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Managing global monetary spillovers

How the Fed's interest rate hikes and uncoordinated tightening affect the euro area

Policy Department for Economic, Scientific and Quality of Life Policies
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Abstract

Inflation pressures have triggered a largely synchronised tightening of monetary policy around the world. The sharp appreciation of the US dollar is adding to the challenges that policymakers confront. The paper sets out to identify the channels through which US tightening spills over to the rest of the world, with a particular focus on the euro area. It also examines the risks that stem from uncoordinated monetary tightening and discusses how different forms of global cooperation can help mitigate those risks.

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CONTENTS

LIST OF ABBREVIATIONS

BIS	Bank for International Settlements
CPI	Consumer price index
ECB	European Central Bank
Fed	Federal Reserve
IMF	International Monetary Fund
GDP	Gross domestic product
HICP	Harmonised index of consumer prices
US	United States
USD	United States dollar

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EXECUTIVE SUMMARY

- **Successive interest rate hikes by the United States Federal Reserve (Fed) since early 2022 have sizeable global spillover effects.** In the age of economic and financial globalisation, interdependent economies are affected by policy decisions of their partners, and the world's largest economy is in a prominent position from this respect.
- **The Fed's tightening exerts its spillover effects through multiple channels.** The tightening shock is transmitted both through global trade and the financial system. Existing macroeconomic literature shows that US tightening puts downward pressures on other countries' GDP growth, and a mix of upward and downward pressures on prices.
- **The euro area is exposed to a mix of inflationary and contractionary forces as a result of the Fed's tightening.** Imported inflation rises, as the weaker euro exchange rate pushes up energy and commodity prices. Meanwhile, aggregate demand drops due to two forces: US tightening reduces foreign demand for euro area exporters, and it also reverberates through a globally-integrated financial system, tightening monetary conditions in the euro area too.
- **The euro area is in a vulnerable position to absorb these spillovers.** The euro area has been hit by a severe recessionary energy price shock driven by Russia's invasion of Ukraine, and is set to suffer a slowdown in economic activity that is worse than other advanced economies. Dramatic spikes in energy and food prices gave rise to a cost-of-living crisis. Spillovers from US tightening pile on top these challenges.
- **An uncoordinated, simultaneous hike of interest rates around the world raised alarms about the risks of overtightening, and a global recession.** First, central banks can be pushed to engage in a mutually-damaging "race to the top", increasing interest rates aggressively to cut imported inflation at each other's expense. Second, they can fail to adequately take into account demand feedback loops as they calibrate their monetary policy. Third, a credit crunch can cascade into broader financial instability.
- **There have been calls for international coordination to help mitigate these overtightening risks**. But the exact meaning and content of this coordination can be manifold: institutionalised or ad hoc agreements on policy decisions, information exchanges between central banks, or cooperation in managing financial crises.
- **The historical record shows that a degree of coordination can indeed be beneficial**. However, institutionalised setups or multilateral interventions in foreign exchange markets like the famous Plaza Accord seem neither realistic nor effective in the current political and economic circumstances.
- **What policy makers could focus instead are three things: 1) avoid a "race to the top",** either by coordination, or simply by anticipating the risk of retaliation, and not engaging in overtightening spirals; **2) foster information exchanges** among central banks about their respective policy reaction functions, so that demand spillovers are correctly factored into monetary policy decisions; **3) cooperate in strengthening financial safety nets**, for instance by providing international liquidity. Given the outsized role of the dollar in the global economy, the Fed's role remains especially pronounced.

1. INTRODUCTION

Inflation is at a multi-decade high in several economies. According to the International Monetary Fund (IMF), global inflation is expected to peak at 9.5% this year before decelerating to 4.1% by 2024. In advanced economies, inflation reached its highest rate since 1982 but the disinflation dynamic for this group of countries is expected to be more pronounced than for other country groups over the next two years (IMF, 2022a). In the euro area, dramatic spikes in energy and food prices are giving rise to a cost-of-living crisis and the risks to economic activity are clearly on the downside.

Inflation pressures have triggered a largely synchronised tightening of monetary policy around the world. Since the start of 2022, central banks of Australia, Canada, the euro area, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States, which together account for around half of global gross domestic product (GDP), have raised their policy rates by 200-300 basis points (bps). The generalised tightening of monetary conditions is widely expected to translate into a broad-based slowdown in economic activity. The World Bank recently warned that the simultaneous and mutually-compounding tightening of financing conditions that is currently undertaken by central banks around the world might exceed what is necessary to contain inflation and could exacerbate the risk of a global recession (World Bank, 2022). This can be particularly problematic for the euro area where the risks to economic activity are already markedly on the downside.

In this context, the sharp appreciation of the US dollar (USD) is adding to the challenges that economic policymakers confront, by increasing the costs of imported goods.

Some economists and policymakers have pointed out that uncoordinated, yet synchronised rate hikes bear the risk of overdoing monetary tightening, inducing a contraction of economic activity that is harsher than what is needed to achieve price stability mandates in their respective jurisdictions (e.g. Obstfeld, 2022; Panetta, 2022). These warnings do not imply that central banks should change the direction of monetary policy – given the severe social costs of inflation, it is crucial to avoid a de anchoring of expectations and ward off second-round effects. However, it is just as important that central banks properly take into account spillover effects and not engage in overtightening relative to their carefully calibrated monetary policy stance.[1]

The purpose of this paper is twofold. First, the paper sets out to identify the channels through which US tightening spills over to the rest of the world, with a particular focus on the euro area. Second, the paper examines the risks that stem from uncoordinated monetary tightening and discusses how different forms of global cooperation can help mitigate those risks.

The paper argues and illustrates that the euro area is exposed to a mix of severe inflationary and recessionary forces as a result of the Federal Reserve's tightening. It also illustrates how uncoordinated monetary policy decisions indeed carry overtightening risks of overdoing monetary tightening, Finally, this paper argues that institutionalised setups or multilateral interventions in foreign exchange markets like the famous Plaza Accord do not seem realistic in current circumstances, where neither the US nor its trading partners have political interest in addressing the misalignments. However, there are multiple other avenues for coordination: agreements to avoid competitive appreciation risks, information exchanges to properly account for demand feedback loops, or financial crisis cooperation.

[1] It is important to emphasise that assessing the appropriate monetary policy stance is outside the scope of this paper. The analysis focuses on spillovers from US monetary tightening, and concludes that the lack of international coordination mainly entails overtightening risks. Throughout the text, overtightening is understood as relative to the optimal policy stance.

