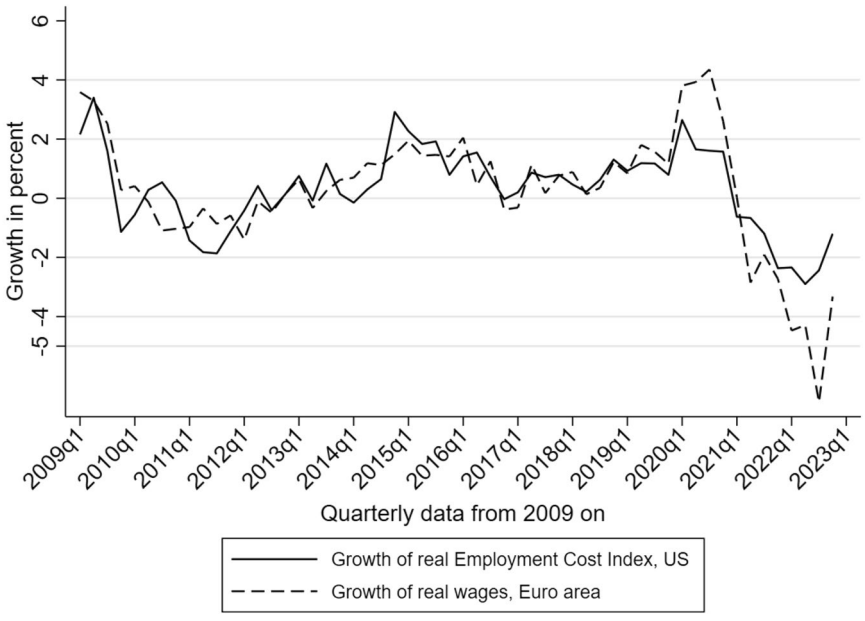


**Fig. 9** Growth of real employment cost and wages in the US and the Euro zone. Source: FRED Federal

## 4 Persistence of inflation rates and central banks' policy

In the meantime, the question of the persistence of high inflation rates has become a crucial issue in the debate. Will inflation continue as the wage-price spiral kicks in? As mentioned above, this is not very likely. The persistently high inflation rates seem to be driven less by wage increases and rising labor costs than by energy, commodity and food prices (Alvarez & Hansen., 2023; Ha et al., 2023; IMF, 2023b).

However, there are also other forces that could keep inflation high and persistent. First of all, there are the "excess liquid capital and liquid income movements", which cause price increases in certain sectors when there are bottlenecks. On the other hand, the prices of fossil fuels have been falling again for a few months and have an inflation-inhibiting effect. Due to a prolonged adjustment period and targeted adaptation measures, the impact of the lost access to Russian oil and gas has been less dramatic than would have been expected if Russian oil and gas had become inaccessible as early as March 2022, immediately after the Russian invasion of Ukrain. In the meantime, Russia's share of total EU natural gas demand is down to only 10% by the end of 2022 compared to 40% in 2021.

Another inflationary risk could be the emergence of so-called "greenflation". This is a short name for inflation driven by the decarbonization of the economy, caused by the rise in the prices of those commodities that are needed in large quantities during decarbonization. A frequently cited example of this are the so-called "rare earths". The name alone suggests sectoral scarcity and thus high prices.

Weber et al., (2022) point to another source for a huge potential to hike prices of goods, that is the market structure. They argue that the market and thus pricing power of companies is highly concentrated in oligopolistic branches of industry. It is true that this is a secular phenomenon that has developed for a long time and did not emerge suddenly in 2021. However, it is likely that the corona-related bottlenecks in goods supply were the environment in which suppliers feel that exercising market and price setting power will be successful.

