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Is monetary tightening a threat to financial stability?

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Is monetary tightening a threat to financial stability?

Abstract

The rise of policy rates in the euro area has led to a tightening of financing conditions raising concerns for financial stability. The risk of financial crisis should be neither ignored nor overstated. The euro area is not facing conditions for which there would be the highest probability of a crisis. The risk faced by banks depends on the share of adjustable-rate mortgages. At this stage, net interest margin of banks and profitability have slightly improved.

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LIST OF ABBREVIATIONS

APP	Asset purchase programme
ARM	Adjustable-rate mortgage
CET	Common Equity Tier
ECB	European Central Bank
EP	European Parliament
ESRB	European Systemic Risk Board
EU	European Union
FRM	Fixed-rate mortgage
GFC	Global financial crisis
GDP	Gross domestic product
IMF	International Monetary Fund
LCR	Liquidity coverage ratio
NPL	Non-performing loans
NSFR	Net stable funding ratio
HICP	Harmonised index of consumer prices
PEPP	Pandemic emergency purchase programme
RWA	Risk-weighted asset
TEU	Treaty on European Union
TFEU	Treaty on the Functioning of the European Union
TLTRO	Targeted longer-term refinancing operations
TPI	Transmission protection instrument
SVB	Silicon Valley Bank
USD	US dollar

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EXECUTIVE SUMMARY

- Despite the role of the ECB in the financial supervision of the banking sector, the distinction remains between the authority in charge of the implementation of monetary policy – the Governing Council – and the authority in charge of the supervision of the European banking sector – the Supervisory Board. **An important issue is whether, the implementation of monetary policy should consider the risks for financial stability**.
- The hierarchy of the objectives of the ECB, as laid down in Treaties, highlights that price stability may be conducive to financial stability. However, there can be trade-offs between price stability and financial stability as **financial stability may be hurt by monetary policy decisions**.
- Since the increase of the policy rates in July 2022, market interest rates have increased at all maturities, retail banking interest have risen, credit conditions have tightened and credit growth has decreased.
- Based on historical data for the United States, we show that not all tightening periods are followed by adjustments of stock prices, house prices and the ratio of credit-to-GDP. **The financial cycle is not correlated with the inflation gap**.
- Recent evidence show that the probability of a financial crisis rises in the first two years following the increase of interest rates. More importantly, **the risk of financial crisis is amplified when there has been an excessive credit growth or asset price bubbles**. In the current context, **the risk of financial crisis in the euro area should be limited** because the ratio of credit-to-GDP has diminished and there is rather weak evidence of stock and house price bubbles.
- The trade-off between financial stability and price stability may also be addressed through the share of adjustable-rate mortgages (ARMs). With ARMs the interest rate risk would be passed through to homeowners, whereas **with fixed-rate mortgages (ARMs) more risk is born by the banking system**. There is substantial heterogeneity in the share of ARMs among euro area countries. The share of ARMs also changes substantially of over time. This implies of course that monetary policy is being transmitted very unevenly across countries and that the risk for banks is unevenly distributed.
- **Net interest margin in the euro area is on the rise in conjunction with rising interest rates**. This can be explained by the fact that banks enjoy low rates on sticky deposits, while they increase interest rates on credits. Anecdotal evidence in fact also seems to suggest that **banks tend to "like" higher interest rates**. Finally, return on equity also seems to be on the rise (overall) in 2022-Q4 compared to a year ago.

1. INTRODUCTION

Since July 2022, the key ECB policy rates have been increased at each Governing Council with the aim to bring inflation back to target. These decisions are part of a worldwide monetary tightening cycle. Since the bulk of the rise in euro area inflation stems from the direct and indirect effects of rising energy prices, the ECB has faced the well-known trade-off when the economy is hit by energy shocks. Dealing with inflation as requested by its mandate may be at the cost of amplifying the economic slowdown.

Yet, the rise of interest rates has also given rise to another trade-off as there may be a risk that the tightening of financial conditions will ultimately lead to financial instability and a banking crisis. The *souvenir* of the Global financial crisis has indeed resurfaced after the recent setbacks of banks in the United States and of Credit Suisse in Switzerland. These events remind us that financial crises are often preceded by interest rate increases, even though whether interest rate increases really cause financial crisis is open to debate. The banking crisis in Scandinavian countries, in the beginning of the 1990s, was for instance preceded by a tightening of monetary policy as central banks were aiming to reduce inflation.[1] This was also the case in 2008. The Global financial crisis followed a tightening of monetary policy cycle that started in June 2004 in the United States with the Federal fund target reaching a peak in June 2006. Will this time be different? Are interest rate increases always followed by financial risks such that central banks would not be able to reach price stability without endangering financial stability? This concern contradicts the "conventional wisdom", which prevailed before the Global financial crisis according to which price stability is a sufficient condition for financial stability (see section 2). While this view has clearly been questioned after 2009, it remains true that monetary policy inevitably affects both price and financial stability as its transmission fundamentally hinges on its pass-through to asset prices and bank credit.

The risks of financial crisis may not only be rooted in credit variables and asset prices. Financial fragilities also stem from the risk exposure of the banking system. Financial crises indeed occur when the level of risks taken by the system as a whole is excessive, which may not only be seen through the dynamics of credit but also through macroprudential indicators.

With the sharp rise of interest rates in the euro area as well as other countries, notably in the United States, it is crucial for central banks to monitor not only inflation but also how asset prices, banking credits and banks' ability to deal with tightened financial conditions react. Although the aim of the central bank is to slow down the economy, the central bank is not looking for a financial crisis. This would probably push the economy too far into depression, which would eventually lead the central banks to a sudden reversal of the monetary stance. It is therefore crucial to document the interconnection between monetary policy, financial stability and price stability. To complement this analysis, we also aim to gauge the risks through macroprudential indicators.

[1] See Blot et al. (2009).

2. THE LINK AND INTERACTION BETWEEN PRICE STABILITY AND FINANCIAL STABILITY

2.1. The Treaties

According to the Treaty on the Functioning of the European Union (TFEU, Article 127(1) and Article 282(2)), the primary objective of the European Central Bank (ECB) is to maintain price stability within the Eurozone. Following its latest strategy review in 2021, the ECB Governing Council "*considers that price stability is best maintained by aiming for two per cent inflation over the medium term. The Governing Council's commitment to this target is symmetric. Symmetry means that the Governing Council considers negative and positive deviations from this target as equally undesirable. The two per cent inflation target provides a clear anchor for inflation expectations, which is essential for maintaining price stability*".

Without prejudice to the price stability objective and beyond the secondary objectives as laid down in Article 3 of the Treaty on the European Union (TEU), "*the European System of Central Banks shall contribute to the smooth conduct of policies pursued by the competent authorities relating to the prudential supervision of credit institutions and the stability of the financial system*".

While the ECB has neither an exclusive power in the achievement of financial stability nor competence to act on its own, in practical terms, the ECB performs its financial stability role through a number of tools and activities. These include:

- Conducting regular macro-prudential assessments to identify and monitor systemic risks in the financial system;
- Participating in international discussions and agreements on financial regulation and supervision;
- Providing liquidity support to the banking system in times of stress;
- Supervising significant banks directly through the Single Supervisory Mechanism (SSM);
- Coordinating closely with national supervisors and other European institutions to ensure a consistent approach to financial stability issues.

By promoting financial stability and ensuring a sound banking system, the ECB is meant to create the conditions necessary for price stability to be maintained in the euro area over the long term.

In addition to the tools and activities mentioned, the ECB also oversees and evaluates financial market infrastructures to minimise risks and improve their overall functioning in the euro area. Furthermore, the ECB collaborates with other central banks to trade, lend, and provide monetary policy operations.

Despite the ECB's role as financial supervisor of the banking sector since 2012, the distinction remains between the authority in charge of the implementation of monetary policy – the Governing Council – and the authority in charge of the supervision of the European banking sector – the Supervisory Board. Moreover, the supervision focuses on banks while the issue of financial stability is more general.[2] An important issue is therefore whether and how the ECB considers the risks for financial stability in the conduct of the monetary policy. Should it be considered as a second objective?

On this peculiar topic, at this stage, it is certainly important to recall the strategic change elaborated by the ECB after its Strategy Review in 2021. Financial stability is a precondition for price stability and vice

[2] See Allen and Wood (2006) for a discussion.

versa[3]. This statement is at odds with the former strategy that assumed that price stability was a precondition for financial stability, but not the other way round (see below). This new strategy allows the ECB to argue that there is no trade-off between both objectives or, following Isabel Schnabel's recent speech in London (19 May 2023), that there is a separation principle. According to Schnabel, this separation principle "posits that monetary policy stance considerations can be separated from financial stability concerns" if different monetary instruments are used to achieve different targets according to the Tinbergen principle[4]. With unconventional measures such as liquidity interventions targeted at banks' stability and conventional measures targeted at price stability, the ECB would have been able to achieve both objectives with none of its policies hurting any of them. Does it always work this way? Isabel Schnabel answers yes in most cases, except during the Silicon Valley Bank (SVB) turmoil which is unfortunately quite topical at the moment.