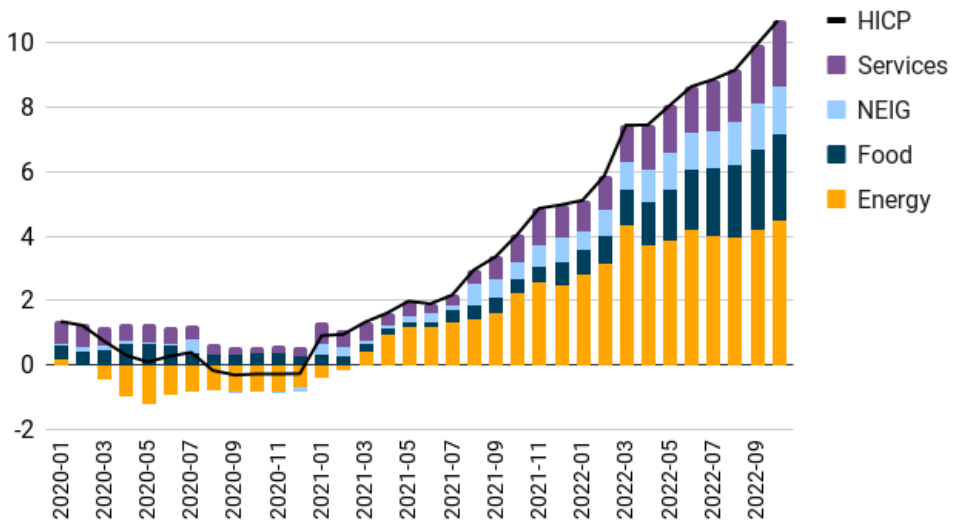
The paper is organised into three parts. In section 2, we examine the current inflation dynamics in the euro area. In Section 3, we discuss the global spillovers of US tightening through the trade and financial channels and their implications for the euro area economy. Finally, in Section 4 we review the risks of continued, uncoordinated monetary tightening in the United States and the potential benefits of global cooperation to address the negative spillover effects of US tightening. In doing so, the paper also provides a brief review of the historical development of macroeconomic policy coordination and financial crisis management cooperation among advanced economies.

2. INFLATION DYNAMICS IN THE EURO AREA

Euro area inflation has reached double-digit levels, the highest since the inauguration of the common currency. In October 2022, headline inflation reached 10.7%, while core inflation rose to 5%.[2] Inflation is driven by a series of severe supply shocks. These include global supply chain disruptions in the wake of the COVID-19 pandemic and, especially, the Russian invasion of Ukraine with the resulting dramatic spike in energy prices. As shown by Figure 1, energy prices' contribution to the headline harmonised index of consumer prices (HICP) number was negative throughout 2020, and rose to over 4% by the last quarter of 2022. Food price inflation also accelerated, strongly linked to surging prices of energy inputs, but also exacerbated by extreme weather events (Bodnár and Schuler, 2022). According to the latest monetary policy statement by the European Central Bank (ECB), the risks to the inflation outlook continue to be on the upside, while the risks to the economic outlook are clearly on the downside (European Central Bank, 2022). In particular, high inflation is dampening spending and production in the euro area, while financial conditions for firms, households and banks have tightened in response to the rise in interest rates.

The inflation and economic outlook in the euro area also need to be understood against the global background and, in particular, against the monetary tightening that has taken place across high-income countries. As anticipated, since the start of 2022, in addition to the ECB, the central banks of the United States, the United Kingdom, Canada, Australia, New Zealand, Norway, Sweden, and Switzerland have raised their policy rates by 200-300 bps (see Figure 2).

Figure 1: Contributions to euro area headline HICP inflation

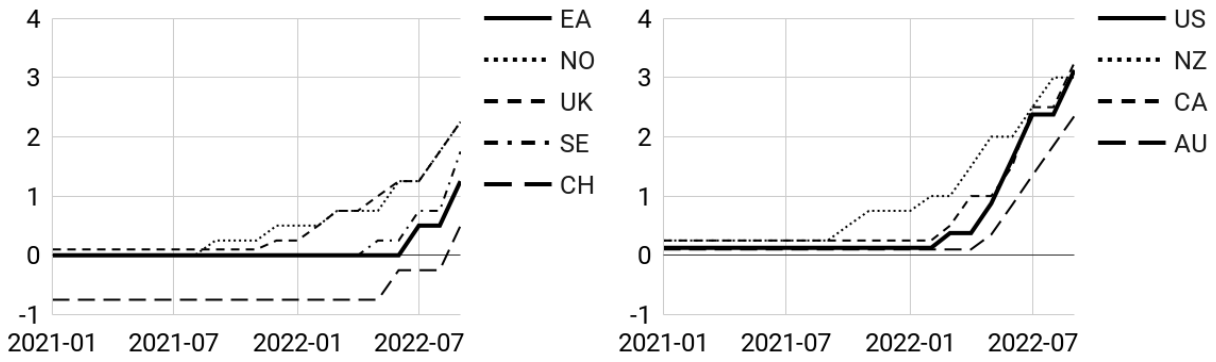


Source: Eurostat.

Notes: Monthly data. NEIG: non-energy industrial goods. Latest observation: 2022-10.

[2] Because of scope limitations, the paper views the euro area as a whole, and does not delve into heterogeneity among members. However, there is significant variation, also in inflation rates: worst-hit members are the Baltic countries, with over 20% inflation, compared to 6.2% in France. The second set of papers prepared for this Monetary Dialogue deals with this issue in more detail.

Figure 2: Policy rates of the ECB, Fed and select advanced economies



Source: Bank for International Settlements.

Notes: Latest observation: 2022-09.

Given the centrality of the dollar in global trade and finance, the monetary policy decisions taken in the United States deserve particular attention. Since the start of the year, the US Federal Reserve (Fed) has increased the federal funds effective rate from 0.08% to 3.08% in October.[3] In its latest interest rate decision in November, the Federal Open Market Committee decided to increase the federal funds rate further to a target range to 3.75-4%. In addition to the interest rate tightening, the Fed accelerated the shrinkage of its balance sheet (Federal Reserve, 2022). Financial conditions have tightened accordingly. The 10-year Treasury yield has risen more than 200 bps since the beginning of the year and is near its highest level in over a decade (Brainard, 2022).

