Discussion Note NBS

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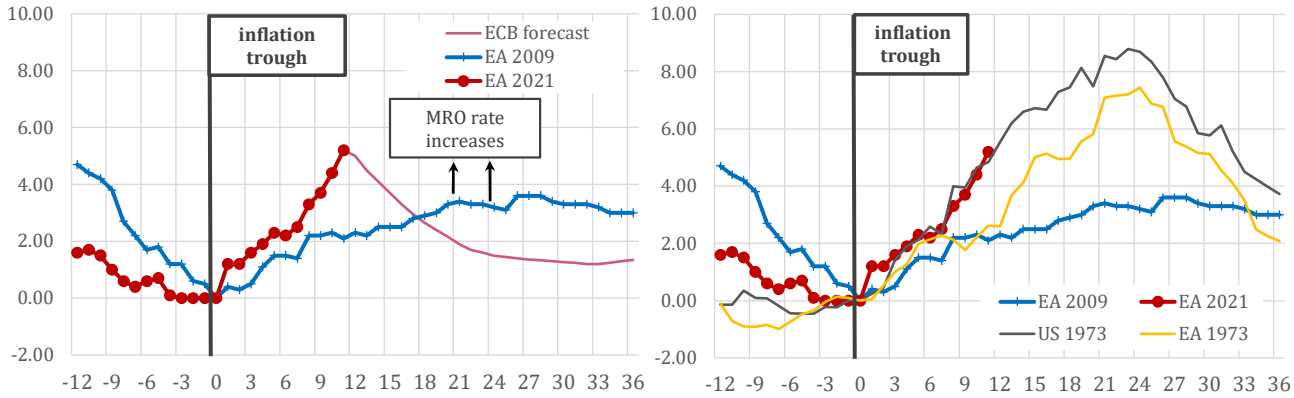
EUROSYSTÉM

How to avoid inflation in the long run

Inflationary pressures in the developed economies have gained strength. Most central banks assert that current inflation is exclusively driven by short run factors and will securely return below the policy target in the medium term. However, if such reversal takes too long, the anchoring of inflation expectations could be compromised by secondary effects from the labour market. In the medium to long run, other inflationary sources may also arise from structural changes resulting from ageing, global decline of the labour force, disruptive effects of green transformation or from excessive debt and inefficient effort of fiscal consolidation. Eventually, resorting to well communicated and coordinated commitment of fiscal and monetary policy might be the best solution.

Inflationary pressures have been present in most of the advanced economies for most of 2021. Their driving factors are highly unusual, and we do not have sufficient experience to respond to their combination. Inflation is forecast to moderate close to the target by the end of 2022, but the uncertainty of this outlook is greater than usual. Traditional demand-driven recovery has been stronger thanks to the pandemic support programmes and accumulated savings of households and corporations. The combined growth of commodity prices (energies, metals, and minerals) is more robust than ever before, and the supply of industrial goods does not adjust quickly enough following pandemic outages. Synergy of these two plots accelerates short-term inflationary dynamics that may trigger secondary effects on the labour market.

Figure 1a and 1b: Path of inflation



Source: Eurostat, ECB and own computation.

Note: Horizontal axis represents inflation since its trough (centred to zero), before its later acceleration. ECB forecast dates to December 2021. EA2009 episode represents the recovery after the GFC, US1973 and EA1973 episodes illustrate the supply driven inflation after the first oil shock in the early 1970s.

Most of the identified inflationary pressures in the euro area are still of a short-term nature. (commodity and energy prices, base effect of the temporary VAT reduction in Germany in 2020, changing geopolitical landscape and missing out on production capacities of some highly demanded components). However, the firm anchoring of inflation expectations and clear communication of monetary policy objectives are what matter in the longer run. Therefore, despite stronger inflation dynamics compared to the recovery of 2009 (5.2 bp in 12 months compared to 3.6 bp in 24 months,

Figure 1a), it is generally expected that short term effects will fade away and mid-term inflation expectations will take inflation down under the level of the symmetric target of 2%.

The current presence of supply shocks and inflationary pressures points to a historical parallel with the early 1970s, uppermost featuring similar inflationary dynamics (Figure 1b).[1] Steep inflationary dynamics in that historical episode however related to a general lack of confidence in the ability of monetary policy to tame inflation, underestimation of the effect of longer-term inflation expectations and favouring a focus on trend inflation using excess money supply (Goodfriend, 2007). Drawing a lesson, we are now more aware of how important well anchored inflation expectations and the clearly formulated commitment of future monetary policy are.

