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1 Introduction

Let me start with a disclaimer: Since we are one week away from a monetary policy decision my speech today will not make any reference to the actual monetary policy stance or monetary policy decisions. Rather my remarks are of a more fundamental nature.

The financial market developments of the past 12 months and the culmination of events in the last fortnight have attracted a lot of interest from the general public. These events have highlighted the interlinkages between the financial and the real sphere and the implications these linkages have for monetary policy.

Understanding developments on financial markets is a cornerstone for monetary policy making. This is true in normal times, and even more so in the extraordinary times we live in today. An analysis of the monetary transmission process is therefore of the utmost importance for central bankers. And a thorough understanding of the ways in which financial market developments might influence the impact of monetary policy measures is a cornerstone of recent research efforts.

However, financial markets are also a very important information pool for monetary policy decision-makers. The current tensions on the financial markets also complicate the task of deriving the information embedded in financial markets. In the following I will try to elaborate on these two related aspects – financial markets and monetary policy transmission, and the information content of financial markets for decision-making.

I will attempt always to relate to the experiences of the past 12 months in order to give real-world examples to illustrate the more general aspects of both topics. In order to do so, I will give a brief outline of the underlying causes of the recent financial market tensions.

2 The underlying causes of the recent financial market turmoil

When looking at the underlying causes of the recent tensions in the global financial system, no one particular development can be clearly identified as the root cause. Numerous culprits have been put forward: securitisation, quality of risk management, credit rating agencies, compensation schemes, accounting standards – to name just a few. But I am extremely sceptical of monocausal explanations. Instead, I believe that a cocktail of various ingredients triggered the shock waves that have rocked the financial system. Many of these factors are related to financial innovations or, to be more precise, from a combination of new and complex instruments to transfer credit risks and the “originate and distribute” business model.

The disruptions of the past few months have highlighted the heightened complexity of credit risk transfer (CRT) instruments. This would have been less problematic had the risk management systems of financial intermediaries kept pace with the changing characteristics of the financial landscape. However, not all of them did. At the same time, the investor base has become more diffuse, with some participants only recently having entered the CRT markets, maybe not sufficiently familiar with the instruments at hand. All of this suggests that several investors may not have fully appreciated the higher-risk nature of CRT products and were therefore overly optimistic in their assessments of the risks involved.

Securitisation activity was fostered by the “originate and distribute” model in place at large banks and securities firms. On a positive note, the securitising, tranching and trading of credit risks has led to a fairly broad risk dispersion – a feature which most market participants and observers deemed to be purely positive. However, it has become clear now, that the “originate and distribute” model can actually improve the resilience of the financial system only if a high-quality standard is maintained at all levels of the transfer process and no new concentrations of risk arise. The past few years, however, have been characterised by a series of distorted incentives, which has manifested itself in lax origination standards for products such as subprime mortgages and an excessive reliance on credit ratings by some investors. As a final point, let me add that, at the end of the day, the “originate and distribute” model led – rather unexpectedly – to a huge reintermediation of credit risks on to banks’ balance sheets; in some sense, therefore, the clock is turned back.

In other words, the financial market turmoil has demonstrated that (1) risks disappear and that (2) removing assets from bank balance sheets does not mean that banks are no longer exposed to the risks associated with them. Hence, the designers of risk management systems should reconsider their view of credit guarantees and credit lines to off-balance-sheet entities such as structured investment vehicles and conduits and the reputational risk associated with them. In a nutshell, securitisation, as Claudio Borio aptly put it in 2008, has, ultimately, “distributed fear rather than risks”. However, while financial innovation has undoubtedly increased vulnerabilities in the global financial system, there is more to the present financial market turmoil than the proliferation of structured finance products. The “originate and distribute” model would arguably not have been possible without the benign economic and financial backdrop notably robust global economic growth, low inflation, a low level of interest rates, low default rates and rising asset prices in many countries, not just in the USA.