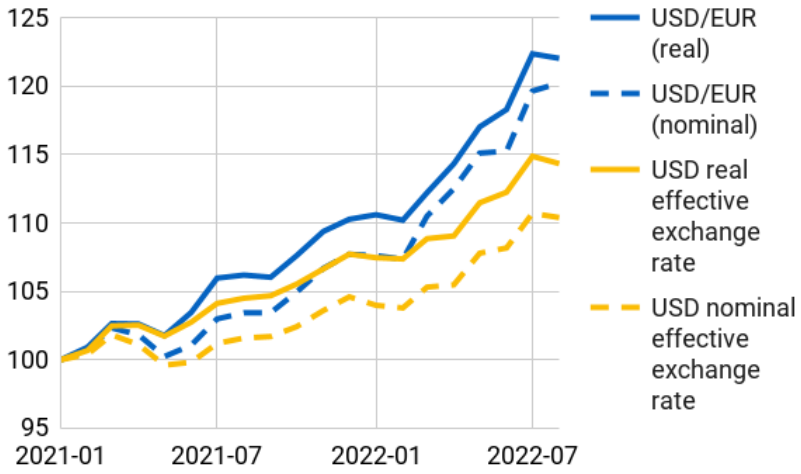
In addition to the domestic effects, the monetary decisions taken by the US Fed have international effects via the impact on exchange rates. The USD is now at its strongest level since the early 2000s and its appreciation is particularly marked against the currencies of other advanced economies (Gourinchas, 2022). The euro is below parity with the dollar for the first time since 2002.

Figure 3 demonstrates the steep appreciation of the US currency. Both in nominal and real terms, it has appreciated by over 20% relative to the euro since the beginning of 2021. The dollar's effective exchange rates (against the 42 biggest trading partners of the US) show similar dynamics, although appreciation relative to the euro is significantly stronger.

The dollar surge is mostly driven by economic fundamentals thus far, that is mainly tight monetary policy and the global terms-of-trade shock associated with high energy prices that has hit some countries, especially the euro area, more severely compared to the US (Gopinath and Gourinchas, 2022). Even if justified by economic fundamentals, the dollar surge is a potential source of global instability.

[3] Board of Governors of the Federal Reserve System (US), Federal Funds Effective Rate [FEDFUNDS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/FEDFUNDS, 9 November 2022.

Figure 3: USD/EUR exchange rates and USD effective exchange rates (real and nominal)



Source: Authors' calculations based on Eurostat.

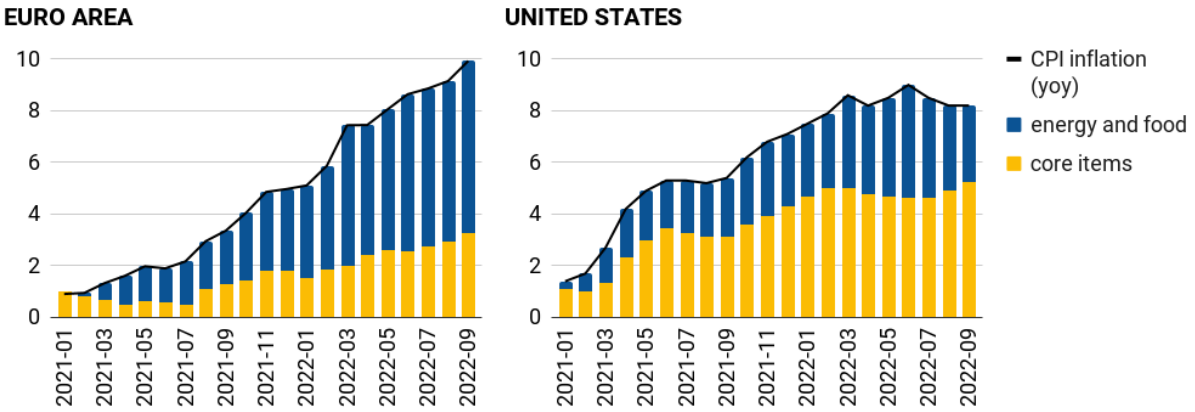
Notes: 2021-01=100. Monthly data. Latest observation: 2022-08. Effective exchange rates are trade-weighted averages of bilateral exchange rates against the 42 biggest trading partners of the United States.

Amidst the synchronised tightening, there has been some policy divergence across advanced economies, in particular the Fed and the ECB. The Fed moved sooner and more aggressively with rate hikes, raising the Fed-ECB interest rate differential to 1.875 percentage points in September 2022, from 0.125 in the previous year. The reason for this is that the two central banks needed to respond to quite dissimilar shocks: inflation was more demand-driven in the US, more supply-driven in Europe. As shown in Figure 4, the United States saw a surge in inflation much earlier,[4] and driven by core items, Europe suffered a recessionary terms-of-trade shock (Gopinath and Gourinchas, 2022), confronting policymakers with very different and harsher trade-offs between curbing inflation and hurting employment/output (see also: Ricarte et al., 2022).

The policy divergence between the US and the euro area, with the attendant surge of the dollar against the euro, may act as a strong driver of imported inflation, primarily through higher energy and commodity prices. At the same time, the strong dollar may export recessionary pressures by dampening domestic demand in the US and thus amplifying the impact of the ECB monetary tightening on euro area economic activity. In order to disentangle these inflationary and contractionary effects, the paper focuses on the cross-border effects of US monetary policy and, in particular, on the general transmission channels and the specific ones for the euro area.

[4] This difference between US and euro area inflation is also visible in the larger gap between real and nominal USD/EUR exchange rates in Figure 3.

Figure 4: Contributions to headline inflation in the euro area and United States



Source: Authors' calculations based on Eurostat, U.S. Bureau of Labor Statistics.

Notes: Monthly data. Latest observation: 2022-09.

3. GLOBAL TIGHTENING AND THE EURO AREA

3.1. Spillover channels of US tightening

US monetary tightening has spillover effects, transmitted via global trade and the financial system, through multiple channels. It is difficult to view these channels in isolation, since they interact with domestic conditions and policy responses, and they can be offset by other shocks, while also interacting with one another. Yet it is useful to disentangle a few important ones. Channels 1 and 2 work through trade (or the real economy), while channel 3 works through the financial system.

1. The most direct spillover effect is exerted through **imported inflation**. Relative monetary tightening in the US strengthens the nominal dollar exchange rate, and this (mechanically) increases consumer price inflation (CPI) of trading partners. It works through the rise in the prices of (final) import products and imported intermediate inputs. It has an *immediate* impact, while others are expected to occur with time lags. The effect is **inflationary** and **contractionary**. The strength of this transmission channel depends on each country's trade openness, imports' share in consumption and imported inputs' share in production.

