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The EU Without Russian Oil and Gas

Following the Russian invasion and brutal attack on Ukraine, the West and in particular the United States, the United Kingdom, Canada and the EU have agreed on a number of major and far-reaching sanctions. And while these sanctions had strong effects on the Russian economy, they are falling short of their goal of ending Russia's attack and bringing its economic capacity for war to an end. Further sanctions on Russian oil and gas need to be discussed.

The financial sanctions against Russia since its invasion of Ukraine began on 24 February have included three main planks, as Nicolas Véron and Joshua Kirschenbaum point out. First, sanctions against named Russian individuals have expanded dramatically. Second, a series of sanctions have been imposed on individual Russian banks. These include the disconnection of individual Russian banks from SWIFT, the international interbank messaging system which is based in Belgium and thus under EU jurisdiction. Third, the Bank of Russia, the country’s central bank, has been blocked from using its international reserves in several jurisdictions. Critically, these include the US, the EU, the UK, Canada, Japan, Australia and Switzerland – in other words, all the world’s core reserve-currency jurisdictions bar China.

A second set of sanctions concerns technological products. Targeted sanctions on specific technologies, financial sanctions and “self-sanctioning” by private companies are effectively decoupling Russia from supplies of high-tech goods. The combination of technological and financial sanctions, public pressure and reputational risk, and the collapse of the Russian economy has made the decision to leave the Russian market easy for companies, and not just those from NATO allied countries.

Russia is highly reliant on imports of high-tech goods, with imports worth around $19 billion annually. The largest share (45%) comes from the EU, with 21% from the US, 11% from China and 2% from the UK. Most nuclear technology imports in 2019 came from the EU (68%). The EU is also the main provider of biotechnology, electronics, life sciences and flexible manufacturing goods. Russia has tried to resist technological sanctions by import substitution, but without much success. High-tech products are developed using inputs from many countries, but few of them can function without inputs from the EU or the US. In some high-tech goods industries, the effects of sanctions are already being felt. In the long term, sanctions will also severely affect Russia's growth outlook and ensure that waging war means Russia will cease to be a modern economy.

These sanctions have had a strong effect on the Russian rouble. In fact, the currency initially dropped massively by almost 50% and even Russia acknowledged in early March that the sanctions were constituting a significant blow to its economy. However, the exchange rate recovered substantially, undoing more than half of the initial loss.

An important reason why, despite all these sanctions, the rouble could recover and the Russian economy did not completely implode is the continued stream of revenues from oil, gas and coal sales. In fact, Russia remains the world’s first exporter of oil and gas, and at current energy prices this provides large hard currency revenues, estimated at around $700 million per day for crude oil and refined products and $400 million per day for piped natural gas to the EU alone.

1 https://www.bruegel.org/2022/03/war-in-europe-the-financial-front/.
While the US, Canada and the UK have announced embargoes or phase-out measures for Russian energy in the wake of the war in Ukraine, the EU has held back, instead launching a new energy strategy, REPowerEU. This aims to reduce the EU’s gas imports from Russia by nearly two-thirds by the end of 2022, and to make Europe independent from all Russian fossil fuels well before 2030. However, such a partial and gradual wind-down of volumes from Russia is ineffective. There is a risk that this strategy will drive up prices even further, over-compensating Russia for the loss of volume.

The current sanction strategy is therefore not effective enough to meaningfully change the calculations of Russian leadership. And as Russian economists Sergei Guriev and Oleg Itskhoki point out, the continued revenues from oil and gas sales are used by President Putin to finance his brutal war in Ukraine. In fact, the revenues from fossil fuel sales are so high that they can likely solve Russia’s fiscal and balance of payment problems. The authors point out that the pre-war budget was balanced at an oil price of $44 per barrel. Without the external revenues coming from the sale of fossil fuels, Russia would run a substantial fiscal deficit. It is true that Russia can print roubles to close the deficit. However, already now, the inflation rate has massively increased and the loss of hard currency revenues would likely result in a further increase in inflation. Put differently, the salaries of Putin’s police and military would also lose value if fossil fuel revenues dried up.

Numerous voices therefore call on EU leaders to follow the US, UK and Canada and implement a full embargo on imports of Russian fossil fuels and gas. However, German Chancellor Olaf Scholz rejected the embargo and stated that this represents a conscious decision by European governments, as these imports are of essential importance for the everyday life of European citizens.

An immediate EU fossil fuel embargo would undoubtedly imply substantial costs. However, a group of economists have argued that these costs are still manageable in size, quite comparable to the fallout from the COVID-19 pandemic. This is not the place to discuss the paper and the subsequent controversy around it. It should be noted, however, that an important reason why the cost is limited relates to adjustments, or substitution effects. The German Chancellor’s reasoning, that entire economic sectors would be affected or even stopped, is therefore an inaccurate description of the overall effect of a full embargo as the industrial structure of Germany would shift, adjusting to the energy price shock. In fact, I would argue that it would make sense to accept such a sectoral change in the composition of Germany’s economy. Reducing its reliance on cheap fossil energy may be necessary and specialising in relatively energy-intensive industries with large export potential may be an economic model that has run its course.

Nevertheless, a full embargo would be a huge and far-reaching step. And while it would hit Putin hard in the short term, it would also accelerate the adjustment process in Russia towards different sources of demand for its fossil fuels. Currently, the physical infrastructure is not there to bring the oil and gas to energy-hungry Asia. Still, even with the infrastructure in place, Putin would likely lose – even in the long term – as China will exploit its unique position as the main remaining buyer of Russian fossil fuel to reduce the price.

Overall, a more sensible approach may therefore be for the EU to impose price caps or even tax energy imports from Russia. An import tariff as recently proposed by Ricardo Hausmann could go a long way towards reducing the major source of revenues to the Russian economy and to Putin himself. The EU and the West need to acknowledge and accept the fact that European liberal democracy is being defended in Ukraine – a clearer message to Putin is needed. A slow and gradual phasing out of Russian fossil fuel is simply neither ethically acceptable nor politically and economically smart.

The Challenges of Inflation in Europe and the US

Inflationary pressures and uncertainties related to the severity and duration of the coronavirus pandemic have been growing steadily in the last year. Different approaches to supporting labour force participation in Europe and the United States have led to different inflationary outcomes. In addition, the Russian war against Ukraine, which began on 24 February, has provided a definitive answer to questions about whether rising inflation is just temporary. The sharp increase in already volatile food and energy prices is presenting monetary policymakers with new challenges. The authors in this Forum consider how to respond to rising inflation, discuss why inflation is so hard to predict and examine whether long-term inflation expectations have de-anchored.

Inflation Developments in the Euro Area Since the Onset of the Pandemic
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European Inflation in an American Mirror
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Why Did (Almost) No One See the Inflation Coming?
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Inflation Developments in the Euro Area Since the Onset of the Pandemic

The coronavirus (COVID-19) pandemic shock required lockdowns and containment measures in the euro area, which implied a shutdown of businesses and/or an increase in costs for some sectors. The shock was multidimensional, stemming from both external and domestic sources, hitting both demand and supply and affecting both the aggregate and the sector-specific level. At the same time, the pandemic shock was countered by an unprecedented policy response both at the national and the supranational level. In combination, all of this has led to considerable volatility of inflation in the euro area. As measured by the Harmonised Index of Consumer Prices (HICP), headline inflation in the euro area, which had equalled 1.2% in 2019, fell to 0.3% in 2020 and was even negative in the second half of 2020 before increasing again to 2.6% in 2021. Since mid-2021, headline inflation increased particularly sharply and reached a historical high of 5.9% in February 2022. This article discusses the drivers of inflation developments in the euro area since the onset of the pandemic as well as the recent inflation outlook, which has become very uncertain and will crucially depend on how the war in Ukraine will unfold.

The pandemic has shaped the pattern of inflation in the euro area

Headline inflation as reflected in the HICP – the index underlying the ECB’s definition of price stability (Eurosystem work stream on inflation measurement, 2021) – showed a decreasing trend over 2020 and declined from 1.2% in February 2020 (before the start of the pandemic in the euro area) to 0.3% in December 2020 (see Figure 1). The initial decline in headline inflation was mainly due to a fall in the contribution of energy inflation resulting from collapsing oil prices. Headline inflation fell further in the second half of the year as HICP inflation excluding energy and food (HICPX) also increasingly contributed to the disinflationary tendencies, mainly owing to a decline in services inflation and, to a lesser extent, a decline in non-energy industrial goods (NEIG) inflation. This can be linked to pandemic-related restrictions but also to temporary factors like the reduction of the German VAT by three percentage points in the second half of 2020 (O’Brien et al., 2021).

From January 2021 on, headline inflation showed a strong upward trend bringing headline inflation to 5.9% in February 2022. While energy inflation played a key role in this upward trend of headline inflation since autumn 2021, higher NEIG and services inflation as well as higher food inflation in recent months have also been important.

Energy inflation is currently accounting for more than half of headline inflation

Oil and gas prices fell sharply at the onset of the pandemic.1 This large drop reflected mainly the negative impact of the pandemic on energy demand (Koester and Rubene, 2021). As a result, the annual rate of change of HICP energy declined markedly, reaching its trough in May 2020 at -11.9%, levels last observed in 2009, and HICP energy inflation contributed negatively to headline inflation through most of 2020 (see Figure 1). Since mid-2020, energy prices started to rise as global demand recovered and supply constraints, especially on the gas market, rose. Consequently, HICP energy increased from its trough in May 2020 to 28.8% in January 2022 – with base effects linked to the previous collapse of oil prices contributing around ten percentage points to HICP energy inflation. Data for the first months of 2022 suggest that the contribution of gas and electricity prices to HICP energy inflation has increased further (see Figure 2), with prices for electricity and gas being reset at the start of the new year in many countries. Overall energy inflation accounted for more

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1 The immediate decline in the oil price was particularly pronounced as for instance the Brent crude oil price dropped by 75% while the Dutch Title Transfer Facility (the Dutch trading hub for gas and the main reference hub for gas trading in Europe) gas price fell by 44% between February and April 2020.
that half of headline inflation in February 2022. The Russian war in Ukraine has implied a further soaring in energy prices and energy inflation to a new historical high of 32% in February 2022 and increased the uncertainty about the future path of energy prices and inflation more generally.

Indirectly, higher energy commodity prices also feed in through the pricing chain via higher input costs to food, non-energy industrial goods and services (Koester et al., 2021a). NEIG and services with high energy intensity such as pharmaceutical products or travel services can be particularly affected. The rising energy costs have likely contributed to increases in food inflation and non-energy industrial goods inflation – which stood at 4.1% and 3.0% respectively in February. Yet, this pass-through takes time and unfolds over years, implying that rising energy prices will likely push up food and underlying inflation in the future.

External factors have played a key role for inflation developments in the euro area

Already now, the largest part of inflation in the euro area reflects shocks generated abroad, via net imports of energy and commodities or via the import content of other goods and services. This can be illustrated by decomposing HICP inflation into energy and food as well as into items with a high and a low import content (Figure 3). Inflation in items with low import content, for which domestic price pressures play a key role, has been much lower than for HICP and also HICPX. This contrasts with the period prior to the pandemic where the shocks driving inflation were more equally distributed and reflected both external as well as domestic factors.

Underlying inflation increasing and broadening

Indicators of underlying inflation, which signalled low inflation in the euro area for an extended period from 2013 to 2019 (Koester et al., 2021b) have remained subdued since the start of the pandemic before picking up strongly over recent months.

As no single measure of underlying inflation has proved superior, the ECB is usually monitoring a broad range of different indicators (Nickel and O’Brien, 2018; Ehrmann et al., 2018). HICP excluding food and energy inflation rose to 2.7% in February, up from 2.3% in January (Figure 4). Measures of underlying inflation that seek to remove the impact of temporary factors like HICPXX inflation (which, in addition to energy and food, also excludes travel-related items, clothing and footwear), the model-based Persistent and Common Component of Inflation (PCCI) and the Supercore indicator (which comprises cyclically sensitive HICP items), have tended to edge upwards in recent months. While all indicators of underlying inflation have moved above 2%, this probably reflects – at least in part – the indirect effects of elevated energy prices.

Price pressures have been broadening across the spectrum of goods in the euro area (see Figure 5). This is reflected by the fact that the share of items with inflation...
lated services, for quite some time with a direct impact on service inflation (Lis and Nordeman, 2021). At the same time, a relative expenditure switch towards the consumption of goods has strongly increased demand for goods. In addition, manufacturing production continued to be

rates above 4% (accounting for 24% of items in December) and of items with inflation rates between 2% and 4% (accounting for 44%) has strongly increased. A year ago – in February 2021 – these shares were much lower and equaled 6% (share of items with inflation rates above 4%) and 10% (share of items with inflation rates between 2% and 4%).

Supply bottlenecks and reopening effects have played a key role

The pattern observed in underlying inflation in the euro area can be linked to developments in the real economy with a large decline in global economic activity in 2020 followed by a significant recovery starting in the third quarter of 2020 and a boost from the rollout of vaccine programmes since late 2020 (Lane, 2021a). This is in line with the finding that while the assessment of the euro area Phillips curve (linking inflation to developments in economic slack) has become more complicated due to numerous confounding factors during the pandemic, it is still at play – even if it is hard to pin down precisely (Bobeica et al., 2021).

The economic recovery has remained asymmetric as social distancing has constrained demand and activity levels in high-contact service sectors, especially travel related services, for quite some time with a direct impact on service inflation (Lis and Nordeman, 2021). At the same time, a relative expenditure switch towards the consumption of goods has strongly increased demand for goods. In addition, manufacturing production continued to be
low-contact services increased only very moderately (Figure 7). This reflects a key role of re-opening effects linked to the easing of the containment measures as well as an impact of the energy price increase – which pushes up costs for transportation, which are also part of the high-contact services.

Wage growth has remained muted and longer-term inflation expectations have re-anchored

Wage growth – a major driver of services inflation in the euro area – has remained moderate thus far. Important measures of wage growth like compensation per employee or compensation per hour have been heavily affected by the changing impact of government support measures related to job retention schemes (Dias da Silva et al., 2020). Workers maintained their employment status but actual hours worked per person declined and workers only received part of their usual compensation, lowering compensation per employee while annual growth in compensation per hour increased. Over the course of the pandemic, the divergence between compensation per employee growth and compensation per hour growth was strongly affected by the importance of job retention schemes. The distortion from these schemes has declined recently and can be expected to remain moderate looking ahead – but will not entirely disappear until the pandemic is fully over and these support schemes are not needed anymore. This causes some difficulty in interpreting developments in wage measures like compensation per hour or per employee.

2 A key role of supply bottlenecks and reopening effects for underlying inflation has also been observed in other jurisdictions – see e.g. Cuquerella Ricarte et al. (2022) and Koester et al. (2021c).

3 Historical decompositions are based on a VAR including a bottleneck proxy, oil prices, HICP NEIG, producer prices, industrial production, export and import volumes. The bottleneck and oil price shock are identified using short-run restrictions averaged across all possible orderings of the bottleneck and oil price series. As a bottleneck proxy, a PMI supply shock is estimated from a separate VAR including PMI output and supply deliver times and identified via sign restrictions. Gas prices are not explicitly included in the model, but oil prices are highly correlated with gas prices, and thus capture a major part of the energy shock.
The pandemic led to a fall in longer-term inflation expectations in the euro area to historically low levels in 2020. During 2020, long-term survey-based inflation expectations based on the ECB Survey of Professional Forecasters (SPF) stayed at a narrow range of 1.64%-1.67%. Since the beginning of 2021, longer-term inflation expectations have been moving up, indicating that long-term inflation expectations across a range of measures have re-anchored at the ECB’s inflation target. This is reflected, for example, in the ECB’s Survey of Professional Forecasters (SPF) for the first quarter of 2022 (which was conducted in the second week of January) and the January 2022 Consensus Economics forecasts, in which longer-term inflation expectations have risen to 2.0% and 2.1% respectively, up from 1.9% in their respective previous survey rounds (Figure 9). This should also contribute further to underly- ing inflation and help headline inflation to settle durably at the 2% target of the ECB. Looking ahead, it will be key to closely monitor the potential effects of the current spike in inflation on the evolution of indicators of longer-term inflation expectations, especially in the euro area, which has been relatively insulated from developments in other parts of the world. In this context, a recent ECB survey of large European companies indicates that wage growth in 2022 could be somewhat stronger, with some respondents citing the current high levels of inflation as a contributing factor (Gareis et al., 2022; Lane, 2022).

Over the medium to long term, inflation expectations play a key role in the achievement of a central bank’s inflation target. Inflation expectations that are firmly anchored in line with the inflation target support the achievement of that goal by guiding wage- and price-setting decisions in the economy. Deviations of inflation expectations from the inflation target may become self-reinforcing (Eurosystem work stream on inflation expectations, 2021).

The pandemic led to a fall in longer-term inflation expectations in the euro area to historically low levels in 2020. During 2020, long-term survey-based inflation expectations based on the ECB Survey of Professional Forecasters (SPF) stayed at a narrow range of 1.64%-1.67%. Since the beginning of 2021, longer-term inflation expectations have been moving up, indicating that long-term inflation expectations across a range of measures have re-anchored at the ECB’s inflation target. This is reflected, for example, in the ECB’s Survey of Professional Forecasters (SPF) for the first quarter of 2022 (which was conducted in the second week of January) and the January 2022 Consensus Economics forecasts, in which longer-term inflation expectations have risen to 2.0% and 2.1% respectively, up from 1.9% in their respective previous survey rounds (Figure 9). This should also contribute further to underlying inflation and help headline inflation to settle durably at the 2% target of the ECB. Looking ahead, it will be key to closely monitor the potential effects of the current spike in inflation on the evolution of indicators of longer-term inflation expectations in particular. This is even more important given the finding that households’ inflation expectations tend to be influenced strongly by the prices of goods that they purchase frequently (D’Acunto et al., 2022) such as fuel and groceries – which currently record very high inflation rates.

The outlook for inflation in the euro area

Over recent months, headline inflation has soared significantly, reflecting mainly a sequence of energy price
shocks, but also global supply bottlenecks and re-opening effects have contributed to inflationary pressures. These turned out to be more persistent than previously expected by most forecasters. Still, these factors are assessed to be the result of transitory disturbances and pandemic-related adjustments and, hence, are expected to fade over the coming years.

While the Russian war in Ukraine has intensified the uncertainty on energy prices, oil and gas price future curves suggest a decline in energy prices, which implies sharp declines in energy inflation looking ahead. Similarly, global supply disruptions might increase in the near term, again due to shortages of key inputs from Russia, and only fade later easing the pressure on non-energy industrial goods inflation. As more and more containment measures are lifted across Europe, price pressures in high-contact services are likely to ease. The Russian war in Ukraine might have some dampening effects on inflation via the negative growth effect on underlying inflation in the euro area, but these are likely to be offset by indirect effects from the higher energy prices triggered by the conflict.

So, while inflation in the euro area is expected to stay high this year as inflationary pressures have broadened and become more persistent, inflation is likely to stabilise at 2% in the medium term. This is also reflected in the latest ECB (2022) staff projections – in which the baseline foresees inflation equal to 5.1% in 2022 before falling to 2.1% in 2023 and 1.9% in 2024. An adverse scenario and a severe scenario, however, expect substantially higher inflation in 2022 and 2023 but a moderation of inflation to 1.9% (in the severe scenario) or even 1.6% (in the adverse scenario) in 2024 (Figure 10).

Looking further ahead, structural changes are likely to play an important role for inflation in the euro area. Climate change and climate policies in particular are likely to impact energy prices, changes in relative prices and the dynamics in overall inflation. The overall impact is subject to high uncertainties in terms of sign, size and timing. The Russian war in Ukraine has increased this uncertainty even further. Until around the end of this decade, upward pressures on consumer energy prices and increased energy price volatility are possible, mainly due to higher taxes and enduring high dependence on fossil fuels. Around the end of this decade, upward pressure might ease, especially for electricity prices as the share of renewables in electricity production is expected to grow fastest. For transport and heating, fossil energy sources will still dominate beyond this decade and changes in energy commodity prices will continue to have a significant impact on HICP energy inflation. Yet, their relative importance should gradually decline with increasing electrification based on renewable sources and increasing energy efficiency. There is hope that the Russian war on Ukraine could expedite the energy transition in Europe leading to a new and more environmentally sustainable steady state.

4 See also the discussion in part 5 of Koester et al. (2021b).
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Barry Eichengreen

European Inflation in an American Mirror

Even before Russia’s invasion of Ukraine, it had become painfully obvious that the United States had an inflation problem. Now Mr. Putin’s war has added fuel to the fire by pushing up energy and food prices and creating additional supply-chain disruptions. It is clear that the Federal Reserve has fallen behind the curve, having failed to anticipate the magnitude of the inflation in the pipeline. What is not clear is whether and how it will now catch up. Nor is it clear whether other central banks, notably the European Central Bank (ECB), will avoid committing the same unforced error.

Anchors aweigh

The numbers for the U.S. are not good. Annual inflation accelerated to 7.9% in February, the highest level since early 1982, propelled by rising prices of energy, shelter, food and motor vehicles. Alarmed observers point to parallels with the 1970s, when commodity prices shot up, the Fed fell behind the curve, and inflation expectations became unmoored. Consumers, producers and workers all expected prices to keep rising at the same or even at an accelerating pace. Accordingly, workers adjusted their wage demands, consumers their spending patterns, and businesses their prices, unleashing what became a self-fulfilling inflationary spiral.

The current situation is different. Inflation expectations, for the moment, remain at least tenuously anchored. The University of Michigan Survey of Consumers for February confirms that respondents expect inflation to approach 5% over the coming year, but then to fall back to just above 2% in the subsequent four years, consistent with the Fed’s inflation target. The Federal Reserve Bank of New York’s Survey of Consumer Expectations for the same month similarly shows that respondents expect inflation to run at 6% over the coming year but to then fall back to 3.8% over a three-year-ahead horizon. As of mid-March, the break-even inflation rate derived from five-year Treasury inflation-indexed securities shows expectations of inflation averaging around 3.5% over the next five years—meaning that inflation between 2023 and 2026 is expected to be somewhat lower, given expected inflation of 5% for 2022.1 Although these numbers noticeably exceed the Fed’s traditional 2% inflation target, it can be argued that they are not out of line with its new average inflation targeting framework, in which it seeks to keep inflation around 2% on average in the medium term, given how 2% was undershot in the preceding period.

The question, of course, is whether inflation expectations, however stable they are for the moment, will remain anchored in the future. Answering it, and assessing the analogy with the 1970s, requires understanding how those expectations became unmoored in that earlier instance. It requires determining whether the conditions leading to the “Great Inflation” have in fact been consigned to the dustbin of history. The answer, as with many things economic, turns out to be “yes and no.”

Dustbin of history

In 1973, consumer price inflation in the United States reached 6%, approaching where it is today. That inflation, like ours, was led by rising food and energy prices; then as now, there were sharp changes in relative prices below the surface of an accelerating headline inflation rate (Blinder, 1979). Food and energy prices are volatile. This means that they can drop sharply, tamping down inflationary pressures, as well as continue to rise. The key question is thus why consumers, producers and workers, when forming expectations, extrapolated the elevated inflation rates of 1973-74 into the future. The answer is straightforward. The parties were more than justified for thinking that inflation would persist because there were absolutely no grounds for believing that the Federal Reserve would take action to tamp it down.