This Goldilocks economy, where conditions were neither “too cold” nor “too hot”, had – as a side effect – masked the gradual build-up of financial imbalances; a development many of us have seen already before the turmoil. And the BIS is one very prominent example that made this very clear already at an early stage of the process. Hence, while lending and risk-taking experienced rapid growth, words of warning from central banks and other institutions largely went unheeded with the argument that “this time, developments are surely different from the past”. The fact that minor financial market tensions in the spring of 2005 and 2006 had left financial markets more or less unscathed only served to reinforce that impression. However, once the vulnerabilities in the global financial system were revealed in August last year and financial imbalances started unwinding, we all witnessed that the environment had changed considerably since then.

3 Recent financial market tensions: Lessons for monetary policy

The list of lessons to be learnt from the current financial turmoil covers many areas. I do not want to discuss in any detail the many proposals that are currently being debated in different national and international bodies. As the G-7 finance ministers and governors have recently stated, it is important to recognise the need for more effective regulation. In that context we remain fully committed to the recommendations of the Financial Stability Forum to improve the resilience of the international financial system. While I do not deny the importance of these aspects, in the following I would like to focus on an aspect that is more related to the general theme of today’s conference, namely the lessons to be learnt by monetary policy makers in their core business of setting short-term interest rates to safeguard macroeconomic stability.

I therefore do not intend to describe the reactions of central banks to the current turmoil in terms of money market operations, but take a step back from this sort of crisis management to the more general issue of conducting monetary policy in the face of a procyclical behaviour of financial market participants.

In the first half of this decade, monetary policy was expansive in most industrial countries. This is true of interest rate based measures of the monetary policy stance, and it is also evident in indicators such as money and credit aggregates. The expansive monetary policy stance after the New Economy bubble burst has been well documented for the United States. But traditional indicators also signal an expansionary policy stance for a prolonged period of time for the euro area. At the same time, risk premia on financial markets have been historically low for reasons we could not explain with the aid of traditional macroeconomic factors.

As there is empirical evidence that protracted low interest rates may have fostered financial market participants' gross risk appetite and contributed to the dynamic growth of credit aggregates worldwide via this risk-taking channel in the monetary policy transmission, the events of the past 12 months also throw up some serious questions on the role of monetary policy.

The debate about monetary policy and financial markets is too often slanted towards the question of how to deal with asset price bubbles. Here, the current majority view is: a) monetary policy cannot and should not target asset prices; b) monetary policy should not prick asset price bubbles; c) monetary policy should focus on limiting the fallout from bursting bubbles ex post.

In my opinion, this view of monetary policy and asset prices is too narrow. A more fruitful debate on appropriate monetary policy reactions to developments on financial markets would be possible if the focus were redirected from financial bubbles to the issue of procyclicality. Monetary policy makers should not view boom and bust episodes on the financial markets as unrelated events. In the medium term, the monetary policy reaction to downturns on the asset markets influences market participants' risk perception in the following upturn. This is especially evident where monetary policy makers apply a risk management approach that asymmetrically lowers rates in times of severe financial market downturns, over and above what would be deemed necessary given the baseline outlook on prices and growth.

A more symmetric approach would treat boom and bust episodes not as isolated events but would try to look through the financial cycle in order to steady policy. To be more specific, a more symmetric policy would also realise implicit risks in times when money and credit growth is dynamic,

asset prices go up and risk perceptions decline, possibly creating the need to act despite sufficiently low current inflation rates.

This, however, does not mean that monetary policy should downgrade the price stability objective for the sake of other objectives. Rather, it means that central banks should take a longer-term perspective which takes into account the future inflationary consequences of such unfavourable developments.

And indeed, empirical work pioneered by the BIS has found that excessive money and credit growth has significant leading indicator properties for sharp corrections on asset markets and severe repercussions on the rest of the economy. As financial crises increase the volatility of macroeconomic variables such as inflation and growth, and given that monetary policy operates under the traditional loss functions, these results indicate that a more symmetric policy would improve welfare and macroeconomic stability. Moreover, it could be argued that the variance of macroeconomic variables itself is not independent of the monetary policy strategy chosen. A more symmetric monetary policy approach to financial cycles therefore has an additional endogenous impact.

Given the macroeconomic relevance of financial crises, we have good reason to widen our monetary policy time horizon and give low-frequency movements in credit and monetary aggregates more weight in our analytical frameworks and our monetary policy decision-making processes. That is not to say that such an approach would eliminate financial cycles altogether. However, in the medium to long term, a monetary policy that followed a more symmetric course would do more to dampen damaging financial cycles than a monetary policy that merely tries to limit damage after the event using aggressive interest rate measures.