2. US monetary conditions also affect each partners' **trade balance** (net exports), with an impact on inflation. This effect is both more indirect and ambiguous. It is useful to further differentiate between two components of this effect, since they point to different directions. There are two ways to adjust the trade balance. *Expenditure switching* is a change in relative prices, shifting spending towards more competitive (i.e. cheaper) goods and services of the depreciating country. *Expenditure changing* is a change in the overall level of spending, moving the trade balance by depressing or boosting demand for both imported and domestically produced goods and services.

    a) Through expenditure switching, US monetary tightening appreciates the real dollar exchange rate, boosting trading partners' competitiveness and exports (hence, aggregate demand). The effect is inflationary and expansionary (in fact, the only expansionary channel among those listed). The strength of this transmission channel depends on the price elasticity of exports.

    b) Through expenditure changing, US monetary tightening depresses US aggregate demand, including import demand. Trading partners experience a drop in foreign demand for their goods and services. The effect is deflationary and contractionary. The strength of this transmission channel depends on trade openness towards the US market.

3. A separate channel is linked to the dollar's outsized role in global finance, and economies' **financial (dollar) exposure.** The tightening of monetary conditions by the Fed leads to the tightening of monetary conditions elsewhere, also in countries where additional monetary tightening is not necessary. The effect is **deflationary** and **contractionary**. The strength of this transmission channel depends on the economy's exposure to dollar funding and integration with US financial markets.

The financial channel, too, has multiple components, as Ca' Zorzi et al. (2020, pp. 19-21)explain in detail. First, US tightening pushes trading partners' price levels up by raising imported inflation (channel 1). This triggers an interest rate policy response, ultimately *raising the yield curve* in the rest of the world. Second, countries outside of the US have assets and liabilities denominated in US dollars. This can give rise to *currency mismatch* problems, and a strengthening dollar can lead to valuation losses, and severe

contractionary effects. Third, in a financially-integrated world, monetary tightening in the US squeezes the entire global financial system through the so-called *balance sheet* channel. Higher interest rates tighten the balance sheets of overly-leveraged investors in the US (who do not have enough equity to absorb shocks), and financial stress spreads across borders. Globally shrinking dollar liquidity creates problems, because of widespread reliance on dollar funding. If funding dries up, borrowers are unable to refinance and roll over debt, and events can cascade into funding crises and more widespread financial turmoil.

To sum up, US monetary tightening exerts spillover effects on other countries' economic aggregates through multiple channels. On economic output, all transmission channels apart from 2a (expenditure switching) point towards contractionary effects, predicting a net negative impact. On inflation, the picture is more mixed: two channels imply inflationary, two others deflationary pressures.

Table 1: Overview of transmission channels

	Spillover channel	Effect on other countries' GDP	Effect on other countries' inflation
1	Imported inflation	–	+
2a	Expenditure switching	+	+
2b	Expenditure changing	–	–
3	Financial exposure	–	–

Source: Authors' own conception.

3.2. Impact on the euro area

As the overview of the transmission channels has shown, US tightening affects the euro area with mainly downward pressures on GDP, and a mix of upward and downward pressures on prices. The net effect depends on the significance and relative strength of these channels. This question has been addressed extensively by the empirical macroeconomic literature, and a short overview of some relevant findings is presented.

A result that is robust across multiple studies is that a US monetary tightening shock has a negative impact on foreign countries' GDP, employment and industrial production (Georgiadis, 2016; Dedola et al., 2017; Dieppe et al., 2017; Iacoviello and Navarro, 2019; Ca' Zorzi et al., 2020). This is in line with theoretical expectations mapped out above. External demand drops, and subsequent tightening by domestic authorities depresses domestic demand too. The effect of financial channels is especially pronounced. Positive impacts of trade competitiveness through expenditure switching are dominated by contractionary forces. It is quite remarkable that some studies estimate these effects on output to be even larger than impacts within the United States of a Fed tightening (Ca' Zorzi et al., 2020, p. 30; Jarocinski, 2021).

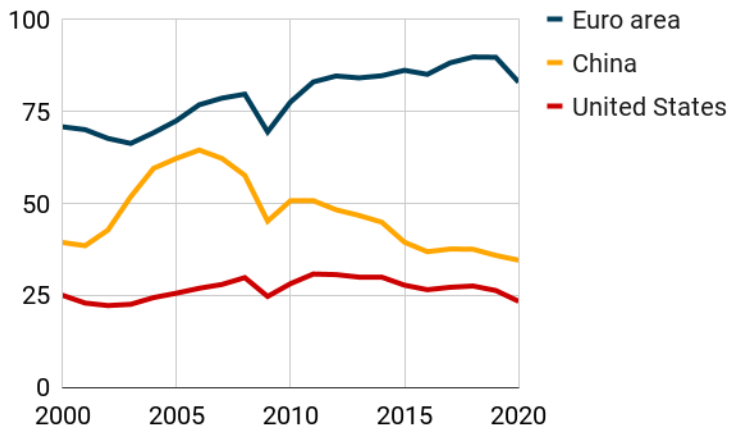
Effects on other countries' inflation are more ambiguous, probably linked to the multiple offsetting impacts mapped out above. Ca' Zorzi et al. (2020, p. 29) find a short-lived rise in euro area inflation, as a depreciating exchange rate raises commodity prices and imported inflation – but the effect fades away after one quarter due to offsetting recessionary forces pushing prices down. Dedola et al. (2017) estimate a fall in euro area CPI inflation (a magnitude of −0.1%, in response to a one standard deviation monetary tightening shock).

Are there any distinct vulnerabilities of the euro area in the present period, along the abovementioned channels? Some descriptive statistical insights below provide some hints.

Firstly, the euro area is highly vulnerable through the imported inflation channel. Relative to economies of comparable size, trade openness in the euro area is high (see Figure 5). So is integration to global value chains. Given the context of an energy crisis, a particularly painful aspect of a weak euro exchange rate is the euro area's dependency on energy imports. Overwhelmingly, commodities are traded in dollars in world markets, which drives up their cost in euro terms, for a given dollar price of those commodities.[5] The euro area relies on imports for over 62% of its energy consumption (to compare, this figure is around 15% for China, and under 10% for the United States).[6] Imported energy supplies such as US liquefied natural gas (ramped up as an avenue to curb Russian dependence), become costlier, further exacerbating energy price inflation. All this together points to a large inflationary shock.

Effects through the trade balance channel are much more ambiguous, since there are two opposite forces at play. On the one hand, US monetary tightening is an indirect inflationary shock. This is the expenditure switching channel at work: euro area goods and services become more competitive (cheaper) through a depreciating euro exchange rate. This shifts demand towards euro area producers, boosts aggregate demand, and raises inflation. This channel is the only expansionary one. However, as discussed above, the literature finds robust evidence that Fed tightening has a negative impact on foreign countries' GDP, which suggests that this sole expansionary channel is dominated by the other, contractionary ones. One relevant factor explaining this could be the role of dollar invoicing in international trade, which dampens competitiveness gains from a depreciating currency (Gopinath, 2015).

Figure 5: Trade openness: exports and imports as a percent of GDP



Source: OECD.