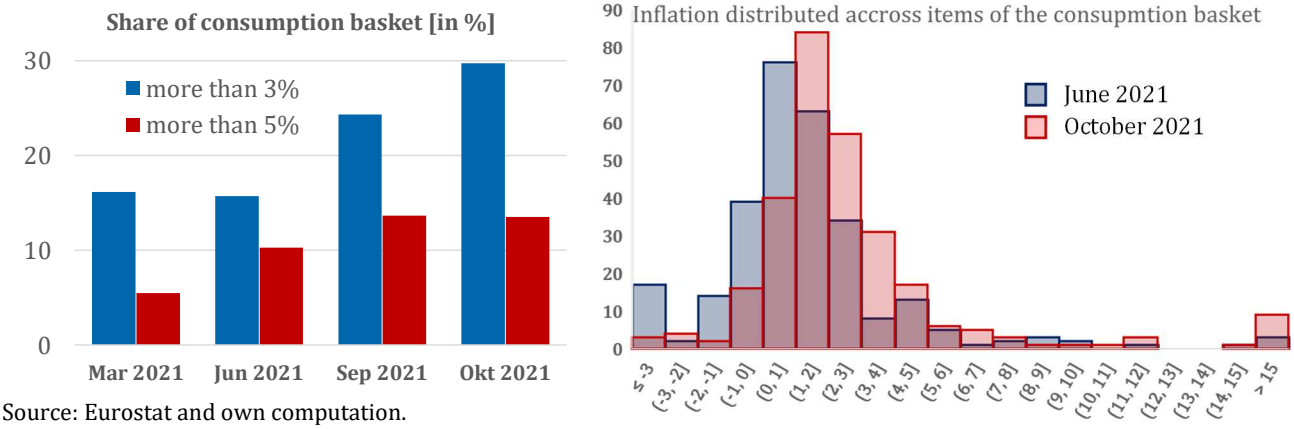
Inflationary dynamics, the extent of contagion and short-term inflationary pressures are easy to measure. On the other hand, longer term factors of inflation are complex, and our understanding of their size and intensity is rather limited. Often, we can only express their occurrence and impact with a certain rate of probability. Their cautious interpretation is therefore necessary.

The aim of this note is to identify short-term and longer-term factors which may affect inflation in the years to come and to review eventual risks they may create. A subsequent shift of average inflation upwards could inaugurate a new economic environment - a new regime, where excessively indebted private and public sectors, modified structure of assets and liabilities or income and wealth distribution may play a role in the monetary policy response.

Short-term view (prices, labour market, households, inequalities)

Expectations about inflation falling under 2% arise from the fact that more than half of the contribution consisted of energy prices and another fifth was industrial goods in October and November. Prices of the latter were rising due to strong recovery of demand and too slow onset and adjustment of supply. [2] Furthermore , only limited classes of goods were subject to higher inflation – only 13% of the consumption basket exceeded 5% inflation while the headline was 4.1% in October (Figure 2a).

Figure 2a and 2b: Expansion of HICP inflation across the consumption basket items



Source: Eurostat and own computation.

Notes: We are using 5-digit COICOP classification (250 items). Lefthand chart accounts for weights of individual items in the consumption basket. Righthand chart illustrates frequency of consumption basket annual inflation broken down to 1pp bands.

Prices of goods are more flexible than in the past and inflation tends to expand also to more stable components of the consumption basket. More flexibility mainly of the non-energy industrial

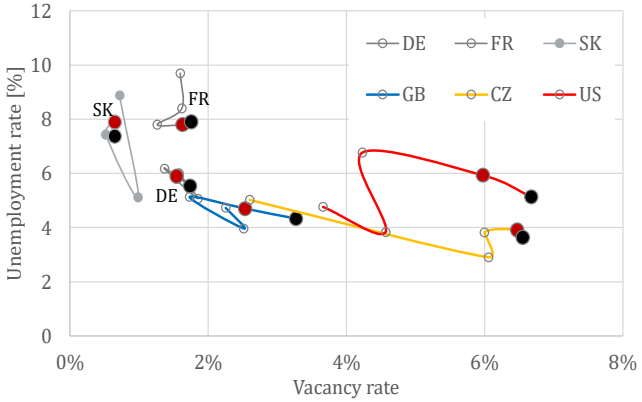
[1] A very similar path of double-digit inflation was presented by IMF as an extreme case scenario of persistent commodity shocks and adaptive inflation expectations (IMF WEO, 2021).

[2] After subtracting these effects and those of German VAT adjustment, headline inflation would stand at only 1.2% instead of 4.1% in October.

durable goods prices (NEIG) were identified by Eurosystem PRISMA research network (Gautier et al. 2021). This specific sector is the most affected by contemporary supply constrained inflation. The most stable core inflation indices (e.g., sticky-price index or trimmed-mean index) capable of explaining future inflation are currently at their highest levels.[3] Most of the goods are however still in the area of low inflation (below 2%) and distribution of the consumption basket is strongly skewed to the right (Figure 2b).