2.2. Why price stability can be important for financial stability

The hierarchy of the objectives of the ECB, as laid down in Treaties, highlights that price stability may be conducive to financial stability. Why might it be so? There are five common lines of argument that would go in such a direction.

- Greater predictability: when prices are stable, it is easier for people and businesses to plan and make decisions. Uncertainty around prices can make it harder for investors to make informed choices, and for businesses to make accurate financial projections.
- Lower risk of asset bubbles: during periods of high inflation, investors may look to put their money balances into assets like property or stocks, which can drive up their prices to unsustainable levels. When inflation is low and stable, there is less pressure to chase higher returns through riskier investments, and bubbles can be avoided.
- Encourages responsible borrowing and lending: when interest rates are low and inflation is stable, borrowers are more likely to borrow a lot while lenders are more likely to lend only a little. This reduces the risk of financial instability caused by excessive borrowing and lending.
- Maintains confidence in the currency: when prices are stable, people have more confidence in the currency and are more willing to use it for transactions. This reduces the risk of a currency crisis, which can lead to financial instability.
- Promotes economic growth: when prices are stable, the economy can grow more predictably and with lower risks. This can lead to job creation, increased investment, and higher standards of living for citizens. Overall economic stability promotes financial stability.

The latter points give the mainstream view about the causation from price stability to financial stability that prevailed at least since the global financial crisis (GFC). It originated in a few academic contributions that went under more scrutiny after the GFC (see Blot et al., 2015, for a critical review of these early contributions).

Actually, the causal relationship between monetary and financial stability gave rise to a conventional wisdom: "*A monetary regime that produces aggregate price stability will, as a by-product, tend to promote stability of the financial system*" (Borio and Lowe, 2002, p.27). This conventional wisdom originates in Schwartz (1995). She highlights the detrimental effects of inflation (price instability) on asset prices. She

[3] See Financial Stability Review, November 2021: https://www.ecb.europa.eu/pub/financial-stability/fsr/html/ecb.fsr202111~8b0aebc817.en.html

[4] Tinbergen (1956) showed that to achieve *n* targets, policymakers need to control at least *n* instruments.

notably argues that inflation brings distortions, uncertainty, shortened investment horizons, and governments' nominal gains via the inflation tax that gives an incentive to raise government expenditures, deficits, and debts.

Before the GFC, the "conventional wisdom" had already come under criticism, e.g. by Borio and Lowe (2002), Rajan (2005), White (2006) and Leijonhufvud (2007), although it had had no concrete consequences on the mandate of central banks. The afore-mentioned authors claimed that monetary stability could lead to financial instability because low interest rates ("cheap money") favour risk-taking in the choice of projects (see also Adrian and Shin, 2009). They also pointed out that major economic and financial crises were not preceded by inflationary pressures. This is the "paradox of credibility": central banks have gained credibility in curbing inflation, which has ultimately led to an increase in the vulnerability of the financial system. Consequently, inflation is not a good predictor of banking or financial crises (IMF, 2009) whereas larger credit-to-GDP ratios are (Schularick and Taylor, 2012).

2.3. Possible trade-offs

There can be trade-offs between price stability and financial stability. At least three kinds of reasons may make it complicated to achieve one of those two objectives without hurting the other.

First, financial stability may be hurt by monetary policy decisions. While central banks may increase interest rates in order to maintain price stability, this can also lead to a tightening of credit conditions which can affect financial stability. The transmission of monetary policy actually hinges on its effects on financial conditions. The literature on those transmission channels emphasizes the role of the interest rate channel, the credit channel and the asset price channel. All the variables on which these channels rest may affect financial stability.[5] The impact of monetary policy on asset prices can also modify financial risk (see Drechsler et al., 2018). Besides, a change in aggregate demand after a monetary contraction can trigger a change in the demand for credit, in interest rates and asset prices. An economic slowdown and a recession may trigger losses in the financial market. It may increase the risks of financial instability (Figure 1). Finally, there is a feedback loop of financial instability on the economic downturn as emphasised by Bernanke et al. (1999) with the financial accelerator: the tightening of credit conditions to dampen an adverse shock ultimately amplifies its propagation. With the adoption of the Transmission Protection Instrument (TPI), the ECB intends to limit this feedback loop to the economy. Yet, it rests on the purchases of public, rather than private, securities. The trade-off between financial and price stability may still arise with the current monetary instruments.

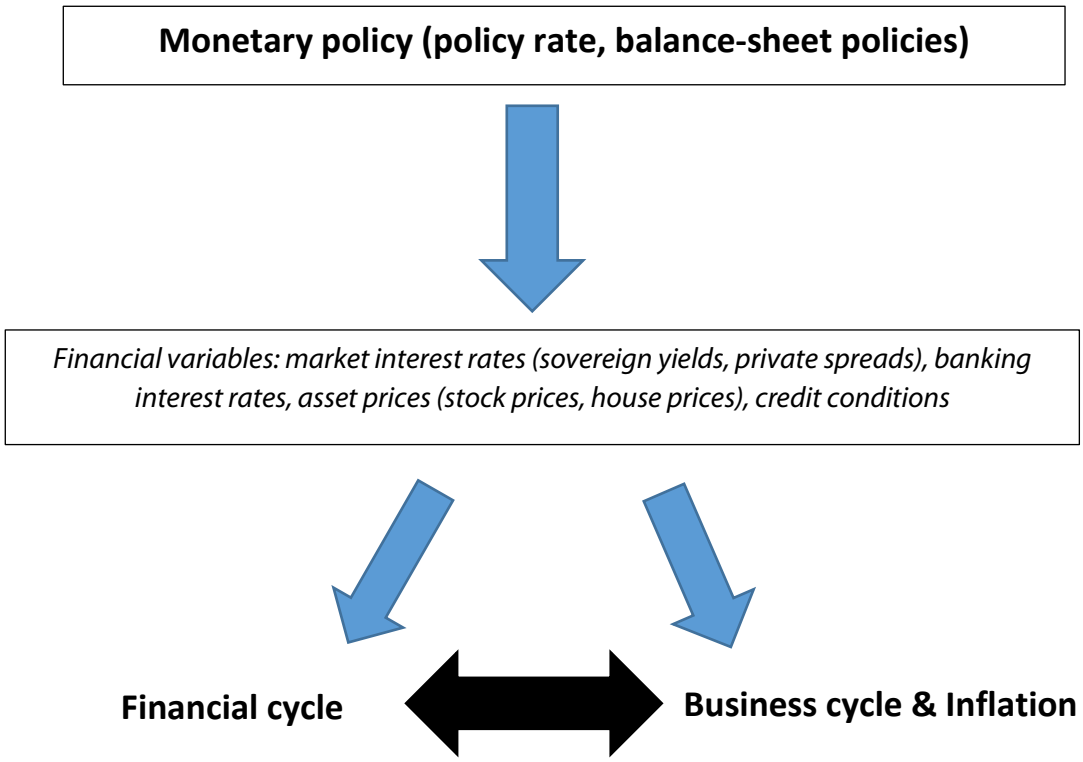
Second, financial sector vulnerabilities like rising non-performing loans (NPL) may be detrimental to price stability. However, the mere decision to limit the share of NPL in total credit, via an overall limit on banking credit or higher interest rates, will inevitably weigh on economic growth. The "leaning against the wind" policy (see Woodford, 2012) [6] would end up increasing rates beyond the level that would be required by the macroeconomic variables and the central bank could then undershoot the inflation target.

Third, although this is much less relevant for a large and advanced area like the Eurozone, external shocks may have an impact on the balance of payments. Global economic shocks like an oil price surge or economic sanctions can translate into an abrupt drain on a country´s foreign reserves. Any uptick in interest rates designed to mitigate such shocks could strain the economy and financial markets and feed financial instability (see e.g. IMF, 2020).

[5] This may call for a better coordination of monetary policy and macroprudential policy as emphasised by Malovaná and Frait (2017).

[6] After a boom in credit, a "leaning against the wind" policy consists in raising policy rates substantially, in a kind of "whatever it takes" policy to curb the credit cycle, regardless of the business cycle position or the inflation rate.

Figure 1: Monetary policy transmission, the business cycle and financial stability



Source: Authors.

