

**“MONETARY POLICY, REGULATION
AND VOLATILE MARKETS”**

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INTRODUCTION

*By Morten Balling
Ernest Gnan and Catherine Lubochinsky*

Turmoil in financial markets causes reflection. Is monetary policy conducted in the most efficient way? Are regulatory and supervisory arrangements adequate when market volatility increases and financial institutions come under stress? In the present SUERF Study, we have collected the reflections by an outstanding group of top officials, researchers and observers. The editors are proud to be able to present their joint insights to SUERF readers. The papers were presented at the 27th SUERF Colloquium in Munich in June 2008: *New trends in asset management: Exploring the implications*.

In the first paper, *Axel A. Weber*, President of the Deutsche Bundesbank asks if the far-reaching structural changes in global financial markets in recent years have also changed the financial markets' reaction to monetary policy. Monetary policy is transmitted through an interest rate channel, a balance sheet channel and a banking lending channel. Increased competition between banks has led to a closer relationship between market and bank interest rates. This has strengthened the interest rate channel. The increasing role of mortgage markets and mark-to-market accounting has strengthened the balance sheet channel, while the broadening of banks' and borrowers' options has weakened the banking lending channel. On balance, monetary policy remains a powerful tool for delivering price stability.

The author defines financial stability as the ability of the financial system to perform its key functions efficiently, namely, the allocation of capital and risks and the settlement of payments and securities transactions. Financial stability analysis and monetary policy analysis are closely interrelated. A standard analytical model of financial stability has not yet been developed, but improvement in the framework for financial stability analysis is a very high priority for central banks. During the 2007–2008 financial turmoil, central banks from all over the world have acted as liquidity providers of last resort to the banking system. In free market economies, central banks' liquidity support must, however, always be confined to a transitional period.

Financial integration can help individual EMU member states to absorb country-specific shocks more easily. Financial integration also strengthens the

stability of the euro area financial system. Risks tend to be more diversified on a cross-border scale which should lead to financial intermediaries, markets and infrastructure becoming more resilient to idiosyncratic shocks. Financial integration is most advanced in those market segments which are closest to the single monetary policy. Financial integration has progressed most in government bond markets and is least advanced in equity markets. Integration in the retail banking markets has remained limited. The president concluded by saying that the Eurosystem contributes to safeguarding financial stability by maintaining price stability in the euro area in the medium term.

In the second paper, *Sushil Wadhvani*, CEO, Wadhvani Asset Management revisits the debate on whether monetary policy should respond to asset price misalignments. The author starts by summarizing the case for “Leaning against the wind.” He argues that central banks seeking to smooth output and inflation fluctuations can improve macroeconomic performance. Moderating changes in asset prices diminishes fluctuations in economic activity so long as the underlying reason for the asset price movement can be traced to a disturbance in the demand and/or the supply of the asset in question. Taking asset price misalignments into account in the normal course of determining monetary policy may impact on expected inflation and contribute to avoiding unnecessarily large business cycle fluctuations.

Many central bankers and academics have argued that the difficulties associated with identifying a bubble makes leaning against the wind impractical. The author does, however, not see any significant difference between the informational requirements of any form of monetary policy rule that requires a reasonably accurate aggregate demand forecast, versus a leaning against the wind rule. Substituting monetary policy with a leaning against the wind tilt by going for inflation forecast-targeting assuming financial market efficiency is, in the view of the author, likely to lead to poor monetary policy. The author also argues against relying on mopping up after bubble bursts. If the monetary authorities in the UK want the financial framework to be less procyclical, the Monetary Policy Committee should, at a minimum, explicitly say that they will look at asset price misalignments in addition to a fixed horizon inflation target.

Countercyclical elements could be built into the regulatory framework by linking capital adequacy requirements to “excessive” growth of the value of bank assets or by varying maximum loan-to-value ratios. In his conclusion, the author expresses the hope that he has persuaded the readers of the

theoretical and empirical case for considering a leaning against the wind tilt to the way monetary policy is run.

In the third paper, *Andrea Vivoli*, Researcher, Banca d'Italia looks with critical eyes at the current EU regulation of collective investment schemes and proposes an alternative approach based on risk budgeting. In order to protect investors in collective investment schemes, the regulation in force at European and national levels provides for asset allocation risk-spreading rules. Limits are set to counterparty risk, investments in non-listed securities, the degree of leverage, and exposure to derivative instruments. The UCITS Directive contains information requirements regarding a simplified prospectus that should guide investors' decisions. The document is, however according to the author too long and not understood by its intended readers. The risk descriptions applied are useless.

A cluster analysis is carried out in order to assess if the asset allocation approach applied in the EU Regulation allows an effective discrimination of Italian mutual funds' risk profiles. It shows that there is no perfect matching between asset allocation classes and risk-based clusters.

As an alternative type of regulation, the author suggests risk budgeting in which a risk comfort level is identified first and an asset allocation consistent with that risk level is determined afterwards. Regulation of risk budget funds should provide minimum criteria regarding liquidity of shares, portfolio diversification, leverage and short selling of eligible assets, risk indicators and organisational requirements. The new approach could – together with Basel II and the MiFID Directive – provide significant advantages to all parties and start a movement away from rule based compliance enforcement to a more flexible and comprehensive risk-based supervisory framework.

In the fourth paper, *Jesper Ulriksen Thuesen*, Adviser, Danmarks Nationalbank, discusses the feasibility of regulating hedge funds. Many analyses indicate that hedge funds have so far generally had a positive impact on financial stability by contributing to better price formation and spreading of risk in global financial markets. However, the increasing importance of hedge funds is also associated with a number of potential risks. The author provides an overview of the largest hedge-fund crises from the 1998 Long-Term Capital Management Crisis to the beginning of the 2007 financial market turmoil. None of these events gave rise to systemic crises in the financial markets.

As regards regulation of hedge funds, an overall distinction can be made between direct, indirect and market-based regulation. Direct regulation would imply risk-based requirements for capital adequacy and risk management systems. Indirect regulation would involve requirements to hedge fund counterparties like brokers and financial investors. Market-based regulation relies on a considerable degree of market transparency so that all market participants are able to take the relevant risks into account. It is in any case essential that the financial institutions that are, in one way or another, counterparties to hedge funds have the necessary risk management tools and information at their disposal to be able to manage portfolios that include hedge funds. The author finds it not advisable to let consumer protection issues set the agenda for regulation of hedge funds. The focus should be on financial stability issues.

In the fifth paper, *Fernando Restoy*, Comisión Nacional del Mercado de Valores, attempts to provide an overview of the main lessons for financial supervisors to be learned from the 2007 market turmoil that followed the sub-prime mortgage crisis in the US. The paper is organised around four key words: transparency, credit rating agencies, liquidity and organizational arrangements. The sub-prime crisis initiated a crisis of confidence in financial markets worldwide. The best way to address this is to ensure an appropriate degree of transparency. Disclosures on exposure to off-balance sheet vehicles must be improved. The author criticizes proposals for abandoning fair value accounting. We should not “shoot the messenger.” Using prudential policy tools is a more efficient way to address financial stability concerns than distorting the criteria used to report financial information. Structured financial products have contributed to the efficiency of the global financial system. The phenomenon may, however, have gone too far, too quickly. The rapid increase in the issuance of structured products is especially due to the significant acceleration of CDOs, collateralized debt obligations. CDOs do, however, not represent new investment opportunities; just the repackaging of already existing risk-return profiles. The practice of generating investment grade securities through CDOs has been particularly dubious. The author argues convincingly that there is a transparency deficit in structured products that calls for strengthening of information requirements. The current EU regulation introduces demanding criteria for pre and post-trade transparency in regulated stock markets, but establishes no requirements for other instruments. The author recommends that transparency requirements should be extended to some non-equity markets and as a first step be imposed on markets in relatively liquid instruments – such as some corporate and covered bonds – and subsequently applied to other more complex assets.

Credit rating agencies have played a key role in the developments following the sub-prime crisis in the US. The agencies offered investors risk evaluations of the different tranches of highly complex structured products. The developing sub-prime crisis in the summer of 2007 triggered an intense downgrading wave that affected a wide range of structured products. Subsequently, the methodologies, procedures and transparency of the credit rating agencies have been heavily criticized. Obviously, investors may have attached too much weight to credit ratings. IOSCO has recently released a new code of conduct which incorporates more stringent requirements on the agencies' methodologies, transparency and organization. To establish a system of official regulation and supervision of credit rating agencies is a difficult task. Official agencies do not normally have the means and expertise to supervise complex assessment methodologies. At the same time, extensive monitoring by a public agency may generate the perception of public responsibility for the accuracy of the work done by the rating agencies.

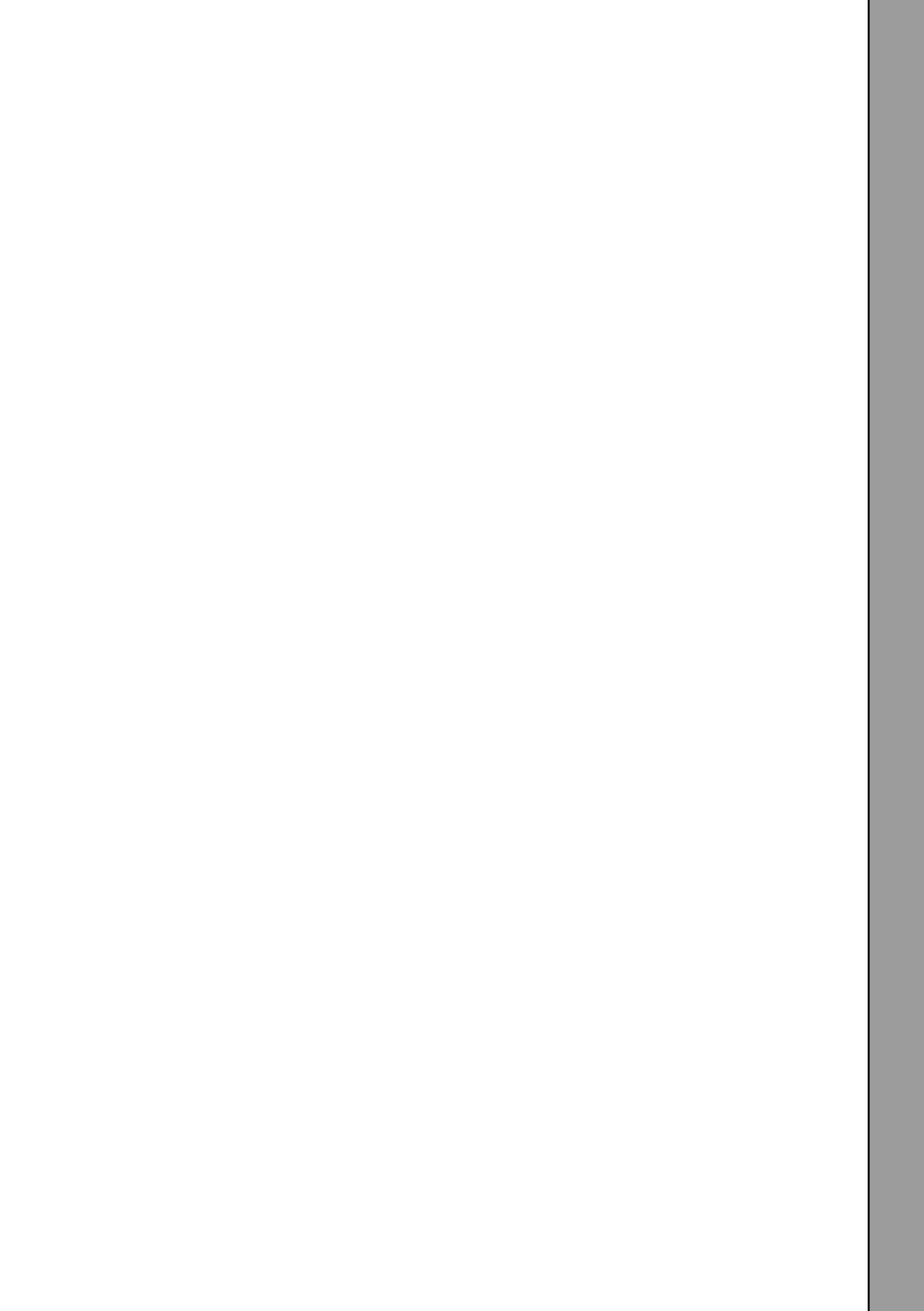
Following the sub-prime crisis there was a substantial reduction in financial market liquidity. The author discusses the possibility for regulators and managers of market infrastructures to improve liquidity in wholesale markets and the treatment of liquidity risk in current regulations.

The spill-over effects from the US sub-prime crisis have revealed a number of deficiencies in the functioning of the financial system which have a genuinely global character. The global nature of the problems calls for global solutions. The author argues that there is a need for faster convergence on the financial information standards applied in different jurisdictions, that regulatory differences vis-à-vis credit rating agencies and non bank financial intermediaries should be reduced, and that market transparency requirements should become more homogeneous. With reference to potential conflicts between transparency and financial system stability, the author endorses the idea of assigning responsibilities for market conduct and prudential oversight to two different institutions (the twin peaks model).

In the sixth paper, *John P. Calverley*, Head of Research, North America, Standard Chartered Group, evaluates the interaction between the US housing bubble, the sub-prime crisis, liquidity, and the global financial turmoil in 2007–2008. He argues that the US housing bubble was the main cause of the financial crisis not merely the trigger. The author points out that financial innovation reinforced the house price boom. Sub-prime lending, adjustable rate mortgages, interest only mortgages, option mortgages, and mortgage bundling all played a role. Another key factor was the so-called “bubble

mentality.” During the upturn, people were prepared to borrow more and more because they believed that house prices would never fall. Higher house prices meant that house owners felt wealthier and increased their spending in general. When in 2007 house prices began to fall, the bubble mentality was replaced by the feeling of uncertainty. House buyers became very cautious and home owners reduced their expenditures and borrowing. Consumer spending in general slowed down. Falling stock prices contributed to the negative impact of the declining household wealth. So did the increasing oil prices. The author gives an overview of the debate whether the authorities should attempt to limit house price declines. He concludes that the authorities have limited options. A gentle “leaning against the wind” in the form of low interest rate policy may be worth contemplating but this may conflict with the central bank’s inflation objective. Government guarantees to the mortgage sector can keep mortgage markets open and ensure that spreads and terms are not too onerous. Finally, the authorities can try to limit the flood of foreclosures in cooperation with the banking sector. Monetary policy can do little on its own.

Together, the papers in the present SUERF Study give the readers an outstanding opportunity to understand the important monetary policy and regulatory and supervisory perspectives of the 2007–2008 turmoil in financial markets.



FINANCIAL MARKETS AND THE CENTRAL BANK

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1. Introduction

In recent years, we have seen far-reaching structural changes in global financial markets. Financial innovation has manifested itself in various ways, the most prominent being the growing importance of new and complex financial instruments, the increasing significance of new business models, especially in the realm of securitisation and disintermediation, and intensifying competition, partly owing to the consolidation process in the banking sector, partly owing to the rising importance of relatively new, largely unregulated players, such as hedge funds, private equity firms, conduits and SIVs.

These remarkable financial developments are bound to alter the range of activities financial market participants pursue. But are they also changing financial markets' reaction to monetary policy?

The starting point for answering this question is easy to find: the monetary policy transmission process. This term describes the long, variable and uncertain process by which a change in a central bank's official interest rate impacts first on financial markets and is ultimately transmitted to the economy in general and the price level in particular. As a significant part of this monetary policy transmission process takes place in financial markets, it goes without saying that the recent trends in global financial markets are of special interest to central bankers – and it would not have needed the recent financial market turmoil to drive home that point.

Against this backdrop, I will focus my remarks today on the following three issues. First, have the recent structural changes in the global financial system

altered the transmission process of monetary policy – and, if so, do these changes make a central banker’s life more – or less – difficult? Second, how can central banks help avoid disturbances in the financial system? This is a crucial question because financial stability is a precondition for the effective transmission of monetary policy decisions to the real economy. Third, how does financial integration affect monetary policy transmission? Specifically, what is the current state of affairs in the euro area?

2. Financial markets and monetary policy transmission

I shall start with the most general question. To what extent have the recent financial market trends changed the way monetary policy affects the economy and its price level? This is a crucial issue. Without a fair knowledge of the monetary transmission process, its key variables and the lags involved, central banks will face a tough job when deciding on official interest rates. For this reason, the Eurosystem closely monitors structural developments in financial markets. We also try to detect how financial innovations could have modified the way changes in short-term interest rates are transmitted to other financial variables, output and inflation.

Without wanting to go into too much detail, it is essential to point out that, when it comes to the impact the recent financial trends have on monetary policy transmission, several countervailing effects are in play. These countervailing effects are best captured when unravelling monetary policy transmission into its different channels, that is by considering individually the different ways in which a change in central bank interest rates affects economic variables – at least in the short term.

Let me focus on the channels and arguments that are the most prominent in the euro area. To begin with, there is the interest rate channel. According to the existing literature, the development of deeper, more complete and more competitive financial markets seems to have strengthened the pass-through from central bank interest rates to market interest rates. This can be put down to two factors: Consolidation in the banking system, implying the emergence of (fewer and) larger banks and thus improved arbitrage opportunities between

different financial markets, and an enhanced availability of alternative capital market-based instruments for debt financing.

It is indeed likely that the increased competition between banks, as well as between bank loans and different financial market products, has led to a closer relationship between market and bank interest rates. Consequently, the deepening of financial markets should have amplified and/or speeded-up the effects of monetary policy on bank interest rates (and, other things being equal, on other financial variables, output and inflation).

Financial developments over the past decade should also have strengthened the balance sheet channel. Basically, the idea is that, in an economy with highly developed mortgage markets and a proliferation of mark-to-market accounting rules, changes in the value of collateral and wealth have a greater impact on the economy. In such an environment, borrowers' balance sheets tend to fluctuate more, which leads to a higher volatility in the amount of funds banks are willing to lend to households and firms. Obviously, greater changes in the supply of credit will translate into greater changes in consumption and investment, thereby strengthening monetary policy transmission.

At the same time, a third prominent monetary policy transmission channel, the bank lending channel, is generally supposed to have become less important. Comparable with the balance sheet channel, the bank lending channel emphasises that monetary policy can influence aggregate demand not only through interest rates, but also through its impact on the supply of bank loans. Whereas the balance sheet channel focuses on the availability and value of collateral necessary for borrowing operations, the bank lending channel refers to changes in the banks' and borrowers' funding possibilities.

Usually, two reasons are put forward why the balance sheet channel has weakened of late. Banks have become more flexible because of the growing use of securitisation and improvements in risk management. Consequently, banks can respond more flexibly to changes in financial market conditions and will therefore not pass through each and every change in the central bank's official short-term interest rate. Hence, other things being equal, the effect of monetary policy on the overall loan supply has decreased. Moreover, financial development has not only broadened banks' options in terms of responding to interest rate changes; it has also broadened borrowers' financing opportunities, reducing their dependency on bank loans.

To put all the arguments in a nutshell, monetary policy seems, on balance, to have gained influence on financial market prices and the real economy in the short run. This is confirmed by the existing theoretical and empirical literature, which, by the way, delves much more deeply into the intricacies of the various transmission channels than I am able to do today. In any case, it should be borne in mind that the evidence is still tentative. As financial development is an ongoing phenomenon, it should therefore be considered valid only at the current juncture. Nonetheless, the bottom line is that, in the face of greater competition among financial intermediaries, financial innovation and financial globalisation, monetary policy remains a powerful tool for delivering price stability.

In this context, however, it is of the essence that the monetary policy strategy utilises a broad-based approach in order to guarantee a robust assessment of the developments in the economy and on financial markets.

3. Financial stability

3.1. Financial stability analysis

Let me now turn to financial stability. A widely accepted definition of financial stability is the ability of the financial system to perform its key functions efficiently, namely, the allocation of capital and risks and the settlement of payments and securities transactions. These functions must be fulfilled smoothly not only in normal times, but also during periods of structural adjustment and stress.

For obvious reasons, supporting financial stability is an important objective for central banks – and has always been so. First, as noted above, monetary policy is largely transmitted through financial market operations. Hence, the effect that monetary policy has on the real economy depends crucially on the smooth functioning of financial intermediaries and financial markets. It is at this point that financial stability analysis and monetary policy analysis are most closely interlinked.

Second and more generally, major macroeconomic objectives, especially price stability and sustainable output growth, are jeopardised if the financial system suffers from instability. This is underlined by the generally high macroeconomic costs of financial crises. In addition, this aspect has gained importance since financial turbulences seem to have become more frequent in past decades owing to accelerated growth in financial transactions and the greater complexity of new financial instruments.

Third, financial stability is closely linked to a central bank's interest in the prudent design and management of the payment and settlement systems which process its currency. The Eurosystem, for instance, has the statutory task of promoting the smooth operation of payment and settlement systems.

Against this background, referring to financial stability analysis as a new trend among central bankers would be something of a misnomer. Indeed, financial stability analysis is anything but a passing fashion. It has, in fact, been a field of research of its own right since the mid-1990s. This is reflected in the wide dissemination of Financial Stability Reports, which are now produced in more than 50 countries worldwide.

Nonetheless, it is fair to say that financial stability analysis is still, to a large extent, work in progress. To illustrate my point, let me outline briefly the kind of challenges central banks face. To begin with, financial stability is not easily measured. This is hardly surprising as, in contrast to monetary policy analysis, there is no single indicator (such as inflation) to observe. Similarly, initiatives to create some sort of an all-encompassing financial stability index have failed to convince so far. Instead, the concept of financial stability involves various financial intermediaries, financial market segments and infrastructure, for which a whole host of different quantitative and qualitative indicators exist. As a consequence, determining the degree of financial stability remains a highly complex task.

At this point, the natural suggestion from an academic outsider would be to construct a theoretical model. Such a simplified representation of reality would help the academic to single out the most relevant indicators and to define the interrelationships between financial market and economic variables. However, model-based financial stability analysis is still in its infancy. Three issues are particularly striking.

The feedback effects between financial system behaviour and the real economy are difficult to model, especially in episodes of stress. Currently,

most macroeconomic models treat key financial system interactions and feedback effects only in a rudimentary manner. Therefore, the “true” costs in terms of real GDP that are associated with systemic risk in financial markets are difficult to determine. This is a significant limitation, given that feedback effects play a crucial role in assessing a financial system’s vulnerability to contagion and system-wide stress.

Another principal reason why episodes of stress are difficult to model lies in the fact that financial instability is inherently non-linear. As one consequence of this non-linearity, risk factors typically are not normally distributed. Instead, their distribution is characterised by fat tails, implying that extreme values are observed more frequently than what would be predicted under the assumption of normality. Modelling non-linearities greatly complicates research, but it is indispensable, given the central focus of financial stability analysis on default, contagion and spill-over effects.

A further challenge faced by financial stability analysts is a lack of relevant data. First of all, historical time series on episodes of stress are rare, luckily. But that makes it even more difficult to understand financial markets’ behaviour in the fat tail of risk distributions. Moreover, and more generally, some of the data needed for financial stability analysis still require development. With the exception of market prices and regulatory information, only a limited set of data is on hand in a timely, comparable and satisfactory manner. Think, for instance, of financial intermediaries’ financial reporting and the little information available on credit risk transfer. Therefore, methods have to be found for handling the shifting demand for data in an environment in which financial markets are constantly undergoing change.

To sum up, feedback effects, non-linearities and the handling of a limited set of data are prime examples of the numerous challenges encountered by financial stability analysts in designing financial stability models. As a consequence, it comes as no surprise that a standard analytical model of financial stability has not yet been developed. At present, modelling is often scattered with respect to risk categories, financial market segments and structural or regulatory issues.

Mind you, there is no reason to play down the progress achieved so far, on the contrary. Financial stability analysis is becoming more and more sophisticated, as is borne witness by the increasing number of related working papers and conferences.

As for the recent financial market turmoil – the trigger for the recent financial market turbulence, the speed at which it spread across global financial markets and its persistence were not foreseen, but that does not conflict with my statement. Far from it – financial stability analysis does not aim for clairvoyance. Instead, it is most likely that financial crises will continue to emerge in spite of perceptible progress in financial stability analysis. But the crucial point is that their impact can be alleviated by warnings, moral suasion and – if necessary – adjustments to the institutional and regulatory framework. For this reason, further improvement in the framework for financial stability analysis is a very high priority for central banks.

3.2. Dealing with episodes of financial instability

There is yet another reason why central banks need to keep well-informed on financial market developments. The turmoil that has been affecting global financial markets since summer last year has been a further example of central banks not only taking a predominantly passive role in analysing and commenting on financial stability, but also of playing an active part as well. Indeed, the role of central banks in crisis management dates back to the 19th century and was reflected in the views of Thornton and Bagehot. Both noted that a central bank should – under specific conditions – provide liquidity to the banking system as a lender of last resort.

And that is exactly what happened when the crisis in the US subprime market triggered a rapid loss of confidence among financial intermediaries on a global scale. As a result of it, uncollateralised interbank lending has been muted – the reasons for which are twofold. On the one hand, banks' willingness to lend has fallen sharply due to mounting counterparty risks. On the other, the uncertainty banks face with respect to their own longer-term liquidity planning has increased considerably. To alleviate ongoing tensions in interbank money markets, central banks from all over the world have acted as liquidity providers of last resort to the banking system.

As for the Eurosystem, we have so far stood the test in this challenging environment. Owing to the broad design of our liquidity operations toolbox, the Eurosystem's operational framework has had to change only slightly since the outbreak of the financial market turbulence. What is more, the Eurosystem succeeded fairly quickly in reestablishing confidence in the functioning of the Euro money market by promptly injecting additional funds on a temporary basis. We shall continue to provide liquidity flexibly – which

seems warranted given the ongoing tensions in the Euro money market, including, and especially, in the longer-term sector.

Although there have recently been some identifiable signs of easing in several financial market segments, it is still too early to give the all-clear. Specifically, the still elevated level of money market spreads underlines the fact that there is no room for complacency.

In this context, I would like to stress two points. In the Eurosystem, we have strictly separated our management of aggregate liquidity conditions from the determination of our monetary policy stance. Hence, when deciding on interest rates, the primary objective of the Governing Council has been (and will continue to be) price stability. Against the background of the continuing and persistently strong upside risks to price stability, the Governing Council is in a state of heightened alertness and in readiness to act. Moreover, our strict separation makes clear that the Eurosystem does not intentionally and directly offer some sort of ex post insurance to financial market participants who have engaged in excessive risk-taking. This is intended to limit moral hazard to a large extent.

Apart from this, it seems appropriate to point out that, in a free market economy, central banks' liquidity support must always be confined to a transitional period. In other words, in the medium run, central bank interventions cannot substitute the need for financial intermediaries to regain confidence gradually. At the top of the list of requirements, I would like to see financial intermediaries trying to enhance their transparency regarding credit and market risk exposures and also, if necessary, raising capital and adjusting business models. Furthermore, it is essential that financial intermediaries convince investors that the financial system as a whole is capable of managing risks adequately in a setting of continuously changing financial market trends.

Finally, taking a step back from crisis management, the recent financial market turmoil has underscored the need for crisis prevention to be strengthened. This is exactly what is taking place at the moment. National, European and international forums and organisations are currently putting a lot of effort into identifying the lessons to be learned. There are various initiatives under way, but it is particularly important that the recommendations made by the Financial Stability Forum are implemented rapidly and effectively. The implementation of these recommendations, including those on disclosure

standards and risk management, will be a major step forward in enhancing the resilience of the international financial system.

4. Financial integration in the euro area

If I were governor of a central bank whose currency area coincided with the boundaries of its financial markets, I could end my speech here with a brief summary. However, as governor of a central bank that is an integral part of the Eurosystem, there is yet another topic to cover: financial integration. It is generally accepted that, in a currency union, well-integrated financial markets facilitate the implementation of the single monetary policy. There are three aspects worth mentioning.

First, a currency union should work more smoothly, the more integrated the national financial markets are. Indeed, financial integration can help individual EMU member states to absorb country-specific shocks more easily. The reason for this is that the more diversified the sources of national income and the easier it is to borrow abroad, the less consumption and investment need to follow fluctuations in national output. Hence, national consumption and investment levels can be insulated from domestic macroeconomic shocks via cross-border risk sharing.

Second, financial integration strengthens the stability of the euro area financial system – and of the macro economy in general. Basically, in a well-integrated financial system, risks tend to be more diversified on a cross-border scale which should lead to financial intermediaries, markets and infrastructure becoming more resilient to idiosyncratic shocks. Having said that, integrated financial markets arguably broaden the scope for spillover effects across borders – as manifested by the recent US subprime crisis.

Third, I have already stated that the Eurosystem's tasks include the smooth operation of payment and settlement systems – which is closely linked to the progress of financial integration. There is an abundance of evidence that the launch of the euro was a major catalyst for financial integration in the euro area.

In general, financial integration is most advanced in those market segments which are the closest to the single monetary policy. This is particularly visible in the unsecured money market, which was almost perfectly integrated right at the start of EMU, as measured by the low cross-country standard deviation of the average overnight lending rates among euro area countries. Moreover, the euro has significantly reduced home bias in the euro area bond and equity markets, albeit to varying degrees. Principally, financial integration has progressed most in government bond markets and is least advanced in equity markets. Having said that, the percentage of cross-border holdings of bonds and equities in the euro area has grown over the past ten years. In addition, bond market yields and share prices are increasingly being driven by common euro-area factors, although local factors continue to play a role. These developments have been supported by the elimination of currency risk within the euro area, the higher demand from a larger pool of investors, and – as far as bonds issued by smaller member states and companies are concerned – the reduction of liquidity premiums in domestic-currency debt. In essence, however, these developments reflect the high degree of substitutability among bonds and equities issued by various governments and corporations across the euro area.

Let me also highlight the fact that the recent financial market turbulence has not undone the process of financial integration in the euro area. True, euro-area sovereign spreads vis-à-vis the German benchmark have increased substantially. Moreover, cross-border country and cross-sector dispersions in euro area equity returns have risen since the second half of 2007. Both examples indicate that national factors in market dynamics and asset pricing have regained importance in a time of financial market tensions. But the scale on which this has happened is still small in comparison with the major developments of the past ten years.

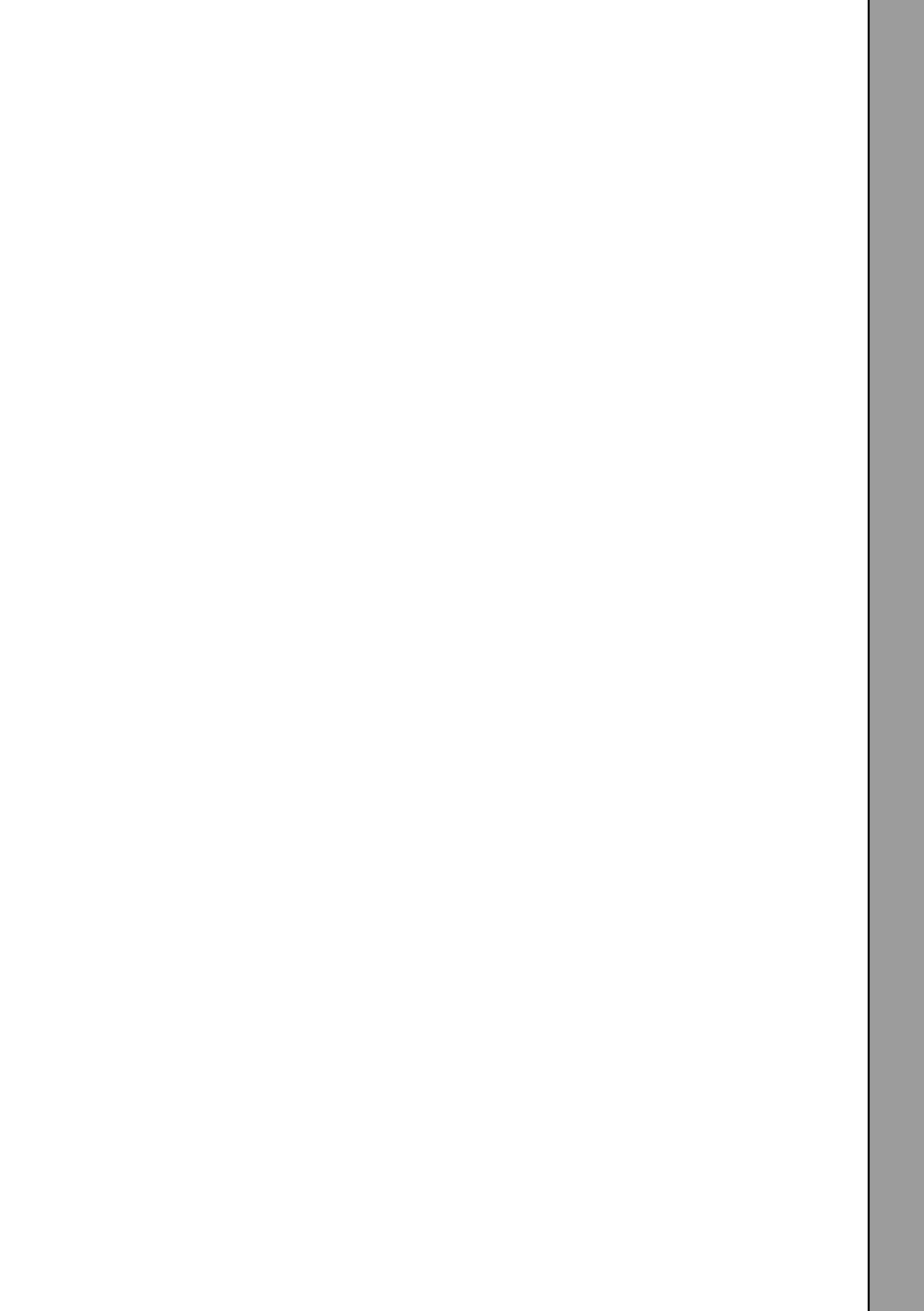
As already noted, financial integration in the euro area has not proceeded at the same pace across all sectors and markets. Integration of the retail banking markets, for instance, has remained limited, reflecting the persistence of legal, institutional and cultural differences. This shows that financial integration in the euro area is dependent not only on how close a market segment is to monetary policy, but also on how far the relevant market infrastructures have become integrated. A case in point is the high degree of integration of the large-value payment systems in the euro area. They have made possible the integration of euro area money markets. TARGET2, offered by the Eurosystem, is a further step forward in that direction. Other efforts to reduce infrastructure barriers are under way. One of the most significant initiatives

in this regard is the Eurosystem's TARGET2-Securities project which will provide a pan-European securities settlement platform. These innovations demonstrate that the Eurosystem attaches great importance to promoting financial integration in the euro area.

5. Concluding remarks

Ladies and gentlemen, this has been a wide-ranging overview of the changing relationship between central banks and financial markets. I hope it has given you some flavour of the importance that financial stability, financial market developments and financial integration have for monetary policy implementation. Financial markets have always been a field of vital interest to the Eurosystem, but certainly, the recent financial market turmoil has been a further spur to our efforts in coping with periods of financial stress, conducting financial market research, and supporting the integration of the euro-area financial markets.

First and foremost, however, the Eurosystem contributes to safeguarding financial stability by maintaining price stability in the euro area in the medium term.



SHOULD MONETARY POLICY RESPOND TO ASSET PRICE BUBBLES?REVISITING THE DEBATE

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Executive Summary

1) The case for “Leaning Against The Wind” :- (LATW hereafter)

We argue that central banks can improve macroeconomic performance by reacting to asset price misalignments over and above their reaction to fixed horizon inflation forecasts. This is because such countercyclical monetary policy tends to offset the impact on output and inflation of such bubbles. In addition, if it were known ex ante that monetary policy would LATW in this way, it might reduce the probability of bubbles arising at all.

2) “Practical” objections to LATW:-

Although bubble identification is difficult, there is no significant difference between the informational requirements of any form of monetary policy rule that requires a reasonably accurate aggregate demand forecast versus a LATW rule. Also, central banks are better equipped to LATW because they are less subject to short-termist performance pressures. Some argue that one would need to create a recession to prick a bubble. However, LATW does not imply an attempt to prick bubbles, and is merely an attempt to improve overall macroeconomic stability.

3) Are we better off just mopping up after the bubble bursts?

We strongly disagree with relying on “mopping up.” The inherent asymmetry is likely to reinforce the procyclicality of the financial system. Further, a central bank may find itself unable to mop up after a bubble bursts (e.g. an external inflation shock that makes it difficult to cut rates, or a credit crunch that impairs the transmission mechanism). This “nightmare scenario” is alas, only too real at the moment.

4) Can we just rely on an inflation targeting system?

In practice, the answer is probably no, as asset price misalignments often cause difficulties at time horizons well beyond the one-three year period that are typically considered. Since a LATW is wholly consistent with the remit of the MPC in the UK, there may well be a case for the Government encouraging the MPC to discharge its remit more effectively in this regard. To those who regard LATW as “impractical”, we remind them that the Swedish Riksbank has done it in the context of an inflation-targeting regime.

5) Potential changes to the regulatory framework:-

Since using monetary policy to LATW is unlikely to be enough, it is important to also examine other regulatory changes that might help (e.g. requiring more bank capital in good times, or maximum loan-to-value-ratios). Also, tax policy may also be considered.

1. Introduction¹

It is a great privilege to be here today at the SUERF colloquium. When Professor David Llewellyn kindly invited me to speak, it was with some trepidation that I suggested that I attempt to revisit the debate on whether monetary policy should respond to asset price misalignments. It had become a deeply unfashionable subject, and I was also conscious that I had battled the central banking consensus on this subject for at least nine years.²

Indeed, when Stephen Cecchetti, Hans Genberg, John Lipsky and I (CGLW hereafter) published a report on “Asset Prices and Central Bank Policy” arguing that central banks should “lean against the wind” (LATW hereafter) in early 2000, I recall that a major newspaper largely neglected it, which was in sharp contrast to, say, *The Economist*, which made our report the foundation for their cover story. When I politely questioned a journalist at this newspaper about this anomaly, I was informed that the powers-that-be had told all journalists to steer away from “abstract” and “academic” material that was not of “practical” interest.

You can therefore imagine my feeling of relief when the organisers told me that the other keynote speaker this morning, Professor Axel Weber of the Bundesbank, was also going to, among other things, discuss central banks and financial markets, and I am greatly looking forward to his remarks this morning.

The recent credit crisis appears to have had a significant impact on the importance attached to this debate. For example, the *Financial Times* informs us:-

“The US Federal Reserve is reconsidering the way it deals with asset price bubbles in the wake of the housing and credit bust, in a move that could see the central bank using extra regulation – or even interest rates to fight unjustified increases.”

May 14, 2008

¹ I am greatly indebted to Stephen Cecchetti and Hans Genberg, with whom I have had the privilege of working in this area over the past years. I am also very grateful to Roy Cromb for his advice and help on this speech. Of course, I bear responsibility for all errors.

² See Wadhvani (1999) and CGLW (2000), though, of course, among others, economists at the BIS (see, e.g. Borio and Lowe (2002) and White (2006)) have also disagreed with the consensus view and made many valuable contributions to the debate.

Moreover the US Treasury has proposed that the Federal Reserve be given new powers as a stability regulator in the hope that it would reduce the risk of asset bubbles.

I will now begin by restating the case we have previously made for central banks to “lean against the wind” in situations involving asset price misalignments and then turn to a review of the debate. I shall also consider alternative policies designed to make the financial system less cyclical.

2. The case for “Leaning against the wind”

In this section I simply restate the arguments presented in CGLW (2000) and CGW (2002) for how asset price misalignments should be used to guide central bank policy. We were primarily interested in examining whether and how asset price misalignments should influence monetary policy once other factors, such as the short-term inflation outlook and the output gap, have been taken into account.

One should not neglect the fact that bubbles can be costly. The 2003 IMF World Economic Outlook estimates that the average equity price bust lasts for 2 ½ years and is associated with a 4 per cent GDP loss. Housing busts are around twice as long and are associated with output losses that are about twice as large.