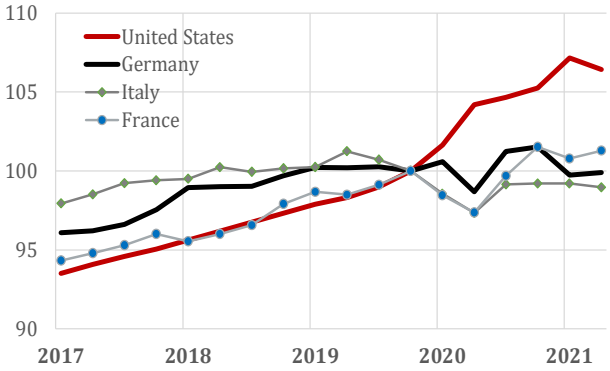
Labour market developments also confirm the transitory character of inflation. No significant pressures could be detected in euro area countries at the end of 2021. It could be portrayed on the Beveridge curve, a scatter plot relationship between rate of unemployment and rate of vacancies. While euro area countries' labour markets seem not to be so tight, movement along the curve is much more visible in the Czech Republic, where the central bank has begun the monetary policy tightening cycle rather swiftly and, in the U.S., where a faster pace of tapering is being discussed (Figure 3). Despite some countries wage developments being quite tightly indexed to inflation (e.g., Belgium) or strong labour unions being present (e.g., France), a direct effect on wages cannot be yet identified.

Figure 3: Labour market tightness (Beveridge curve)



Source: Macrobond a own computation.
Note: Individual points of scatter plot represent periods 16Q4, 18Q4, 20Q4, 21Q2 in red and 21Q3 in black.

Figure 4: Disposable income of households



Source: Dallas Fed and own computation.
Note: 2019Q4 = 100

Some negative shifts in labour supply are indeed present, however they still seem to be temporary. Part of the disposable labour supply is constrained by pandemic measures and part of the workforce have not returned to their former jobs. In most countries, households have received either direct compensation or indirect support through employment protection. Funds distributed in the U.S. were predominantly directed to corporations, in the euro area these were mainly employment protection schemes and direct subsidies to vulnerable households.[4] In times of recovery, given the economic structure, both alternatives strongly encourage consumer demand.

Besides the programmes, an extra mile in favour of even stronger consumer demand in the U.S. has been steeper growth of disposable income of households (Figure 4)**, which is mainly driven by different asset structure. A** higher share of income deriving from financial assets provided U.S. households on average with higher purchasing power. On the other hand, more income and wealth

[3] Gomez-Pineda et al. (2021) point to unusual growth of traditionally stable components of prices in 2021 and their information content of core inflation measures for future inflation. Andrle et al (2013) then pioneer in documenting the information value of core inflation (specifically trimmed mean inflation) in the Phillips curve.
[4] Effect of the support schemes to the labour demand or supply depend on the programme design. Programmes that are typically directed to households as compensation tend to stimulate more consumption and undermine incentive to work. Overall private sector compensation in the U.S. was about the same size as in Germany in 2020 (approximately 9000 USD per capita), but the structure was much more in favour of households in Europe (IMF. 2021b).

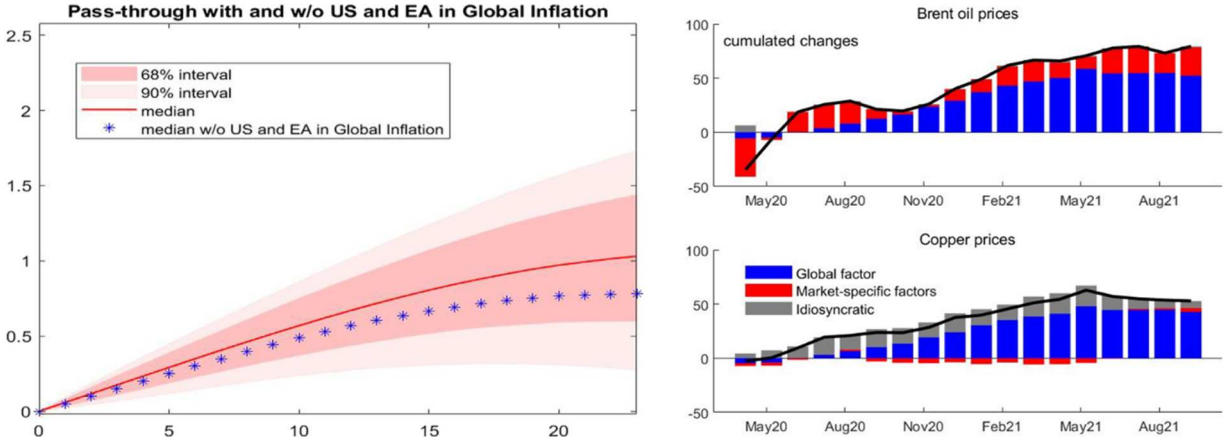
inequality constrain consumption of lower and medium income households in the U.S. to a larger extent than in Europe, where households have taken advantage of employment guarantee schemes. However, financially strong corporations also sufficiently add to the demand pressures of the U.S. private sector. Their strong labour demand and limited post-pandemic labour supply generate stronger wage pressures in specific sectors and professions.

Countries with higher income and wealth inequality are thus subject to a stronger short-term boost in demand, while they also face long-term demand constraints that curb economic growth. Growing income and wealth inequality stimulates further flow of capital from debtors to savers. Debtors increase their indebtedness, and this trend constrains consumer spending of lower and medium income indebted households. These constrained debtors together with savers who defer their consumption then tie down aggregate demand and consequently compress the natural interest rate.

