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**Central banks in action: financial market
turbulences and policy measures**

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1. Introduction

It is a pleasure and honour for me to have the opportunity to speak at the Annual Meeting of the Association of Foreign Banks. The foreign banks are the fastest growing group of banks in Switzerland. This demonstrates the attractiveness of Switzerland as a financial centre. At the same time it also shows how important the foreign banks are for Switzerland. I am therefore very much looking forward to interesting interaction with my distinguished audience.

In my talk, I will focus on the financial market crisis and the policy measures taken by central banks in response to the crisis. I will also try to identify some preliminary lessons that central banks have learned through applying these measures.

In recent weeks, financial markets have improved, to some extent, from the situation that prevailed at the height of the turmoil in mid-March: risk premia have fallen on most assets, and equity prices have recovered. Even money markets, although still tense, have improved somewhat. These developments have given rise to the hope that the worst of the financial crisis might have passed by now. However, it may be too early to give the all-clear. There could still be a number of setbacks; we have already witnessed periods of apparent improvements in recent months, only to see the crisis return in full force. Thus it is still difficult, at this point of time, to draw conclusive lessons for the future.

2. Objectives and instruments of monetary policy

Before I delve into the subject of the financial market crisis, let me begin by reminding you of the objectives and instruments of monetary policy. These will be important things to keep in mind later on.

The objectives of monetary policy can be neatly summarised as *stability, stability and stability*. To be more precise – the objectives of monetary policy are price stability, economic stability, and financial stability. We can order these three stability objectives according to the time lag between the specific monetary policy action and the effects of that action on the particular objective. The longest lag between action and reaction is to be found in the transmission of monetary policy to prices. Thus, monetary policy should aim at price stability in the long run. Under long run, I understand a horizon of up to a number of years. In

the medium term, with a horizon of one to two years, monetary policy can be used for smoothing economic cycles. And in the short run, immediate action may sometimes be required to safeguard the stability of the financial system.

We can also order the three stability objectives according to the degree to which monetary policy is responsible for the eventual outcome. Regarding price stability, monetary policy is fully responsible for prices in the long run. Or to put it more simply – a broad-based and sustained rise in prices is always attributable to monetary policy. As for economic fluctuations, monetary policy can affect them, but it cannot control them entirely.¹ Concerning the stability of the financial system, the role of monetary policy measures is mostly limited to crisis management, through reacting to increased liquidity demand and providing support to the banking system in times of crisis. In the longer term, central bank action does not determine financial stability directly, it is other factors, such as regulation, supervision, and incentive structures which determine the stability of the financial system.²

I would also like to say a few words on the hierarchy of these objectives. It is sometimes argued that only one objective can be pursued – on the assumption that a central bank has only one instrument, usually a short-term interest rate. Some objectives must therefore be subordinate to other objectives. In theory, this view is certainly correct.

However, practice is more complex than theory. In practice, the problem of having more objectives than instruments in monetary policy is less severe than theory might suggest. There are three reasons for this.

First, the three objectives are not necessarily contradictory. On the contrary, they are mutually conditional: A policy that ensures price stability in the long run also contributes to stabilising the economy and the financial system.

Second, even if the objectives sometimes appear to require a contradictory stance for monetary policy, it is possible – even with one instrument only – to successfully pursue several

¹ This is due, first, to uncertainties about the current state of the economy and its future evolution, and second, to long and variable lags in the transmission from monetary policy to the real economy. Therefore, monetary policy can and should only react to large and persistent deviations from equilibrium. Attempts at fine-tuning the economic cycle may even be counterproductive, in that they are procyclical.

² Obviously, central banks also have some long-term influence on financial stability, first because of moral hazard induced by actual or expected central bank action, second, by affecting asset prices, and third, due to the involvement of central banks in banking regulation and banking supervision. Furthermore, one can also argue that price stability and economic stability are also conducive to financial stability.

objectives. This is due to the fact that the impact of monetary policy on the different objectives occurs with different lags. To give an example: Monetary policy action aimed at ensuring financial stability in the very short run or aimed at stabilising the business cycle over the medium term does not necessarily endanger price stability in the long run if the stimulus is removed in time and compensated for by a more restrictive monetary policy stance afterwards. In other words, there are several paths for the monetary policy instrument that are consistent with the long-term objective of price stability.³

Third, and most importantly, monetary policy is not restricted to one instrument alone. Price stability and economic stability do indeed rely on the same instrument. However, the financial market crisis has clearly shown that central banks have a battery of other instruments at hand, with which they can manage liquidity during times of financial market turmoil.