Given that the eye of the current storm is the US real estate market and that the US Federal Reserve is well known for actively pursuing a risk-management approach, it comes as no surprise that most debates currently focus on US monetary policy. But given the prolonged period of low interest rates in the euro area over the past couple of years, these issues must also be addressed by monetary policy makers in the Eurosystem.

Here, the Eurosystem's monetary policy strategy already possesses, in the shape of its monetary analysis, such a stabilising element, which is especially suited for the analysis of long-term developments. The recent financial turmoil has shown that the often criticised monetary and credit analysis has a valuable role to play in monetary policy analysis.

4 MTM and financial developments

The relationship between monetary policy and financial markets, however, is by no means one that is of interest to policy makers only in the face of a crisis. Developments on financial markets have the potential to modify core economic relationships and are therefore of utmost interest for monetary policy. Let me therefore move away somewhat from the recent stress episode to discuss other structural issues related to financial innovations and monetary policy transmission.

The remarkable financial developments of the past decade brought with them a wide range of new financial products, greater competition, a notable increase in securitisation activities, disintermediation, and a consolidation process in the banking sector. This has broadened the range of financial market participants' activities and possibly also changed their reaction to shocks, e.g. to monetary policy innovations. A priori, the overall impact of such changes caused by financial development is unclear, but the empirical literature provides us with some useful hints:

Increased competition in banking together with enhanced availability of alternative capital market-based instruments for financial investment has likely amplified and/or accelerated the effects of monetary policy changes on bank interest rates (and, *ceteris paribus*, on output and inflation).

The bank lending channel is generally thought to have lost importance, because

- ... banks' flexibility to react to interest rate hikes has increased and ...
- ... financial development has broadened borrowers' financing options, reducing their dependency on bank loans.
- With the growing use of derivative instruments, banks' lending policies might also have become less vulnerable to monetary policy tightening (e.g. Purnanandam (2007)).

The additional funding opportunities entail a larger share of market-based (rather than bank-based) products; as these are more standardised and less idiosyncratic, collateral may play a more important role now, potentially increasing the importance of the balance sheet channel.

However, there is not much evidence for the euro area on whether and how financial development has changed the overall monetary policy transmission process in terms of output and inflation (and not just specific transmission channels). We in the Bundesbank have recently taken an aggregate look at the data without imposing too many a priori restrictions and estimated a series of canonical VARs in order to capture the overall monetary transmission process in the euro area. More specifically, we

have checked whether there have been notable changes to the general way in which monetary policy affects output and inflation. Using a data-driven search based on aggregate data, we found that euro-area transmission did indeed undergo notable changes in the mid-1990s; specifically, there is evidence of a structural break around 1996 and possibly a second one around 1999. Interestingly, these changes to the monetary transmission process do not seem to have altered the long-run responses of real output and inflation to monetary policy: notably, long-run neutrality still holds, and monetary policy is able to control inflation in the long term. But, maybe surprisingly, monetary transmission in the period 1980-1996 is not significantly different from that in the period 1999-2006. We interpret this as evidence of an “atypical interim period” characterised by “fluctuations” or “perturbations” lasting from 1996 to the end of 1998. During this period, the monetary transmission process in the euro area differed significantly from the periods before and afterwards. However, this result does not necessarily mean that financial development left monetary transmission unchanged: Financial development may have had offsetting effects on different transmission channels, e.g. speeding up the interest rate channel, lessening the importance of the bank lending channel and boosting the role of the balance sheet channel. Moreover, it could well be that other influences were at work as well, possibly mitigating the effects of financial development on the transmission process, such as the creation of the euro area or, as a secular trend, globalisation.

To sum up: Since a good knowledge of the monetary transmission process is essential for monetary policy, central banks must monitor developments in the financial markets closely because they have the potential to seriously affect the monetary transmission process. This conference adds a great deal to this issue. At the same time, the existing evidence must be “processed” in order to obtain a reliable empirical assessment of possible changes to the transmission process as a whole. For the time being, monetary policy has to be based on a broad range of different indicators to avoid running the risk of misreading important information.