If inequalities continue to rise, private sector demand and labour productivity growth may remain muted in the long run, which could provide some extra space for higher risk premia. Lower growth and higher inflation in the medium term has a capacity to reduce inequalities and help redistribute resources from savers back to debtors. The risk of stagflation may also be reduced by higher rates of wealth taxes, higher public investment into education, research, and health care. These structural issues would also be inflationary; however, they would support demand in the longer term and improve international competitiveness.

We have shortly documented different sizes and sources of short-term inflationary pressures between the U.S. and euro area. Inflation today however is a global phenomenon. There are several channels through which financial markets are capable of transmitting inflation expectations. Well documented are spillovers through intensively traded financial instruments[5] (Figure 5a) or through global co-movement of commodity prices that otherwise have no common denominator[6] (Figure 5b). In addition, newly reviewed monetary policy strategies of the ECB and Fed[7] allow us to accept more inflationary pressures before resorting to a tightening cycle of monetary policy.

Figure 5a and 5b: Common factor of global price movements



Source: Ciccarelli and Garcia (2021), Delle Chiaie et al. (2021).

Note: Chart 5a) U.S. inflation effect on global inflation in time. Red line represents median inflation, blue is median inflation without the U.S. and euro area. Chart 5b) Global component is the dominant factor of price movements (blue columns).

[5] Ciccarelli and Garcia (2021) use interest swaps as a medium to portray the global character of inflation expectation.

[6] Delle Chiaie et al. (2021) find that the global demand factor pulls commodity prices that would otherwise have no common underlying fundamentals, e.g., oil, timber, wheat, precious metals.

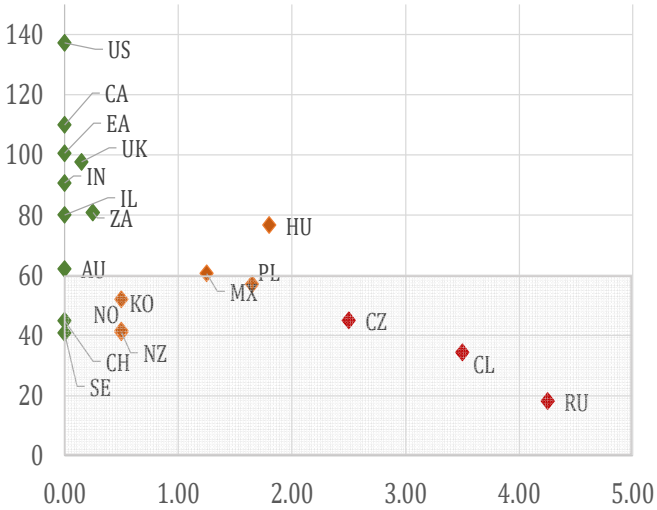
[7] Average Inflation Targeting (AIT) allows the Fed to consider a longer low inflation period in the past. Symmetric inflation target of the ECB allows overlooking of higher realized inflation in the short run if inflation expectations in the policy horizon are below the target level.

Long-run trends (indebtedness, green transformation, ageing, demographics)

As shown earlier, looser anchoring of inflation expectations in one global economy may spill over to the rest of the world. More than 50 years ago, when the majority of developed economies were looking for a way out from double-digit inflation, the problem was resolved by vigorous changes in the fiscal and monetary policy paradigm, i.e., by significant cuts to direct taxes and exceptionally tight monetary policy.

Tight monetary policy in the environment of high public debt is challenging and for countries with very high debt, such as Italy or Greece, fiscal sustainability would be very complicated. In the case of a significant increase in the costs of financing, the commitment of fiscal consolidation is essential for economically and socially vulnerable countries.

Figure 6: Debt constraint of monetary policy



Source: Macrobond and own computation.
Note: Monetary policy tightening in 2021 is on the horizontal axis and public debt to GDP on the vertical axis.

Countries with a higher debt to GDP ratio seem to be more cautious in monetary policy tightening. A number of central banks around the world started their tightening cycle in 2021 (Annex, Figure A1). Overall, these were generally economies with lower public debt. Although observations are scarce, there seems to be some relationship between the amount of tightening in 2021 and their public debt to GDP (Figure 6).

In the environment of higher public debt, the central bank decides between the range of tolerance towards inflation and higher debt service of domestic government, securities of which it has purchased. However, the latter alternative is also subject to the higher probability of elevated inflation since a higher risk premium will stimulate higher inflation expectations.[8]