3. THE INTERCONNECTION BETWEEN PRICE AND FINANCIAL STABILITY

3.1. Financial conditions in the euro area

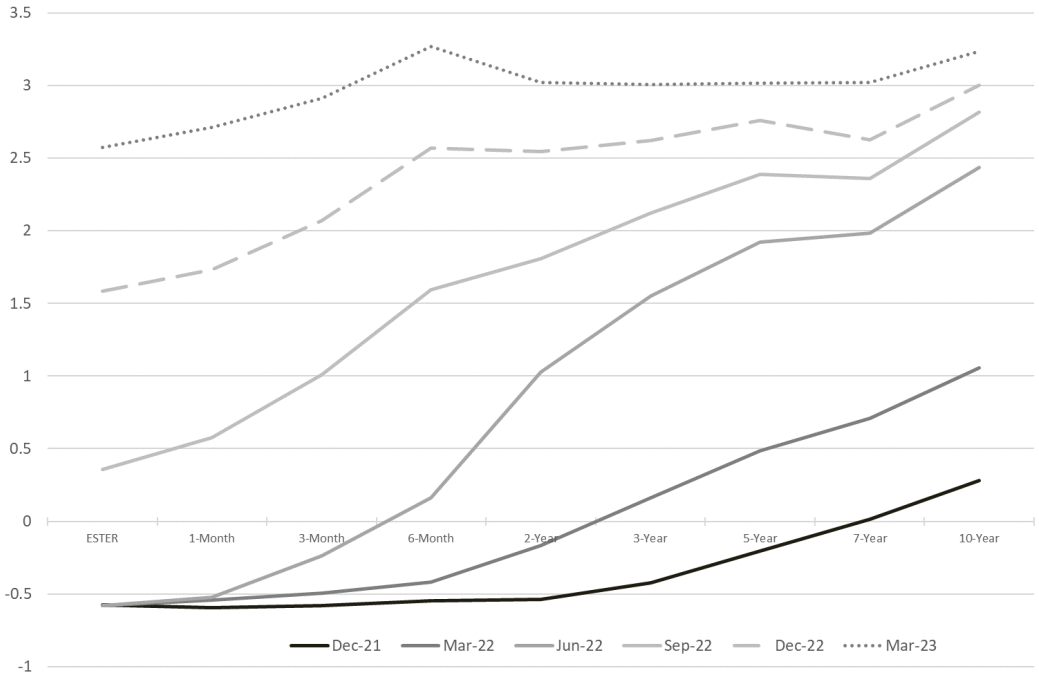
The role of financial variables in the transmission of monetary policy can be easily seen in the recent context of policy tightening. The ECB started to increase its policy rate in July 2022. Figure 2 highlights the terms structure of interest rate in the euro area. More precisely, for some selected dates, it shows the level of interest rates at different maturities: the overnight rate (ESTER), the interbank interest rates for maturities below two years and the sovereign yields for maturities from two years to ten years. It shows that long-term interest rates increased *before* the first policy rate hike as illustrated by the difference in the term structure of interest rates in December 2021, in March 2022 and in June 2022. It reflects the fact that the decision was expected. Actually, it was announced in a forward guidance statement 9 June 2022[7] ahead of the July meeting of the Governing Council. The stance of monetary policy was also modified through the announcements regarding the phase out of asset purchases. According to the term structure of interest rates, the yield on a sovereign bond for a given maturity accounts for the expected policy rate. With the rise of inflation in the euro area, financial investors started to anticipate the future increase in the policy rate from the beginning of 2022. From September 2022 onwards, the change in the term structure has mainly resulted from the change of interest rates at short maturities whereas the increase in the 10-year sovereign rate did not exceed 1 percentage point.

As banks obtain refinancing from the Eurosystem, the change in the policy rate increases their cost of funding, which is then passed through to the retail market banking interest rates (Figure 3). For credit granted at longer maturities, the interest rate set by banks not only depends on the policy rate but also on market rates. Thus, the decisions on the policy rate are passed through to the banks either "directly" or indirectly through market interest rates.

Monetary policy is also expected to be transmitted to other asset prices, notably to stock and house prices. The DJ Euro Stoxx 50 index decreased from the end of 2021 until October 2022, potentially also reflecting (at least in part) the effect of policy announcements. Since Bernanke and Kuttner (2005), it has been largely documented that policy decisions, and mainly unexpected decisions, affect stock prices. Yet, daily prices may react to the flow of new information that are priced in by financial investors. Thus, the decrease of the stock prices in the euro area would also be the consequence of the Russian war against Ukraine, as it was expected that this event would amplify the energy crisis and weigh on the economic outlook. Beyond the decision taken by the ECB about the policy rate, the information conveyed by central banks when taking decisions and communicating about their economic forecasts may also trigger a reaction of stock prices.

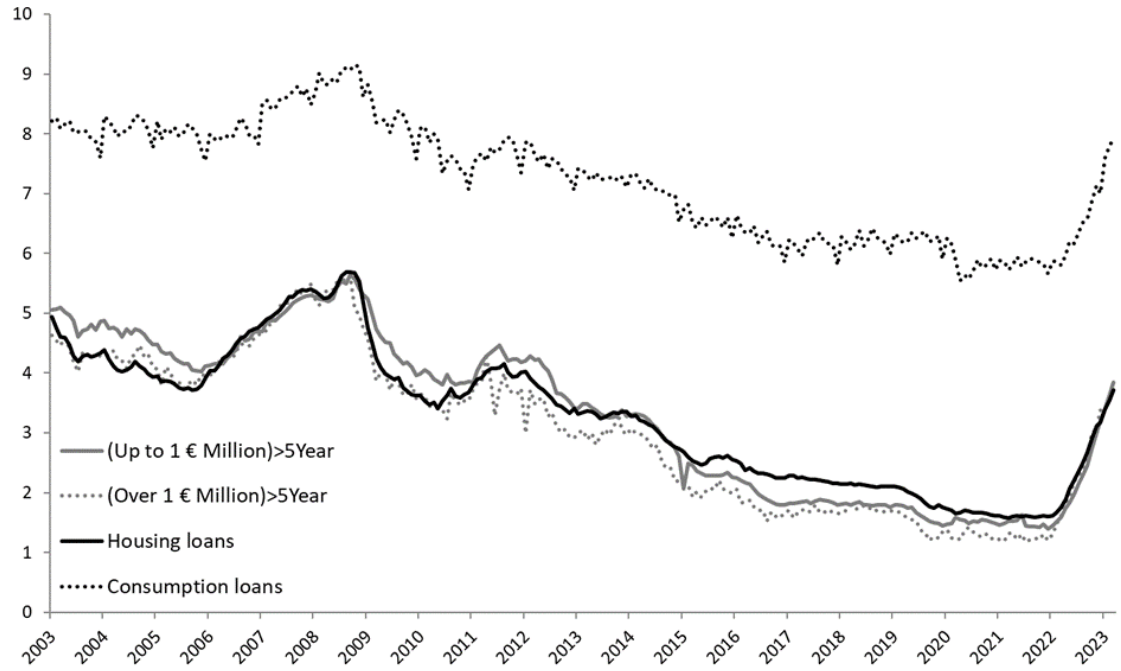
[7] During the press conference, Christine Lagarde stated explicitly that "Accordingly, and in line with our policy sequencing, we intend to raise the key ECB interest rates by 25 basis points at our July monetary policy meeting."

Figure 2: Term structure of interest rates in the euro area (in %)



Source: Refinitiv Eikon Datastream.

Figure 3: Retail banking interest rates (in %)

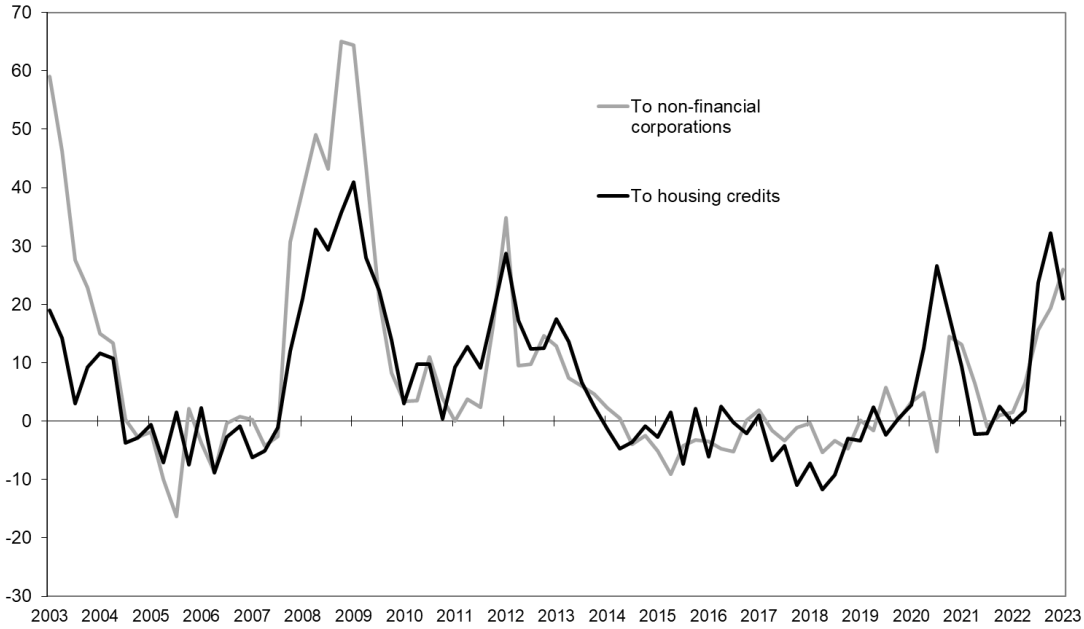


Source: ECB.