Notes: Imports and exports of goods and services as a percent of GDP.

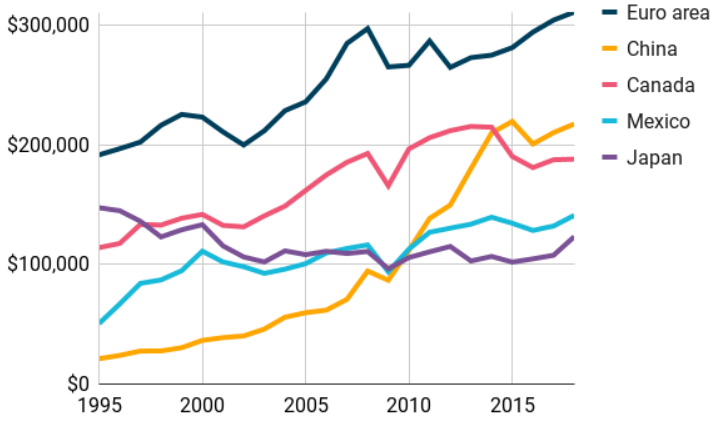
On the other hand, there is a simultaneous deflationary effect, through expenditure changing: euro area exporters confront a demand collapse in an important market absorbing their products and services. This latter channel is not negligible at all, given the euro area's dependence on US demand

[5] This does not yet include the effect of an increase in the dollar price of these commodities, which is also happening, but not due to US monetary policy tightening, but due to the energy and food supply crisis triggered by the Russian invasion of Ukraine.

[6] Data: Eurostat, OECD IEA Statistics.

(Polyak, 2022). As shown by Figure 6, the euro area accounts for more US imports than China, or any other partner.

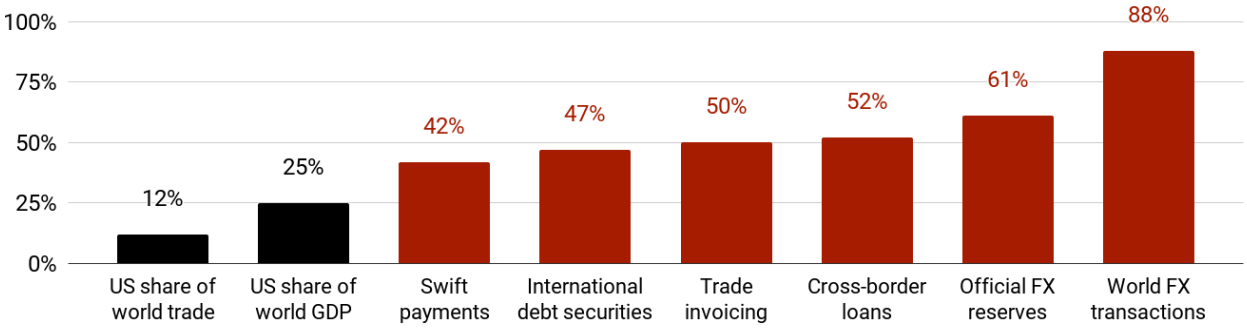
Figure 6: United States, import volumes by partners



Source: OECD TiVA.

Notes: million dollars (constant, 2015 prices), imports in a value added perspective (foreign value added embodied in domestic final demand), top 5 partners.

Figure 7: The international role of the dollar



Source: Bank for International Settlements.

Notes: Data refer to 2019-2020, for details, see: BIS (2020, p. 3).

As for the financial dollar exposure channel, the euro area is much less vulnerable, compared to emerging market economies, for instance. First, debt dollarisation is more widespread in emerging market economies than advanced euro area economies. Second, although European banks were heavily involved in USD funding in the run-up to the global financial crisis (Tooze, 2018), they have significantly decreased their activity, while emerging market economies increased it (BIS, 2020). This does not mean that these financial impacts leave the euro area unscathed, however. The empirical literature, such as recent analysis by Furceri et al. (2022) stresses that the relative strength of the financial transmission channel is higher than that of trade. So, even a smaller exposure can move the needle significantly.

Moreover, the US dollar is the dominant currency in the international financial system, meaning the shockwaves it sends are hardly limited to dollarised emerging markets. As Figure 7 shows, according to BIS statistics, while the US accounts for 12% of world trade and 25% of world GDP, almost 90% of all foreign exchange transactions involve the dollar, and almost half of all outstanding international debt securities in 2019-2020 were denominated in dollars.

Also, an important difference between the 2008 financial crisis and the current situation is that then, the major sources of risk stemmed from overly-leveraged big banks, while now, balance sheet vulnerabilities are particularly elevated in the "shadow", nonbanks financial sector (IMF, 2022b, p. 9).

4. THE NEED FOR INTERNATIONAL COORDINATION

4.1. The risks of uncoordinated monetary tightening and potential benefits of a coordinated approach

The risks of uncoordinated monetary decisions in advanced economies had already occupied policymakers' attention over the past decade. With the onset of the global financial crisis in 2008, most central banks in these countries cut policy rates to historical lows – this included a joint announcement of rate cuts in October 2008. They also set-up large-scale asset purchase programs to lower long-term interest rates and support economic activity. While these policies were necessary to address the prolonged deflationary shock in crisis-hit countries, they also generated serious macroeconomic challenges for countries whose monetary policy was not aligned with the overly accommodative stance in advanced economies. Indeed, lower interest rates and security purchases induced large capital flows to countries offering higher returns, raising serious macroeconomic and financial stability problems for the recipient countries.

In particular, several emerging market countries found themselves in the difficult position to cope with rising credit growth and currency appreciation harming domestic export sectors. In September 2010, Brazilian Finance Minister Guido Mantega even lashed out against US "currency wars", after the first wave of quantitative easing in the United States led to what he regarded as a protectionist devaluation of the US dollar against other currencies caused by the Fed accommodative policy. This situation is reminiscent of the competitive devaluation dynamics of the 1930s, when countries set in motion a severe deflationary spiral by devaluing the currencies to gain export advantages over their trading partners. In the post-2008 deflationary context, global cooperation was thus advocated as a way to prevent the risk of competitive devaluations and the attendant risk to global macroeconomic and financial stability (Moschella 2015).

In the post-2021 inflationary context, the situation has reversed. In an environment of globally elevated inflation, uncoordinated monetary policies raise the spectre of so-called 'reverse currency wars' or competitive exchange rate appreciation (Frankel, 2016, 2022). As countries strive to bring down inflation by raising interest rates and strengthening their exchange rates, the race to the bottom known as devaluation spirals becomes a race to the top. One's tightening raises the other one's imported inflation (channel 1), triggering further monetary tightening to offset the imported inflationary pressures. This creates a beggar-thy-neighbour dynamic analogous to competitive devaluations and threatens with an overtightening spiral, playing out through the following steps: 1) the Fed tightens, and the dollar appreciates against the euro. 2) This raises imported inflation in the euro area. 3) As a response, the ECB tightens too, and the euro appreciates against the dollar. 4) This raises imported inflation in the US. The Fed is prompted to tighten again (and the sequence starts anew).