To avoid confusion or misunderstanding, I want to emphasize that we are **not** advocating that asset prices should be **targets** for monetary policy, neither in the conventional sense that they belong in the objective function of the central bank, nor in the sense that they should be included in the inflation measure targeted by the monetary authorities. Instead our principal claim was that central banks can improve macroeconomic performance by reacting systematically to asset price misalignments, over and above their reaction to inflation forecasts and output gaps. It is our view that central banks seeking to smooth output and inflation fluctuations can improve these macroeconomic outcomes by setting interest rates with an eye toward asset prices in general, and misalignments in particular. The main reason for this is that asset price bubbles create distortions in investment and consumption, leading to excessive increases and then falls in both real output and inflation. Raising interest rates modestly as asset prices rise above what are estimated to be warranted levels, and lowering interest rates modestly when asset prices fall below warranted levels, will tend to offset the impact on output and inflation of these bubbles, thereby enhancing overall macroeconomic stability. In addition, if it were known *ex ante* that monetary policy would act to “lean against the wind” in this way, it might reduce the probability of bubbles arising at all, which would also be a contribution to greater macroeconomic stability.

The rationale for our conclusions comes both from the intuition gained from simple theoretical models and from quantitative simulation results.

As I said back in 2002 (see CGW (2002)), the first illustration of the potential usefulness of reacting to asset prices is an application of the basic insight of Poole (1970), that leaning against the wind of interest rate changes is useful when disturbances originate in the money market. In CGLW we generalized this argument slightly to allow for movements in equity (or real estate) prices in an economy where the stock market (or the housing sector) is particularly important and to allow for changes in the exchange rate in an economy where the external sector is crucial.

A straightforward application of Poole’s analysis shows that moderating changes in asset prices diminishes fluctuations in economic activity so long as the underlying reason for the asset price movement can be traced to a disturbance in the demand and/or the supply of the asset in question. To be sure, the same logic implies that when asset prices change as a result of disturbances in other markets, for example if equity prices increase because of favourable productivity shocks, then the case for leaning against the wind of the asset price change disappears. It is important not to react automatically to any and all changes in asset prices, but to evaluate each situation separately and act accordingly.

The second illustration given in CGLW is based on a model due to Kent and Lowe (1997). Their model is dynamic and explicitly incorporates the notion of asset price misalignments. In their setup, when a bubble develops in equity markets, standard wealth effects drive current inflation up. Importantly, though, expected inflation may not change since there is a probability that the bubble will disappear by itself, reducing future inflationary pressures. A forward-looking central bank that sets the current interest rate in response to expected inflation (and does not take the equity price bubble into account) would not tighten monetary policy under such circumstances. As a result the bubble in the equity market will bring about even higher inflation in the future if it continues and an even stronger economic slow-down if it collapses from an even higher level. Although expected inflation (i.e. the probability weighted average of these two future scenarios) may be on target, the country will suffer from highly variable economic activity as a result of the stance of monetary policy. By contrast, a policy of pre-emptively tightening in response to the emerging equity price bubble reduces this variability.

Similar mechanisms play a pivotal role in models in which monetary policy is transmitted via credit channels, and where the financial accelerator plays a significant role. In these cases, an emerging financial market bubble leads to higher investment as, given the higher value of their collateral, firms find

it easier to borrow. More investment does stimulate aggregate demand and output in the short run, but in the end creates overcapacity and results in a sharp downturn. Even if average inflation is not affected significantly, the asset market bubble leads to higher output volatility. A central bank that reacts to the root cause of the instability - the asset price misalignment - will reduce the overall volatility in economic activity.

At an intuitive level, these arguments establish a *prima facie* case for taking asset price misalignments into account in the normal course of determining monetary policy, not only because they have an impact on expected inflation, but also because misalignments lead to unnecessarily large business cycle fluctuations. These conclusions were confirmed by the simulation results which we presented in CGLW (2000).

Of course, there are some alternative simulation results (e.g. Bernanke and Gertler (1991, 2001)) which have yielded different results. However, as we discuss in some detail in CGW (2002), as long as the central bank can and does distinguish between moves in asset prices that originate in that market versus other markets (e.g. productivity shocks), then we would stand by our original simulation results. Since, in any case, we do not believe that the central bank should lean against the wind if asset prices rise because of sound fundamental reasons, that is as it should be.

It is also worth emphasising that, in any case, these simulation exercises probably underestimate the gains from LATW. First, these models do not allow for the possibility that if it were known *ex ante* that the central bank would take this into account, then this would likely reduce both the probability and the eventual size of any bubble. Indeed, arguably this may be an even more important effect of LATW than is incorporated in these simulation exercises, (see also Allen and Gale (2000) for a theoretical model which incorporates such an effect).

Second, asset price bubbles tend to produce distortions (e.g. overinvestment in the internet sector in 1999–2000, and in construction during the recent US house price bubble). These distortions may be costly over and above their effect on output and inflation volatility. Once again, the simulation exercises tend to ignore these additional social costs imposed by these distortions.

Notwithstanding the above arguments, LATW is opposed by many thoughtful and highly respected central bankers. In some cases they are willing to accept the theoretical presumption in favour of LATW, but oppose it on practical

grounds. Hence, for example, Bernanke (2002), who dubs a LATW policy as “*bubble insurance*”, argues that “...it is rarely the case in economics that the optimal amount of insurance in any situation is zero. On that principle, proponents of leaning against the bubble have argued that completely ignoring incipient potential bubbles, if in fact they can be identified, can’t possibly be the best policy.... I believe that, nevertheless, “leaning against the bubble” is unlikely to be productive in practice.”

Therefore, it is to some of the “practical” objections to LATW that I turn to next.

3. Commonly advanced objections to LATW

3.1. Problems vis-à-vis Identifying a Bubble

Many central bankers and academics have argued that the difficulties associated with identifying a bubble makes LATW impractical³. Typically, the argument is that central bankers have neither more information nor greater expertise in valuing a particular asset than private market participants. Moreover, there are concerns that if central bank judgements replace those of the market in valuing assets, financial market efficiency may be compromised.

I would not want to quarrel with the notion that it is difficult to identify bubbles. However, I do not believe that bubble identification is a problem that is unique to a LATW policy. It is also a problem for inflation forecast-targeting policy, and/or monetary policy that uses an interest rate reaction function that uses the output gap as an input. The absence/presence of a bubble can have a large effect on one's inflation forecast, as I recall from my own experience of attempting to set monetary policy in 2000–2001 within the inflation targeting regime in the UK (as the equity price “bubble” was bursting). Specifically, it is very difficult to accurately forecast aggregate demand (e.g. because of wealth effects on consumption and overinvestment by the corporate sector because of bubbles in the equity or housing markets) without forming a view on whether there is a bubble, and one's judgement on its likely persistence. Hence, *I do not see any significant difference between the informational requirements of any form of monetary policy rule that requires a reasonably accurate aggregate demand forecast, versus a LATW rule*. The problems associated with bubble identification makes the setting of monetary policy difficult irrespective of whether or not one has a LATW bias.

Moreover, it is not immediately obvious to me that it is any easier to estimate the output gap than to identify bubbles. Indeed, any credible estimate of the prospective output gap depends, in any case, on bubble identification. Not only is the absence/presence of a bubble relevant to an aggregate demand forecast, but it also affects estimates of aggregate supply (as a bubble can affect corporate investment and observed productivity growth). In practice, Orphanides (1998) shows that over the period 1980–1992, the real time estimate of the output gap averaged -3.99% , while, by 1994, the revised

³ Bermanke (2002), Gertler (1998) and Issing (1978)

figures suggested an average output gap estimate of -1.64% . If one had inserted these output gap estimates mechanically into a Taylor rule, the implied difference in interest rates would have been over 100bp!

I wonder whether some of those who object to a LATW-tilt in monetary policy on the grounds that bubble identification is too difficult are really saying that they would rather carry out inflation forecast-targeting policy on the assumption that financial markets are efficient and there are no bubbles. Indeed, this predisposition to believe that financial markets are efficient on the part of some members was a frequent source of disagreement when I was a member of the MPC at the Bank of England. For example, when I joined the committee, it was conventional to project the exchange rate assuming uncovered interest parity, even though there was a large body of research documenting that this was likely to be a biased predictor (see e.g. Wadhvani (1999)). Similarly, in early 2000, at what proved to be the peak of the NASDAQ market, there was considerable resistance on the part of some colleagues to allow for the likelihood that corporate investment would be weak after the bubble burst.

It is also important to emphasise that, often, recognising a bubble does not necessarily require central bankers to have more information or any greater insight than some private sector financial market participants. During bubbles, it is not unusual for at least some private sector participants to be aware that the market is “overvalued”, but yet, to be unwilling or unable to bet against it. This relates to Keynes’ dictum that markets can remain irrational longer than an individual investor may remain solvent.⁴ Of course, the central bank has significant institutional advantages over its private sector counterparts. The central bank is much less subject to short-termist performance pressures

However, in a stimulating and important paper, Gruen, Plumb and Stone (2005, GPS hereafter) come up with a sophisticated example of a situation where not knowing enough about the stochastic properties of a bubble can lead to a LATW tilt being sub-optimal relative to doing nothing. Essentially, the LATW policy-maker needs to worry about the countervailing influences. On the one hand, policy needs to be tighter than a fixed horizon inflation-targeting benchmark to counter the expansionary effects of future expected growth in the bubble and to increase the probability that the bubble will burst. On the other hand, policy needs to be looser to prepare the economy for the possibility that the bubble may have burst by the time policy is having its

⁴ See, e.g. Stein (2004) for a model where a bubble can persist even though everyone knows the bubble is there.

impact on the economy. It is this latter effect that complicates the task of the policy maker who is attempting to use a LATW tilt.

GPS contend that because the information requirements of following a policy with a LATW tilt may be so great (to make sure that one does not tighten policy when it might be the optimal policy to ease) that it might, indeed, be optimal under certain circumstances to be a policy “sceptic” and completely ignore the future possible path for the asset price bubble in setting policy). While GPS make an important and interesting point, we should note that, even within their own model, LATW is optimal in all scenarios if one, plausibly, believes that the distortions induced by a bubble imposes efficiency losses on the economy. Moreover, Haugh (2008) shows that the GPS result is special. If, instead one modifies their model a little in a more realistic direction (whereby the output gap depends on the size of the asset price bubble in addition to its growth rate), then, in general for asset prices changes that are sufficiently large, it is optimal to LATW.

In general, I would not wish to imply that a LATW policy will not occasionally lead to the central bank tightening when it should have eased. However, such errors are inevitable in any process of setting policy under uncertainty. My own, strong presumption, based on my reading of the literature, is that a LATW policy will, on average, improve social welfare.

Given the frequency with which bubbles have occurred historically, it does seem unwise to ignore bubbles when setting monetary policy. Substituting monetary policy with a LATW tilt by going for inflation forecast-targeting assuming financial market efficiency is likely to lead to poor monetary policy.

3.2. The Difficulty of “Safe Popping”

Bernanke (2002) argues that “...my suspicion is that bubbles can normally be arrested only by an increase in interest rates sharp enough to materially slow the whole economy. In short, we cannot produce “safe popping”, at least not with the blunt tool of monetary policy.”

Greenspan (2007) has made a similar argument. However, I believe that this argument only applies to those that are actually using monetary policy to actively prick bubbles. As already discussed, this is not what a LATW-tilt to monetary policy involves. Such a tilt is directed towards improving

macroeconomic stability, not to pricking bubbles per se. Note that the degree of the “tilt” imparted to monetary policy is designed to optimise macroeconomic stability, and is most unlikely to involve creating a recession to prick a bubble. Recall that the simulation results in CGLW (2000) suggested that the LATW-tilt helped stabilise output and inflation relative to the no-tilt scenario even when monetary policy does not directly affect the bubble.

3.3. The Federal Reserve in the 1920s

Bernanke (2002), in discussing the 1920’s, argues “...that monetary policy tried over zealously to stop the rise in stock prices. But the main effect of the tight monetary policy....was to slow the economy.....The slowing economy, together with rising interest rates, was in turn a major factor in precipitating the US stock market crash.” He, and others, have argued that this illustrates the dangers of bubble popping by a central bank.

However, Bernanke (2002) himself says that in early 1928, the “...*Fed passed into the control of a coterie of aggressive bubble-poppers.*” It is my belief that we would all agree that a LATW-tilt to monetary policy in an attempt to enhance macroeconomic stability is wholly different from aggressive bubble-popping, and, therefore, the experience of the 1920’s in the US sheds little light on the optimality of a LATW-tilt.

3.4. Can one use a LATW tilt in a small, open economy?

An objection to a LATW tilt policy is that if an equity price misalignment is caused mainly by developments in financial markets elsewhere, then changes in monetary policy in a small, open economy will not be able to affect the level of equity prices significantly. However, this does not invalidate the use of a LATW tilt. Remember that one is not trying to target a particular level of share prices, but react to them. One can respond to the potentially destabilising effects of these equity price changes in the interests of improving macroeconomic stability regardless of what causes these misalignments.

4. Are we better off just mopping up after the bubble bursts?

Greenspan (1999) formally argued that it was important to focus on policies “to mitigate the fallout when it occurs and, hopefully, ease the transition to the next expansion.” Not only has the Federal Reserve explicitly followed such a policy, but many other central bankers (as, for example represented by Bean (2003) of the Bank of England) also appear to be sympathetic to this notion.

However, relying purely on mopping up after the event is dangerous for a variety of reasons.

First, the inherent asymmetry of this policy seems to make it a rather dangerous strategy to pursue. If the Greenspan “risk management” approach implies doing nothing when asset prices rise alongside rapid credit expansion, but then reacting aggressively by cutting interest rates when asset prices fall, then some argue that this could contribute to moral hazard, excessive risk-taking and possible damage to the credibility of the central bank (see, e.g. White (2006)). Kohn (2006) counters that the Federal Reserve has not been asymmetric, but that the shocks have been asymmetric. Of course, in these matters, perceptions trump reality. I would venture that the vast majority of financial market participants perceive the Fed to have been asymmetric and one imagines that this has affected their behaviour, and, thereby, reinforced the pro-cyclicality of the financial system.

It is perhaps no coincidence that some critics regard the Federal Reserve as having become a “serial bubble blower”.

A second difficulty with the Greenspan doctrine of mopping up after the event is that, thereby, the central bank misses the opportunity afforded by a LATW-tilt to monetary policy to reduce the size of the bubble by affecting expectations.

Third, and perhaps most importantly, the central bank may find itself unable to mop up and, hence, a deep and prolonged recession might occur after a bubble bursts. For example in Wadhvani (2007), I argued that it was not difficult to envisage circumstances where an external inflation shock might lead the MPC of the Bank of England to raise interest rates even as the house

price “bubble” unwound. This “nightmare scenario” is, alas, only too real at the moment. If we do now get a recession in the UK, a part of the blame for this must lie with the Bank of England for not being more willing to have a LATW-tilt while house prices were rising.

Another possible scenario that should worry those who rely on mopping up is the possibility that monetary policy becomes less effective once bank balance sheets are hurt. This appears to have played some role in the explaining the “lost decade” in Japan. Again, alas it is a feature of the current conjuncture, and were significant further shocks to hit bank balance sheets, we might yet find that central banks find it difficult to stimulate economies through interest rate cuts.

Hence, to summarise, I do not believe that the “conventional” wisdom of doing nothing as asset prices rise, but relying on “mopping up” after the bubble bursts is either a desirable or a reliable way of running monetary policy. If we are to reduce the likelihood of deep and prolonged recessions, we need to find a better way.

5. Can we just rely on an inflation targeting system?

Some authors (e.g. Bean (2003)) have argued that, in a flexible inflation targeting framework, if you look at the entire future path of expected inflation and growth, there is no independent role for asset prices.

Of course, as a purely theoretical proposition, we agree, and CGLW (2000) explicitly asserted this. Indeed CGW (2002) say “this paper is not about what the central bank objective should be. Instead, we concurred with how an inflation-targeting central bank can most efficiently fulfil its objectives.”

5.1. So what then is the controversy about?

The key issue in the debate, in my opinion, is that in practice much of interest rate setting is not driven by looking at inflation and growth forecasts at all horizons, but is based on rules of thumb. In particular, inflation targeting is usually based on inflation forecasts one to three years out, often with a focus on a fixed horizon such as two years. This can have the effect that asset price misalignments get an insufficient weight in policymaking.

At the Geneva conference when we first presented our work in 2000, Ueda-san argued that a Japanese central banker who was looking 10 years out would have been raising rates in 1987-88. But, given that the central bank was focused on inflation only one or two years out, it was more difficult to justify raising rates (see CGLW (2000), pp 111–12).

This is why just lengthening the inflation forecast horizon from, say, 2 years to 3 years (as supposedly happened in the UK) is unlikely to be enough⁵.

We are simply proposing that, where the reaction function includes fixed-horizon inflation forecasts, it should also incorporate asset price misalignments.

As we said in 2000:

⁵ I say “supposedly”, as in its May 2008 Inflation Report, the Bank of England published a 3-year-ahead inflation forecast which is below target, but did not explain why it had not led them to cut rates.

“A purist might argue that the central bank should really look at inflation forecasts at several (all) future time periods ... such a policy might not be easy to implement ... The proposal for incorporating asset price misalignments can be interpreted as an alternative way of allowing for considerations relating to longer time-horizons” (CGLW (2000) p 51).

Hence, our view was simply that including asset price misalignments would help us to do better than existing rules of thumb.

5.2. But why focus on Rules of Thumb?

There are those, like Bean (2003), who argue that improving on existing rules of thumb is not interesting or relevant. Instead, one should just use the theoretically “optimal” policy rule. Recall that, in this case, that might involve reacting to a 10-year-ahead inflation profile. My heart sinks at the thought of having to attempt to implement such a rule.

(1) Practical considerations. It is very time-consuming to agree on a two-year profile for inflation, let alone going out many years into the future. Also many of the econometric models that underlie such forecasts perform particularly badly at longer horizons.

(2) It is what most central banks do in practice. Therefore, unsurprisingly, for most of the period I was on the Bank of England Monetary Policy Committee (MPC), the emphasis was on the two-year ahead horizon. This was reflected in the substantial time spent on deciding whether the inflation forecast was 2.4, 2.5 or 2.6% at the two-year-ahead horizon. Of course, towards the end of my term on the MPC, the relationship may have become a little less tight. But, even then, for the majority of members of the committee, the two-year-ahead point forecasts remained central.

(3) Ease of communication. Both internally and in terms of how policy is communicated to the public, simple rules are much easier to work with. In particular, if the inflation target is more easily understood, inflation expectations will be better anchored, providing crucial support to the success of monetary policy.

(4) Accountability. If the framework is vague, it is difficult to make the central bank accountable.

5.3. Avoiding Bubbles

Bean (2003) asserts that:

“... the design of monetary policy does not require a change in the formal structure of inflation targets” (p 18).

I wonder.

A clear and explicitly enunciated role for asset prices in the inflation targeting framework has the advantage that bubbles will be discouraged. Having a transparent reaction function consisting of the two-year-ahead inflation forecast plus an asset price misalignment adjustment could potentially make bubbles less likely to occur.

As already discussed above, one key point is that the simulation work in the literature significantly understates the benefits of including asset price misalignments in the reaction function. It doesn't allow for the Kent-Lowe (1997)/Allen-Gale (2000) effect – i.e. the impact that the central bank can have on the probability of the bubble growing, by signalling that it will respond.

Over the years, several current and former members of the MPC at the Bank of England have expressed scepticism about a LATW tilt to monetary policy. In the absence of the MPC unanimously agreeing to a LATW tilt, and it being clearly understood by the wider public that policy would react to a growing bubble, one is unlikely to see the benefits of such a policy. Note that the remit already requires that the MPC look at potential inflation deviations from target “at all times”, but the committee has chosen to interpret this, as something closer to fixed horizon inflation-targeting. This is a pity. If we are to make our financial framework less- procyclical, it is important that the MPC, at a minimum, explicitly say that they will look at asset price misalignments in addition to a fixed horizon inflation target. The Government must ensure that the MPC do so, because this clarification of the remit would make what the MPC actually does closer to what the remit already says it should do. It would be easy to do so through, say, a letter from the Chancellor to the MPC.

Of course, as a political matter, having a consumer price index measure in which the prices of houses played an important role would have gone some way towards imparting a LATW tilt to monetary policy.

While I believe that the measure of inflation chosen to target should ultimately be the measure that is conceptually most appropriate, this may have been a pragmatic way of, at least, getting the MPC to focus a bit more on a proxy for asset price misalignments. In that regard, it is a pity that the UK switched from the RPI-X measure to the current HICP measure, that excludes housing costs.

5.4. Lack of Clarity of the current UK Framework

While the current UK framework has many advantages, there is a lack of clarity on asset prices and imbalances. The “flexibility” of the framework in this area has meant that MPC members have, in the last two to three years, had a whole host of views on how they should react to the imbalances. This has therefore been confusing to the public.

In particular, some members have reacted differently to the exchange rate “misalignment” and the house price/consumption “misalignment”. According to our suggested rule of thumb:

- (1) Since unsustainable house price growth could lead to a crash and very low inflation three to four years out, interest rates should initially have been higher than warranted by the two-year-ahead forecast to prevent a build-up of debt and house prices.
- (2) But, acting in the opposite direction, since the exchange rate was higher than warranted, interest rates should have initially been set lower than otherwise. This would have helped keep the exchange rate lower, thereby reducing the size of its eventual crash.

However, some members did not apply this same logic to both misalignments. The same members argued for higher interest rates because of the housing market, in line with our proposed rule of thumb. But, at the same time, these members argued that the strength of sterling also argued for higher interest rates. The reasoning was that this meant there was a risk of future exchange rate falls, stimulating inflation at some uncertain point.

Therefore, so-called flexible inflation targeting allows people to be inconsistent in their treatment of misalignments in different asset markets. It would be much better to have a transparent and consistent rule of thumb in that case.

6. Can LATW work in Practice? The Swedish Case

There are those who argue that a LATW-style monetary policy is not feasible⁶ Yet, it would appear that Sweden does offer us a modern-day example of where policy with a LATW tilt has been used.

Lars Heikensten, the former governor of the Riksbank recently wrote: *“With house prices increasing drastically...On a few occasions in 2004–05 the Riksbank did for that reason not follow a strict inflation-targeting rule. We “leaned against the wind”, in the sense that we did not take rates down as quickly as we could have done considering the outlook for inflation.... We explicitly referred to asset prices in our published minutes, press releases and speeches...”* (Heikensten (2008))

Of course, Heikensten openly acknowledges that LATW is not enough, and that, perhaps, more should have also been done with respect to better and more effective regulation or fiscal policy. It is also my belief that LATW monetary policy should be a part of a broader counter-cyclical financial framework. One does not want to overburden monetary policy and regulatory policy also needs to play a role. It is to this that we turn our attention next.

⁶ Greenspan is quoted in the Financial Times, May 27, 2008 as saying that he would be “fully supportive” of “leaning against the wind” with interest rates when asset prices are rising if someone could provide a credible framework for doing so. He is quoted as saying “I have just not seen any evidence that it is feasible”.

7. Potential Changes to the Regulatory Framework

As discussed above, monetary policy has been perceived as asymmetric. White (2006) reminds us that the same has been true of our regulatory framework. A safety net is provided by features such as deposit insurance, a Lender of Last Resort function and the “too big to fail” doctrine. However, heretofore, the regulatory framework does not require that more capital is built up in good times. Specifically, Goodhart and Persaud (2008) have suggested that Basel II capital adequacy requirements be modified by a ratio linked to the “excessive” growth of the value of bank assets. This proposal seems to deserve further study.

There are also other sensible things that need to be investigated. In a UK context, one did not have to have a Ph.D in Economics to realise that a loan-to-value ratio of 125% might lead to difficulties, but our regulatory framework did nothing about it. Cecchetti (2006) argued that maximum loan-to-value ratios might have been considered, and also raises the possibility of using the tax system.

Having said that, in the current political atmosphere, it would not be difficult to see the “wrong” type of regulatory charges being implemented. Specifically, one might either see either harmful or ineffectual changes being proposed.

The Assistant Secretary for Financial Institutions, David Nason, is quoted in the Financial Times (April 30, 2008) as saying that the US central bank should use its proposed new powers as a stability regulator to force institutions to change their investment strategy if it is judged they threatened the wider economy. Even assuming that this was feasible, it is far from obvious that it would be socially desirable. It is also obviously important that we contemplate regulatory reforms that will make a difference. There might be a lot that is inappropriate about the compensation packages of the financial sector, but it is not obvious that changes in their remuneration structure would have made a significant difference e.g. whatever went wrong at Bear Stearns was not because the employees and shareholders did not know that they had plenty to lose.

In any case, these changes in the regulatory framework are to prevent a future build up of imbalances and the next crisis. In the here and now, we need to ensure that appropriate monetary, liquidity and regulatory policies are put in place in an attempt to protect the real economy from the downside risks associated with the current credit crisis.

8. Appropriate Policy after a Bubble bursts

We discussed in section IV above that aggressive interest rate cuts after a bubble bursts may create an unfortunate asymmetry (if one does not LATW when asset prices rise), and this may sow the seeds of the next crisis.

However, irrespective of whether one did LATW on the upside, once a bubble bursts, the lessons of history (e.g. see the discussion of monetary policy in the US after the 1929 crash, and in Japan after their 1989–90 fall in share prices in CGLW (2002)) are that aggressive interest rate cuts are desirable in order to reduce the probability of a long-lived recession.

As already noted, it is an unfortunate feature of the current conjuncture that the simultaneous rise in oil and food prices has made several central banks less willing to reduce interest rates.

In CGW (2000), after having analysed previous historical experiences, we concluded that

“....at very high frequencies, liquidity needs to be provided to ensure orderly markets..... it is very important to ensure that, when it (bubble) bursts, the damage does not wipe out the financial intermediation system.”

These lessons seem to have been well absorbed by authorities in the US and Europe.

Unfortunately for a while last year, it was not immediately obvious that these lessons had been taken on board by the UK authorities. For example, after the August 9, 2007 shock, the Bank of England allowed the overnight rate to stay well above the interest rate set by the MPC for a significant time period. This can be dangerous, and it may well have contributed to the well-publicised difficulties of the time. Once a bubble bursts it is imperative that one does not spend all one’s time worrying about “moral hazard” – it is much more important to deal with the crisis at hand, and turn one’s attention to improving institutional design at a later stage. Of course, inappropriate liquidity and LOLR policies in a crisis can carry significant downside risks for the economy and can then place an inappropriate burden on monetary policy. Fortunately, subsequent events might suggest that better sense has now prevailed, and we sincerely hope that this remains true as this crisis unfolds.

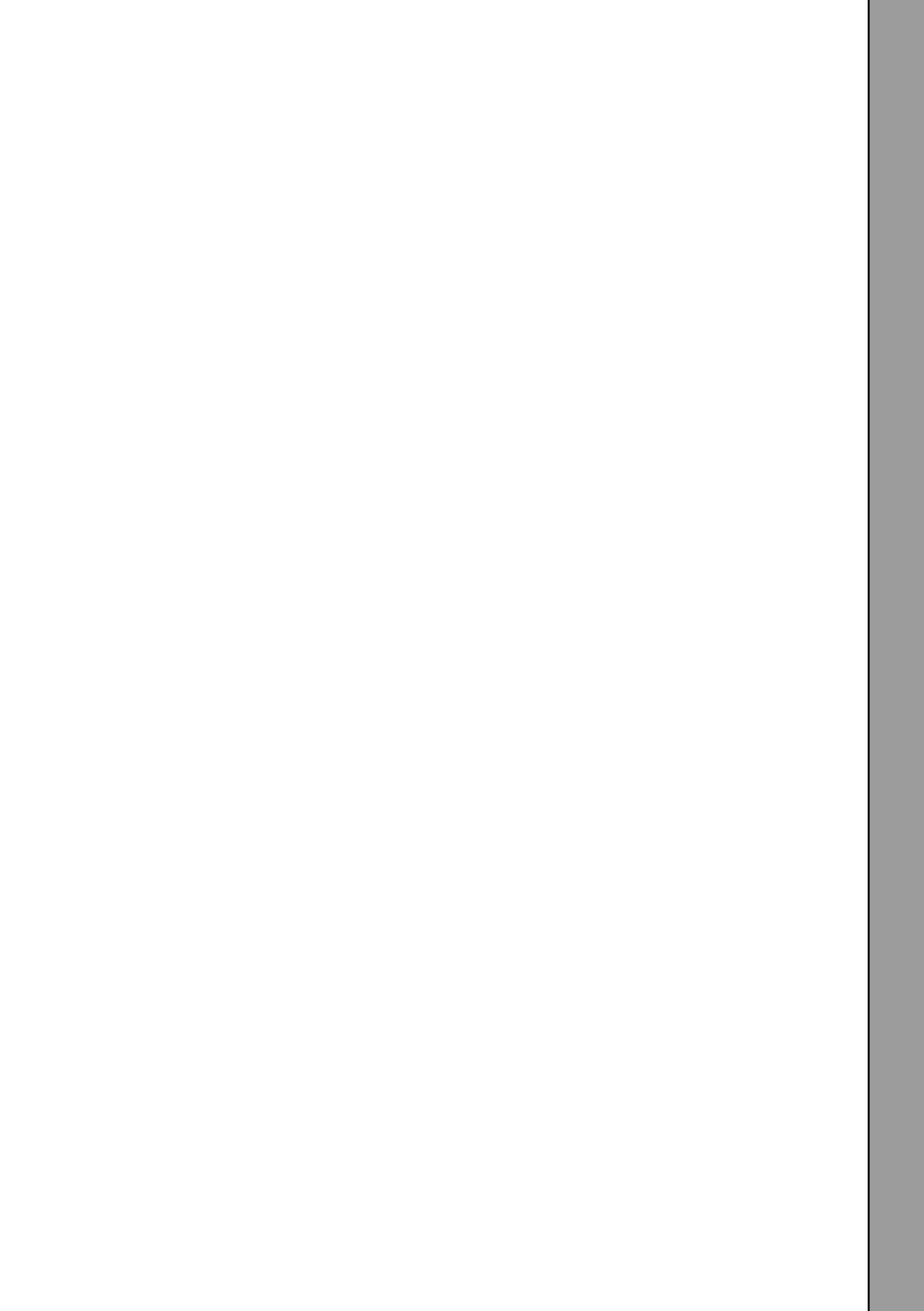
9. Conclusions

I hope that I have persuaded you today of the theoretical and empirical case for considering a LATW tilt to the way we run monetary policy. I expect this to enhance macroeconomic stability and reduce microeconomic distortions. Carrying out such a policy is entirely feasible. Of course, it would be highly desirable if such improvements in monetary policy-making were also accompanied by other changes in the regulatory framework that made our financial system less pro-cyclical.

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AN ALTERNATIVE APPROACH TO REGULATION OF COLLECTIVE INVESTMENT SCHEMES: FROM ASSET ALLOCATION TO RISK BUDGETING

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1. Introduction

In order to protect investors of collective investment schemes the regulation in force at European and national level provides for asset allocation risk-spreading rules. In case of harmonised fund, the European directive 85/611², as amended by directive EU/108/2001, set prudential rules in order to limit risk exposure. Moreover, fund management companies investing in financial derivatives, are required to employ a risk-management process which enables it to monitor and measure at any time the risk of the positions and their contribution to the overall risk profile of the portfolio.

Starting from the empirical evidence of the Italian market, this paper aims at addressing three main issues:

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² The 1985 UCITS Directive (85/611/EEC) introduced a passport for the investment funds harmonised by the Directive. The passport is based on mutual recognition. It allows the units of a UCITS authorised in its home Member State to be marketed in other Member States without seeking authorisation in those host States, provided that the notification requirements are fulfilled.

1. Do regulatory investment and borrowing restrictions capture the portfolio overall risk profile?
2. Is the regulation in force really effective in protecting retail investors?
3. Which alternative approach could be adopted?

Data analysis carried out in the paper prove that funds, subject to the same risk spreading rules, having similar investment policies can differ significantly in terms of risk. To this end, a cluster analysis of Italian mutual funds is conducted in order to aggregate funds according to their risk profile.

The findings tend to confirm that “long only” harmonised mutual funds have – on average – a greater exposure to risks than alternative investments (such as hedge funds) subject to less regulatory burdens.

The market evidence suggests that associating the fund’s risk profile to portfolio composition can be misleading: on one hand, the volatility of the same asset class is not constant but changes over time; on the other, portfolio exposure to the same risk factors can be modified by means of investment decisions.

A retail investor could prefer to have a well defined risk exposure with a flexible asset allocation instead of a rigid asset allocation with a changing risk profile. The analysis intends to verify if it could be more convenient to set regulatory limits in terms of risk budgeting rather than in terms of portfolio constraints. If this is the case, we could consider a complementary approach to regulation, moving from an asset allocation perspective to a risk budgeting one, focused mainly on the risk-return profile of managed products.

The paper intends to provide a general framework starting from which further discussions about a risk-based approach to regulation of collective investment schemes may be developed.

This paper has three substantive sections: section 1 describes how European regulation addresses risk of collective investment schemes; Section 2 illustrates the main findings of the cluster analysis along with the outcomes of a comparative examination of Italian mutual funds’ returns with respect to financial markets and hedge funds indices; Section 3 explores the risk budgeting approach, considering its pros and cons.

2. European regulatory approach on matter of risk

2.1. Investors' risk perception

In recent years, risk perception by investors has greatly increased due to financial scandals and market turbulences.

The understanding of the risk-return profile of financial products is crucial for all sectors of financial intermediation. According to theory, informed investors can make better financial decisions and thus be able to attain a better risk-return combination and higher than average final wealth. But acquiring financial information is costly, either because it may entail monetary costs or because it is time intensive.

Since their creation, mutual funds³ have been a popular investment vehicle for investors. Their simplicity along with other attributes provides great benefit to investors with limited knowledge, time, or money. For retail investors⁴ mutual funds offer significant advantages. Instead of picking stocks or bonds one at a time, they can invest in a collection of them designed to match investment goals. Asset managers pool investors' money and assemble portfolios designed to achieve specific investment objectives, which are spelled out in the fund's prospectus.

³ Mutual funds are investment vehicles, created with the sole purpose of gathering resources from investors to be invested in a diversified pool of assets. Investors buy securities issued by the fund against the underlying assets, and the value of those securities fluctuates with the value of the underlying assets. In this way, small investors can buy exposure to a professionally managed and diversified basket of financial assets. Overheads are spread over the pool of investors, reducing average cost for the investor. By law, a fund must buy back its shares when investor wants to sell them. The price at which fund shares are bought and sold is based on the fund's net asset value, or NAV, which is the market value of the fund's holdings, minus management expenses and taxes, divided by the number of fund shares outstanding.

⁴ The term "retail investor" is referred to an individual who buys and sells securities for his personal account, and not for a company or an organization. Similar terms are "individual investor" or "small investor".

Unfortunately, all funds carry some level of risk⁵. Investors may lose some or all of the money invested because the securities decrease in value. Dividend or interest payments may also fluctuate as market conditions change.

European regulation of collective investment schemes is intentionally designed to protect retail investors. In the long walk to achieve this goal, there has been a relevant progress in the refinement of rules in order to make them more sensitive to risk factors. To this end, three key elements have been taken into account by European regulators: 1) the risk limitation rules that all harmonised funds have to comply with in order to ensure liquidity and risk diversification; 2) the list of assets which are eligible for investment; 3) information about risk to be given to investors. Hereinafter the main steps of this process are summarised.

2.2. Risk limitation rules

In order to protect investors of collective investment schemes the regulation in force at European and national level provides for asset allocation risk-spreading rules. In the case of harmonised funds, the Council Directive 85/611/EEC of 20 December 1985 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS), as amended by Directive 2001/108/EC, set prudential rules in order to limit:

- concentration by UCITS in investments which expose them to counterparty risk to the same entity or to entities belonging to the same group;
- the investments in non-listed securities;
- the recourse to leverage;
- the maximum potential exposure relating to derivative instruments so that it does not exceed the total net value of the UCITS's portfolio;
- the risk exposure to a counterparty of the UCITS in an OTC derivative transaction.

As underlined by the **European Commission Recommendation of 27 April 2004** on the use of financial derivative instruments for UCITS, one

⁵ In this paper we refer primarily to market risk as key risk category for investors. In case of mutual funds other risks (such as operational risk) need to be considered in order to assess their overall risk profile; on this matter specific considerations are developed in Section IV.

of the aims of the amendments introduced by Directive 2001/108/EC⁶, was to ensure investor protection. Directive 85/611/EEC, as amended, therefore establishes an extensive system of risk-limitation. In order to ensure that the risks related to the new classes of financial instruments, in particular regarding derivatives, are duly and accurately monitored, measured and managed, management companies or investment companies are required to apply sound risk measurement processes under the supervision of the competent authorities.

The Recommendation is intended as a first step towards a uniform understanding of risk measurement methodologies in the UCITS area to ensure an equivalent and effective protection of investors throughout the Community and level the playing field for UCITS operators and products regulated under different jurisdictions.

According to the European Commission, the total exposure of a UCITS needs to be assessed on the basis of both default risk of the UCITS and leverage produced by the use of financial derivative instruments. It should therefore be ensured that the market risk of a UCITS is adequately measured, and possible approaches of market risk measurement are being investigated, by clarifying the conditions for the use of two different methodologies: the commitment approach; the Value-at-risk approach (VAR approach) and stress tests in case of sophisticated UCITS.

Member States are recommended to ensure that management or investment companies employ risk measurement systems which are adapted to the relevant risk-profile of a UCITS in order to make sure that they accurately measure all material risks related to the UCITS under the supervision of the competent authorities⁷.

⁶ Directive 2001/108/EC, “the product directive” (along with Directive 2001/107/EC, “the profession directive”) is commonly referred to as “UCITS III Directive”.

⁷ The Recommendation proposes some harmonised interpretation of limitations to the UCITS’ risk- exposure to derivatives, as follows:

- *limitation to a UCITS’ global exposure on derivatives and overall risk exposure.* Member States are recommended to ensure that the global exposure relating to financial derivative instruments may not exceed 100 % of the UCITS’ net asset value (NAV), and hence that the UCITS’ overall risk exposure may not exceed 200 % of the NAV on a permanent basis.

- *Limitation to possible temporary borrowing.* Member States are recommended to ensure that the UCITS’ overall risk exposure may not be increased by more than 10 % by means of temporary borrowing, so that the UCITS’ overall risk exposure may not exceed 210 % of the NAV under any circumstances.

To this end, the Recommendation distinguishes between “non-sophisticated UCITS”, which have overall less and simpler derivative positions by using e.g. a few plain vanilla options, and “sophisticated UCITS”; for this two categories of funds the methodological approach in measuring risk is differentiated⁸.

To date, only Luxembourg, France, Germany and Ireland have defined the concept of sophisticated versus non-sophisticated UCITS⁹.

Considering that these risk-measurement methodologies need further refinement, the European Commission encourages Member States and National Authorities to undertake further work with a view to elaborating more advanced methods of risk-measurement and thus develop a convergent Community-wide approach. This concerns in particular:

- the criteria to identify sophisticated and non-sophisticated UCITS;
- the conversion of financial derivative instruments into equivalent underlying assets and the netting of positions underlying the financial derivative instruments in case of the application of the commitment approach;
- best practices in the area of VAR and stress tests;
- the standards which internal models must meet in order to be used by UCITS.

2.3. Definition of eligible assets

Tightly connected to the definition of investment limits is the definition of the eligible assets in which a harmonised fund can invest. Financial innovation makes much more difficult for regulators to trace the perimeter of the universe of assets in which harmonised funds can invest; the variety of financial instruments traded on financial markets has increased considerably, leading

⁸ In the case of “sophisticated UCITS”, Member States are recommended to require management or investment companies to apply regularly VAR approaches. In the VAR approaches, the maximum potential loss that a UCITS portfolio could suffer within a certain time horizon and a certain degree of confidence is estimated. Member States are recommended to require management or investment companies also to apply stress tests in order to help manage → risks related to possible abnormal market movements. Stress tests measure how extreme financial or economic events affect the value of the portfolio at a specific point of time. The Commission invites Member States to consider, as a possible reference the following parameters: a 99 % confidence interval, a holding period of one month and ‘recent’ volatilities, i.e. no more than one year from the calculation date without prejudice to further testing by the competent authorities.