For example, price premiums are currently particularly high in sectors where demand is high and supply bottlenecks and disruptions are severe. The increased energy costs can be passed on particularly easily where the fossil energy industry and the manufacturers of energy-intensive industrial goods are suppliers to other industries. The upward forces on prices then depend on the inter-industrial linkages. Under these circumstances, the costs can be passed on to a disproportionate extent, as a look at the profits per unit good in the Euro zone in the fourth quarter of 2022 reveals. According to Arce et al. (2023), unit profits grew 9.4% year-on-year, accounting for more than half of the quarter's price pressure. In contrast, unit labor costs rose by only 4.7%, with a correspondingly lower contribution. In the US, too, companies reported strong profits in bottleneck sectors last year despite the highest inflation in 4 decades.

Chen and Semmler (2023) explain why widespread persistent rates of inflation can occur. Using a new estimation method, a mixed co-integration method (Vector Error Correction Model, VECM), they show that when some variables are

non-stationary and other variables are stationary, only the non-stationary variables have persistent and permanent effects. Thus, only a shock in the non-stationary drivers leads to permanent effects on other non-stationary variables.

When it is currently being discussed whether inflation rates will remain high for a longer period of time, another question has become the center of economic discussion. That is the controversial question about the contribution of a restrictive central bank policy to the persistent upward pressure on prices. The rapid increase in key interest rates has not only made credit more expensive, it has also created new financing constraints, whether through an increase in risk premiums or in the form of a beginning credit crunch. The increasing financing constraints resulting from soaring interest rates will exacerbate output constraints and hence the upward forces on prices. It is well known that financing restrictions particularly affect innovative companies, especially companies with innovative activities in the environmental sector (Hottenrott & Peters, 2012; Jensen et al., 2019; Schäfer et al., 2017). It is to be feared that the new restrictive central bank policy will particularly affect environmental and climate protection investments and innovations negatively.

The effects of the restrictive central bank policy on supply and thus on prices has recently been referred to as the "financial theory of inflation" (Korinek & Stiglitz, 2022). In contrast to the monetary theory of inflation, which is increasingly being discussed in Germany (e.g. Merz, 2023), which starts with the money supply and demand, the "financial theory of inflation" describes how a restrictive central bank policy can heat up the inflation rate instead of taming inflationary processes.

## 5 The central bank dilemma

To lower the rate of inflation, the central banks, the FED and the ECB, have used their policy of high interest rates and were pursuing "quantitative tightening" (QT). This policy only has a very delayed effect on the inflation rate, since external forces are also driving the inflation rate and, moreover, the labor market must first be slowed down before the inflation rate can drop. However, the effect of the rise in interest rates on banks and the capital market is more immediate. The turbulence in the banking sector, particularly in the USA but also in Switzerland, has raised the question of whether the restrictive central bank policy is destabilizing the financial markets. Can central banks achieve both targets, bringing down inflation and keeping financial markets stable? Does the central bank really have different tools to pursue both goals, as it explains? Would the rise in inflation rates possibly be further promoted by the decarbonisation of the energy sector and important sectors linked to it?

Central banks face two main problems when raising interest rates. First, raising interest rates to fight inflation also tightens the borrowing conditions faced by the real economy, possibly even up to the point of a credit crunch and credit supply disruptions. A prerequisite for eliminating the production bottlenecks, however, are sufficient and affordable loans for operating resources, investments and innovations. Stricter conditions and restrictions on the availability of credit have the opposite effect, the production bottlenecks and sectoral upward price pressure are intensified.

On the other hand, the restrictive monetary policy is also a double-edged sword for banks. It is true that the increase in the interest rate will make new lending more profitable and a bank's own central bank deposits will be remunerated more. As of 2022, banks in the Euro area hold around 4 trillion Euros in deposits with the ECB. As Fig. 3 illustrates, between July 2022 and July 2023 the rate on bank deposits at the ECB increased from − 0.5 to 3.75%. This means a considerable windfall profit for the banking sector. De Grauwe and Ji (2023) sharply criticize this windfall profit. They argue that the created interest income should accrue to the general public and not to the banks.

At the same time, however, banks' investments in fixed-income securities are falling in value. If only enough depositors begin to doubt the value of the investments on the assets side of the bank, e.g. because large holdings of government bonds have lost substantial value as a result of interest rate hikes by the central banks, then a "bank run" will occurs and the bank will fail with certainty. This is what the first gradually accelerating and then finally hasty withdrawals of customer deposits at Silicon Valley Bank, Signature Bank and First Republic have again proven impressively, in the Spring 2023. It is possible that the liquidity-driven increased risk of bank insolvency will spread to the real economy as a shortage of credit-crisis.