As a result of this race to the top, countries end up in a suboptimal equilibrium: at the end of multiple rounds of this sequence, they reach the same interest rate differential (and amount of imported inflation), but with much higher interest rates, hurting aggregate demand in the process. In game theory terms, payoffs resemble those in a Prisoner's Dilemma. It would be a Pareto-improvement to coordinate policies, and move out of the non-cooperative Nash-equilibrium.

The same overtightening spiral may play out in case of expenditure switching (channel 2a), although here, the inflationary effect is more indirect. A stronger dollar exchange rate makes other countries' goods and services more competitive, shifting spending towards them, and creating indirect inflationary pressures through an overheating economy. This may prompt central banks to engage in

similar competitive rate hikes. This risk is negligible: the empirical literature finds this effect to be drowned out by other, contractionary forces (e.g. Dedola, et al., 2017; Ca' Zorzi et al., 2020).

As the previous sections explained, the Fed's tightening transmits not only inflationary, but also deflationary spillovers – propagated through the expenditure changing channel, a dampening effect of trading partners' foreign demand (2b). These type of spillovers have different implications for the risks of uncoordinated policies.

In case of the competitive appreciation race described above, there is a conflict of interest, giving rise to a beggar-thy-neighbour logic: countries can cut their imported inflation at each other's expense (tightening more, relative to their trading partners, puts them at an advantage). Here, an overtightening risk arises, because the two central banks are tempted to engage in a race to the top.

In case of deflationary spillovers, this conflict disappears, and the risks are of a different nature. A central bank can overshoot its own need for tightening, if it cannot accurately forecast a feedback loop: the drop in demand in its partner economy, triggered by its policy move.

For example, if the Fed tightens, and the ECB tightens in response, the ECB reduces aggregate demand in the Euro area, effectively squeezing foreign demand available for US exporters. The Fed needs to have a correct forecast about the reaction function of the ECB, and the size of the demand drop in the Euro area, because it reduces the need for its own tightening in the first place – the tightening itself aims to create domestic economic slack (a demand gap), and some of that slack is "imported" from abroad (Obstfeld, 2022). Here, overtightening does not emerge out of an inherent interest of each central bank – but because of a mistake, incorrectly accounting for demand feedback-loops, also referred to as "spillbacks" (Brainard, 2022).

Spillovers through the financial channel are similarly deflationary and contractionary in their effect. The risks of uncoordinated tightening are in part, similar to the expenditure changing channel: US tightening tightens monetary conditions globally, and thus squeezes demand abroad. However, the financial channel also carries larger, more systemic risks. Because of the outsized role of the dollar in the global financial system, and widespread reliance on dollar funding, a crunch in dollar liquidity can cascade into a more widespread funding crisis. Here, the lack of coordination can even morph into a full-scale financial crisis.

In sum, uncoordinated monetary policy decisions largely carry overtightening risks: the risk that central banks, in the pursuit of their price stability objective in their respective jurisdictions, overdo monetary tightening.

These risks are particularly worrisome from the euro area's perspective. To start with, the expected slowdown in economic activity in 2023 is more marked than the one expected for the United States, especially as a result of surging energy prices (IMF, 2022a). Furthermore, an overtightening scenario is worrisome for the Euro area because tightened monetary conditions contribute to higher debt financing costs, hitting more indebted euro members asymmetrically.

The following table summarises the transmission channels, their effects on economic activity, and what they imply for the potential benefits of a more coordinated approach. There are three distinct types of risks identified, with different implications:

- The risk of competitive appreciation or an overtightening spiral points to the need for policy coordination. There is an incentive for an either explicit or implicit agreement on interest rate differentials, since a tit-for-tat cycle of subsequent rate hikes hurts the interests of both sides. What is also important, however, is that given the mutually destructive nature of these spirals,

simply correctly anticipating the retaliation from the other side should be enough to persuade authorities not to engage in competitive appreciation.

- The risk of demand feedback loops (or spillbacks) necessitates information exchanges between central banks, so that they can correctly forecast the reaction functions of each other, and factor in demand feedbacks when they define their monetary policy stance. This is less of a "coordinative" exercise, and more focused on consultation and dialogue to better calibrate one's own policies.
- The risk of systemic instability of financial markets as a result of a Fed tightening necessitates yet another kind of cooperation – financial crisis cooperation, for instance through international liquidity provision and provision of swap lines, or synchronised policy moves supported by joint communication to quickly resolve market uncertainty (Ca' Zorzi et al., 2020, p. 49). Because of the central role of the dollar in global finance, the Fed bears a central responsibility in this regard.

Table 2: Overview of spillover channels and their implications for coordination

	Spillover channel	Effect of spillover channel on economic activity	Risk of no coordination	Type of coordination needed
1	Imported inflation	inflationary and contractionary	competitive appreciation	macroeconomic policy coordination
2a	Expenditure switching	inflationary and expansionary	competitive appreciation	macroeconomic policy coordination
2b	Expenditure changing	deflationary and contractionary	demand feedback loops (unaccounted for)	information sharing
3	Financial exposure	deflationary and contractionary	systemic financial instability	financial crisis cooperation (e.g. liquidity provision)

Source: Authors' conception.

4.2. Historical experience

Given the risks that stem from uncoordinated monetary tightening, in principle, a more cooperative approach could help mitigate them or, at least, manage them if they materialise. The historical record of coordination among major economies shows that such coordination can indeed be beneficial. It also shows that different forms of coordination have been experimented with over time. This last section thereby expands on the historical experience with macroeconomic policy coordination and cooperative arrangements in financial crises.

4.2.1. Macroeconomic policy coordination

The most commonly mentioned historical episode that speaks to the importance of international macroeconomic cooperation revolves around the agreement reached among the G5 countries in 1985: the so-called Plaza agreement. This episode is also particularly relevant for the purposes of this analysis

because the economic conditions that led to the Plaza agreement show several similarities with present economic conditions.

The agreement reached in Plaza was primarily motivated by the strong appreciation of the US dollar against the other major currencies. To fight domestic inflation, the US Fed led by Chairman Paul Volcker set in motion a decisive tightening cycle. Monetary tightening broke the back of inflation: core consumer price index inflation, which had surpassed 11% in 1979, fell to under 5% by 1982. However, the success at taming inflation was not without consequences. First, inflation-fighting came at the cost of domestic recession and high unemployment that reached 10.8% in November 1982. Second, the Fed tightening unleashed serious global spillovers via the appreciation of the dollar. In particular, from 1980 to 1985, the value of the dollar climbed around 44% against other major currencies (Frankel, 2015, p. 2, also Bordo, 2021, p. 599).