⁹ European Commission – DG Internal Market - PricewaterhouseCoopers (2008).

to uncertainty in determining whether certain categories of instruments are encompassed by Directive 85/611/EEC.

New investable asset can influence significantly the funds overall risk profile: therefore it is crucial to determine if the asset is coherent with the fund's investment strategy and fund rules.

Uncertainty in applying the definitions gives rise to divergent interpretations of the Directive. In order to ensure a uniform application, the **European Commission issued Directive 2007/16/EC of 19 March 2007** to develop a common understanding as to whether a given asset category is eligible for a UCITS.

This Directive, along with CESR's¹⁰ guidelines (Ref. CESR/07-044), to be brought into effect by Members States by March 2008, clarifies which assets are eligible, comprising credit derivatives, closed end funds, financial indices – included hedge funds indices¹¹ – and which conditions have to be fulfilled.

2.4. Disclosure obligations on risk profile

From investors' point of view, it is essential to receive adequate information on the basic characteristics of financial products and the risks and costs associated with investing in such products so that they can decide what best suit their needs. Adequate disclosure enables investors to take an investment decision on a properly informed basis and to compare among products. The UCITS Directive (Section VI) tried to achieve this goal through the introduction of the simplified prospectus (SP). The SP contains, in summary form, key information about the UCITS. It must be offered to investors free of charge before the conclusion of the contract.

However, the SP, as currently implemented, has proven not to be a useful tool to guide investors' investment decisions. In most cases, the document is too long and not understood by its intended readers. Member States have implemented the SP in different ways and some established additional

¹⁰ CESR is an independent Committee of European Securities Regulators established under the terms of the European Commission's Decision of 6 June 2001. In summary, the role of CESR is to improve co-ordination among securities regulators; act as an advisory group to assist the EU Commission and work to ensure more consistent and timely day-to-day implementation of community legislation in the Member States.

¹¹ For further details see CESR's guidelines concerning eligible assets for investment by UCITS. The classification of hedge fund indices as financial indices. July 2007; ref: CESR/07-434

stringent national requirements. The outcome is a document of limited value to the investors and a considerable overhead for the fund industry.

In matter of risk, the simplified prospectus tends to be useless attended that it adopts standardised risk descriptions which do not really discriminate funds having the same eligible assets. And even in case of funds having different investment strategies, the ambiguity is not overcome because of the overlapping among risk categories and the absence of any indication of which risks are more relevant for each fund. In Table 1 the risk description of three harmonised open-ended funds managed by one of the major European asset management company is reported (extract from the Simplified Prospectus).

Table 1 – Example of risk description

Type of fund	Fixed Income	Balanced	Equity
Investment Strategy	<p>The Fund will invest primarily in fixed income debt securities of U.S. or non-U.S. issuers that, in the judgement of the Investment Manager, offer the highest yield available without excessive risk at the time of the purchase.</p> <p>The Fund normally will be invested in fixed income debt securities with investment grade or lower grade ratings, if issued by U.S. issuers, or, if issued by non-U.S. issuers or unrated, their equivalent.</p> <p>The Fund may also, temporarily and/ or on an ancillary basis, seek investment opportunities in any other types of securities. The Fund may invest up to 10% of its assets in credit-linked securities. The Fund may also invest up to 10% of its total assets in securities in default.</p>	<p>The Fund will invest in a diversified portfolio of debt and equity securities worldwide. The Fund seeks income by investing in a portfolio of fixed and floating rate debt securities and debt obligations of governments, government-related or corporate issuers worldwide including emerging markets, as well as stocks the Investment Manager believes offer attractive dividend yields. In particular, the Fund may purchase debt obligations issued by governments and supranational entities organized and supported by several national governments. The Fund may invest in investment grade and non-investment grade debt securities issued by U.S. and non-U.S. issuers including securities in default.</p>	<p>The Fund will invest primarily in U.S. equity securities, including common and preferred stocks, or securities convertible into common stocks, as well as American Depository Receipts and American Depository Shares that are listed on the major U.S. stock exchanges.</p> <p>On an ancillary basis, the Fund may employ hedging techniques and hold cash reserves from time to time.</p>

Type of fund	Fixed Income	Balanced	Equity
Risk description	<ul style="list-style-type: none"> • Credit risk • Credit-Linked Securities risk • Defaulted Debt Securities risk • Derivative instruments risk • Foreign Currency risk • Interest Rate Securities risk • Low-Rated or Non-Investment Grade Securities risk 	<ul style="list-style-type: none"> • Credit Risk • Defaulted Debt Securities risk • Emerging Market Risk • Equity risk • Foreign Currency risk • Interest Rate Securities risk • Low-Rated or Non-Investment Grade Securities risk 	<ul style="list-style-type: none"> • Credit risk • Derivative risk • Equity risk • Interest Rate Securities risk • Low-Rated and Non-Investment Grade Securities risk

European regulators are aware that the concept of “simplified prospectus” should be replaced by a new concept of “key investor information” to be drawn up by the investment company, or in case of unit trust or common funds, the management company and to be provided to investors (either directly by the fund manager or through the relevant intermediaries) prior to the subscription of units in a UCITS by investors.

CESR published in February 2008 its advice to the European Commission on ‘the content and form of Key Information Document disclosures for UCITS’ (Ref. CESR/08-087), known as the KID, which should contain only the essential elements for making and carrying out investment decisions, which excludes information serving only legal or regulatory requirements.

The description of risk factors and presentation of the relationship between risk and reward is a particularly difficult issue. CESR recommends testing two high-level approaches – one which is based on a purely narrative description of risks (a qualitative assessment), and one which uses a synthetic indicator to evaluate the level of risk that investment in the fund would represent (a quantitative assessment). There has been support from consumer representatives for the use of a synthetic indicator¹².

¹² According to CESR the use of synthetic risk indicators has already been endorsed by the regulators of some European countries, or adopted by individual firms, using a variety of methodologies and presentational formats. There are a number of complex issues that would have to be resolved in relation to developing a methodology and presenting the results, including whether it could capture all relevant risks and whether it may be unsuitable for certain types of fund. CESR does not propose to recommend a particular methodology at this stage, but has included a set of possible criteria for the assessment of methodologies. These might then be used

CESR considers that even though no preferred methodology has yet been identified, it is still possible, and indeed necessary, to test whether a synthetic indicator, despite its possible limitations, is likely to improve investors' perception of risk and reward. Further work on methodological issues and the use of structured fund scenarios, involving industry practitioners and other stakeholders, can proceed in parallel with the first phase of consumer testing.

2.5. Conclusion

European Directives address risk by means of investment and borrowing restrictions in order to ensure a minimum level of diversification of fund's holdings, a maximum level of leverage and a maximum exposure to financial derivatives. To some extent, regulation tends to mitigate specific risk¹³ by means of issuers diversification.

As a matter of fact, UCITS regulation provides for an extensive grid of investment limits and an exhaustive list of eligible assets: in this paper we define this approach to regulation, based on portfolio constraints, as "asset allocation approach".

Despite its level of detail, UCITS III has not prevented from differences in the legal framework governing funds across European Member States. The main divergences are observed with reference to the use of derivatives, the eligible

to identify or develop a common methodology at European level, to be built either by regulators or by industry participants.→

Any synthetic indicator would require appropriate explanatory text, addressing such points as what the indicator means, why the fund has been classified in that category, and what its limitations are (e.g. not a guarantee, may not hold true in adverse market conditions). Such text could also indicate in broad terms the connection between risk and reward. For the purpose of consumer testing, CESR suggests using generic wording that refers to the typical features and limitations of a volatility-based measure. CESR suggests that a presentation based on a numeric scale (e.g. from 1 to 5) should be tested against other possibilities (words such as "high risk" or "low risk", or graphics / icons). Alternatively, if the indicator cannot be adapted to a particular fund the KID should explain this. Special considerations might apply to structured funds, where the use of prospective scenarios or tables might help investors to understand potential outcomes. CESR suggests testing an example scenario or table with consumers, although further work is needed to refine the proposal.

¹³ For both equity and debt securities, risk can be ideally divided into two components: specific risk and generic (or systematic) risk. Specific risk depends on the characteristics of the issuer and can be substantially reduced by investors spreading their investments over securities issued by different issuers (portfolio diversification), whereas systematic risk represents the portion of the variability in the price of a security that depends on the fluctuations of the market and cannot be eliminated through diversification.

counterparties and the valuation rules for OTC derivatives. Those differences are significant enough to demonstrate that the harmonization of supervision for UCITS is not yet complete¹⁴.

Concerning UCITS disclosure, European regulators are aware of its importance for retail investors provided that only information on risk-return profile can help them make informed judgements on risk and compare products effectively.

Nevertheless, the simplified prospectus has proven its inefficiency in ensuring a proper risk perception by investors. Moreover, no agreement has been yet reached about the synthetic risk indicator to be used in the KID nor, in case of quantitative measure, which is the best one.

* * *

In order to verify if an “asset allocation approach” induces an effective discrimination of funds’ risk profile, we assume that open-ended funds subject to the same risk spreading rules and characterised by the same investment policy should have the same, or at least, similar, risk profile.

In the following section this assumption is tested through a cluster analysis carried out on a sample of Italian harmonised funds.

¹⁴ European Commission – DG Internal Market - PriceWaterhouseCopeers (2008)

3. Cluster analysis

In order to assess if an asset allocation approach allows an effective discrimination of mutual funds' risk profile we carried out a cluster analysis¹⁵ using time series of past daily returns¹⁶ of 368 Italian open-ended mutual funds operative between December 1997 and December 2007 (i.e. 2,601 observations for each fund).

Our aim is to verify if a classification of funds based on portfolio holdings is consistent with a classification based on risk¹⁷. As a matter of fact, if the clusters obtained with the first method matches with the second, all relevant information about risk are reflected by asset allocation of each fund. As a consequence, investors could assume well informed investment decisions based on offering documents where information about asset allocation and regulatory investment and borrowing restrictions are spelled out.

If this is not the case, further considerations should be made about the regulation approach of collective investment schemes.

3.1. First step: portfolio composition classification

In Italy, as well as in other European countries, the national association of mutual funds managers (Assogestioni) keeps and publishes its own classification, which is based on the periodical screening of funds portfolio holdings.

¹⁵ Cluster analysis, also called "segmentation analysis" or "taxonomy analysis", creates groups, or clusters, of data. Clusters are formed in such a way that objects in the same cluster are very similar and objects in different clusters are very distinct.

¹⁶ For each open-ended Italian mutual fund Banca d'Italia calculates – on a daily basis – an index whose value reflects the unit price (equal to the net asset value divided by the number of issued units) and the dividends paid to the units holders (if any). More formally, let I be the index referred to fund "i" at day "t" with unit price equal to Quote, paying dividends "Div", then:

$$\text{Index}(f_i, t) = [(\text{Quote}(f_i, t) + \text{Div}(f_i, t)) / \text{Quote}(f_i, t-1)] * \text{Index}(f_i, t-1)$$

For new funds the first value of the index is set equal to 100.

The daily total return has been calculated as a log return $\rightarrow \ln[\text{Index}(f_i, t) / \text{Index}(f_i, t-1)]$

¹⁷ A cluster analysis of Italian open-ended funds has been conducted also by Pattarin, Paterlini and Minerva (2004) who propose a classification algorithm for mutual funds style analysis, based on the time series of past returns to identify clusters of funds characterized by the same style. The classification procedure is applied to a data set of 186 equity funds that were present in the Italian market between 1996 and 2000, for which the end of period classification by investment objectives is known. The clustering method proposed may be used as a low-cost tool to monitor managers' investment behaviour.

Assogestioni's ranking model¹⁸ is conceived as an orientation tool for retail investor within the variegated offer of management products and services. The declared principal objective of this ranking model is to allow the saver to identify in immediate and effective way the most important risk factors that characterize the investment policies of mutual funds. According to Assogestioni, the link of the classification proposed with well known risk indicators represents for the saver an incentive to take into account the binomial risk-return and a clear invitation to deepen the knowledge of the product through the careful reading of the offering documentation (prospectus and fund rules).

A third characteristic that defines Assogestioni's ranking model is represented by a rigorous set of rules according to which Italian funds are classified in different classes. Each of Assogestioni's classes is defined by specific asset allocation limits that must be satisfied by any fund belonging to it. In order to prevent opportunistic behaviours, asset managers declare the class they want their fund to be attributed to, thus committing themselves not to violate the stated asset allocation limits; Assogestioni periodically checks if these are met by querying managers about their portfolio holdings. In the case of this being violated, the manager is compelled to rebalance his portfolio or to choose a different class for the fund; if the manager defaults, mandatory reclassification is undertaken by Assogestioni itself. In our sample, we have 368 funds belonging to 29 classes by investment allocation (Table 2)

¹⁸ For a complete description of Assogestioni ranking model see "Classification Guide" available on www.assogestioni.it.

Table 2 – Number of funds for each of Assogestioni’s class

ASSOGESTIONI CLASS	NUMBER OF FUNDS
BALANCED	26
BALANCED BOND	9
BALANCED EQUITY	4
BOND FUNDS – DOLLAR GOVERNMENT MEDIUM/LONG TERM	9
BOND FUNDS – DOLLAR GOVERNMENT SHORT TERM	1
BOND FUNDS – EMERGING MARKETS	6
BOND FUNDS – EURO CORPORATE INVESTMENT GRADE	2
BOND FUNDS – EURO GOVERNMENT MEDIUM/LONG TERM	31
BOND FUNDS – EURO GOVERNMENT SHORT TERM	33
BOND FUNDS – FLEXIBLE	4
BOND FUNDS – INTERNATIONAL GOVERNMENT	26
BOND FUNDS – MIXED	18
BOND FUNDS – OTHER SPECIALIZATIONS	12
EQUITY FUNDS – AMERICA	23
EQUITY FUNDS – COMSUMER GOODS	1
EQUITY FUNDS – EMERGING MARKETS	8
EQUITY FUNDS – EURO AREA	6
EQUITY FUNDS – EUROPE	25
EQUITY FUNDS – FINANCE	2
EQUITY FUNDS – HEALTH	4
EQUITY FUNDS – INTERNATIONAL	24
EQUITY FUNDS – ITALY	32
EQUITY FUNDS – MEDIA	2
EQUITY FUNDS – OTHER SECTORS	2
EQUITY FUNDS – OTHER SPECIALIZATIONS	1
EQUITY FUNDS – PACIFIC	24
EQUITY FUNDS – TECHNOLOGY	2
FLEXIBLE	12
MONEY MARKET FUNDS – EURO AREA	19
TOTAL	368

3.2. Second step: risk profile classification

Risk analysis is carried out assuming a retrospective viewpoint. As an investor, we are interested in how different has been funds' risk profile looking backwards at past returns. Our view is therefore completely different from an active asset manager¹⁹ who needs to define a risk policy for each managed portfolio. The differences are summarised in Table 3.

Table 3 – Investor vs. Asset Manager approach to investing

Subject	Investor	Asset Manager (Active)
Objectives	<ul style="list-style-type: none"> • Evaluate fund's risk profile • Compare investment alternatives 	<ul style="list-style-type: none"> • Define a risk policy • Assume investment decisions
Documentation	<ul style="list-style-type: none"> • Prospectus • Periodic audited/unaudited reports 	Detailed information about any single portfolio holding provided by stock exchange management companies, info providers (such as Reuters, Bloomberg, Telekurs, etc.), issuers, brokers, financial analysts.
Data set	Mutual fund's past returns	<ul style="list-style-type: none"> • Assets' returns, volatilities and correlations • Financial market trends
Instruments	Simple	Complex
Methodology	Self assessment or investment proposal by financial (or banking) salesmen	In house (or advisors') methodology to define asset allocation, stock picking and market timing.

¹⁹ In an active investment strategy, the fund managers attempt to beat market return by selecting securities that they believe will outperform the market. A passive investment strategy (also referred to as an index strategy) seeks to match the return of a market, rather than beat it, by investing in a basket of securities that replicate the performance of an index. Fees for actively managed strategies are generally higher than index strategies and reduce net investment returns. Advocates of index strategies believe that markets are generally efficient and it is difficult to consistently outperform the benchmark after transaction costs and advisory fees. Additionally, turnover is lower with passive investing because managers only buy and sell securities to reflect changes in the underlying index. This results in lower transaction costs. Index funds generally provide investors with a low-cost, effective method of gaining diversified market exposure and realizing competitive long-term returns. Low fees are a primary advantage of an index strategy. In addition to index and active investment strategies, there are enhanced index strategies seeking to slightly outperform a specific index while maintaining an overall risk profile comparable to the index. Enhanced index strategies are typically implemented through risk-controlled security or sector-selection strategies that exploit small inefficiencies occurring within capital markets.

Before carrying out the clustering, tests have been conducted to determine whether our daily returns are normally distributed or not. We used the Jarque-Bera test, a two-sided goodness-of-fit test suitable when a fully-specified null distribution is unknown and its parameters must be estimated²⁰.

The test statistic is

$$JB = \frac{n}{6} * (s^2 + \frac{(k-3)^2}{4})$$

where n is the sample size, s is the sample Skewness, and k is the sample kurtosis²¹.

For all funds belonging to our sample, the hypothesis of normality has been rejected. That's why we refer to the actual values of risk measures without recurring to statistical hypothesis about the characteristics of the distribution.

Risk encompasses many different concepts and, consequently, it makes difficult any reduction to a single quantitative measure. In this paper 6 different risk measures have been calculated for each fund (standard deviation, downside risk, Historical Value at risk at 99% confidence level, Historical Expected Shortfall at 99% confidence level, Sortino Ratio and Sharpe ratio), along with the sample mean of past returns.

Starting from daily returns, risk measures have been calculated as illustrated in Annex A.

²⁰ Judge et al. (1988) and Gujarati (2003) recommend the Jarque-Bera test. Büning and Thadewald (2007) demonstrate that different tests could be used, depending on the shape of the empirical distribution. The Jarque Bera is superior to its competitors for symmetric distributions with medium up to long tails and for slightly skewed distributions with long tails. The power of the Jarque-Bera test is poor for distributions with short tails, especially if the shape is bimodal. In this case a modification of the Cramér-von Mises test or the Shapiro-Wilk test may be recommended. In this paper we use the "Jarque-Bera" in consideration of its general acceptance as a standard test.

²¹ The statistic JB has an asymptotic chi-square distribution with two degrees of freedom and can be used to test the null hypothesis that the data are from a normal distribution. The null hypothesis is a joint hypothesis of the skewness being zero and the excess kurtosis being 3, since samples from a normal distribution have an expected skewness of 0 and an expected excess kurtosis of 3. As the definition of JB shows, any deviation from this increases the JB statistic.

In the field of fund management, most analysis consider other risk indicators such as the Tracking Error Volatility²² or Relative-VAR²³ over a given benchmark, in order to verify how well fund managers are able to track the returns on some index related to the fund's announced purpose (stated in the prospectus).

Also in the investment management industry, it is common practice to control the risk of active managers by imposing a constraint on tracking error. According to Jorion (2003) this setup, however, can be seriously inefficient. When myopically focusing on excess returns, the active manager ignores the total risk of the portfolio. As a result, optimization of excess returns will always increase total portfolio risk relative to the benchmark.

In this paper, are taken into account only risk measures related to mutual funds' absolute risk; this option is assumed as closer to retail investors' perspective.

In order to make this point clearer consider Figure 1 where are plotted two funds (Y and X) with respect to a benchmark and the evolution of their net asset values over 1 year.

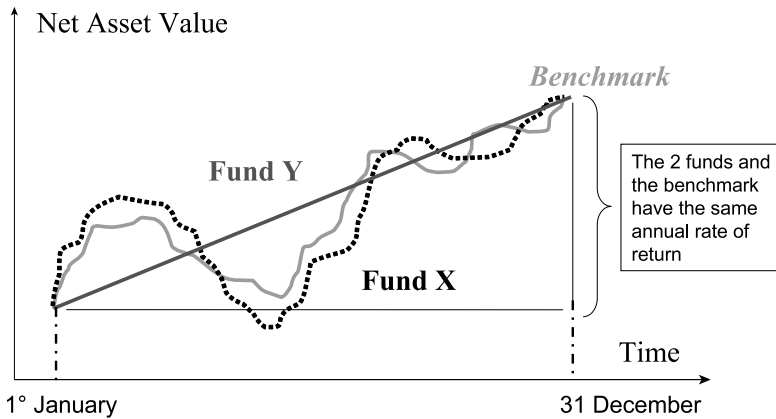
²² Tracking error is the difference between a portfolio's return and the benchmark or index it was meant to mimic or beat. Tracking error is sometimes called active risk. There are two ways to measure tracking error. The first is to simply subtract the benchmark's cumulative returns from the portfolio's returns. However, the more common way is to calculate the standard deviation of the difference in the portfolio and benchmark returns over time. The formula is as follows:

$$TE = \sqrt{\frac{\sum_{i=1}^n (R_p - R_b)^2}{N - 1}}$$

Where:

- TE = Tracking Error
- R_p = Return of Manager or Fund
- R_b = Return of Benchmark
- N = Number of Return Periods

²³ Relative VaR'' (RVaR) is defined as the level of tracking error that will not be exceeded over the chosen time horizon with an assigned confidence level (Maspero and Saita, 2002).

Figure 1 – Absolute risk vs. Relative risk

In relative terms, considering their tracking error volatility, Fund Y is riskier than Fund X; but if we consider the standard deviation of absolute returns, the conclusion is reversed.

3.3. Cluster Analysis

The methodology used for the cluster analysis is the *K-Means* clustering which partitions data into k mutually exclusive clusters, and returns the index of the cluster to which it has assigned each observation²⁴. Unlike hierarchical clustering, *K-means* clustering operates on actual observations (rather than the larger set of dissimilarity measures), and creates a single level of clusters. *K-means* clustering is more suitable than hierarchical clustering for large amounts of data, as in our case.

We got a multivariate dataset (368-by-7 matrix) to be clustered in 29 groups. One of the key issues in *K-means* clustering is to determine ex ante the

²⁴ *K-means* treats each observation as an object having a location in space. It finds a partition in which objects within each cluster are as close to each other as possible, and as far from objects in other clusters as possible. There are different distance measures (such as squared Euclidean distance) that can be used, depending on the kind of data to cluster. Each cluster in the partition is defined by its member objects and by its centroid, or center. The centroid for each cluster is the point to which the sum of distances from all objects in that cluster is minimized. *K-means* computes cluster centroids differently for each distance measure, to minimize the sum with respect to the specified measure. *K-means* uses an iterative algorithm that minimizes the sum of distances from each object to its cluster centroid, over all clusters. This algorithm moves objects between clusters until the sum cannot be decreased further. The result is a set of clusters that are as compact and well-separated as possible.

In order to verify if it is appropriate to consider all these risk measures instead of choosing a single one, we run the cluster analysis considering each risk indicator separately. Only in case of VAR, the results are similar; the choice of different risk indicator leads to a suboptimal clustering, assuming as optimization criteria the discrimination between bond (and monetary) funds and equity funds (i.e. no bond or monetary fund should be included in the same cluster with an equity fund). For further details see Annex C.

However, some limitations of this analysis should be taken into account. The conclusions are influenced by the time at which the risk evaluation is performed. Assogestioni's classification takes into account only end of period funds' asset allocation: it means that during the period under review (10 years) some funds have changed class and maybe their classification changed as a consequence of the introduction of new classes fitting better their investment policy. Moreover, funds mergers may determine volatility breaks during the funds life.

Secondly, different investors may have quite different and legitimate perceptions and concerns about risk, depending on, among other things, their time horizons, goals, financial situations, other investments in their portfolios, and basic attitudes. As a consequence, different risk measures could have been used.

Even in presence of such limitations, it can be claimed that mutual funds risk profile cannot be adequately captured considering only investment and borrowing power restrictions laid down in the regulation.

The risk spreading rules tackle only partially risk profile: investment limits set in the European regulation are too broad, applying to all categories of harmonised funds regardless different fund's investment strategies.

The cluster analysis signals that a classification based on asset allocation tend to be misleading for investors: investment decisions based on investment strategies, as declared in the prospectus, and on institutional classification, may be distorted when considering risk, because they do not embrace the overall funds' risk profile.

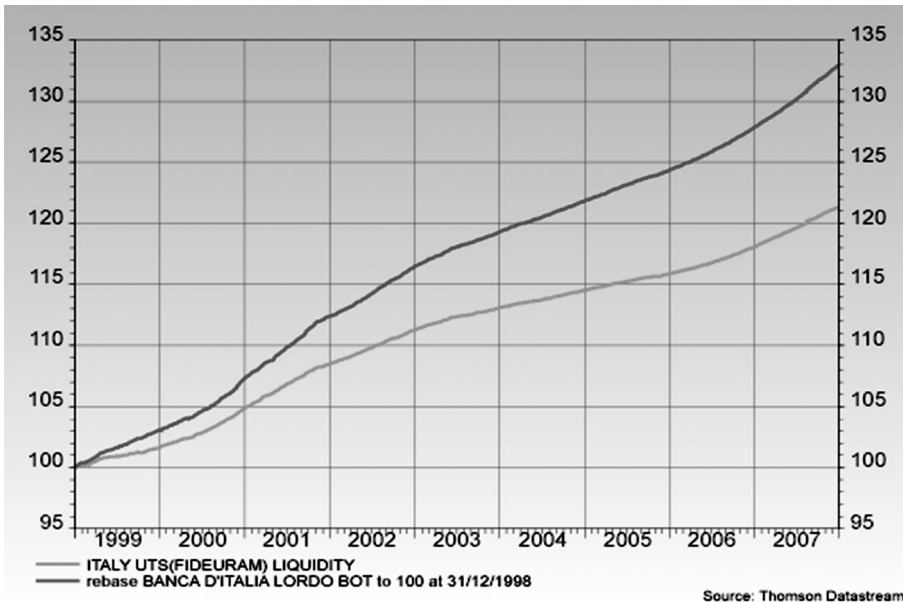
Besides possible distortions in risk discovery process, we have to consider how effective are the rules in place in protecting retail investors. It is important to note that – for long only funds – diversification and leverage restrictions do not ensure capital protection in a declining market.

As a matter of fact, investment limits have not prevented retail investors from bearing – especially in case of equity, balanced and flexible funds – huge losses. In the next paragraph is provided an evidence of how Italian harmonised mutual funds performed in recent years with respect to financial markets and hedge funds indices.

3.4. Italian Funds Indices vs. Financial Markets Indices

In order to evaluate Italian funds behaviour we consider a person investing 100 Euro equivalent amount of money at the end of 1998 in 3 different funds (liquidity, bond and equity) whose monthly performance are equal to the weighted average monthly performance of all funds belonging to the same category; to this end, we use Fideuram mutual fund indices²⁵. The comparison is made taking into account the Italian market; equity and bond indices have been rebased to 31/12/1998. Indices expressed in US Dollars have been converted into Euro.

Figure 2 – Italian liquidity funds vs. Italian short term government bond

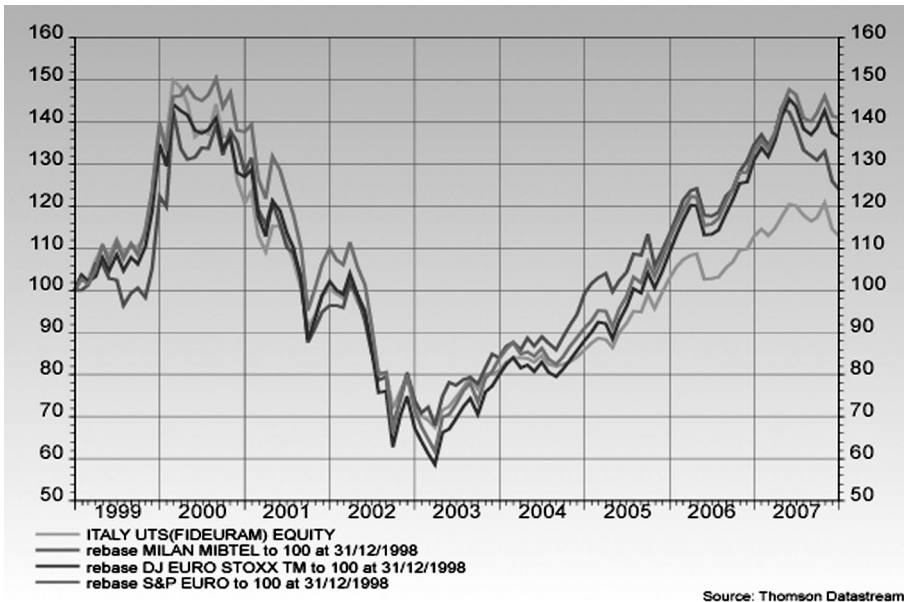


²⁵ Fideuram indices are published by Banca Fideuram. For further details about calculation methodology see https://sito.bancafideuram.it/fideuram/news_e_mercati/indici2/come_sono_costruiti.html.

Figure 3 – Italian Bond Fund Index vs. JPM Global Bond Index (All Maturities) and Euro MTS Index



Figure 4 – Italian Equity Funds Index vs. Stock Indices



The charts show as mutual funds have registered a lower final wealth with respect to market indices. A substantial part of the underperformance is due to fees and taxes, that Italian mutual funds calculates on a daily basis applying a 12.5 per cent levy on capital appreciation and income, although actual payment is made once a year²⁶; as a consequence, fund shares are quoted net of fees and taxation, making difficult a direct comparison with market performances.

3.5. Italian Funds Indices vs. Hedge funds Indices

In order to evaluate the effectiveness of risk limitation rules ensured by UCITS in protecting retail investors, it has been considered the universe of Italian UCITS (Fideuram Indices) w.r.t. a sample of Hedge funds Indices (HFR indices²⁷). In Table 5 are summarised the average monthly returns²⁸ from January 1999 to December 2007. The summary statistics include mean, standard deviation (SD), Skewness²⁹ and Kurtosis³⁰. Moreover, we calculated the Historical VAR (at 95% and 99% confidence level), Historical Expected Shortfall (ES 99%) and a scale independent risk-adjusted measure (Mean/SD), expressing the return generated by the funds' indices per unit of risk.

²⁶ Computationally, the levy is applied to the difference between the NAV at time t and the NAV at time $t - 1$. If this difference is negative, taxation is also negative, that is, a tax credit results. This induces a difference between Italian and Foreign mutual funds as the latter are taxed when capital gains are collected, affecting net performances. See, Savona (2006).

²⁷ Hedge Fund Research, Inc. (HFR) is a research firm specializing in the aggregation, dissemination and analysis of alternative investment information. The HFRI Monthly Indices ("HFRI") are a series of benchmarks designed to reflect hedge fund industry performance by constructing equally weighted composites of constituent funds, as reported by the hedge fund managers listed within HFR Database. The HFRI range in breadth from the industry-level view of the HFRI Fund Weighted Composite Index, which encompasses over 2000 funds, to the increasingly specific-level of the sub-strategy classifications.

²⁸ We consider monthly returns provided that daily or weekly returns of hedge funds tend to manifest a high autocorrelation as a consequences of the lack of significant intra-month net asset values changes.

²⁹ Skewness (Skew in the table) measures the "tailing" properties of a distribution (the third moment of the distribution). A negative value means that the distribution is skewed to the left; while a positive value means the distribution is skewed to the right. In a normal distribution, perfectly symmetric, the Skewness is 0.

³⁰ Kurtosis measures the "elevation" properties of a distribution (the fourth moment of the distribution). The Kurtosis value for a normal distribution is three. The larger the value (positive) the more "peaked" is the distribution. The smaller the value (negative) the flatter is the distribution. In Table 5 is reported the "excess" Kurtosis value (coefficient of Kurtosis minus three), so if Kurtosis value is positive, then the distribution tends towards being more peaked than a normal distribution; while if Kurtosis value is negative, then the distribution tends towards being flatter than a normal distribution.

Details about calculation methodologies of VAR and ES are provided in Annex A.

Table 5 – UCITS vs. Hedge Funds (Source for monthly returns: Thomson Financial Datastream)

	Mean of monthly returns	SD of monthly returns	Mean/SD	Skew	Kurtosis	VAR 95%	VAR 99%	ES 99%
ITALIAN UCITS								
FIDEURAM GENERAL	0,066%	1,344%	0,049	-0,326	1,751	-2,312%	-3,612%	-3,759%
FIDEURAM LIQUIDITY	0,179%	0,082%	2,179	0,507	-0,196	0,059%	0,036%	0,035%
FIDEURAM BOND	0,188%	0,403%	0,466	-0,157	0,536	-0,513%	-0,691%	-0,852%
FIDEURAM BALANCED	0,128%	1,748%	0,073	-0,159	0,460	-3,274%	-3,716%	-3,971%
FIDEURAM EQUITY	0,125%	4,037%	0,031	-0,324	0,319	-7,763%	-9,275%	-9,639%
FIDEURAM FLEXIBLE	0,058%	2,515%	0,023	-0,148	2,089	-4,362%	-5,655%	-6,978%
HEDGE FUNDS (EUR)								
HFR1 EQUITY HEDGE	0,830%	2,497%	0,333	0,926	3,368	-2,652%	-4,580%	-4,769%
HFR1 EQUITY MARKET NEUTRAL	0,465%	0,833%	0,558	0,848	2,084	-0,852%	-1,223%	-1,447%
HFR1 MACRO	0,678%	1,614%	0,420	0,497	1,930	-1,784%	-2,478%	-3,268%
HFR1 FUND OF FUNDS COMPOSITE	0,628%	1,409%	0,446	0,958	4,401	-1,451%	-1,762%	-2,737%
HFR1 FUND WEIGHTED HEDGE FUND	0,770%	1,848%	0,417	0,446	1,813	-2,100%	-3,134%	-3,567%
HEDGE FUNDS (DOLLAR)								
HFR1 EQUITY HEDGE	0,906%	2,517%	0,360	0,843	2,763	-2,610%	-4,174%	-4,245%
HFR1 EQUITY MARKET NEUTRAL	0,495%	0,829%	0,597	0,416	1,103	-0,866%	-1,326%	-1,450%
HFR1 MACRO	0,765%	1,715%	0,446	0,476	1,254	-1,991%	-2,806%	-3,260%
HFR1 FUND OF FUNDS COMPOSITE	0,708%	1,485%	0,477	0,776	2,968	-1,529%	-2,161%	-2,774%
HFR1 FUND WEIGHTED HEDGE FUND	0,862%	1,889%	0,456	0,390	1,184	-2,127%	-2,860%	-3,176%

In case of HFR Indices we considered both Euro and US Dollar (original) values; in the first case, we assumed the perspective of a European investor willing to compare the performance of UCITS and Hedge Funds on a currency unbiased basis. In the second one, risk measures have been computed analysing the indices on a stand alone basis in order to appreciate their intrinsic risk.

On average, Italian UCITS show a negative Skewness, with the exception of Liquidity funds, with a left tail of the distribution of monthly returns more pronounced than the right one (i.e. losses are more likely to be extreme even though they occur less frequently) whilst in case of hedge funds the situation is reversed³¹.

³¹ When comparing Hedge funds Indices and Mutual funds Indices, it should be considered the “survivorship bias” that can affect mostly the Hedge Funds Indices provided that funds are included in the database on a voluntary basis, and in case of poor performance the asset manager can stop sending reports; consequently, the risks associated may be underestimated. In case of HFR Indices a fund is removed when:

- it liquidates, or
- the fund manager requests removal from the database, or
- it fails to satisfy the requirements for constituency (e.g. the amount of assets falls below the minimum asset threshold, equal to 50 million dollars).→

Over the period under review, Hedge Funds Indices present significant fat tails, but their returns per unit of risk are – on average – better than UCITS (except for Liquidity Funds).

It is worth noting that the downside risk, captured in Table 5 by Historical VAR, is greater for some categories of UCITS than for Hedge Funds: Equity, Balanced and Flexible UCITS present the worst values in terms of VAR at 95% confidence level. Surprisingly, the VAR at 99% confidence level and the average of losses beyond VAR (ES 99%) has been significantly higher for Equity and Flexible UCITS than for all categories of Hedge Funds.

The findings tend to confirm that “long only” harmonised mutual funds have – on average – a greater exposure to risks than alternative investments (such as hedge funds) subject to less regulatory burdens.

*
* *

In 2005 the European Fund and Asset Management Association (EFAMA) agreed with the European Commission that the heavy reliance of the UCITS Directive on detailed investment limits and risk-spreading rules is no longer the right approach to protect investors. It recognised that other approaches should have been discussed (e.g. a risk-based approach) with both Commission and CESR, but it would need a complete redrafting of the UCITS Directive³².

In the following section, a possible risk-based approach is depicted.

However, a fund’s past performance will always remain in its respective index up until the point of liquidation or manager-requested removal from HFR database. In order to limit survivorship bias, HFR declare to “exhaust all efforts to receive a fund’s performance until the point of final liquidation. This convention provides the most robust characterization of results possible”. Likewise, when a new fund is added to the Index, the historical performance of the new constituent fund will not affect the finalized historical performance of the index.

³² EFAMA comments on the EU Commission Green Paper on the enhancement of the EU framework for investment funds (sec(2005) 947) - 15 November 2005.

4. An alternative approach: risk budgeting

4.1. A new approach for UCITS.

Financial innovation and the growing demand for more sophisticated products able to protect the nominal capital invested, have contributed to the build of investment products more and more complex.

It is quite difficult for retail investors to assume informed investment decisions, assessing ex ante the risk of mutual funds: as a matter of fact, the prospectus does not appear completely effective attended that it adopts standardised risk descriptions which do not really discriminate funds having the same eligible assets.

The market evidence signals that associating the fund risk profile to portfolio composition could be misleading: on one hand, the volatility of the same asset class is not constant but changes over time; on the other, portfolio exposure to the same risk factors can be modified by asset managers by means of investment decisions.

A retail investor could prefer to have a well defined risk exposure with a flexible asset allocation instead of a rigid asset allocation with a changing risk profile. As a matter of fact, the asset allocation tells us less about funds' overall risk profile than expected: it may be better to first identify a risk comfort level and then derive an asset allocation consistent with that risk level³³.

Therefore it could be more convenient to set limits in terms of risk budgeting instead of portfolio constraints. If this is the case, we could consider a complementary approach to regulation in the asset management sector, moving from an asset allocation perspective to a risk budgeting one, focused mainly on the risk-return profile of managed products.

As a first step, the paper considers the possible benefits associated with the introduction a of new category of harmonised mutual funds (i.e. “risk budget funds”) with a predefined level of financial risk – set in the fund rules – that allows asset managers to change portfolio allocation more freely in order

³³ Stubbs and Gulpa (1998).

to respect the risk budget³⁴ taking into account all relevant risks (liquidity, market, credit and counterparty risk).

In the following paragraphs are examined the characteristics of the new approach, its pros and cons and the possible impact on supervisory activity.

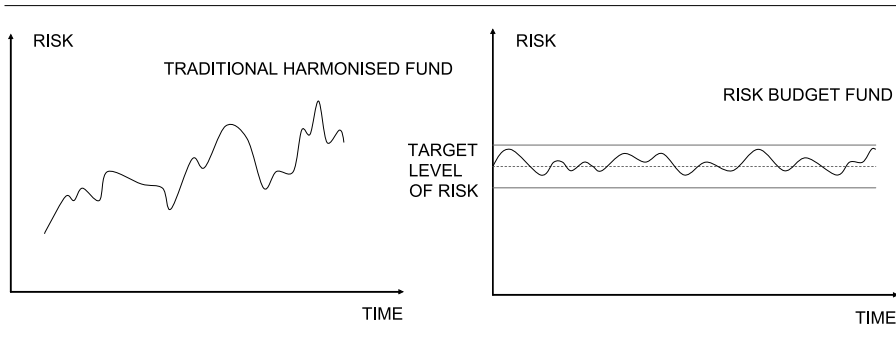
4.2. Risk budget funds vs. harmonised funds

In the mutual funds universe are already offered to investors harmonised products that assume – as investment objective – the maintenance of a given risk profile (for example, Value at risk) or have a flexible investment policy which allow asset managers to vary fund asset allocation according financial market conditions or propose a capital protected investment strategy. Sometimes, these three elements can be combined in the same investment vehicle.