At the end of July 2023 the FED raised the interest rate to 5.5 percentage points. According to the Federal Deposit Insurance Corporation (FDIC), banks were sitting on unrealized losses of 620 billion US dollars at the end of 2022 (FDIC, 2023).[2] More recent estimates assess the unrealized losses in the US banking system at 1750 to 2000 billion US dollars (Drechsler et al., 2023; Jiang et al., 2023). Within a year, from March 2022 to March 2023, US banks lost about $1 trillion in deposits due to the Fed's interest rate hike and the widening interest rate differential between bank deposits and investments in money market funds. In the week of April 5 to April 12 2023 alone, deposits in US banks shrank by $76.2 billion. If US banks had continued to lose deposits at this rate, the US banking sector would have lost nearly $4 trillion in a year. This amount is far higher than the total equity of US banks. That was 2.205 trillion in December 2022.

The non-compensated withdrawels at the liabilities side of the balance sheet inevitably result in a shrinking of the assets side. This is done either through the sale of assets to pay off depositors, or through depreciation and impairment, or, as in the case of Silicon Valley Bank, Signature Bank, and First Republic, a combination of both. The withdrawn bank deposits are preferably invested in money market funds with a higher return on investment. Competition from those funds is also forcing US banks to pay higher interest rates on deposits in order to, at least partially, curb the liquidity drain. The margins, which have only just improved by the interest rate increases, are thus weakened again.

Small and medium-sized banks often generate a particularly large amount of income from the coupons on the securities in which they had invested the incoming deposits. If they have to sell the securities to pay back the withdrawing depositors, this income is lost. In addition, the depreciation of investments in very long-dated

[2] https://www.fdic.gov/news/speeches/2023/spmar0623.html.

securities is particularly high when interest rates rise. These losses are only in the books and the coupons will continue to be paid at the contractually agreed rate. However, with every emergency sale, the banks realize the losses. Former book losses become real losses that reduce the scarce equity. The distance to the specified regulatory minimum equity capital becomes smaller and the probability of bankruptcy increases.

In principle, the increased margins on new lending contracts work against such adversity. However, revenue can only be improved in the long term. In addition, higher-interest loans are also associated with a higher risk of default, which is expensive to hedge and therefore may not be done (Korinek & Stiglitz, 2022; Stiglitz & Regmi, 2022). Each further interest rate hike lowers security prices, potentially triggering even more need for value adjustments and increasing the pressure to keep competition from money market funds in check with higher deposit rates. Higher costs increase the risk of bank failures system-wide. Even more banks could become victims of a "bank run'' and then fail generating large losses for shareholders and uninsured depositors. A takeover of the insolvent institution by the FDIC is usually followed by a sale to a major bank, as it has happened with the First Republic, which was taken over by JP Morgan.[3] In general, the concentration in the banking sector will increase with an uncertain outcome for stability (Baum et al. 2020).

The banks will tighten the conditions for loans to households, companies and public bodies. With a shrinking lending in the Euro zone, where the withdrawal of bank deposits is currently much less pronounced than in the USA, the pressure for further interest rate hikes is receding but consumption and investment are also falling. Positive feedback effects on economic growth can reduce public revenues and increase debt levels. The financing capacities of the countries in the Euro area could deteriorate.

Of course, the bank supervisors could and should have assessed such risks, interest rate hikes and default risks, and included them in bank stress tests. But neither the FED nor the ECB did that. As it turns out, by raising interest rates quickly and sharply, the central banks could miss two goals at the same time: reducing the inflation rate and keeping the financial markets stable. No one knows whether the turbulence in the US banking system has ended for the US regional banks with the failures of Silicon Valley Bank, Signature Bank and the First Republic, which was taken over by the FDIC and sold to JP Morgan at the end of April, 2023, or whether the crisis will sometimes continue on a higher level.