By 1985, the global implications of the strong dollar had become a highly politicised issue. In Europe, Germany and France were particularly vocal in complaining about the imbalances which had led the Bundesbank to intervene to offset the depreciating mark and the French to advocate for coordinated intervention in the foreign exchange market (Frankel, 2015; Bordo, 2021). US economic authorities initially shrug off the complaints arguing that the strong dollar reflected a global vote of confidence in the US economy (Frankel, 2015). However, as the strong dollar started to become a drag on the US economic activity, the background was ready for the agreement negotiated at the Plaza Hotel in New York City. The agreement revolved around coordinated exchange market interventions to bring down the value of the dollar and paved the way for the attempts at intensive coordination of major economies' macroeconomic policies that extended into 1987, with the Tokyo summit and the Louvre accord (Bergsten and Green, 2016).

The Plaza accord is often referred to as a watershed episode of economic cooperation among major advanced economies. What are the lessons that can be drawn from this notable episode for the prospect of global macroeconomic cooperation in general and under current circumstances in particular?

First, the conditions that favoured Plaza are deeply connected to developments in US politics and economic conditions in other major economies. To start with, despite the international pressures and complaints in the US, what ultimately led the US to accept a devaluation of the dollar were the risks for the US export sector and the mounting protectionist threats in the US Congress (Frankel, 2015). Furthermore, economic conditions in key US trading partners at the time were also crucial to pave the way for the Plaza accord. In 1985, both Germany and Japan were experiencing a positive expansionary cycle. This means that these countries "could afford to take a longer view, accepting that some near-term currency correction would stave off larger protectionist and other problems in the future" (Bergsten and Green, 2016, p. 8). These conditions are hardly on display in current circumstances, notably neither in the US nor in the euro area.

Second, the evidence of the success of the Plaza accord is mixed. In particular, there are mixed views about the effectiveness of coordinated exchange market interventions in bringing down the dollar value. While some scholars argue that these interventions and the discussion that led to the agreement are key to understanding market reaction (Frankel, 2015), others argue that the exchange rate policy is only a limited factor to explain the dollar decline, particularly because the dollar had peaked well before Plaza (Feldstein, 1988, 1994, see also: Taylor, 2016). Furthermore, the effect of foreign exchange market intervention proved short-lived. The dollar depreciated significantly after the Plaza accord leading to later interventions to stabilise its value.

The mixed evidence on the effectiveness of Plaza also helps explain the evolution of the thinking of global macroeconomic cooperation. As Frankel (2015, p. 12) writes tellingly, "In 1985, G7 coordination meant joint intervention in the foreign exchange market. Today G7 coordination means refraining from intervention, which is called currency manipulation." Furthermore, by the end of the 1980s, major economies came to embrace the view according to which the best mechanism to ensure global macroeconomic stability does not lie in foreign exchange market interventions and coordinated macroeconomic policies. Achieving global macroeconomic stability came to be associated instead with the domestic monetary policy actions carried out by independent central banks acting in their own countries' interests (Bordo, 2021). This thinking has weakened the case for global macroeconomic coordination of the like that had taken place in the 1980s. Global cooperation was instead re-conceived largely in terms of financial crisis management.

Box 1: Dollar strength episodes and multilateral adjustment

Each time the dollar surges against other currencies, calls for a "new Plaza Accord" usually intensify in media and policy discourse. What follows is a quick comparative overview of three episodes of outsized dollar strength, to assess similarities, differences, and conditions for multilateral adjustment – and to show why a "new Plaza" is politically improbable.

1985: Plaza Accord. The agreement to weaken the dollar through a multilateral intervention was rooted in domestic interests within the United States, manufacturers and farmers were seeking competitiveness gains from devaluation. The "twin deficits" problem got politicised, and Congress threatened G5 partners with tariffs if they did not move to correct their "undervalued" exchange rates (Ito 2009). There was also an element of coinciding interests: trading partners with persistent surpluses, like Germany and Japan, had a reason to agree to revaluation (beyond their interests in avoiding tariffs): to push down domestic inflation. Average inflation in the 5 years preceding Plaza was over 6% in Germany, just below 5% in Japan.

2016: Trade war, no adjustment. The dollar appreciation cycle from the 2010s onwards reached a boiling point around 2016, with demands for protectionist policies in the US growing louder. Some of the factors that facilitated the Plaza Accord were there. The US had a vested interest in propping up the ailing manufacturing sector, who were especially sore because of widespread claims of Chinese "currency manipulation." Trade deficits were politicised. After the February G20 meeting, there were even speculations about a "secret" Shanghai Accord, an agreement to weaken the dollar, which was denied by all parties. This time, multilateral adjustment did not materialise, not even after the US actually levied tariffs. Why not? First, managing interests in a G5 setting was probably easier than in a G20, with China (a systemic rival) among the players. Second, while the 1980s was an inflationary period in Europe and Japan, the world had the opposite problem in the 2010s: deflationary pressures. Finally, between the 1980s and the 2010s, attitudes towards exchange rate interventions changed too, towards a more market-driven logic.

2022: Adjustment unlikely. What sets the current case apart is that this time, there is no appetite from the US side to weaken the dollar, until the Fed can bring down inflation (Wolf, 2022). This would be a necessary condition for any coordinated intervention. Other factors hindering agreement in 2016 are also still relevant: it is difficult to coordinate interests on the G20 level, and there are doubts about the effectiveness of exchange rate interventions.

The following table summarises these factors, suggesting that political conditions for a 'new Plaza Accord' are not present in 2022.

	Participants	Domestic pressure	Partners' inflation	Multilateral adjustment
1985	G5	high	high	yes
2016	G20	high	low	no
2022	G20	low	high	*unlikely*

Source: Authors' own conception.

4.2.2. Financial crisis management cooperation

By the 1990s, high-income countries definitely moved away from the use of foreign exchange market interventions as a way to address the international spillovers of currencies misalignments (Bordo and Schwartz, 1991; Bordo et al., 2012). As anticipated, two factors underpinned this development. First,

the evidence on the effectiveness of foreign exchange market interventions was not straightforward (Truman, 2003). Second, developments in macroeconomic theory and practice came to prioritise low inflation as the goal for independent central banks to pursue with the attendant expected benefit of reducing instability in nominal exchange rates (Bordo, 2021, p. 597). This intellectual context combined with the achievement of low inflation in the era of Great Moderation led global cooperation to address the spillovers of monetary and currency misalignments to take the form of crisis management. In the 1990s, crisis management cooperation was mostly meant to address the macroeconomic and financial stability risks stemming from the crises in emerging market countries (Moschella, 2010). With the onset of the global financial crisis, however, cooperation returned to address problems, also among high-income countries.