Why risk budget funds should be different?

All harmonised funds have to comply with the risk limitation rules set in the European Directives. In case of risk budget funds the aforementioned these rules would not be applied. Asset managers should be free to adjust fund's asset allocation and leverage provided that their goal is to keep risk profile in line with a fixed risk target. The basic idea behind this approach can be caught by the following graph.

³⁴ In financial literature the term “risk budgeting” has different denotations related to specific risk optimization techniques: Jorion (2003) defines it as the conversion of optimal mean–variance allocations to Value at Risk assignments for active managers while in Gilkeson and Milcheson (2004) risk budgeting is a process that seeks to maximize expected alpha subject to a total tracking error constraint for the portfolio (the assumption underlying the process is that selected managers will produce additional alpha as they are allotted addition tracking error from the total portfolio constraint). Before them various aspects of risk budgeting have been explored by Chow and Kritzman (2001), who provide an overview of the process, by Rawls and Izakson (2000) who differentiate between traditional mean-variance optimization and the risk budgeting framework. Lee and Lam (2001) discuss the risks that must be estimated when constructing a risk budget, arguing that information risks (the accuracy of a specialist's estimates) are as important as statistical risks.

Figure 5 – Traditional Funds vs. Risk Budget Funds

Let's consider more closely a risk budget fund and its characteristics.

4.3. Technical characteristics of risk budget funds

Regulation of risk budget funds should deal with, at least, the following main issues:

1. liquidity of fund's shares;
2. portfolio diversification;
3. leverage and short selling;
4. eligible assets;
5. risk indicators to be used;
6. asset management company's organisational requirements.

4.3.1 Liquidity of fund's shares.

The new category of funds should be included in the list of open-ended harmonised funds offered to retail investors all over the European Community; to this end, the collective investment schemes must preserve the ability to redeem its units at the request of the unit-holders and to calculate its net asset value whenever units are issued or redeemed.

It is therefore essential to consider the main requirements the assets held in the portfolio should comply with. We believe that some key elements concerning liquidity settled in the Council Directive 85/611/EEC of 20 December 1985

and in the Commission Directive 2007/16/EC of 19 March 2007 should be maintained.

The liquidity risk is a factor that the asset management company must consider when investing in any financial instrument in order to be compliant with the portfolio liquidity requirement.

A financial instruments is liquid when can be sold at limited cost in an adequately short time frame, taking into account the obligation of the fund to repurchase or redeem its units at the request of any unit holder. This quality can be presumed when the financial instrument:

- is freely transferable;
- is admitted to, or dealt in on, a regulated market (unless there is information available to the UCITS that would lead to a different determination);

In any case, its liquidity must be verified taking into account all information available³⁵.

Whenever securities are not admitted to trading on a regulated market, liquidity cannot automatically be presumed. The UCITS will therefore need to assess the liquidity of such securities where this is necessary to meet foreseeable redemption requests. With reference to non listed securities, they can be bought or held only if there are sufficiently liquid securities in the portfolio so as to be able to meet liquidity requirement.

4.3.2 Portfolio diversification.

Diversification is one of the milestone of asset management sector regulation. All risk spreading rules aim at mitigating risk via reducing the impact of any one investment held in fund portfolio.

³⁵ According to CESR, examples of the matters a fund manager may need to consider in assessing the liquidity of the financial instrument are: the volume and turnover in the transferable security; if price is determined by supply and demand in the market, the issue size, and the portion of the issue that the asset manager plans to buy; also evaluation of the opportunity and timeframe to buy or sell; where necessary, an independent analysis of bid and offer prices over a period of time may indicate the relative liquidity and marketability of the instrument, as may the comparability of available prices; in assessing the quality of secondary market activity in a transferable security, analysis of the quality and number of intermediaries and market makers dealing in the transferable security concerned should be considered. CESR's guidelines concerning eligible assets for investment by UCITS. March 2007; ref: CESR/07-44

A wide literature has approached the diversification problem starting from the seminal works of Markowitz (1952, 1959) that identified the risk-reduction benefits associated with holding a diversified portfolio of assets. Subsequently a number of authors have attempted to measure the rate at which risk-reduction benefits are realised as the number of securities in a portfolio is expanded. Evans and Archer (1968) modelled risk in terms of a portfolio's standard deviation and concluded that for a randomly selected and equally weighted portfolio (i.e. naïve diversification) there is very little risk-reduction to be obtained from expanding a portfolio beyond eight to ten securities. Subsequent studies have used similar techniques to confirm the risk-reduction advantages of diversification.

Statman (1987) contradicted this conclusion, showing how a well diversified stock portfolio must include, at the very least, 30 stocks for a borrowing investor, and 40 stocks for a lending investor. Many other studies analysed the same problem in case of hedge funds.

From the regulatory side, the UCITS Directive requires a minimum portfolio diversification of the fund; for example, in case of stocks, mutual funds must invest at least in 16 different issuers³⁶.

In this paper, no minimum diversification criteria are proposed. We regard as arbitrary setting a minimum threshold; in case of risk budget funds the key point should be the contribution to the overall risk profile of each asset held in portfolio. The number and the type of assets depend on how they concur to the achievement of the target risk level.

As a matter of fact, no asset manager could offer a fund which is actually invested in only one single stock or bond!! We think that the minimum level of diversification should be autonomously set by the asset management company and declared in the contract/prospectus.

³⁶ According to article 22 of UCITS Directive, a fund may invest no more than 5 % of its assets in transferable securities issued by the same body. Member States may raise the 5 % limit to a maximum of 10 %. However, the total value of the transferable securities and the money market instruments held by the UCITS in the issuing bodies in each of which it invests more than 5 % of its assets must not then exceed 40 % of the value of its assets. Consequently, an equity fund could invest 40% of its portfolio in 4 issuers and the residual 60% in 12 issuers, for a total of 16.

4.3.3 Leverage and short selling.

Risk budget funds innovations do not affect portfolio diversification only. Regarding liabilities, UCITS regulation – as already noted – aims at reducing risk profile setting limitations to short selling³⁷, borrowing and total exposure to derivatives.

Recent developments in the UCITS marketplace has seen an increase in new trading strategies particularly with the introduction of long/short trading strategies, commonly referred to as 130/30 funds. These funds use investment strategies which maintain 100% net long exposure by a combination of 130% long and 30% short. They allocate 100% of NAV to long positions and then short sell securities to the value of 30% of NAV. The proceeds from the short sale are then used to acquire additional long positions, thereby bringing the total exposure to 130% long and 30% short.

In any case, no physical “covered” short sales should be allowed³⁸. The European Commission has recently confirmed this negative position (in a letter addressed to the CESR), considering this technique as inconsistent with important provisions of the UCITS Directive such as those regarding the prohibition on borrowing set in Article 36 which is not confined to borrowing money but also extends to securities. Other concerns are related to the absence of explicit provisions governing exposures through physical short selling or the organisational and technical requirements for managing the related risks (i.e. market, operational and counterparty risks).

As a matter of fact, this position is totally comprehensible within the boundaries of UCITS regulation.

³⁷ Short selling is the practice whereby an investor seeks to act on the belief that a particular security is likely to fall in value. There are a number of techniques for short selling. These broadly fall into two categories, “physical” short-selling or “synthetic” short selling. Physical short selling involves the actual sale of the security and may be covered or uncovered. An uncovered short sale is where the investor has no right to the security at the time of agreeing to the sale. The investor will then seek to purchase the security before delivery is required. In contrast, in a covered sale, typically the security is borrowed from another party. The security is then sold on in the belief that when the time comes to return it, it will be possible to purchase it more cheaply. The profit is the difference in the sale and purchase prices, less the cost of borrowing and any transaction costs incurred. Synthetic short selling involves the use of financial derivative instruments to create an exposure to the price of the security, rather than the actual sale of the security.

³⁸ The conditional is motivated by the fact that Irish Financial Services Regulatory Authority (IFSRA), under certain conditions, recently gave regulated investment funds the green light to perform direct physical short sales of assets, removing one of the few remaining absolute restrictions within the UCITS framework. Other countries are likely to follow; see also D. Prime (2008). Moreover, in France short sales of transferable securities are allowed up to 10% of the assets covered by repos.

The adoption of a risk-based approach to supervision of collective investment schemes (as suggested in this paper) could foster the use of such techniques. A relaxation of investment limits (including leverage, exposure to derivatives and short selling) could be possible only if asset managers demonstrate their capacity to identify, measure, monitor and control all relevant risks associated to portfolio management techniques they intend to use.

This reflects a more general recognition by financial supervisors worldwide that it is no longer feasible to monitor all of the operations of financial institutions, and that a more effective approach entails ensuring that these institutions have sound risk management practices and internal controls.

A key issue to be addressed refers to the degree of freedom allowed to risk budget funds: if short selling is no more limited for UCITS which would be the difference with respect to hedge funds?

Before answering to the question, it should be considered that a convergence is visible between alternative investments and sophisticated UCITS funds. UCITS III allows the structuring of funds replicating several alternative investment strategies with absolute returns. It has also observed the interest of Prime Broker, a service provider essential to Hedge Funds managers, for sophisticated UCITS³⁹.

Anyway, some structural differences should be maintained.

Firstly, liquidity requirements set by UCITS regulation should be preserved in order to mitigate the risk of investing in illiquid assets which are, on the contrary, “eligible” for hedge funds.

Secondly, it should be set a global limit to the leverage of risk budget funds which takes into account debt, borrowed securities (in case of physical short selling) and financial derivatives leverage. This restriction on leverage tend to limit not only fund’s market risk exposure but also the risk for the stability of banking and financial systems, preventing UCITS from becoming high leveraged institutions.

A possible measure could be the following ratio:

$$LAVERAGE\ RATIO = \frac{(Debt + Market\ Value\ of\ Short\ Positions + OTC\ Derivatives\ Commitments)}{(Total\ Assets)} \leq 0,8$$

³⁹ European Commission – DG Internal Market - PriceWaterhouseCopeers (2008).

The maximum leverage ratio is set equal to 80% of total assets in order to preserve a buffer for unexpected events that could cause a strong increase in fund's liabilities (e.g. redemptions of units, depreciation of total assets, margin calls on listed financial derivatives).

We tend to exclude listed financial derivatives from the numerator for three reasons: 1) these contracts can be sold, liquidated or closed at any time; 2) the effective fund's commitment is limited to the margin (included among the total assets) and 3) provided that most listed financial derivatives are futures on market indices, whose commitments are calculated multiplying the reference capital by the value of the index, we consider as too stringent their inclusion into the global leverage ratio.

As a matter of fact, the notional value is not an indicator of the risk exposure associated with financial derivatives. The effective risk exposure is only a small fraction of the notional value and depends on the features of the contracts (underlying asset, indexation mechanism and duration) and the characteristics of the market in which the transactions are handled (the expected volatility of the value of the underlying asset, the market liquidity and the credit rating of the counterparty).

Pertaining OTC derivatives commitments, their calculation should be made using market standard methodologies, as taken in national regulations⁴⁰. It is to discuss if the requirements set in the UCITS Directive should be maintained, provided that the counterparty risk should be included in the

⁴⁰ First of all it should be allowed the netting of positions. According to the Italian regulation:

1. the transactions must have the same underlying and maturity. Maturity mismatching shall be permitted only if the maturities differ:
 - by not more than seven days, where the transactions to be netted have a residual maturity of between one month and one year;
 - by not more than thirty days, where the transactions to be netted have a residual maturity of more than one year;
2. the risk exposure created by one transaction must be of opposite sign to that created by the other.

Where netting concerns transactions of opposite sign that give rise to commitments of different value, the difference must be included among the fund's commitments.

Secondly, the calculation of fund's total commitments should include:

- a) in the case of options, the current value of the underlying assets multiplied by the option's delta. Management companies that manage funds with substantial positions in options must adopt organizational measures to keep risk factors other than delta under control;
- b) in the case of forward sales contracts, the value of the contract (e.g. the reference capital multiplied by the contract settlement price);
- c) in the case of derivative financial instruments whose execution involves the payment of cash differentials, other than those referred to in a) and b), the commitment shall correspond to the contract's reference capital.

risk measures adopted by the fund managers in order to control the overall fund's risk profile.

Furthermore, UCITS should declare in the offering documentation the maximum threshold levels for leverage and short positions.

Another substantial difference between hedge funds and risk budget funds is that the latter should be subject to the supervisory review process aiming at verifying the adequacy of asset managers' organisation. A strong incentive mechanism should be put in place in order to commensurate the operational possibilities (in terms of leverage, short selling and use of derivatives) to the soundness of risk management systems, the adequacy of investment decision process, the reliability of IT systems.

Proportionality should therefore be ensured among the depth of supervisory controls, the sophistication of risk models adopted by fund managers and the widening of investment and borrowing powers; to this end, a formal recognition by the Supervisor of internal risk models could be deemed as necessary.

4.3.4 Eligible assets.

The definition of eligible assets is one of the most challenging task for UCITS regulators provided that financial innovation – as an ongoing process – generates a multitude of new products, including many new forms of derivatives and alternative risk transfer products, more and more complex to evaluate.

Rather than establishing exhaustive lists of financial instruments and transactions, it should be preferable to set the general criteria to be respected in order to assess if an asset is eligible or not. To this end, it must be preserved fund's liquidity (see § 4.3.1), the accuracy of net asset evaluation, and the proper management of assets (e.g. avoiding derivatives contracts that could entail the physical delivery of commodities).

Pertaining portfolio evaluation, any financial instruments should have a value which can be accurately determined at any time, based primarily on available market data; to this end, evaluation criteria set in the European Directive 85/611 could be applied to risk budget funds' assets as well.

4.3.5 Risk indicators to be used.

The key element in risk budget funds is the choice of the risk indicator which should drive asset managers' investment decisions. We recognise that in this field "one-size-fits-all" principle could generate severe inefficiencies; therefore it is not possible for regulators to impose one single risk measure to be used without distorting the investment process or competition among asset managers.

It's up to the asset management company to decide which kind of risk policy to adopt, as described in the funds rules and in the prospectus, subject to supervisory review. As Brandolini, Pallotta and Zenti (2003), we define a risk policy as a "reaction function" by which an asset manager reacts to different level of portfolio risks, changing assets' weights.

A risk-based investment process should therefore involve:

- the choice of a set of relevant risk indicators;
- the definition of an investment holding period;
- the choice of a target risk threshold;
- the ex ante estimation of possible values for the chosen risk indicator;
- a systematic comparison between ex ante estimation and the target, changing assets' weights in order to align portfolio risk profile to the target level of risk.

More formally, assuming that the portfolio rebalance is conducted with a frequency equal to h (i.e. the holding period of any asset is equal to h , for example 1 week), we denote with w_t the vector of weights of assets held in the portfolio at time t and with w_{t+h} the vector of weights determined at time t that remain unchanged till time $t+h$. Consequently, w_t is determined at time $t-h$ as a result of the risk policy and of the evolution of assets' returns in the period between $t-h$ and t .

Assuming $Risk^*$ as the target value for the generic risk indicator stated in the fund rules and setting $Risk_t$ as the ex ante estimation at time t of the same indicator, the risk policy can be represented as a function RP according to which:

$$w_{t+h} = RP (Risk_t - Risk^*, w_t), w_{t+h} \in W$$

where W is the set of possible values of weights, satisfying the limitations imposed by the regulation or autonomously set by the board of director of the asset management company.

In our general equation, the input for function RP is the actual level of risk ($Risk_t$) and the difference from the target level ($Risk^*$). The portfolio rebalancing could be a two step process:

first, the asset manager determine the unconstrained weights, according his views on the markets ;

- secondly, the weights are rescaled (up or down) in order to attain the target level $Risk^*$.

Considering the technical difficulty to maintain constantly the actual level of Risk equal to $Risk^*$, deviations from this target should be allowed in the very short term (i.e. 1 week) ensuring that on a monthly basis the average is in line with the expected value⁴¹.

Pertaining the characteristics that the risk indicator should comply with, it could be suggested that a “coherent measure” à la Artzner (1999) should be chosen but this option would exclude a number of risk measures commonly used by asset managers, such as Value at Risk⁴²; in this paper, we consider as preferable not to restrict the set of possible risk measures.

It is worth stressing the substantial difference existing between the risk-reward measure suggested by CESR⁴³ for the Key Information Document and the risk indicator used within a risk budget fund. In the first case, the measure has only informative purpose; in the second one, it is a tool used by asset managers in order to orientate investment decisions. In the latter case, risk indicator is really implemented within the organisation and does not need to be “translated” in the “key indicator”.

Reminding that the main objective of regulation in the asset management sector should be the protection of retail investor, we assume that only

⁴¹ It could be allowed a deviation from $Risk^*$ of no more than 5% (up or down).

⁴² According to Artzner et al. (1999), a coherent risk measure is a risk measure that satisfies properties of monotonicity, sub-additivity, positive homogeneity, and translational invariance. Value at Risk is not, in general, a coherent risk measure as it does not respect the sub-additivity property; as a consequence Value at Risk might discourage diversification. Value at risk is, however, coherent, under the assumption of normally distributed losses.

⁴³ See paragraph 2.4.

measures addressing funds' total risk should be taken into account: it means that indicators capturing "relative risks" (w.r.t. a benchmark), such as Tracking Error Volatility and Relative-VAR are not considered as relevant for risk budget funds.

4.3.6 Organisational requirements.

With reference to organisational requirements, the management of a risk budget fund implies – among others – that:

the asset management company has defined a risk measure (or more than one risk measure) on the basis of which the fund managers assume investment decisions;

the board of director has approved the risk management system and the investment process, being aware of the main technical aspects concerning the aforementioned risk measures;

the company has in place risk management systems able to capture the funds' overall risk profile. This entails that fund managers should identify and understand the sources of risks inherent in their investment processes and, above all, should estimate the impact of an event on the portfolio's risk (and the probability of this event occurring). The sophistication of the risk management system is consistent with the nature of the risk indicators adopted by the asset management company;

the risk management function is involved in the strategy decision making process;

an independent and periodic review is carried out by the Internal Audit function testing model control practices and model validation procedures to ensure compliance with established policies and procedures;

the information system is able to track and report funds' risk exposure in a timely manner to all relevant parties involved in the risk taking and risk controlling processes;

the investment decision making process, the risk control activities and the structures involved should be set forth in bylaws, board resolutions, or written management plans adopted by the board or its designated committee.

4.4. Advantages of risk budget funds

This new category of funds may provide relevant advantages for investors, distributors, asset managers, and regulators.

From the investors' perspective, it seems more respondent to the demand for investment products with a well pre-defined risk profile enhancing the discovery process of funds that really match investors' risk appetite.

A risk budget fund is required to set in the contract the engagement to preserve a given exposure to risk during its life: supervisory experience suggests how many investors' complaints are referred to unexpected losses suffered during the permanence in the fund. In many cases, at the moment of the subscription of units the risk was perceived or represented as low.

Risk perception is influenced by information gathered at the moment of subscription of the funds' units. To this end, a risk budget fund can facilitate – w.r.t. standardised risk descriptions stated in the prospectus – the awareness about risk; this is crucial when the purchase of fund's shares is made in “execution only”, with no assistance by brokers in deciding which fund fit the best investor's investment objectives and risk tolerance⁴⁴; in this case the financial intermediaries do not offer any advice, but simply act on the client's instructions.

In addition, a clear description of risk target stated in the prospectus contributes to mitigate the problem of asymmetric information experienced by investors.

For European distributors of financial products, MiFID Directive – entered into force on 1 November 2007 – is reshaping distribution business models with the aim to ensure a higher level of protection of investors when making investment decisions.

⁴⁴ According to the MiFID Directive (Directive 2004/39/EC, replacing the Investment Services Directive adopted in 1993) if an investor buys or sells non-complex products, such as harmonised investment funds, at his initiative (for example, via Internet) the principle of ‘execution only’ will apply. It means that the intermediary has no obligation to check investors' knowledge and experience.

To this end customers are split into three categories: 1) non-professional (retail) customers; 2) professional customers; 3) eligible counterparts. The protection is the maximum for retail customers and the least for counterparts.

For a retail investor, the purchase of funds' shares may be made not only at his initiative, but in most cases, in consequence of services carried out by a bank, an investment firm or an asset management company; in such circumstances, financial intermediaries are required to assess if the mutual fund is appropriate or suitable for the investor⁴⁵.

The quest for marketing instruments able to discriminate funds' risk profile is a challenge faced by all distributors in the UCITS III world. The emergence of alternative strategies in sophisticated UCITS and their public placement requires reasonable market segmentation in order to limit reputation and regulatory risks.

Risk-budget funds could facilitate asset managers and distributors in complying with MiFID directive requirements, because investment funds could be classified according to their risk profile. As a consequence, distributors would also be supported in assessing the risk of different products and their appropriateness or suitability to the clients' financial situation, investment objectives and risk appetite.

⁴⁵ When the subscription is made as a result of a placement activity, the firm providing such service has to require to the investor information about his knowledge and experience in the investment field relevant to the specific type of product or service offered or demanded so as to enable the firm to assess whether the product or service envisaged is appropriate for the client (in the sense that the client has the necessary experience and knowledge in order to understand the risks involved in relation to the product or service). Where the appropriateness test applies, firms must either offer to a client or transact for him only those products that are appropriate or, if the client demands a product that is assessed as inappropriate for him, give the client a warning (which can be in standard form if the firm wishes) that the product is inappropriate to the client's circumstances in terms of the test. If a client is provided with a warning but still wishes to proceed, the firm should consider whether to do so having regard to the circumstances. If the client does not, or cannot provide sufficient information to allow the firm to judge appropriateness but the client still wishes to do business with the firm, the firm must warn the client that it is unable to judge appropriateness before considering whether to proceed.

When the purchase of fund's share is made in consequence of investment advisory service, the firm has to perform a suitability test. In order to make an assessment of suitability, the firm needs to obtain the necessary information in relation to the client to assess: (i) his investment objectives; (ii) his financial situation; and (iii) his knowledge and experience. Knowledge and experience can be assumed for products, services or transactions in respect of which a client has been classified as professional; it cannot be assumed for retail clients. If a firm does not obtain the necessary information to assess suitability, it cannot make a personal recommendation to the client or take a decision to trade for him.

For regulators, the solution proposed could represent a possible way out in the debate on eligible assets: financial innovation makes much more difficult for regulators to define the list of assets in which harmonised funds can invest. In case of risk budget approach the problem could be mitigated because the focus is on the asset's contribution to risk and not on the nature of the each eligible asset, considered on a stand alone basis (see also § 4.3.4).

Considering the possible applications of this new approach, we should take into account which kind of supervision should be carried out on entities managing risk budget funds.

The European supervision model in place attributes a high relevance to the respect of investment limits; a significant portion of supervisory activity is still dedicated to licensing of new products and administrative controls of asset managers' compliance with regulatory restrictions. The new approach involve a significant shift in supervision mentality evolving from the emphasis on ensuring compliance with rules to a much more comprehensive approach designed to ensure proper management of all risks associated with fund management.

As a consequence, Supervisors should not authorise any single fund established by the company but should assess asset managers' capacity to manage the funds they intend to promote.

To this end, it could be thought of a sort of program of funds to be launched within a given period of time ("set up program") where are specified the characteristics of each category of funds in term of investment objectives, risk policy and fees structure. Once the Authority has reviewed the risk management systems, and has verified that the organisation is coherent with the investment process adopted by the asset management company, funds can be offered to investors without further prior intervention by the Authority.

The supervisory framework should enable to tailor examination activities to the level of risk of each category of funds.

From the regulatory perspective, a risk based approach in the asset management sector:

- could entail a reduction of the regulatory burden for supervised entities in exchange for demonstrated risk management capacity;
- encourages greater risk awareness in entities and supervisors;

- requires an evaluation of risks through scoring systems that combine quantitative and qualitative standards;
- enables better allocation of supervisory resources, more focused on technical and organisational analysis supporting selective interventions based on evaluation of the quality of the management of funds and changes;
- is coherent with the Basle II approach to banking supervision.

The supervisory review process should evaluate the main elements of the risk model adopted by fund managers, among which key elements are: the underlying assumptions, the model's capacity to include all relevant risk factors, the reliability of data sources, the robustness of calculation methodologies, the completeness of back-testing activities, and the consistency of stress tests.

Along with financial risk, supervisors have to consider operational risks as well, which are attached to the different features and quality of the trading, settlement and accounting procedures operated by the collective investment schemes, as their high level of complexity, or their poor quality, may increase the chances of losses due to human or technical errors.

This process requires high level financial and technical expertise within supervisory authority and effective deployment of this across different units involved.

The adoption of such approach may call for internal organization changes of the Authority requiring the presence of specialist risk units or risk experts, the issue of regulatory standards and guidelines; the definition of robust risk scoring models.

4.5. Possible drawbacks

Although the new approach paves the way for reducing compliance burdens and improving fund asset management sector efficiency, so far there is no agreement to what extent this trade-off can be widened. How much regulatory requirements should be relaxed in order to get an increase in the investment process efficiency without reducing investors' protection?

The choice of the risk indicator is crucial: ideally, the risk measure should be sensitive to all relevant risk factors affecting the net asset value of funds. To this end, Value at Risk models seem the more appropriate to capture overall

risk profile; specific requirements should ensure the control of liquidity risk (if not captured by other risk measures) and operational risk.

As far as, the domestic regulation of four European countries (Luxembourg, France, Germany and Ireland) provides a VAR approach for UCITS (including non-sophisticated collective investment schemes), even if there is no convergence on VAR models to be used and on parameters to be satisfied⁴⁶.

Another possible drawback of risk budget funds is the definition of time horizon: setting a very short term for portfolio rebalancing, so as to maintain the risk profile in line with the target level of risk, could entail high transaction costs or preclude time diversification gains. In this section, we referred to a time frame of 1 week in order to adjust the vector of weights of the assets held in portfolio; it could be preferable to allow multiple time horizons – coherent with the nature and the complexity of investment strategies of each fund – over which the fund managers assume the obligation to align funds' overall risk profile to the target.

Moreover, the management of risk budget funds could be potentially pro-cyclical producing market distortions: when markets become more volatile, the goal of maintaining the fund's risk profile as close as possible to the target may induce to sell risky assets thereby accentuating market volatility.

Last but not least, what happens if the risk target levels are not met? At this regard, possible enforcement measures should be provided for, such as the prohibition to launch new funds or the imposition of specific capital requirements in consequence of proven inability of asset managers to control fund's risk profile.

⁴⁶ European Commission – DG Internal Market - PriceWaterhouseCopeers (2008).

5. Conclusion

The fund business is undergoing profound structural changes which will have lasting consequences such as continuous innovation in investment strategies and products, new forms of business model, emergence of specialised service providers, more discerning investors.

Regulatory challenge is to ensure that the supervision framework is capable of representing a viable basis for the successful development of the fund industry over the longer-term while assuring a high level of investor protection. According to the European Commission the UCITS Directive establishes several lines of defence to protect investors; however, new risks are emerging and market expectations are changing. There may be need to consider reflections on a more comprehensive risk-based approach to investor protection.

In this paper, we have underlined the weaknesses of UCITS regulation based on an extensive grid of investment and borrowing restrictions and on an exhaustive list of eligible assets: despite its level of detail, the regulation does not seem capable to capture fund's risk profile.

To this end, a cluster analysis has been carried out on a sample of Italian UCITS in order to group funds having similar risk profiles; the outcomes demonstrate that funds, subject to the same risk spreading rules, having analogue investment strategies, can differ significantly in terms of risk.

In addition, stringent investment and borrowing power restrictions on “long only” harmonised mutual funds do not seem to have been really effective in protecting individual investors. As a matter of fact, on average, Italian UCITS present a downside risk greater than alternative investments (such as hedge funds), subject to less regulatory burdens.

In this context, we have proposed a new category of harmonised funds (risk budget funds) intended as a first step to a new approach to regulation of collective investment schemes that, instead of focusing on investment limits, provides for minimum criteria to be met by asset managers related to the following items: liquidity, leverage and short selling, eligible assets and organizational requirements. The proposal aims at increasing the protection of investors, stimulating the offer of funds with a pre-defined risk level which should be maintained by means of investment decisions.

The adoption of a risk-based approach to supervision of collective investment schemes (as suggested in this paper) could foster a redrafting of UCITS Directive. The main driver would be a relaxation of investment limits (including leverage, exposure to derivatives and short selling) in presence of a recognised capacity of asset managers to identify, measure, monitor and control all relevant risks associated to portfolio management techniques they intend to use. A stringent supervisory process should ensure proportionality among the depth of supervisory controls, the sophistication of risk models adopted by fund managers and the widening of investment and borrowing powers.

This approach – coherent with international regulatory trends induced by Basel II and MiFID Directive – could provide significant advantages to all parties involved in the fund management industry entailing, for Supervisors, a movement away from rule based compliance enforcement to the development of a more flexible and comprehensive risk-based supervisory framework.

Annex A Risk indicators used in the cluster analysis

Standard deviation is a measure of the dispersion of a set of data from its mean. The more spread apart the data, the higher the deviation. The dispersion is defined as the variability around the central tendency (i.e. the mean of the distribution). In finance and investment theory, the central tendency is the measure of the reward and the dispersion is a measure of risk. The statistical measurements are the variance σ_i^2 and its square root, the standard deviation σ_i .

The standard deviation is estimated by examining a random sample taken from the population. The most common measure used is the sample standard deviation, which is defined by

$$\sigma_i = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (x_i - \bar{x})^2}.$$

where (x_1, x_2, \dots, x_n) is the sample and \bar{x} is the sample mean. The denominator $N - 1$ is the number of degrees of freedom in the vector.

Following the modern portfolio theory developed by Markowitz, the overall concept of risk is that as it increases, the expected return on the asset will increase as a result of the risk premium earned – in other words, investors should expect a higher return on an investment when it carries a higher level of risk.

The sample dataset used in this paper show as the volatility of funds' returns changes over time as a consequence of volatility changes of any of the assets held by the fund or as a consequence of an active investment strategy.

This matter has been analysed – among others – by Beltratti and Miraglia (2000) aiming at associating Italian open-ended mutual funds to a category of risk, so that to allow the potential investor to appraise the risk profile of each fund. The authors based their analysis on the standard deviation of past returns, a risk indicator easy to understand for retail investors. The results confirm how difficult is to find stable volatility clusters to which mutual funds can be associated: their paper suggests to limit the number of cluster to 5 in order to avoid frequent migrations of a fund from one category to another⁴⁷.

⁴⁷ In case of 6 volatility classes the authors found frequent migrations, independently from the frequency of data used for the calculation of standard deviation. In order to get a reasonable stability they suggested rankings based on 5 classes. Such rankings are stable if the episodes of migration are considered asymmetrically (index of permanence modified), from a lower to a higher volatility rank. The authors proposed 5 volatility clusters: from 0% to 5%, from 5% to 10%, from 10% to 15%, from 15% to 20% and more than 20%. For example, if a fund XY

Downside risk and Sortino ratio

Standard deviation isn't a good measure for every situation. First of all, it doesn't help to evaluate whether a fund has the ability to limit downside risk (not falling as far as the market in a down period). For example, a fund losing constantly 0.1% per day will have a standard deviation equal to 0, but it does not mean that the fund is a risk free asset!! Moreover, the statistic doesn't distinguish between upward and downward fluctuations.

Downside Risk (DD) can provide additional insights to standard deviation, capturing the risk of not achieving the minimum acceptable return (MAR) necessary to accomplish some goal (whilst standard deviation captures the risk of not achieving the mean). Semi-standard deviation can help in analysing the fund profile especially when the distribution of returns is not symmetrical.

As many surveys confirm, for a retail investor “risk aversion” tend to be equivalent to “loss aversion”, i.e. the risk that portfolio value will decline in the future⁴⁸. In this paper we assume MAR equal to the target annual inflation ratio set by the European Central Bank (i.e. 2% per annum); in other words, the goal is to protect at least the real value of the capital invested.

According to Sortino⁴⁹, the most frequently used and least reliable procedure for calculating downside risk considers only those historical returns that fall below some minimal acceptable return. Errors should be reduced by using simulation procedures to generate a discrete distribution of annual returns from monthly data. Simulation results could be further improved by fitting a curve to the data that allows the distribution to be skewed.

Nonetheless, looking backwards to past returns in order to evaluate what has been realised (and not what could happen in the near future) allow us to limit the calculation to the basic formula.

initially attributed to the interval 10%–15%, in the following period is associated to a lower rank (volatility less than 10%) the episode is not considered as example of migration since the investor doesn't hold a riskier investment product. If, instead, in the following period, the fund XY presents a volatility greater than 15% this episode is considered a case of migration by the moment that the underwriter originally holds a riskier investment with respect to the one he first selected.

⁴⁸ See, among others, Duxbury and Summers (2004) whose paper, starting from the antinomy between finance theory (which tends to see risk as related to variance in expected returns) and psychology literature (which tends to link risk to probability or size of potential losses), investigates whether individuals' perceptions of risk are linked to variance aversion or loss aversion, and finds that a link to loss aversion is supported.

⁴⁹ Sortino and Forsey (1996).

Once calculated the DD, we obtain the Sortino ratio as:

$$SO_i = \frac{\overline{(R_t - MAR)}}{DD}$$

where the numerator is the average of historic daily differential of fund's returns (R_t) and MAR (equal to 0.005% on a daily basis) and the denominator is the daily semi-standard deviation (DD).

Sharpe ratio. It is a risk adjusted indicator of the excess return (or risk premium) per unit of risk in an investment asset or a trading strategy. It is built on Markowitz' mean-variance paradigm, which assumes that the mean and standard deviation of the distribution of one-period return are sufficient statistics for evaluating the prospects of an investment portfolio. According to Sharpe (1994) comparisons based on the first two moments of a distribution do not take into account possible differences among portfolios in other moments or in distributions of outcomes across states of nature that may be associated with different levels of investor utility.

The original author defined both ex ante and ex post versions of the Sharpe Ratio. We focus on ex post ratio⁵⁰, assuming the excess return w.r.t. a risk free asset (three month Italian Government Bond), using the formula:

$$S_h \equiv \frac{\overline{(D)}}{\sigma_D}$$

The ratio indicates the historic average differential daily return per unit of historic daily variability of the differential return.

⁵⁰ Sharpe (1994) defined a generalised version of the ex post ratio as follows. Let R_{Ft} be the return on the fund in period t, R_{Bt} the return on the benchmark (or a risk free asset) in period t, and D_t the differential return in period t:

Let \bar{D} be the average value of D_t over the historic period from $t=1$ through T:

$$\bar{D} \equiv \frac{1}{T} \sum_{t=1}^T D_t$$

and σ_D be the standard deviation over the period:

$$\sigma_D \equiv \sqrt{\frac{\sum_{t=1}^T (D_t - \bar{D})^2}{T - 1}} \quad \rightarrow$$

The ex post, or historic Sharpe Ratio (S_h) is:

$$S_h \equiv \frac{\bar{D}}{\sigma_D}$$

When excess returns are negative, problems arise for the standard Sharpe Ratio interpretation. As a matter of fact, if two funds have the same negative excess returns, the preferable fund (in term of higher Sharpe ratio) is the one with the higher standard deviation (i.e. the riskier one). Apart possible interpretations that justify this outcome⁵¹, such situation – that affects 125 funds in our sample – does not concern the findings of the cluster analysis as we are interested in grouping funds with a similar risk profile instead of ranking them on the basis of the Sharpe ratio.

Historical VAR and Historical Expected Shortfall. Value at Risk, or VAR, is a commonly used statistic for measuring potential risk of economic losses in financial markets.

It can be defined as the worst expected loss over a given time interval under normal market conditions at a given confidence level⁵². With VAR, financial institutions can have a sense on the minimum amount that is expected to lose with a small probability (1 or 5%) over a given time horizon k (e.g., 1-day or 10 days); different methodologies are available in order to calculate VAR⁵³.

We compute VAR through the model-free (or unconditional mean/variance) method (i.e. historical simulation). The simplest way to estimate VAR is to use the sample quantile estimate based on historical return data. The method is an unconditional model approach that has no assumptions about the distribution and is referred to as Historical VAR. Since Historical VAR is based on the unconditional distribution of losses, it allows departures from normality to be captured to some extent.

In order to examine the actual losses suffered by investors of each fund, we consider the 99th percentile of the distribution of equally weighted past daily returns to determine which is the Historical VAR of each fund in order to cluster them. Consequently, the Historical Expected Shortfall⁵⁴ has been calculated as the average of losses beyond Historical VAR.

⁵¹ McLeod and Van Vuuren (2004).

⁵² More formally, value at risk (VAR) can be interpreted as the cutoff point such that a loss will not happen with probability greater than p (e.g. 95% percent). If $f(u)$ is the distribution of profit and losses on the portfolio, VAR is defined from:

$$F(x) = \int_{-\infty}^x f(u) du = (1 - p)$$

where p is the right-tail probability, and c the usual left-tail probability. VAR can then be defined as the deviation between the expected value and the quantile, $\text{VAR}(c) = E(X) - Q(X, c)$.

⁵³ Jorion (2006).

⁵⁴ Expected Shortfall (or Conditional VAR) is the expected value of the loss when it exceeds

Annex B Cluster methodology

We carried out an iterative partitioning (number of iterations=1000) with the aim to minimize the infraclass variance; after standardization of each variable, we obtain a 29*29 matrix (see Table 4 in the document).

The *K-means* algorithm consists in iteratively improving an initial partition by minimizing within-group variance. At each iteration, the algorithm calculates the centroids of the clusters in the current partition, then assigns each observation to the nearest centroid in order to form a new partition whose within-group variance is lower than the previous one. The variation used ensures that all clusters contain at least one observation.

In order to improve the convergence to the optimal solution the *K-means* algorithm is based on 1000 random initial partitions, selecting the best final partition from those that are created, i.e. the stable groups (the observation groups that have always been classified together). The stable groups are the intersection of all the partitions considered. Observations that are not part of any stable group are assigned to one cluster or another depending on the initial partition used. These observations are generally in intermediate regions located between stable groups. To identify stable groups, has been considered at most the 10 best partitions obtained via multiple executions of the algorithm. In the following table are illustrated the final barycentres of each cluster.