It remains unclear why the crisis banks were not able to stop the sharp withdrawal of deposits, despite the fact that future income opportunities have been greatly improved by the interest rate hikes. Is the withdrawal of deposits only due to interest rate competition from money market funds? If this had been the case, why could the troubled banks not stem the outflow by paying competitive deposit rates? Apparently, customers assumed that the banks' assets side was overvalued in such a way that the future depreciation far outweighed the greatly improved future revenue potential.

[3] https://www.fdic.gov/bank/historical/bank/bfb2023.html.

Whether these banks remain isolated cases or whether financial market stability is endangered, with noticeable consequences for the real side of the national economy, will be apparent from the development of bank shares and the financial market stability index (ECB, 2023; IMF, 2023d). The shareholders of several US regional banks had to accept double-digit price losses. Hedge funds, which use short sales to test the resilience of US banks identified as vulnerable, also weighed down prices. On the customer side, household and firms that had to roll over mortgages and real estate loans at a significantly higher rate contribute to a higher downside risk for the banks' asset side. The decline of the prices of capital assets as Minsky would see it, has then impacted the real side and the inflation dynamics.

## 6 Ways out of the dilemma?

Depositors' confidence in their banks should have increased further. Central banks could have created confidence through regulation, supervision and stress testing. Stress tests were geared towards checking the health of banks' balance sheets (see for example ESRB 2021). The consequences of different growth rates in the economy as a whole for the regulatory capital of the banks were simulated, but not the consequences of historically rapid and strong interest rate hikes (Gross et al., 2018; Meyland & Schäfer, 2021). This is seen as a supervisory failure of the FED—and possibly also the ECB—and will go down as such in the history of the financial market disruptions. It seems that the central banks themselves did not anticipate the possibility of tightening interest rates so dramatically. The suspicion arises that they have come under pressure from governments' efforts to contain inflation through fiscal measures, and have taken flight to the front in order to maintain their reputation as the strict and only effective inflation guards.

In 2018, the Trump administration exempted small and medium-sized banks from some tough provisions of the Dodd/Frank Act. The threshold above which banks are considered systemic risk and are subject to stricter supervision has been raised from US$50 billion to US$250 billion. These institutions no longer had to take part in the regular stress tests. There were no serious stress tests with a focus on interest rate risk anyway. Trading, credit and capital rules for banks with assets under $10 billion have also been relaxed. The regulatory and supervisory authorities had risks such as leverage, the increasing shadow banking system or the ''too big to fail'' phenomenon in mind, but not the interest rate risk. As a result, bank assets collapsed and investors moved capital to safe havens, with no chance for the ailing banks of breaking the vicious circle.

The typical feeling of "being on the save side" that accompanies a long boom, i.e. the ignorance of risks, has again almost led to a "Minsky moment" 15 years after the Lehman bankruptcy. This time the "Minsky moment" came as an interest-driven collapse in bank assets and slow, but unstoppable "bank runs". While banks are only viable on the trust of their customers, according to Minsky, too much trust paves the way for the coming catastrophy by fostering ignorance of the unfolding risks.

Appropriate regulation, monitoring and oversight should under normal circumstances prevent such developments. However, the banking crises of the past

decades have shown that the stability risks are forgotten from 10 years on after an acute crisis. Demands for deregulation are then raised again, mostly with the same justifications as before the acute crisis. The demands also regularly find political attention, as in 2018 under the Trump administration. Before the banking sector turbulences in 2023, the tightening of the minimum capital requirement regulation (mainly through the so-called Basel III output floor), which had been planned for a long time, was in danger of not being introduced in the EU.

It cannot be ruled out that the climate policies of the governments will create a new inflation problem, the so-called "greenflation". These are price drivers that may be fueled by the urgent need to decarbonize the energy sector and other important sectors. A $CO_2$ tax could also drive inflation when it is passed on. The tax must be high to generate the intended steering effect. However, the price-driving effect should become less the more the tax takes effect and people switch to low-$CO_2$ products and technologies.