The 2008 global financial instability triggered the usual search for dollar assets safety among investors, leading to the appreciation of the US dollar. In addition to the global flight to safety under conditions of market volatility, a significant source of pressure for dollar appreciation was the unwinding of carry trades, with the dollar rising as a key funding currency (McCauley and McGuire, 2009). The subsequent scramble for the US currency made it hard to borrow contributing to the global dollar shortage. European banks faced some of the most acute difficulties in raising dollars. Indeed, as Baba, McCauley, and Ramaswamy (2009) show, European banks had increased their dollar asset positions from about USD 2 trillion in 1999 to more than USD 8 trillion by mid-2007.

Central banks responded to the dollar funding strains in the global financial system by creating swap lines agreements (McCauley and Schenk, 2020). Given the importance of the US dollar to the global banking system, the swap lines the Fed extended were crucial to alleviate the dollar funding problems and restore market confidence. In particular, since 2008, the Fed established swap lines with selected advanced and emerging market economies. The Fed swap line to the ECB was initially extended in 2007 and expanded in size in 2008. In addition to the emergency and ad hoc Fed swap lines, the central banks of major advanced economies established a network of permanent swap lines among themselves. In particular, since 2013, the Bank of Canada, Bank of England, European Central Bank, Bank of Japan, Federal Reserve, and Swiss National Bank have standing swap arrangements in place.

With the re-emergence of stress in the US dollar funding market in the wake of the 2020 COVID crisis, international swap lines were once again activated to alleviate pressures on domestic banks. For instance, most of the Fed's counterparty central banks—all but those of Canada, New Zealand, and Sweden—drew upon their US dollar swap lines in 2020. In contrast, the ECB's swap lines with other advanced economies went largely unused, reflecting the limited turmoil in the euros market (Steil et al., 2021).

Recent experience suggests that central banks' swap line agreements, particularly the Fed's swaps, were important tools to alleviate funding stress and restore market confidence during the 2008 and 2020 crises (Allen and Moessner, 2010; Aizenman et al., 2021). Similar beneficial effects can be expected in future crises, including one that could be triggered by the surge in US dollar. As discussed above, the dollar's dominance in the global financial system has not disappeared after the 2008 and 2020 crises (see Section 3.2 above). This creates benefits but also vulnerabilities, especially for borrowers in foreign (US dollar) currency. Cooperation among the Fed and other central banks is thus an important crisis management tool to address market turmoil triggered by tightened monetary and financial conditions in the US. Of course, this tool has limits. To start with, the Fed swap lines are with "selected" countries, meaning that the financial safety net they provide is circumscribed. Second, albeit important, swap lines are crisis management tools, that is to say, they are important in managing crises after they occur. However, they are only partially designed to prevent crises from happening in the first place.

5. CONCLUSIONS AND RECOMMENDATIONS

As the central bank of the world's reserve currency, the Fed's monetary policy decisions have effects well beyond the borders of the United States. The post-2021 Fed's decisive tightening of monetary policy has been no exception: following the US Fed's interest rate rises, the value of the dollar has surged, sending international shockwaves through the global trade and financial systems. The US is also not the only country grappling with inflationary pressures: by 2022, all major central banks in advanced economies have tightened monetary policy.

This cycle of uncoordinated monetary policy decisions carry the risk of inducing an excessively contractionary effect on economic activity, going beyond what is needed to bring inflation to the target. As discussed in this paper, central banks can get into competitive appreciation cycles, they can mismeasure the effect of demand feedback loops as they calibrate their monetary policy stance, and a generalised credit crunch can cascade into broader financial turmoil.

The historical record shows that a degree of coordination can be beneficial to address the overly contractionary risks. However, coordinated macroeconomic policy adjustments or multilateral interventions in foreign exchange markets like the ones marked by the 1985 Plaza Accord do not look realistic in current circumstances. Neither the US nor its major trading partners in advanced economies are in a political situation that favours the pursuit of international over domestic economic goals.

Policy makers, and especially monetary policymakers, could focus their cooperative efforts along three directions:

1) Avoiding a "race to the top" and a mutually damaging cycle of competitive appreciation. This can happen through an (even implicit) coordination of interest rate movements, or simply by taking into account the risk of retaliation, and not engaging in overtightening spirals. Forward-looking policymakers would see that after multiple rounds of tightening, the competing sides end up with the same interest rate differential and same amount of imported inflation they started with, but at higher levels of interest rates, unleashing unnecessarily harsh recessionary forces in the process;

2) Fostering information exchanges among central banks about their respective policy reaction functions, so that demand spillovers are properly taken into account. Monetary authorities have a long history of information-exchange cooperation and well-established fora for the exchange of analyses and data. This web of interactions can be easily utilised to help central banks calibrate their monetary decisions under current, uncertain circumstances, also by factoring in how they reinforce each other's policy impacts;

3) Strengthening financial safety nets to increase the resilience of the global financial system in the face of tightening shocks. Here, an avenue to explore could be formalising existing ad-hoc arrangements for international liquidity provision and swap lines, so that there are ex-ante blueprints for cooperation in crisis times. As shown by examples in previous episodes of financial stress, joint policy movements and coordinated public communication can also be helpful to raise market confidence in uncertain times.

An important overall message is that although some degree of coordination of monetary policies can alleviate risks from overtightening in the future, the euro area's painful inflationary and recessionary trends are not rooted in uncoordinated monetary policies. The policy measures necessary to counteract existing challenges need also to focus on supply side issues like the regulation of energy markets, rather only on demand management via central banks.

The toxic mix of high inflation and deepening economic contraction leaves policymakers with difficult choices, and this is not a crisis with easy ways out. Factoring in the complex effects of global spillovers

pile on top of these challenges. This calls for a cautiously calibrated policy stance, walking the tightrope between decisively fighting inflation, but avoiding that overly vigorous rate hikes spark off a global recession or financial volatility. A more coordinated approach to monetary policies is one tool to help walking that tightrope.

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Inflation pressures have triggered a largely synchronised tightening of monetary policy around the world. The sharp appreciation of the US dollar is adding to the challenges that policymakers confront. The paper sets out to identify the channels through which US tightening spills over to the rest of the world, with a particular focus on the euro area. It also examines the risks that stem from uncoordinated monetary tightening and discusses how different forms of global cooperation can help mitigate those risks.

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