VAR. This measures the average of the loss conditional on the fact that it is greater than VAR. Define the VAR number as q . Formally, the Conditional VAR is given by:

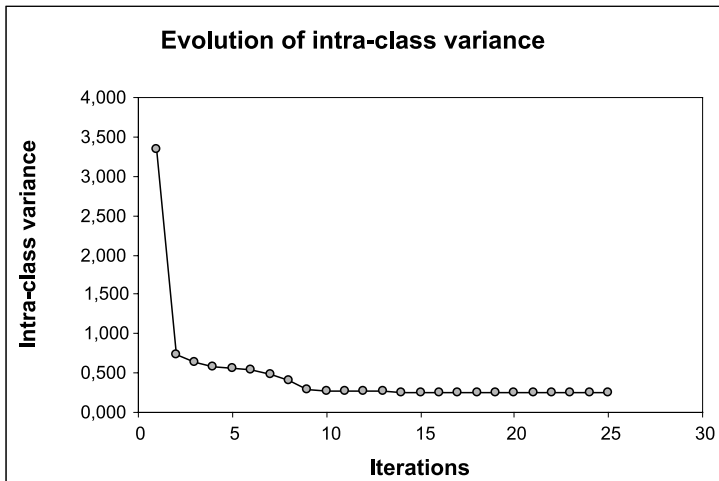
$$E[X | X < q] = \int_{-\infty}^q xf(x)dx / \int_{-\infty}^q f(x)dx$$

Table 6 – Clusters' barycentres

Clusters	Mean	Standard Deviation	Downside risk	Sortino ratio	Sharpe ratio	Historical VAR 99%	Historical ES 99%
1	0,011%	0,127%	0,087%	0,071	0,038	-0,317%	-0,412%
2	0,003%	0,215%	0,171%	-0,014	-0,017	-0,525%	-0,848%
3	0,009%	0,166%	0,128%	0,032	0,016	-0,427%	-0,610%
4	0,026%	1,024%	0,776%	0,019	0,013	-2,958%	-3,824%
5	0,018%	0,511%	0,381%	0,027	0,018	-1,429%	-1,922%
6	0,008%	1,051%	0,756%	-0,002	-0,003	-2,895%	-3,710%
7	0,010%	0,061%	0,041%	0,124	0,058	-0,163%	-0,200%
8	0,031%	1,019%	0,784%	0,027	0,019	-2,946%	-3,872%
9	0,010%	0,039%	0,023%	0,218	0,085	-0,085%	-0,131%
10	0,006%	0,507%	0,361%	-0,007	-0,007	-1,357%	-1,719%
11	0,003%	0,885%	0,646%	-0,013	-0,011	-2,490%	-3,125%
12	0,015%	0,993%	0,735%	0,007	0,004	-2,864%	-3,600%
13	0,009%	0,325%	0,188%	0,005	-0,001	-0,692%	-0,931%
14	0,000%	1,150%	0,812%	-0,011	-0,009	-3,064%	-4,006%
15	0,011%	0,816%	0,603%	0,001	-0,001	-2,309%	-2,911%
16	0,019%	1,164%	0,881%	0,003	0,001	-3,347%	-4,326%
17	0,043%	1,108%	0,785%	0,039	0,029	-2,899%	-3,881%
18	-0,004%	1,018%	0,726%	-0,022	-0,017	-2,810%	-3,580%
19	0,009%	0,027%	0,010%	0,388	0,099	-0,021%	-0,061%
20	-0,003%	0,595%	0,456%	-0,026	-0,022	-1,772%	-2,319%
21	0,032%	0,578%	0,426%	0,059	0,042	-1,575%	-2,068%
22	0,008%	1,705%	2,080%	0,011	0,020	-3,056%	-6,519%
23	0,032%	1,612%	0,653%	0,005	0,002	-2,492%	-3,187%
24	-0,018%	1,356%	1,761%	-0,004	0,021	-0,290%	-3,157%
25	-0,015%	1,699%	2,053%	-0,007	-0,009	-3,020%	-6,199%
26	-0,009%	2,491%	2,960%	0,006	0,016	-2,221%	-7,521%
27	-0,024%	1,054%	0,794%	-0,046	-0,035	-2,991%	-3,763%
28	0,028%	0,985%	0,017%	1,454	0,022	-0,039%	-0,119%
29	-0,022%	1,750%	2,011%	-0,006	-0,012	-2,985%	-6,271%

The drop in intra-class variance in consequence of iteration process is depicted in the following figure.

Figure 6 – Intra-class variance



Annex C Alternative Clustering Results

In the following tables are illustrated the clustering results obtained using, along with the average of daily returns, different risk indicators. Only in case of Value at Risk at 99% confidence level we obtained an outcome similar to Table 4 with only one bond fund, belonging to the “Emerging Markets” class, included in the same risk-based cluster with 3 equity funds (2 equity funds in the general case, where all risk measures have been applied).

The optimization criterion is that neither bond nor monetary funds should be included in the same cluster where equity funds are present. Implicitly, we assume that in case of flexible and balanced funds, overlapping are possible.

Here the outcome is similar to the general case.

Table 9 – Clusters based on Historical Expected Shortfall at 99% confidence level

ASSOCIATION CLASS	CLUSTERS BASED ON EXPECTED SHORTFALL																													TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
BALANCED BOND	1				13																									26
BALANCED EQUITY	1	1	2							4		2	1	1						5		1	1						9	
BOND FUNDS – DOLLAR GOVERNMENT MEDIUM/LONG TERM					1			1																					4	
BOND FUNDS – DOLLAR GOVERNMENT SHORT TERM											9																		9	
BOND FUNDS – EMERGING MARKETS					3						1								3										6	
BOND FUNDS – EURO CORPORATE INVESTMENT GRADE	1										7						1					2	1	1				2		
BOND FUNDS – EURO GOVERNMENT MEDIUM/LONG TERM	15				2																								31	
BOND FUNDS – EURO GOVERNMENT SHORT TERM											2																		4	
BOND FUNDS – FLEXIBLE					1																								4	
BOND FUNDS – INTERNATIONAL GOVERNMENT	1				14						1																		28	
BOND FUNDS – MIXED	1				1						4																		18	
BOND FUNDS – OTHER SPECIALIZATIONS	2				1						2	2	2	1															12	
EQUITY FUNDS – AMERICA					1				9		2	1		8	1														23	
EQUITY FUNDS – CONSUMER GOODS											1																		1	
EQUITY FUNDS – EMERGING MARKETS	2										1								3		1								8	
EQUITY FUNDS – EURO AREA											2																		6	
EQUITY FUNDS – EUROPE	5										1	7	1																25	
EQUITY FUNDS – FINANCE											1																		2	
EQUITY FUNDS – HEALTH	1										2																		4	
EQUITY FUNDS – INTERNATIONAL											10																		4	
EQUITY FUNDS – ITALY	13										8																		32	
EQUITY FUNDS – MEDIA	1										1																		2	
EQUITY FUNDS – OTHER SECTORS																													1	
EQUITY FUNDS – OTHER SPECIALIZATIONS																													1	
EQUITY FUNDS – PACIFIC	2										9	1	3																24	
EQUITY FUNDS – TECHNOLOGY																													1	
FLEXIBLE	8				1						1																		12	
MONEY/MARKET FUNDS – EURO AREA	28	27	24	24	21	21	20	16	16	16	16	16	16	14	14	14	13	12	10	9	5	5	4	3	2	2	1	1	368	

Table 11 – Clusters based on Sortino ratio

ASSEGESTIONI CLASS	CLUSTERS BASED ON SORTINO RATIO																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	TOTAL	
BALANCED	1																														26
BALANCED BOND		1		1	1	4	3	2	3	1	1	2	4																		9
BALANCED EQUITY		3		1	1	1			1	1	1	1	1																		4
BOND FUNDS – DOLLAR GOVERNMENT MEDIUM/LONG TERM					1			4			1																				9
BOND FUNDS – DOLLAR GOVERNMENT SHORT TERM							2					2	1	1																	1
BOND FUNDS – EMERGING MARKETS																															6
BOND FUNDS – EURO CORPORATE INVESTMENT GRADE				2																											2
BOND FUNDS – EURO GOVERNMENT MEDIUM/LONG TERM	15	2		2	1		9	1																	1					31	
BOND FUNDS – EURO GOVERNMENT SHORT TERM	1	1	15				6					2													1					33	
BOND FUNDS – FLEXIBLE	2	1																												4	
BOND FUNDS – INTERNATIONAL GOVERNMENT	1	4		3			4	3	6	1																				26	
BOND FUNDS – MIXED	5	6	1				1	1	1	1	1	1																		18	
BOND FUNDS – OTHER SPECIALIZATIONS	1	3	1			1	1	2	1	1	1	1																		12	
EQUITY FUNDS – AMERICA				5		2		2	1	1	5																				23
EQUITY FUNDS – COMSUMER GOODS																															1
EQUITY FUNDS – EMERGING MARKETS				2		2	1																								8
EQUITY FUNDS – EURO AREA				2																											6
EQUITY FUNDS – EUROPE				3		6	5	3	1			2	1													2					25
EQUITY FUNDS – FINANCE																															2
EQUITY FUNDS – HEALTH				1																											4
EQUITY FUNDS – INTERNATIONAL				1	6	3		2	1	4	3	1																			24
EQUITY FUNDS – ITALY				7			1					7	7																		32
EQUITY FUNDS – MEDIA																															1
EQUITY FUNDS – OTHER SECTORS																															2
EQUITY FUNDS – OTHER SPECIALIZATIONS																															1
EQUITY FUNDS – PACIFIC				2		1	2		1	3	5	4																			24
EQUITY FUNDS – TECHNOLOGY				1	1	2	2	1	1	1	1	1																			2
FLEXIBLE	1	1	1	2	1	2	1	1	1	1	1	1																			12
MONEY MARKET FUNDS – EURO AREA				2																											19
TOTAL	26	23	21	21	21	20	19	18	17	17	17	16	16	14	14	13	12	10	8	8	7	5	4	3	1	1	1	1	1	366	

Table 12 – Clusters based on downside risk

ASSOCIATION CLASS	CLUSTERS BASED ON DOWNSIDE RISK																														TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
BALANCED						1				4		10				1	7				1	1	1	1	1	1				26	
BALANCED BOND			2			2																								9	
BALANCED EQUITY					1		1				1	1																		8	
BOND FUNDS – DOLLAR GOVERNMENT MEDIUM/LONG TERM									9																					9	
BOND FUNDS – DOLLAR GOVERNMENT SHORT TERM									1																					1	
BOND FUNDS – EMERGING MARKETS																			2											6	
BOND FUNDS – EURO CORPORATE INVESTMENT GRADE	1							1												2										2	
BOND FUNDS – EURO GOVERNMENT MEDIUM/LONG TERM				14		6	1					5	1	2							1	1								31	
BOND FUNDS – EURO GOVERNMENT SHORT TERM	13					2		11			6																			33	
BOND FUNDS – FLEXIBLE					1	3															1									4	
BOND FUNDS – INTERNATIONAL GOVERNMENT				1	1	1	12								5	6					1									26	
BOND FUNDS – MIXED				1	5	4	2								3						2									18	
BOND FUNDS – OTHER SPECIALIZATIONS	1			1	1	3	2					1	2	1							1									12	
EQUITY FUNDS – AMERICA				2							8	1	2																	23	
EQUITY FUNDS – COMSUMER GOODS																														1	
EQUITY FUNDS – EMERGING MARKETS					2		1											2	1			1								8	
EQUITY FUNDS – EURO AREA						1								2								1								6	
EQUITY FUNDS – EUROPE	1			6		4		1						4							6	1	2							25	
EQUITY FUNDS – FINANCE				1																										2	
EQUITY FUNDS – HEALTH	2																													4	
EQUITY FUNDS – INTERNATIONAL	11			7							3	1										1	1							24	
EQUITY FUNDS – ITALY					10																										4
EQUITY FUNDS – MEDIA						1																									2
EQUITY FUNDS – OTHER SECTORS																															2
EQUITY FUNDS – OTHER SPECIALIZATIONS				1																											1
EQUITY FUNDS – PACIFIC	5			6		1		2			4			2							1	1								24	
EQUITY FUNDS – TECHNOLOGY																															2
FLEXIBLE	2			1		1	1	1	1	4					2																23
MONEY MARKET FUNDS – EURO AREA	10												2		1																13
TOTAL	30	26	24	23	21	21	20	18	16	15	15	14	14	14	14	11	10	9	9	9	7	6	6	5	4	3	2	1	1	368	

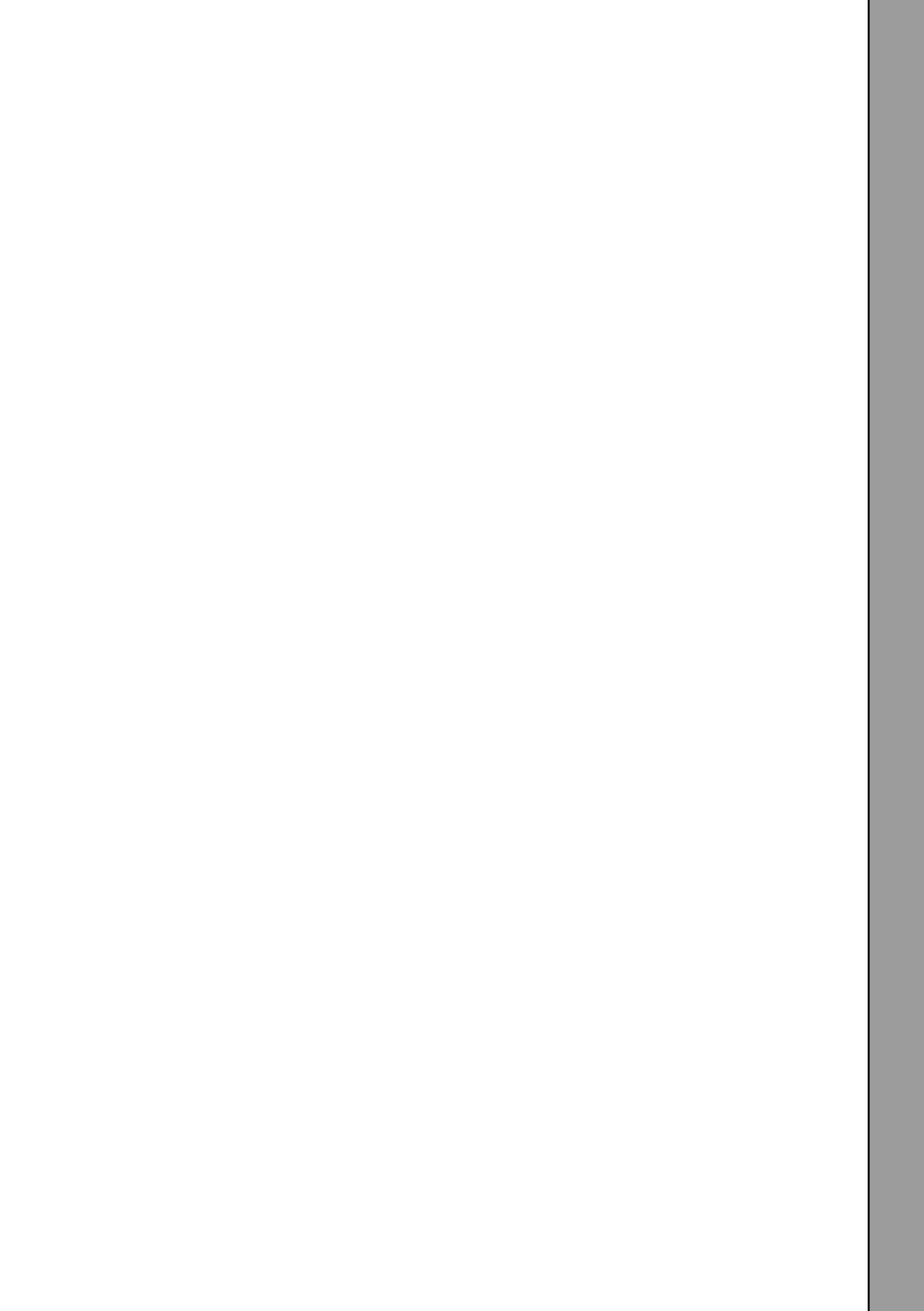
The use of Sharpe and Sortino ratios tends to be inefficient in discriminating equity and bond funds, mixing in the same clusters funds of both categories. The use of ex post Sharpe ratio provides the worst results, putting together monetary and equity funds in three cases (see clusters n. 6, 10 and 21); the use of Sortino ratio gives a similar result in only one case (see cluster n. 9).

The findings are better than those illustrated in Table 7, provided that no monetary fund falls in clusters where equity funds are present.

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A FINANCIAL STABILITY APPROACH TO THE APPROPRIATE REGULATION OF HEDGE FUNDS

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Summary

The increasing role of hedge funds has been a key structural trend in the international financial markets in recent years. The development has spurred international discussions on both the need for and the feasibility of regulating hedge funds. Traditionally, regulation of financial institutions has been governed by two primary considerations, i.e. consumer protection and limiting systemic risks.

The main challenge for regulation of hedge funds is to address the potential risks to financial stability, while maintaining a legal framework in which hedge funds can continue to contribute positively to the development and the stability of the international financial system. On the one hand hedge funds contribute to strengthening financial stability by, among other factors, improving price formation and supporting the development of new securities markets. On the other hand, the growing importance of hedge funds is associated with potential risks of systemic crises, in part because it can be difficult for both market participants and authorities to obtain detailed information relating to

¹ Conclusions and opinions expressed in this paper are the authors' and cannot necessarily be attributed to Danmarks Nationalbank.

the strategies and portfolios of the hedge funds. Probably the largest risks associated with hedge funds are the risks of crowded trades. However, these risks are not restricted to involve hedge funds. Thus, risks of crowded trades should be dealt with in a much broader context including other institutions such as banks and - not the least - sovereign wealth funds.

As regards regulation of hedge funds, an overall distinction can be made between direct, indirect and market-based regulation. The best protection against financial instability caused by hedge funds is competent risk management in the financial enterprises that are hedge-fund counterparties, and which are already under financial supervision and regulation. Regulation should continue to focus on the stability of these institutions, i.e. it is the indirect and market based approaches to regulation of hedge funds that could be developed further. It is essential that the financial institutions that are, in one way or another, counterparties of hedge funds have the necessary risk management tools and information at their disposal to be able to manage portfolios that include hedge funds.

As the products offered by hedge funds have become more easily accessible to retail investors, for instance via funds-of-funds, there has been a growing political pressure to take consumer protection issues into account. It would not be advisable to let these concerns set the agenda for regulation of hedge funds. In particular, it would most likely be counterproductive to try to apply a direct approach to regulation of hedge funds.

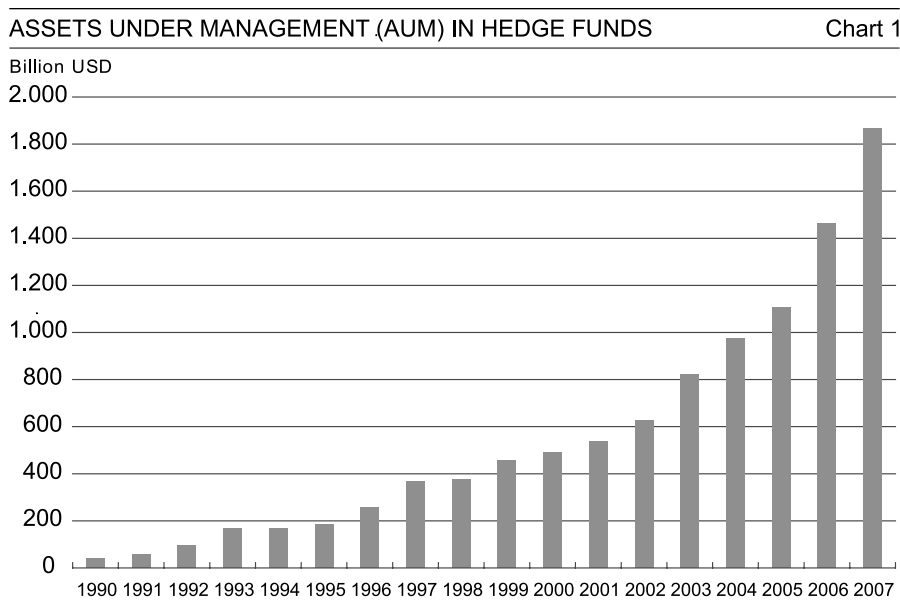
The financial market turmoil which started in the summer of 2007 cannot be attributed to hedge-fund activities, and throughout the turmoil so far yields generated by hedge funds seem to have shown less volatility than yields on shares. But some of the initiatives generated by the turmoil, for instance on improving accounting standards and valuation of complex financial products, are likely to strengthen the feasibility of indirect and market based approaches to regulating hedge funds.

1. Background: Tendencies in the development of hedge funds

1.1. Increased activity by hedge funds

The increasing role of hedge funds has been a key structural trend in the international financial markets in recent years. The current number of hedge funds is estimated to be around 10,000 globally, with AUM (assets under management) totalling 1,500–2,000 billion dollars. The uncertain estimate can be attributed to incomplete statistical coverage of hedge funds and their activities in national and international financial markets. This is partly due to the absence of a clear and generally accepted definition of a hedge fund, partly to the fact that a considerable number of hedge funds do not report data systematically to authorities or international databases.

The hedge funds' AUM has been on the increase since 1990, and the development has accelerated especially in the last five years, as illustrated in Chart 1.



Source: OECD (2007:1)/Hedge Fund Research.

The growth in hedge funds has taken place even though yields reported since 2003 have not been systematically higher than those on e.g. shares-only portfolios, cf. Table 1². The relatively more modest yields can be viewed as a result of the maturing and broadening of the hedge fund sector.

Table 1: Annual percentage yield in hedge funds compared with shares and bonds

	2000	2001	2002	2003	2004	2005	2006	2007
Hedge funds	8.4	6.3	0.1	18.6	7.7	8.6	12.1	11.1
Shares	-9.1	-11.9	-22.1	28.7	10.9	4.9	15.8	5.5
Bonds	11.6	8.4	10.3	4.1	4.3	2.4	4.3	7.0

Note: The yield is stated as the yield calculated on the basis of S&P 500 (for shares), Lehman Brothers Aggregate Bond Index (for bonds) and Greenwich Global Hedge Fund Index (for hedge funds). The latter index is constructed on the basis of information on approximately 7,000 hedge funds in and outside the USA. Fund of funds are not included in the index. Yield in hedge funds is excluding manager fees.

Source: Greenwich Alternative Investments.

In addition to actual hedge-fund activities, similar investment strategies³ are being pursued from managed accounts with considerable funds at their disposal, i.e. portfolios managed by hedge-fund managers on behalf of private or institutional investors. For managed accounts, the investors typically have direct ownership of the managed assets, which ensures the investors almost full transparency as to the composition of the portfolio and the trading activity. Furthermore, the investors can realise their portfolios at very short notice. The extent of managed accounts is difficult to estimate. However, it is estimated that around one quarter of the existing hedge funds operate managed accounts, and that private managed accounts alone amounted to more than 300 billion dollars at the end of June 2005⁴. Furthermore, strategies similar to those pursued by hedge funds are increasingly

² Direct application of traditional risk measures to investment in hedge funds often entails problems. As a result, comparisons with traditional investments in e.g. shares and bonds are difficult to interpret. One reason is that the yield profiles of hedge funds may be characterised by other distributions than those traditionally used for calculations of risk-adjusted yields. Another problem is the potential bias in the available data on hedge-fund yields. Funds with particularly high yields may have an incentive to keep a low profile if the investors call for discretion. Funds with particularly low yields may have an incentive to refrain from reporting, considering new potential investors. In addition, data from the hedge funds that have closed down because of unsuccessful investments are not included. Finally, some hedge funds differ from more traditional investments in that the hedge-fund manager can choose not to manage the capital in periods when attractive placement opportunities are found to be insufficient within the hedge fund's chosen strategy. In that case, the deposits are simply returned to the investors until the manager can see investment opportunities again.

³ The hedge funds' most frequently applied investment strategies are outlined in Thuesen (2005).

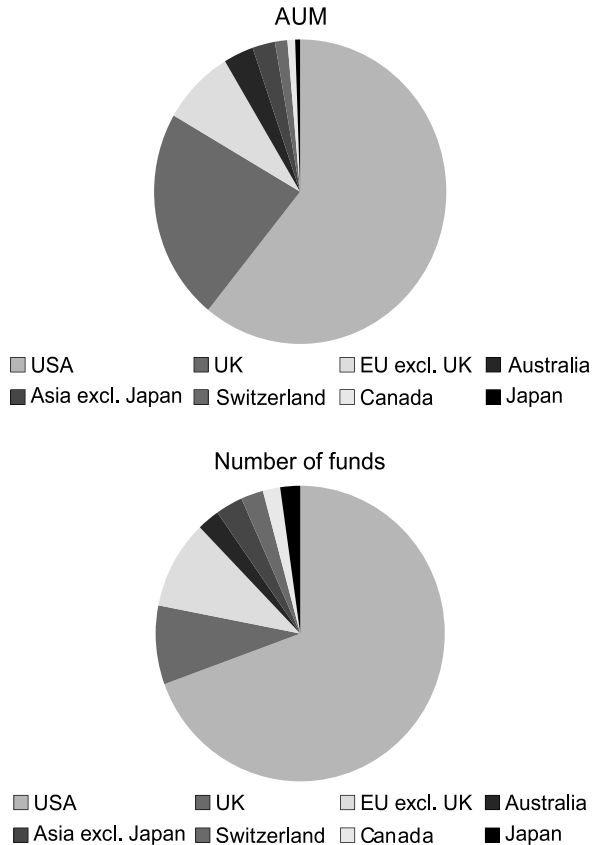
⁴ Source: ECB (2007:2).

being applied by the proprietary trading desks of major international banks⁵. In addition, strategies that might be applied by hedge funds have been indirectly applied by some banks through the establishment of conduits and SIVs.

1.2. Developments in the geographical spread of the activity

Until 10 years ago, hedge funds were primarily a US phenomenon. The USA still accounts for the largest share by far of hedge-fund activity, but hedge funds have now also rapidly gained ground elsewhere, especially in the UK. Chart 2 illustrates the geographical spread measured in terms of AUM and the number of hedge funds.

Chart 2: Geographical Spread of Hedge-Fund Activities



Note: Data is based on questionnaires from the OECD and IOSCO, mainly calculated as of mid-2006.
Source: OECD (2007:2) and OECD (2007:3).

⁵ Source: ECB (2007:2).

1.3. A key role in trading and price formation in securities markets

Despite the growth in recent years the portfolios managed by the hedge funds are still modest compared to the estimated amount of approximately 18,000 billion dollars managed globally by conventional investment funds. In most countries, AUM for hedge funds account for less than 10 per cent of AUM for investment funds⁶. Many hedge funds tend to trade their portfolios more often than other portfolio managers. Consequently, hedge funds now account for a considerable share of total turnover in many major securities markets. This is illustrated by US data in Table 2. Hedge funds therefore play a key role in liquidity and price formation in the international securities markets.

Table 2: Hedge Funds' Share of Trading in Selected Securities in the USA, 2006

Security	Percentage of trading
Shares	30
Credit derivatives (plain vanilla)	60
Credit derivatives (structured)	33
Emerging market bonds	45
Distressed debt	47
Leveraged loan trading	33
High yield bond trading	25

Source: OECD (2007:2), Greenwich Associates, Financial Times.

1.4. A Wider spread on more hedge-fund strategies

Hedge funds often try to identify and exploit market imperfections. As the number of hedge funds increases, and in step with the growing complexity of the financial markets, hedge funds are increasingly specialising, and the pattern of investment strategies shows greater dispersion. This means that the traditional long/short strategies⁷ are less dominant than previously, although they are still estimated to make up almost one third in terms of AUM.

⁶ In Sweden, Austria and the USA, the figure is approximately 10 per cent, while Switzerland and the UK are notable exceptions with approximately 20 per cent and almost 60 per cent, respectively. Source: OECD (2007:3).

⁷ A long/short strategy enables the hedge fund to utilise any assumed imbalances in relative prices within the same class of assets. For instance, a hedge fund might buy a corporate bond that it believes to be priced too low and short-sell a corporate bond that it believes to be priced too high. The overall position may be neutral in relation to the market, so that the yield does not →

1.5. Less clearcut interfaces to other investment types and financial players

In step with the increasing prevalence of hedge funds, the traditional distinction between hedge funds and other investment types and financial players has in some cases become blurred. A case in point is the distinction between hedge funds and private equity funds. The latter are characterised by investing in individual business enterprises in order to obtain a controlling influence on the enterprises' strategies and operations, i.e. "governance activism". In contrast, conventional hedge funds operate with portfolio investments only, among other characteristics. However, recent years have seen several examples of large hedge funds playing an active role in e.g. negotiations on consolidation of banks or operators of securities markets.

1.6. Changed composition of investors

Traditional investors in hedge funds are private individuals with very substantial wealth. Part of the growth in hedge funds can be attributed to the higher number of such people globally. In recent years, institutional investors, including a number of pension companies, have placed an increasing share of their assets in hedge funds. Furthermore, there has been a tendency for increased investment in hedge funds by private individuals who do not fall into the category of very affluent. These investments are primarily indirect investments via FoHF⁸. The structural shift in the investor base, especially the tendency towards more retail investors, has given rise to an international debate concerning whether the authorities should introduce consumer protection rules in relation to hedge funds similar to the rules applying to traditional investment products offered to retail investors.

depend on changes in the level of interest rates, but only on changes in the relative prices of the two bonds selected. The classic hedge fund is an *equity long/short* fund, with short and long positions in shares within the same category, e.g. the same industry. Such hedge funds are not always market neutral, and some may rapidly shift from being net long to being net short in the market.

⁸ Cf. e.g. Crockett (2007).

2. Implications for financial stability

2.1. *How hedge funds can affect financial stability*

Many analyses indicate that hedge funds have so far generally had a positive impact on financial stability e.g. by contributing to better price formation and spreading of risk in the global financial markets⁹. This can be attributed to the following direct and indirect factors, among others:

Hedge funds' strategies and methods of analysis are often based on identifying and exploiting even very small market imperfections, thereby contributing to more efficient price formation.

Through considerable trading activity and position-taking, hedge funds contribute liquidity to the financial markets

Hedge funds often possess financial expertise and risk appetite that can benefit the development of new markets. An example is the development of the credit derivatives markets in recent years.

Hedge funds may contribute to limiting market volatility. Since they often aim at absolute yields, they might be less inclined to buy in a rising market and sell in a falling market¹⁰.

Hedge-fund investors cannot usually withdraw their deposits at short notice. This contributes to dampening the hedge funds' need for rapid realisation of assets, which could result in an unintentional negative impact on already falling markets. In this respect, hedge funds are different from e.g. conduits and SIVs, whose financing structure has contributed strongly to the recent turmoil in the financial markets.

⁹ For example, the ECB finds as follows in ECB (2007:2): "So far, experience with the active participation of hedge funds in financial markets over the past decade has, on balance, been very positive ...".

¹⁰ An example of a stabilising effect: When an index rises, investors that benchmark themselves against the index are increasingly exposed in the index, particularly in the securities that rise the most. Hedge funds aiming at absolute yields (not relative yields) will leave the index as it rises (basically, they do not want to change their exposure in the index). The opposite applies when the index falls

Yields on investments in hedge funds have proved to be significantly less correlated with yields in the share and bond markets than e.g. yields in the share and bond markets with each other. Inclusion of hedge funds in portfolios therefore increases investors' possibilities of diversifying their portfolios.

However, the increasing importance of hedge funds is also associated with a number of potential risks. The risks that are most often pointed out are as follows:

Probably the most important risks associated with hedge funds are crowded trades, i.e. a situation with most of the hedge funds trading in the same direction in a falling market, thereby reinforcing downturns in the international securities markets. This can be amplified by the fact that the proprietary trading desks of large investment banks may pursue trading strategies similar to those of hedge funds.

A related risk to crowded trades is the potential for vicious circles of price declines in asset markets. If losses by hedge funds would lead to margin calls by prime brokers and/or redemption calls by hedge fund investors, this could lead hedge funds into forced sales which could lead to price declines in asset markets, which could lead to further losses for hedge funds etc. Since hedge funds account for a large share of trading in many securities markets, they play a key role in price formation, as mentioned above. Thus, this vicious circle could be further enforced as markets become less liquid, because hedge funds are being restricted in their role as significant liquidity providers.

Due to the increasing hedge-fund activity, prime brokerage has become a substantial business area for some of the large international investment banks. For these banks, there are risks associated with the further development of the hedge-fund sector and potential shifts in the terms of competition between the existing and any new providers of prime brokerage.

- Losses on hedge funds had no significant implications for financial stability as long as the investors were mainly very affluent individuals. As more and more banks and institutional investors have increased their direct or indirect positions in hedge funds, the potential risks associated with hedge funds have risen. It is essential that the financial institutions that are, in one way or another, counterparties of hedge funds have the necessary risk management tools and information at their disposal to be able to manage portfolios that include hedge funds.

These potential risks, among other factors, have given rise to the debate on hedge funds in recent years. A central policy issue in the debate has been whether it is expedient – and possible – to launch international initiatives to strengthen the regulation of hedge funds.

2.2. Ten years of “pre-market turmoil” history of major hedge-fund crises

In connection with the most well-known collapse of a hedge fund, Long-Term Capital Management, LTCM, in the autumn of 1998, the Federal Reserve actively encouraged a solution in view of the potential negative impact on the financial markets of compulsory liquidation. LTCM was thus subsequently acquired by other private financial enterprises¹¹. However, experience from the years after LTCM shows that problems and losses for even large hedge funds did not give rise to systemic crises in the international financial markets. Table 3 provides an overview of the largest hedge-fund crises from the LTCM-crisis to the beginning of the recent market turmoil.

Table 3: Selected Crises in Hedge Funds 1998–2006

Hedge fund	Estimated loss USD m	Year
Amaranth	6,400	2006
Long-Term Capital Management	3,600	1998
Tiger Management	2,600	2000
Soros Fund	2,000–5,000	2000
Princeton Economics International	950	1999
Lipper	700	2001
Lancer	600	2003
Beacon	500	2002
Manhattan Investment Fund	400	1999
MotherRock	230	2006

Source: Ferguson et al. (2007).

¹¹ In connection with the LTCM crisis in the autumn of 1998, 17 LTCM counterparties stood to lose 3-5 billion dollars in total.

It is estimated that well in excess of 2,000 hedge funds closed down in the period 1999 – 2005¹². None of these events gave rise to systemic crises in the financial markets.

Liquidations can be voluntary, i.e. initiated by the hedge-fund manager, or involuntary if it is no longer possible to obtain sufficient AUM volume. Many liquidations are attributable to the latter reason either because the hedge funds are unable to attract a sufficient number of new investors, or because the investors execute their right to withdraw their investments from the hedge funds.

2.3. Hedge funds and the recent turmoil in the international financial markets beginning in the summer of 2007

During the second half of 2007 hedge funds generally generated reasonable yields despite the financial market turmoil, although some hedge funds experienced losses particularly in August and November 2007. The relatively robust performance came as a surprise to some market observers. Others interpreted the development as a consequence of the more specialized and focused investment strategies often followed by hedge funds, and many hedge funds' focus on absolute returns. A part of the explanation is probably the heterogeneous nature of the hedge fund sector in terms of strategies and risk levels. Consequently, hedge funds are affected in different ways by sudden shifts in market conditions, and they also have different response patterns. During the first months of the turmoil, it seemed that although a few hedge funds had to close down, there were only few examples of hedge funds being forced to sell their assets or having to refuse investors who wanted to withdraw their investments, in order to avoid forced sale of the their assets. In other cases, hedge funds apparently contributed to stability by buying assets in falling markets¹³. Another likely explanation could be, that hedge funds as a group was initially less exposed to the US subprime market than some observers had believed.

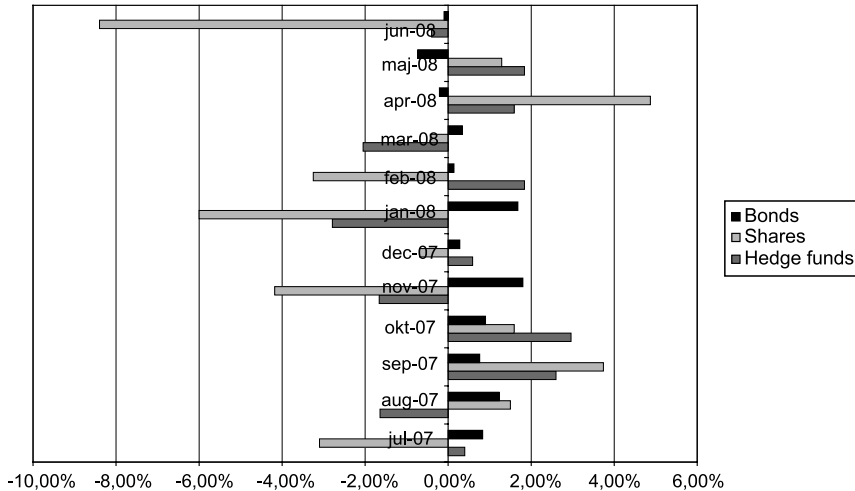
In the first months of 2008 hedge funds experienced considerable losses – as did a number of other financial institutions. The losses seem to have been reported mainly for January and March, while reports for February, April and May seem to be on the positive side. In total, yields reported for hedge

¹² Cole et al. (2007). The assessment is based on the inflow and outflow of reporting hedge funds to the LipperTASS Database. It is not possible to state the precise number of closed-down hedge funds since there might be other reasons why a hedge fund chooses no longer to report to the database. According to an estimate for 2006, more than 700 hedge funds closed down, while just under 1,000 new funds were established.

¹³ According to analyses from - among others - Bank of England and ECB.

funds for the first six months of 2008 seem to be close to zero. At the same time, there have been considerable losses on shares, and yields on shares have shown much higher volatility, cf. chart 3.

Chart 3: Hedge Funds' Relative Performance during the Turmoil



Note: The yield is stated as the yield calculated on the basis of S&P 500 (for shares), Lehman Brothers Aggregate Bond Index (for bonds) and Greenwich Global Hedge Fund Index (for hedge funds). The latter index is constructed on the basis of information on approximately 7,000 hedge funds in and outside the USA. Fund of funds are not included in the index. Yield in hedge funds is excluding manager fees. Preliminary data for June 2008.

Source: Greenwich Alternative Investments

However, the probably most remarkable phenomenon in relation to hedge funds was that they became restricted in their role as significant liquidity providers in important markets, because prime brokers were forced to or inclined to restrict their businesses with hedge funds as a consequence of the turmoil. According to some analyses there are tentative signs that the relatively poorer hedge fund performance in the beginning of 2008 could have had the effect that more hedge fund investors are looking to redeem funds towards the end of the year¹⁴. This would add to the difficulties for the hedge fund sector to restore its liquidity providing capabilities.

Throughout the financial market turmoil so far, yields generated by hedge funds – seen as a group – seem to have shown less volatility than yields on shares, cf. Chart 3¹⁵.

¹⁴ Bank of England (2008).

¹⁵ There are considerable differences in yield performance between different categories of hedge funds.

3. Regulating hedge funds and supporting financial stability

The increasing role of hedge funds has spurred international discussions on both the need for and the feasibility of regulating hedge funds.

3.1. Approaches to regulation of hedge funds

As regards regulation of hedge funds, an overall distinction can be made between direct, indirect and market-based regulation¹⁶.

3.1.1. Direct regulation

Direct regulation of hedge funds can be associated with a number of problems.

For instance, it would be difficult to regulate hedge funds on the basis of risk-based requirements for capital adequacy and risk management systems, along the lines of the regulatory framework applying to other financial institutions. One reason is that the rapid restructuring of the hedge funds' often very complex portfolios would require frequent and resource-intensive inspections by the supervisory authorities. On the liabilities side it may be somewhat easier for the authorities to limit investor access, in practice blocking retail investors' access to invest in hedge funds, which would minimise consumer protection concerns. However, this raises the fundamental issue of whether only already very affluent individuals should have access, as private investors, to the potentially higher yields that can be achieved by including hedge funds in portfolios¹⁷.

In addition, there is the perhaps most important and practical problem in relation to direct regulation, i.e. that many hedge funds are registered in

¹⁶ This distinction is often applied in the literature, cf. e.g. Crockett (2007).

¹⁷ The Danish Act on Hedge Associations, which entered into force on 1 July 2005, provides a solution that does not limit the associations' investment strategies, while accommodating consumer information needs by imposing information requirements on the hedge associations as regards investment strategies and risk profiles.

offshore financial centres¹⁸, or can easily move to offshore financial centres if new regulatory requirements are imposed.

3.1.2. Indirect regulation

Indirect regulation of hedge funds may take prime brokers as the starting point. Prime brokers are typically already regulated and subject to financial supervision. By imposing the right requirements on prime brokers, the authorities can contribute to curbing the risk that problems in the hedge-fund sector spread to the core of the financial system. Such requirements could encompass the size and quality of collateral for loans and securities lending, the size of margins on derivatives contracts, capital requirements for exposure to hedge funds and the quality of risk management systems.

In principle, the objective of, and approach to, indirect regulation of hedge funds is no different from the regulation applying to prime brokers and other traditional financial enterprises to ensure appropriate risk management and capital adequacy in these enterprises. However, having hedge funds with complex investment strategies as counterparties may present special challenges. An important advantage of indirect regulation is that it is feasible in practice, which makes it the most frequently recommended approach to hedge funds in recent years' international reports¹⁹.

It should be noted that indirect regulation does not necessarily prevent problems in one or more hedge funds from causing problems in the financial markets as a result of crowded trades and sudden liquidity shortages, as described above.