The Fed, or more specifically those responsible for its policies, were seen as unlikely to act because they lacked a coherent model of the connections between central bank policy and inflation. In the 1950s and first half of the 1960s, the anchor for policy, such as it was, was the Bretton Woods international monetary system. Under Bretton Woods, the U.S. pegged the dollar price of gold at $35 an ounce and stood ready to pay out gold for dollars on demand to foreign central

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1 It can be argued (e.g. Christensen and Gillan, 2011) that the small size and limited liquidity of the Treasury Inflation-Protected Security market makes the implied breakeven rate an unreliable measure of expectations. This is, of course precisely the rationale for also considering other evidence such as survey data.
banks and governments. The Fed understood that excessive inflation made possible by lax central bank policy might jeopardize this commitment. If U.S. interest rates were too low, capital would flow out of the country, gold would be lost to foreign entities acquiring dollars, and U.S. rates would have to be raised. If U.S. spending was too strong, imports would surge, gold would again be lost, and the Fed would be forced to rein in demand.

The Federal Reserve was not targeting inflation. It was not targeting high employment. Rather, it was seeking to preserve U.S. gold reserves and to defend the dollar’s Bretton Woods peg. The minutes of the Federal Open Market Committee document these concerns (Bordo and Eichengreen, 2013). The value attached by the Fed to the stability of the exchange rate was public knowledge, by virtue of statements by members of the Board of Governors. Hence, if demand increased, fueling inflation and causing the balance of payments to deteriorate, there was an awareness that the Fed would tighten, which in turn limited the inflationary consequences. Expectations were anchored by the Fed’s commitment to obeying what might be called the “Bretton Woods rules of the game.” This limited inflationary inertia and prevented inflation from taking off in response to shocks.

It is now commonplace to ascribe the advent of the Great Inflation to the 1971-73 collapse of Bretton Woods (Reis, 2021). In fact, however, Bretton Woods had already lost its bite, and inflation had already begun to accelerate, in the second half of the 1960s, prior to the 1971-73 Bretton Woods crisis. In this earlier period, the U.S. adopted policies, such as an Interest Equalization Tax on American foreign financial investments, loosening the link between inflation and gold losses. The Treasury Department asserted its responsibility for managing the foreign exchange market, allowing the Fed to dismiss gold losses and dollar weakness as someone else’s problem. There was a decline after 1965 in the frequency of references in the minutes of the Federal Open Market Committee (FOMC) to exchange rate and balance of payments concerns (again see Bordo and Eichengreen, 2013). As a result, U.S. inflation approached 6% already in 1970, even before the collapse of Bretton Woods.

Removing the exchange rate anchor would not have made a difference had the Fed possessed a coherent theory connecting monetary policy with inflation. Unfortunately, it did not. The closest thing to a theory was Chairman Arthur Burns’ view that monetary policy did not matter. Burns saw inflation as caused, variously, by the excessive wage demands of unions, price increases by firms with market power, poor harvests and high oil prices, none of which monetary policy could directly control. He recognized a link between excessive budget deficits and inflation, but not one that a change in monetary policy could offset. In his academic career as a business cycle researcher, Burns had portrayed output and price fluctuations as shaped by institutional arrangements in product and labor markets, not by central bank policy (Burns and Mitchell, 1946). He brought to his tenure at the Federal Reserve this same focus on arrangements in labor, product, energy and commodity markets.

The next Fed chair, G. William Miller, lacked Burns’ academic credentials and was not inclined to challenge the views of his illustrious predecessor. Eventually, Paul Volcker would have something to say about this, but not until the 1980s. Even then, it took Volcker time, and multiple tries, to alter expectations and firmly place the anchor.

### The rocky road ahead

Circumstances today are different. Federal Reserve officials understand that, in all but the most exceptional circumstances, namely those of a liquidity trap, monetary policy and inflation are intertwined. They possess a coherent policy framework, namely average inflation targeting.

But circumstances today are also different from the 1980s, when Paul Volcker crushed inflation. The Powell Fed is strongly committed to not disturbing financial markets. It has communicated its intention of raising its policy interest rate in 25 basis point increments, presumably seven times between March and December of 2022, corresponding to its seven regularly scheduled Federal Open Market Committee meet-
ings. It has so indicated through speeches by governors and Reserve Bank presidents and through FOMC statements and minutes. By relying so heavily on forward guidance, and by attaching such importance to the state of financial markets, it has effectively locked itself into that trajectory. Its fear is that moving faster, in response to more alarming inflation numbers, would constitute an unpleasant surprise for the markets. It might lead to a sharp correction in asset prices. A sharp shift in interest rates, by wrong-footing investment funds with leveraged positions in fixed-interest securities, might jeopardize financial stability. This is not the same as 1970s-style denial of the power of monetary policy. But it is evidence of a reluctance to use that power. Unfortunately, this nuance does not make the current policy stance less of a problem.

The issue is that seven 25 basis increases would leave the Federal funds target range at 1.75%-2% at the end of the year, and the real (inflation-adjusted) interest rate deep in negative territory. Federal Reserve policy would remain highly accommodating – in an economy with unemployment below 4% and inflation running well above target. For subduing inflation, the Fed would be relying entirely on declining spending, as the fiscal stimulus of 2021 recedes in the rearview mirror, and on increased supply, as global supply chains recover from COVID-19 era disruptions.

But, for better or worse, consumer spending shows little sign of declining. Although the federal government’s stimulus checks may be an increasingly distant memory, households’ excess savings, acquired in the pandemic period, still remain to be spent down. Now, moreover, there is the specter of new supply disruptions, as Chinese cities and factories lock down in response to the Omicron variant, containerships are caught in economic slowdown in Western Europe, it will be in a position to pivot. In these highly uncertain times, flexibility has value.

A final important question is how different Europe is from the United States. The U.S. applied more fiscal stimulus, in general and specifically in 2021, creating more intense inflationary pressure. In addition, the “great resignation,” as workers were detached from their employers during the pandemic, put more downward pressure on the U.S. labor supply, in contrast to Europe’s more extensive policies designed to maintain those employment connections and to support continued labor-force participation (Pisani-Ferry, 2022). For both reasons, inflation prior to the eruption of war in Ukraine was more subdued in the euro area than the United States. Working in the other direction is that Europe is likely to see more inflation from rising energy prices, given that it is less self-sufficient in oil and gas. Inflation rose to 5.8% in February, on the back of rising food and fuel prices, lower than in the U.S. but still almost three times the ECB’s inflation target. The central bank may be inclined to “look through” rising energy prices if their tendency to rise is only transitory. But it will not be able to look through recession risk if natural gas supplies from Russia are significantly curtailed, whether at the behest of President Putin or the West. By comparison, U.S. reliance on Russian oil and gas, and therefore the risk of a significant slowdown, are less.

Thus, while the risks in the U.S. are clearly tilted toward inflation, those in the euro area are more evenly balanced. Fortunately, the ECB does not share the Fed’s fixation on the reaction of financial markets, perhaps because Europe has a more heavily bank-based and less market-based financial system. The ECB provides forward guidance, but by the standards of the Fed it is relatively vague. Some observers criticize President Lagarde and the ECB for unclear communication. But the positive interpretation is that the ECB has not gone as far as the Fed in locking itself into a policy position for 2022. This is good. If conditions call for it to accelerate the normalization of policy rates, the ECB will be in a better position to act. Equally, if events in Russia and Ukraine instead lead to an economic slowdown in Western Europe, it will be in a position to pivot. In these highly uncertain times, flexibility has value.

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Jason Furman*

Why Did (Almost) No One See the Inflation Coming?

The United States and Europe are both experiencing the fastest inflation in a generation. The inflation in both economies was not foreseen by the standard economic models used by official and private sector forecasters. This failure should lead to some reassessment of the models and should increase uncertainty and concern about the trajectory of inflation going forward. In particular, policymakers should not rely on statistical relationships that held in the decades before the pandemic when making predictions in today’s very different environment. This situation calls for both rethinking the underlying economics — for example, inflation will play a more salient role in setting wages and prices at its faster pace so wage-price passthrough could be higher as well — and widening confidence intervals to reflect the greater uncertainty.

Specifically, the linear Phillips curve with anchored expectations failed to predict the inflation of 2021 because, by construction, that Phillips curve can essentially never predict high inflation. Even with a massive fiscal stimulus that cut the unemployment rate to the likely impossibly low level of 1%, the inflation rate would still be predicted to remain below 3%. An alternative model, in which fiscal stimulus predicts nominal (not real) demand, real output can rise but not above its short-run potential, and inflation is the difference between the two, does a much better job of making sense of the extraordinary inflation in 2021 by dispensing with the labor market intermediation.

Despite the shared underestimation of inflation, the specific situations differ on the two sides of the Atlantic with inflation running considerably higher in the United States than in Europe and the GDP recovery conversely further behind in Europe. Policy in Europe should avoid the trap of being too driven by developments and news in the United States.

What were the major forecasters thinking when they predicted low inflation?

To understand the possible trajectory of inflation in 2022 and beyond, it is helpful to understand why the United States and Europe had so much inflation in 2021. This analysis is based on the U.S. experience; many of the same lessons and takeaways also apply in the European context — albeit all of them to a lesser degree.

None of the major private sector or official sector forecasters saw the 2021 inflation coming nor was it reflected in market prices, as shown in Table 1. All of the forecasters appeared to be using relatively standard multipliers to analyze the impact of the fiscal expansion on real GDP and then a relatively flat, linear Phillips curve with anchored expectations to simulate the impact of real GDP and unemployment on inflation. Given that estimates of the slope of the Phillips curve vary from about 0.1 to about 0.3, it is impossible to generate much inflation from this setup. Even if the unemployment rate had been driven down to the historically, and likely impossibly, low 1%, and the natural rate was 4%, the result would only have been 2.3% to 2.9% inflation. A linear Phillips curve with anchored expectations simply cannot explain the inflation of 2021 nor can it explain the variations in inflation rates over time and across countries, which are considerably larger than any differences in slack could justify.

Working through a typical multiplier model, we can understand why the linear view of the world produced the predictions it did. Figure 1 shows the GDP forecast made in December 2020 by IHS Markit, a leading forecast firm. It then adds to it based on the $2.8 trillion of fiscal assistance passed in December 2020 and March 2021 two sets of multipliers: normal multipliers that were used in the past by the Council of Economic Advisers (CEA; 2009, 2014) and low multipliers, which are suppressed by the non-pharmaceutical interventions associated with COVID-19, from the Congressional Budget Office (CBO; 2020a). Figure 2 mechanically translates the GDP numbers into unemployment numbers based on the relationship between GDP growth and employment gains described by the Council of Eco-

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* Wilson Powell III provided outstanding research assistance for this piece.

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1 The cumulative four-quarter normal multipliers are: 1.44 for public investment outlays, 0.66 for individual tax cuts, 0.98 for state fiscal relief, 1.44 for aid to directly impacted individuals and 0.08 for business tax incentives. The cumulative four-quarter low multipliers are 0.66 for enhanced unemployment, 0.44 for recovery rebates, 0.59 for direct assistance to state and local government, 0.07 for business tax provisions and 0.27 for the Paycheck Protection Program.
However, the models still would not have predicted much inflation—because no amount of unemployment rate reduction can generate much inflation from these models.

In the case of the normal multipliers, this results in the economically absurd forecast of a 1.1% unemployment rate in the first quarter of 2021, a sign that something is wrong with this methodology—a topic I will return to.2

Even the implausibly low unemployment rate would not have been expected to translate into much inflation using a conventional approach. Ball et al. (2021), for example, estimate that the Phillips curve has a slope of -0.17—i.e. each one percentage point reduction in the unemployment rate boosts the inflation rate by 0.17 percentage points. Figure 3 shows predicted inflation based on this Phillips curve. (Note, a Phillips curve approach cannot explain the U.S.-euro area inflation differential and in fact would predict higher inflation in Europe because employment was higher there.)

In summary, forecasters using major models should have been nervous that absent any judgmental adjustments, their models were forecasting GDP well above potential and implausibly low unemployment rates. Regardless of such judgmental adjustments, however, the models still would not have predicted much inflation—because no amount of unemployment rate reduction can generate much inflation from these models.

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2 In reality, no forecasters predicted an unemployment rate like this and in fact virtually all of them expected the unemployment rate to still be above the pre-COVID-19 rate by the end of 2021. Most forecasters, however, did expect GDP to be above its pre-pandemic trend by the end of 2021. The difference was bridged by implicit or explicit forecasts of a temporarily very large increase in productivity growth—the residual between GDP growth and employment growth. IHS Markit’s forecast for 2021Q4 GDP, for example, increased by 5.4% between December 2019 and June 2021.
The net effect is ambiguous but evidence from earlier in the pandemic suggests this was more plausibly negative than positive because, first, the initial wave of COVID-19 in 2020 reduced inflation. Second, the timing of the inflation generally followed the reopening of the economy, rising first in the United States when its economy was reopening and then later in the euro area when its economy reopened somewhat later. This suggests that the net effect of the coronavirus pandemic is to suppress inflation and that inflation would have been even higher without the Delta and Omicron variants. Even if not correct, it is unlikely that the Delta and Omicron variants had a large positive effect.

The shift from services to goods. Another candidate for the error term is what could be described as a taste shock: For example, people felt unsafe in the gym so, instead of paying gym memberships, they bought exercise bicycles. To the degree that the supply of goods is more inelastic than the supply of services, this would increase inflation. There are two issues with this theory, however. First, the increase in goods spending seems more a consequence of the overall level of demand than a taste shift – goods spending was considerably higher in the spring of 2021, as COVID-19 case numbers were low and falling, than it was in the winter of 2020-21, when case numbers were high and rising. Moreover, both goods and services spending was higher in the United States than in Europe (although service spending in the two economies had largely converged by the end of 2021). This suggests that it was the economic impact payments and other fiscal support that drove goods spending not a taste shift. Second, while it is plausible that the supply curve for goods is more inelastic than the supply curve for services, there still would have been some additional services inflation if there had been less of a shift from goods to services. As a result, the goods-services shift is at most part of the story of the error term.

Supply chain disruptions. There is no doubt that supply chain disruptions explain some of the increase in inflation, most notably in microchips and the dynamics of rental fleet purchases and sales of used vehicles. These drove the spectacular increase in motor vehicle and parts prices that contributed 1.1 percentage points to core personal consumption expenditure (PCE) inflation in 2021. But a lot of the so-called supply chain issues are really large increases in demand coming up against supply that was relatively inelastic. The result was a combination of higher prices and higher quantities. U.S. ports, for example, were not disrupted and, in fact, were processing 18% more than in 2019. This, however, was not enough to keep up with demand – as a result, both prices and quantities increased.

The “great resignation” as labor force participation remains low. This is a U.S.-specific factor of low labor force par-

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**Figure 3**

*Estimated effect of December 2020 and March 2021 fiscal stimulus on core CPI inflation*

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
<th>Normal multipliers due to NPIs</th>
<th>Low multipliers due to NPIs</th>
<th>CBO Jan. 2019-23</th>
<th>IHS baseline</th>
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<tr>
<td>2020</td>
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</tr>
<tr>
<td>2021</td>
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<td>3.0</td>
<td>2.0</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>2022</td>
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<td>4.0</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>2023</td>
<td>4.0</td>
<td>5.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>


Source: CBO; IHS Markit; CEA; Ball et al. (2021); Bureau of Labor Statistics; author’s calculations.

Where did all the inflation come from if not from a linear Phillips curve?

The general Phillips curve is:

\[ \text{Inflation} = \text{expected inflation} - \theta(\text{unemployment} - \text{natural rate of unemployment}) + \text{error term} \]

The discussion of the increase in inflation is organized around the different terms of this equation.

A positive error term: Supply shocks and COVID-19 taste changes

One possibility is that the inflation we have seen reflects the error term – unforeseeable events that happened essentially outside the economic model and did not transmit to inflation through aggregate demand or the labor market. It is likely that is part of the story but probably only part of the story. Some of the main candidates for the error term include:

The emergence of the Delta and Omicron variants of COVID-19. Slowing the reopening of the economy is commonly cited as a reason that inflation was higher than expected in the second half of 2021. But the rapid reopening of the economy as people were vaccinated in the first half of the year was also cited as a reason for rapid inflation then. While it is possible both arguments were true, it seems unlikely. The resurgence of COVID-19 likely raised durable goods prices but lowered service and gasoline prices.

The shift from services to goods. Another candidate for the error term is what could be described as a taste shock: For example, people felt unsafe in the gym so, instead of paying gym memberships, they bought exercise bicycles. To the degree that the supply of goods is more inelastic than the supply of services, this would increase inflation. There are two issues with this theory, however. First, the increase in goods spending seems more a consequence of the overall level of demand than a taste shift – goods spending was considerably higher in the spring of 2021, as COVID-19 case numbers were low and falling, than it was in the winter of 2020-21, when case numbers were high and rising. Moreover, both goods and services spending was higher in the United States than in Europe (although service spending in the two economies had largely converged by the end of 2021). This suggests that it was the economic impact payments and other fiscal support that drove goods spending not a taste shift. Second, while it is plausible that the supply curve for goods is more inelastic than the supply curve for services, there still would have been some additional services inflation if there had been less of a shift from goods to services. As a result, the goods-services shift is at most part of the story of the error term.

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The “great resignation” as labor force participation remains low. This is a U.S.-specific factor of low labor force par-
It may have played a role in increasing inflation by reducing supply. But it also decreased demand so the net effect on inflation is unclear and unlikely to be very large. Also, the effects of the great resignation on inflation depend on interactions with other fiscal support. It is possible that this could have had more of a role in the early part of 2021 since many people who were not working could get unemployment insurance sufficient to maintain their consumption until September 2021. Now, however, people returning to work are likely to increase both supply and demand.

A steeper Phillips curve or tighter labor markets

Part of the disconnect between predicted and actual inflation may be related to the slack term in the Phillips curve. Some plausible modifications could add at most about one percentage point to inflation, bridging part of the gap, but not all of it.

A steeper Phillips curve. It is possible that low unemployment translates into a larger increase in inflation than the 0.17 percentage point assumed above based on Ball et al. (2021). There are a number of difficulties in estimating the slope of the Phillips curve and more effective monetary policy and anchored inflation expectations can create the statistical illusion that the Phillips curve is flatter than it seems. Hazell et al. (2022) get around these issues by using state-level data on the relationship between unemployment and inflation finding a coefficient that is closer to 0.3. Even this, however, cannot generate much inflation, certainly nothing like the roughly 5% inflation the United States has been experiencing.

A temporarily higher natural rate or a speed limit. Even if the natural rate of unemployment was 3.5% in the run-up to the pandemic, it was likely higher during 2021, especially the first half of the year as it takes time for people to connect to jobs, hysteresis temporarily raises the natural rate, the pandemic itself temporarily disrupted people from taking jobs, and unemployment insurance reduced the willingness of people to take jobs. Alternatively, it is possible that there is a “speed limit” of how fast employment can improve without triggering inflation (which could be modelled as a temporarily higher natural rate that only falls slowly; Turner, 1995). These changes, however, could not add much to inflation because they are limited by the relative flatness of the Phillips curve itself – even a 5% natural rate combined with a 0.3 slope of the Phillips curve would generate less than an additional 0.5 percentage point of inflation.

Alternative measures of slack showed a tighter labor market. The unemployment rate is the standard measure of slack. But in 2021, job openings and the quits rate both soared, suggesting a much tighter labor market than indicated by the unemployment rate, especially earlier in the year. Some evidence suggests that the ratio of unemployed to job openings and quits are both better predictors of inflation than the unemployment rate; using them would add more to the inflation prediction (Furman and Powell, 2021; Domash and Summers, 2022).

Higher expected inflation

The final possible explanation for the recent inflation, sticking with the linear Phillips curve model described at the start of this section, is that expected inflation increased. This is also not a satisfying explanation because any increases in expected inflation mostly followed the price and wage increases instead of preceding them and the increases in expectations were relatively small. At the end of 2020, financial market expectations for inflation over the next five years were very low, they rose sharply starting in December 2020 but settled only modestly above their normal level (see Figure 4). Consumers did increase their near-term inflation expectations sharply starting in January 2021. And, as shown in Table 1, forecasters were well behind inflation all year. Moreover, most forecasting models incorporate long-run, not short-run, inflation expectations and those

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3 In the prediction models reported by Furman and Powell (2021), they find the adjusted $R^2$ in predicting core CPI is 0.47 for quits as an explanatory variable, 0.45 for the ratio of unemployed to job openings, 0.35 for the unemployment rate and 0.22 for the prime-age (25-54) employment rate.
remained well anchored all year (Reifschneider and Wilcox, 2022).

**Is the Phillips curve nonlinear?**

Looking at reasonable ranges for the parameters of the linear Phillips curve above, it is possible to make changes that generate some additional inflation but they do not plausibly account for all of the inflation in 2021. Moreover, many of these changes are ad hoc and may not actually be right. And none of them provide a particularly satisfying explanation.

To understand the limits of the linear Phillips curve for this situation, consider a much more extreme policy. Imagine that households were each given $100,000 in 2019. An economist using a linear Phillips curve would not predict very much inflation because the policy could not lower the unemployment rate below 0% and so the tight labor market (the only way the Phillips curve incorporates demand) would not add much more than one percentage point to the inflation rate. But clearly a forecast that this policy would lead to only 3% inflation is absurd.

The better way to think about this thought experiment – and the less extreme actual policy carried out in 2020 and 2021 – is through a highly nonlinear model. Imagine that the Phillips curve itself is nonlinear (e.g. Nalewaik, 2016; Fair, 2021; Forbes et al., 2021). But a lot of other research has found that any nonlinearities in the Phillips curve are not robust or are unstable and that it is better to work with a linear one (e.g. Marcelino, 2008). Moreover, even a standard nonlinear Phillips curve would struggle with the fact that we have never before seen core PCE inflation jump in this way despite the unemployment rate being well within its normal range. Additionally, it is not a particularly satisfying way to generate *ex ante* predictions – the nonlinear Phillips curve would not be a good way to predict the differences in inflation that would result from increasing the hypothetical helicopter drop from $100,000 to $1 million per household.

A better model is to dispense with the additional step of modelling the impact of demand on the labor market and the labor market on inflation and instead just go straight from nominal demand to inflation.

**Fiscal stimulus as supporting nominal demand, not real demand**

Most of the microeconomic research that has been used to develop fiscal multipliers actually looks at parameters like the marginal propensity to consume in nominal terms – asking questions like, “If you give people $100, how much do they increase their nominal spending?” (e.g. Parker et al., 2013; Sahm et al., 2012). This suggests a simple three-step framework for thinking about inflation in 2021:

1. Use multipliers to predict nominal GDP.

2. Use the productive capacity of the economy adjusted down for the effects of the pandemic to predict real GDP. That is, assume that there is a limit on the amount that fiscal support can increase real production.