5 Financial market indicators and monetary policy decision making

5.1 Financial market indicators as information variables for monetary policy

The previous section examined the possible effects of financial market developments on monetary policy transmission. Although the ongoing development of financial markets may have induced changes in monetary policy transmission, I – as a central banker and monetary policy decision maker – would like to point to another link between monetary policy and

financial market development. That is – as it were – the reverse causation: How does financial development affect (the) monetary policy decision making (process).

Important information for monetary policy decisions can undoubtedly be derived from financial market indicators. When considering the usual monetary policy transmission from a change in central bank interest rates to the ultimate monetary policy objective, information derived from financial market indicators as part of regular monetary policy preparations can be divided into the following categories.

First, information on market expectations about interest rates, including central bank interest rates as expected monetary policy moves. E.g., we derive the interest rate path expected by financial markets using EONIA swaps. In addition to this path, we assess financial markets' uncertainty surrounding their interest rate expectations. To this end, we derive the risk-neutral density from the options on the three-month Euribor future.

Second, information on financing conditions in the private sector (including risk premia in the financial markets) as well as market expectations concerning the development of major real economic indicators – such as the real interest rate, economic activity or commodity prices.

Third, information on financial markets' expectations about future price developments, especially as an indicator of the credibility of monetary policy and, hence, as an indicator for second round effects. Here, we use information derived from inflation-indexed bonds and inflation swaps.

All these indicators proved to be very important for assessing the current economic situation and for monetary policy decisions. Consequently, financial market are not just important for the transmission of monetary policy, they also supply us with important information for monetary policy decisions.

Furthermore, financial development has increased the number of instruments from which such information can be derived. However, the financial market turmoil has made an analysis of financial market indicators even more important – while at the same time making interpretation much more difficult – an aspect I would like to illustrate in the following section.

5.2 Current difficulties in interpreting financial market indicators

5.2.1 Interest rate expectations

Financial market expectations concerning future short-term interest rates constitute an important input in assessing the possible impact of monetary

policy measures on economic developments. Short-term interest rate expectations derived from financial market data show whether or not a possible interest rate step is already priced into the financial markets. Thus, a change in key interest rates causes market interest rates to react more strongly, the more unexpected the interest rate step is. Precise knowledge of interest rate expectations also helps to counteract any undesired developments, perhaps using communication policy instruments to bring market interest rate expectations more into line with the central bank's own view. E.g., the financial market's interest rate expectations for the euro area can be calculated using EONIA swaps. This exercise yields an expected interest rate path for the one-month interest rate. The key interest rates expected by the financial markets can be deduced under the assumption of a fixed interest rate spread between the one-month rate and the minimum bid rate. Based on this expected interest rate path one can, e.g., calculate the probability financial markets attach to an interest rate change of 25 base points at the next Governing Council meeting. It should be clear, however, that this probability is critically dependent on the assumption of a fixed interest rate spread between the expected one-month rate and the deduced expected minimum bid rate. A one base point change in the assumed spread would lead to a change in the probability of a 25 base point hike by 4 base points.

Given the current money market distortions, however, considerable fluctuations in the spread between the one-month rate and the minimum bid rate cannot be ruled out. One reason could be tensions on the swap market owing to a decline in market participants' willingness or ability to take risks. Our assessment of financial markets' uncertainty regarding their interest rate forecast could also be distorted by the current financial market turmoil because of variations in the risk premia contained in the three-month money market interest rates: In order to estimate market participants' uncertainty regarding their interest rate forecast, we derive the risk-neutral density from options on the three-month Euribor future. The more certain market participants are about their point forecast on the three-month Euribor, the smaller the standard deviation of the estimates should be. We therefore usually interpret a change in the expected three-month Euribor distribution as indicating a change in financial markets' expectation of Eurosystem policy rates. However, currently we cannot rule out the possibility that the financial market turbulence has caused volatility in the risk premium which is currently contained in the interest rate for unsecuritised three-month-money (Euribor). In order to obtain an answer to the question of what factors are driving an expected change, we continuously analyse the development of the Euribor-Forward three-month EONIA swap spreads. That is the difference between an implied three-month interest rate derived from Euribor rates and one derived from EONIA swaps. In general, this spread provides information on liquidity premiums for different maturities in the money market. Financial market expectations of a steady decline in money market uncertainty would imply

not only an ongoing drop in liquidity premiums but also lower premiums for time periods further in the future compared to less distant time spans.