3.1.3. Market based regulation

Proposals for market-based regulation of hedge funds are based on the assumption that if all market participants are sufficiently well informed, they can take the relevant risks into account²⁰. In principle, this also applies to the

¹⁸ The Cayman Islands, the British Virgin Islands, Bermuda and the Bahamas are examples of offshore financial centres with a large number of registered hedge funds.

¹⁹ Examples are Financial Stability Forum (2007) and Alternative Investment Expert Group (2006).

²⁰ Another prerequisite for well-functioning market-based regulation is that the market participants can use the available information for risk assessment purposes.

risks associated with e.g. crowded trades. A considerable degree of market transparency is therefore a precondition for well-functioning market-based regulation.

Prime brokers and financial investors in hedge funds are qualified counterparties that should only do business on an informed basis. The hedge funds are therefore effectively under substantial pressure to provide information to the counterparties, although not necessarily to the general public. Nevertheless, there may still be a need to increase the transparency of hedge funds with a view to monitoring by both market participants and authorities of the potential risks that hedge funds may represent to the financial system overall. For example, how will the compulsory liquidation of a large hedge fund affect the financial system, and what are the potential risks associated with crowded trades? However, even if a documented need for increased transparency exists, it is not always clear how the right information can be provided in practice. For example, in many cases the balance sheet of a hedge fund does not provide a very good and easily accessible view of its risk profile since exposure management is also conducted on an off-balance-sheet basis, including widespread use of a range of derivatives.

3.2. The financial stability approach to regulating hedge funds

Traditionally, special regulation of financial institutions has been governed by two primary considerations, i.e. consumer protection and limiting systemic risks.

3.2.1. Focus on financial stability issues

The main challenge for regulation of hedge funds is to address, where possible, the potential risks to financial stability, while maintaining a legal framework in which hedge funds can continue to contribute positively to the development and the stability of the international financial system. It should be recalled, that one of the reasons why hedge funds have in many cases been able to contribute positively to the functioning and development of markets is that they have been able to implement investment strategies that could not have been implemented under the regulatory framework for traditional financial institutions such as banks and investment associations. Any need to regulate hedge funds' portfolio management should therefore be considered in relation to the potential drawbacks of regulation.

A default of a hedge fund - or its investors for that matter – is not as such a financial stability issue as long as it does not have severe consequences for the core of the financial system. As illustrated above, there have in recent years been many defaults in hedge funds, even large hedge funds, without severe financial stability consequences.

The best protection against financial instability caused by hedge funds, therefore, seems to be competent risk management in the financial enterprises that are hedge-fund counterparties, and which are already under financial supervision and regulation. Regulation should continue to focus on the needs of these institutions, i.e. it is the indirect and market based approaches to regulation of hedge funds that could be developed further. This is in line with recent recommendations from Financial Stability Forum²¹ and the approach taken so far in the EU²². It is essential that the financial institutions that are, in one way or another, counterparties of hedge funds have the necessary risk management tools and information at their disposal to be able to manage portfolios that include hedge funds.

The financial market turmoil which started in the summer of 2007 cannot be attributed to hedge-fund activities. However, hedge funds play an important role in markets for securitization and trading of credit, i.e. for those financial structures and markets that have been put into focus in the ongoing work to deal with the turmoil and support future financial stability. And some of the initiatives generated by the turmoil are likely to strengthen the feasibility of indirect and market based approaches to regulating hedge funds. One example of this is the accelerated work on transparency in securitisation processes and markets. Another example is the work on principles for the valuation of illiquid or complex financial products. Besides the fact, that the financial turmoil has highlighted the general need for ways of valuing illiquid assets and complex portfolios, a special characteristic of hedge fund industry is that the hedge-fund managers' remuneration is often directly linked to the calculation of the hedge funds' yields and, hence, to the valuation principles. A third example is

²¹ Financial Stability Forum (2007).

²² In the EU, hedge funds were discussed at the informal Ecofin meeting in April 2007, and in May the Ecofin Council adopted Council conclusions on hedge funds. The conclusions acknowledge that the existing approach with indirect regulation/supervision has so far strengthened the resilience to systemic risks, and the Council encourages market participants and authorities to remain alert as to potential risks. However, at the same time the Council points out the need for better understanding of the significance of hedge funds to financial stability. Finally, the Council conclusions refer to the concerns expressed by some member states regarding retail investors' investments in hedge funds. The European Commission has been asked to investigate the need for EU regulation of the investment funds that are currently subject to national legislation and are on offer to the general public. These might include some funds of hedge funds.

the accelerated work on accounting and disclosure standards for off-balance sheet entities.

The strong political focus has put pressure on the hedge-fund sector to be more willing than previously to engage in a dialogue with the authorities on the potential risks associated with hedge funds. One result has been that in the summer of 2007 a working group of 14 of the largest European hedge funds invited other European hedge funds to cooperate on formulating a code of conduct for hedge funds. Their resulting report came in January 2008²³. Another result has been that in the US two committees of the President's Working Group on Financial Markets released their respective best practices recommendations for hedge fund managers and investors in April 2008²⁴.

Special attention needs to be devoted to the potential systemic problems caused by crowded trades and/or shifts in very large portfolios which are de facto controlled by a small number of market participants. Since hedge funds play a crucial role for liquidity and price formation in many markets (at least they did so until recently and they are expected to regain this role), solutions need to include ways to approach hedge funds in these matters. This is not an easy task at all, and so far there does not seem to be obvious solutions. For instance, it would be very complicated even for supervisors with powers to collect institution-specific data to gain an overview of all major market players, their portfolios, and the potential for crowding trades implied by their trading strategies. And even if a point-in-time overview could be obtained, this could change very quickly.

In order to address these challenges one must be aware that the potential systemic problems related to crowded trades are not restricted to involve hedge funds. Also the proprietary trading desks of large financial institutions have the potential to end up in systematic crowded trading behaviour. And probably even more importantly, the fast growing influence of sovereign wealth funds on markets should be involved in considerations on how to avoid crowded trades and how to secure well functioning capital markets in the future.

²³ Hedge Fund Working Group (2008).

²⁴ Asset Managers' Committee to the Presidents's Working Group on Financial Markets (2008) and Investors' Committee to the Presidents's Working Group on Financial Markets (2008)

3.2.2. Less focus should be on consumer protection issues when dealing with hedge funds

The consumer protection issue has until recently not been relevant to hedge funds, as the funds' investors have traditionally been high net worth individuals and subsequently also institutional investors and other professional investors. However, as the products offered by hedge fund have become more easily accessible to retail investors, for instance via funds-of-funds, there has been a growing political pressure to take consumer protection issues into account. This could raise a number of problems.

One issue is that regulatory actions motivated by consumer protection issues often tend to take the form of direct regulation. As explained above, there are a number of problems connected to direct regulation of hedge funds.

Another issue is whether there is at all a traditional case for consumer protection when it comes to hedge funds. For financial institutions such as banks, pension funds, investments funds etc. main reasons for regulation on consumer protection are a) to compensate for the asymmetries in information and skill between the demand side and the supply side of the market and b) support demand side confidence. This is in the interest of all market participants, since financial businesses are basically trust businesses, and if one financial institution were to exploit its customers and act unethically, there is a risk that this behaviour would harm also the future business of all other suppliers of financial services. In the interest of the whole economy, retail investors should have access to - and confidence in - banking services, pension schemes, basic savings products, insurance etc. However, there is not necessarily a public interest in securing retail investors' general access to investments in hedge funds as an asset class. In other words, if some retail investors should decide to invest in hedge funds – and if they should default on these investments – it is not at all clear why this in itself provides a case for regulating hedge funds. (Assumed, of course, that hedge funds are not allowed to market themselves to the general public, and that these investments are not sold via for instance banks, in which case the investments should be covered by the consumer protection rules concerning banks).

A third fundamental issue is, whether hedge funds could be considered an asset class, and whether this asset class is at all suitable for retail investors. The large differences between hedge funds in terms of strategies, risk profiles and the instruments they use, means that the concept “hedge fund” is rather a business model or a legal structure than an asset class in the traditional sense.

This makes it difficult to apply a “one-size-fits-all” consumer protection legislation in a meaningful way. Furthermore, the sometimes complex financial structures used by hedge funds as a natural part of their business model implies, that retail investors – considered as general group - could probably never be expected to understand the actual risk profiles of advanced hedge fund portfolios. If lack of financial literacy is of concern in relation to retail customers’ buying standardized financial services – and everything indicates that it is – this problem would be expanded dramatically with an ambition of making investments in hedge funds generally available to retail investors within the same framework as more traditional financial services.

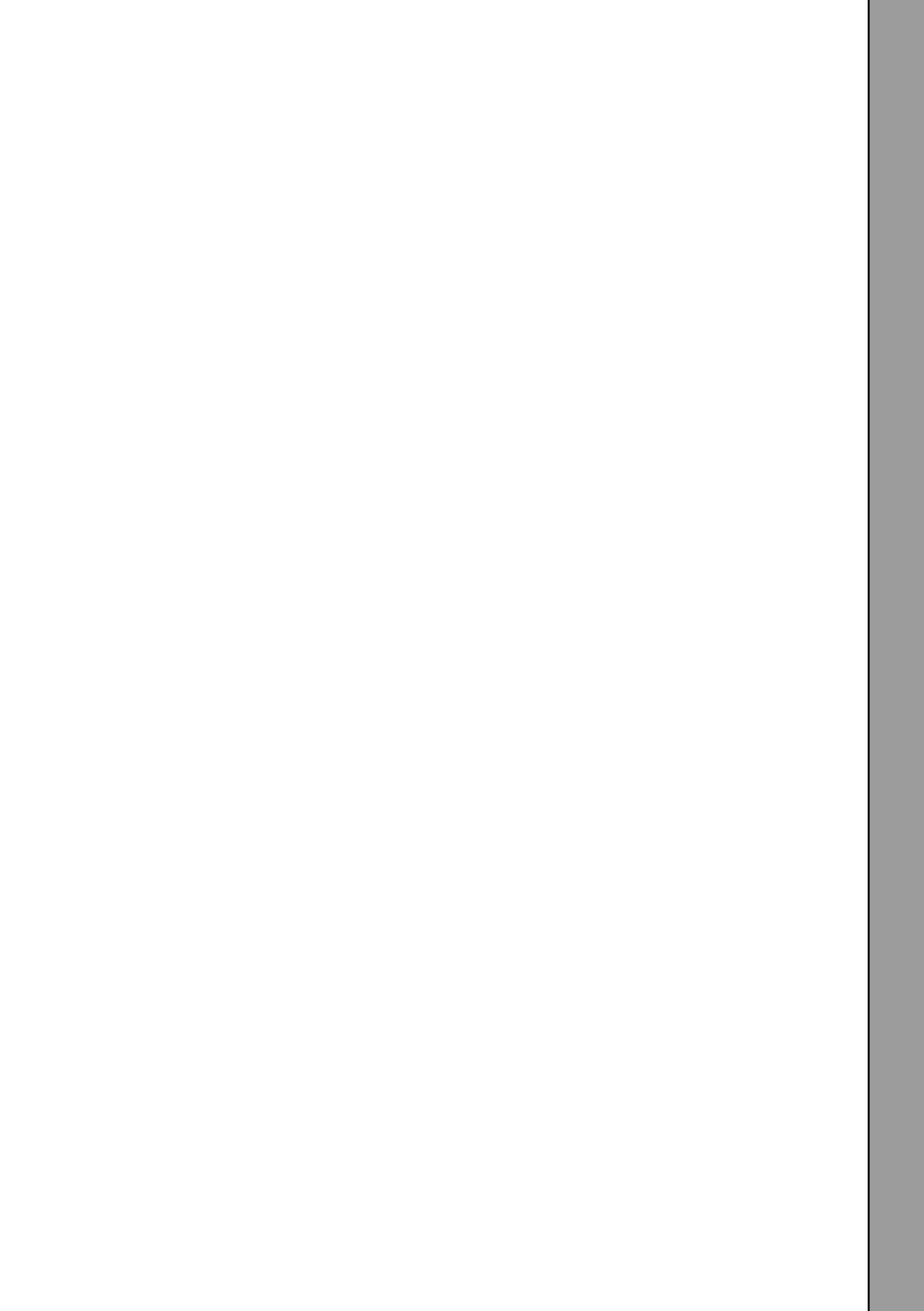
In other words, it would not be advisable to let consumer protection issues set the agenda for regulation of hedge funds. These concerns ought to be scaled down in the political discussions on the rationale for regulating hedge funds. In particular, it would most likely be counterproductive to try to apply a direct approach to regulation of hedge funds.

First and foremost, consumer protection concerns should not stand in the way for a strong focus on financial stability issues when it comes to designing the right regulatory approach to regulating hedge funds.

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THE SUB-PRIME CRISIS: SOME LESSONS FOR FINANCIAL SUPERVISORS¹

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Abstract

The recent market turmoil following the crisis of sub-prime mortgages in the US has provided rich evidence of some serious deficiencies in the world financial system. This paper provides some elements for reflection on how to address them. The issues analysed in the paper are classified around four key words: transparency, credit rating agencies, liquidity and supervisory arrangements.

As the market turmoil is mainly driven by a confidence crisis among market participants, improving transparency is a necessary condition to avoid similar episodes in the future. This entails improving disclosure of risk exposures by financial institutions. In particular, more complete public information on implicit exposures to off-balance sheet vehicles is warranted. In addition, investors and issuers would benefit from some additional guidance by accounting standard setters on appropriate valuation techniques for illiquid instruments. At the same time any revision on the scope of application of

¹ This paper was prepared for the 28th SUERF Colloquium on "New Trends in Asset Management: Examining the Implications" held in Munch on 12 – 14 June 2008, and has not been revised to take into account developments since unfolding thereafter.

the fair value principle should be consistent with the primary objective of accounting principles; namely, to reflect properly the economic reality of the reporting companies.

Transparency regarding financial institutions should be complemented with more enhanced monitoring of the process of financial innovation. This would include eliminating spurious forces (such as regulatory arbitrage or lax credit assessment practices) that currently invite the issuance of highly complex structured products. In addition, information flows between originators, vehicles and investors should be improved and more standardisation of instruments should be promoted. Moreover, transparency requirements should be tightened up for non-equity markets – those most affected by the turmoil.

Credit rating agencies have done a poor job of assessing different types of structured products. Recent proposals by the FSF and IOSCO to improve the current Code of Conduct are welcome, in order to promote the use of robust methodologies, prevent conflicts of interest and increase transparency, comparability and competition. At the same time, the extent of the problems identified should convince public officials to find effective ways to monitor these agencies beyond the self-regulation schemes now in place in most jurisdictions. The possibility of establishing, at a global level, an independent body to issue and monitor compliance with more specific rules than those contained in the current code of conduct deserves to be seriously considered.

The lack of liquidity in a number of wholesale markets urges measures to increase activity in non-equity markets through product standardisation and the consolidation of trading platforms for non-equity instruments in the eurozone. Problems of liquidity in interbank markets have been effectively mitigated by central bank actions. Those, such as the Eurosystem, with more flexible collateral and counterparty eligibility criteria have been the best positioned to provide the required liquidity to those institutions adversely affected by abnormal market conditions. There is scope however to increase the transparency of the Eurosystem's collateral policy, particularly in relation to the valuation methods which it currently applies to eligible illiquid instruments. In the regulatory sphere, there is a need to enhance supervisory control of the liquidity risk of credit institutions, at least through Pillar 2 of Basel II. Moreover, accounting standard setters should reflect on the benefit of requiring disclosures on variables – such as maturity mismatches – that would help investors to assess companies' liquidity risk. Finally, regulators

may have to consider whether standard investment funds (of the UCITS category) should be subject to stricter controls of their portfolios' liquidity.

The recent turmoil has evidenced that prudential supervision and aggregate liquidity management are two closely related functions which might best be assigned to a single institution: the central bank. It has also shown that the degree of transparency that well functioning markets require will not always coincide with that which makes it easiest to cope with a situation of stress in the banking sector. This provides arguments for organising financial supervision along the lines of a "twin peaks" model: one institution (the central bank) being responsible for the prudential supervision of all types of financial institutions, while another institution supervises good practices in financial services markets.

1. Introduction

Since the summer of 2007, the world has been undergoing a prolonged period of turbulence in financial markets. Its origins lay in a particular segment of a national market: that of sub-prime mortgages in the US. However, the effects spread rapidly across the global financial system.

The main diffusion channel has been structured product markets. A large part of sub-prime mortgages were securitised: sold by credit institutions to off-balance sheet vehicles which financed those purchases by issuing securities. These securities were sold to institutional investors located worldwide, or at times to other vehicles which issued higher-rated instruments backed by packages of the original securities, normally with additional credit enhancements. The risk entailed by sub-prime mortgages was therefore distributed among a wide variety of international investors. The substantial increase in defaults experienced last summer, and the failure of some entities (monolines) to bear the losses they were supposed to cover generated write-downs in the balance sheets of a number of institutions exposed to structured products linked to sub-prime mortgages. However, not all the impact of the sub-prime crisis on global financial markets can be explained in terms of the widespread exposure to bad quality mortgages originated in the US. The crisis has also hit markets in financial instruments without any linkage to the US sub-prime mortgage markets.

In addition to a significant depreciation of some classes of financial instruments, the turmoil has generated a substantial and generalised reduction of activity in several primary and secondary markets. The result was a failure of pricing mechanisms that limited the funding available to financial institutions with or without exposure to sub-prime assets, and this, in turn, occasioned a serious distortion in the regular real-sector financing mechanisms of many economies around the world.

Those developments have opened a rich debate on the aspects of the global financial system which may have helped generate or intensify the turmoil. Four areas at least deserve special attention.

The first issues to focus on are those related to market transparency. The significant contagion effects on a wide range of markets can only be explained as a confidence crisis. The stress faced by holders of sub-prime related instruments led some market participants to suspect that other instruments and/or other

financial institutions apparently unaffected by the sub-prime crisis could in fact be exposed to the same or similar problems. When a confidence crisis erupts, it is normally the consequence of a transparency deficit. This deficit could refer to information on the real situation of relevant institutions, on the nature of some of the instruments traded in financial markets or on the supply and demand conditions of the markets where those instruments are traded.

The effects of the crisis have spread to the global financial system by way of structured product markets. Since those markets rely heavily on the assessments made by credit rating agencies (CRAs), the work undertaken by those agencies also merits careful scrutiny. They play a key role as translators of available financial information into the language of investment decisions.

Both transparency issues and the role of CRAs are key inputs to any analysis of the causes of the confidence crisis that has swept global financial markets. And given that an important direct consequence has been a drought in interbank and some private bond markets, a third element that merits analysis is the supervision and regulation of liquidity conditions in wholesale markets and on the balance sheets of financial firms.

Finally, the episode of market turbulence has affected the activity of several public agencies –including central banks, security markets and banking supervisors – and a number of international organisations and financial forums. This makes it a good scenario against which to test the effectiveness of different organisational arrangements for financial regulation and supervision.

This paper attempts to provide an overview of what the author believes are the main lessons from the crisis. This overview takes due account of the proposals put forward by relevant international bodies such as the Financial Stability Forum (FSF), the International Monetary Fund (IMF), the International Organisation of Securities Commissions (IOSCO) or the Basel Committee on Financial Supervision (BCBS). However, it takes issue with some of the initiatives put forward and adds some reflections of its own, in most cases from the perspective of a securities markets supervisor.

Following the list of analytical priorities outlined above, the paper is organised around four key words: i) transparency, which is covered in section 2; ii) credit rating agencies, the subject of section 3; iii) liquidity, dealt with in section 4; and iv) organisational arrangements, dealt with in section 5. These are followed by a final section with concluding remarks.

2. Transparency

2.1. Transparency of issuers: the fair value debate

Most analysts concur that the losses stemming from the sub-prime crisis have not yet been fully reported by financial institutions. In particular, the IMF speculated last April that at least one third of estimated subprime-related losses remained unreported. (see IMF, 2008).

It is clear that a prerequisite for the restoring of market confidence is a rigorous calculation and full disclosure of the write-offs associated to instruments affected by the market turmoil. This constitutes a relevant challenge for firms, auditors and supervisors. But, whatever the scale of losses, a cause for concern is that they were largely the result of exposures which were not easily identifiable ex-ante by investors, or even supervisors. Specifically, financial institutions' exposure to vehicles like conduits or Special Investment Vehicles (SIVs) was not fully recognised in their published financial statements. Indeed, contingent liquidity obligations vis-à-vis those vehicles were often poorly recognised or absent..

There is now broad consensus that the full implementation of the new capital accord (Basel II) will provide more control on exposures to these vehicles (through Pillar 1) and also more information (through Pillar 3). Yet, a more forceful enforcement of current consolidation rules for SIVs might be warranted². In any event, additional efforts are needed to improve disclosures on exposure to off-balance-sheet vehicles. In this connection, the FSF's call to financial institutions to release exposures to sub-prime related instruments and to the International Accounting Standard Board (IASB) and the US Financial Accounting Standard Board (FASB) to adopt more convergent a complete disclosure standards must be viewed as a welcome development.

A more controversial issue in this domain is that of a possible reform in the valuation rules for financial instruments. Accounting principles require instruments in the trading books of financial institutions to be stated at fair value: i.e. at market prices when the market is active or using a model in which market inputs are maximized when there is no active market. Some claim that fair value accounting may not be a sound approach when markets are under

² See, in particular, IAS 27,28 and 31 SIC 12 in IASB (2008).

stress. Two arguments have been put forward to substantiate this position. First, when trading is thin and security prices are not aligned with their fundamental values, the application of current fair value rules can give a false picture of the firm's economic reality. Second, in today's circumstances, fair value measurement promotes "dramatic write-downs of sound assets that adversely affect market sentiment, in turn leading to further write-downs, margin calls and capital impacts in a downward spiral ... (that) worsen liquidity problems and contribute to the conversion of liquidity problems into solvency problems." (IIF, 2008)

In relation to the first argument, it is clear that the dearth of activity in some markets – particularly for structured products – represents a challenge to the application of the fair value principle. At the same time, a possible misalignment of prices with fundamental values can hardly constitute a strong argument to propose a discontinuation of the mark-to-market approach.

Fair value is defined by the IASB as "the amount for which an asset could be exchanged or a liability settled between knowledgeable, willing parties in an arm's length transaction³". Despite its name, then, fair value is not meant to express an instrument's fundamental or equilibrium value, but is rather an estimate of the price at which it could normally be sold in the market. Unless observed market prices are heavily contaminated by distressed sales – e.g. liquidation of companies – they represent the best measure of fair value, even though markets may at times overreact to positive or negative news. And even if asset prices are considered excessively high or low by the preparers of financial statements, they will still be consistent with a fair representation of the current economic reality of the firm.

The possibility that fair-value-based accounting rules could be unduly procyclical has been long debated in the literature. The starting point for analysis of this issue should always be that accounting systems are simply information devices that help managers communicate their company's economic reality in a faithful manner. An accurate evaluation of a firm should take into account not only current business conditions but also expected future cash flows, possibly in different cyclical situations. Fair value is perfectly consistent with this approach, in that the market prices of assets are supposed to represent the present discounted value of the expected income streams associated to each instrument. The discount factor to be applied to future cash flows incorporate a number of elements, including the willingness of market participants to take

³ See IAS 39.9 in International Financial Reporting Standards (IFRS) issued by the IASB.

on risk. As this willingness is typically procyclical, fair values, like market asset prices, tend also to be procyclical. Consequently, the intrinsic value of firms' assets will normally be positively correlated with economic activity. One would then expect firms' financial statements to be consistent with that structural feature of the economic reality they are meant to represent.

It is true, however, that the reporting of capital losses due to adverse market conditions may trigger reactions that could eventually contribute to amplifying market corrections. In particular, we have seen in the recent crisis how incipient declines in asset values have been followed by margin calls and asset sales that have generated subsequent price falls and, in some cases, detracted from market liquidity. Yet it is by no means clear how accounting principles – a set of conventions aiming at facilitating a systematic communication on firms' financial situation – could themselves generate destabilising spirals. Indeed, margin calls are typically the result of private contracts in which the parties acquire commitments that are contingent on market prices. Moreover, asset sales are sometimes triggered by companies' internal decision rules aimed at limiting capital losses in an adverse market situation. Although this phenomenon could represent a coordination failure in capital markets and serve to aggravate market turbulence, the blame can hardly lie with norms designed to inform outsiders about a firm's economic reality.

It could be argued, finally, that, due to regulatory capital requirements, fair value accounting can place undue pressure on banks' capital when markets are falling, triggering either asset fire sales or a desperate search for additional equity. While it is hard to deny that such destabilising effects may occur in stressed markets, the right response is not to call for changes in accounting rules -i.e. *to shoot the messenger*- but to employ adequate prudential policies. The latter could perhaps incorporate features to mitigate the procyclical effects of minimum capital requirements, for instance by establishing capital buffers that could be fed in good times and expensed in bad times, in the spirit of Spain's system of dynamic provisions. Using prudential policy tools would seem a more efficient way to address financial stability concerns than distorting the criteria used to report financial information.

In any event, the most powerful argument for the fair value measurement of the instruments in bank trading books is the absence of a reasonable alternative. There have recently been some proposals to adjust fair value measurement to make it less sensitive to short-term movements in market prices. One idea is that financial statements should value instruments at their average market price over a given period (say 6 to 12 months) rather than

on the corresponding reporting date (see Zielve et al., 2008). This proposal is seriously misguided. It essentially means that the information provided by issuers would no longer represent their financial situation at a specified date, but an arbitrary combination of different situations at different moments over the more or less recent past. Although, by definition, this approach could smooth out the effects of market volatility on financial statements, it would be at the heavy cost of underreporting the actual impact of relevant market developments.

A more sophisticated proposal has recently been made by a set of financial institutions (see IIF, 2008). The idea is to temporarily adopt a “refined valuation methodology” for instruments traded in markets which seem illiquid or dislocated. This consists essentially in allowing firms to measure some illiquid eligible financial instruments at the lower of book value at the time of application or amortised cost. What the IFF is proposing basically is to prevent a chain of revise-downs in the value of certain instruments – typically structured products – by setting a floor level equivalent to amortised cost. In addition, the IIF calls on accounting standard setters to adopt a more flexible reclassification of instruments from the trading book category (measured at fair-value) to the held-to-maturity (or banking) book (measured at amortised cost).

This proposal would help issuers to avoid hefty write-downs of devalued assets. However, it entails a significant rupture with the spirit and letter of IFRS. If accepted, it would imply consolidating an asymmetric procedure of financial reporting: when the market is booming or even bubbly, market prices remain a good reference for the valuation of instruments and the reporting of capital gains; however, when markets are under stress, managers can avoid reporting the impact of that stress on their capital and profits. This bias could severely undermine the faithfulness of financial statements and threaten the integrity of capital markets. Moreover, the proposal would not actually remove the stress from banks’ portfolios, it would just make it less explicit for investors and supervisors.

Notwithstanding the above, the current turmoil has made it clear that some aspects of financial reporting principles require a thoroughgoing review. This review should touch basically on two aspects: specific valuation techniques and disclosure practices.

The IASB has admitted that valuation principles are, at present, unduly complex (see IASB, 2008 b). They contemplate a relatively large number of

categories of instruments subject to different valuation methodologies, and there is an evident need for some form of streamlining.

As stated, IFRS require firms to use market prices to estimate fair value in the presence of an active market. If no such market exists, they have to fall back on a valuation technique. It may be worth providing firms with added guidance on the concrete criteria they should use in deciding to use one or other procedure to calculate fair value. Some additional references to help assess the suitability of specific market inputs for valuation techniques, particularly proxies for the credit risk of structured products without an active market, would also be welcomed by the industry⁴.

But probably it is in the field of disclosure where there is most room for substantive improvements. Financial statements should, as a rule, contain more information on the techniques used to value financial instruments, including market references, the structure of models, assumptions, inputs and risks arising from model uncertainty.

2.2. Product transparency

Another element which has contributed to the geographical extension and intensity of market distress has to do with the uncertainty surrounding the risks of structured products.

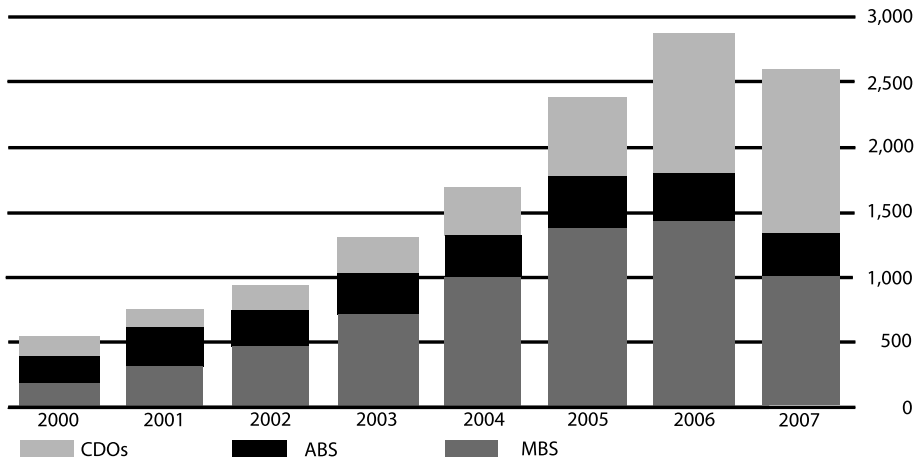
There is now little doubt that structured financial products have contributed to the efficiency of the global financial system. On the supply side, securitisation has allowed banks to more flexibly manage their credit risk exposure, as well as enhancing their ability to obtain funding at a time when deposits were more dynamic than the demand for loans. From investors' point of view, asset-backed securities give them access to banks' credit risk while enlarging their choice of instruments. Moreover, as credit risk exposure has become more spread out across different types of investors, structured finance may also have had some positive effects on overall financial stability. Therefore, from a social welfare point of view, the emergence of structured financial products is unquestionably a favourable development. It has helped complete markets

⁴ At the time of writing this paper, banking supervisors (BCBS and CEBS) and securities supervisors (CESR) are working on procedures and associated disclosures. However official guidance can only be provided by the IASB itself. Following a request by the FSF, this issue has also been included in its short-term agenda.

and has opened the door to a more efficient distribution of credit risk across the whole financial system.

Despite these benefits, there is growing evidence that the phenomenon may have gone too far, too quickly. Although there is little official data on these markets, the available information indicates that the issuance of main structured products – such as asset-backed securities (ABS), mortgage-backed securities (MBS) and collateralised debt obligations (CDO) – in the US and Europe reached USD 2,500 billion in 2007, despite the deceleration of the last quarter. This is more than five times the equivalent figure for the year 2000. (see graph 1)

Graph 1: European and US Structured Credit Issuance (USD bn)



Sources: Inside MBS & ABS; JPMorgan Chase & Co.; and European Securitization Forum.

Interestingly, this rapid increase in the issuance of structured products is not only due to the securitisation of commercial loans but, especially, to the significant acceleration of CDOs. These are securities issued against already existing securities, normally ABS, typically with additional credit enhancements. By diversifying riskier tranches of ABS, CDOs generate larger volumes of the investment grade securities eagerly demanded by institutional investors due to regulatory or internal portfolio constraints. However, they do not represent new investment opportunities; just the repackaging of already existing risk-return profiles. In this sense, the pace that structured product issuance has reached cannot be entirely rationalised as a welfare-improving response to the demand from investors to amplify their opportunity set.

Indeed, there are signs that behind that phenomenon lurk some spurious reasons that have pushed issuance volumes to excessive highs.

Specifically, an important driving force behind securitisation has been regulatory arbitrage. The Basel I Capital Accord allowed banks to free regulatory capital when they moved commercial loans to off-balance-sheet vehicles, even if the originator retained substantial exposure to the transferred assets. Moreover, the very processes of securitisation and structuring generate income – in the form of fees – which is often partly appropriated by the originator itself. Finally, as we know now, rating agencies contributed significantly to the boom by failing to properly assess the underlying default risk. Particularly dubious was the practice of generating investment grade securities through CDOs, as it relied on estimates of the pay-off correlations of the underlying loans which were downward biased.

It seems likely that regulatory reforms will contribute to more sustainable dynamics for structured products. The full implementation of Basel II will ensure that off-balance-sheet exposures are subject to commensurate capital requirements. At the same time, the new accord implies higher capital requirements for holdings of below-investment-grade paper. Moreover, the BCBS is currently studying raising capital requirements for highly rated complex instruments, such as CDOs of ABS. These regulatory changes may significantly reduce banks' incentives to hold structured products on their balance sheets, as well as induce a rebalancing of their preferred funding routes in favour of more traditional instruments like covered bonds.

At the same time, wherever credit risk transfer through securitisation continues to be pursued, its buyer public will increasingly comprise institutional investors outside the heavily regulated banking sector. As a consequence, a larger range of investors may become directly or indirectly exposed to instruments which are currently owned by credit institutions. This strengthens the need for greater transparency on the risk-return characteristics of structured products; something that can only be achieved through more exacting disclosure obligations and the further standardisation of complex instruments. In most countries, the prospectuses of securities issued by securitisation vehicles offer fairly comprehensive information on the nature and historical default records of the underlying loans. However, they do not always give enough information on originators' willingness to retain credit risk by purchasing the risky tranches issued by the vehicle. The recent sub-prime crisis has shown that investors can legitimately expect that when originators retain a substantial

part of the underlying credit risk, the institution's due diligence procedures on the securitised loans will be more reliable.

Another relevant deficiency is the scant information that originators typically transmit on the performance of securitised assets. Existing regulations are fairly lax about originators' reporting commitments in respect of the securitised assets they administer. In most jurisdictions, they are not even obliged to directly notify impairments of the securitised loans to the corresponding special purpose vehicles. Information requirements for vehicle managers are also relatively limited and unsystematic. And though they notify significant developments that may potentially affect securities, they are not legally required to present regular financial statements.

The solution to this transparency deficit in structured products will require a joint effort by securities market supervisors and the industry. The strengthening of information requirements for originators and vehicles will probably necessitate direct regulatory action. There is however some scope for self-regulation as regards the harmonisation of prospectuses, including information on originators' intentions.

Another area which the industry can usefully work on is that of standardisation. The development of a small number of standard products – or categories of products – would facilitate due diligence by investors, asset managers and rating agencies. This would also help promote more liquid markets for those instruments, increasing their attractiveness for institutional investors. Finally, standardisation may aid asset managers and securities market supervisors in assessing the suitability of each specific instrument for different types of investment or pension funds.

2.3. Market transparency

The transparency deficit refers not only to the financial situation of relevant parties or to the nature of financial instruments, but also to the conditions under which securities are actually traded on the market.

The amount of information available on market conditions differs widely across instruments and countries. In general, equity markets are subject to stringent transparency requirements, including access to bid-ask quotes (pre-trade transparency) and to the volumes and prices of transactions effectively conducted (post-trade transparency).

The situation regarding non-equity markets is much more heterogeneous across countries. In general, for transactions conducted outside exchanges – a large majority of the involving private bonds and derivatives – the extent of pre and post transparency is very limited indeed.

A relevant exception is the US markets where a Trade Reporting Publication System (TRACE)⁵ provides detailed post-trade information on a wide range of fixed-income securities. This system covers both on-market and off-market transactions.

The current EU regulation introduces demanding criteria for pre and post-trade transparency in regulated stock markets, but establishes no requirements for other instruments⁶. Moreover, most Member States have not imposed additional disclosure obligations, although some regulated bond and derivatives markets do publish some, usually limited, post-trade information.

Behind the absence of regulation on the transparency of non-equity markets lie a number of arguments of differing strength. It has been contended, for instance, that participants in non-equity markets are sophisticated institutional investors. Such investors often have access to the information provided by dealers, so may not be too concerned about the lack of public disclosures. Another argument is that trading intentions in certain non-equity markets, such as those of corporate bonds, have traditionally been based on internal valuations of the traded instruments. In this situation, the actual transaction prices or volumes may not be that relevant.

⁵ The system was established in 2002.

⁶ See the Directive on Markets in Financial Instruments (MiFID), Articles 44 and 45.

Yet the most effective argument which has been made against regulating transparency is that good public knowledge of market conditions could eliminate the information advantage on which dealers' business is based. According to this view, a high degree of transparency may kick market makers out of price-driven markets, thereby reducing liquidity.

The European Commission used those arguments to conclude in a recent report (see EC, 2008) that "there does not seem to be at this point of time, a need for regulatory intervention at Community level in terms of an expansion of the current transparency provisions of MiFID to financial instruments other than shares". However, this report was produced using inputs from different sources that were mostly submitted before the sub-prime crisis. Indeed, recent developments make some of the arguments wielded against tighter regulation of transparency requirements in non-share markets a lot less forceful. In particular, although most participants in private bond and derivative markets are institutional investors, they do not all have sufficient capacity to value the complex structures which are now traded on those markets. Timely information on the prices and volumes of concluded transactions is therefore useful for both investment decisions and accurate fair-value reporting. At the same time, although direct participation by retail investors is at present very limited, they may still have a natural interest in monitoring the management performance of the intermediaries through which they indirectly participate in the market. Also, supervisors are charged with monitoring investment firms' compliance with the due diligence provisions of current regulations. For both purposes, the availability of timely information on market conditions is of considerable import.

There remains however the concern that transparency could damp down market activity if it excessively reduces dealers' role and reward. The strength of this effect is arguably far from clear from either a conceptual or empirical point of view. In principle, market activity does not primarily depend on the benefit that dealers obtain from their market-making activity. If markets are more transparent, investors (even retail investors) will be more willing to participate, and this could itself contribute to boosting issuance and trading activity.

The empirical evidence on the link between transparency and liquidity is inconclusive at best. The launch of TRACE in the US has clearly helped reduce transaction costs and bid-ask spreads, although there has been no direct analysis of its effects on trading volumes.

In the light of the deficient degree of transparency in non-equity markets and the evidence of how this deficiency has adversely impacted on the markets worst affected by the recent turmoil, it makes sense to promote additional disclosures of prices and volumes in these markets. This is indeed one of the recommendations of the FSF report. At the same time, although the risk is limited, some caution is probably warranted when designing and implementing transparency requirements, in view of their possible impact on market liquidity. Specifically, the regulator should concentrate on post-trade transparency, since pre-trade transparency provides lower value-added for investors and places more impediments on the counterparty-search job conducted by dealers. In addition, a gradual approach may be helpful – as in the case of TRACE in the US. Transparency requirements should be imposed on markets in relatively liquid instruments – such as some corporate and covered bonds – and subsequently applied to other more complex assets. And a reasonable lag should be envisaged in transaction reporting, on a transitional basis at least. Although the goal must be to bring reporting as close as possible to the trading date, provisionally allowing a few days' delay will help dealers adjust more smoothly to the new information requirements.

Ideally, regulators should work closely with market participants throughout this process. But they should also remain keenly aware that the interests of institutions, who act as dealers and therefore profit from the absence of easily available information, may not fully coincide with those of investors.

At European level, in line with the gradual approach suggested above, it may be premature to amend the relevant Directive, which only came into force in November 2007. One option would be for the Commission to issue a recommendation to Member States to go beyond the minimum requirements of the MiFID by extending post-transparency conditions to some non-equity markets.

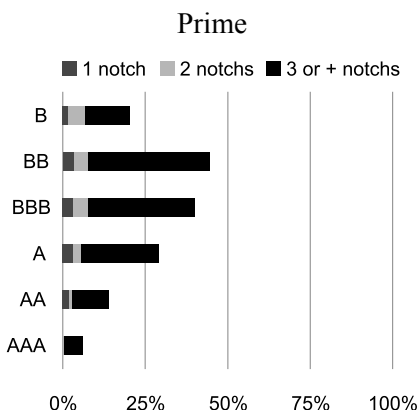
3. Rating Agencies

Credit rating agencies (CRAs) performed a key role in the developments following the sub-prime crisis in the US. As we have seen, the effects of the crisis spread across the entire financial system and affected many large financial institutions worldwide through the medium of structured product markets. These markets rely heavily on rating agencies, which offer investors a credit risk evaluation of the different tranches of sometimes highly complex structured products. And it now looks certain that without investors' confidence in the accuracy and due diligence of rating companies, the popularity of instruments like ABS, MBS, CDOs etc. would have been considerably less.