In addition, decarbonization needs a lot of "rare earths". These are metals that are mainly found in China and partly in Russia, Africa, Brazil and Australia, but are not yet being explored and produced to the required extent (Fard et al., 2023). The increasing demand for these metals will lead to sectoral shortages and price increases, which, like energy prices, can spill over into the overall economy and fuel inflation. Initiatives which mitigate the imminent shortage of these metals are urgent (e.g. through research into substitutes) so that the possible surge in inflation can be counteracted. It is already becoming apparent that additional tightening of the monetary policy is not beneficial here. Every interest rate step makes it more difficult to take out loans, makes investments in decarbonization and climate protection more expensive, and thus increases the risk of not making the necessary investments (e.g. Fard et al., 2023).

Finally we want to note that the rapidly rising interest rates in advanced countries triggered capital flows out of developing economies and emerging markets. During the low or near zero interest rate period, during which advanced countries have used unconventional monetary policies and quantitative easing, those regions of the global economy experienced strong capital inflows, exchange rate appreciation, domestic liquidity rise, extensive lending and borrowing, but also declines in exports because of a higher value of the currency. Yet, when the quantitative tightening and a rapid rise of interest rates occurred in advanced countries the developing economies and emerging markets experienced not only capital outflows but also higher transmitted inflation rates through resource prices, decline of currency reserves and increased domestic financial fragility. They had also to increase the interest rates which became detrimental to financial stability and sovereign debt. Also, in those countries there is now little fiscal space for climate finance and green investments.

## 7 Conclusions

Apparently, the current measures cannot achieve all aims: slowing down inflation, stabilizing the financial markets and keeping growth going. The central banks still believe that they can treat and control the problems separately. But it does not seem to work well that way. If interest rates remain high, but external forces with persistent effects emerge and keep inflation rates high, especially in smaller emerging markets, it is difficult to counteract this on a country- or region-specific basis through high interest rate policies and a national control of price- and wage-Phillips curves.

A sharp rise in central interest rates raises the cost of capital, creates credit crunches, creates further supply constraints and creates additional inflationary pressures. In addition, the climate policies and energy conversions that have been introduced will cause greater demands on existing capacities and increase inflationary pressure if the bottlenecks are not prevented or alleviated by additional capital and further investments. The central justification for the US Inflation Reduction Act was that some of these investments promise increasing supply and returns and a reduction in price pressure in the longer term. Government subsidies have been justified under these circumstances by many economists in the US.

The rapid tightening of interest rates by the FED and ECB also hits the weakest and most heavily indebted countries the most. Although there is some indication that emerging markets are less vulnerable this time then they were in the 80ies when the Volcker disinflation led to the debt crisis in South America and in the 90ies when the US monetary tightening prepared the ground for the Asian crisis (Kalemli-Özcan & Unsal, 2023), financial market fragility and debt problems are increasing in emerging economies as well as in developing countries (IMF, 2023c).

Bond holders might benefit since long term bond yields are high, but so are term and risk premia and this may accelerate the risk of bankruptcy. This will also be a strong brake on investment and it will almost certainly need to be neutralized by fiscal packages if climate investment targets are to be met. The interest rate policy of the central banks remains a risky game for vulnerable banks, companies, private housing and for states. It also has a strong negative impact on climate protection investments. There is, therefore, an urgent need for further discussion and analysis on how investments (including climate protection investments) could be increased to eliminate sectoral bottlenecks (Stiglitz & Regmi, 2022). Further stimulus packages of the type the US has pursued with its Inflation Reduction Act which is actually more of a sectoral and macroeconomic policy program against climate risks are necessary.

Overall, the too fast interest rates hikes have put the central bank at risk of missing its goals—reducing the inflation, keeping the financial market stable and avoiding output contractions. Financial disruptions are likely to come. Inflation rates are only sluggishly reduced, driven by external forces, not under control of the central bank, and expected output growth seems to move into the recessionary direction. Other tools are needed to curb inflation and keep it under control, for example more investment in sectors with supply disruptions and a massive expansion of investment in renewable energy.

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