Regarding the effect on house prices, the transmission channel is different notably because housing prices are not continuously quoted and do not react immediately to news (the housing market is not as liquid as the stock market). The effect of monetary policy is transmitted with more delay and may notably depend on the retail banking interest rates and on the credit conditions set by banks, beyond the interest

rates. According to the credit channel of monetary policy, banks may choose to reduce the supply of credit by asking for more collateral requirements before granting credits, taking additional margins on loans, notably on riskier loans, and tighten any other factor so that a given borrower with the same risk profile finds it harder to get some credit from banks. The Banking Lending Survey conducted by the ECB provides information on those conditions by asking whether banks have (and will) tightened or eased credit conditions for housing loans, consumption loans and loans to non-financial corporations (Figure 4). It shows that banks in the euro area have tightened credit conditions since March 2022. Consequently, the credit dynamics may slow-down either because of higher interest rates reduce demand or because banks constrain access to credit. According to the ECB, the yearly growth of the outstanding amount of credit to households and firms in the euro area was 3.1 and 4.8% respectively in March 2023 against a peak at 4.8% for household in July 2022 and 8.3% for non-financial corporations in October 2022.[8]

Figure 4: Net percentage of banks responding that they have tightened credit conditions



Source: ECB (Bank Lending Survey).

3.2. Monetary policy, financial cycle and price stability

Even if financial variables are expected to react to monetary policy decisions, the key issue is whether those reactions do increase financial instability and the risk of financial crisis as well as whether there may be a conflict with the price stability objective of central banks. To that end, we may have better insight on the connection between monetary policy, financial stability and price stability by looking at US data available over a longer period, which may then account for several tightening episodes and therefore more financial cycles.[9] To that end, we first identify periods of tightening (and easing) monetary policy and financial cycles computed for the stock, the housing and the credit markets. We disentangle periods

[8] In March 2023, the production of new credits was 40% and 3.5% lower for house purchase and consumer loans compared to March 2022.

[9] For instance, the credit-cycle computed by the BIS for the euro area is only available from 2009-Q1 whereas it is calculated since 1957-Q4 for the United States. Consequently, it only covers one financial cycle for the euro during which monetary policy was almost always expansionary. Over the common period, Figure 10 in the Annex shows that bot cycles are correlated. In both areas, there was a peak in the credit cycles occurred in the early 2021. The last dip would have occurred earlier in the United States (2013) compared to the euro area (2018).

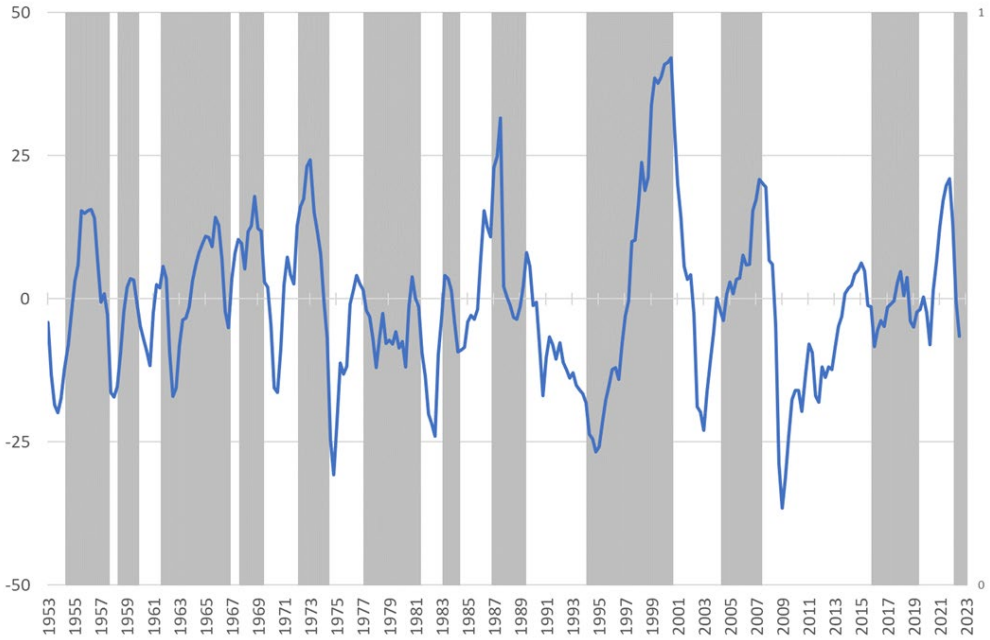
during which the policy rate (the effective federal funds rate) set by the Federal Reserve increases from those during which it decreases. The identification of the financial cycle is trickier as financial instability may be captured by several variables. As in Drehman et al. (2012), we focus on equity prices, house prices and the credit-to-GDP ratio. For the credit market, the BIS calculates a credit cycle as the difference between the credit-to-GDP ratio and statistical trend aimed to capture what would be the level of this ratio in "normal conditions". We resort to a close methodology to compute the housing and stock price cycles.[10] The data are collected from Shiller for the real equity and housing prices.[11]

We show that not all tightening periods are followed by adjustments of stock and house prices (Figure 5 and Figure 6). The equity cycle may switch from a dip to a boom during the period in which the Federal Reserve tightens the US monetary policy. This is notably the case in the 1950s and 1960s. In 1987, the beginning of the tightening period coincides with– if not triggers – a sharp contraction in stock prices. Yet, during the 1990s, the Federal Reserve started increasing interest rates in a period of low stock prices and, despite several interest rates hikes, a boom of equity prices was observed. From 1953 to 1963, the housing cycle was very flat despite three episodes of tightening monetary policy and two periods of easing. The tightening cycle that started in 1972 has been followed by the end of the boom in housing prices but, during the 1990s, there has been a long decline in house prices despite a period during which the Federal Reserve did ease monetary policy. The housing boom that preceded the GFC started in the end of the 1990s despite a rise of the policy rate. The boom amplified in the early 2000s when the Federal Reserve loosened its monetary policy stance following the dotcom crash. From 2004, the central banks started to tighten the monetary policy stance as inflation had increased above 3 %. The housing boom did however continue until the end of 2006. The increase of interest rates did certainly play a role in bursting the housing bubble, but it did also prevent its start in the 1990s so that the duration of the boom has not always been related to monetary policy.

[10] The identification is based on a statistical (Hodrick-Prescott) filter.

[11] Both variables are deflated by the consumer price index (CPI). The stock price is the S&P composite index.

Figure 5: Monetary policy tightening in the US and the equity price cycle (deviation from a statistical trend in %)

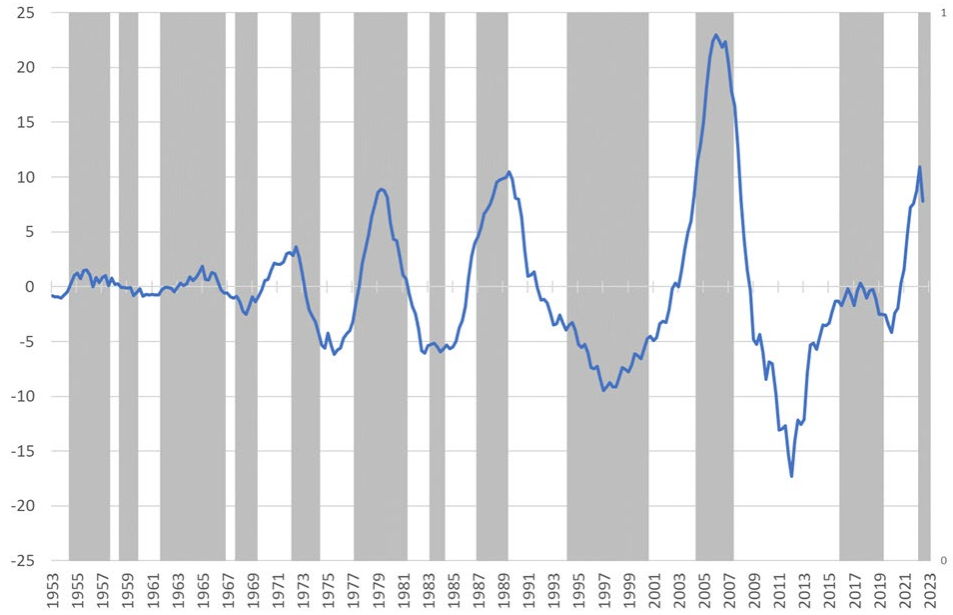


Source: Refinitiv Eikon Datastream, Robert Shiller's online data and authors' calculations.

Note: the grey bar represents periods of monetary policy tightening. The deviation from the statistical trend is the gap in % between the equity price at each date and a trend computed with the Hodrick-Prescott filter and aimed to represent "normal conditions".

The same patterns can be observed with the credit cycle. This notably reflects the fact that the housing and the credit cycles are correlated (See Table 1 in the Annex). More importantly, data suggest that the financial cycles, either identified for the stock market, the housing market or the credit market, is not correlated with the inflation gap. Drehmann et al. (2012) reached a similar conclusion regarding the correlation between the financial cycle and the business cycle. They notably highlighted that the duration of the financial cycle was much longer than for the business cycle. These conclusions are also in line with Blot et al. (2015) who find no correlation between price stability and financial stability. It is crucial for monetary policy as it implies that achieving the price stability objective does not help to achieve financial stability nor does it systemically create a trade-off between both objectives. Even though monetary policy affects domestic demand and inflation through its transmission through financial variables, achieving price stability cannot be considered as detrimental for financial stability.