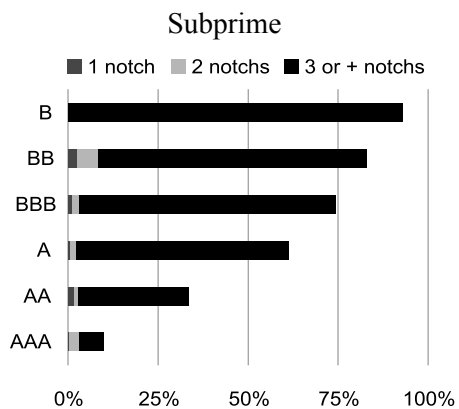
The emerging signs of deterioration of securitised sub-prime loans in the summer of 2007 triggered an intense downgrading wave that affected a wide range of structured products. As graph 2 shows, a large majority of sub-prime-exposed securitisation instruments rated single A or below were revised down, normally by three or more notches. Moreover, as much as 10% of AAA instruments were also downgraded. The wave of rating revisions also significantly affected securitisation instruments backed with prime loans. For example, more than a quarter of sub-prime-free securitisation bonds rated A or below suffered some degree of downgrade, usually three or more notches. This process undoubtedly exacerbated the confidence crisis and contributed to the abnormal behaviour of prices and volumes in several wholesale financial markets.

Graph 2:

U.S. RMBS Q12005-Q32007 period issues downgrades from original rating



Graph 3:



Source: Standard and Poor's

The work conducted by different international forums (FSF, IOSCO, CESR...) and, to some extent, the self-examination performed by agencies themselves (see CRAs, 2008) have revealed a certain consensus on the deficiencies affecting the work of CRAs. These can be classified into four categories: methodology, organisation, transparency, and misperceptions of agencies' role.

On methodology, CRAs do not normally perform a thorough analysis of the data submitted by issuers. Moreover, calculations of expected losses – on which ratings are based – often use models which have not proved robust to recent events. In particular, estimates of the payoff correlations of securitised assets were clearly set too low, thereby exaggerating the scope for risk diversification and triggering an excess of investment grade instruments.

On procedures, CRAs have long been criticised for not adopting sufficiently effective measures to control internal conflicts of interest. In particular, CRAs typically provide issuers with consultancy services which may come into conflict with their core business of providing accurate credit quality assessment. These conflicts become more acute when dealing with structured products. Many structured product issuers have, as an objective, the generation of a sufficiently large volume of highly rated instruments. This places pressure on CRAs that may distort the rating process. Finally, the generalised downgrading of instruments in the last few months suggests CRAs have not been diligent enough in revising their initial ratings when conditions change. This may be partly because agencies are reluctant to modify ratings so as not cast doubts on the accuracy of their initial assessments.

On transparency, while admitting that CRAs have made an effort in recent years to inform about their valuation models and performance record, there is still considerable room for improvement. In particular, performance indicators may not be readily comparable from one CRA to another. Also, more information on assumptions made and on the uncertainty surrounding credit analyses would give investors a better understanding of the scope of the credit assessments.

On agencies' role, one widely shared conclusion from recent developments is that investors may have attached too much weight to credit ratings. Investors have tended to consider ratings a sort of sufficient statistic on the underlying quality of the rated instruments. Highly rated assets are often perceived as carrying not only low credit risk but also low market or liquidity risk. Moreover, the fact that ratings are based on a specific, partial measure of credit risk – expected loss – has been given little consideration in investment strategies.

Regulation may have contributed to this widespread misunderstanding of the meaning of ratings. In particular, new capital requirement rules – Basel II – make intensive use of ratings without discriminating much between equally rated instruments of differing liquidity or complexity.

This agreement on the main shortcomings of the work done by CRAs has led to a general consensus on the key avenues for reform. These include a tightening up of the code of conduct – produced by IOSCO – to which all leading CRAs voluntarily subscribe. Indeed, IOSCO has recently released a new code of conduct which incorporates more stringent requirements on CRA methodology, transparency and organisation (see IOSCO 2004, 2008). It also makes sense to revisit Basel II, and develop a more fine-tuned treatment of different types of instruments with the same rating. In this connection, the Basel Committee on Banking Supervision (BCBS) is studying a possible increase in capital requirements for holdings of highly rated complex products.

However, some of the ideas put forward are a lot more controversial. For example, the FSF has suggested using specific rating codes for structured products. The reasoning behind this idea is, in principle, sound. The rating of a structured product is technically a more difficult job than that of more standard fixed-income securities. Moreover, as the importance of low probability high-impact events (the so-called tail risk) is probably higher than for regular instruments, ratings provide a less robust measure of credit risk. Another suggestion is that CRAs should also assess the liquidity of the markets where rated instruments are traded and modify their current rating codes accordingly.

Although those proposals would provide investors with more complete information on the quality of rated instruments, they could also add to the confusion about what ratings really mean. As a minimum, ratings should help investors compare the credit risk of different types of instruments. Therefore different credit rating codes for different types of instruments would sooner or later invite the industry to establish code-to-code conversion tables. And that would be a tortuous route to come back to where we started. Further, if CRAs enlarged on the risk concepts to be assessed, they would inevitably be faced with new methodological challenges. And in the meantime, investors would perceive, more strongly than now, that CRAs provide a comprehensive assessment of instrument quality, so would have even less incentive to seek out complementary information or analysis.

An alternative to expanding the taskload of CRAs is to make them focus more clearly on what they are supposed to do well. In other words, they should concentrate on providing accurate estimates of the expected loss of instruments of differing complexity. They should also strive to get across as clearly as possible the risks surrounding their assessments, giving some indication of how ratings would change in the presence of specific circumstances. Differentiation between complex and non complex instruments should come through risk analysis rather than through different codes which may become confusing. This, together with a more nuanced use of ratings by regulators and educational actions by private and public bodies, would help investors understand what ratings actually mean, reducing their somewhat excessive role in today's financial markets.

Probably the most contentious issue in the debate on credit rating agencies concerns the regulatory approach to controlling their activities. At present, two different models coexist. In the US, the SEC has powers to set specific rules – besides the IOSCO code of conduct – for agencies and assess compliance with the same. On the basis of this assessment, the SEC issues a quality certificate conferring the status of Nationally Recognised Statistical Rating Organization (NRSRO). In the rest of the world, CRAs are subject to few regulatory requirements and little official supervision⁷. In Europe, for instance, the Committee of European Securities Regulators (CESR) conducts a relatively informal annual assessment of compliance with the IOSCO code.

The recent turmoil, as well as past financial crises, provides ample evidence that the self-regulatory approach has not performed well. Moreover, there are reasons to believe that pure self-regulation or soft regulation (around the IOSCO code) may not be a sensible approach from a social welfare standpoint. There are at least four types of arguments to justify this claim:

- First, this industry satisfies many of the conditions of a natural oligopoly. CRAs need to be widely recognised in the market for their work to be appreciated by investors and regulators. This implies strong barriers to entry that impede competition. Without sufficient competition there is normally little incentive to improve quality standards and pursue effective methodological innovations.
- Second, even if CRAs had to compete among themselves to capture higher market share, it is not necessarily true that this would imply an

⁷ In the banking regulation area, national authorities may determine the eligibility of ratings from some CRAs in the computation of capital requirements.

improvement in average quality. As CRA clients are typically issuers rather than investors, more intense competition could actually put more pressure on them to satisfy issuers' desire to obtain good ratings.

- Third, although the review of the IOSCO code will mark an important step forward, it is clear that the rules need to be more detailed in order to make CRAs' work sufficiently reliable. In particular, the code does not go far enough in providing methodological guidelines and templates for the disclosure of performance data and the detailed reporting of conflict of interest controls. The problem is that the more detailed the rules the more complex their design and the more frequently they will need revising. And this task lies beyond the current IOSCO remit.
- Fourth, effective rules need effective enforcement mechanisms. It is hard to imagine that this could be done by the industry itself – comprising only a handful of relevant players. Enforcement should be the responsibility of entities with the means, powers and incentives to penalise non compliance with existing rules.

True, a system of official CRA regulation and supervision (by a securities markets supervisor for example) is far from problem free. Official agencies do not normally have the means and expertise to supervise complex assessment methodologies. This may partly explain why the SEC has long focused its supervision on CRAs' fulfilment of organisational requirements. More recently, it has also begun assessing performance on the basis of input provided by the CRAs, but little effort has been made so far to supervise methodological approaches (see Dittricht, 2006).

At the same time, excessive monitoring by a public agency may generate the perception of public responsibility for the accuracy of the work done by CRAs. In extreme cases, investors may be tempted to believe that an instrument possessing a high rating from a closely supervised CRA is free of all default risk. And more generally, a tight supervisory system may distort incentives for investors to factor the technical uncertainty surrounding ratings in their own analysis of investment opportunities.

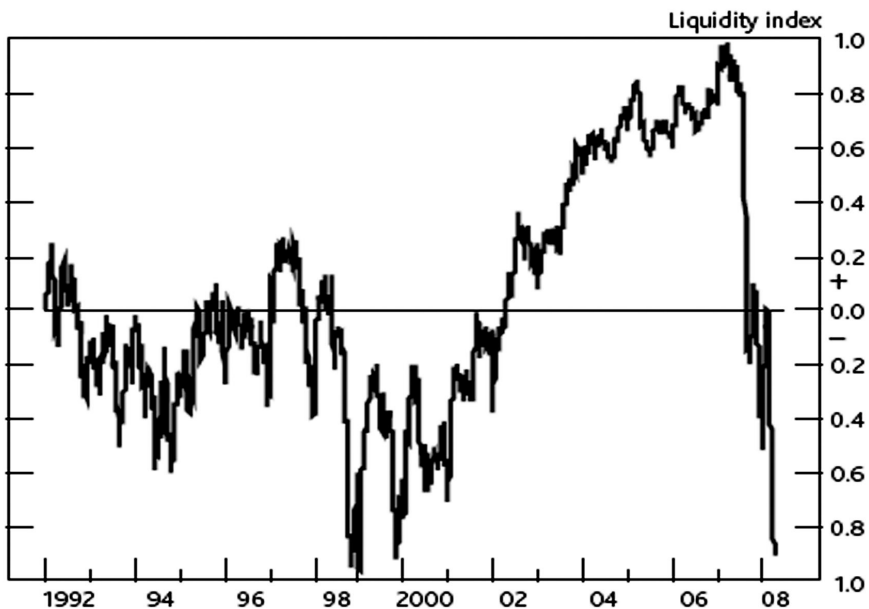
Finally, a standard system of official regulation of CRA activity would typically be country-specific. Since most CRAs are global operators, this would imply a number of national supervisory agencies performing essentially the same task – a wildly inefficient setup that would also entail the risk of gross inconsistencies across jurisdictions.

Given the limitations of the self-regulatory regime and the shortcomings of a system of standard official regulation, it may be worth exploring mixed solutions that could be applied at the global level. One possibility, for example, would be to establish independent bodies to conduct the work that in the US is performed by the SEC. This could involve a format such as two committees of technical experts. The first would set, and regularly revise, principles of good rating practices. The second would be responsible for monitoring compliance and administering a status of suitability process, with powers to name and shame non-compliant. These committees would report to an oversight body made up of interested parties (investor associations, auditors, issuers), including national supervisors and relevant international organisations. This oversight body would appoint the members of the two technical committees, ensure that they work efficiently and comply with established due diligence procedures, and seek funding from public and private sources. CRA monitoring would thus come under a single global solution based on the work of groups of highly qualified professionals appointed, supervised and financed by a suitable mix of private and public sector representatives. This approach finds part of its inspiration in the working of the boards which currently design international accounting standards (IASB), international audit standards (IAASB) and international asset valuation standards (IVSB).

4. Liquidity

After transparency and credit rating agencies comes a third key word, liquidity, introducing another set of lessons from the recent turmoil. In fact, among its most singular features was the slump in activity affecting various primary and secondary markets. Available measures of liquidity in financial markets show a marked decline since summer last year. For example, the synthetic indicator produced by the Bank of England (see graph 3) signals a substantial reduction in financial market liquidity after a period of around five years in which liquidity conditions were highly favourable.

Graph 3:

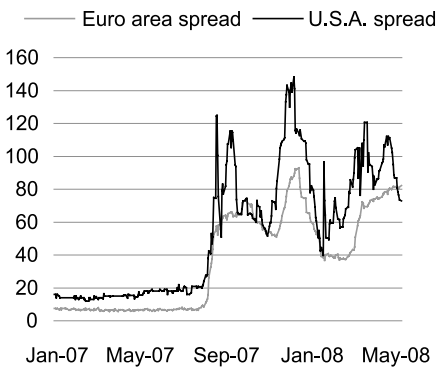


Sources: Bank of England, Bloomberg, Chicago Board Options Exchange, Debt Management Office, London Stock Exchange, Merrill Lynch, Thomson Datastream and Bank calculations.

In particular, the amount of transactions in interbank markets worldwide beyond the very short term has been extremely low since August last year. Moreover, issuance and trading activity in markets for structured products like ABS, MBS and CDOs remain notably subdued.

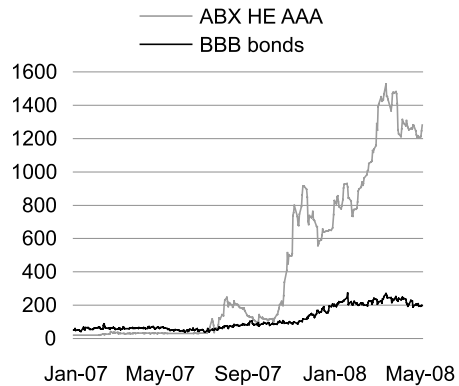
This lack of market activity is the result of a quantity rationing which has pushed interest rates to very high levels. As we can see from graph 4, three-month interbank spreads over repo rates have touched 150 b.p. in the US and 100 b.p. in the eurozone, compared to normal intervals of between 10 and 20 b.p.. Market malfunctioning is even more evident in the case of structured products. Indices of ABS prices – such as ABX – have fallen sharply in the last few months (see graph 5). And the spreads corresponding to AAA securities have soared to around 12 p.p., substantially higher than those of lower rated standard corporate bonds.

Graph 4: Depo-repo spreads



Source: Datastream Credit risk spreads

Graph 5: Credit risk spreads



Source: Reuters and CNMV

These adverse liquidity conditions in wholesale markets coincided with the heightened funding needs of various financial institutions, particularly institutions exposed to conduits. These vehicles – which lie outside the consolidation perimeter of financial groups – were used by banks to issue securities backed by their commercial assets. Typically conduits would acquire banks' assets and finance their purchases by issuing short-term commercial paper. They also enjoyed an implicit guarantee from the originating banks to cover liquidity needs in case of adverse market conditions. As the market for these instruments virtually disappeared following the sub-prime crisis, financial institutions had to rescue their conduits either by providing them with liquidity or, more often, by repurchasing their assets. As a consequence, not only have liquidity risks become larger in the current turmoil, but banks' exposure to those risks have increased significantly. It was left to central banks to mitigate the problem by making their funding more accessible to institutions struggling to raise liquidity in wholesale markets.

These developments suggest at least three areas for reflection. First, the possibility for regulators and managers of market infrastructures to improve liquidity in wholesale markets; second, the limits on central bank support; and third, the treatment of liquidity risk in current regulations.

4.1. Market liquidity

Market liquidity is normally defined as the ability by participants to liquidate (or issue) an asset in the market with little price impact. Thus defined, market liquidity depends on two elements: i) the ability of potential investors to understand the nature of the transactions (either a loan or the exchange of a financial instrument) taking place on that market; and ii) the existence of mechanisms (trading platforms, market makers..) to effectively match up supply and demand.

The first element is linked to the existence of reliable information – provided by issuers, analysts, CRAs, etc – on all the relevant variables investors need to calculate the expected return and risks entailed by purchasing a financial instrument or granting a loan at prevailing market prices. From this angle, liquidity is related to other variables, like the transparency of issuers, products and markets and the conduct of CRAs, which have been covered in previous sections.

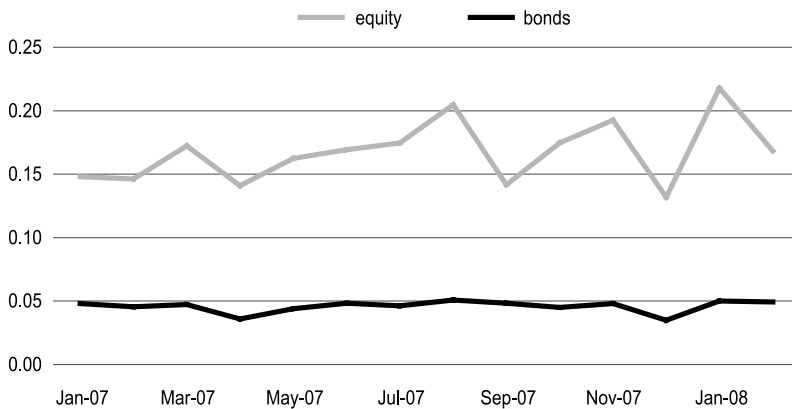
The second element is more directly linked to the functioning of the markets. At present, regulated markets tend to have limited liquidity requirements. In Europe, the Consolidated Admission Requirements Directive (CARD) establishes quantitative references – in terms of minimum volumes and free float – for shares to be admitted to trading on stock markets. However, no such formal requirements exist for the admission of non-equity instruments. In specific fixed-income markets, like those of public debt, the present trading platforms typically provide a satisfactory degree of liquidity. Moreover, covered bond markets in some countries –notably the jumbo-Pfandbrief market in Germany⁸– are fairly liquid thanks to the work of market makers specializing in each listed instrument. Still the fact is that bond market turnover is always significantly lower than that of equity markets (see graph 6).

At this stage, it may be excessive to legislate tighter liquidity requirements for non-equity markets, as this could cause the expulsion of a number of

⁸ Other examples are the markets of obligations foncières in France and of *letter de page* in Luxembourg. See Mastroeni (2001)

instruments that can hardly be traded on a frequent basis. Also, there is scope to pursue the development of pan-European markets for specific non-equity instruments such as covered bonds or some ABS. These pan-European markets could be equipped with reasonable liquidity by means of electronic platforms or market makers, though this would demand an important effort to harmonise the nature of instruments, issuance practices and the relevant national legislation.

Graph 6: Monthly turnover of the equity and bonds listed in developed country exchanges



Source: World Federation of Exchanges

4.2. The role of central banks

Action by central banks has helped financial institutions to mitigate the effects of the abnormal functioning of interbank and other wholesale markets. This action has not generally consisted of providing specific emergency loans to illiquid banks. Nor has it implied, of itself, a net injection of liquidity significantly exceeding normal volumes or a relaxation of the policy stance. The action has rather consisted in ensuring that liquidity injection operations reach a sufficiently large range of financial institutions, given the inability of the market itself to distribute available liquidity with sufficient speed.

This task has required central banks to make some adjustments to their regular operational procedures. In the case of the Eurosystem this has only meant conducting ad hoc tender operations to offer loans at other-than-standard maturities (see González-Páramo, 2008). However the US Federal

Reserve and the Bank of England have also had to modify, albeit to differing extents, more substantive aspects of their respective operational frameworks, such as the range of counterparties in their tender operations and the list of assets accepted as collateral for central bank loans⁹.

It is therefore clear that the Eurosystem's operational framework have proved more robust than that of other central banks. In particular, the policy of accepting a wide range of collateral – both public and private – has enabled many banks to obtain financing that was difficult to find on the market. Indeed the Eurosystem accepts instruments, such as highly-rated ABS and RMBS, whose markets – never very liquid – are currently particularly inactive. Note that with stricter eligibility criteria central banks could do little more than the private repo market to compensate the dearth of activity in the uncollateralised interbank market.

It could be argued that by accepting relatively complex instruments, the Eurosystem is taking on too many risks and buoying up the valuation of assets which would otherwise be less attractive to investors. However, provided credit risk is properly assessed, these instruments' peculiarity vis-à-vis other eligible assets is only their higher liquidity risk. In principle, central banks are best positioned to bear this type of risk. At the same time, market neutrality can be assured if central banks value illiquid instruments on a sufficiently frequent basis and following accurate and transparent procedures. In this regard, there could be some scope for the Eurosystem to improve the transparency of their valuations and the methods they follow to price relatively illiquid instruments.

Although their actions have been instrumental in preventing the abnormal market situation from deteriorating into a solvency crisis, there are obvious limits to what central banks can achieve in the current market circumstances. Financial institutions, in any event, have to undertake more complex liquidity management, as central banks cannot reasonably offer the range of financing facilities that a well-functioning market provides. Moreover, even by increasing the frequency of their operations and the range of eligible collateral and counterparties, central banks could do little to combat the frictions in money markets. In effect, as graph 3 shows, the spread between interbank deposit rates and repo rates remained very high even after extraordinary liquidity

⁹ The Federal Reserve has introduced three new facilities: the Primary Dealer Facility, the Term Auction Facilities and the Term Securities Lending Programme. The BoE enlarged the list of eligible collateral for the three-month tenders. Moreover, in April it introduced the Special Liquidity Scheme which establishes swap facilities to increase the availability of treasury bills to credit institutions in exchange for a wide variety of private fixed-income instruments.

injections. Furthermore, frequent direct intervention by the central banks may be counterproductive in restoring market activity, as it may actually reduce incentives for borrowing institutions to pay the high premiums required by lenders. That is why actions by central banks outside their regular operating procedures should remain as limited as possible in scope and duration.

4.3. Regulatory issues

At present, the regulatory treatment of liquidity risk is significantly less stringent than for other types, notably market risk and credit risk.

In the banking sphere, the capital accord (Basel II) does not factor any liquidity risk measurement in the calculation of minimum capital requirements (Pillar 1). Moreover, there are no specific limits on exposure to non liquid instruments in trading books or on maturity mismatches. The supervisory approach tends to rely on the fulfilment of good liquidity management practices (see IIF, 2007 and BCBS, 2008). In this connection, what seems to be required is the strengthening of liquidity risk oversight, at least under Pillar 2. The BCBS's plans to issue guidance on the management and supervision of liquidity risk, as required by the FSF, are also a necessary step forward.

Nor is liquidity risk efficiently represented in financial reporting requirements. For example, the concept is not explicitly listed in IFRS among the factors preparers should incorporate in their valuation techniques (IAS 39.AG 82). Moreover, disclosure requirements (IFRS7) make only scant references to variables related to liquidity (see IASB, 2008). Preparers are supposed to disclose information on the maturity of their liabilities, but there is no similar requirement for the maturity of financial assets, making it hard for analysts and investors to assess the liquidity situation of firms. Some reflection by the IASB on these issues would seem warranted in view of recent financial markets events.

Finally, an area which has received insufficient attention in the ongoing debate on the implications of the market turmoil is the regulation of investment funds. In Europe, current regulation is based on the UCITS Directive. Investment funds covered by this Directive are meant to publish net asset values on a frequent basis and to redeem shares within a short period. For this reason, the Directive limits (to 10%) the share of the portfolio that can be invested in instruments which are not traded on regulated markets. However, there is no limit on investment in instruments which are listed on regulated

markets but are not in practice actively traded. This is the case of many RMBS, ABS and CDOs. Through lower-rank norms, national regulators have introduced additional safeguards of a relatively general nature. In Spain, for instance, managers are required to monitor the depth of the markets on which the instruments they hold are traded. In general, however, there is little regulatory protection against a large part of a UCITS' portfolio being invested in fairly illiquid assets. As such, EU securities supervisors should collectively assess the possibility of more direct liquidity controls on at least certain types of investment funds. This could entail establishing intermediate categories (between current UCITS and hedge funds) with different liquidity requirements depending on the flexibility of their redemption policies.

5. Supervisory Arrangements

Several features of the current market turmoil provide useful input regarding the role of the different public bodies with responsibilities in the financial domain:

- First, as we have seen in the previous sections, the large spill-over effects from the US sub-prime crisis have revealed a number of deficiencies in the functioning of the financial system which have a genuinely global character. The problems identified, relating to the transparency regime of firms, products and markets, the role of CRAs or the regulatory treatment of liquidity risk, are common to all jurisdictions.
- Second, the turmoil illustrates an intense interaction between real and financial sector developments. Lax financial conditions generated imbalances in the real sector – particularly the US housing market – which, in turn, caused distress in first local and then global financial markets. This distress distorted the ability of financial institutions to obtain funds in wholesale markets, making them less willing to satisfy credit demand. And the credit supply adjustment is already intensifying the downward correction of economic activity.
- Third, recent experience shows that the line between financial institution's liquidity problems and insolvency risks is relatively thin, and that failure to manage the former may trigger the latter in a short period of time.
- And fourth, since much of the financial market turmoil arising from the sub-prime crisis has to do with a lack of confidence among market players, transparency emerges as a relevant ingredient of financial stability. At the same time, the policy debate in the heat of the turmoil has shown that not all involved parties have the same sensitivity towards the need to strengthen transparency requirements – including valuation and disclosure practices – for financial institutions.

The global nature of the problems identified in the functioning of the international financial system calls for global solutions. And the international community has reacted in a timely manner. Particularly promising is the work being conducted by the FSF on the basis of input from several international organisations – such as IOSCO, IASB, BCBS, etc. The FSF has set a demanding work agenda involving all relevant public and private parties

which should deliver concrete actions before the end of this year. However, it is also clear that national authorities must move quickly to adopt common approaches in some specific areas. In particular, the proper functioning of the world financial system requires faster convergence on the financial information standards applied in different jurisdictions. And there is also clear scope for reducing regulatory differences vis-à-vis CRAs and non bank financial intermediaries. Finally, market transparency requirements should become more homogeneous across financial instruments and jurisdictions.

The interaction between the real and the financial sector invites central banks and financial regulators to enlarge their policy framework. First, it is increasingly clear that central banks should not base their interest rate actions on narrow approaches consisting of minimising the gap between expected consumer price inflation and a concrete target over a specified policy horizon. Central banks cannot only consider the most likely outcomes extracted from a standard macroeconomic model. They must factor the potential impact on macroeconomic stability of abnormal financial developments triggering significant imbalances, and the links between the latter and the policy stance. At the same time, regulators and risk managers must make proper allowance for macroeconomic developments affecting the solvency of financial institutions through the correlation of risks associated with different exposures. Moreover, while safeguarding the accuracy of public financial information, regulators should seek ways to ensure that capital requirement regulations do not unduly exacerbate financial market stress during cyclical downturns

The links between liquidity and solvency risks pose doubts about an institutional model which entrusts responsibility for prudential oversight and the system's liquidity management function to two separate agencies. Coordination failures between those two agencies may actually trigger a solvency crisis which could be avoided by prompt liquidity support. As the latter function is performed by monetary authorities, coordination failures would be minimised by assigning prudential responsibilities also to central banks. Moreover, recent experience, particularly in the eurozone, shows that a situation of liquidity stress in the banking sector can be handled without altering the policy stance or even the operational framework. In addition, the lesson that financial stability considerations should remain cleanly separate from monetary policy making weakens the standard argument regarding conflicts of interest between these two functions. Indeed, if the internal organisation of central banks is sufficiently sound, the combination of both responsibilities may generate useful synergies.

Finally, on the priority to be attached to transparency, everyone would agree that the optimal degree of transparency does not imply the immediate release of all conceivable information. However, it is clear that the amount and accuracy of the information that market participants require to make informed investment decisions may not coincide with what some issuers or borrowers are willing to supply in a situation of stress that they may consider transitory. For example, in the ongoing debate on the fair value measurement of illiquid instruments, some financial institutions have advocated a flexible interpretation of the accounting standards that would have helped them reduce the impact of the turmoil on their balance sheets. Naturally, this would have damaged the ability of potential investors to assess the real situation of financial firms.

As such, we cannot rule out specific circumstances in which the degree of transparency required for the adequate functioning of financial markets clashes with the management requirements of a situation of distress in the banking sector. This may give rise to a conflict between two desirable social objectives.

This example endorses the idea of assigning responsibilities for market conduct and prudential oversight to two different, albeit well co-ordinated, institutions (twin peaks). This is, in essence, the regime now in place in countries like Australia and the Netherlands and seems to be very much the way the US is heading (see US Treasury, 2008). The main virtue of this system is not to eliminate potential conflicts between transparency and financial system stability, but to make them explicit. This should increase incentives for authorities to find solutions that properly target both social objectives, without imposing artificial hierarchies like those that may appear if a single institution is entrusted with supervising prudential as well as conduct aspects.

6. Concluding Remarks

Whenever a financial crisis arises, the international financial community initiates a debate on regulatory changes that may reduce the likelihood a similar crisis happening in future. And concern is often voiced that, in the heat of a crisis, regulatory authorities tend to overreact to events and strengthen existing prudential rules to an extent that may hamper the efficiency of the financial system. At times, the argument goes as far as to suggest that ensuring a permanently stable financial system is an impossible task, and any attempt to accomplish that goal by means of regulatory adjustments is not only ineffective but may be counterproductive. This line of thinking normally leads to the proposal of a minimal regulatory system, possibly accompanied by the ex-post provision of aid to those vulnerable savers most affected by the crisis.

The recent turmoil is not a good fit with these terms of reference. Many of the lessons of the crisis are not directly linked to a perceived inability of prudential regulation to ensure financial stability, but to the identification of market failures which impede the efficient functioning of financial markets and can cause serious distress.

Specifically, this paper has stressed that market mechanisms do not guarantee an adequate degree of transparency. In particular, available information on issuers' financial situation, on the nature of some of the products offered in the markets and on actual market conditions are often not sufficiently comprehensive. Credit rating agencies, on whom participants rely heavily in making their investment decisions, have failed to provide an adequate service, due mainly to the adverse incentives generated by the oligopolistic regime in which they operate. These are examples of important deficiencies which, as the recent turmoil shows, may impede the proper functioning of market pricing mechanisms, thereby preventing an adequate allocation of resources. The corollary is that there is scope for regulatory action aimed at correcting the market failures identified.

The paper has also drawn some lessons for the conduct of public authorities when there is evidence that markets are not working correctly. The best example is the role of monetary authorities when interbank markets fail to distribute liquidity in an effective manner. Our discussion has shown that, in this situation, central banks have a role to play in preventing major disruptions in the banking sector. We have seen also that this can be done

without altering the policy stance, and without generating too much distortion in the functioning of regular market mechanisms.

It is argued that the concept of liquidity risk should feature more prominently in the regulation of bank and non-bank financial intermediaries. This is the issue which comes closest to the standard debate on the pros and cons of financial regulation. Like any proposed strengthening of prudential rules, this suggestion may generate some sort of inefficiencies. As always, it is up to the political authorities to weigh such drawbacks against the potential benefits in terms of financial stability. However, it seems likely that the liquidity risks of credit institutions can be effectively controlled without modifying capital requirements and, therefore, without too large an impact on their income. A system of enhanced management and supervision of liquidity through internal models and reliable stress tests may suffice. Regarding investment funds, the question is simply for regulation to reflect more accurately – e.g. when establishing categories of funds – the logical link between the liquidity of both sides of their balance sheets.

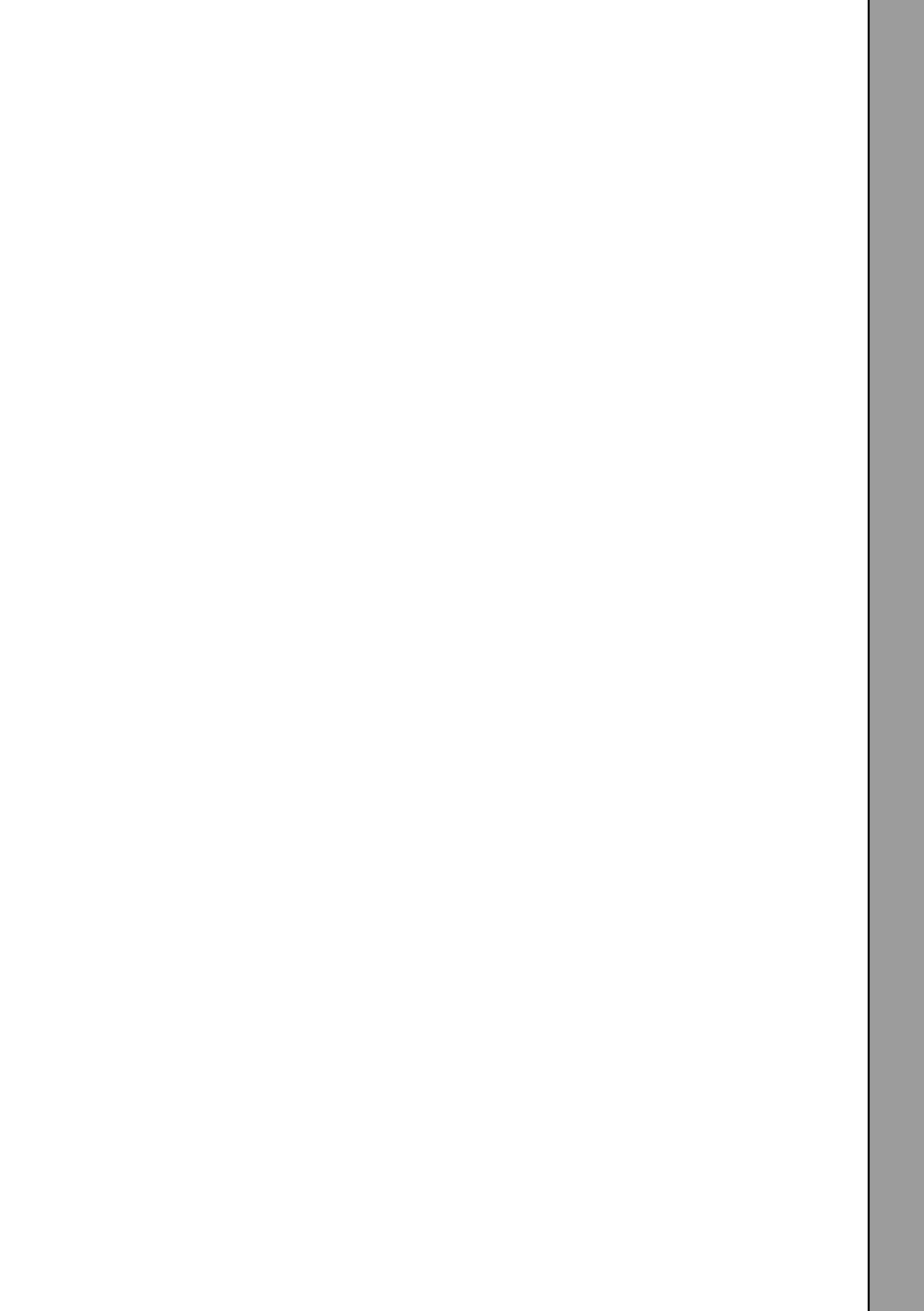
In any event, a fruitful way to facilitate a socially acceptable balance between financial stability on one hand and efficiency on the other, is to assign oversight of the adequate functioning of all financial markets to an institution separate from the prudential supervisor, along the lines of the twin peaks model.

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THE HOUSING BUBBLE, LIQUIDITY AND CENTRAL BANKS

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Synopsis

The US housing bubble was the main cause of the financial crisis and should not be regarded as merely a trigger. A typical “bubble mentality” emerged, which meant the downside risk for house prices was seriously underestimated, leading to mistakes by borrowers, lenders, rating agencies, security structuring firms, investors and regulators. Also the rapid growth in mortgage borrowing was an important source of the general excess liquidity prior to 2007 and is implicated in the shortage of liquidity since the crisis began. The collapse of the housing bubble will continue to play a crucial role in the fate of both the financial sector and the economy. It is slowing the economy through the collapse in house-building, tighter credit availability and via wealth effects, though the latter are very small so far. The Fed has responded well, providing liquidity as needed, avoiding a disorderly collapse of Bear Stearns and cutting rates rapidly once it became clear that GDP growth was threatened too. House prices look set to fall significantly further from the 17% recorded as of March 2008 (Case-Shiller index), since inventories are very

¹ The views expressed here are personal and are not necessarily shared by Standard Chartered Group or its affiliates.

high and mortgage availability is tight. But the scale of the eventual fall and the extent to which the personal savings rate will rise are major uncertainties. The potential for limiting the house price decline is limited, though there is a case for trying to prevent a huge undershoot on the downside (just as there was a case for trying to limit the bubble on the upside in this author's view). But monetary policy can do little on its own.

1. Introduction

The financial crisis beginning in August 2007 was triggered by the collapse of the US housing bubble and the sub-prime crisis. The word “sub-prime” is now in common parlance, though it was known mainly by consumer lending insiders before February 2007.² But the full importance of the US housing bubble for the shape of the 2005–8 world economic boom, and subsequent bust, sometimes now seems to be under-estimated. Many analyses treat housing as merely a trigger, with the implication that, even if house prices had remained stable, another trigger for the crisis would have emerged in due course. These analyses put the emphasis on a variety of factors including excessive liquidity creation, the originate and distribute model, mistakes by rating agencies, pro-cyclical leverage, de-regulation and lack of transparency.³

While these are all relevant contributory factors, this paper argues that it was the particular pathology of a bubble, in this case the housing bubble, which allowed the mistakes to happen. Moreover the rise in liquidity (to be defined later) was in part linked to the housing bubble. The housing bubble was sustained by the view that house prices were highly unlikely to fall, since they had not fallen in the US on a national level since the 1930s. If people had recognized that house prices could fall significantly (and were more likely to fall given how far they had risen), borrowers would not have borrowed so much, lenders would not have lent so much, rating agencies would have been more cautious in ratings and investors would have been less willing to buy housing-backed securities. Sometimes the crisis is attributed to a failure of risk analysis and indeed it was. But the particular failure was the underestimate of the risk inherent in house prices and mortgage lending during a housing bubble.

The focus on the housing bubble is important, not just in understanding the origins of the crisis, but also in anticipating how bad it may become, in designing policies to alleviate it and also in the debate about how to prevent something similar recurring. It may also be relevant for other countries though that is outside the scope of this paper. For investors, the course of

² The sub-prime crisis first hit the headlines in February 2007 when HSBC announced huge write-downs on its Household Finance Corporation business in the US, which is largely focused on sub-prime lending.

³ See for example Willem Buijter, *Lessons from the North Atlantic financial crisis*, paper presented to the New York Fed and Columbia Business School conference on the “Role of Money Markets”, May 29–30th 2008

house prices and the response of consumers to reduced wealth will remain a crucial determinant of the course of the US economy, at least for several more years. It will continue to have implications for related bonds and stocks, where some see amazing value and others see worse to come. But it will also help determine the course of markets in general.

The paper is organized as follows. First it briefly documents the housing bubble itself. Then the effects of rising prices are examined, outlining the linkages between the housing bubble, confidence, debt and liquidity which created a virtuous circle of rising wealth, rising liquidity and a strong economy. In section 4 the linkages to liquidity are further examined using a distinction between bankers', investors' and market liquidity. Then the paper looks at the effects of falling home prices, where the circle goes into reverse, before asking whether the authorities should attempt to limit the decline in house prices. The final section concludes.

2. The housing bubble

US home prices rose 106% from January 2000 to the peak in July 2006 and have since fallen back 17% (as of April 2008), returning to August 2004 levels. This is according to the S&P Case Shiller CS-20 index. The government's OFHEO index rose a lesser 70% and has since fallen back 4%. The CS-20 index measures the price changes for all recorded deals in the 20 largest cities, with or without a mortgage.⁴ The OFHEO index covers the whole country but includes only those deals with a mortgage provided or guaranteed by the Agencies, (e.g. Freddie and Fannie).⁵ The OFHEO index therefore excludes deals with sub-prime mortgages, jumbo mortgages (loans above the agencies' USD 417,000 limit) and also houses bought without a mortgage. During the bubble years these were the most common methods of financing in areas where prices rose the most.