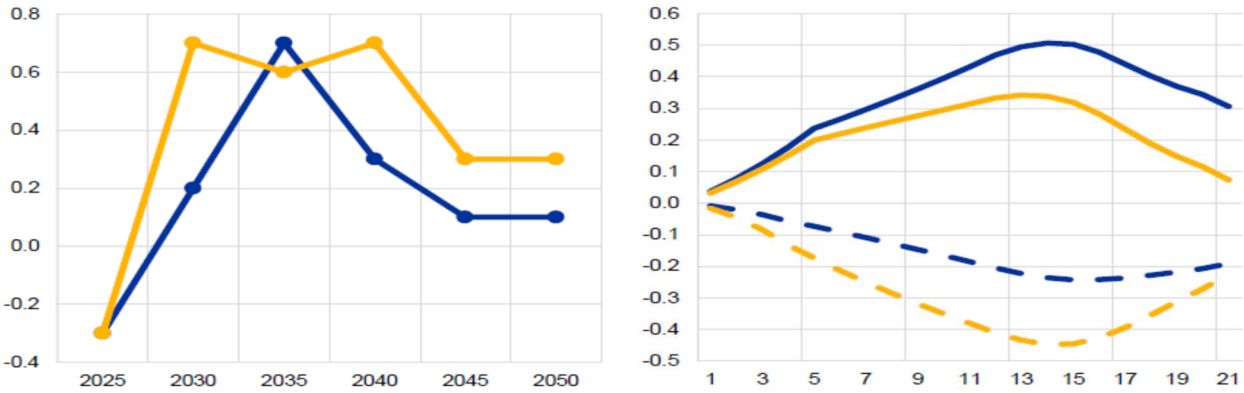
Climate costs as well as long-term costs of green transformation could also turn out to be inflationary and therefore their timing is rather unfortunate. On the one hand, global warming may affect the prices of food and energy in the long-run and sudden shocks from extreme events may increase their volatility. On the other hand, global solutions require changes in long-term consumer behaviour and the onset of new technology and innovative procedures may also have a disruptive effect on prices. Both alternatives are therefore subject to long-term inflationary pressures that may materialize in the further growth of energy prices, costs of materials, or carbon prices that producers will need to incorporate into the costs of reducing carbon emissions.

Besides postponing climate commitments, carbon price revisions and negative shocks to productivity are the main risks of disruptive transformation that could significantly weigh on inflation in the long run. Due to lower economic activity, disruptive transformation should reduce inflationary pressure in the short run, all the stronger then can the effect on carbon prices become in the longer-term, due to a delayed and more vigorous response. Estimates of this effect come close to

[8] If in a tightening cycle a central bank stops reinvesting principal payments from maturing securities, government will need to seek a new investor for the issued volume. This new investor will have to be endowed with a belief that government can pay off its higher debt in future. Not even a clear and credible plan of fiscal consolidation will be sufficient to compress the risk premium, and therefore expected yield of the newly issued security. This event could lead towards an explosive process of risk accumulation, mounting costs and consequent debt crisis and inflation (Cochrane, 2021).

0.5% annually (Allen et.al, 2020 and ECB, 2021b), (see Figure 7a). The monetary policy response to these pressures therefore plays a rather important role. The estimates account for higher tolerance to supply driven inflation even in excess of the inflation target for a longer period of time. If, however, monetary policy responds to core inflation rather than relative price dynamics in the headline inflation, the negative effect on inflation should be more moderate, but with a larger GDP shortfall (see Figure 7b). This is however a very long-term process and therefore the anchoring of inflation expectations could become more challenging. Green transformation however contains uncertainty that could also entail positive technology shock, which we may not be able to acknowledge today and could eventually support labour productivity and reduce negative consequences of green transformation for inflation.

Figure 7a and 7b: Long term effect of green transformation to inflation



Source: 7a) Allen et. al (2020), 7b) ECB (2021b).

Notes: Chart 7a illustrates long term effects of disruptive transformation to inflation. Yellow line represents the path of random disorders, blue line represents the path of delayed transformation. Solid line in the Chart 7b documents effects on inflation and dashed line effects on GDP. Blue line refers to core and yellow line to headline inflation.

Another factor that exerts on inflation in the long run is an ageing and declining workforce. Developed economies have been benefiting from low prices of industrial goods over the past quarter century. Urbanisation and industrialization trends in eastern Asia have been driving factors of a growing number of productive populations engaged in the global production chains, with low labour costs. Limits to urbanisation, deglobalisation trends and consequences of the one child policy from 40 years ago lead to the major reversal of trends literally in these days. In a market with a population of almost 2 billion, net flow into the workforce is negative (see Annex, Figure A4).

A less global workforce will contribute to limited growth of supply of goods and services and mounting bargaining power will weigh also on the wage claims of lower skilled labour. (Goodhart and Pradhan, 2020). Employees will tend to be more engaged in labour unions. An ageing population will, on top, require a higher share of the productive workforce in health care and senior care. Manufacturing and business services will thus enjoy an even lower supply of labour and combined with underlying fiscal costs (higher future taxes) and climate costs (high carbon prices) wage claims could become even stronger.

Implications for monetary policy

Wage pressures resulting from a tighter global labour market and disruptions on the product market are capable of fuelling future inflation. Renewed inflation dynamics will likely revive the original Phillips curve relationship. There is a rich literature on why the Phillips curve has been mostly flat for the past decade. The most common explanation was our belief that decades of inflation targeting helped us to learn how to better anchor inflation expectations (Rusticelli et al., 2020). Del Negro et al. (2021) also argue that globalised trade and ample liquidity conditions have provided large non-financial corporations and global chains with an abundance of liquidity, so they are able to internalize smaller shocks to prices. Furthermore, the transnational character of corporations helped a

number of them to become price setters in their markets and allowed them to freely compensate for idiosyncratic shocks to prices and wages across countries.[9] In other words, shocks in the past decade were not strong enough to be challenging for price setting in the private sector. Firmly anchored inflation expectations that in the corporate sector are mostly backward looking (Rudd, 2021) and a history of inflation of just above 1% in the past decade have been contributing to low and stable inflation.