Figure 6: Monetary policy tightening in the US and the house price cycle (deviation from a statistical trend in %)



Source: Refinitiv Eikon Datastream, Robert Shiller's online data and authors' calculations.

Note: the grey bar represents periods of monetary policy tightening. The deviation from the statistical trend is the gap in % between the house price at each date and a trend computed with the Hodrick-Prescott filter and aimed to represent "normal conditions".

3.3. Does monetary policy tightening always increase the risk of financial crises?

The key issue is thus whether and under which circumstances, a monetary policy tightening threatens financial stability and may increase the risk of financial crisis. It must be reminded that financial crises include several kinds of events but all involve severe disruptions of financial intermediation either because asset prices plummet, the volume of credits falls or some financial institutions suffer from balance sheet problems (Claessens and Kose, 2013). Not all asset price or credit decreases are crashes and financial stability becomes an issue only occasionally. Let us contemplate two early episodes of monetary tightening. It may be considered that the interest rate increases implemented by the Bank of Japan in 1989 triggered the burst of the housing and stock market bubbles. In the United States, the tightening cycles of the end of the 1970s and 1983-1984 revealed the fragility of the Savings and Loans associations. There is yet a difference between those two episodes of monetary policy tightening. Differently from the Bank of Japan, the Federal Reserve did not seem aware of the financial boom in the United States at the end of the 1970s when interest rate increases aimed at reducing inflation, which had exceeded 10%.

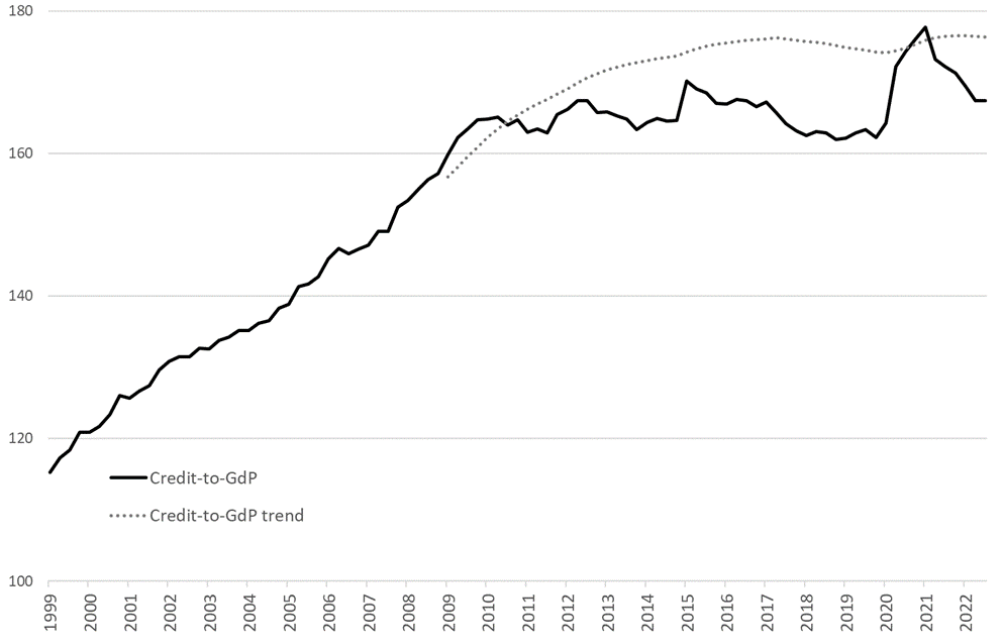
To assess the risk associated to monetary policy tightening decisions, Schularick et al. (2021) estimate the effect of interest rate increases for a large sample of countries over a long historical period. They show that the probability of a financial crisis rises by 2 percentage points after a 1-percentage point increase in the policy rate.[12] The highest risk would occur during the first two years. More importantly, the risk of

[12] These results are consistent with Bauer and Granziera (2017) who find that restrictive monetary policy shocks increase the debt-to-GDP ratio and as a consequence, the risks of a financial crisis.

financial crisis is amplified under some circumstances. When there has been an excessive credit growth or asset price bubbles, the probability of a crisis can be 8 percentage points higher.

With these results in mind, we might assess whether the current monetary policy tightening in the euro area, which aims at reducing inflation, threatens financial stability. The risk would notably be heightened in case of a credit boom and asset price bubble. In 2022-Q3, the credit-to-GdP ratio in the euro area reached 167.4% (Figure 7).[13] It has yet decreased by 10 percentage points since a peak observed in 2021-Q1. The BIS also computes a statistical trend and assesses a credit-to-GdP gap. This gap may indicate whether there is a credit boom or not. The recent decline in the ratio below its trend suggests that there is no credit boom in the euro area.

Figure 7: The credit-to-GDP in the euro area (in %)



Source: BIS.

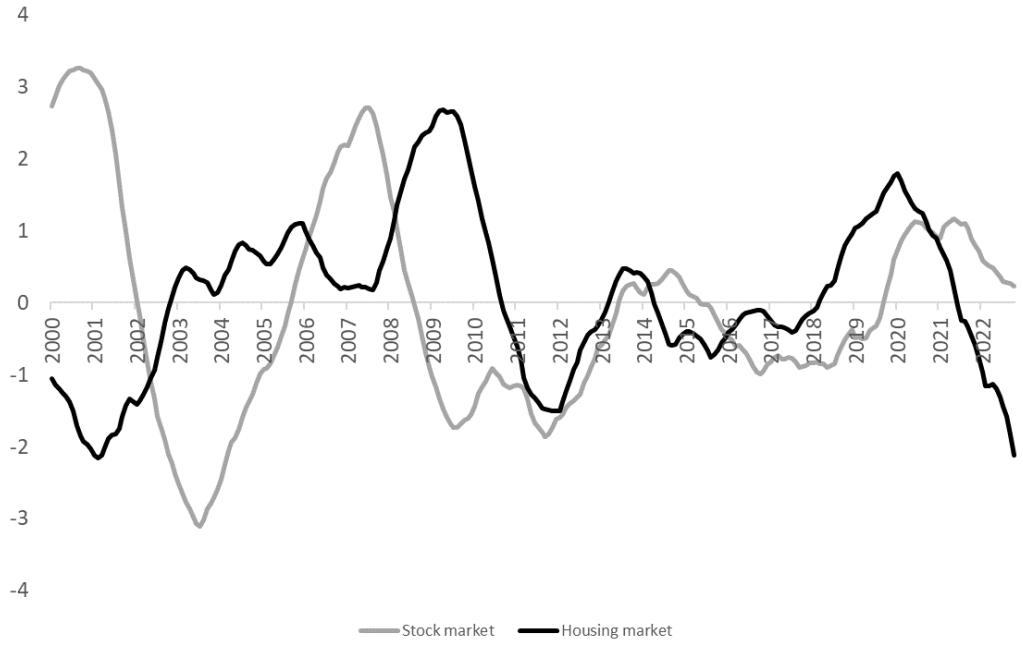
Finally, Blot et al. (2020) build an indicator of stock and house price bubbles that is based on alternative approaches. These indicators estimated until December 2022 suggest that there would be no bubble on the housing market and only a small bubble in the stock market, that would be much less important than in 2000 and 2007 (Figure 8). However, we should remain careful when looking at this indicator. First, the bubble is estimated for the euro area, however the possibility of national bubbles should not be dismissed. Second, the model may underestimate the size of the bubble. House prices in the euro

[13] Household debt has notably decreased according to Eurostat data. In the end of 2022, it was 94.2% of the gross disposable income, 3 points lower than in 2021-Q3. The peak for household debt was observed between the end of 2010 and 2011-Q3 when it reached 100% of gross disposable income.

area have increased continuously from 2014 to the early 2022, leading the ESRB to issue warnings on potential vulnerabilities for the residential and the commercial real estate.

Consequently, and by looking at aggregate financial indicators for the euro area, it seems that the risk of financial crisis that would be triggered by the current monetary policy tightening should not be ignored; however, the situation is not one of heightened risk.

Figure 8: Stock and housing price bubbles in the euro area (Standardised variables)



Source: OFCE from Blot, Hubert and Labondance (2020).

4. THE IMPORTANCE OF ADJUSTABLE-RATES VS FIXED-RATES LOANS

Even though, credit volumes and asset prices do not point to a critical situation, vulnerabilities of the financial system may be embedded in other indicators of the soundness of banks. Banks are intrinsically exposed to many risks and notably to the change of interest rates. The crucial issue is yet about the consequences of monetary policy tightening on their activity and their profits. Finally, in case of losses, what would be their ability to deal with them.