3. Price increases are the residual.

What this approach means for U.S. inflation in 2021 can be discerned from looking at the prediction the standard multiplier models had for output relative to potential (see Figure 5), which is just another way of showing the results of the multiplier exercise reported in Figure 1. This shows that output was projected to be about 1% to 4% above the pre-pandemic projection of potential in 2021Q4, depending on the multipliers. Even hitting the pre-pandemic projection for potential would have been hard given that the population was smaller due to reduced immigration and excess deaths, the capital stock was smaller due to foregone investment, the COVID-19 pandemic was still disrupting production, and U.S. income support policies like unemployment insurance and stimulus checks caused sustained reductions in labor supply. On the other
In the context of the linear Phillips curve, low levels of labor market slack suggest more inflation in 2022 than in 2021 but the error term (e.g. supply shocks), which likely added to inflation could move to zero or even negative in 2022. This would cause inflation to fall relative to 2021. The trickiest issue to assess is the inflation expectations term. Reifschneider and Wilcox (2022) model this term as largely based on professional forecasts of inflation over the next ten years, which have been stable. But in the current context, short-run inflation expectations may be more relevant and appear to be becoming embedded in wage and price setting (Furman, 2022).

All in, core inflation is likely to be lower in 2022 than it was in 2021. However, with several forces pushing inflation higher, it may still end up in the 3.5% to 4.5% range, depending on the measure used. Moreover, it is plausible that inflation in 2023 will exceed inflation in 2022 if, for example, there is an unusually large one-time decline in goods prices in 2022 due to a glut in the supply of cars.

Similarities and differences between the United States and Europe

The European situation is somewhat different from the U.S. one because GDP growth has been weaker and inflation has not increased as much, with the apparently smaller European fiscal response likely at least partially responsible for the difference.

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4 Two caveats are in order. Baseline expectations for inflation might have been below 2% absent the two rounds of fiscal support in December 2020 and March 2021. IHS Markit, for example, was expecting core PCE to be 1.8% for 2021 Q4/Q4 in its December 2020 baseline. On the other hand, it is possible people had enough excess savings from the transfers in 2020 and the reduced consumption in that year to finance an above-normal level of spending when the pandemic receded and that giving them additional money in this context would have a very low marginal propensity to consume. In this case, the multiplier might be towards the low end but the underlying baseline inflation it would be adding to could be towards the high end.
Both the United States and the euro area suffered rapid reductions in GDP when the COVID-19 pandemic hit, followed by partial bouncebacks as restrictions eased. The United States, however, has had a stronger GDP recovery, both in absolute terms and relative to its pre-pandemic trend, as shown in Figure 6. This stronger U.S. GDP recovery has materialized despite U.S. employment lagging employment in Europe as the United States has experienced a large withdrawal and only partial return to the workforce. The gap between these is made up for by the increase in average work hours and a temporary boost in productivity in the United States relative to Europe.

It is difficult to make a meaningful comparison of the size of the U.S. and European fiscal responses because of differences in how fiscal stimulus is described and measured. Ex post deficits and debt are also of limited use, especially when, for example, Germany’s deficit numbers appear to reflect macroeconomically unmeaningful charges that increase the deficit and debt in 2021 to make it easier to satisfy the debt brake in future years. The degree to which the U.S. fiscal support was considerably larger than European fiscal support can be seen by comparing the trajectory of disposable personal income in the major economies. Germany and France successfully protected disposable personal income, keeping it close to its previous trend even amidst a massive economic contraction, but that was nothing compared to the huge increase in disposable personal income in the United States, as shown in Figure 7. Other aspects of stimulus may also have been larger in the United States, which, for example, had a considerably larger and less targeted grant program for small and medium-sized businesses, called the Paycheck Protection Program, than anything in the major European economies. The result of the increase in disposable personal income in the United States is that U.S. consumption, particularly of goods, greatly outpaced European consumption.

The flip side of the larger fiscal support and faster pace of U.S. GDP recovery has been higher inflation in the United States, as shown in Figure 8. The United States and Europe have been hit by different supply shocks. The increase in the price of used cars is a bigger deal in the United States, where they are a larger part of the consumption bundle, but Europe has been hit by much larger increases in spot natural gas prices. Europe also had a lower inflation rate in 2020, in part because of the way that temporary value added tax reductions fed into the inflation rate, and experienced larger base effects as its economy moved towards normalizing in 2021. Overall, U.S. core inflation is well above its 2% target trend, whereas the core harmonized index of consumer prices (HICP) in
the euro area still falls slightly short of 2% annual growth since the start of the pandemic.

How should the United States and Europe respond?

Predicting inflation is hard, understanding what to do about it is even harder. The Federal Open Market Committee’s expectations for its own interest rate path are much more moderate than even a very dovish version of a Taylor-type rule would imply, as shown in Figure 9. This may well be the appropriate expectation for policy given the many uncertainties in the real economy and financial market reactions, the rapidly diminishing fiscal support for the economy and the desire to avoid risking a recession. But it is very far from the way policy has ever been conducted before.

Europe is closer to its inflation target and further away from its output target. Moreover, Europe faces a potentially much more serious economic impact from the Russian invasion of Ukraine. As a result, it makes sense for the European Central Bank to be more patient in tightening monetary policy, giving the economy more room to recover and more cushion against spillover from the Russian invasion.

While getting inflation under control and keeping expectations anchored is critical in both economies, central bankers also need to be thinking about changing the inflation target itself. Given the decline in equilibrium interest rates, a higher target, like 3%, would give more room for policymakers than the current 2% one. It is possible that the current moment will turn into an opportunity to achieve this new target. But even keeping inflation at 3%, especially in the United States, will be a challenge.

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On Returning Inflation to Target

In the latter half of 2021, inflation in the United Kingdom as measured in the Consumer Price Index (CPI) surged, more than doubling from 2% in July to 5.5%, for the 12 months to January 2022. Survey data on price and wage developments tell the micro story. The most recent summary of business conditions by the Bank of England’s agents reported that pay awards in 2021 were 2.5%-3.5%, with some awards of 5%–7% (Bank of England, 2022a). Firms in the latest Decision Maker Panel (DMP) survey reported price increases of 5.4% on average for the three months to February (Bank of England, 2022b). This momentum from prices and wages is pushing up expectations for 2022, with agents reporting expected pay settlement of 4.8% and firms expecting price increases of some 4.5% for 2022. If realised, headline inflation could stay strong for longer, well into 2023, particularly if exacerbated by the geopolitical events of early 2022.

Before assessing the prospects for returning inflation to the 2% target, and the role for monetary policy, it is important to review the sectoral sources of the 2021 inflation surge. First, going into the pandemic, the UK’s CPI price level was roughly trending along its 2% inflation path, unlike in the US or the euro area, where inflation had been persistently below target. Second, global demand recovery and supply limitations, as well as geographical shipping mismatches in 2021 yielded robust inflation momentum, particularly for energy and core goods – all of which are mostly external to the UK economy. However, a domestic supply-demand imbalance has also been apparent in the UK with production constraints, shortages of lorry drivers, and other widespread recruiting difficulties leading to domestic cost-push pressures above and beyond external sources.

Will the underpinnings to the global dynamics and their domestic equivalents moderate, with inflation easing? Or will the dynamics of 2021 repeat in 2022 to keep inflation strong for longer? To gauge the breadth of current inflation and prospects for inflation returning to target, we consider disaggregated measures of CPI inflation to evaluate trends and then consider different scenarios for the realisation for wages and prices.

With regard to the first consideration, while it may have been true initially that inflation was mostly a phenomenon of external shocks generating price increases in a few volatile components of the CPI, going into 2022 this story no longer holds up. With regard to the second consideration, if expectations are realised, wage and price dynamics may become embedded into contracts beyond 2022, making for a self-reinforcing inflation path. It matters for forward-looking monetary policy whether underlying inflation is broad or narrow and whether firms and workers expect to recoup the costs incurred in 2021 in their wage and price contracts of 2022 and beyond.

Measuring underlying inflation

The Bank of England’s Monetary Policy Committee, and most other major central banks, sets its policy in order to achieve price stability which is defined in terms of a certain aggregate price index, which in the Bank’s case is the Consumer Price Index. Naturally, a variety of shocks will disturb the trajectory of this index at any point in time, which blurs the signal from any one data point. The Bank’s remit (HM Treasury, 2021) recognises that optimal monetary policy may look through some disturbances which knock the inflation rate off target in the short term, so long as in the longer-term trend, price growth is anchored at 2%. Responding to every up-and-down move in the CPI would whip-saw monetary policy, potentially causing instability in financial markets and introducing unnecessary variation in the broader macroeconomy. However, this raises the question of how to estimate trend growth or so-called underlying inflation.

Attempts to measure underlying inflation can be broadly split into two categories: exclusion-based indices, which reflect inflation only in some parts of the overall basket; and estimation-based measures, which use some type of statistical model to extract the underlying signal from the...
The theme common to these measures is to remove the especially volatile component of inflation which is driven by perhaps large but in the end transitory shocks. The resulting series may then plausibly be considered a measure of underlying or trend inflation. The next section offers another attempt at stripping out the most volatile component by classifying components directly by their historical realised volatility.

A volatility-based measure of inflation

For the simplest example (displayed in Figure 1), we compute and then aggregate into volatility buckets realised volatility of the 85 items in the Office of National Statistics’ CPI basket over the period starting with the Bank’s independence in 1997 and ending before the onset of the COVID-19 pandemic. We do not average across the pandemic period since the price-setting behaviour in a time of lockdowns and supply bottlenecks may be fundamentally different to what came before. However, we do find that the properties of the CPI and its components were largely consistent with the behaviour before the coronavirus pandemic – conditional on a deep recession and the subsequent recovery. Only from the second half of 2021 onwards do we see a marked difference in the aggregate behaviour of CPI inflation.

Alternatively, one might compute volatility separately for certain subsamples or on rolling windows. We find, how-
ever, that the relative ranking of components by volatility does not materially change in that case. The relative sensitivity of CPI components to different shocks, as measured by their higher moments, appears to be relatively stable even if their first moments can swing quite significantly.

As is well known, headline inflation has now surpassed its previous post-independence peaks, reaching 5.5% in January 2022. A large part of this increase is being driven by high and rising energy prices but even when adjusting for their direct impact, inflation rates are still well above the Monetary Policy Committee’s (MPC) target. Figure 1 plots these series (headline and core CPI inflation) alongside two volatility-based measures of inflation.

The first series, which is the weighted average inflation excluding the most volatile fifth of components measures, as expected, is something close to core inflation. What is more surprising – and perhaps more worrying – is the behaviour of the lowest-volatility fifth of components. By definition, these components tend to adjust relatively little over time. Some examples are pharmaceutical products and hairdressing, but also housing rents, and restaurants and canteens. These latter two each account for over 8% in the CPI basket and are therefore important for the behaviour of the aggregate.

Note that the low volatility components do not anchor inflation to the target – indeed they run above the target for the whole period since 1997. But, inflation within this bucket has been confined to rather narrow and stationary bands around some mean for most of the last 25 years, with the mean apparently having shifted down by about one percentage point in the post-2011 period (see dotted line in Figure 1). More research is necessary to assess the cause of this step-down and is beyond the scope of this article. However, since inflation was – on average – at target both before and after 2011, the step-down in the lowest-volatility bucket must not have decisively driven aggregate inflation. It is tautological but the mixture of shocks and policy hitting both high- and low-volatility components was consistent with achieving the 2% inflation target in both regimes.

Starting in the second half of 2021, however, rates in the lowest-volatility bucket have left their range of the last decade and now look more in line with the period of 2011 and before. High inflation clearly is no longer limited to components that are typically quite volatile, but now has seeped into those that typically are rather stable. This raises a number of difficult questions for a monetary policymaker at the current juncture: Are these components just experiencing a pandemic-related jump to settle down soon? Or are cost-price dynamics that push the volatile components being embedded throughout. If robust inflation can be found in more than just isolated pockets, how will it get back to target? Surely, macroeconomic conditions exist that are consistent with achieving the inflation target while inflation in the low-volatility components is north of 3%. But that implies that there needs to be a drag, i.e. inflation below 2%, from other components.

**Strong for longer**

Looking into and beyond 2022, there is a key role for expectations, which if realised could mean that inflation stays strong for longer. For firms, 2021 exposed them to significant cost-push factors including increasing costs of shipping and raw materials, export-related costs, rising wholesale energy prices and increasing wage pressures (arising from both staff shortages and underlying wage pressures such as minimum wage increases). In the Bank’s DMP, some firms also mentioned higher costs associated with insurance, debt repayments, CO₂ emission reductions and coronavirus safety measures (Bank of England, 2022d). Will firms be able to pass these costs into their prices in 2022?

The DMP shows an asymmetry in the relationship between prices and sales. Firms that experienced faster sales increases due to COVID-19 also hiked their prices at much steeper rates than firms reduced their prices as their sales fell. This convex price profile using firm-level data is mimicked in research using macro data that finds a convex Phillips curve relating inflation to slack in the economy (Collins et al., 2021).

The MPC’s November 2021 Monetary Policy Report (Bank of England, 2021) recognised that downward price rigidity is an upside risk to the inflation outlook as the near-term effects of COVID-19 pandemic fall away. Firms’ pricing expectations from the DMP survey solidify this upside risk for 2022. Similarly for wages, Bank research shows wage demand and inflation expectations are correlated, and that items that consumers buy frequently, such as energy, food and clothing have particular salience for their short-term perceptions of inflation (Bonciani et al., 2022). Given the rapid increase in prices for some of these salient items, it is not surprising that consumer expectations for inflation in the short term have jumped, too. Wage compression has been a feature of the period after the global financial crisis, but the environment of higher price inflation and tighter labour markets may herald a regime change for wage outturns.

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Scenarios for inflation based on alternative historical outturns and expectations

The earlier section showed that the behaviour of inflation within different buckets of the volatility distribution could be revealing a fundamentally changed macroeconomic environment. The surveys implied that current price and wage momentum is being reflected in 2022 wage and price expectations, which suggests an embedded dynamic. Naturally, this is speculative and we will continue to learn more from macro data and micro surveys as we go along. However, even assuming that we are not on the cusp of a regime change and that the mixture of shocks in the economy will return to what it was before the COVID-19 pandemic, we are still faced with the possibility of staying in uncomfortable territory with inflation above target for longer than initially thought.

This section shows some simple arithmetic exercises about how wages and goods prices might evolve going forward if some of the 2021 wage and price increases are repeated in 2022, as has been suggested by the Bank of England’s surveys and agents’ intelligence.

Consider wages first. As Figure 2 shows, wages have rebounded from their 2020 trough, leading to high year-on-year outturns in 2021. As of January, average wages were slightly elevated compared to their pre-coronavirus trend but showed little sign of spiralling. For the arithmetic exercise, to project forward from the current data, we make three very simple assumptions: One scenario holds wages fixed until they reach their pre-pandemic trend. A second continues the historical trend from the latest data point. A third scenario shows what would happen to wages if there was another strong settlement season in 2022. According to the Bank’s agents, some further upward pressure on wages is to be expected in the coming months as firms and workers adjust to the higher costs of doing business and costs of living (Bank of England, 2022a). To stand in for such a scenario, we let average weekly pay rise by 3% over the second quarter, then return to its pre-COVID-19 trend growth. From the perspective of wage inflation, wage settlements even only as strong as last year would keep wage inflation strong for longer.

Ultimately, however, it is firms’ pricing decisions that generate inflation. The next set of charts explores what would happen if the goods price increases of 2021 were repeated in 2022, as surveys suggest firms will attempt to do. Over the course of last year, core goods prices had already risen markedly and now stand about 4% above their trend level (Figure 3, left-hand panel). They have come off the top a bit in January but are obviously still well above trend. If in fact this decrease in goods prices continues, so much the better for inflation rates and household purchasing power in the near term. After all, any decrease in goods prices is directly deflationary. For now though, similar to the wages example above, we show three scenarios for goods prices where levels at least are sustained. The only difference to wages is that,

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**Figure 2**

Scenarios for average weekly earnings

![Figure 2: Scenarios for average weekly earnings](image-url)

Note: Latest observation: January 2022.
Sources: Office for National Statistics and authors’ calculations.
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about competitors’ pricing can affect the optimal pricing behaviour of the firm, and thereby affect aggregate outcomes. A loosening of supply constraints, perhaps paradoxically, could also support faster price growth in the short run as loosening supply is met with even stronger demand.5

Global trade issues seem more set to push up prices. Although shipping rates look like they may have peaked, they are still very high compared to their history, raising the cost of trade around the world. UK Purchasing Managers’ Indices reflect this ongoing disruption. While variation in delivery times generally has small effects on aggregate prices, the especially severe disruptions in 2021, which are likely to persist, will likely show up in prices into 2022.

Further, the UK’s evolving trading situation post-Brexit may exacerbate any inflationary impulse from global goods and commodity markets by adding another wedge of administrative costs as well as changing the competitive landscape and perhaps altering the variety of products available. Bank research estimates a widening Brexit wedge on the supply side of the economy of some 2% by the end of 2024 from the pre-pandemic trend. Already,

in the upside scenario, we assume a 4% rise in prices over the whole of 2022, consistent with the outturn for 2021.

From the right hand panel it is immediately apparent that all of these pricing scenarios imply robust goods price inflation rates by year-on-year metrics. If we take the current level of prices as given, most inflation in the near term is already baked in. Even if prices stopped rising right now, goods inflation would arithmetically increase to over 6% in February. Peak goods inflation does not differ much between scenarios, either: It is going to be between 6% and 8%, and sometime in the first half of this year. What does differ significantly is the length of time for the price shock to work through and return inflation to trend.

In the two more benign scenarios – where goods prices are unchanged or only grow at their historical annual average of 1.2% – core goods inflation reaches its pre-COVID-19 average by the end of the year. But in the scenario where firms are able to push through another 4% price increase, inflation remains elevated through all of 2023. From a mechanical perspective, any shocks to the price level only wash out after one full year has passed. This exercise assumes that the jump in prices is not repeated in 2023 or beyond – i.e. that cost inflation does not get embedded in pricing behaviour.

There are a variety of underlying factors which might push up prices in 2022. Uncertainty is one of them: Chan (2021) finds that, in a model with incomplete information, beliefs

5 See for example Cesa-Bianchi and Ferrero (2021) who, in US data, find evidence for complementarities at the product level through which sectoral shocks can cause aggregate fluctuations.
both UK export and import volumes have been tracking well below their G7 peers.

Finally, not discussed here, but extremely important for the near-term dynamics of inflation is the impact of energy prices and the revision of the Ofgem price cap. The Russian invasion of Ukraine has already caused another shock to energy prices and – given the lagged calculation of the cap – will likely have sizeable effects on consumer prices beyond the current year.6

Implications for monetary policy

Waves of surging inflation – from the reopening from COVID-19 and associated energy and goods-price inflation, from the Russian invasion of Ukraine and further leg-up in energy prices, and likely from the most recent coronavirus lockdowns of production facilities in China – have pushed core and headline inflation in many advanced economies to highs not seen for many decades. What was transitory at first has spread to more product categories and into labour markets, raising even the least volatile components of the UK CPI, perhaps heralding a regime change to where prices in these categories once again trend above the inflation target.

Current price and wage expectations coming from the DMP survey are inconsistent with the Bank of England’s 2% target and, if they are realised in 2022, are likely to keep inflation strong for longer, which could embed a reinforcing cost-price dynamic. The longer wages and prices stay above target, the more persistent the headline inflation. A first defence against persistence is to lean against expectations. However, expectations are not the only factor relevant for monetary policy. The price increases already in train and those embedded via the Ofgem price cap will hit household income, and likely will constrain purchasing power and therefore pricing power over non-energy goods and services. In considering the appropriate policy path to achieve the inflation target in the medium term, it is necessary to evaluate the tenacity of wage and price expectations against expected aggregate demand outcomes.

References


6 For more information on the effects of energy price shocks on the UK economy, see the scenarios using standard forecast methodology versus the full futures curves alternative in the November and February Monetary Policy Reports (Bank of England, 2021 and 2022c).

Global inflation has increased to levels not seen in 40 years. This increase has been widespread: In February 2022, year-on-year headline inflation was 7.9% in the US, 5.9% in the eurozone and 6.2% in the UK, and it is likely to peak in the 8%-9% range. Excluding food and energy, year-on-year inflation was 6.4% in the US, 2.7% in the eurozone and 5.2% in the UK.¹ Other measures of underlying inflation, such as median or trimmed inflation, have showed increases of a similar magnitude, suggesting that price increases are becoming widespread and no longer concentrated on a few items. However, while inflation is a global phenomenon, some countries have bucked the trend: Year-on-year headline inflation in Japan, for example, was just 0.9% in February 2022.

This acceleration in inflation, which started around mid-2021, has been a surprise, after a few decades of very low inflation. This paper looks at the drivers of the inflation surge, its prospects and its implications for monetary policy. The discussion is focused on the US, but the main conclusions also apply to the EU and the UK: While the upside risks to inflation are higher than they have been in decades, the appropriate policy mix inflation will likely stabilize around the target.

Why has inflation increased? A series of unfortunate events

We use the Phillips curve as an organizing principle for this discussion: Inflation would be a function of slack, inflation expectations, and supply shocks. In this frame-work, supply shocks are, by definition, short term and transitory, while slack averages out over the business cycle. Therefore, over the medium term, the Phillips curve approach implies that inflation would converge towards inflation expectations, and changes in inflation expectations have permanent effects on inflation.² Two hypotheses, not mutually exclusive, may explain the recent surge in inflation.

One hypothesis argues that a series of supply shocks have caused the surge in inflation. This surge would therefore be transitory yet it could be very persistent, because with a series of successive shocks it could take an extended period of time until all the shocks fade away. The other hypothesis argues that the surge in inflation is permanent, driven by excessively expansionary demand policies that generated too rapid an erosion of slack and lifted inflation expectations.

The two hypotheses can be difficult to tell apart in real time if, as it is the case, a series of simultaneous but unrelated price shocks affect a wide range of sectors of the economy. The breath and scope of these price shocks make them observationally equivalent to a macro shock to inflation, driven by demand growth outstripping supply. But the implications of each hypothesis are very different. This article analyzes the three components of the Phillips curve as way to tell which of the hypothesis is more valid.

Transitory supply shocks: Scarcity of goods and commodities

The key to understanding the series of supply shocks that have hit inflation is the nature of the COVID-19 recession. It was not a standard recession triggered by overheating or by financial instability. Instead, it was triggered by a health shock that forced policymakers to shut down the economy, and suddenly put it in an induced economic coma. To support the economy during the coma, large fiscal and monetary policy easing packages were deployed with the objective of supporting incomes for those out of work, and minimizing hysteresis among workers and firms...
so that the disruption to the structure of the economy was minimal.