This leads me to the second part of my introduction, namely, the central bank's main monetary policy instrument and the transmission mechanism. For most central banks in developed countries with floating exchange rates, the main monetary policy instrument is a short-term interest rate, referred to generally as the 'policy rate'. While in many other countries the policy rate is an overnight rate, the SNB has an operating target for the 3-month Swiss franc LIBOR (London Interbank Offered Rate).

Without going into detail, I would like to stress two important points with respect to the transmission from the monetary policy instrument to the economy. First, monetary policy works primarily through financial markets. By setting the policy rate, monetary policy affects exchange rates, interest rates, risk premia and asset prices in general, and is thus transmitted via financial markets to the real economy and to prices.⁴ Monetary policy therefore strongly relies on well-functioning and liquid markets. The tensions in the money markets in recent months therefore posed a serious headache to most central banks. Not only did money market tensions indicate potential problems for financial stability, but it also threatened the smooth functioning of the transmission mechanism of monetary policy.

³ To the best of my knowledge, this idea was first put forward by J. Niehans (1978), *The Theory of Money*, chapter 12, and was designated the 'three frequency approach to monetary policy'.

⁴ For a discussion of the transmission of monetary policy to financial markets see Ph. Hildebrand (2006), 'Monetary Policy and Financial Markets', speech given to the Annual Conference of the Swiss Society for Financial Market Research, 7 April 2006, or Th. J. Jordan (2007), 'Globalisierung und Finanzmärkte: Herausforderungen und Chancen', speech given at the ETH Zurich, 13 November 2007.

The second important point concerning the transmission of monetary policy is the fact that it is not the current value of the policy rate that matters. Rather, it is the expected future path of that rate that determines the stance of monetary policy. For example, a central bank can have an impact on the economy simply by signalling that its own view about the future path of the monetary policy rate is different from the current market view. If the central bank is credible, market expectations will adjust correspondingly and financial prices will henceforth reflect the new view communicated by the central bank.⁵

3. Chronology of the crisis

After these preliminaries, I will now turn briefly to the origins and the course of the financial market crisis, and in particular, the liquidity tensions brought about by the turmoil.

The US housing market stands at the epicentre of the financial market crisis. After rising for several years, US house prices peaked in 2006. In the ten years between mid-1996 and mid-2006, house prices in the US almost tripled, growing on average at an annual rate of 11%.⁶

An important development during the house price boom was the deterioration of lending standards, which can be traced back to the 'originate-to-distribute' financial intermediation model. Originate-to-distribute (as opposed to originate-to-hold) is a process whereby new loans are not held by the bank, but bundled, sliced, repackaged, and sold to investors. While the incentives in the originate-to-hold process favour the origination of good loans which can be expected to be serviced and paid back, the incentives in the originate-to-distribute process favour the origination of as many loans as possible, in order to profit from the fees involved in the underwriting and securitisation process. It is thus not surprising that credit standards decreased during the boom.

After house prices had peaked in 2006, it became more and more obvious to some market participants that many sub-prime borrowers would soon be unable to service their debt. Prices of sub-prime-backed securities started easing in 2007. As 2007 progressed, the deteriorating sub-prime market began affecting the confidence in related structured finance products and, in August 2007, led to a general repricing of risk and the deterioration of

⁵ Of course, to retain credibility, the central bank must refrain from deceiving the markets, i.e. from announcing future action without actually intending to act.

⁶ As measured by the Case Shiller Composite Index.

liquidity in many market segments, not least in the money market. As banks became more concerned about their own liquidity and more cautious about counterparty risk, they became less willing to lend, especially on the unsecured money market, at maturities longer than a few days.

As a central banker, I would date the outbreak of the financial market crisis to the beginning of August, when overnight interbank rates increased sharply. The first central banks to react were the ECB and the SNB on 9 August, when both banks conducted extraordinary fine-tuning operations. Soon afterwards, other central banks followed suit, also injecting additional liquidity.

So far, there have been three waves of money market strains. After subsiding somewhat in late September, the strains increased again in November, exacerbated by year-end pressures. The third wave started in March. The worst peak of the financial market crisis so far was attained in mid-March, when Bear Stearns was taken over by JPMorgan. The takeover, which was facilitated by the Federal Reserve, resulted in a calming of markets. Since mid-March, financial markets have improved somewhat, with the exception of money markets, which are still rather tense.

4. Action by central banks

I would now like to discuss in more detail the ways in which central banks reacted to the financial market crisis. Given that operational frameworks differ from one central bank to another, and given the highly technical nature of the subject, I will restrict myself to some stylised facts relating to the actions taken by central banks in general and those taken by the Swiss National Bank in particular.