The renaissance of the Phillips curve therefore signals weaker anchoring of long-term inflation expectations. This could become even weaker if the long-term inflationary pressures discussed above materialise. Only a more ambitious monetary policy, ensuring a quicker retreat of inflation close to the target can safeguard anchored inflation expectations. Households and corporations usually look at past changes to prices to distinguish between transitory and more persistent inflation shock. If monetary policy is too lax towards inflation moving away from target, the private sector could consider such shocks to be lasting and this could weaken the anchoring of inflation expectations.[10]

Economic theory often works with an assumption that permanent real effects cannot arise from nominal shocks. This means that it is not the response of real wages to nominal shocks, but the character of monetary policy that is relevant for anchoring inflation expectations. Short term shocks to energy prices, the product market, or technologies that we are witnessing in the second half of 2021 are indeed adjustments of relative prices of goods and services. A strong belief in the transitory character of inflation rests on pointing to the absence of systematic (trend) components. Inflation expectation is therefore a key element, which is still rather close to 2%. Maintaining it in this ballpark rests on how the market sees future monetary policy. Therefore, it is of the utmost importance for monetary policy to stay credible, free of rapid and immediate responses to short term shocks.

Despite July 2021 changes to the forward guidance, tying it more closely to the inflation outlook, the ECB still commits to maintaining an accommodative monetary policy stance for an extended period of time, at least until the end of the Asset Purchase Programme (APP). This also reflects (December 2021) market expectations about termination of the APP in mid-2023 (despite its open-ended feature) and estimates lift-off at the end of 2023. Earlier termination of the programme and lift-off is technically possible, but in the unwelcome event of secondary effects and the emergence of trend components in the course of 2022, a clearly communicated sequence of steps towards policy tightening could limit the necessary monetary policy response.

Monetary policy commitment may therefore represent a challenge to credible monetary policy. If signs of trend inflation appear, it will be necessary to do „whatever it takes to maintain price stability ". Therefore, in the environment of higher public debt, along with a monetary policy response, a clear and credible plan of fiscal consolidation will be of the essence.

Conclusions

For inflationary pressures, we need to distinguish which are transitory and which could have a more persistent character. Contemporary updates to relative prices still do not include a trend component and inflation expectations are still anchored in the vicinity of 2%. A trend component can

[9] Ample research has pointed out the structural change and the need to update the definition of costs. Andrle et al. (2013) argued that we need to refocus to more stable price components, specific measures of core inflation (trimmed mean). Nickel et al. (2017) argued for labour costs to be used to estimate the Phillips curve. A working group on wages in the Eurosystem (WEG) has also identified factors of missing inflation, or a mystery of wage growth, the result of which rested on the delayed response of wages to inflation, or so-called loss of inflation memory in the countries with wage indexation, or lack of information value of employees' compensation for predicted inflation. (Jonckeere and Saks, 2019).

[10] Jørgensen and Lansing (2021) label these two regimes incorporated into the macroeconomic modelling framework as strong and weak anchoring of inflation expectations.

emerge from the short-term sources, such as higher wage claims in the labour market, or from longer term sources, such as a smaller global labour force, costs of green transformation, or from expected higher taxes given necessary fiscal consolidation.

Temporary elevated inflation needs to be closely monitored and disruptions assessed for the eventual presence of a longer-term component. The emergence of secondary effects is a function of time. While entering the GFC in 2008, we understood the events as short term market failures and unconventional monetary policy measures were adopted as „*temporary in nature*". We know that inflation expectations are to a large extent backward looking. Relying on a history of firmly anchored inflation expectations cannot be justified.

If we keep witnessing market disruptions for longer than expected, will we be capable of a proper response to secondary effects if public debt is mounting? We are in a period with a considerable risk of fiscal dominance. This means that much of the future inflation is, besides credible monetary policy, determined by credible and clear fiscal policy with an unequivocal plan of fiscal consolidation.

Strategic coordination of monetary and fiscal policy, its clear communication and ability to act timely and decisively, will be of the essence for successfully maintaining price stability in future. This applies for post-pandemic challenges of market disruptions and unequal recovery as well as for persistent inflationary pressures that lie ahead in the long run.