This policy strategy was very successful. As a result, the economic reopening was also very abrupt, and the economy bounced back very fast. But while economic policies succeeded at preventing a deterioration of potential output, the composition of output changed in an unexpected way: The risk of COVID-19 contagion penalized the consumption of services, triggering a large shift in the consumption of goods vs services.\(^3\) In graphic terms, people suddenly stopped going to the gym and bought a bicycle. This meant that the global supply of durable goods became utterly insufficient overnight. Something similar happened to the production of semiconductors, the demand for which skyrocketed well above available supply due to, among other reasons, the need to manufacture all the computers needed to work from home. Since semiconductors are a critical input for the car production, this generated a global scarcity of cars.\(^4\) Moreover, the global trading system and supply chains, optimized for efficiency and with little slack, broke down in multiple places with a global shortage of containers and trucks, and were not able to handle this sudden surge in global goods demand (see the discussion in Celasun et al., 2022). The result was a global supply bottleneck which, combined with robust demand growth, generated severe scarcity effects in goods markets, affecting multiple items in the CPI basket.

Scarcity effects generate non-linear increases in prices: the same amount of demand generates an outsized increase in prices. For example, with car inventories at all-time lows, the price of used cars in the US increased by almost 50% in 2021. Figure 1 illustrates the outsized impact of the price increases in cars on US inflation. While cars represent less than 10% of the CPI basket, it has generated about 50% of core CPI inflation. The counterfactual is clear: Had demand been better distributed across goods and services, the same amount of demand would have generated a much smaller increase in prices.

This sudden increase in the global demand for goods also generated a sharp increase in the global demand for energy. Goods are more energy intensive to produce than services – think again about the comparison between going to the gym and buying a bicycle. This met a commodity market that was undersupplied for a variety of reasons, including years of underinvestment in fossil fuels, not enough renewable energy capacity and a geopolitical risk premium. The Russian invasion of Ukraine has added to this supply shortage and risk premia. Because energy commodities are a critical input for metals and food, the energy price surge had severe spillovers in the rest of the commodity complex. As a result, global commodity prices have skyrocketed. The Bloomberg commodity index, a broad basket of commodities including energy, metals and food, has appreciated over 100% since the COVID-19 trough in March 2020.

These scarcity effects in goods and commodities are, by definition, transitory shocks, though likely very persistent. Figure 2 shows the outlier nature of these price shocks. While US core goods inflation has historically averaged about zero, it is running at well over 10% year on year. Barring new shocks, it stands to reason that goods prices will at least stabilize, and thus their inflation rate will decline to zero. Their inflation rate could also become negative, for example, if the lagged production generated by these scarcity effects eventually results in an excess supply of goods, or if the geopolitical risk priced in commodity markets subsides.

**Erosion of slack: The “great renegotiation”**

Of course, the enabling factor for this large array of price shocks is strong demand growth – these scarcity effects would not have happened had demand growth been weak. Demand has been strong due to the expansionary policy mix implemented across all countries, including the very large US fiscal stimulus adopted in early 2021. The differences in fiscal stimulus across countries, and the

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3 To wit: US durable goods consumption is 20pp above the pre-COVID-19 level. This divergence is less acute in the EU, which explains the milder increase in core inflation, as scarcity effects in goods have been much less pronounced (see Lane, 2022).

4 The supply of semiconductors had been disrupted by the US export restrictions introduced by the Trump administration, see Bown (2021).
that it may have increased to about 5.9% – about 1.5 percentage points higher than pre-COVID-19. That would imply that the surprise in the unemployment gap would be double, about 3 percentage points. Still, with the coefficient of the pre-COVID-19 period, this would have generated additional inflation of only about 0.3 percentage points, a rounding error of the 2.8 percentage point surprise.

It is possible that the Phillips curve has become steeper – that the coefficient of the unemployment gap has increased, thus generating more inflation for a given erosion of slack. But it does not appear so initially. Figure 4 shows the relationship between the unemployment gap (the difference between the unemployment rate and the Congressional Budget Office’s estimate of the NAIRU) and core services inflation (the more sensitive part of inflation, a priori, to slack), for the last three expansions (defined as the periods when the unemployment rate was declining). It shows that differential timing of the reopening of the economy, are factors explaining why the inflation surge started in the US, and only later appeared in the UK and the EU.  

But how much inflation did the erosion of slack generate? Was it enough to explain the large upside surprise in core inflation? Slack, defined as the difference between the unemployment rate and the non-accelerating inflation rate of unemployment (NAIRU), is an unobserved variable, but its near term evolution can be proxied by the change in the unemployment rate. Figure 3 shows the evolution of the consensus forecast for the US unemployment rate and for core personal consumption expenditure (PCE) year-on-year in 2021Q4. It shows that as of 2021Q1, the unemployment rate was forecast to end the year at 5.5%, and core PCE was forecast to end at 1.7%. Alas, the unemployment rate fell to 4.2% in 2021Q4 while core PCE rose to 4.5%. In other words, the surprise in unemployment was 1.3 percentage points, while the surprise in core PCE was 2.8 percentage points. Under the Phillips curve specification that prevailed prior to the COVID-19 crisis, which estimated a coefficient of about 0.1 for the unemployment gap (see Reifschneider and Wilcox, 2022), this unexpected decline in the unemployment rate would have generated just about 0.1-0.2 percentage points of additional core inflation.

It is possible that the NAIRU has increased, and that this decline in unemployment represents a bigger erosion of slack. While employment has recovered to pre-COVID-19 levels, the labor force participation rate is still below, likely reflecting a combination of retirements and COVID-19 related hesitancy. Crump et al (2022) estimate the evolution of the NAIRU during the COVID-19 period and conclude that it may have increased to about 5.9% – about 1.5 percentage points higher than pre-COVID-19. That would imply that the surprise in the unemployment gap would be double, about 3 percentage points. Still, with the coefficient of the pre-COVID-19 period, this would have generated additional inflation of only about 0.3 percentage points, a rounding error of the 2.8 percentage point surprise.

5 See Gros (2021) for a discussion of the different fiscal stimulus across countries.
the current episode is for now roughly consistent with the past experience – though the number of observations is small and thus caution is warranted. However, for a steeper Phillips curve to explain the inflation surge, the coefficient would have had to increase tenfold.

The relationship between slack and inflation is driven by two factors: the relationship between slack and wages (the original Phillips curve was a relationship between unemployment and wages) and the relationship between wages and prices, which is driven by markups and pricing power. Thus, this apparent stability of the Phillips curve could be masking moves in these two relationships.

In fact, the rapid increase in wage growth (the Atlanta Fed tracker shows year-on-year wage growth of 5.8% in February 2022) could be signaling an incipient steepening of the Phillips curve. A main driver of this strong wage growth could be the policies implemented in the US to deal with the COVID-19-related lockdowns – rather than furloughing workers and keeping the employer-employee relationships, as most other developed countries did, the US opted for income support via cash checks and enhanced unemployment benefits. This led to a large and sudden increase in unemployment, followed by a large and sudden recovery in employment. This led to the “great renegotiation”, with record high amounts of workers searching for new jobs upon reopening. In an environment of strong economic activity, this large-scale renegotiation of contracts has given workers bargaining power to demand higher wages – something that is apparent in the acceleration of wage growth for job switchers, which reached 6.6% in February 2022. This great renegotiation has happened mostly at the lower end of the pay distribution. The Atlanta Fed data shows that while wage growth for the first quartile has accelerated to the highest levels since 2001, wage growth for the second, third and fourth quartiles is broadly similar to the last decade. This acceleration of wage growth for low-wage jobs may have been exacerbated by the restrictions to immigration, as immigrants have traditionally been more willing to fill jobs at the lower end of the pay scale. To a large extent, the observed dynamics of wage growth are similar to a sudden increase in the “market minimum wage” driven by the great renegotiation. As such, it could just be a one-off adjustment in wage levels – though, in the context of a rapid increase in commodity prices, there is a material risk that workers will also want to be compensated for their loss in real incomes, demanding further wage increases and thus triggering a wage-price spiral (see Blanchard, 2022). The lack of unionization in the US labor market reduces this risk, but only time will tell.

At the same time, it is possible that this faster wage growth at the lower end of the pay scale is driven by a fundamental transformation of jobs that is not inflation-ary. After all, the key variable affecting future inflation is not wage growth, but wage growth relative to productivity. The COVID-19 pandemic has led to a potentially permanent increase in online commerce, as consumers have become used to ordering online and habit formation is typically persistent. This implies an increase in the market share of commercial distribution of Amazon and similar firms, with an important implication: Amazon applies the principles of manufacturing to commercial distribution and can therefore generate higher productivity growth than the in-person retail sector.6 Thus, a growing share of the services sector is becoming like the manufacturing sector, and thus susceptible to productivity gains. Amazon can afford to pay higher wages that match this higher productivity growth, de facto putting a floor in low skilled wages and generating competitive pressures for the rest of the low wage sector, which must match these higher wages to retain workers and, along the way, increase their productivity if they want to survive. The increasingly monopsonistic nature of the US labor market gives large firms an advantage that exacerbates these effects.

The final element is the markup of prices over marginal costs. Empirically, markups have behaved in a countercyclical manner: During periods of high unemployment, firms benefit from lower wage growth and build large markups, and as the unemployment rate declines and wage growth picks up, firms absorb the increase in labor costs by reducing markups, allowing them to keep prices stable and retain market share. But this countercyclical nature of markups is an empirical fact, not a fundamental property of the economy, and may have been the result of a globalization-driven multidecade trend that limited wage gains and firms pricing power. In an environment where all labor inputs are increasing and all companies are raising prices, it is possible that markups no longer behave in a countercyclical manner, thus increasing the probability of a wage-price spiral.

Overall, the contribution of slack to the inflation surge has likely been very small and, while wage growth has accelerated and pricing power seems widespread, it is too early to tell if it is a one-off or will lead to a permanent increase in inflation.

Inflation expectations: Increasing from too low levels, now compatible with the inflation objective

The third element of the Phillips curve is inflation expectations. Short-term measures of inflation expectations have increased, mostly the reaction to the increase in food and

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6 See the discussion in Ubide (2022).
energy, the most salient prices. But short-term inflation expectations have not, in the past, been a good predictor of inflation: Reifschneider and Wilcox (2022) show that one-year-ahead inflation expectations have been negatively correlated with inflation one year out. Longer-term measures of inflation expectation are more relevant for future inflation and have increased from the excessively low levels that were prevailing pre-COVID-19, but have stabilized at levels compatible with the 2% inflation objective. For example, Figure 5 shows the evolution of US 5-year, 5-year inflation expectations derived from three different approaches: survey of professional forecasters, consumer surveys and financial markets. These three measures are at levels similar to or below the levels prevailing in the 2004-2007 period, when there was widespread consensus that price stability had been achieved.

However, the breadth of the surge in prices could cast doubt on the underlying stability of measured inflation expectations. If inflation expectations were to become more adaptive (more backward looking, reacting more to the recent inflation prints), then the anchoring of inflation expectations would be at risk. Figure 6 shows the estimates of the adaptive component of US inflation expectations, from a model that decomposes the evolution of 5-year, 5-year inflation expectations as a function of forward-looking and adaptive components. It shows that while there was an increase in the adaptive component during the 2014-19 low inflation period, reflecting deflationary fears, there is little evidence now that long-term inflation expectations are becoming adaptive, reflecting inflationary fears. It is comforting that, despite the 40-year high in measured inflation and the widespread and salient increases in prices, long-term inflation expectations remain well anchored – if not now, when would inflation expectations de-anchor, one could ask. But vigilance is certainly warranted as the tails of the distribution of market-based inflation expectations are widening (see Hilsher et al., 2022).

Implications for monetary policy: A different policy strategy

Overall, the conclusion is that there is, for now, little information in the current acceleration of inflation that casts doubt on the future stability of inflation. But inflation is, after all, an economic policy phenomenon, and thus this conclusion is critically dependent on the continuation of a policy mix, both monetary and fiscal, that ensures that inflation expectations remain well anchored so that, if and when the inflation shocks fade, inflation can return to target. The concept of the policy mix is critical: Fiscal policy is the right instrument to address the hit on incomes from the price surge, allowing monetary policy to adjust accordingly.

What should monetary policy do? With inflation expectation at target and the labor market very close to approaching maximum employment, monetary policy must now adjust and increase interest rates towards neutral levels. For as long as inflation expectations remain well anchored, this can be achieved with a series of rate increases and a clear commitment to do whatever it takes to ensure price stability. Forward guidance is a symmetric tool that should also be used during tightening cycles. In fact, by the time the Fed started to raise rates in March 2022, 30-year mortgage rates had already increased by 150 basis points since mid-2021, tightening financial conditions. Forward guidance also operates in the risk space in a cyclically adjusted manner (see Ubide, 2017). During times of low inflation, forward guidance contributes to re-
laxing the effective lower bound (ELB) constraint by conveying certainty about the future rate path and promoting risk taking. During periods of high inflation, forward guidance can contribute to tightening financial conditions by limiting the information about the future pace of rate increases and limiting risk taking.

The current tightening cycle will be, by design, different from past cycles. In the past, monetary policy was preemptive—it started to tighten policy while the unemployment rate was still above the NAIRU. For example, the Fed started raising rates in 2015 with the unemployment rate at 5.1%, about 1.5 percentage points higher than the 3.5% level achieved in 2019, and with core PCE at 1.1%, well below the 2% objective—so that the tightening cycle would be gradual. However, in doing so, monetary policy was, de facto, treating the inflation objective as a ceiling, not a symmetric target, and the outcome was suboptimal, with inflation and inflation expectations staying below target. The innovation of this cycle, in part by design but also in part due to the surprisingly strong recovery, is that monetary policy has sought to overcome the ELB constraint by no longer being preemptive, waiting to start the tightening cycle until the unemployment rate had reached the NAIRU and inflation was at target. Therefore, the tightening process starts later in the cycle than before. But this also means that it can and will likely be less gradual.

But can monetary policy deliver a faster tightening process and yet also achieve a smooth landing? Some Fed tightening cycles have ended in recession, but others have not. History may not be a good guide: There are few observations (just seven tightening cycles since the 1980s) and the initial conditions, productivity trends and shocks of each cycle have been different. For example, during the 1980-2000 period, the Fed engaged in a strategy of opportunistic disinflation, with the objective of starting each expansion with a lower level of inflation than that prevailing at the peak of the previous cycle. This means that each tightening cycle aimed at lowering the level of trend inflation, not just stabilising inflation at target. And this required, most of the time, a recession to shift the inflation dynamics lower. The 2004-07 episode ended with a financial crisis, and the 2015-18 episode ended with the COVID-19 recession.

This time is also different because the Fed only wants to stabilize inflation and inflation expectations at target, not reduce the trend level of inflation. If inflation expectations remain anchored and supply shocks fade, the Fed can achieve this by raising rates to a bit above neutral levels and stabilize the unemployment rate at the NAIRU. Once there, the Fed must decide whether it wants to keep inflation at 2% or, considering that inflation typically declines during recessions, stabilize core inflation in the 2%-2.5% range so that it averages 2% over the business cycle. This strategy of opportunistic refl ation (as suggested in Ubide, 2017) would help overcome the ELB constraint and boost future growth.

In the end, central banks must accept that a symmetric inflation objective requires taking some upside risk with inflation. Let us not forget that many central banks, especially the ECB, have struggled since 2007 to lift inflation to target. There is a clear trade-off: the less upside inflation risks are accepted, the more the inflation objective is a ceiling, and not a midpoint, and the more future growth is foregone.

**Conclusion**

The surge in inflation has been due mostly to large and widespread price level shocks, in a context of strong demand growth and anchored inflation expectations. As such, there is little information in the current inflation surge that suggests this increase in inflation will be permanent. Conditional upon the right fiscal policy response to cushion the hit on incomes – this is more critical in the eurozone, where the shock from the Russian invasion of Ukraine is large and inflation expectations are still fragile after a decade of very low inflation, and it is therefore too early to declare mission accomplished on the re-anchoring of inflation expectations at the 2% target – a well-managed adjustment of monetary policy should be able to stabilize inflation at the target. The current inflation environment is extraordinary and will require nimble and symmetric decision-making. There is no room for complacency, but no need to panic either.

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Determinants of Inflation Expectations in the Euro Area

Inflation expectations matter for inflation in economic models commonly used for monetary policy analysis (Clarida et al., 1999; Smets, 2003; Woodford, 2003; Levin and Moessner, 2005; Moessner, 2021). The recent debate on monetary policy frameworks, including average inflation targeting, focused on the role of inflation expectations, e.g. in the monetary policy strategy reviews of the US Federal Reserve and the European Central Bank (ECB) (Powell and Wessel, 2020; Eurosystem work stream on inflation expectations, 2021). The decisions by the Federal Reserve to adopt an average inflation targeting framework in 2020, and by the ECB to change to a symmetric inflation target of 2% in 2021, were partly based on the role of inflation expectations. Policymakers also considered inflation expectations to be important for economic outcomes and monetary policy decisions in the past, despite difficulties in identifying their determinants: Former chair of the Federal Reserve Alan Greenspan noted, “I am not saying what that [inflation expectations] is a function of. We know it’s a very difficult issue, but that is the key variable. It’s important, but just because we can’t make a judgment as to what these driving forces are in an econometric sense doesn’t mean that it’s not real” (Federal Open Market Committee, 1994; Coibion et al., 2018).

The literature on inflation expectation formation mechanisms has been reviewed in Coibion et al. (2018), who argue that survey-based expectations should be included more systematically in macroeconomic studies. Shiller (1978) noted the importance of studying the determination of inflation expectations. A recent review of the literature on the determinants of inflation expectations in advanced and emerging economies and new evidence can be found in Kose et al. (2020). They conclude that empirical studies on inflation expectations have mostly focused on advanced economies, and on testing the implications of the theoretical literature and evaluating the degree of anchoring of expectations.1

The Eurosystem work stream on inflation expectations (Eurosystem work stream on inflation expectations, 2021) has recently studied the determinants of inflation expectations in the euro area within the ECB’s monetary policy strategy review, but without considering the effects of exchange rate changes. They find that short-term euro area inflation expectations have been affected by oil prices, monetary policy shocks and central bank inflation projections. Galati et al. (2018) also find that short-term inflation expectations in the euro area have been affected by oil prices. Household inflation expectations in the United States and Japan responded to changes in food and oil prices (Ueda, 2010). Gerlach et al. (2011) find that short-term inflation expectations in major advanced and emerging economies have been affected by food, energy and core consumer price inflation. Patra and Ray (2010) find that lagged inflation, movements in food and fuel prices and the output gap are the main determinants of short-term inflation expectations in India. They note that the scarce literature on the determinants of inflation expectations in emerging economies has mainly focused on target credibility or the role of fiscal expectations (Minella et al., 2003; Celasun et al., 2004).

Euro area inflation has been rising strongly in the wake of the COVID-19 pandemic, giving rise to concerns that there could be second-round effects, with higher inflation leading to higher inflation expectations, which in turn lead to higher inflation. This could result in more persistent rises in inflation. It is therefore important to study the drivers of inflation expectations.

Our paper contributes to a better understanding of the determinants of short-term inflation expectations in the euro area. As possible determinants of inflation expectations, we consider food and energy prices, both country-specific measures in the form of components of the consumer price index (CPI), and global food commodity prices and oil prices. We also consider the effects of changes in exchange rates and global freight prices. Moreover, we include the output gap as an explanatory variable.

1 Kose et al. (2020) note that theoretical studies have focussed on investigating how public and private information is used by economic agents in formulating inflation expectations.
This paper analyses the determinants of survey-based short-term inflation expectations of professionals in the euro area, using dynamic cross-country panel estimation for 16 euro area member countries from the first quarter of 2000 to the first quarter of 2021. We use survey-based CPI inflation expectations of professionals, since they are available on a comparable basis for the countries in our sample, and since they are not distorted by risk and liquidity premia, in contrast to financial market-based measures.\footnote{The advantages and disadvantages of survey- and market-based measures of inflation expectations are discussed in Galati et al. (2011).}

We find that country-specific food CPI inflation has a significant positive effect on professionals’ survey-based inflation expectations in the euro area. This effect is larger than that of energy CPI inflation and of oil and global food commodity prices. We also find that depreciations of the nominal effective exchange rate lead to significantly higher inflation expectations. Moreover, inflation expectations in the euro area are persistent and the output gap has significant positive effects.

**Data**

We use data on professionals’ survey-based CPI short-term inflation expectations. These are taken from Consensus Economics surveys for next-year CPI inflation expectations.

Data on headline consumer price indices (CPI) comes from Datastream and national sources. Data on food CPI indices, energy CPI indices and core CPI indices are based on data from the OECD, national data and Bank for International Settlements (BIS) estimations. Core CPI inflation is defined as excluding food and energy. Brent oil prices (quarterly averages, US dollar per barrel) are from Datastream. Global commodity prices are taken as the IMF all commodity price index. Global food commodity prices are taken as the UN FAO food nominal price index. As a measure of global freight prices we use quarterly averages of the Baltic Dry Index, as reported daily by the Baltic Exchange in London, from Datastream (in US dollar per points). This index provides a benchmark for the price of moving the major raw materials by sea.

Data on output gaps (as a percentage of potential GDP) was obtained from the OECD, and is linearly interpolated from annual data. Nominal effective exchange rate indices (broad indices, quarterly average) are from the BIS, with an increase reflecting an appreciation of the domestic currency.

We consider the following 16 euro area member countries: Austria, Belgium, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, the Netherlands, Portugal, Slovakia, Slovenia and Spain. The sample period is from 2000Q1 to 2021Q1 at quarterly frequency.

**Method and results**

We study the determinants of inflation expectations by estimating the following dynamic fixed effects panel regressions, using a panel of 16 euro area member countries:

\[
\pi_{it}^\delta = \rho \pi_{it-1}^\delta + \mu \Delta \text{NEER}_i + \gamma_\text{food CPI}_i + \gamma_\text{energy CPI}_i + \gamma_\text{core CPI}_i + \phi \text{outputgap}_i + \chi \text{commodity}_i + \alpha_i + \varepsilon_{it},
\]

where \(\pi_{it}^\delta\) denotes next-year CPI inflation expectations from Consensus Economics surveys in percent; \(\pi_{it}^\text{food CPI}\) and \(\pi_{it}^\text{energy CPI}\) denote year-on-year CPI food price inflation and CPI energy price inflation, respectively, in percent, in country \(i\) at time \(t\); \(\text{outputgap}_i\) denotes the output gap; \(\Delta \text{NEER}_i\) is the quarter-on-quarter change in the nominal effective exchange rate in percent, calculated from the log change in the nominal effective exchange rate, with an increase indicating an appreciation of the domestic currency; \(\pi_{it}^\text{commodity}\) are year-on-year changes in global commodity prices; finally, \(\alpha_i\) are country fixed effects to control for observed and unobserved country heterogeneity. We use robust standard errors clustered at the country level.

Equation (1) is our baseline specification and the results are shown in column I of Table 1. We find that country-specific food CPI inflation has a significant positive effect on professionals’ survey-based inflation expectations. A ten percentage point increase in food CPI inflation leads to an increase in inflation expectations of around 0.5 percentage points. By contrast, energy CPI inflation has no significant effect. We also find that depreciations of the domestic exchange rate in nominal effective terms have a significant positive effect on inflation expectations. A 10% depreciation over the quarter of the domestic exchange rate in nominal effective terms leads to an increase in inflation expectations of around 0.7 percentage points. Moreover, we find that the output gap has significant positive effects on inflation expectations. These effects are in addition to those of lagged inflation expectations. The inflation expectations are highly persistent, with a coefficient of around 0.7 on lagged inflation expectations.