5.2.2 Financial-market-based expectations on important economic indicators

In addition to this money-market analysis, we monitor the development of capital market-oriented measures of risk premia. Assuming freedom from arbitrage in capital markets, affine term structure models can be used to determine to what extent macroeconomic factors, such as the inflation rate or potential output utilisation, can explain the current term structure. Conversely, such models show the contribution of latent or undetermined factors to the current term structure. In Germany, for example, historical data show that, the longer the term to maturity, the smaller the amount of interest rate variation attributable to macroeconomic factors is.¹

Information about factors driving term structure is important for assessing whether the yield curve is influenced by shocks to the term premium. In this case, a monetary policy impulse may affect long-term interest rates in a different way than in previous periods. This aspect has been particularly important in the recent past when it proved difficult to explain the low level of long-term rates in the United States despite increases in short-term rates. This information is particularly relevant when looking at the current financial market turbulence. On the other hand, however, the current turmoil complicates the derivation of the risk premia because upwardly “distorted” money market rates are usually included within the set of chosen interest rates.

5.2.3 Financial-market-based inflation expectations

It is extremely important for central bankers to know the level of inflation expectations. They provide information on what inflation rates are taken into account in wage negotiations, for example, and whether there is a risk that temporary inflation shocks will lead to a permanent increase in the inflation rate which could not be tolerated by monetary policy. Long-term inflation expectations are therefore a good indicator for the credibility of monetary policy.

Information on economic agents’ inflation expectations is gained mostly from surveys. Within the euro area, Consensus Economics and the ECB regularly ask for such information. The plausibility of this survey-based information can generally be verified using the inflation premiums contained in financial market prices. To determine financial-market-based inflation expectations, we use the breakeven inflation curve as well as

¹ See “The determinants of the term structure of interest rates – approaches to combining arbitrage-free models and monetary macroeconomics”, Bundesbank monthly report, April 2006, pp 15-28.

information from inflation swaps. The resulting BEIR term structure is the difference between a nominal and a real interest rate curve. The latter is derived from the returns on inflation-linked bonds of AAA rated euro-area countries. Looking at the long-term risks to price stability the fact that both survey-based and financial-market-based long-term inflation expectations are now noticeably higher than they were before the outbreak of the financial market turbulence is cause for concern.

Current financial-market-based indicators for inflation expectations may, however, be distorted by the turbulence. Like the market for interest rate swaps, the market for inflation swaps may be suffering from a smaller supply of inflation protection. While banks usually supply inflation protection, a decrease in their willingness or their ability to take risks – i.e. given less room for manoeuvre in liquidity-absorbing asset swap activities – could have increased the inflation swap premium. This could be one reason why the difference in the long-term measures of inflation expectations using inflation swaps and using the BEIR-curve has widened substantially over the last couple of weeks.

On the other hand, however, strong safe haven effects in nominal AAA-rated government bonds may have caused the term premiums of the respective securities to shift, resulting in a downwards distortion of the BEIR curve. It is consequently not immediately clear whether long-term inflation expectations based on swaps or long-term inflation expectations based on the BEIR curve are currently more reliable. Our reaction to this finding has been to increase the weight we attach to survey-based indicators of long-term inflation expectations – although, of course, they too have disadvantages.

6 Conclusion

I have tried to illustrate some aspects of the close relationship between monetary policy and financial markets. In so doing, I have tried to strike a balance between focusing on recent events in financial markets and more general aspects. Financial developments have the potential to change the transmission process. Financial markets provide valuable information for decision-makers. However, during episodes of financial turmoil, the information embedded in asset prices is distorted and requires careful interpretation. Monetary policy should react to the financial cycle in a more symmetric way in order to reduce low-frequency volatility in important macro variables. All these points illustrate the growing influence of financial market developments on monetary policy. However, they by no means alter the ultimate goals of monetary policy.

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