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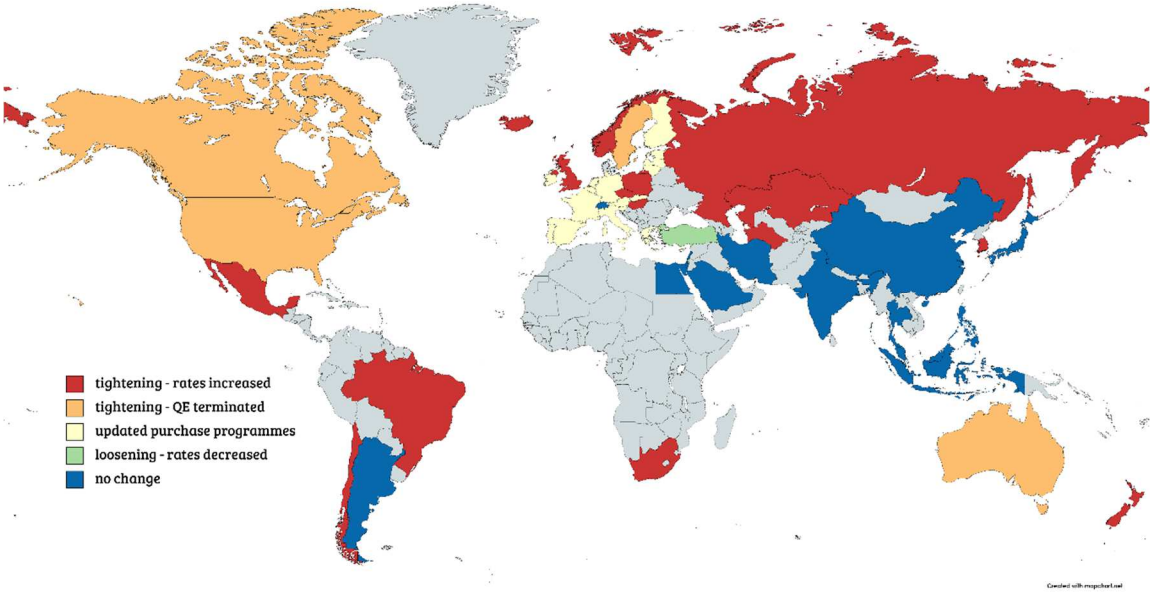
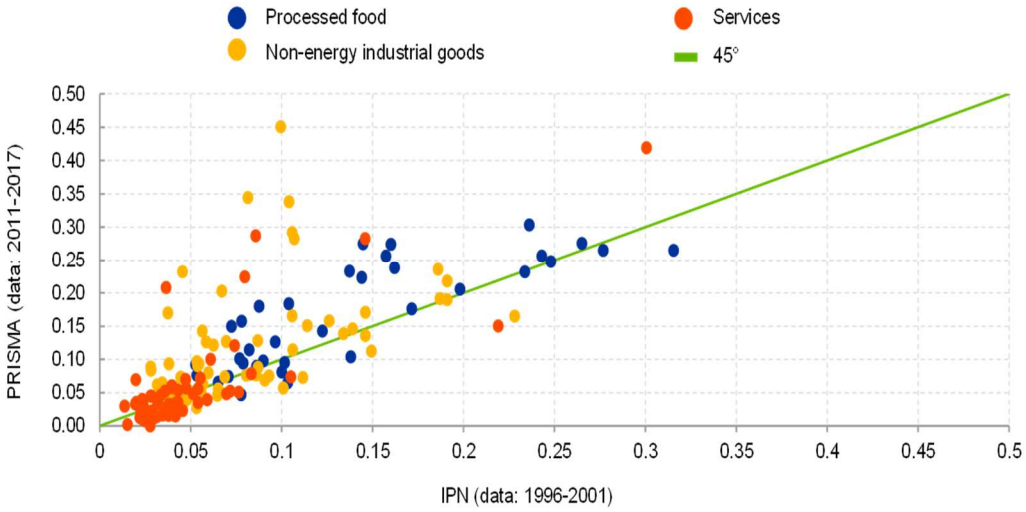
Figure A1: Changes in monetary policy across the world.



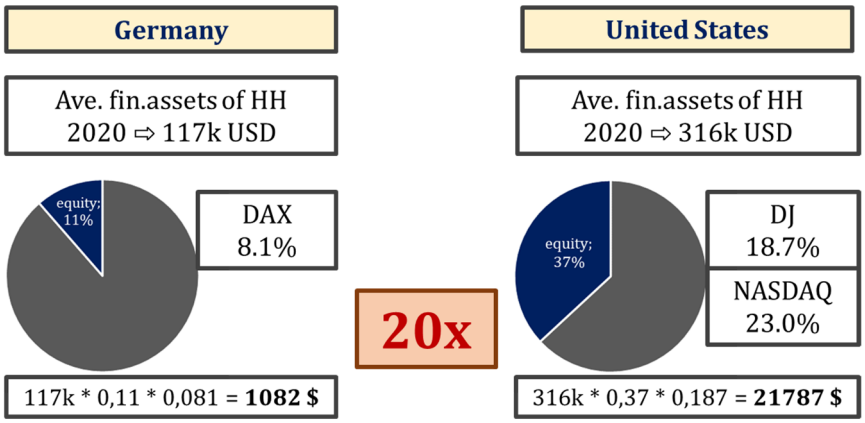
Source: Own compilation based on https://mapchart.net/world.html