For robustness, we also estimate versions of equation (1) where we add core CPI inflation, \(\pi_{it}^\text{core CPI}\), and changes (year-on-year) in global freight prices, \(\pi_{it}^\text{freight}\). These re-
prices, instead of country-specific food and energy CPI inflation,

\[
\pi_t^e = \rho \pi_{t-1}^e + \mu \Delta \text{NEER}_t + \psi \text{outputgap}_t + \chi_t \pi_t^{\text{food}} + \chi_d \pi_t^{\text{oil}} + \alpha_t + \epsilon_{it}. \tag{2}
\]

Here, \( \pi_t^{\text{food}} \) denotes changes (year-on-year) in global food commodity prices, and \( \pi_t^{\text{oil}} \) denotes changes (year-on-year) in oil prices in percent. The results of equation (2) are shown in column IV. We find that the effect of global food prices is positive and significant, but smaller than that of country-specific food CPI inflation. Oil prices also have a small significant positive effect on inflation expectations. Again, exchange rate depreciations and the output gap have significant positive effects on inflation expectations of a very similar magnitude to those for the baseline specification in equation (1).

We also estimate a version of equation (2) where we consider changes in global commodity prices instead of oil prices and global food prices. These results are shown in column V of Table 1. We find again that global commodity prices have a significant positive effect on inflation expectations, with a similar magnitude to the baseline specification shown in column I.

### Conclusions

This paper analysed the determinants of short-term inflation expectations in the euro area based on surveys of professionals, using dynamic cross-country panel estimation for 16 euro area member countries. We find that country-specific food CPI inflation has a significant positive effect on professionals’ survey-based inflation expectations. A ten percentage point increase in food CPI inflation leads to an increase in inflation expectations of around 0.5 percentage points. This effect is larger than that of global food prices. Oil prices and global commodity prices also have a significant positive effect.

We also find that depreciations of the domestic exchange rate in nominal effective terms lead to significantly higher inflation expectations. A 10% depreciation over a quarter of the domestic exchange rate in nominal effective terms leads to an increase in inflation expectations of around 0.7 percentage points. Moreover, inflation expectations in the euro area are persistent and positively affected by the output gap.

These results on the drivers of inflation expectations are relevant for monetary policy, since euro area inflation has been rising strongly in the wake of the COVID-19 pandemic. Additionally, there are concerns of possible second-

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Short-term inflation expectations</th>
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<tbody>
<tr>
<td>Dep. var.: ( \pi_t^e )</td>
<td>I</td>
</tr>
<tr>
<td>( \pi_{t-1}^e )</td>
<td>0.6821***</td>
</tr>
<tr>
<td>( \Delta \text{NEER}_t )</td>
<td>-0.0678**</td>
</tr>
<tr>
<td>( \pi_{t-1}^{\text{food CPI}} )</td>
<td>0.0483***</td>
</tr>
<tr>
<td>( \pi_{t-1}^{\text{energy CPI}} )</td>
<td>-0.0091</td>
</tr>
<tr>
<td>( \pi_{t-1}^{\text{core CPI}} )</td>
<td>0.0207</td>
</tr>
<tr>
<td>( \text{output gap}_t )</td>
<td>0.0217***</td>
</tr>
<tr>
<td>( \pi_{t-1}^{\text{food}} )</td>
<td>0.0062**</td>
</tr>
<tr>
<td>( \pi_{t-1}^{\text{oil}} )</td>
<td>0.0020***</td>
</tr>
<tr>
<td>( \pi_{t-1}^{\text{commodity}} )</td>
<td>0.0076***</td>
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<tr>
<td>( \pi_{t-1}^{\text{freight}} )</td>
<td>0.0003</td>
</tr>
<tr>
<td>constant</td>
<td>0.5387***</td>
</tr>
<tr>
<td>observations</td>
<td>1082</td>
</tr>
<tr>
<td>number of countries</td>
<td>16</td>
</tr>
<tr>
<td>R² within</td>
<td>0.839</td>
</tr>
<tr>
<td>R² between</td>
<td>0.977</td>
</tr>
</tbody>
</table>

Note: Fixed effects panel estimation; sample period: 2000Q1-2021Q1. Robust standard errors clustered at the country level. ***/**/*** denote statistical significance at the 1%/5%/10% confidence level, respectively.

Source: Author’s calculations.
round effects, with higher inflation leading to higher inflation expectations, which in turn lead to higher inflation. This could result in more persistent inflation increases. Such second-round effects would make it more difficult and costly for monetary policy to bring inflation back down to target.

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This paper discusses how financial stability governance has evolved and how central banks and financial regulators are coping with the threats posed by climate uncertainty, providing an overview of G20 countries’ green central banking experiences in the past 20 years. The analysis shows that most central banks realise their climate ambitions through financial stability mandates, leaving the monetary stability mandate unaffected. Considering the debate on market neutrality, the concerns on the risk of overstretching the central banks’ mandate, violation of Tinbergen’s principle and threats posed to central banks’ independence, the provided evidence reveals a mismatch between the observed policy practice and its theoretical underpinnings. Drawing on these findings, we argue that effective green central banking governance should be based on a synthesis between monetary and macroprudential policymaking.

Since the Paris Agreement, central banks and regulatory authorities have been urged to keep global warming below 2°C by scaling up green finance and protecting financial stability, i.e. the macroprudential objective (D’Orazio and Popoyan, 2019). The determination of monetary and financial regulatory authorities to scale up the finance to align with climate change mitigation roadmaps was also confirmed in the COP26 Glasgow Declaration by the Network of Central Banks and Supervisors for Greening the Financial System, central banks and financial regulators in order to integrate climate considerations into their decision-making processes.

Due to their financial regulatory oversight on money and credit flows, central banks have, on the one hand, a dominant position in promoting efficient green finance through fair pricing of climate risks by financial intermediaries (Kemfert et al., 2020). On the other hand, their implicit or explicit responsibility for financial and macroeconomic stability urges monetary authorities to address climate-related and other environmental risks on a systemic level (Carney, 2015). However, preserving the central bank’s mandate and independence while leaning against climate-related risks is undoubtedly not an easy task. Supply and demand shocks driven by extreme weather events or a sudden transition to a low-carbon economy because of changes in climate policies can impact output and inflation in different directions (Pfister and Valla, 2021). Moreover, traditional policy instruments may be less effective in smoothing these shocks; thus, central banks need to opt for unconventional measures to support climate agendas on a “pure” monetary policy playground.

The critical question that thus arises is how can monetary authorities and financial regulators get out of this institutional deadlock. Although monetary authorities have recently shown greater engagement in climate-related issues, their institutional nature limits their action. Central banks are unelected delegates, and their actions are closely connected with their operational mandates and objectives. They are endowed with extensive political independence and authority to achieve monetary policy objectives and exert power without distorting the market, thus coping with market neutrality. Hence, directing financial flows to low-carbon activities without an explicit mandate could compromise the credibility and independence of the monetary authority (Cochrane, 2020).

In recent years, the allocation of supervisory powers and responsibility has been at the core of an intense debate among policymakers and academics. The global financial crisis has contributed to reviving this debate, and incorporating financial stability into the central bank framework...
has opened new questions on coordination between post-crisis financial regulations (mainly referred to as macroprudential) and monetary policy (Smets et al., 2014; Popoyan et al., 2017).

The need for coordination arises through dependencies and overlaps in transition mechanisms as they operate in the same field affecting monetary aggregates, credit conditions and credit growth (Popoyan et al., 2020). Furthermore, in a broader framework that considers climate-related financial risks and the need to scale up green finance, the question emerges as to how the interaction between the two policies will work. This paper investigates how financial stability governance has evolved in the past decades and how central banks and financial regulators are coping with the threats posed by climate uncertainty. From a political economy perspective, we find it worthwhile to examine which kinds of institutional mandates and financial stability governance architecture are in place when macroprudential authorities decide “to go green”. This analysis is relevant considering the current debate on the ideal of market neutrality for the conduct of monetary policy (van’t Klooster and Fontan, 2020; Schnabel, 2020), the concerns raised regarding the risk of overstretching central banks’ mandates, the violation of Tinbergen’s principle and threats posed to central bank independence (Weidmann, 2020; Cochrane, 2020). Moreover, a better understanding of the increasing complexity of the monetary-financial policy landscape in the face of climate change could help address climate mitigation and contribute to low-carbon structural change.

The proposed analysis consists of three steps. First, this article presents the evolution of monetary policy mandates over the past decades and discusses the channels of transmission of climate change to monetary policy. Second, it analyses the diffusion of climate-related financial policies. Third, it addresses the role of financial stability governance models and examines the possible entanglements when monetary authorities institutionally embrace the climate change challenges.

Climate change and monetary policy

In the past decade, the increasing public recognition of the risks posed by climate change produced an intense debate on the role central banks could play in withstanding the threats posed by climate uncertainty (Batten et al., 2016; Campiglio et al., 2018; D’Orazio and Popoyan, 2019). There is a growing awareness that climate change can directly or indirectly affect a central bank’s ability to meet its price stability objectives because of the materialisation of supply and demand shocks in the economy (Pfister and Valia, 2021). Losses deriving from extreme climate events can generate demand-side shocks, having a negative wealth effect and causing a reduction in private consumption. Supply-side shocks induced by extreme weather events can lead to a shortage of commodities followed by price volatility, erosion of productive capital stock, and ultimately higher risk, market volatility and slower economic growth. They could also cause adverse financial shocks driven by high uncertainty, stranded assets and financial losses (Semieniuk et al., 2021).

Additionally, supply-side shocks can arise because of a sudden or disorderly transition from a high-carbon economy to a low-carbon economy, implying a choice between the need to limit climate change effects in the long run with a short-term cost of reducing the resources available for economic growth. Furthermore, the above-mentioned factors can directly or indirectly affect precautionary saving, credit spreads, real interest rates and financial instability, hence affecting inflationary pressures, for which monetary policy is responsible. There is therefore a clear transmission channel that relates the conduct of monetary policy and the materialisation of physical and transition risks, thus making central banks susceptible to the risks posed by climate change (see Bolton et al., 2020 and Semieniuk et al., 2021 for reviews of the transmission channels). Accordingly, monetary authorities will need to identify the nature, persistence and magnitude of the climate-induced shocks hitting the economy and prepare an adequate instrumental set-up to address them.

Roles and objectives of modern central banks

Most central banks acknowledge that climate change and the uncertain trajectories of the developments it brings are a significant threat to monetary policy. The debate is often focused on whether central banks should act directly, take auxiliary functions or ignore the climate debate. And in case they act, how they should align their climate ambitions with their operational mandates (Krostrup and Oman, 2019). This concern derives from the historical differences in central banks’ policy traditions and the evolution of institutions’ mandates (Goodhart et al., 2011), which mostly focus on price stability.

Central banks’ mandates often include contributions to general economic welfare in addition to the main price stability objective, but sustainability is far from being an explicit mission statement when considering G20 countries’ experiences (see Figure 1). While the heterogeneity in operational scopes is indisputable, an explicit similarity emerges as all countries have a price stability objective as a necessary component of the institutional mandate. Compared to emerging economies’ experiences, monetary authorities in advanced economies have narrower
mandates. Having a broader monetary policy (and frequently also developmental objectives) gives, for example, to the Chinese and Brazilian central banks marked flexibility in their mandate interpretations. As a result, climate-related financial instruments directed to canalising credit flows to more environmentally friendly sectors have been employed as part of economy-wide sustainable development objectives in these jurisdictions.

Regarding the financial stability objective, we note that the global financial crisis triggered a massive transformation in monetary policymaking, reshaping central banks’ institutional role, governance and mandate structures. As shown in Figure 1, in 2000, financial stability was an objective rarely present in central banks’ mandates; indeed, only three out of 19 central banks targeted financial stability. Induced by the global financial crisis and heavy criticism towards central banks for omitting systemic financial risks from the monetary policy radar, this picture changed between 2007 and 2012, leading to the massive adoption of financial stability as an operational target of central banks (58% in 2020 vs. 16% in 2000). High-income countries included economic stability in the hierarchical context, focusing primarily on price stability (see Figures 1 and 2). In contrast to developed countries, emerging economies either lack financial stability or it is present at the same level as the primary price stability mandate. The absence of implicit financial stability mandates in these jurisdictions is often compensated with sustainable economic growth and development objectives. Monetary authorities in emerging economies are assigned supervisory objectives to safeguard the financial system’s stability to achieve the final goal. All in all, central banks in G20 countries are directly (through primary or secondary objectives) or indirectly (through broad mandates supporting economic growth) involved in preserving financial stability.

Towards a green monetary policy

Three main “green” monetary policy approaches could be distinguished (Krogstrup and Oman, 2019). The first is related to implementing the so-called green quantitative easing, based on the recalibration of asset purchase programmes by eliminating high-carbon assets from central banks’ portfolios, thus favouring low-carbon assets. The second relates to targeting refinancing operations, con-
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In this setting, the cost of refinancing could be linked to the amount of household and firm loans to carry out environmental investments, implying that central bank liquidity will be provided at preferential interest rates. In the euro area framework, this approach has been recently proposed by van’t Klooster and van Tilburg (2020). Alternatively, differentiated rediscount rates, i.e. the possibility of rediscounting green loans at lower rates at the central bank, are also conceivable. The third approach considers revising the collateral eligibility criteria in monetary refinancing operations (Oustry et al., 2020).

Looking at G20 countries’ experiences, a few central banks have decided on considerable climate action on the monetary policy side. To the best of the authors’ knowledge, only the People’s Bank of China has a dedicated policy to promote green finance via monetary policy so far. Other countries, such as Brazil, India, Indonesia and Japan, adopted credit allocation measures to prioritise environmentally friendly sectors, such as green lending quotas and concessional loans. The ECB has recently shown a greater engagement in this respect, defining climate change as mission-critical and strongly emphasising climate change implications for the primary monetary policy objective (ECB, 2020). In July 2021, the Governing Council of ECB decided on an ambitious roadmap to incorporate climate change considerations into its policy framework to reflect environmental sustainability considerations in its monetary policy. The decision follows the strategy review of 2020-21, in which the reflections on climate change and environmental sustainability were of central importance (see ECB, 2021). The ECB’s action plan seeks an optimal interaction scheme of financial supervision, monetary policymaking and financial markets, replacing the market neutrality principle with market efficiency to thoroughly incorporate the risks and societal costs associated with climate change (Schnabel, 2021). The commitment of the ECB will mainly be directed to (i) developing new models and statistical methods to monitor the implications of climate risks to the financial system and the transmission of the monetary policy; and (ii) including climate risks in monetary policy operations, in particular in the area of disclosure, risk assessment, collateral framework and corporate sector asset purchase.

When approaching the issue of greening monetary policy, three aspects need to be considered. First, since many central banks, especially in developed and high-income countries, possess significant institutional and operational independence, addressing long-term sustainability issues is regarded with a degree of reluctance. Moreover, central banks’ action in this realm is often considered a second-best intervention compared to other policy actions such as taxation of carbon emissions and cap-and-trade policies. Incorporating sustainability objectives into the monetary policy’s operation may overstretch the mandate (a point that has been previously emphasised), thus creating conflicts between the objectives and endangering institutional independence (see Campiglio et al., 2018 for a review). Furthermore, such actions are frequently viewed as a massive departure from the non-distributional and mar-

Figure 2

Structure of institutional mandates of central banks in G20 countries as of 2021

Note: The bubble size indicates the role of a monetary policy objective in the structure of central banks’ mandates. Two bubbles of equal size: dual mandate; two bubbles, one is bigger than the other: hierarchical dual mandate.

Source: Authors’ calculations based on central banks official acts and laws, and IMF Central Banks Legislation Database.
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Market-neutral principle of monetary policymaking (Cochrane, 2020; Weidmann, 2020). Second, the operational scope of supporting the climate agenda varies widely across central banks, with sustainability far from being a universally explicit mission statement as discussed above (see Figure 2). Some monetary and financial regulatory authorities have relatively narrow interpretations of their mandate to address climate issues, while others, e.g. in China, Brazil or India, possess somewhat broader policy remits to support green finance measures and climate policy. Indeed, while an increasing number of central banks show a notable public engagement in acknowledging the threats posed by climate-related risks (Elderson, 2018), the institutional arrangement in some jurisdictions limits the scope of their actions. Third, “market neutrality” is often introduced for motivating the “prudence” to make monetary policy sensitive to climate risks (Weidmann, 2020). Some argue that to achieve the policy goals of (mainly) price and financial stability, central banks must not distort financial markets. Accordingly, their intervention in promoting low-carbon activities without a dedicated mandate could compromise their independence and credibility, creating institutional deadlock (Cochrane, 2020). Thus, the market neutrality ideal (partially) explains why the debate on central banks’ role in addressing climate change is usually inclined towards the importance and effectiveness of fiscal instruments, such as carbon pricing, considered the best tool to achieve decarbonisation. Indeed, the support of the ideal of market neutrality and the reluctance to engage in green monetary policy operations is motivated by the fact that it would imply politicising monetary policy (van’t Klooster and Fontan, 2020).

Climate change and financial supervision and regulation

The literature classifies the risks posed to financial stability by climate change in two main categories: physical and transition risks (Carney, 2015). The former is associated with the economic cost of actual or expected extreme climate events that can cause the erosion and high volatility of physical and financial assets’ monetary value, thus increasing overall uncertainty in financial markets. The latter derives from a sudden or disorderly transition, triggered by, among others, unanticipated changes in public policy caused by market participants and concerns about their destabilising effects on the financial system, such as lower portfolios value, higher non-performing loans in banks’ balance sheets or a decline in returns for insurance companies (Batten et al., 2016).

Since the signing of the Paris Agreement, many financial regulators have shown greater engagement in addressing climate-related financial risks and coping with climate uncertainty. Following the seminal contribution of the former Governor of the Bank of England (Carney, 2015), the Financial Stability Board advocated for the Task Force on Climate-related Financial Disclosures creating the High-Level Expert Group.

A review of existing climate-related financial policies highlights that no climate-related macroprudential measure concerning capital requirements, leverage ratios or systemically important banks or liquidity requirements have been adopted in G20 countries (see D’Orazio, 2021b, 2022). However, several risk management and supervisory measures exist: Significant action has been detected concerning climate-related stress testing. Other policies, such as climate-related disclosure requirements of the climate-related financial risks associated with climate change, are also relevant to developing a credible green financial system and avoiding so-called greenwashing (TCFD, 2018). The Chinese macroprudential authority, the Indonesian central bank as well as Turkey and Mexico’s banking associations have promoted banks’ disclosure requirements. Instead, disclosure requirements for non-financial institutions, pension funds, insurance companies and green finance principles and guidelines have been widely adopted over the past 20 years in most G20 countries. At the euro area level, we note that most countries have developed green market-shaping policies and adopted disclosure requirements for non-financial firms, insurance companies or institutional investors. A summary of the adopted policies in the G20 countries over the period 2000-2020 is provided in Table 1.

Governance structure, policy interaction and coordination

The analysis indicates that most central banks address climate-related financial risks and support the transition towards a carbon-neutral economy.

There are two main climate-oriented policy options. The first refers to central banks’ supervisory roles and responsibility to protect the banking sector’s safety and soundness. It involves assessing climate-related financial risks and correct pricing in financial institutions’ balance sheets. The second option refers to central banks’ portfolio management; it calls for a responsible approach that considers climate risks when deciding non-monetary portfolios’ composition and how to align them with the Paris Agreement goals.

The evidence collected in the investigation indicates that few G20 central banks have engaged in unconventional green monetary policies, i.e. the People’s Bank of
Green Monetary Policy

Examining climate-related financial policies reveals, instead, a larger commitment of G20 countries. In our view, this evidence calls attention to the financial stability governance structures.

In the past decades, the annexation of the financial stability mandate to monetary policy objectives gave rise to three main financial stability governance models based on coordination efforts between monetary and macroprudential policies (see Figure 3).

We refer to the central bank model when the monetary and prudential policies are under one roof because the prudential policy is included in the central bank mandate, and the central bank is the prudential authority. In the separate committee model, different authorities work in a committee related to the central bank or an independent committee to conduct monetary and pru-

Table 1
Diffusion of climate-related financial policies and authorities responsible

<table>
<thead>
<tr>
<th>Financial policy area</th>
<th>Category</th>
<th>Instrument</th>
<th>Objective</th>
<th>Countries that adopted (Authority responsible for promotion/implementation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>Quality and level of capital</td>
<td>CAR with GSF/BPF, CCyB Sectoral leverage ratios, Sectoral capital requirements</td>
<td>Mitigate and prevent excessive credit growth and leverage</td>
<td>Australia (PRA), China (CB, PRA, GOVT), France (PRA, GOVT), Indonesia (GOVT), Mexico (CB), UK (PRA)</td>
</tr>
<tr>
<td></td>
<td>Governance and risk management</td>
<td></td>
<td></td>
<td>Canada (CB), China (PRA), France (PRA), UK (PRA)</td>
</tr>
<tr>
<td></td>
<td>Climate-related stress test (macro)</td>
<td></td>
<td>Evaluate effect of economic or financial shocks to the financial system</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Green Asset Ratio</td>
<td></td>
<td>Assess exposure of banks’ portfolios to carbon-intensive assets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Internal Capital Adequacy Assessment Process</td>
<td></td>
<td>Include social and environmental risks when assessing their capital needs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Climate-related disclosure requirements</td>
<td></td>
<td>Inform about concentration of carbon-intensive assets in the financial sector</td>
<td></td>
</tr>
<tr>
<td>Liquidity</td>
<td>Liquidity</td>
<td>LCR, NSFR</td>
<td>Mitigate and prevent market illiquidity and maturity mismatch</td>
<td>Brazil (CB), China (PRA), Indonesia (CB), Mexico (BA), Turkey (BA)</td>
</tr>
<tr>
<td>Large exposures</td>
<td>Lending limits</td>
<td>Large exposures limit</td>
<td>Mitigate systemic risk by limiting the concentration of certain exposures</td>
<td>All G20 countries except Saudi Arabia</td>
</tr>
<tr>
<td>Green financial principles:</td>
<td>to create green financial markets</td>
<td></td>
<td></td>
<td>All G20 countries except Argentina, Mexico, Saudi Arabia, Turkey</td>
</tr>
<tr>
<td>Other disclosure requirements:</td>
<td>to promote the public disclosure of climate risks (also for non-financial institutions)</td>
<td></td>
<td></td>
<td>Japan (GOVT), South Korea (GOVT)</td>
</tr>
<tr>
<td>Green credit allocation policies:</td>
<td>to directly promote green credit measures and investments</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: CAR: Capital Adequacy Ratio; GSF: Green Supporting Factor; BPF: Brown Penalising Factor; CCyB: Countercyclical Capital Buffer; LCR: Liquidity Coverage Ratio; NSFR: Net Stable Funding Ratio; BA: Banking Association; PRA: Prudential Regulatory Authority; CB: Central Bank; GOVT: Government.