4.1. Theoretical considerations

Thinking about interest rate risk is particularly important, and even more so on the side of households: for example, it may have played an important role in First Republic's recent demise.[14] Paradoxically, the trade-off between price stability and financial stability could in theory be much less severe when there are more adjustable-rate mortgages (ARMs), as interest rate risk would then be passed through to homeowners, and at the same time not impair banks' balance sheets, as in the case of fixed-rate mortgages (FRMs). Thus, contrary to what is often being heard, less ARMs and more FRMs are not necessarily a source of strength and stability.[15] As John Campbell has recently argued in a presentation entitled "Mortgage choice and financial stability"[16], the problem with ARMs is that the rise in households' interest rate on mortgages is the probably main channel through which monetary policy pass-through occurs, and interest rates increases affect consumption. This has indeed been confirmed by research analysing the aftermath of the 2008 US financial crisis, and which has confirmed indeed how important the mortgage market was for the pass-through of monetary policy. In particular, Di Maggio et al. (2017) showed that when interest rates go down, households with an ARM benefit from a reduction in mortgage payments, and this tends to increase their consumption.[17] It should be noted, to complicate things further, that Wong (2015) has provided compelling evidence that refinancing of FRMs at lower rates (on the way down) could lead to a substantial increase in consumption; but of course no such effect is to be expected on the way up because there is no refinancing possibility.

To summarise, monetary policy rate hikes are less effective with more FRMs: in his presentation, John Campbell even argues in such a context that having FRMs is a bad idea, because it forces the central bank to increase interest rates by even more for a given desired effect on consumption. In so doing, central banks put more financial strain on banks' balance sheets, which is probably not something which is desirable. In other words, to the extent that aggregate demand is being slowed down more with more ARMs, and that a slowdown in aggregate demand implies less inflation, monetary policy is both more

[14] In the financial press for example, see:

First Republic's Jumbo Mortgages Brought On Bank's Failure. Bloomberg. May 1, 2023. https://www.bloomberg.com/news/articles/2023-05-01/first-republic-s-history-of-jumbo-mortgages-led-bank-to-failure-sale.

First Republic handed out billions in ultra-low-rate mortgages to the wealthy. It backfired horribly. April 25, 2023.https://finance.yahoo.com/news/first-republic-handed-billions-ultra-023833711.html#:~:text=Business%20Insider-,First%20Republic%20handed%20out%20billions%20in%20ultra%2Dlow%2Drate%20mortgages,It%20backfired%20horribly

[15] This argument has for example been recently made in a recent blog by the OECD (2022): "Overall, financial stress among households should be contained in most OECD countries due to relatively strong balance sheets and the moderate use of Adjustable-Rate Mortgages (ARM)". See: OECD (2022). Damien Puy and Kimiaki Shinoz. Mortgage Rates are rising: should we be concerned? August 23, 2022. https://oecdecoscope.blog/2022/08/29/mortgage-rates-are-rising-should-we-be-concerned/

[16] See Campbell, J. Mortgage choice and monetary policy. Markus' academy. May 4, 2023. https://bcf.princeton.edu/wp-content/uploads/2023/05/Markus-Academy-John-Campbell-4-May-2023.pdf

[17] Their identification strategy is extremely clean and convincing: they exploit quasi-experimental variation in the timing of resets of ARMs, showing that an instrumented decline in mortgage payments led to a significant increase in durable purchases.

effective with more ARMs and there is less of a trade-off between financial stability and price stability in that context.

However, one perhaps needs to qualify this statement of ARMs improving the trade-off between price stability and financial stability. First, because with ARMs, some households may default on their mortgages altogether if they cannot meet their higher payments, rather than reduce their consumption. This rise in default rate, if substantial, can be a threat to financial stability and potentially have detrimental effects on banks' balance sheets. When foreclosure is less easy (households cannot go as much into bankruptcy), then it is a good thing for banks' health, but it means that households suffer more from the increase in mortgage payments which they cannot escape. In a sense, there is no free lunch: the fact that banks are in trouble also reflects the fact that households are shielded from interest rate risk. One cannot get both: either households get hurt (and this is supposed to be one channel through which monetary policy works to reduce economic activity – and therefore inflation) or alternatively banks get hurt, which may perhaps in some cases reduce bank lending, but is also potentially a direct threat to financial stability. Of course, this discussion neglects an important further complication in the euro area: that of substantial heterogeneity in the share of ARMs in different countries. The following paragraph documents this heterogeneity and discusses the consequences for the conduct of monetary policy and for the trade-off between price stability and financial stability in the euro area.

4.2. Importance of Adjustable-Rate Mortgages in the Euro Area

Table 2 shows that there is indeed substantial heterogeneity in the share of ARMs issued each period (as flows) in different countries of the euro area for households. Moreover, this share of ARMs changes substantially over time, as shown in the last column, with sometimes quite hectic evolutions (see in Greece or Slovenia). Other countries have more stable shares of ARMs: at one extreme Finland, with almost all mortgages being issued as ARMs, around 98% most recently. At the other extreme, France, with a very low stable share of ARMs issued (at least recently), below 5%.

This implies of course that monetary policy is being transmitted very unevenly across countries, and that monetary policy leads to a much more important slowdown in aggregate demand in Finland (or in Lithuania, Estonia, and Latvia) than in France (or in Germany, Belgium, Slovenia, Slovakia). At the same time, as was discussed previously, this implies that there is probably less residual interest rate risk on bank's balance sheets in Finland and the Baltic countries, than there is in countries with higher shares of FRMs. Of course, as is discussed in OECD (2021) and van Hoenselaar, F., et al. (2021), FRMs are very heterogeneous themselves, depending on the recourse character of the loan, their duration, etc.

Table 1: Share of adjustable-rate mortgages (ARMs) for households

	MARCH 2023[1]	MARCH 2022	MARCH 2008	2008-2023[2]
Finland	98,0%	96,7%	96,7%	
Lithuania	96,2%	95,8%	60,6%	
Estonia	91,7%	85,0%	86,7%	
Latvia	90,1%	95,4%	52,7%	
Cyprus	84,5%	99,0%	72,8%	
Portugal	74,6%	62,8%	97,4%	
Malta	68,5%	62,2%	85,9%	
Austria	51,0%	28,4%	60,8%	
Luxembourg	39,1%	36,4%	86,6%	
Italy	36,6%	16,6%	33,0%	
Greece	35,9%	NA	29,6%	
Spain	25,7%	22,6%	92,0%	
Netherlands	19,7%	8,5%	17,6%	
Germany	16,1%	8,4%	13,2%	
Ireland	8,8%	18,8%	88,3%	
Belgium	8,3%	5,6%	11,3%	
Slovenia	7,8%	8,8%	79,8%	
France	3,5%	2,7%	12,8%	
Slovakia	3,3%	1,3%	73,6%	
Croatia	NA	10,7%	NA	

[1] Share of ARMs in the flow of new mortgage loans in March 2023

[2] Share of ARMs: Time series from March 2008 to March 2023

Source: ECB, Risk Assessment Indicators, authors' own elaboration. "NA" for missing data.

4.3. The recent evolution of average interest rates paid by households and corporations in the Euro Area

Table 3 shows the evolution of interest rates since the outbreak of the Russian war against Ukraine in February 2022 until February 2023. It allows to gauge the evolution of interest rates in different countries thus far, which is consistent with the above data on the share of ARMs across countries, and shows that interest rates increases have been higher in countries with larger shares of ARMs. This confirms also that there is a correlation between the stock and the flow of credit.

Table 2: Interest rates for households and corporations in the euro area

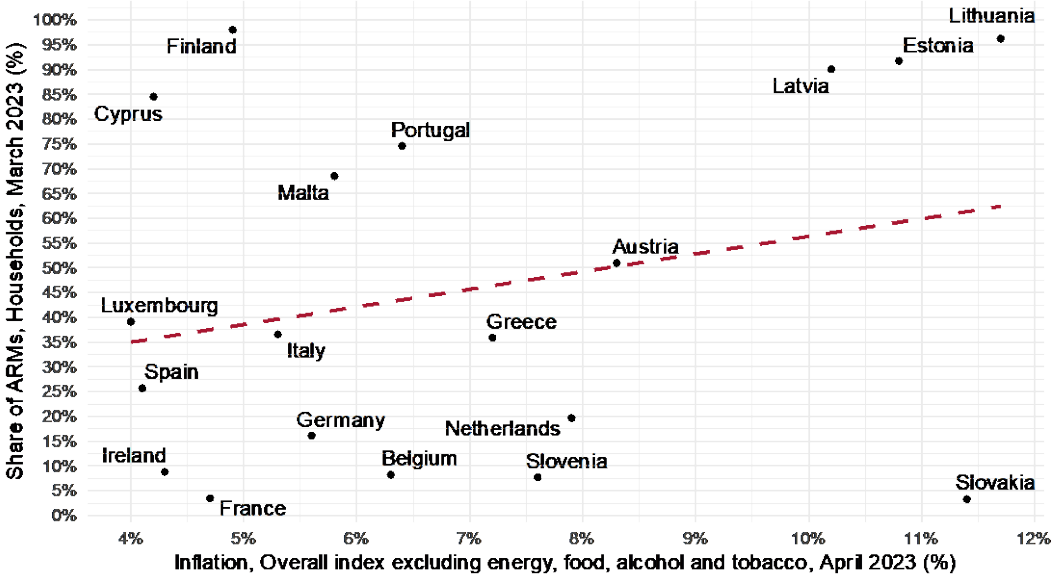
		HOUSEHOLDS			CORPORATIONS		
		FEBRUARY 2022	FEBRUARY 2023	CHANGE IN %	FEBRUARY 2022	FEBRUARY 2023	CHANGE IN %
	Estonia	2,7%	4,9%	2,2%	2,5%	4,8%	2,3%
	Lithuania	2,7%	4,8%	2,1%	2,6%	4,7%	2,1%
	Latvia	3,5%	5,5%	2,0%	2,8%	4,6%	1,8%
	Portugal	2,0%	3,9%	1,9%	2,0%	3,8%	1,8%
	Finland	1,3%	3,0%	1,7%	1,2%	3,1%	1,9%
	Austria	1,8%	3,2%	1,4%	1,5%	3,2%	1,7%
	Cyprus	2,5%	3,7%	1,2%	3,0%	4,8%	1,8%
	Spain	2,3%	3,5%	1,2%	1,6%	3,1%	1,5%
	Luxembourg	2,2%	3,4%	1,2%	1,4%	3,1%	1,7%
	Italy	2,6%	3,6%	1,0%	1,6%	3,7%	2,1%
	Slovenia	3,2%	4,2%	1,0%	1,8%	3,8%	2,0%
	Ireland	3,1%	3,7%	0,6%	2,8%	4,5%	1,7%
	Croatia	4,0%	4,2%	0,2%	2,2%	3,1%	0,9%
	Slovakia	2,2%	2,4%	0,2%	2,2%	4,1%	1,9%
	Belgium	1,9%	2,0%	0,1%	1,5%	2,7%	1,2%
	Netherlands	2,3%	2,4%	0,1%	1,7%	3,0%	1,3%
	France	1,8%	1,9%	0,1%	1,4%	2,5%	1,1%
	Germany	2,2%	2,3%	0,1%	1,6%	2,6%	1,0%
	Malta	5,2%	3,5%	−1,7%	3,6%	4,4%	0,8%
	Greece	NA	NA	NA	3,1%	5,3%	2,2%