Central banks responded to the financial market turmoil gradually, by progressively shaping and expanding their instruments. At the outset, central banks tried to counter rising short-term money market rates by applying their existing instruments in a more flexible way, by adjusting the size, frequency, and the conditions of their discretionary open market operations. For example, in order to react to the fluctuations in the demand for reserves, the SNB now conducts more frequent fine-tuning operations than in the past.

Although the enhanced use of fine-tuning operations managed to stabilize overnight rates, term spreads remained high. Central banks felt that it was necessary to address this situation, because it not only reflected an increase in credit risk but was also a sign of a lack of liquidity in these markets.

Central banks therefore introduced new facilities with longer maturities and offered exceptional long-term financing operations. For example, in September, the SNB carried out a CHF 5 billion repo auction with a three-month maturity. Until then, the maturity of its daily repo auctions had usually been one week. In an internationally coordinated effort, longer-term operations of this kind were intensified in December, in order to meet heightened demand surrounding year-end pressure. In December, the SNB conducted several repo transactions with maturities between three and four weeks to cover year-end requirements. In March, there were three auctions of three-month Swiss franc repos.

A consequence of tensions in the money markets was an inefficient distribution of liquidity. While some institutions tended to hoard liquidity, other institutions found it hard to come by. Some central banks therefore enlarged the range of counterparties for their liquidity management operations. A good example of this is the Term Auction Facility (TAF) introduced by the Federal Reserve in December, which provides 28-day term loans. This facility functions essentially like an open market auction, but is open to depository institutions, while access to the Fed's regular open market operations is restricted to 20 primary dealers. Furthermore, some central banks broadened the range of eligible collateral for their operations. This allowed the banks to keep their best collateral for the money market.

Another problem during the crisis was the dollar liquidity shortage of European banks. This resulted in additional uncertainty and in a high intraday volatility of dollar rates. In an internationally coordinated effort, the Federal Reserve therefore, in December, established a US dollar swap line for the ECB and the SNB. On December 17, the SNB, for the first time ever, conducted a repo auction in foreign currency and provided four billion US dollars of liquidity for 28 days to its counterparties. Due to the persistent strains in the money market, the swap lines were increased in March and again in May. Currently the SNB is providing a total of 12 billion US dollars of liquidity to its counterparties through bi-weekly auctions of six billion dollars each. These repo transactions will continue to be renewed until conditions improve. For Switzerland, the motivation for participating in this coordinated

action is twofold. First, our counterparties obtain easier access to dollar liquidity. Second, money markets in different currencies are highly interrelated. Fewer tensions in the dollar market also mean fewer tensions in the Swiss franc market.

The Federal Reserve's swap line is only the most visible result of the intense cooperation between central banks that has taken place since the outbreak of the crisis. In general, international consultation among central banks has proved very useful in managing the financial market crisis.

A further important action taken by central banks was the introduction of facilities that allow banks to swap collateral that is less liquid for securities that are highly liquid, such as government bills. In March, the Federal Reserve introduced a Term Securities Lending Facility (TSLF), which allows to lend up to USD 200 billion of Treasury securities to primary dealers in exchange for a broad range of collateral, including asset-backed securities. In April, the Bank of England introduced its 'Special Liquidity Scheme', a new facility which allows banks to temporarily swap their mortgage-backed and other securities for UK Treasury Bills. The aim of these collateral swap facilities is twofold: first, balance sheets of financial institutions become more liquid, and second, the prices of the collateral are indirectly supported, as fire-sales of such assets accepted as collateral become less likely.

An attractive feature of collateral swaps is that they leave the amount of central bank money unaffected. They support liquidity in the banking system without driving short-term money market rates below the policy target. Furthermore, the size of these operations can, potentially, be very large, since there are almost no limits as long as the Treasury provides the securities or the central bank can issue its own bonds.

The single most far-reaching action by a central bank in the crisis so far, however, was the Federal Reserve's decision to facilitate the takeover of Bear Stearns by JPMorgan, in that it took over risky assets in significant quantities. By stepping in, the Federal Reserve put an end to a disorderly de-leveraging process on the part of highly interconnected financial institutions, and probably made a crucial contribution to defusing the third and most recent wave of the financial market crisis.

Given its open access policy with respect to counterparties and the broad collateral base, it was not necessary for the SNB either to increase its range of counterparties or to expand its

list of collateral.⁷ Neither has it been necessary to introduce a facility for swapping illiquid for liquid assets, so far.

How should we assess the impact and success of central bank actions so far? Although they have helped to limit tensions in the money market, the situation is still far from normal. Despite all the liquidity measures that have been taken, term premiums in the money market remain elevated. This provides further evidence of the fact that the lack of confidence in the market cannot easily be removed by central bank action alone. Market participants have to undertake the necessary steps themselves to restore market confidence.