Source: Authors’ elaboration based on D’Orazio (2021b).

China, the Bank of Japan and the ECB, which shows increasing interest in this direction (ECB, 2020d). Examining climate-related financial policies reveals, instead, a larger commitment of G20 countries. In our view, this evidence calls attention to the financial stability governance structures.
Green Monetary Policy

Figure 3
Financial stability governance models in G20 countries

Source: Authors’ calculations based on elaborations of official acts and statutes of central banks.

On the one hand, the importance of having a central bank that has climate-related macroprudential regulation in its mandate is supported by the fact that tools and transmission mechanisms of monetary and macroprudential policy are so profoundly intertwined that it is both ineffective and impossible to delineate a clear separation of the two policy objectives. For example, climate-related macroprudential measures to reduce carbon-intensive lending and direct resources to sustainable sectors impact money creation, directly feeding into price stability. The close interaction between monetary and macroprudential policy leaves room for the bottleneck approach. Consider, for example, a situation in which carbon-intensive sectors are profoundly affected by a debt overhang because of the low-carbon disorderly transition. If this situation does materialise, these sectors should be primarily supported. The contraction of the carbon-intensive industry could indeed quickly end up in a liquidity spiral, consequent fire sales of assets and cause self-reinforcing deflationary spirals. In this framework, the monetary policy equipped with a price stability mandate is short-handed,
whereas the climate-related macroprudential policy can target a specific sector (D’Orazio and Popoyan, 2019). On the other hand, separate governance models benefit from balanced coordination without falling into time inconsistency issues and the advantages of the central bank model, namely, the expertise in analysing systemic risk, independence from short-term political pressure, and coordination between the two policy decision-making processes. These features allow policymakers to mitigate the so-called financial dominance, reputational risk and time inconsistency that usually represent more significant risks in the pure central bank model (Smets et al., 2014).

Realising the climate ambitions through the macroprudential mandates can cause trade-offs because climate-related financial and monetary policies differ substantially in terms of objectives. Whereas the former focuses on climate-related financial stability, i.e. reducing systemic risks posed by climate change, the latter relies, in most cases, on monetary stability. In terms of policies, when addressing climate-related threats to price and financial stability, the interaction is more complicated because of possible conflicts due to intertwined transmission mechanisms (Popoyan, 2020). As shown in Figure 5, the field of influence of macroprudential and monetary policy passes indeed through the financial system.

In a broader framework that considers climate-related financial risks and the need to scale up green finance (Kemfert et al., 2020), the question emerges as to how the interaction between the two policies will work. In our view, the challenges posed by climate change call for the development of a synthesis between monetary and macroprudential policymaking. As emphasised in Figure 4, in this setting, monetary policy is concerned with its primary objective, mainly price stability. In contrast, macroprudential policy, enriched with climate-related objectives, is concerned with financial stability, reaching the goal of addressing climate-related financial risks and scaling up green finance. Nevertheless, the implementation of this synthesis poses questions about whether it implies stretching central banks’ mandates and whether this violates the well-known principle of Tinbergen (1939, 1952) according to which “for each policy objective, at least one policy instrument is needed”. We note that by considering Tinbergen’s rule that $n$ objectives require $n$ tools, the inclusion of climate-related objectives in the price stability mandate could, on the one hand, jeopardise the principle itself and, on the other hand, lead to an overstretched of the central bank mandate. The latter becomes less clear and too broad, thus undermining the monetary authority’s independence. However, if the climate-related macroprudential regulation is considered an offspring of the more general macroprudential policy, the leaning against the climate-related risk function can be undertaken without violating the Tinbergen principle. This approach is consistent with the EU Task Force’s position on Climate-related Financial Disclosures (FSB, 2019), which places the reporting of climate risk at the same level as reporting financial risks.

**Conclusions**

The analysis in this paper highlights the fact that some G20 countries realise their climate ambitions through financial stability mandates without affecting the monetary stability mandate. This result is puzzling because of the mismatch between the observed policy practice and its theoretical underpinnings.

We propose engagement in climate-related financial policymaking by studying the types of financial stability governance structures that characterise these countries. The evidence that separates financial stability governance structures is the most common when climate-related financial policies are active; this could be interpreted with respect to the higher expertise and effectiveness of
decision-making that characterises these governance models. The rationale is that when the macroprudential policy mandate is shared among multiple agencies, and each is represented by high-level technical expertise, the decision-making regarding implementing new climate-related instruments is more specialised and eased. Still, the coordination with monetary policy is guaranteed by the important role played by the central bank in the separate committee governance model.

Drawing on these findings, our study emphasises that the potential hurdles emerging from the interaction between monetary and financial policy require a rethink of monetary authorities’ and supervisors’ roles when dealing with climate change uncertainties and their effects on central banking. In the presence of massive market failures such as climate change, some economists are already calling for overtaking the ideal of market neutrality. As a complement to this view, and based on the evidence collected in our study, this paper argues that effective green central banking governance should be based on a synthesis between monetary and macroprudential policymaking that will allow the countries to realise their climate ambitions through climate-related financial policymaking without affecting the monetary policy mandate.

We note that a lack of adequate responses to the climate-related financial risks from central banks and financial regulators could lead to inaction bias and build up additional risks (D’Orazio, 2021a), implying additional threats to the price stability mandate. This calls for a larger engagement at the global level for integrating climate-related financial risks under the macroprudential regulations radar.

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Ákos Kengyel

Would Renationalisation and Co-financing of the Common Agricultural Policy Be Justified?

During the past decades several attempts have been made to reform the Common Agricultural Policy (CAP). The article analyses the possible new directions of CAP implementation and financing of the CAP. It discusses whether renationalisation and co-financing of the CAP would be a beneficial approach to make the policy more efficient and to help restructuring not just the CAP expenditure but the whole EU budget. The author analyses the changes in light of the new regulatory frameworks to be implemented from 2023.

The Common Agricultural Policy (CAP) has been subject to changes several times. This demonstrates that the CAP is always developing to meet new economic, societal and environmental needs. Due to the changing role of European agriculture, gradual and continuous reforms are justified. Given the different situation in individual member states, many of the desirable changes can be supported more efficiently at the national level. Therefore, the gradual shift to a CAP emphasising the multifunctional role of agriculture, with a greater focus on environmentally friendly farming and maintaining the appearance of the countryside, logically raises the issue of renationalisation.

Reforms notwithstanding, the CAP is the most integrated of all EU policies and consequently takes a large share of the EU budget. The present CAP is divided into two pillars. Pillar 1 (market measures and direct payments) expenditure is fully financed by the EU budget, and Pillar 2 (rural development) spending is co-financed by member states (varying from 25% to 75% depending on the measures and region). Additional reforms are unavoidable in the future in order to reach a more efficient and effective implementation and more balanced way of financing the desirable priorities.

A political agreement was reached in June 2021 on a “fairer, greener and more flexible” CAP integrating environmental and climate policy goals in line with the Green Deal and its Farm to Fork and Biodiversity strategies (European Commission, 2021e). Finally, the reform package was approved by the European Parliament in November 2021.1 The new CAP regulation will enter into force in 2023. Because of the new elements defined in the regulatory frameworks, it can be stated that the future CAP will represent a paradigm shift in the implementation of agricultural activities in 2023-2027. However, the proposed changes will not lead to a drastic renationalisation of the policy, especially as far as budgetary resources are concerned.

The new requirement to prepare national CAP Strategic Plans at the member state level shows a kind of shift towards renationalisation of the policy in some respect. The new delivery and implementation frameworks can help to improve the efficient use of the available budget for agriculture. On the other hand, during the negotiations on the future regulatory frameworks, member states did not take the introduction of national co-financing of the direct payments into account. Due to several considerations, the member states clearly reject these further steps towards renationalisation. However, renationalisation and co-financing of the CAP could jointly support and implement agricultural policy objectives in a more efficient and flexible way.

Fulfilled original objectives and questioned efficiency

The Common Agricultural Policy has become one of the most regulated and most controversial policies of the EU (Lynggaard and Nedergaard, 2009; Kengyel, 2014; Kuhmonen, 2018). Agriculture has been at the heart of the European integration process since the very outset due to

1 See the background documents on the website of the European Parliament (2021).
food market instabilities, the disproportionate influence of food prices on inflation and a need to maintain domestic food industries for political reasons (Germond, 2019). The CAP initially sought to increase agricultural productivity in the EU and secure availability of food supplies. Originally, it was intended to be a form of protectionism to defend less competitive and more expensive European producers from cheaper products outside the EU.

The established objectives have generally been met. As a result of the CAP, agricultural productivity improved, significant technological modernisation took place, the quality of agricultural produce increased, average crop yields rose, markets became stable, supply security has been achieved and an adequate income level for agricultural workers has been reached. The funding made it possible to build agricultural infrastructure, i.e. storage capacities, transport vehicles and cold storage facilities essential for agricultural activity.

However, it should be noted, that the subsidy system has not only become incredibly expensive, but it has also created inequality between farmers (Giannakis and Bruggeman, 2015). In reality, direct payments of the CAP are somehow distorted, which means that large industrial farms get significantly more financial support than medium- or small-sized farms that are actually in need (Krezminski, 2019; Niemi and Kola, 2005). An evidence-based fitness-check of the CAP has pointed out several inconsistencies (Pe’er et al., 2017). The study concluded that the CAP has had a positive effect in supporting farm incomes, however, direct payments have created dependencies on subsidies and reduced efficiency. The study stressed that the distribution of direct payments is highly inefficient and poorly justified, and, in addition, there is no clear link between objectives and instruments.

There are several scholars who call attention to the fact that the defendants of the direct payments have found new objectives to maintain the high level of funding (Erjavec and Erjavec, 2015). The “greening strategy” proved to be successful because the subsidies can be seen as remuneration for farmers to preserve the environment and biodiversity (Heinemann, 2017; Navarro and Lópe-Bao, 2019). Because of lacking binding requirements, greening conditions have not reached their original goals (Lakner et al., 2019) and have not been effective enough to change agricultural production (Heinemann and Weiss, 2018; Pe’er et al., 2019).

**New delivery model for the period 2023-2027**

According to the future regulatory frameworks of the CAP, the EU wants to ensure CAP’s ability to continue providing uniquely strong support for farming, improving rural areas and high-quality food production within the EU. The future CAP wants to play a crucial role in strengthening the efforts of European farmers to contribute to the EU’s climate objectives and to protect the environment (European Commission, 2021e). The implementation of the proposed reforms will only start by January 2023, due to the long-lasting negotiations among the member states and between the Council of the EU and the European Parliament. The 2014-2020 CAP regulations continue to apply throughout the first two years of the 2021-2027 Multi-annual Financial Framework (MFF).

In the period 2023-2027, the new delivery model will bring both pillars of the CAP under a single strategic planning process, allowing for complementarity and synergy between the two pillars. The legislative proposal defines the expected content and structure of the national CAP Strategic Plans, including key features such as an assessment of needs and a description of the different interventions to be used as part of a member state’s overall intervention strategy. The new model will allow the member states to plan a mixture of mandatory and voluntary measures in both pillars to meet the environmental and climate objectives defined at the EU level (Bourget, 2021; Rac et al., 2020; McEldowney and Rossi, 2021).

The new green architecture will be based on enhanced conditionality and additional environmental and climate-related requirements that can be achieved through the eco-schemes in Pillar 1 and environmental and climate-related measures in Pillar 2. Member states will describe eco-schemes in their CAP Strategic Plans. Eco-schemes should be key tools to deliver on the Green Deal targets (European Commission, 2021d). At least 35% of the rural development budget should be spent on environmental and climate-related measures and, as a general rule, at least 25% of the direct payments budget should be dedicated to eco-schemes, which would be voluntary but would increase farmers’ income (Table 1).

The new design and implementation of the CAP can have a positive impact on the overall greening of the policy, but it will be dependent on implementation at the member state level. Concerning the increased environmental ambition, there are no guarantees of achieving the desirable objectives because the proposed safeguards are too weak. More accountability would be required during the formulation and implementation of national Strategic Plans. Several research studies call attention to flexibility, which member states often use to follow the least ambitious approach, especially for environmental and climate targets (Matthews, 2018; Rac et al., 2020). Without necessary accountability mechanisms due to the lack of quantified objectives at EU
Table 1
Main changes in the CAP regulatory frameworks

<table>
<thead>
<tr>
<th>Current system</th>
<th>New system (2023-2027)</th>
<th>Main changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery and implementation</td>
<td>Strategic planning only in Pillar 2 (rural development programmes)</td>
<td>Introduction of national Strategic Plans for the entire CAP</td>
</tr>
<tr>
<td>Environmental conditionality/ Green architecture</td>
<td>Cross compliance: conditioning of some payments on compliance with certain requirements, including environmental ones (Pillar 1 and some Pillar 2 payments)</td>
<td>Enhanced conditionality replaces cross compliance and greening requirements Flexible eco-schemes (in Pillar 1) and environmental and climate-related measures (in Pillar 2)</td>
</tr>
</tbody>
</table>

Source: The author’s own compilation.

level, a race to the bottom is possible (Heinemann and Weiss, 2018, 12-13).

The CAP Strategic Plans will be assessed in light of the Green Deal. According to the planned timetable, the Commission will assess whether Green Deal targets are likely to be met by 2025 and readjust Strategic Plans through Performance Review in 2026-2027. Theoretically, the indicators must be meaningful in relation to the objectives and impact indicators should be used as promptly as possible during the funding period to assess success (Schulze, 2018; Moore, 2021). Based on the new regulation, mainly output and result indicators will be used, whereas the impacts will be analysed only after the end of the funding period within the framework of ex post evaluation starting from 2028. This approach does not appear to be the most efficient way to monitor and evaluate the achieved goals.

Declining but high budgetary transfers

The CAP has always been criticised for its large budget and for supporting inefficient agricultural practices (Greer, 2013; Kengyel, 2016). Nowadays, agriculture generates only around 1.3% of the EU’s GDP, and represents around 4% of total employment, yet more than one-third of the EU budget is spent on the CAP. Nevertheless, its share of the EU budget has decreased very sharply over the past four decades, from 65.5% in 1980 to 35% in 2020 (European Commission, 2021c). These changes reflect the expansion of the EU’s other responsibilities and cost savings from reforms. The CAP budget for 2014-2020 allocated €291.3 billion for direct payments (71.3% of the CAP budget), €17.5 billion for market interventions (4.3%) and €99.6 billion for rural development (24.4%). Agricultural expenditures totalled €408.3 billion from 2014 to 2020 (European Commission, 2021b). Figure 1 shows the gradual restructuring of EU level CAP expenditure and its GDP share.

According to the regulation on the MFF 2021-2027, €378.6 billion (at current prices) will be available to CAP beneficiaries, representing 31% of the total EU budget (Council of the European Union, 2020). Rural development measures under the CAP will be given additional resources from the Next Generation EU (NGEU) programme to fund economic and social recovery following the COVID-19 crisis (€8 billion).2 Total CAP commitments for the 2021-2027 period are therefore €386.6 billion. The CAP’s first pillar (financed by the European Agricultural Guarantee Fund) has a €291.1 billion budget. Up to €270 billion will be allocated to income support programmes, with the rest going to agricultural sector support (European Commission, 2021a). The overall allocation for the second pillar of the CAP (financed by the European Agricultural Fund for Rural Development) is €95.5 billion. This includes €8 billion from the NGEU recovery instrument. The CAP budget for 2021 accounts for 33.1% of the 2021 EU27 budget (€55.71 billion). As shown in Figure 2, direct payments and market measures (Pillar 1) represent 76.8% of agricultural appropriations (€40.4 billion) and rural development measures (Pillar 2) 23.2% (€15.3 billion).

2 Next Generation EU will increase the budget to assist rural areas in making the systemic improvements needed to meet the European Green Deal and digital transformation goals.
Renationalisation and co-financing as connected approaches

Although, the issue of renationalisation of the CAP seems to be a taboo subject, it is not a new feature. Even the MacSharry reforms of 1992 increased both the demand and the scope for renationalisation. The shift from market support to direct income payments increased the involvement of national authorities in the implementation phase. Theoretically, it is a crucial issue whether renationalisation of the CAP is an applicable way to implement a policy sensitive enough to national and regional needs and priorities (Niemi and Kola, 2005). It must be emphasised that there is no fixed framework for a renationalised agricultural policy yet, as negotiations about the topic have stalled or were neglected (Matthews, 2018, 2).

When talking about renationalisation of the CAP, we refer to a process of giving several competences from EU institutions back to the member states in terms of decision-making or financing or implementation – or all of these. In theory, renationalisation mainly deals with two issues: should Member States have more power and freedom on decisions of agricultural policy, and should there be a shift from common financing back to national funds? Renationalisation can be understood as a propensity to reinforce the power of the Member States in CAP matters at the expense of the EU decision-making process. (Niemi and Kola, 2005, 24)

What would be the specific effects of renationalisation of the decision-making processes and implementation? First of all, renationalisation would help national governments to become more sensitive and aware of regional needs. Member states would have more freedom in terms of decisions in the agricultural sector and more autonomy with the policies they would like to implement. The main reason why a more decentralised decision-making process is needed is that the CAP cannot handle the level of agricultural diversity in the EU. It is natural that there is a high level of diversity in terms of productivity, share in the economy, number of people employed, level of modernisation, etc. (Grochowska and Koisor, 2008).

With respect to the CAP, two principles that may be at stake in case of renationalisation are market unity and financial solidarity. There is a general impression that renationalisation could endanger the single market: If the time comes for national measures and financing, a single homogeneous market is naturally harder to maintain. If CAP policies are no longer wholly financed from the EU budget but rather by member states, this would create the risk of divergence between states that are able and states that are unable to provide funding for these policies. This process would undermine the financial solidarity achieved by funding from the EU budget.

This divergence could in turn harm the principle of market unity, when the variation in financial capabilities between member states results in such a significant dispar-
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When we look at the proposed legal frameworks for the period 2023-2027, the main novelty is that each member state should prepare a national CAP Strategic Plan describing how to achieve the defined common objectives. This new approach gives member states more flexibility to take local conditions into account. Obviously, the new rules represent changes in the implementation of the policy; therefore, it can be stated that in some way the renationalisation is going to start – at least from the point of view of implementation. At the same time, it should be emphasised that the policy will be governed through common objectives and criteria and it will be monitored according to defined indicators. The new regulatory framework will avoid “transforming the CAP into an ‘à la carte’ agricultural policy which would then lead to its renationalisation” (Bourget, 2021, 2). On the other hand, co-financing will not become part of the new implementation model of the CAP.

Potential advantages and disadvantages of co-financing

Practically speaking, co-financing should be introduced to address the huge burden of financing the CAP on the EU budget (Kengyel, 2016). As member states are obliged to co-finance Pillar 1, the EU could focus on different challenges. At the same time, it can be assumed that the ownership of the policy would be strengthened in the member states and it would result in a more efficient use of budgetary resources.

The main considerations in favour of the introduction of co-financing can be summed up as follows (Matthews, 2018; Heinemann, 2017; Heinemann and Weiss, 2018):

- The reduction of EU level agricultural subsidies through the possibility of national co-financing of Pillar 1 payments would be the only way to make a much better use of the very limited resources available at the EU level. A 30%-40% national co-financing rate would save annually about €15 billion to be spent on other EU policies.

- National co-financing of Pillar 1 would put the two pillars of the CAP on equal footing. This will result in a more balanced approach during the discussions about the roles of the two pillars.

- Theoretically, national co-financing of Pillar 1 payments could ensure continued transfers to farmers in the event of cuts in the EU CAP budget. However, it should be noted that the possibility of receiving additional funding from the national budgets could depend on the actual budgetary situation in a member state.

It is crucial that national policy should be in conformity with the EU’s main rules, including the principle of the four freedoms and the rules defined by EU competition policy (including rules on state aids).

The core idea behind renationalisation and co-financing is the same: to take the burden off the EU’s shoulders in terms of financing and to give a bigger role to member states. The main difference is that while renationalisation would change CAP into a policy that could turn the supranationalist CAP into a multi-layered system of regions and nationals, co-financing would mainly mean a financial redistribution. Therefore, co-financing does not aim to cause an in-depth change and spare the common market feature of CAP (Heinemann, 2017, 10). The rejection of co-financing is just the result of path dependency. Obviously, because of national budgetary interests, the member states would like to maintain the funding of agricultural policy from the EU level budget.

As a result, questions arise of how market unity, a fundamental principle of the CAP, may comply with steps towards more national influence... Renationalisation should not pave the way for governments to give unlimited national aids to their agricultural sectors. If market unity should be conserved along with a more nationally-oriented policy, it would be essential that the Commission should be able to survey – and enforce – that national assistance ... do not give rise to unfair competition (Niemi and Kola, 2005, 37).

It is crucial that national policy should be in conformity with the EU's main rules, including the principle of the four freedoms and the rules defined by EU competition policy (including rules on state aids).

Figure 2
CAP allocations in the period 2021-2027
commitments in current prices, billion euros

There are some possible cons for a co-financing system. However, these counter-arguments are mainly based on misleading assumptions that can be questioned. The counter-arguments can be summarised as follows:

- Member states often emphasise that Pillar 1 payments should be financed 100% from the EU budget as they implement common policy. This argument may sound nice, but it does not reflect reality. Other common policies of the EU are also co-financed by the member states. In fact, Pillar 1 of the CAP is an exception to the rule.

- There are fears that national co-financing would lead to an unbalanced distribution of resources if there are member states that have the necessary resources to provide high-level co-financing to farmers while others are unable to do this. Contrary to this argument, the experience of other EU policies that require national budgetary contributions shows that member states are able to find the required resources for co-financing.

- There is also an assumption that the introduction of co-financing would lead to the destructive race of national subsidies, which would distort the competition within the single market. With regards to this point, EU competition policy rules should be respected, which means that subsidies would remain under strict control.

**Concluding remarks**

Based on the experiences of the past decades, a radical reform of EU level agricultural policy is needed due to the fact that, besides being extremely costly, the subsidy system has not proved very efficient. In addition, the Common Agricultural Policy is not able to take into account and handle the different needs and conditions of different member states. One way to renationalise the CAP would be to implement a policy sensitive enough to national and regional needs and priorities.

To conclude, we return to the original question: Are renationalisation and co-financing justified? First, we assume that co-financing of the CAP is justified, especially if we consider that member states already co-finance the CAP Pillar 2. It seems to be an appropriate answer to the changes happening in the EU today (new challenges and emerging priorities which require EU level budgetary resources). It would be a rational reform direction. Co-financing should, however, be strictly limited and should obviously fulfil EU competition rules in order to avoid the risk of distortion of competition and to secure a level playing field.