Prices rose the fastest in the largest inner cities and inner suburbs, where space is at a premium, while increasing much more slowly in less dense areas where new supply is easier to create. The difference between the two indices is further widened because the CS-20 index weights by value, thus boosting the importance of the jumbo sector and, more broadly, the east and west coasts where prices are highest. Which is the best index? By excluding so much of the market the OFHEO index understated the bubble and is now understating the bust, while the Case-Shiller index may be overstating both. However, neither index includes condominiums, which is one of the worst affected types of property and the CS-20 also excludes foreclosed properties. Overall the Case-Shiller index is probably the best indicator of what is happening to housing wealth. At the time of writing it is widely expected to go lower.

The bubble reached its height during 2004–2005. The number of states with house prices rising 10% or more in the year to the fourth quarter was 8 in 2002, 14 in 2003, 22 in 2004, 25 in 2005, 8 in 2006 and 0 in 2007. (Note this is calculated using OFHEO data which understated the bubble). In the year to Q4 2005, five states plus Washington DC had gains of more than 20% - Arizona 34.9%, Florida 26.8%, Hawaii 23.8%, Washington DC 22%, Maryland 21.5% and California 21.1%. It was during 2005 too that many of

⁴ See www.homeprice.standardandpoors.com

⁵ See www.ofheo.gov OFHEO stands for Office of Federal Housing Enterprise Oversight and is the regulator for the government-backed mortgage providers Fannie and Freddie.

the other characteristics of a bubble became increasingly evident, including massive media attention and highly speculative buying (see table 1).

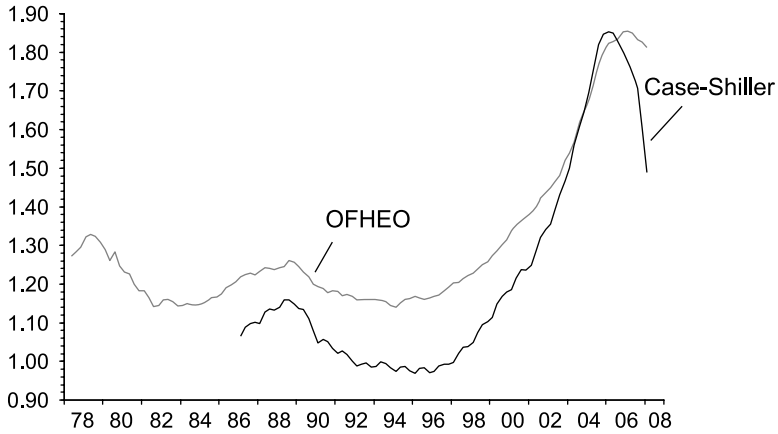
Table 1: Checklist: Typical characteristics of a Bubble

- Rapidly rising prices
- High expectations for continuing rapid rises
- Overvaluation compared to historical averages
- Overvaluation compared to reasonable levels
- Several years into an economic upswing
- Some underlying reason or reasons for higher prices
- A 'new' element – e.g. technology for stocks or immigration for housing
- Subjective 'paradigm shift'
- New investors drawn in
- New entrepreneurs in the area
- Considerable popular and media interest
- Major rise in lending
- Increase in indebtedness
- New lenders or lending policies
- Consumer price inflation often subdued (so central banks relaxed).
- Relaxed monetary policy
- Falling household savings rate

Source: John Calverley, *Bubbles and how to survive them*, Nicholas Brealey, 2004, p 13.

Exactly how big the bubble became is a matter of much debate. The IMF recently concluded that US home prices were only 11% overvalued as of mid 2007.⁶ This would imply about a 15% overvaluation at the peak and, with the fall in house prices since then, prices should be approximately in equilibrium now. However in comparison to past cycles the ratio of house prices to consumer prices became much more elevated this time (see chart 1). On this metric, the decline so far looks to be less than half the decline needed to bring prices back to equilibrium. Those who doubt such a bad outcome focus primarily on lower real and nominal interest rates than in past cycles.

⁶ IMF World Economic Outlook April 2008

Chart 1: US House Prices in Real Terms

Source: DATASTREAM/G2Q5

Very expensive compared to past cycles. The Case-Shiller index went up more and down more because it includes sub-prime and jumbo mortgages.

However, the financial crisis has significantly tightened mortgage availability. The market for jumbo mortgages seized up almost entirely for a while though it is now open again. The market for sub-prime mortgages remains largely closed. For all borrowers, borrowing criteria have tightened, mortgage appraisals are much tougher and documentation now has to be exact. Meanwhile mortgage rates are little different from those prevailing before the crisis despite the big fall in the Federal Funds rate and in long-term Treasury bond yields.

Moreover, given the overshoot in house prices on the way up (by almost everyone's reckoning) there is a real risk of an overshoot on the way down, even if the equilibrium ratio for real house prices or house prices to rents can legitimately be higher than in the past. At this point, there remains a huge inventory of houses for sale, both new and existing, which points to further price declines for the remainder of 2008. Much will depend on the course of the economy and particularly of unemployment in the next year or so. But it would seem brave to assume that we are near the bottom for house prices at this point.

Why did house prices rise so much? Low nominal and real interest rates clearly played a key role. Some blame the Fed for keeping rates too low during 2003-5. Others focus more on low world interest rates, due to "excess savings", particularly in Asia as the aftermath of the Asian crisis led to a collapse in investment in Asia (outside China). There were also factors particular to housing including faster rates of immigration, more foreign purchasers (partly

linked to housing bubbles elsewhere), a widening distribution of income which probably spurred investment property purchases and a change in capital gains tax which made gains on housing subject to less tax.

Once the spiral began, there were two key reinforcing mechanisms to keep it going. One was financial innovation, always a feature of bubbles. Partly because the risk was deemed low, (“safe as houses”), and partly because of strong demand there were several innovations, or in some cases a much more widespread use of techniques that were used narrowly before. These included sub-prime lending, adjustable rate mortgages (previously most US mortgages were long-term fixed rate), interest only mortgages, option mortgages, the slice-and-dice approach to bundling mortgages (to enable tranches to be highly rated) and the increased role of the Rating Agencies and the Monoline insurers.

The other key reinforcing mechanism was the so-called “bubble mentality”. This manifested itself in the strong belief that house prices could never fall and that easy money could be made. Some home-buyers rushed to buy out of fear, rather than greed, fear that prices would rise even higher. But many chose to buy larger houses than they needed or simply bought rather than rented, convinced that it was a sure-fire investment. This was facilitated by very high LTVs with 100% easily attainable and sometimes more. Others bought property to “flip”, to rent out or as a vacation or retirement home. By 2004–5 the “bubble mentality” became widely held among buyers, lenders, rating agencies, mortgage security structurers, investors and apparently also regulators.

3. The effects of rising house prices

During the boom years, roughly 2003–6, rising US home prices formed part of a virtuous circle with rising confidence, rising borrowing, rising economic activity and rising liquidity (to be defined later). Any one of these five links in the circle can be taken as the starting point, though once begun the cycle had strong positive feedbacks. We might posit the very low Federal Funds rate during 2003–4 as the original cause, and indeed it may well have been crucial in starting the circle.

I want to start from rising house prices, not because this was necessarily the starting point but because, in my view, it became the driver of the circle, as prices moved increasingly into bubble territory in 2004 onwards. The rise in home prices led through rising confidence to increased borrowing as home-buyers and investors sought to cash in on the boom. The rise in borrowing of course fuelled the rise in home prices, especially as loan-to-value ratios rose and new buyers, who conventionally relied on renting, entered the market. But the rise in borrowing also permitted mortgage equity withdrawal (MEW), also sometimes called Home Equity Withdrawal.

The conventional concern of those analyzing MEW is the extent to which it fuelled spending in the economy. Estimates vary from 5-10% of the amount withdrawn. Without doubt there was a stimulus too, from higher rates of home-building. Residential investment rose from 4.5% of GDP in Q1 2000 to a peak of 6.3% in Q4 2005. It made a significant contribution to GDP growth particularly during 2003-5 adding respectively 0.41%, 0.53% and 0.39%. In 2007 it subtracted 0.98% from GDP growth and 2008 is on course for a similar decline.⁶⁷

However MEW is also interesting for two other important roles. One is in boosting house prices further by providing the down-payment for purchase of investment, vacation and retirement homes. This of course fuelled the bubble. Another is in adding to money balances (or liquidity in one sense). A significant portion of MEW was used to purchase financial assets or held on deposit.

⁷ US Department of Commerce. Bureau of Economic Affairs. GDP release

Table 2: How the housing bubble affected consumer balances in 2005

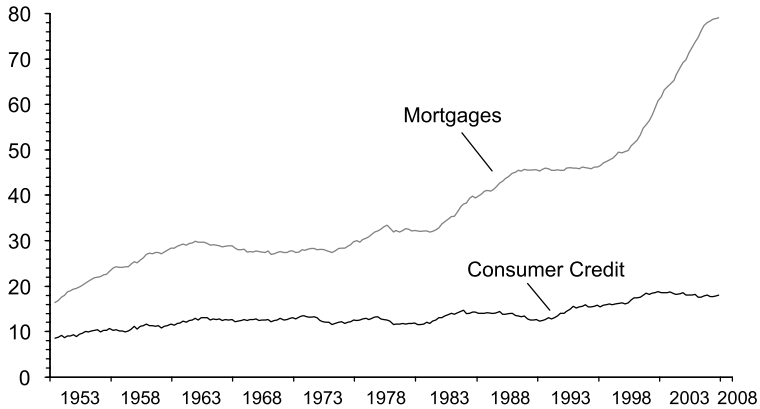
Height of the bubble. (Disposable income = \$9092bn)

- Saved \$44 bn (NIPA defn, excludes consumer durables)
- Invested \$202 bn net in consumer durables
- Invested \$423 bn in housing (new building, extensions)

- Borrowed \$1702 bn (of which \$1096bn in mortgages)
- Acquired \$909 bn net in financial assets

- Net worth rose \$3688 bn (of which \$2219 bn housing)

A snapshot of how the housing bubble affected consumer balances in 2005 is given in Table 2. Personal disposable income was a little over USD 9 trillion, but personal savings was only USD 44 billion or just 0.5% of income. This is the NIPA definition, which excludes net investment in consumer durables of USD 202 billion. There was a further USD 423 billion of investment in housing, including new buildings and extensions etc. Adding all these up would give a total savings rate (i.e. not spent on perishables), of 7.3%, still relatively low. Meanwhile households borrowed a whopping USD 1,702 billion of which USD 1,096 billion was in mortgages, which allowed them to add USD 909 billion to financial assets. But crucially, despite heavy borrowing and very little savings, net worth rose USD 3,688 billion (over 7%) of which USD 2,219 billion was higher housing values. The latter would include the USD 423 billion new investment but still leaves home price appreciation amounting to around 20% of disposable income. Overall then, the virtuous circle brought higher spending, higher asset prices, higher debt and higher liquidity.

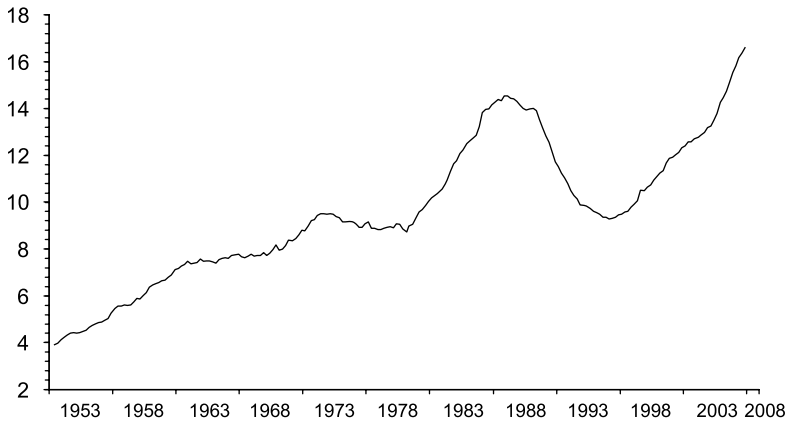
Chart 2: US Household Credit/GDP

Source: DATASTREAM/G3HX

Consumer credit easing down in recent years – easier to borrow against houses. Mortgages up from 45% of GDP to 80%.

The rise in mortgage debt during the bubble is striking (see chart 2). Between 2000 and 2007 mortgage debt rose from 49% of GDP to 79%. In the 1980s house price cycle it rose by less than half that proportion, from 32% to 45%. (The housing boom in the 1980s was more narrowly confined, affecting mainly a few states in the North East and California.) While mortgage debt rose rapidly consumer credit fell slightly as a proportion of GDP. Consumers realized that it was cheaper to borrow against their house than to use credit card or installment debt. For comparison, US commercial mortgages also rose after 2000, but by only 6 percentage points of GDP to 16.6% (chart 3). Some problems are emerging now in the commercial real estate market with the tightening of credit and slowdown in the economy but housing is the main event in this cycle.

Chart 3: US Commercial Mortgages/GDP

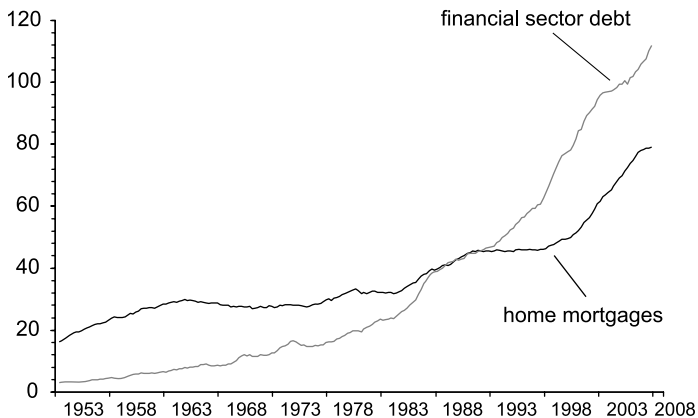


Source: DATASTREAM/G3HY

A pronounced cycle. Up strongly in recent years but not very large in relation to GDP. Problems emerging now but housing is key.

It is interesting to compare the growth in mortgage debt with the rise in the debt of the financial sector of the economy (chart 4). Financial sector debt has grown explosively since the 1970s but in this decade it increased from 77% of GDP to 110% of GDP, a 33 percentage point rise, just slightly more than the rise in mortgage debt. Of course financial sector debt has played a major role in the expansion of liquidity as we shall see in the next section.

Chart 4: Mortgages and Financial Sector Debt to GDP



Source: DATASTREAM/G3PQ

The two growth areas for lending in the last decade

4. The linkages to liquidity

Practitioners use the word liquidity in three senses, what I will call the bankers' view, the investors' view and the market-makers' view. For bankers, liquidity means plentiful deposits and/or low interest rates. The practical banker may face "too many" deposits, and struggle to find a use for them in lending. In this situation, provided that she is comfortable with the risk and can raise sufficient capital, she may well go out to find new areas of lending. Banks' balance sheets, credit growth and money supply are constrained only by capital in the modern system. The housing bubble mentality spread to banks as well, with management seemingly not recognising the risks. Bankers' liquidity was high until August 2007, as evidenced by low lending spreads and the growth of bank lending.

For investors, liquidity is the part of their portfolio held in instruments which are both low risk and easily realizable in the short term. This usually means short term bank deposits or securities such as Treasury Bills and money market funds, though for a while during the boom some other assets were seen as equivalent, notably asset backed commercial paper and even the auction bond market. It excludes investments such as TIPs (unless they have a very short maturity) as their value can change substantially in the short run even though they are the lowest risk investment for a long-term investor.

Investors usually hold plenty of liquidity in three circumstances – when they are active in illiquid assets such as houses, (and therefore have funds waiting to invest or following capital gains), when they have just drawn down a loan, or when they are deliberately holding lots of liquidity waiting for a lower entry point in risk assets.

The latter condition has held to a high degree in late 2007/early 2008 as investors have stood on the sidelines waiting for an opportunity to invest. But during the boom times it was the first two conditions which boosted liquidity. Home buying transactions surged with existing home sales up from 5.2 million in 2000 to 7.1 million at the peak in 2005 and new home sales up from 1.6 million to 2.2 million. At the same time, remortgaging and home-equity-lines-of-credit (HELOCs) surged. As already noted, there was substantial mortgage equity withdrawal in this process, a large part of which added to investors' liquidity. In time, some went into stocks and bonds

and other investments. Some probably also went into other assets such as antiques, collectables etc.

HELOCS played an important role. In fact, stretching the concept of investors' liquidity here, there is little doubt that many Americans saw themselves as being not only wealthier but also enjoying more liquidity simply through higher house prices. Since late 2007 many banks have withdrawn previously agreed HELOC lines as home prices fell. This seems to have left many Americans feeling vulnerable as they had regarded these lines the same way many people regard deposits in the bank as a safeguard against a "rainy day".

For professional investors liquidity rose too, partly as home-owners MEW came their way, but also because of increased leverage. The expansion of hedge funds, as well as the liberalization of the rules for mutual funds allowing them to use more derivatives and increase leverage, gave professional investors access to more liquidity. By 2005–6 the LTCM debacle had been largely forgotten and the stock market crash was dwindling in memory too.

Finally, market liquidity increased as well. Here it was the increased flows into hedge funds that were probably the main driver. This was reinforced by strong confidence about the economy and financial system, as markets were pricing risk so low. If markets should be regarded as efficient, then in 2006–7 they were saying that credit risk generally was very low and liquidity risk could be ignored.

5. Liquidity during the crisis

In August 2007, with the sudden emergence of the financial crisis, bankers' liquidity tightened sharply as placers of funds in wholesale markets became reluctant to place funds with banks other than very short term while takers of wholesale funds found they had to pay substantially more. In the most extreme cases, where institutions relied particularly heavily on wholesale markets or where doubts existed, at least in the minds of some, as to their solvency, liquidity dried up altogether bringing the failure of IKB Deutsche Industriebank, Sachsen LB bank, Northern Rock and later Bear Stearns. Placers of funds were reluctant to take any risk. Even some "household name" large banks, normally regarded as "too big to fail", faced difficulties at first.⁸

As the credit crisis continued, banks increasingly realized that some off balance sheet vehicles (SIVs, conduits etc) would need to be brought back on balance sheet while some warehoused assets, e.g. LBO loans could not be sold off in the market, at least for a while. That meant the banks would need more liquidity in time. In the first half of 2008 the overnight liquidity markets were clearing more easily but the availability of longer term placements remained very difficult, forcing banks to rely more on very short term lending and thereby raising tensions. The various central bank schemes helped, and ensured that money went to the weakest institutions but banks reliant on wholesale funding still felt vulnerable.

Fully restoring bankers liquidity will likely require not just this liquidity provision but sufficient new capital for banks to once again feel comfortable in extending loans to leveraged counterparties. This will take time for several reasons. First, losses are continuing and, especially if the economy performs poorly, they can be expected in the whole range of credit outstanding, consumer and business lending, not just in sub-prime mortgages. Secondly, the final extent of mortgage losses is highly uncertain, depending heavily on how far house prices eventually fall but also the proportion of borrowers who "walk away". Finally, new capital is needed not merely to replace losses but also because banks are likely to deliberately operate their balance sheets with

⁸ It was reported to me in conversation that lending to such institutions was not worth the extra spread because, even though there should be no losses in the event of a failure, placed funds might be locked-in for a time i.e. become illiquid. To paraphrase "If we wake up one morning to find a major institution intervened by the authorities, nobody wants to have to tell their boss or the Board that they had short term placements there".

higher ratios going forward, under pressure from regulators, management and investors.

The shortage of bankers' liquidity from August 2007 onwards quickly spread to market liquidity, as players de-leveraged. Banks tightened up on margin lending to hedge funds, as they tried to reduce their overall asset base and also cut risk in very volatile markets. In early 2008, after the Bear Stearns collapse, prime brokers (i.e. the large investment banks) sharply tightened their margin requirements, forcing many hedge funds to reduce leverage. This drop in market liquidity contributed to a reduction in volumes and a widening of spreads.

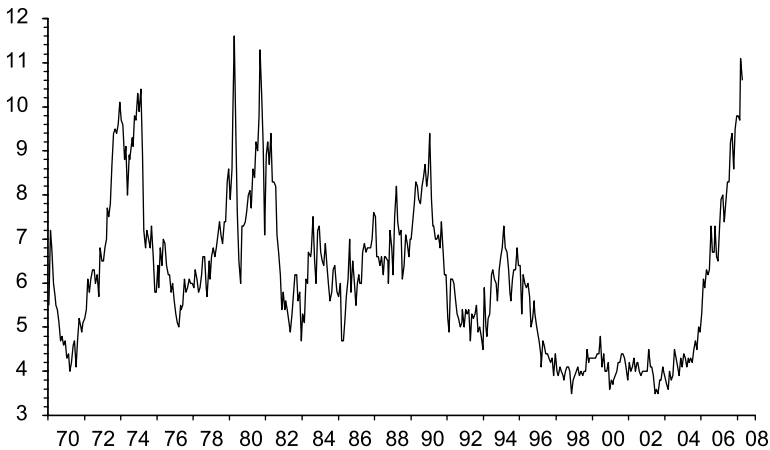
Finally, the third type of liquidity, investors' liquidity, did not change as fast as bankers liquidity at least for non-leveraged investors. Indeed some investors sold risk assets to hold more cash (liquidity).⁹ Repeatedly, during the crisis we have heard that investors are "liquid", or there is a "lot of liquidity on the sidelines" waiting for sufficient comfort to invest. Investors' liquidity was naturally boosted by regular savings contributions such as pension and insurance funds. It was also buoyed by money accruing to oil producers, some of which came back into markets via Sovereign Wealth Funds. For the typical US household, however, the fall in house prices will imply a fall in liquidity over time as the virtuous circle outlined before goes into reverse.

⁹ Of course, selling a security does not increase overall liquidity since the purchaser sees a corresponding fall in liquidity. But declining securities prices (stocks and credit instruments etc) raises the *proportion* of everybody's portfolio that is in liquid assets.

6. The effects of falling house prices

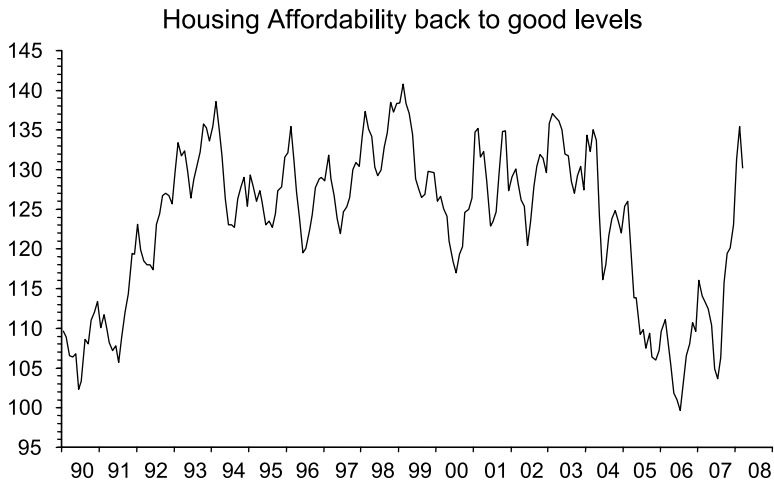
As already noted, the extent to which house prices will fall is very uncertain. At present the overhang of inventories suggests that the direction will be down at least for a while (see chart 5). However affordability is improving with the combination of the fall in prices and continued rise in earnings (see chart 6). Much will depend on how bad the economy becomes and, in particular, how much unemployment rises. However house prices will also be influenced by the extent to which the reverse of the bubble mentality takes hold. Often, following a bubble, a market reaches a state of “revulsion” where nobody believes it can ever possibly be a good investment again. When prices first retreat from the top there are often willing buyers, but after a while repeated disappointment makes buyers very cautious. Meanwhile sellers may resist lower prices at first but later, after persistent price declines, they despair and become desperate to sell. Hence there is a serious risk of an overshoot.

Chart 5: Huge Inventories - Months Supply



Source: DATASTREAM/G3MY

Existing homes for sale in months of supply

Chart 6: Housing Affordability - Back to Good Levels

Source: DATASTREAM/G3NO

Overall then, it seems safe to conclude that the national house prices indices have substantially further to go. But within the averages for the national price index there are wide variations between different regions and even between different neighbourhoods within the same region. Hence a 30% fall in the overall index may have little impact in some parts of the country which see only a 5–10% decline, while other areas are seeing a devastating 40–50% decline.

The effects of the housing bust are already evident in the performance of the US economy. The slowdown in US GDP growth in Q4 2007 and Q1 2008 to 0.6% pa and 1% pa respectively is attributable to three factors. First, the collapse in house-building continued to subtract more than 1% pa from growth (as it had in Q3 as well, following subtractions of 0.75% in H1). Secondly, Q4 saw a substantial cut-back in inventories as fears over the economy prompted a production cut-back by firms, which was also linked to a slowdown in hiring. Inventories were more stable in Q1 2008 but then the third factor, a sharp slow-down in consumer spending, held back GDP growth. Consumer spending grew 2.3% in Q4 2007, only slightly below the 2.6% average of the first 3 quarters of 2007 but then slowed to only 1.1% in Q1 2008.

It would be convenient for this paper if the slowdown in consumer spending could be entirely attributed to the fall in house prices. However, there is another contender - higher oil prices. In Q1 2008 consumers paid out an extra USD 24 billion in oil and fuel costs compared with Q4 2007, due to higher

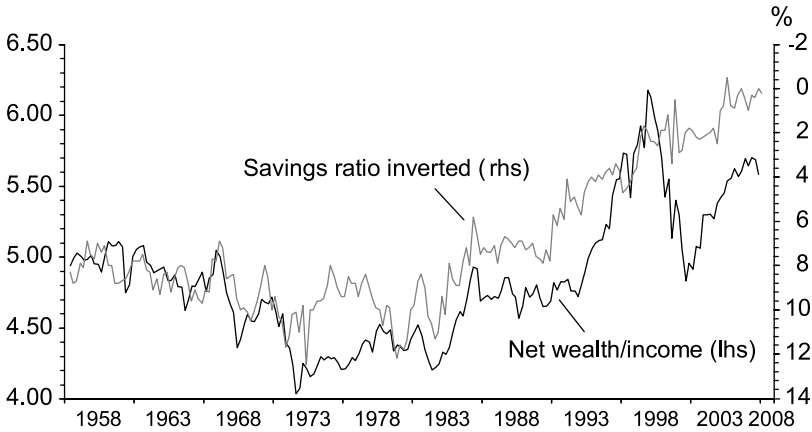
oil prices. This came out of an overall gain in income of USD 137 billion. About another USD 50 billion of the total gain in income was needed to cover core inflation of just over 2% pa. That left about USD 60 bn for consumers to spend on “real” spending growth. In fact they spent only about USD 20-30 bn and saved the rest. This is a “back-of-the-envelope” calculation but it illustrates that the US downturn is partly attributable to the oil shock and partly to housing.

Another approach is to look at the personal savings rate since negative wealth effects should show up in a higher savings rate. The savings rate did indeed rise from 0.2% in Q4 2007 to 0.6% in Q1 2008. This is still very low but represents a sizeable move for one quarter. However we cannot simply attribute the rise to lower wealth. The low savings rate of recent years is partly due to heavy borrowing, since saving is simply the residual of income after subtracting spending (some of which is paid for with borrowings). Consumers might have *chosen* to borrow less because of reduced wealth but it is also possible that the sudden tightening of lending markets due to the crisis acted as a *constraint* on borrowing. If this constraint proves temporary, and mortgage markets have already opened up again after freezing for a time, then the savings rate could go back down again. But the savings rate may also have been influenced by general fears of an economic downturn and weaker jobs market, given the pervasive gloom about the financial crisis.

So it is too early to conclude that the housing wealth effect is already operating. Wealth effects are generally thought to operate over a time horizon of several years rather than months or quarters. In time, however, it does seem likely that the housing bust will bring a rise in the savings rate. From the low levels of recent years there is the potential for a rise of several percentage points, though this expectation is shrouded in uncertainty. Household wealth dropped sharply during the collapse of the stocks bubble in 2001–3 yet, despite falling wealth as well as high unemployment and a war, the savings rate only rose slightly (chart 7). Also much will depend on the performance of the stock market. Housing at the peak accounted for about 40% of wealth with stocks around 35%. If the stock market is weak too, overall wealth could be reduced substantially, not least because, given the leverage in housing, a 25% fall in house prices translates to a nearly 50% fall in housing equity.¹⁰

¹⁰ In the second half of 2006 home mortgages equalled 45% of the value of housing, up from 38% in Q1 2000. The latest figure, for Q4 2007 is 47%. Source : Federal Reserve Flow of Funds Accounts.

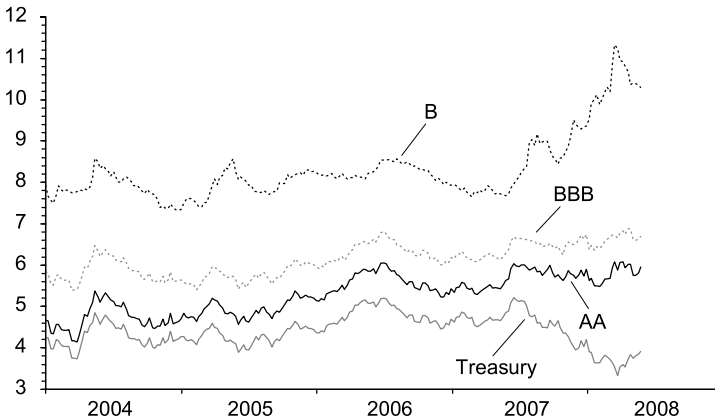
Chart 7: US: Rise in Household Savings?



Source: DATASTREAM/G1RI

The savings rate is near zero and probably will rise. But note that it did not rise much in the early 2000s after the stocks bubble burst. Will it rise this time?

Chart 8: US corporate bond yields



Source: DATASTREAM/G3H6

A rise in the savings rate could finally allow the world economy to find a more sustainable balance. It would imply slow growth in US consumer spending for an extended period, which in turn means relatively low US interest rates and therefore, probably, the dollar remaining undervalued. This should mean that the current account deficit continues to contract. From the peak of 5.4% of GDP in 2007, our forecasts suggest the current account deficit will decline to the 4–5% range in 2008 and into the 3–4% range in coming years. For the

US, there is a danger that if net export growth is not sufficient to make up for slow consumption growth, GDP growth will be low and this will mean a worsening of the fiscal deficit. In contrast to the 2000-3 period, when the US started from a fiscal surplus and so a massive fiscal stimulus to deal with the collapse of the stocks bubble was easily accommodated, the US entered this crisis with a Federal deficit of about 2% of GDP. With considerable background concern about long-term fiscal sustainability the US fiscal deficit is likely to be a major issue in coming years.

The other main danger is that the rest of the world is unable to absorb rising net exports from the US and so slows down too. Until now, the investment boom in Asia and many oil producing regions has kept world growth relatively buoyant, helping in particular US, German and Japanese capital goods exporters. If the Asian investment boom drops off, the whole world will be in for a period of slower growth. High oil prices are a major problem in all this. To contain inflation expectations central banks have little choice but to react to higher prices with stable or tighter policy, depending on the domestic situation. Yet high oil prices are deflationary as well as inflationary, so the economy will tend to slow. The combination of the US slowdown, high oil prices and over-tight monetary policy could easily create a severe world slowdown later in 2008 and 2009. This would undoubtedly make the US adjustment more difficult and mean that the 2% Fed Funds rate and 3.3% 10 year bond yield (seen in March 2008) are not, after all, the lows for this cycle.

Overall then just as rising home prices contributed to increased borrowing, debt, GDP growth and liquidity, falling home prices will have the opposite effect on the way down. However, a crucial difference is that it is harder to reduce debt than to increase it. In part the process will happen through slower debt *growth*. But there may also be a reduction in debt itself, which can be a difficult and deflationary process. If the debt is repaid by borrowers they have less to spend, so GDP is reduced. If the debt goes into default or is forgiven the lender faces a loss and is likely to be cautious in future lending, while the lender's stock-holders and possibly employees suffer. Another alternative is that the debt is bailed out by the tax-payer, which probably has the least deflationary impact. But although the government has introduced a number of schemes to help the housing market, it looks unlikely they will be substantial because of strong political resistance to any bail-out of either the banks or of marginal borrowers. The final alternative is that the debt is transformed into a lower rate debt, with the help of government guarantees. Already this is happening with, for example, the rise in the "conforming loan" limit for the government-backed agencies, bringing many jumbo loans into

their ambit for the first time. Because of the implicit government guarantee for the Agencies, the interest rate can be lower. However, if house prices fall sufficiently far, this could still end up with a government bail-out given how thinly capitalized the Agencies are.

7. Should the authorities attempt to limit house price declines?

The debate continues as to whether the authorities should attempt to limit a bubble on the upside, or even deliberately prick it. But what about on the downside? Is there a case for trying to put a floor under the market? The case for action rests on four arguments. First, the greater the slide in house prices the greater the risk of a particularly bad outcome for the US economy and perhaps the world economy too. Secondly, the more home prices fall, the greater the damage to the banking system, directly via greater losses on mortgages and also through worse losses in other areas, if the economy overall is weaker. For the government, there is also the risk of a significant fiscal cost later if they need to bail out the Agencies. Thirdly, there might be a case for trying to limit the downside to prevent an overshoot of prices below equilibrium (wherever that may). Finally, there are political arguments (and pressures) for helping the individuals and banks worst affected.

There are essentially three arguments on the other side. First, there is the simple argument that it can't be done. The government is not likely to be able to put a floor underneath a collapsing USD 20 trillion housing market and USD 10 trillion mortgage market without taking on an unacceptable fiscal burden or fiscal risk. Secondly, there is the moral and political argument that it would not be fair to artificially limit the downside in prices. Not fair to renters and young people hoping to buy at a lower price, nor, if tax-payers funds are used, to the "silent majority" of home-owners who pay their taxes and meet their mortgage obligations. It would probably also be difficult to implement in a fair way some of the proposals to re-structure mortgages. Some people might gain from it, perhaps by "gaming" government schemes, while others miss out. The final argument is that it is much better to let markets find their own level, ensuring they give the correct price signal. This also reduces the risk of moral hazard next time round.

In practice the authorities have limited options for influencing the housing market so limiting the overshoot seems to me the only hope anyway. With prices falling fast at the moment it would be wise to let them fall some more first before attempting very much. So it may not matter that measures could take a long time coming. The political side will doubtless play out during the election campaign but with many commentators expecting both Houses

of Congress to be controlled by Democrats and with a strong chance of a Democratic President, an interventionist approach next year is quite likely.

There are perhaps three broad types of policies to consider. First, the Fed could keep the Federal Funds rate low for an extended period, in a way analogous to those who argue for “leaning against the wind” during a bubble. However, this is open to the same objections as on the upside, if conditions in the economy do not otherwise warrant low rates. Indeed many argue that keeping rates too low after the collapse of the stock bubble was the mistake which allowed the housing bubble to inflate. And some argue now that commodities are in a bubble because of the current low Fed Funds rate. It is also true that a low Federal Funds rate would not necessarily keep mortgage rates low. With most borrowers now reverting to long-term fixed rate mortgages, it is the level of the 30 year US Treasury yield which matters most and that is only loosely related to the Federal Funds rate.

Some argue that the Fed should follow a low interest rate policy to deliberately foster consumer price inflation.¹¹ High inflation would allow the house price adjustment to proceed with less of a nominal house price fall and therefore less stress for debtors. It is extremely doubtful whether the Fed or any central bank is willing to give up the anti-inflation orthodoxy of the last two or three decades, but even if they were, bond markets would sell off taking mortgage rates up anyway. Overall, then it would seem that monetary policy alone can help little more when a bubble bursts than when it is inflating, though a gentle “leaning against the wind” may still be worthwhile contemplating.

The second approach is to work to keep mortgage markets open by ensuring spreads are low and terms not too onerous. This approach has been enthusiastically embraced by both the Fed and the Government, with the Federal Home Loans Bank stepping up to buy mortgages from commercial banks and the Agencies (Freddie Mac and Fannie Mae) effectively guaranteed by the government which is keen to encourage them to expand their operations. In recent months the government-backed mortgage sector has accounted for the huge majority of new mortgages, up from a little less than 50% historically. However this approach may have a limited effect on restraining the collapse in home prices. First, the terms of these mortgages are naturally more conservative than during the bubble when sub-prime and Alt-A mortgages were widely available at high LTVs and with limited documentation. Secondly, just as it is argued that few people will be deterred from buying a house in a bubble period

¹¹ See for example John Makin, *The Inflation Solution to the Housing Mess*, article in Wall Street Journal, April 14th 2008, p A15

by slightly higher interest rates, so, during a bust, slightly lower interest rates may have only a limited effect. Finally, despite government efforts to shore up Fannie and Freddie they may yet struggle to maintain the level of mortgage lending desired by the government, simply because it may not be in their share-holders' best interests.

The third broad approach to supporting the housing market is to try to limit the flood of foreclosures. Both the government and the Federal Reserve have urged banks to show forbearance, giving home-owners better terms to encourage them to stay in their homes rather than proceeding to foreclosure. However banks face serious practical problems in negotiating a deal satisfactory to all, not least lack of experienced staff. Moreover, borrowers who find themselves with negative equity of 10–30% may naturally walk away unless banks are prepared to forgive as much. But banks cannot routinely forgive large amount to some borrowers without facing a clamour for help from others.

Barney Frank, Chairman of the Financial Services Committee of the House of Representative has been leading the way to develop a structured approach, where banks agree some forgiveness in return for a guarantee on the new mortgage. This looks like an attractive compromise where banks take some losses but less than they might through foreclosure, the government takes on some contingent risk and homeowners accept some loss of equity but keep their home. However, again, if home prices fall too much homeowners may prefer to walk away while, if they don't the government could be exposed to loss. At the end of July 2008 this was enshrined in new legislation due to be implemented in October. Most observers believe these measures will help a little but not very much. They may be expanded next year if home prices are still weak and the political landscape has changed.

8. Conclusion

The US housing bubble was the main cause of the financial crisis and should not be regarded as merely a trigger. A typical “bubble mentality” emerged, which meant the downside risk for house prices was seriously under-estimated, leading to mistakes by borrowers, lenders, rating agencies, security structuring firms, investors and regulators. Also the rapid growth in mortgages was a crucial source of the excess liquidity prior to 2007 and is implicated in the shortage of liquidity since the crisis began. The collapse of the housing bubble will continue to play a crucial role in the fate of both the financial sector and the economy.

The Fed has responded well to the financial crisis, providing liquidity as needed, avoiding a disorderly collapse of Bear Stearns and later of Freddie and Fannie, whilst cutting rates early and rapidly once it became clear that GDP growth was threatened too. The situation has been complicated by the surge in oil prices which is also contributing to the economic slowdown. Bankers’ liquidity has stabilized though is not back to pre-crisis levels, market liquidity has fallen significantly with the deleveraging of hedge funds, while investors liquidity has fallen less so far. But the big decline in mortgage equity withdrawal will show up here eventually too.

The housing bust is slowing the economy through three main channels. First, there is the collapse in house-building which has been subtracting around 1% from GDP growth over the last year. Secondly, credit availability has been severely curtailed – to consumers as collateral values have fallen but also to all but the best risks in every area as banks cut back their exposures due to the crisis. Thirdly, wealth effects from falling home prices may have begun though they are likely small so far. It is too early to be sure whether the small rise in the savings ratio in 2008 is due to wealth effects or due to concerns about the economy, jobs or oil prices. Longer term wealth effects could be very significant and take the household savings rate up considerably. While this will keep the US economy slow and risks setting off a global slowdown, it will nevertheless contribute to a correction of the international imbalances. But get ready to worry again about the budget deficit!

House prices look set to fall significantly further from the 17% decline recorded as of March 2008 (Case-Shiller index), since inventories are very high and mortgage availability is much tighter than before the crisis. But

the size of the eventual house price fall and the extent to which the personal savings rate will rise are major uncertainties. The author's expectation is that the savings rate will rise slowly in the next few years, constraining domestic demand in the US economy. This will be offset to some extent by buoyant net export growth, depending on how well the rest of the world is doing.

The potential for limiting the US house price fall is limited though there is a case for trying to prevent a huge undershoot on the downside (just as there was a case for limiting the bubble on the upside in this author's view). But monetary policy can do little on its own.

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