5. Lessons and consequences for liquidity management operations

What lessons can we learn from the financial market crisis? There are, of course, many lessons to be learned. However, I would like to concentrate on those that are related to central bank liquidity management operations.⁸

Liquidity management vs. changes in the stance of monetary policy

The first lesson concerns the distinction between liquidity management and monetary policy. The crisis has made clear to financial markets, but also to central banks, that in order to safeguard financial stability during financial market turbulence, central banks do not depend solely on the monetary policy rate, but have a broad arsenal of liquidity management instruments at their disposal. To illustrate this point: Lowering the policy rate is not the only thing a central bank can do to ensure financial stability in the short run; a central bank has other efficient instruments at hand, which, depending on the situation, may be equally or even better suited to safeguarding financial stability. Also, these instruments do not affect the stance of monetary policy and thus the economic stability and price stability objective, or only do so to a lesser degree.

⁷ In October 2007 (unrelated to the financial market crisis), the SNB expanded the list of eligible collateral by around 50%, including in its list securities from issuers domiciled in the European Union and the European Economic Area denominated in Swiss francs and other major currencies.

⁸ The report on 'Enhancing Market and Institutional Resilience' by the Financial Stability Forum (2008) presents an extensive list of lessons from the financial crisis.

The difference between liquidity management operations and changes in the stance of monetary policy has been poorly understood by many observers. Liquidity injections, as large as they may have appeared, have in general not resulted in significantly higher levels of reserve money, because they were only of a temporary nature. The liquidity management operations have thus not resulted, as is sometimes claimed by analysts, in huge amounts of excess liquidity, nor can they necessarily be equated with a more expansionary monetary policy stance. Many of the recent central bank liquidity management operations have not affected the monetary policy stance.

However, there have of course been changes in the monetary policy stance during the financial market crisis: the Federal Reserve has significantly lowered interest rates, and in some other countries, the path of the (partly realised, partly expected) monetary policy rate is lower now than last August, which is equivalent to an expansion in the monetary policy stance. However, changes in the stance of monetary policy must not be viewed as an immediate reaction of monetary policy to the financial market crisis, but rather as a reaction to the expected effects of that crisis on economic growth and on inflation. This view also explains the apparent hesitation of some central banks to lower rates, in spite of the serious financial market turmoil. The precise way in which the financial market crisis will affect economic growth and inflation has not been obvious – and is still not obvious.

Operational target and the stance of monetary policy

The second lesson concerns the setting of the stance of monetary policy in times of financial turbulence. The financial market crisis led to a tightening of credit conditions and to higher risk premia, which is tantamount to a more restrictive monetary policy stance. In order to offset tighter credit conditions and higher risk premia, an adjustment of the policy rate may be appropriate. Such an adjustment is not necessarily synonymous with a more expansionary monetary policy and does not necessarily increase inflation risks. The concept of the Swiss National Bank implicitly takes into account changes in certain risk premia: by steering and stabilising the 3-month Libor, which includes a risk premium, the SNB is constantly adjusting the repo rate in order to offset changes in the risk premium.

Appropriate liquidity facilities

The third lesson concerns appropriate liquidity facilities. In order to react quickly and flexibly, central banks must be capable of injecting and withdrawing large amounts of liquidity at short notice. In order to distribute liquidity to banks when the money market is impaired, central banks must also be able to conduct operations with a maximum set of counterparties and against a broad range of collateral. In order to address liquidity premia, central banks should be able to intervene in maturity ranges which are longer than the maturities at which they usually operate. Central banks may also need to enlarge the basket of eligible collateral during a crisis. Furthermore, the crisis has made it clear that the effectiveness of a standing loan facility in times of crisis may be reduced if there is stigma attached to its use.

Moreover, central banks should also have alternative plans up their sleeves on how to deal with severe and persistent illiquidity in the money market. The collateral swap facilities are not traditional liquidity management operations aimed purely at injecting liquidity. They provide a temporary relief of banks' balance sheets and therefore indirectly support liquidity in the money market. However, central banks should use such drastic measures only in exceptional cases. Central banks also need exit strategies for such eventualities.

Finally, the crisis has also shown that, in order to successfully address financial market turmoil, central banks need enough room to manoeuvre and a liberal legal framework. A tight legislative corset hampers flexible and innovative reactions to the different contingencies a financial crisis might throw up.