Source: ECB, MFI Interest Rate Statistics, authors' own elaboration. "NA" for missing data.

Among the largest countries of the euro area, a great divide is under way between, on the one hand, Germany and France where banking rate hikes are quite limited, and Italy and Spain, on the other hand, where rates have increased quite substantially because of ARMs. It should be noted that there exists a positive correlation between the share of ARMs and inflation (as measured here by core inflation

excluding energy and food, but it is true also for headline inflation), as shown on Figure **9**. This implies that monetary policy in the end bites more where it is probably more needed to cool off inflation: inflation is particularly high in the Baltic countries.

Figure 9: Core inflation and share of ARMs across euro area countries



Source: Eurostat, ECB, authors' own calculations. Missing share of ARMs in 03/2023 for Croatia.

4.4. What about banks' health?

As was stated before, the assessment of financial stability is very challenging even conditional on tighter monetary policy, even in countries with large shares of FRMs, as we do not have any information on how and how much banks are able to hedge their interest rate risks. For this, one would for example need detailed data on derivatives, swaps, etc. and their counterparties for which there is very limited information. Moreover, derivatives themselves have different levels of embedded leverage which correspond to different risk exposures, and also heterogeneous beliefs about the future course of interest rates for banks.[18]

This leads us to turn to other potential measures of risks for banks, and in particular supervisory statistics for these banks. As shown on Table 4, aggregate measures of profitability do not seem to point to particular difficulties for banks. Rather to the contrary, net interest margin, which is one measure of banks' profitability, is on the rise with rising interest rates. This can be explained (among other things) by the fact that banks enjoy low rates on sticky deposits, which they can use to earn increasing returns even on short-term securities. In such a situation, and even if they suffer some (accounting) losses on FRMs, they will gain from rising interest rates. Anecdotal evidence in fact also seems to suggest that banks tend to "like" higher interest rates[19], which can be explained by the fact that European banks on average have more diversified activities so what they lose on the one hand can be recovered in some other business segment. While they gain on unit profits, demand for loans drops (by households and by firms), because credit is more expensive, so the effect on total profits is more ambiguous.

[18] Geerolf (2018) develops a purely speculative model of leverage on financial markets.

[19] There has also been ample anecdotal evidence that bankers dislike low interest rates because of the so-called flattening of the yield curve.

Table 3: Net interest margin and Return on Equity in euro area banks (profitability)

	NET INTEREST MARGIN			RETURN ON EQUITY		
	2022, Q4	2021, Q4	CHANGE IN %	2022, Q4	2021, Q4	CHANGE IN %
Spain	2,2%	1,9%	0,3%	10,3%	10,8%	−0,5%
Slovenia	2,2%	1,9%	0,3%	16,9%	10,5%	6,4%
Greece	2,1%	2,1%	0,1%	14,4%	−20,4%	34,9%
Austria	2,1%	1,7%	0,4%	12,8%	8,1%	4,6%
Estonia	2,0%	1,6%	0,4%	10,1%	8,3%	1,8%
Portugal	1,9%	1,4%	0,5%	8,5%	4,1%	4,4%
Latvia	1,9%	1,7%	0,2%	12,3%	10,5%	1,7%
Lithuania	1,5%	1,1%	0,4%	15,0%	10,7%	4,3%
Malta	1,5%	1,2%	0,2%	4,1%	3,3%	0,7%
Italy	1,5%	1,2%	0,3%	9,2%	5,1%	4,1%
Netherlands	1,4%	1,3%	0,1%	8,0%	8,3%	−0,3%
Belgium	1,3%	1,2%	0,1%	11,4%	9,4%	2,1%
Ireland	1,3%	1,1%	0,2%	3,5%	5,9%	−2,4%
Finland	1,1%	1,0%	0,1%	9,8%	9,3%	0,4%
France	1,0%	1,0%	0,0%	6,0%	7,2%	−1,1%
Germany	1,0%	0,9%	0,1%	5,7%	4,1%	1,6%
Luxembourg	0,9%	0,6%	0,3%	4,2%	3,5%	0,8%
Cyprus	NA	1,5%	NA	NA	1,0%	NA
Croatia	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA	NA	NA

Source: ECB, Supervisory Banking Statistics, authors' own elaboration. "NA" for missing data.

Moreover, return on equity also seems to be on the rise (overall) in 2022-Q4 compared to a year ago. Again, this would tend to suggest that, depending on their interest rate management, interest rate increases might not necessarily be bad for banks, and that overall, their speculative positions with respect to duration risk were not as bad as their American counterparts. Moreover, European banks tend to be more universal banks with more diversified activities and clients on average. As is well-known, the European financial system is also much less market-based and much more bank-based, more intermediated, which also implies that the financial system as a whole might be less sensitive to adverse market movements.

We may also look at prudential ratios across Euro area banks, as well as their evolution, both with regards to solvency issues as well as with regards to liquidity issues. In terms of solvency issues, Table **5** shows

that Tier 1 ratios and Common Equity Tier 1 ratios (CET1)[20] are well above 15% in most Euro area countries. However, there has been a slight deterioration in these prudential ratios in the last few quarters.

Finally, liquidity ratios, which are part of the Basel 3 standards applying to EU banks, such as Liquidity Coverage Ratio (LCR) or Net Stable Funding Ratio (NSFR) are also important. For reference, their evolution between 2021-Q4 and 2022-Q4 are again shown on Table 5. It is worthy to note for example that SVB did not apply these key Basel standards.

[20] The highest quality of regulatory capital is called Common Equity Tier 1 (CET1), which is intended to absorb losses of banks immediately when they occur. The CET1 ratio is equal to CET1 divided by risk-weighted assets (RWA), so it is expressing by how much (risk-weighted) assets need to drop for CET1 to be wiped out. RWAs calculate assets weighted by risk. Under Basel 3, US government debt and securities are given a 0% risk weight, whereas residential mortgages (which are not guaranteed by the US government) are weighted between 35% to 200% depending on their risk. Finally, Tier 1 capital also includes Additional Tier 1 capital such as perpetual contingent convertible capital instruments, which are not included in CET1.

Table 4: Tier 1 ratio and Common Equity Tier 1 (CET1) ratios (solvency)

	TIER 1 RATIO			COMMON EQUITY TIER 1 RATIO		
	2022, Q4	2021, Q4	CHANGE IN %	2022, Q4	2021, Q4	CHANGE IN %
Estonia	22,9%	25,9%	−3,1%	22,9%	25,9%	−3,1%
Latvia	21,6%	25,3%	−3,7%	21,6%	25,3%	−3,7%
Luxembourg	20,6%	19,0%	1,6%	19,9%	18,6%	1,3%
Ireland	20,2%	21,4%	−1,1%	19,1%	20,1%	−1,0%
Malta	19,3%	19,9%	−0,5%	19,3%	19,9%	−0,5%
Finland	18,8%	19,5%	−0,7%	17,3%	17,9%	−0,6%
Belgium	18,0%	19,4%	−1,4%	16,9%	18,4%	−1,4%
Lithuania	18,0%	22,3%	−4,3%	18,0%	22,3%	−4,3%
Netherlands	17,6%	19,0%	−1,4%	15,7%	17,0%	−1,3%
Italy	17,3%	16,8%	0,5%	15,7%	15,3%	0,4%
Germany	17,1%	16,9%	0,1%	15,7%	15,5%	0,2%
France	16,5%	16,9%	−0,4%	15,4%	16,1%	−0,6%
Austria	16,4%	15,9%	0,6%	14,9%	14,3%	0,7%
Slovenia	16,1%	17,0%	−0,9%	15,8%	17,0%	−1,2%
Greece	15,2%	14,2%	1,0%	14,8%	13,8%	1,0%
Portugal	15,0%	14,2%	0,8%	14,4%	13,7%	0,8%
Spain	14,1%	14,7%	−0,6%	12,6%	12,9%	−0,3%
Cyprus	NA	19,0%	NA	NA	17,1%	NA
Croatia	NA	NA	NA	NA	NA	NA
Slovakia	NA	NA	NA	NA	NA	NA

Source: ECB, Supervisory Banking Statistics, authors' own elaboration. "NA" for missing data.