The renationalisation of regulatory frameworks should be more balanced. Renationalisation is less justified than co-financing in the context of climate-related and environmental issues. Even if it could be a useful method from the point of view of more effective implementation in general, there may be some doubts about its impact on achieving the desirable environmental goals because it would require a coherent, international action. We may have positive expectations for the new rules on spending a high share of CAP expenditures on climate policy-related goals and “eco-schemes” to support environmental and climate requirements in the period 2023-2027. However, increasing flexibility may have a negative impact on environmental ambitions in different member states and this should be avoided. There are fears that the new delivery and implementation frameworks starting from 2023 will provide a scope for enhanced flexibility that allows member states to choose low-ambition implementation pathways.

Concerning the current budgetary period, the member states, as usual, agreed to “national envelopes” for financing of the CAP. In practice, this approach can strengthen the impression of unconditional entitlement for funding. In addition, the Pillar 1 payments will continue to be financed fully from the EU budget, the option for introducing co-financing was neglected during the negotiations. There are doubts that even the conditionality for receiving the subsidies will not become more effective. If monitoring is going to concentrate much more on spending than on monitoring real performance-based impact indicators, the efficiency of using EU budgetary resources to support agricultural activities will definitely not improve in the future.

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Occupations in the European Labour Market During the COVID-19 Pandemic

In order to capture the consequences of the COVID-19 pandemic on the labour market, several aspects need to be taken into account. First, containment measures put in place in member states at different times and with different levels of severity determined the interruption of several economic activities that were considered non-essential. Second, different occupations require varying degrees of physical proximity and social interaction to be carried out; this implies that they can be considered more or less teleworkable, and affected by different levels of epidemiological risk of contagion. This paper shows the labour market impact of the pandemic on different categories of workers in the EU. Occupations are distinguished by three main characteristics: whether they are critical or non-critical, their level of technical teleworkability and the level of social interaction required in the job. We show that the impact of the COVID-19 pandemic on the labour market has been heterogeneous across occupations and that all three dimensions are relevant to determine whether and to what extent the occupations were affected by the pandemic.

The COVID-19 pandemic revealed its unprecedented nature from the outset. From March to November 2020, over 10 million people in Europe had already been infected, with numbers continuing to rise rapidly (OECD and European Union, 2020), reaching nearly 240 million cases at the global level by mid-October 2021 (Johns Hopkins Coronavirus Resource Center, 2021). Countries implemented a wide range of policy responses, such as lockdown measures and stay-at-home orders to contain and mitigate the spread of the virus. Inevitably, this also impacted the labour market.

During the course of 2020, with official data on the real impact of the pandemic still missing, a number of studies attempted to simulate the possible labour market effect on workers by relying on different classifications of jobs, applied to pre-pandemic data.

Among these, a first group of investigations focused on levels of occupational exposure to contagion. Basso et al. (2020) classified occupations according to epidemiological risk of contagion for the US, the EU and the UK; Lewandowski (2020) developed a methodology to measure country-specific levels of occupational exposure to contagion among workers in the same occupations for 26 European countries using the European Working Conditions Survey (EWCS). Focusing on Italy, and considering the first waves of lockdowns, Barbieri et al. (2020) classified the occupations according to the workers’ disease exposure, physical proximity and possibility to work remotely, mapping them into sectoral indices, based on the Italian Sample Survey on Professions (ICP).

A second group studied the potential for business continuity throughout containment measures, thanks in part to the possibility of working from home. Dingel and Neiman (2020) were the first to develop a classification for all occupations according to the feasibility of working from home, which was followed extensively in the successive literature. They based their classification on data from the US Occupational Information Network (O*NET) Work Context Questionnaire and merged this classification with occupational employment counts in the US. For the EU, Sostero et al. (2020), following a task approach, defined teleworkability indicators of physical and social interaction based on the tasks of specific occupations. They exploited the information from both the ICP and EWCS and quantified the fraction of employees in teleworkable occu-
This paper contributes to the literature by providing evidence on the real labour market impact of the pandemic on different categories of workers in the EU. We develop a taxonomy to identify categories of workers who might have been more or less severely hit by the COVID-19 pandemic. We consider three main characteristics of jobs, namely (i) whether they are critical or non-critical, (ii) their level of technical teleworkability and (iii) the level of social interaction required in the job. We build indices on occupational groups defined at the International Standard Classification of Occupations (ISCO) 3-digit level and analyse the employment evolution of occupations in these groups between 2019 and 2020 by using data from the European Union Labour Force Survey (EU-LFS). The next section illustrates the methodology and classification adopted, as well as the data source used and depicts the results of our descriptive analysis, followed by our conclusions.

**Methodology and data**

To provide a complete picture of the legacy of COVID-19 on labour market outcomes and of changes in working conditions induced by the pandemic, one has to consider different aspects.

First, containment and lockdown measures put in place at the national level at different times and with varying levels of severity determined the interruption of several economic activities that were considered non-essential or more at risk due to the higher threat of contagion. During the first lockdown phase, several countries applied a strict dichotomous categorisation of sectors into essential and non-essential ones, where the latter were formally shut down, unless they could operate remotely. Such provisions were often later relaxed to allow non-essential activities to re-open, under the condition that stringent health and safety requirements were met. From the last months of 2020, in a vast majority of countries, only a few selected sectors were officially shut down (e.g. museums, cinemas, gyms), or allowed to operate with strong limitations (e.g. restaurants and cafés).

Second, different occupations require varying degrees of physical proximity and social interaction; they are therefore subject to different levels of epidemiological risk of contagion and imply different levels of teleworkability. Jobs requiring tasks which do not necessitate physical and social interaction, and can be performed entirely from home, can be considered teleworkable, and therefore “safe” in terms of disease exposure. Conversely, occupations that require interactions can be ranked according to the physical proximity entailed in their execution and classified as more or less “unsafe” due to the different levels of the contagion risk they entail. Teleworkability can also favour business continuity even in lockdown periods, hence reducing potential risks of job disruption.

**Critical occupations**

The distinction between essential and non-essential – or, more broadly speaking, between “shut down” and “not shut down” – economic sectors is done in the literature mostly by looking at national decrees on lockdown and containment measures adopted by single countries during the COVID-19 pandemic. Most of the European studies (Fana et al., 2020; Barbieri et al., 2020) indeed refer to the lockdowns adopted in selected EU countries between March and April 2020, when the containment measures were the strictest. However, for the purposes of an EU-wide analysis, the definition of jobs in essential and non-essential economic sectors is especially chal-
lenging. First, this distinction strictly depends on containment and lockdown measures implemented in each single country, and EU-wide generalisations of national measures are hard to apply. Secondly, even when trying to apply national rules, the identification of economic sectors that were considered essential or non-essential, and hence shut down or not, was often done at a very detailed level of economic activity, which is hard to reproduce using official cross-country statistics.  

To overcome these limitations, for the purpose of the analysis presented in this paper, we identify “critical occupations” based on the categorisation provided by the Communication from the Commission on Guidelines concerning the exercise of the free movement of workers during the COVID-19 outbreak (European Commission, 2020a). This Communication defines a list of “key workers” that should be allowed to move across borders “because they exercise critical occupations by performing activities related to essential services”, which they should be able to do “without undue hindrance”. This categorisation (even though originally devised to allow cross-country mobility) provides a distinction between workers who were most likely allowed to continue working even under the strictest containment measures, and those who were not, unless working from home. Our approach is similar to the one adopted by Fasani and Mazza (2020) and OECD (2020), which also resort to the Communication to define key workers. This dichotomous variable capturing critical occupations represents the first dimension of our taxonomy.  

1 As an example, the initial identification of essential activities in Italian decrees relied on classifications of sectors as detailed as at the 5- or even 6-digit level of NACE, i.e. the Statistical classification of economic activities in the European Community. EU-LFS microdata only provide information on the economic sector of jobs at the NACE 1-digit level.  

2 It should also be noted that since March 2020, the containment measures have been subject to several changes. As mentioned above, the initial strict lockdowns implemented in most of the countries were followed by a strong relaxation of these measures; and with the second wave of the pandemic, only a few selected sectors were officially shut down or allowed to operate with strong limitations, therefore abandoning the initial distinction of essential vs non-essential jobs. Nevertheless, we think that this EU classification can help capture a relevant dimension in the occupations, not only in the first months of the pandemic.  

3 Starting from the list provided in this Communication, we identified workers exercising critical occupations as those working in the following ISCO 2- and 3-digit categories: 213 life science professionals; 214 engineering professionals (excluding electrotechnology); 215 electrotechnology engineers; 22 health professionals; 23 teaching professionals; 25 information and communications technology professionals; 31 science and engineering associate professionals; 32 health associate professionals (except 323 traditional and complementary medicine associate professionals); 35 information and communications technicians; 53 personal care workers; 61 market-oriented skilled agricultural workers; 62 market-oriented skilled forestry, fishery and hunting workers; 63 subsistence farmers, fishermen, hunters, and gatherers; 751 food processing and related trades workers; 816 food and related products machine operators; 83 drivers and mobile plant operators; 91 cleaners and helpers; 92 agricultural, forestry and fishery labourers; 93 labourers in mining, construction, manufacturing and transport; 96 refuse workers and other elementary workers.  

Teleworkability and social interaction  

The second component of our taxonomy considers the task content of occupations. Studies focusing on the features of the job to establish teleworkability, but also epidemiological risk for workers, normally rely on data sources capturing exactly this task content. Based on this information, each occupation can be classified according to different possible indices, such as physical proximity, social interaction or teleworkability.  

For this part of the analysis, we rely on the indices of technical teleworkability and social interaction developed by Sostero et al. (2020), which allow the identification of jobs that can be done from home, and with a certain level of quality. The teleworkability index identifies jobs that are technically teleworkable or not, based on the amount of physical interaction involved in a range of physical tasks.  

The complementary index of social interaction serves as a qualification of the assessment of technical teleworkability; as a matter of fact, despite the technical feasibility of carrying out a job remotely if needed, some occupations involve a high degree of social interaction; the index is based on the assumption that a higher relevance of social interaction tasks implies a lower quality of the service provided when teleworking (e.g. for teachers).  

Based on these two indices, occupations in the EU can be classified according to their level of technical teleworkability and social interaction required; this distinction allows identifying jobs that might have been more at risk of job disruption during the pandemic.  

There are a number of reasons to rely on these indicators from Sostero et al. (2020) rather than one of the many other similar classifications developed during the first months of the pandemic.  

First of all, this study has the advantage of being based on data that is specific to the European context, i.e. the Italian ICP. As mentioned above, many of the first studies on work...
from home relied on classifications based on the US O*NET (Dingel and Neiman, 2020; Basso et al., 2020; Lewandowski, 2020; European Commission, 2020b); however, the use of this source – and the subsequent international crosswalk required to analyse EU labour markets – implies the rather strong assumption that the content of occupations in the US is similar to that of European jobs. The Italian ICP, instead, might be better able to capture the structure of European occupations (Barbieri et al., 2020; Cetrulo et al., 2020).7

Second, it allows a good level of granularity, since it provides technical teleworkability and social interaction indices that are computed at the ISCO 3-digit level, which is also the maximum level of disaggregation available in EU-LFS data.8

Finally, as explained by the authors, these indices are anchored to a task framework developed for occupational analysis (Fernández-Macías and Bisello, 2020) that provides a detailed justification for the items taken into account in the ICP survey.

Data sources

We combine the critical occupations, technical teleworkability and social interaction indices to create a comprehensive classification of EU occupations, which we then apply to data from a Eurostat special extraction from the 2019 and 2020 EU-LFS. We do this by matching the categorisation of occupations to the jobs’ ISCO code available in the EU-LFS, to investigate the employment evolution of occupations based on these three characteristics of jobs. The extractions provided quarterly data, allowing for comparisons in the evolution of employment in specific categories of occupations between the same quarter of different years.

Results

Data from the EU-LFS enable an investigation into the drop in employment registered in the EU. The second quarter of 2020 was the most strongly affected by the pandemic, with widespread lockdowns implemented in several countries. After a period of relative improvement, the last quarter of the year was again severely impacted, with a second outbreak hitting many EU countries. For this reason, we analyse changes in employment for these two quarters; we also show the annual average, to summarise the impact throughout the year.

Overall, employment in the EU9 decreased by less than 3% between Q2 of 2019 and the same quarter of 2020, and by 1.2% in Q4. This relatively limited overall decrease hides considerable differences between categories of workers, and in particular between different occupational groups. Figure 1 shows the employment change by ISCO 1-digit occupations.

Between 2019 and 2020, most occupational groups saw a decline in the level of employment, both in the second and fourth quarters of the year. This is especially the case for low- and medium-skilled occupations (ISCO 4–9), with a stronger decrease in Q2 than in Q4. Elementary occupations and service and sales workers are the categories with the highest employment drops. High-skilled occupa-
Figure 2
Distribution of employment by occupational characteristics, EU27, 2019

Notes: The top panel corresponds to critical occupations and the bottom one to non-critical occupations, according to the definition provided above. Within each panel, the chart is divided into four quarters based on whether the teleworkability and social interaction indices are above or below a certain threshold. The size of the bubble represents the size of employment in the corresponding occupation in 2019. Data refer to the age group 20-64. Armed forces are not taken into account in the analysis.

Source: Authors’ calculations based on a Eurostat special extraction from EU-LFS data.

Tensions, on the other hand, did not register such a decline in employment levels; professionals even saw an increase in both Q2 and Q4, while technicians and associate professionals, after an initial drop in Q2, recovered in the fourth quarter of 2020.

Various features of occupations might explain these patterns. As mentioned above, we identify three dimensions along which occupations might differ, i.e. whether they are critical or not; their level of technical teleworkability; and the level of social interaction required by the job. The latter two indices are expressed on a scale from 0 to 1.

Figure 2 shows a picture of the distribution of employment along these dimensions in the year before the outbreak of the pandemic. Each occupation is represented by a circle whose size is proportional to the number of individuals employed in that occupation in 2019.

The top panel is clearly less densely populated than the bottom one, as few occupations can be considered critical. However, what we notice is that in both panels, many

10 For the sake of clarity, the figure shows occupations at the ISCO 2-digit level. For the purposes of this figure only, the technical teleworkability and social interaction indices, as well as the critical occupations indicator, were aggregated from the ISCO 3-digit to the 2-digit level based on the relative weight of employment in 3-digit occupations in each EU member state in 2019. This procedure is in line with the one used by Sostero et al. (2020) to aggregate from 5-digit Codici Professionali into 3-digit ISCO categories.
circles are concentrated around low values of the technical teleworkability index, suggesting that a high share of occupations cannot be performed remotely at all. This is especially true for critical occupations.

To investigate more in depth the impact of COVID-19 on labour market outcomes, we therefore show the employment evolution of occupational categories defined in terms of these dimensions. Beyond distinguishing between critical and non-critical occupation, we also apply a dichotomous definition of teleworkability and social interaction, as illustrated in Figure 2. In detail, we build on the definitions adopted by Sostero et al. (2020), where an occupation is technically teleworkable if its value of the technical teleworkability index is higher than 0.4, and the level of social interaction required in the job is low/high depending on whether the social interaction index is lower/higher than 0.5. Based on these thresholds, we transform the two continuous indices into binary variables. The two variables are then interacted to create four categories, consisting of occupations that are: (i) non-teleworkable and requiring high social interaction (health professionals; health associate professionals; care, service and sales workers); (ii) non-teleworkable, but requiring low social interaction (such as skilled agricultural, forestry and fishery workers; craft and related trade workers; plant and machine operators and assemblers; most elementary occupations); (iii) teleworkable with high social interaction (e.g., managers; teaching professionals; business, administration, legal, social and cultural professionals and associated professionals); and (iv) teleworkable with low social interaction (such as clerical support workers and ICT professionals). Within each of the above four categories, we further distinguish between critical and non-critical occupations, leading to eight categories in total.

As shown in Figure 3, teleworkability seems to be a main determinant of the employment changes during the pandemic year. While employment in non-teleworkable occupations experienced sharp decreases between 2019 and 2020, employment in teleworkable ones remained stable, and in some cases even increased. On the other hand, less clear patterns emerge for social interaction. In each of the four occupational categories identified, critical occupations registered a better performance than non-critical ones.

Critical, teleworkable occupations are indeed the ones with the most positive developments in terms of employment levels. These occupations saw an increase in employment throughout the whole year. This growth was higher for jobs requiring low social interaction (up to 10% in Q4 2020), and was mostly driven by higher levels of employment among information and communications technology professionals (such as software and applications developers and analysts as well as database and network professionals). Activities in such occupations were essential and therefore allowed to continue operating even under the strictest containment measures; moreover, they could easily be performed remotely and were likely highly requested due to the widespread use of telework during the pandemic. Critical, teleworkable jobs requiring high social interaction, on the other hand, registered only a small increase. This is likely because these occupations can be performed remotely from a technical point of view, but suffer a loss in the quality of the work done. This is the case, for example, for teaching professionals. Employment in teleworkable but non-critical occupations (such as clerical support workers) remained rather stable in 2020.

Unlike teleworkable occupations, non-teleworkable ones suffered a clear decline in employment. Within this group, the smallest decline was registered among critical occupations requiring high social interaction; these include, among others, health professionals and associate professionals (such as doctors and nurses, occupations which were at the forefront of the pandemic, and saw even a small increase in employment), childcare workers and personal care workers. The highest employment drop was experienced in non-critical occupations among the non-teleworkable ones that require high social interaction. This was the case, for instance, for sales workers, who registered a decrease close to 3% in the pandemic year, and for waiters and bartenders, who experienced a decrease of over 15%.

Figure 3
Employment change by occupational category, EU26, 2019/2020
in %

Notes: Data refer to the age group 20-64. Armed forces are not taken into account in the analysis. Germany is excluded from the analysis due to a break in the time series. The figure shows the employment change in Q2/Q4 of 2020 (and the annual average) compared to the corresponding period in 2019.

Source: Authors’ calculations based on a Eurostat special extraction from EU-LFS data.
Overall, teleworkability seems to have provided the strongest protection against job losses during the pandemic, and especially during the lockdowns. Among teleworkable occupations, critical occupations even experienced an increase in employment, especially those requiring limited social interaction. Non-teleworkable, non-critical jobs, particularly those that require high social interaction, underwent the strongest declines in employment.

Conclusions

In this paper, we show the labour market impact of the pandemic on different categories of workers in the EU. We distinguish occupations based on three main characteristics of jobs, namely (i) whether they are critical or non-critical; (ii) their level of technical teleworkability; and (iii) the level of social interaction required in the job. We show that all three dimensions are relevant to determine whether and to what extent the occupations were affected by the pandemic.

Based on 2019 and 2020 data at the EU level, our analysis contributes to showing that the impact of the COVID-19 pandemic on the labour market has been heterogeneous. While employment in non-teleworkable occupations decreased significantly, some teleworkable occupations registered a considerable increase in employment.

Among non-teleworkable occupations, the decline was less pronounced for critical jobs requiring high social interaction, such as doctors and nurses. Among teleworkable jobs, employment in critical occupations increased, especially among those requiring low social interaction (such as ICT professionals and technicians).

As highlighted in European Commission (2021), this type of evidence can help shed light on the labour market disparities exacerbated by the pandemic, hence contributing to the public debate on employment and social development issues, and on the measures that can promote the economic recovery at the EU level. Member states, as well as the EU, put forward a very strong policy response throughout 2020, offering unprecedented levels of assistance. The packages of measures implemented ranged from more accessible unemployment benefits, to expanded paid sick leave, to more widely available and more generous short-time work schemes especially for small and medium-sized firms, as well as exceptional income support measures.

Recent history has shown that additional waves of the COVID-19 pandemic and subsequent containment measures with targeted restrictions cannot yet be ruled out. Learning from the experience of the last two years, the evidence we provide in this paper can help shape the design of both social distancing restrictions and support schemes in a timely and targeted way, with the goal of limiting the damages and sustaining the categories that are more in need and more at risk of being heavily affected.

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Modern Monetary Theory: The Right Compass for Decision-Making

In the November/December 2021 issue of Intereconomics, Françoise Drumetz and Christian Pfister examine Modern Monetary Theory (MMT) and approach it from the policy consequences that would follow. This paper is a reply to Drumetz and Pfister. It restates the core of MMT and offers some suggestions for central banks. Theories are explanations of what we see, and MMT describes money creation and destruction. Hence, MMT cannot be and is not a political manifesto. In contrast to most other theories of money, MMT is falsifiable in its core statements, which are based on a balance sheet approach to macroeconomics. Since many central banks already educate the public about the creation of modern money through bank lending, it would be most welcome if they would do the same for the creation of modern money through government spending. Here, MMT and central bankers can find common ground to move forward and leave the theory of loanable funds and that of the money multiplier behind.

Teaching macroeconomics in 2022 is an interesting exercise. The textbooks usually rely on the money multiplier. They assume that the central bank lends to banks, which then lend to households and firms. This is contrasted by the announcements of practitioners, mostly central bankers and bankers. The St. Louis Fed tweeted the following statement to draw attention to Ihrig et al. (2021): “Many econ textbooks include outdated information on how Fed policy influences banks and the economy. Educators should abandon the ‘money multiplier,’ a popular model that is now obsolete”. If, however, the money multiplier is wrong, then what becomes of the discussion of banks as intermediaries, equilibrating saving and investment? The Bundesbank (2017, 17) writes: “This [the stylized example of the creation of money] refutes a popular misconception that banks act simply as intermediaries at the time of lending – i.e., that banks can only grant loans using funds placed with them previously as deposits of other custome rs”. So, macroeconomics is in need of a new theory. The textbook models have fallen apart, and a new theory of money is needed. That theory should be Modern Monetary Theory (MMT), which over the last 25 years has matured into a legitimate school.

As retold by Ehnts (2020, 293), mainstream economists do not believe that “countries that borrow in their own currency should not worry about government deficits because they can always create money to finance their debt”. Looking at the result from a survey, not a single economist agreed with that statement. If these economists had been right, we would have seen many governments running out of money in 2020 and 2021. After all, tax revenues collapsed, government spending increased and public deficits and public debts skyrocketed. Surely, the Greek government, surpassing 200% of public debt to GDP in 2021, would be in for a repeat of the euro crisis. It did not happen. As we all know by now, a government cannot run out of its own money for technical reasons. The Wall Street Journal recognises that “important elements of MMT are accepted by much of the financial establishment” and that “the lesson of 2020 was that MMT is right” because “a government need never default on
MMT started in 1996, when Warren Mosler contacted some academics. Some points made in the working paper have been omitted from this version. These points are addressed in Ehnts (2022).

MMT started in 1996, when Warren Mosler contacted some academics to discuss monetary theory. Mosler, who worked as a banker, but also constructed racing cars (and a ferry), certainly was not looking to write a political manifesto. In Mosler (1995), he thanks Arthur Laffer for “valuable literary assistance and research with this work”. In Mosler (1997), his first peer-reviewed academic journal article, he describes at length how the monetary system works and how we can use it to achieve full employment and price stability – hardly a political manifesto.

Debt issued in its own currency” (Mackintosh, 2021). In the eurozone, all national governments made their payments on time – all of them. This needs to be explained.

The recent article by Drumetz and Pfister (2021a), published first as a (longer) Banque de France working paper (Drumetz and Pfister, 2021b), could be the start of a conversation about how to reconstruct macroeconomics and narrow the deep gulf between theory and practice in both monetary theory and macroeconomics.