The financial market crisis has demonstrated that the SNB's liquidity management framework is up to its task. The SNB repo auctions allow for quick and flexible action, at different maturities, and facilitate both the provision of and withdrawal of liquidity. The secured repo market in Swiss francs, which was introduced in 1998, has proved very useful in recent months, as it has granted access to liquidity in the secured money market to banks with good collateral. The SNB conducts its auctions with a large group of counterparties and regularly encourages eligible banks to participate in the repo auctions. The SNB even permits banks domiciled abroad to participate in its repo auctions. Shortly before the financial market crisis, the SNB expanded its repo baskets by including more currencies. Nevertheless,

the lessons from the financial market crisis will be taken as an opportunity to review the tool box of instruments and, if necessary, improve it.

The crisis has also demonstrated the limits of central bank intervention. Only in the short term can central bank intervention safeguard financial stability . Ultimately, it is market participants themselves who must overcome the crisis, by enhancing transparency, re-establishing markets for illiquid assets, rebuilding confidence among banks, writing off bad debt, recapitalising balance sheets and running down excessive leverage. Central bank action is a first-aid kit to ensure that the patient does not die on the site of the crash from a loss of blood, but the subsequent healing process is up to the patient.

Taking moral hazard into account

The final lesson concerns the moral hazard problem arising from liquidity management operations. Roughly speaking, moral hazard is the name we give to the situation in which, financial institutions and investors incur higher risks than they would otherwise because they expect the central bank to intervene in times of crisis. This, in turn, may increase the likelihood of future crises.

Moral hazard is relevant both at the level of systemically relevant market players and at the level of markets as a whole. Market participants that are 'too big to fail' or 'too interconnected to fail' may automatically factor in the help from central banks when deciding about their business strategy. However, smaller players and investors that cannot count on individual help may also take the expected central bank reaction to financial market crises into account in their investment decisions.

Because of moral hazard, central bank intervention in order to safeguard financial stability in the short term may be destabilising in the long term. Therefore, when reacting to a financial crisis, the benefits of central bank intervention in terms of short-term stabilisation must be weighed against the long-term cost in terms of moral hazard. This is no easy task, because the future cost is unknown and far away, while an ongoing financial market crisis is a clear and present danger.

Recent events have clearly shown that moral hazard is not just a textbook phenomenon, but is in fact a serious problem. Market players do indeed rely on the implicit insurance granted

by central banks and other authorities, and central banks and authorities, having no choice, do indeed step in to support markets in a crisis.

There is no easy way to address the moral hazard problem. However, the right time to tackle it is probably not primarily during a financial crisis, but during the preceding calm. Since a strict declaration of no intervention by a central bank may not be fully credible, regulation must aim to neutralise the distortion of incentives which financial market participants face because of moral hazard. Larger capital and liquidity requirements are probably a robust means of countering that distortion. Larger capital and liquidity requirements do not eliminate moral hazard, but they limit the risk of an accident and thus the cost to the public in the event of a rescue.

Related to the moral hazard issue is also the issue of the risk-bearing capacity of a central bank. A central bank can only act as a lender of last resort if it has the means to act as one. This is especially important if the banking system has relatively large liabilities in foreign currency. While a central bank can, in principle, create an unlimited amount of domestic currency, its foreign currency reserves are limited. Recent events have highlighted the importance of an adequate level of foreign reserves for financial stability.

6. Conclusions

I would like to close today by stating that, in my opinion, extraordinary central bank action was indeed justified to counter financial market turmoil, and that it was also successful in halting the developments in mid-March, which threatened to develop into a vicious circle of fire sales and falling asset prices.

However, central bank action cannot resolve the underlying problems. It can only provide temporary relief. The solution to the crisis must come from market participants themselves.

Central bank action appears to have been relatively successful. But there's one thing that every economist knows only too well, and it is that there is no such thing as a free lunch. So the question naturally arises, what has been the cost of the recent extraordinary central bank interventions?

The first potential cost of recent central bank action is in terms of moral hazard. One of the biggest challenges that lie ahead of central banks and regulators, once the crisis has settled

down, is to consider how to reduce moral hazard in financial markets, in order to prevent this factor from becoming the reason for the next – and potentially even bigger – financial crisis.

The second potential cost of recent central bank action could be in terms of inflation. The financial market crisis affects inflation in various ways. On the one hand, the crisis has resulted in a more expansionary monetary policy stance in some countries. This has probably contributed to the rise in commodity prices in recent months, and to the rise in energy prices, in particular. On the other hand, the expected economic slowdown associated with the crisis should dampen inflationary pressure. However, the aggregate effect of the crisis on inflation is far from obvious. The crisis has thus increased the uncertainty surrounding the inflation outlook. Consequently, central bankers are currently challenged not only on the financial stability front; they also need to be extremely alert to developments on the price stability front.