Figure A2: Prices are updated more frequently



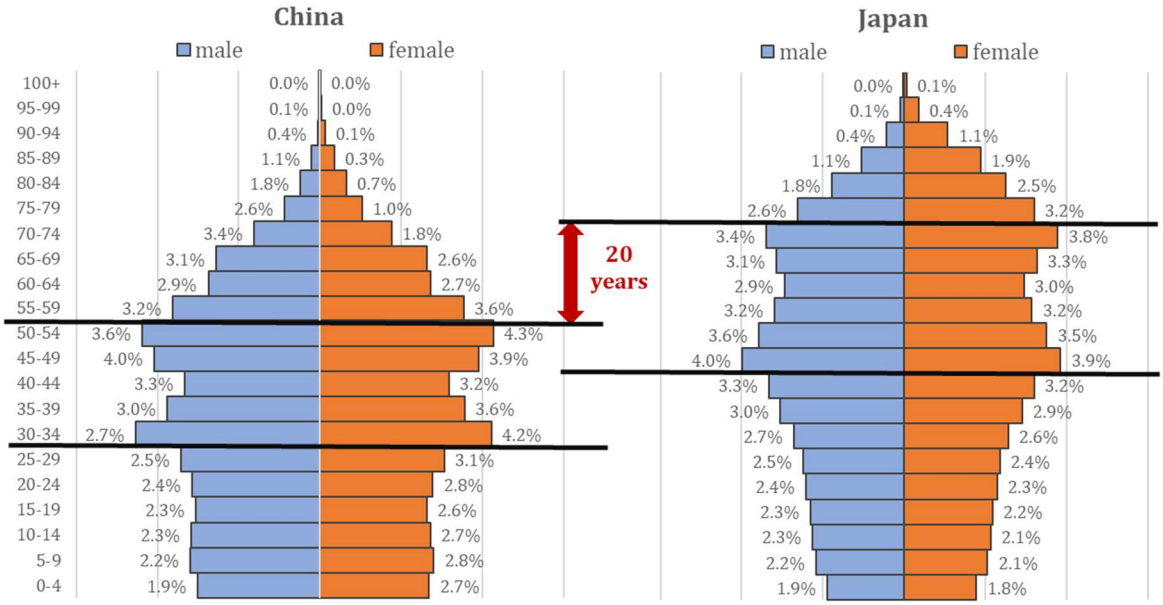
Source: Gautier et al. (2021), "New Facts on Consumer Price Rigidity in the Euro Area", Working Paper Series, ECB

Figure A3: Different structure of households' financial assets in Germany and the U.S.



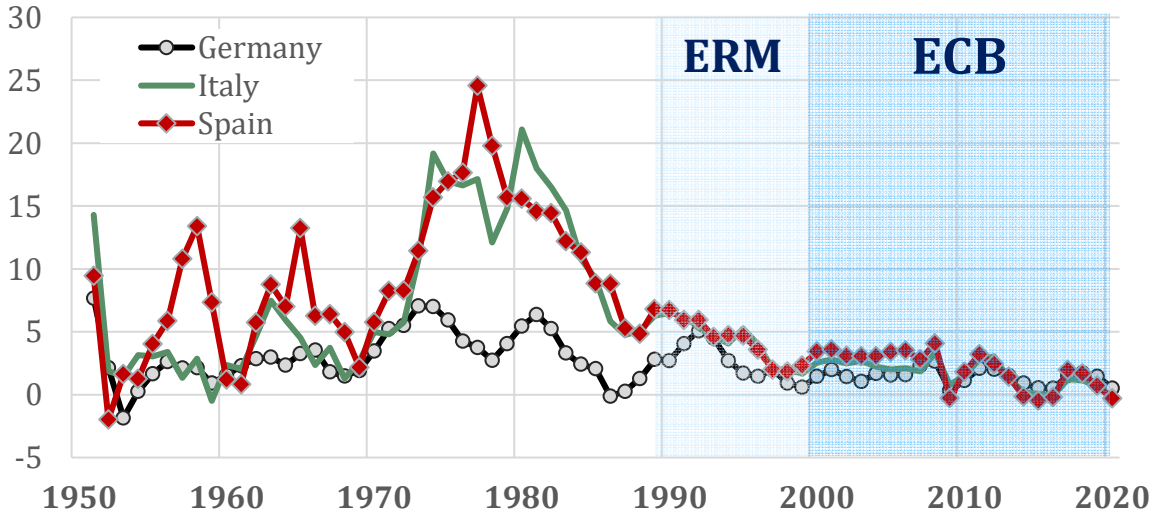
Source: OECD, own computation.

Figure A4: Shortfall of productive population in China is similar to the one in Japan in the late 1990s.



Note: Similar structure of demographic tree in China and Japan is shifted by 20 years.
Source: PopulationPyramid.net

Figure A5: Historical parallel of different monetary policy under common nature of shocks (annual inflation)



Note: Different monetary policy response of central banks of Spain, Italy, and Germany to a similar supply shock in the early 1970s.
Source: Macrobond, own computation.