Mainstream macroeconomics, MMT and real MMT: Theory and the table

Drumetz and Pfister (2021a, 360) start their examination of the meaning of MMT using a table that summarises their views on both mainstream (theory) and MMT. The table (reproduced as Table 1) seems to be a good starting point for a discussion of their paper. The first column describes the issue discussed, followed by the column that summarises the mainstream view, one that summarises MMT as seen by Drumetz and Pfister (2021a) and one that summarises MMT from my own view. Apart from the issue of unemployment, I differ with the authors’ view of MMT. The reason is, I suppose, that the authors approached MMT from the wrong side. Starting with the research question of what the meaning of MMT would be (in the sense of economic policy or institutional reform), they ignored its logical core and failed to recognise the methodological differences from the mainstream approach. This would be comparable to a critique of the mainstream theory by MMT authors that would completely ignore the mathematical model at the core and just discuss the policy implications, i.e. its supposed meaning. This kind of approach implies that the theory is just intellectual hand-waving intended to justify the policy conclusions. But that is not how MMT works.

MMT is, first and foremost, a balance sheet approach to macroeconomics. At its very core lie reserve accounting, then deposit accounting, and then sectoral balances accounting. There is very little behaviour in any of this. Equilibrium rules as all balances balance – in both flows and stocks – and there are no assumptions apart from the existence of a central bank, a Treasury, a banking system and some households and firms. MMT can only be learned by mastering its balance sheet approach. It can only be engaged by discussing the balance sheet operations it puts forward. It is here where value is added. Therefore, I suggest looking at some of these explanations in more detail.

First of all, the main insight of MMT is that the mainstream has the sequence wrong. Whereas they assume that government expenditure is financed by taxes (Table 1, row 1), MMT assumes that government spending is financed by money creation. MMT stresses that the central bank, empowered by the law and serving the state, is the monopoly issuer of currency. In the eurozone, this would be the European Central Bank (ECB) and the national central banks. This logically means that the state has to spend before taxes can be paid in euro. When taxpayers pay their taxes (or banks buy government bonds on the primary market), they first need to have state money. “As the sole issuer of euro-denominated central bank money, the Eurosystem will always be able to generate additional liquidity as needed”, ECB president Lagarde said according to Reuters (2020). As Kelton (2000) argues, issuers of currency finance their spending by creating money when they spend and cannot do otherwise.

When the ECB buys government bonds or other financial assets in the context of its quantitative easing or its asset purchase programmes, it “increases the price of these bonds and creates money in the banking system”, as the ECB (2021) explains on its webpages. With “money” the ECB means “central bank deposits”, also called reserves, since it pays with electronic money and not cash. This process is well understood. In an interview with 60 Minutes, former Federal Reserve Chair Ben Bernanke (2009), was asked where the money the Fed lends would come from. “It’s not tax money,” Bernanke said, “The banks have accounts with the Fed, much the same

6 The explanations of mainstream economists seem unconvincing. Krugman (2021), for instance, writes: “But is the Fed really financing the budget deficit? Not really. At a fundamental level, households are financing the deficit: the funds being borrowed by the government are coming out of the huge savings undertaken by families saving much of their income in an environment where much of their usual consumption hasn’t felt safe.” The problem with this is that obviously the Fed does not borrow household savings (or rather saving since this is about flows). It sells sovereign securities to banks only.

7 Some points made in the working paper have been omitted from this version. These points are addressed in Ehnts (2022).

8 MMT started in 1996, when Warren Mosler contacted some academicians to discuss monetary theory. Mosler, who worked as a banker, but also constructed racing cars (and a ferry), certainly was not looking to write a political manifesto. In Mosler (1995), he thanks Arthur Laffer for “valuable literary assistance and research with this work”. In Mosler (1997), his first peer-reviewed academic journal article, he describes at length how the monetary system works and how we can use it to achieve full employment and price stability – hardly a political manifesto.

9 It is not a coincidence that his view was used by Margaret Thatcher, who claimed that there would only be taxpayers’ money and no public money. The opposite is true, but most macroeconomic textbooks do not reflect that.

10 In their abstract, Drumetz and Pfister (2021) point out that MMT would have gained prominence “in the media and in the public”. In 2019, Mario Draghi reportedly said that “the ECB should examine new ideas like MMT” (Bloomberg, 2019a) while Christine Lagarde said that “MMT is no panacea but may help fight deflation” (Bloomberg, 2019b). John Yarmouth, chair of the House Budget Committee, defended the Biden administration’s policy in terms of MMT, as the New York Times’ (2021) Peter Coy notes.

11 See Tymoigne (2014) for further details on interactions between the Treasury and the Federal Reserve Bank.
way that you have an account in a commercial bank. So, to lend to a bank, we simply use the computer to mark up the size of the account that they have at the Fed.” These are the changes in the respective balance sheets when the Fed extends a loan to a bank that has enough collateral.

It is obvious who is the issuer of currency and who is the user of currency. The Fed creates reserves when it spends or lends. Reserves are created by the computer software that the Fed runs – the payment system. The central bank is the score keeper of its society. This is just how commercial banks work. These create bank deposits when lending, which are destroyed at repayment (McLeay et al., 2014).

To understand questions concerning public debt and fiscal sustainability, we need to look at the way a national (federal) government spends. It is at the level of balance sheets, which are descriptions of reality, that we can expect to find an answer. The following description of the federal government of Germany spending €100 is based on Ehnts (2016, 119). We assume that the day has just started and that the Treasury account of the federal government of Germany (Zentralkonto des Bundes) stands at zero. The Treasury now instructs the German central bank to execute a payment of €100 to a household, who has supplied the Treasury with goods and services. The Bundesbank accordingly credits the account of the seller’s bank, which then credits the account of the seller. At the same time, forced by its rules of operation, the Bundesbank debits the Treasury account. Table 2 shows what the balance sheets look like.

If this is how a federal government spends in the eurozone, there is no possibility that it can “finance” its spending. Its central bank always creates new reserves when it spends on behalf of the government. It cannot spend tax revenues or bond revenues. As the name implies (from French revenir, to come back), when taxes or bonds are paid, the government’s money comes back (revenue) to the government. There is one complication, though. In the eurozone, central banks are not allowed to finance their governments. This is why at the end of the day the Treas-

12 See Armstrong and Mosler (2019).

13 A more recent version can be found in Ehnts (2020a).
The balance in the Treasury account is not money, as the Bundesbank itself notes. It is a number that matters for operational reasons. The Bundesbank can only spend for and on behalf of the Treasury if at the start of the day the Treasury’s account is non-negative. Tax and bond revenues are not about financing, but about creating a green traffic light for the Bundesbank. This is a political complication that other monetary systems do not have. So, in the eurozone a national (federal) government cannot run out of money as long as:

1. tax revenues are high enough to bring the Treasury account back to zero or
2. bond revenues are high enough to bring the Treasury account back to zero or
3. tax and bond revenues together are high enough to bring the Treasury account back to zero.

This means that a eurozone national government does not run out of money until it has exhausted its tax revenues and bond revenues. It would only run out of money due to political reasons that are hardwired into the laws of the European Union, not because its central bank cannot create more euros. MMT sees the purchase of government bonds by the central bank as an asset swap. Government bonds purchased by the ECB, for instance, are not paid off. Government access to central bank financing in the eurozone is therefore limited (Table 1, row 4), at least with the standard rules in place. Since 2020, the general escape clause of the Stability and Growth Pact has been activated and the ECB has initiated its pandemic emergency purchase programme (PEPP), ensuring enough demand for government bonds so that investors perceive them as risk-free. This means that the national governments are free to spend what they think appropriate until the escape clause is deactivated. Public debt sustainability is a political, not an economic issue (Table 1, row 2). This is most clearly visible when looking at Greece, which had a public debt-to-GDP ratio of 130% in the early 2010s when it ran out of money, but has been doing well in 2021 with a public debt-to-GDP ratio of more than 200%.

Public debt equals the money that a government has spent and not yet collected back in taxes. This is something fundamentally different from a private borrower with debt. The private borrower would have to make a payment to rid herself of debt. The government cannot do that — its payments cause the public debt. Actually, taxpayers would have to make payments in order for public debt to come down towards zero. Therefore, government bonds held by the central bank or households do not constitute a debt that has to be redeemed by the government.

**Mainstream, MMT and real MMT: Economic policy and the table**

Drumetz and Pfister (2021a, 357) correctly describe the MMT view on crowding out:

The crowding-out effect on private spending does not exist in MMT because expansionary fiscal policy is supposed to lower interest rates by providing liquidity to banks rather than raising them by crowding-out the private demand for debt financing.
Most central banks intervene in the money market automatically to ensure that the interest rate does not fall (rise) when the government spends (receives tax revenue). This means that there is no financial crowding-out – the government spends reserves that are created anew (and not taken from some pre-existing pot of savings, like the loanable funds theory implies) and the interest rate does not change.17 This, however, does not mean that government spending could not potentially crowd out private spending. If a federal government takes over a part of the organisation of an economy, say health care provision or public education, then obviously private sector firms would be crowded out. MMT does not say that the government is better (more efficient or more effective) than the private sector. MMT simply highlights the fact that resources used for social welfare have opportunity costs since they are not available for alternative private (or public) sector uses (Table 1, row 14).

MMT helps us to understand what the monetary system is. It is in place so that the government can provide itself with the resources and workers it needs to do its job, which is to fulfill its public purpose (Ehnts and Höfgen, 2019). It is important to note that the government can only buy what its citizens are willing and able to sell. This means that a government should be interested in having an educated and productive workforce with plenty of skills providing the government with a higher output (Table 1, row 13). Whether those with higher skills also (do or should) receive a higher income is an empirical question and cannot be answered by MMT. The goal of the economy is to provide us with the goods and services that we need. Public purpose can be served by the private sector as well as the public sector.

Another mainstream view is that the economy should be competitive (Table 1, row 12). From a MMT perspective, this is mistaken. The economy should be targeting full employment and price stability. A competitive economy might provide these, but rather by chance and not through macro-economic policy. If a competitive economy is one in which exports are higher than imports, then the most competitive economy that we can think of is one in which all value added is exported. This means that wages and domestic consumption are zero and all of national income is in the hands of capital owners – hardly a promising target for a modern society. The way this undesirable situation would be achieved is through falling wages (given some exchange rate). The further wages fall, the higher net exports will rise. This used to be called mercantilist policy or beggar-thy-

17 This challenges the concept of monetary and fiscal dominance. The central bank can set and control the interest rate and at the same time execute the government’s payments, as Fullwiler (2020) shows. Any interest rate the central bank sets is compatible with any level of public debt to GDP.

18 MMT recognises that higher interest rates on Treasury bonds increase aggregate demand.

So, what about macroeconomic policy? In mainstream economics, monetary policy has a role to play to stabilise the economy (Table 1, row 7). It is assumed that an increase (decrease) of the central bank’s main interest rate will lead to a decrease (increase) in private investment. This view has lost its credibility after almost a decade of zero and negative interest rates and lacklustre private investment. MMT and the mainstream agree that an increase of the interest rate might, after some time lag, cause a collapse in private investment that is big enough to bring down wage growth and, with it, inflation. However, almost nobody believes that a fall in the interest rate would bring about a recovery with rising private investment. MMT recognises that changes in aggregate demand matter for private investment. The Biden administration’s actions are consistent with this view. Government spending creates, dollar for dollar, private sector income. If firms need to invest before they can sell to the government, then they will do it as long as expected positive profits result. The nominal interest rate is of secondary importance, if at all.

The mainstream view is that the interest rate is and should be the main policy instrument of monetary policy. MMT disagrees. Fighting inflation by creating unemployment through a rise in the interest rate might work, but in the long run it is a socially damaging policy. After four decades, this kind of monetary policy has left most of the Western economies, and the eurozone especially, with high rates of unemployment and high levels of inequality. The eurozone’s rate of unemployment has never been below 7%, which is high compared to other developed countries. Given existing technology, working hours and physical capital, a consistent lack of government spending has caused aggregate demand to fall short of what is required for full employment. Mario Draghi, who understands this, has called for more expansionary fiscal policy over his whole reign as ECB president. Monetary policy should support fiscal policy in finding the right level of spending that is consistent with full employment (Table 1, row 7). This means that the ECB should guarantee the national government’s liquidity and solvency at all times. Only then can we expect that macroeconomic mindset of policymakers to shift from the austerity mode to a European New Deal mode. With regard to the interest rate, it might make sense to leave it at zero to ensure that nobody earns risk-free rewards or to set it at 2% in order to support the inflation target of the same size.18

The question of whether interest rates are set by the central bank or the market has become clearer in the last few years. If the central bank wants, it can steer the overnight
interest rate and all other interest rates (yields) along the yield curve for government bonds (Mosler and Armstrong, 2019). Japan, while not following Modern Monetary Theory as Wray and Nersisyan (2021) point out, has shown that it is possible to directly target bond yields. This means that markets set interest rates (yields) only to the extent that the central bank lets them (Table 1, row 8).

History has shown that full employment and price stability are compatible. They are not at the opposite ends of a trade-off, as the Phillips curve implies. In many Western European countries, we had both full employment and price stability in the 1960s. Between 1961 and 1966, the German unemployment rate was below 1% for five consecutive years, with inflation rates between 2.4% and 3.3%.

According to MMT, both price level and changes in the price level are mostly driven by the behaviour of the state. Due to the monopoly on currency that it enjoys, the state is the only actor in the economic sphere that can pay whatever wages or prices it pleases (Levey, 2021), which sets the price level. When the state pays different prices, the price level changes. This also explains what happens in hyperinflation. The governments of Weimar Germany in the early 1920s and those of Zimbabwe and Venezuela paid higher and higher prices to public employees and also paid more for the currencies, goods and services they procured (Armstrong and Mosler, 2020).

Figure 1 shows the empirical relationship between wages and salaries paid by the US government; it is much tighter than those between monetary aggregates and inflation. Bobeica et al. (2019) in an ECB working paper also find that “labor cost increases will be passed on to prices”. Nevertheless, MMT does not deny that there are other influences on prices as well. For instance, a rising oil price can drive up the price level if the rising energy costs are passed on to consumers. Also, monopolistic competition can drive up prices in areas like education and health care. Alternatively, inflation can arise if there is a lack of workers in any given area of the economy, driving up wages there. All of this means that inflation is a symptom of changes in society and not always a “monetary phenomenon” (Table 1, row 9).

An understanding that inflation is not caused by tight labour markets infers that full employment and price stability are possible (Table 1, row 10). Aggregate spending in the economy determines aggregate output, which – given working hours, technology and capital – determines employment. If private spending is not high enough to reach full employment, it is the task of the government to increase spending. After all, it is the tax liabilities that the government imposes that forces people to look for paid work. Since the government cannot know the future, it is impossible to fine-tune fiscal policy so that full employment results at all times. That is why MMT has suggested the addition of the Job Guarantee (Tcherneva, 2020). In this way, those who can work and want to work always have the option to take on a Job Guarantee job, which would eliminate involuntary unemployment and act as a macroeconomic stabiliser.

The assessment of conventional structural policies from a MMT perspective is open (Table 1, row 11). If conventional structural policies mean imposing hardship on those earning their income mostly through work, there is no reason why this should be a preferred policy. MMT recognises that managing the supply side of the economy and labour relations is important for total productivity and allocation. There is nothing wrong with allocation by the private sector per se. If, however, the results indicate a sub-optimal allocation, then the government should not hesitate to change the rules of the game. This is most important in the context of a Green New Deal (Nersisyan and Wray, 2019).20

Conclusion

Drumetz and Pfister (2021a, 2021b) should be lauded for their intent to engage with MMT. As expected, a cultural shock resulted, as MMT is a falsifiable empirical monetary theory that sets out to explain the real world whereas the mainstream theory sets out from model assumptions and

19 Theoretically, a change in tax rates works as well, but not if it reduces taxes mostly for the rich who then save the additional income.

20 Drumetz and Pfister (2021a, 2021b) make some more points that are worthy of comment which I address in Ehnts (2022).
then moves to the real world. It was the intent of this reply to correct the image of MMT that the authors built up and that is reflected in their Table 1 (also Table 1 of this paper). I have argued that before discussing the macroeconomic implications of MMT (what Drumetz and Pfister call the "meaning") we need to get the balance sheets right. MMT starts with the logic of the payment system (reserve accounting) and then moves on to sectoral balances. Therefore, it provides a discussion of the micro-structure that is absent in most of mainstream macroeconomics. It is at this level that the debate of MMT should start, leaving the question of what to do in terms of macroeconomic policy for later.

Drumetz and Pfister are invited to reply to this paper by engaging with the claims made here. As Table 1 shows, I think that their representation of MMT is flawed and therefore their judgement of MMT is unreliable. To make some progress, I would ask the authors to explain in balance sheets how the French federal government actually spends and/or to refute my balance sheets for the German case. I believe my balance sheet structure shows clearly that the German Bundesbank is a currency issuer and that it creates new reserves every time the German federal government spends. If that is the case everywhere in the eurozone, this would mean that the ECB could solve any problem of fiscal sustainability by making the PEPP permanent, as argued by Ehnts and Paetz (2021). The question of how much governments are allowed to spend is divorced from this issue.

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Will Economic Pressures Weaken Putin’s Position?

Obviously, the West should have been much tougher on Russia earlier. In his speech in Munich in February 2007, Russia’s President Vladimir Putin effectively declared war on the West, but he was greeted with thunderous applause. At the NATO summit in April 2008, he claimed that Ukraine is not a state, and he followed up with a war in Georgia in August 2008. Alas, neither the United States nor the European Union imposed any sanctions on Russia. Putin understood that the West was weak and he could continue his aggression.

In February 2014, Putin seized Crimea from Ukraine in an almost bloodless occupation and annexed it to Russia. The united West imposed sanctions on officials directly involved and companies dealing with Crimea. In addition, the US sanctioned Putin’s four main cronies – Yuri Kovalchuk, Arkady and Boris Rotenberg, and Gennady Timchenko, dubious businessmen from St. Petersburg. The EU, however, did not sanction Boris Rotenberg and Gennady Timchenko, because they are Finnish citizens. Only now, the EU has sanctioned Timchenko, but not yet Boris Rotenberg.

In April 2014, Putin called for half of Ukraine to be taken over by Russia as “Novorossiya” (New Russia), drawing on the imperialism of Catherine the Great. Russian special forces tried to whip up Russian separatism in southern and eastern Ukraine, but they had limited success in the east of the Donetsk and Luhansk regions. In July 2014, Ukrainian armed forces advanced against the separatists. Russia reacted with substantial force. The US responded by imposing sectoral sanctions against financing, oil technology and defense technology. The next day, a Russian missile shot down a Malaysian airplane and all 298 people on board died. Two-thirds of the passengers were Dutch. Two weeks later, the EU imposed sanctions similar to those of the Americans. In early September, the Russian offensive stopped, presumably due to a great extent to Western sanctions.

Nearly eight years of low-intensity war followed. Pro-Russians thought the EU would ease sanctions that had to be renewed every half year, but the sanctions remained. Both the US and the EU carried out minor sanction maintenance, but little changed. Repeatedly, politicians and officials discussed new “sanctions from hell” in public, but little happened, which undermined the credibility of the threat. The EU tended to be divided with a handful of countries calling for fewer sanctions or more exceptions, but ultimately the sanctions were always prolonged. Nobody wanted to break the consensus, and the two dominant countries, Germany and France, held firm.

Early on, the International Monetary Fund assessed the cost of the Western sanctions on Russia at 1%-1.5% of GDP each year, and Russia’s economy did not grow at all from 2014 to 2020. Together with Maria Snegovaya, we have assessed a more likely cost of 2.5% of GDP each year. The Russian government and its banks, on the contrary, claimed that the sanctions cost little or were even good for Russia, which was probably Putin’s view.

After Putin’s aggression against Ukraine in 2014, the West should have armed Ukraine as much as possible, but President Barack Obama thought that sending defensive weapons to Ukraine would be provocative to Russia. During his tenure, President Donald Trump approved the deliv-
ery of lethal weapons to Ukraine, but in 2019 he tried to blackmail President Volodymyr Zelensky to provide him with false evidence against Joe Biden’s son.

With the election of Biden as US president, the floodgates of US arms deliveries have been opened. A few European countries also provided weapons, but only after Russia launched a full-scale invasion of Ukraine on February 24, 2022, did almost all EU countries begin delivering serious arms to Ukraine.

In April 2021, Russia started assembling vast troops around Ukraine, and on July 12, Putin published a long article, insisting that Ukraine was not a state. This resembled a declaration of war, although the timing was unclear. In November 2021, the US started providing the world with extensive intelligence about Russia’s war plans against Ukraine to convince its allies that this was serious.

A broad, new Western consensus arose: If Russia really invaded Ukraine, the West would impose far greater sanctions than ever before. Alas, the Kremlin did not take these threats seriously, because they had heard of “sanctions from hell” so many times before, but nothing happened. It would have been better to impose substantial sanctions earlier to clarify that the collective West was serious.

Nord Stream 2 was particularly demoralizing. In the spring of 2021, the Biden administration refused to sanction the pipeline contrary to adopted law and in July, it agreed with Germany to continue construction. Chancellor Olaf Scholz only stopped the pipeline after Russia started the invasion. This US-German agreement seriously undermined the credibility of the West.

Putin’s full-scale war against Ukraine shocked Europe. Suddenly, the EU was united and agreed on far more serious sanctions than had been discussed before. The two main new financial sanctions were the freezing of Russia’s central bank reserves and the disconnection of major Russian banks from the SWIFT messaging system. Suddenly, Russia was nearly excluded from the global financial system. The ruble and the stock market plummeted.

The US introduced strict export control on about half of its technology exports to Russia, but a popular movement of civil activists, consumers, shareholders and trade unions is prohibiting most Western companies from dealing with Russia in any way. All air traffic between Russia and the EU has ceased. Russia is swiftly becoming completely isolated.

Two big issues remain, Russia’s export of oil and gas, and shipping. The US has decided to stop all energy imports from Russia, and many buyers now refuse to buy Russian oil. The International Energy Agency expects that Russian oil exports will fall by three million barrels a day in April, almost half of Russia’s oil exports. However, Russian shipping has not been sanctioned as such, even if the UK has sanctioned the main Russian state shipping company Sovcomflot. The whole of Russian shipping should be sanctioned.

The aim of Western sanctions on Russia is no longer deterrence, and not really punishments, but cripple the Russian economy so severely that Putin no longer can pursue his international wars. The Western sanctions against Russia are now more severe than those on Iran. They amount to nearly complete isolation, further aggravated by Putin’s increased state control. The exchange rate of the ruble has fallen by 30%-40% and is now regulated. The ruble is no longer convertible. Inflation is bound to skyrocket with the ruble depreciation. The big unknown is how much the absence of imports will reduce production, but a decline of GDP of 20% would appear reasonable.

The collective West should have reacted earlier and issued more credible threats, but now the sanctions on Russia are truly severe and the West is more united than ever. Further sanctions appear nearly self-reproducing.
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