Table 5: Liquidity Coverage Ratio and Net Stable Funding Ratio (liquidity)

		LIQUIDITY COVERAGE RATIO (LCR)			NET STABLE FUNDING RATIO (NSFR)		
		2022, Q4	2021, Q4	CHANGE IN %	2022, Q4	2021, Q4	CHANGE IN %
	Malta	396,1%	419,3%	–23,2%	187,6%	178,3%	9,2%
	Lithuania	268,3%	379,9%	–111,6%	163,3%	203,2%	–39,9%
	Portugal	251,1%	283,9%	–32,8%	155,2%	148,1%	7,1%
	Slovenia	246,7%	293,1%	–46,4%	174,9%	178,3%	–3,4%
	Latvia	227,1%	347,1%	–120,0%	160,3%	180,1%	–19,9%
	Greece	201,8%	200,7%	1,1%	132,2%	124,3%	7,9%
	Ireland	190,1%	167,2%	22,9%	160,7%	150,8%	9,8%
	Italy	185,2%	192,4%	–7,2%	132,1%	132,0%	0,1%
	Finland	176,7%	179,2%	–2,5%	118,7%	116,2%	2,4%
	Spain	171,1%	203,1%	–32,0%	129,8%	135,5%	–5,7%
	Belgium	165,7%	186,2%	–20,5%	140,4%	146,7%	–6,3%
	Austria	163,0%	176,4%	–13,4%	136,0%	142,0%	–6,0%
	Luxembourg	160,8%	173,6%	–12,7%	143,5%	149,9%	–6,3%
	Germany	153,5%	162,5%	–9,1%	123,2%	125,9%	–2,8%
	Netherlands	149,7%	159,2%	–9,6%	132,9%	135,2%	–2,2%
	France	148,0%	158,2%	–10,2%	115,4%	121,3%	–5,9%
	Estonia	142,8%	156,7%	–13,9%	137,2%	141,1%	–3,9%
	Cyprus	NA	333,3%	NA	NA	159,3%	NA
	Croatia	NA	NA	NA	NA	NA	NA
	Slovakia	NA	NA	NA	NA	NA	NA

Source: ECB, Supervisory Banking Statistics, authors' own elaboration. "NA" for missing data.

Of course, one must be extremely cautious in discussing this, as banking has become extremely complicated and no single indicator is able to convey how well banks manage risk. However, at the macroeconomic level, traditional indicators of bank health do not seem to point to a worrying picture for the euro area as a whole, either in terms of profitability, solvency or liquidity.

CONCLUSION

The sharp rise in ECB policy rates since July 2022 has been primarily motivated by the inflation surge and the requirement to slow it down towards the inflation target at two percent. The wave of bankruptcies in the US banking system has, meanwhile, spurs the threat that monetary contraction (in the US) may have triggered banking and financial stability.

Indeed, there can be trade-offs between the achievement of price stability and the achievement of financial stability. For instance, financial stability may be hurt directly by monetary policy decisions via sudden shifts in banking rates, credit supply and asset prices.

We report evidence that the channels of monetary policy towards banks and the financial system in the euro area seem at work: the yield curve has steepened, banking rates have increased, and credit conditions have tightened. These trends shall not be automatically associated with heightened risk of banking and financial stability though. We report evidence on the US that financial cycles and inflation gap are not that much correlated: a trade-off between financial stability and price stability is not easy to identify in the data. Moreover, by scrutinising aggregate financial indicators for the euro area (recent evolutions in credit, housing and stock prices), it appears that the risk of financial crisis should be neither ignored, nor overstated: the euro area is not facing the conditions for which the probability of a financial crisis would be at its highest.

Finally, we report evidence on the share of adjustable vs fixed rates on loans (or mortgages) across euro area countries. Keeping in mind that monetary policy rate hikes are more (resp. less) effective when the share of adjustable rates is high (resp. low), we show that the monetary channels of transmission to interest rates on households and on corporations have been stronger in countries with larger shares of adjustable rates and also higher inflation, like the Baltic States.

The stabilisation property of monetary policy on inflation may make the end of the restrictive monetary stance more likely. This would then alleviate the possible risk of a pass-through to financial stability. According to the latest available figures, it can be stressed that the health of banks in the euro area has improved between 2021 and 2022, hence during the restrictive stance of the ECB: net interest margins of banks have slightly increased in all countries, while in most of them, returns on equity have also increased. The end of the restrictive ECB policy coupled with European banks in overall good health should, in theory, remove the risk of financial instability. Caution requires to wait for what happens in practice though before disregarding this risk.

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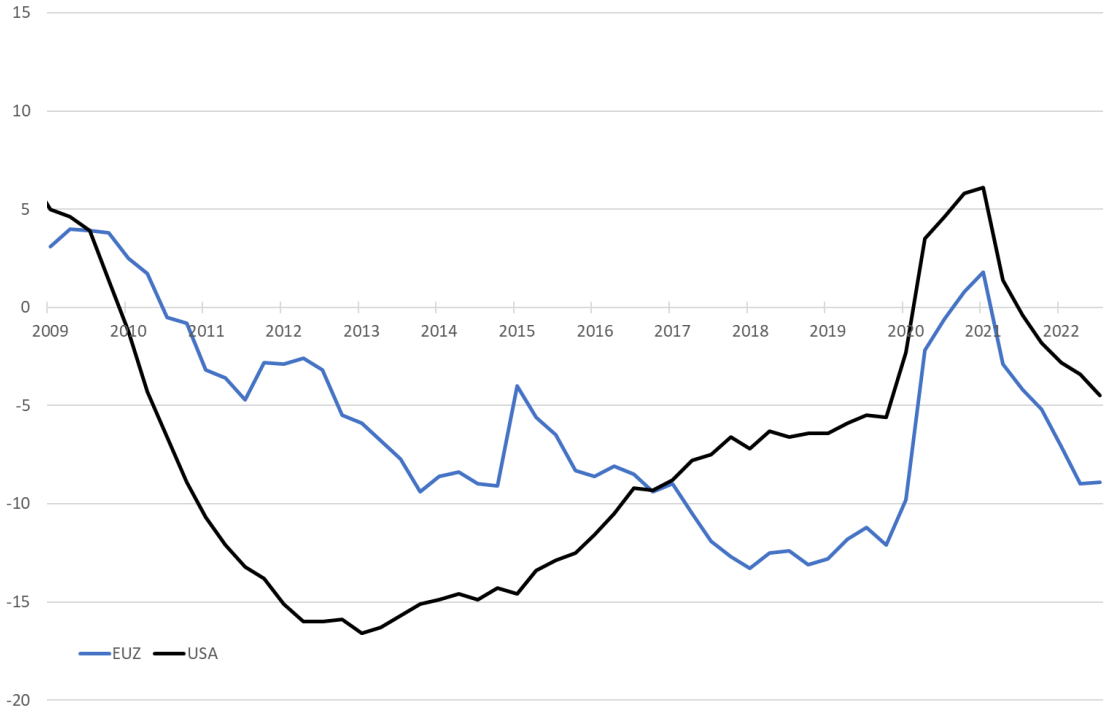
ANNEX

Table 6: Correlation of the financial cycles and the inflation gap

	Credit-to-GdP gap	Stock price cycle	House price cycle	Inflation gap
Credit-to-GdP gap	1			
Stock cycle	0.27	1		
Housing cycle	0.59	0.21	1	
Inflation gap	0.01	-0.07	0.09	1

Source: Refinitiv Eikon Datastream, Robert Shiller online data and Authors' calculations.

Figure 10: Credit cycles in the United States and in the euro area (deviation from a statistical trend in %)



Source: BIS.

Note: The deviation from the statistical trend is the gap in % between the credit-to-GDP ratio at each date and a trend computed by the BIS with the Hodrick-Prescott filter and aimed to represent "normal conditions" for credit.

The rise of policy rates in the euro area has led to a tightening of financing conditions raising concerns for financial stability. The risk of financial crisis should be neither ignored nor overstated. The euro area is not facing conditions for which there would be the highest probability of a crisis. The risk faced by banks depends on the share of adjustable-rate mortgages. At this stage, net interest margin of banks and profitability have slightly improved.

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