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Introduction

I would like to begin by expressing my gratitude for being given the opportunity to address this impressive group of academics, risk management professionals and central bankers.

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I am sincerely glad to be here, as the topic of this conference – “Risk measurement and systemic risk” – is of special interest to me, for at least two reasons: first, as the BIS’s Chief Risk Officer (CRO), issues related to risk measurement are very much a part of my day-to-day activities. Fortunately, or unfortunately, running an effective risk control unit can be a “boring” exercise. In fact, the more successful the unit, the less you have to worry about, and the more “boring” your life can be. But, all in all, if I had to choose between comfort and excitement in this kind of business, no doubt I would much prefer to confine myself to interpreting the results of stress test scenarios, rather than having to deal with live situations.

Second, as a former member of the committee now named CGFS (Committee on the Global Financial System), the focus on systemic risk issues has been part of my professional career, from the Latin American crisis in the mid-1980s to the episodes of financial instability that we have experienced most recently.

That is why, using my two roles at the BIS as a starting point, I will organise my speech tonight as a story of two perspectives: (1) The *CRO’s view* on the importance of risk management for the day-to-day operations of the BIS as a bank; and (2) a *central banker’s view* on the changing nature of the concept of systemic risk.

The CRO's view: the role of risk measurement and management

It may come as a surprise to some of you that the BIS not only bears the title “bank” in its name, but actually is a bank – although a very specialised one. Indeed, with a balance sheet of SDR 180bn (the equivalent of EUR 210bn, as of end-March 2005), the BIS offers a wide range of financial services to assist central banks and official monetary authorities in the management of their foreign reserves.

How is risk measurement and management important for the BIS?

The BIS aims to offer its central bank customers two key things: the “safety and liquidity” of their deposits and the reliability of the BIS's services – even in times of crisis. By design, it is thus a “conservative” investor, avoiding many of the risks that other banks take. This implies that, for lack of involvement in trading some of the more complex instruments used by private sector institutions, demand for highly sophisticated risk measurement and management tools is perhaps somewhat less pronounced than elsewhere. Still, like any other financial institution, the BIS has to balance the opportunities and complexities created by financial innovation with best practice standards, customers' demands for diversified services and shareholders' preference for prudence. Hence, there is a need for constant monitoring of market developments, counterparty assessments, and the subsequent determination of any adjustments to the bank's overall exposure to credit, liquidity and market as well as operational risks. In other words, there is a need for quantitative approaches, such as value-at-risk based models and stress tests, to measure and effectively control risk, appropriately embedded into an overall risk management framework. Indeed, we find it useful to discipline ourselves by having the communication channels and internal controls in place that are so essential in fostering a risk management culture within an organisation.

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Let me note that all this is very much standard procedure across the financial world. But “best practice” has evolved substantially over the last 10-15 years. One issue that is of particular concern for the BIS and, in fact, regularly consumes quite a bit of my own attention is the trade-off between credit quality and concentration risk considerations. To control this risk, we have a series of limits in place, which are derived from the BIS's own internal credit analysis. Among other things, this analysis utilises a Merton-type model and credit default swap spreads in looking for market signals on credit quality. This, again, is very much standard. However, given the aim of providing our clients with “safety and liquidity”, our policies result in the vast majority of the bank's assets being invested with high-quality sovereigns or financial institutions rated A or above. In addition, the number of counterparties big enough to accommodate our business needs is very limited, especially in the domain of OTC derivatives. As this limits the number of eligible investments and counterparties, the BIS runs significant credit risk and business volume concentrations. In fact, the resulting triangularity between credit quality,

liquidity and concentration is exacerbated not only by the growth of our own business volume, but also by the continuing merger activity among issuers and counterparties. As most of you will agree, a situation like this requires careful monitoring and management of the resulting risks; and models alone, though helpful, do not guarantee that we get such a trade-off right. Furthermore, the use of collateral can help mitigate the counterparty risk posed by positions in OTC derivatives, but leaves open a significant part of the risk involved.

Still, sound risk measurement is an indispensable tool for providing decision-makers with the quantitative information needed to better understand the inherent risks of alternative decisions and to underpin otherwise qualitative judgments.

On this basis, I think it is fair to say that financial research has materially influenced the way business is done at the BIS, as is generally the case in the financial sector. It has done so not only by pushing financial innovation and expanding the range of instruments and tools available for trading and risk management, but also by strongly influencing the character of regulatory and policy initiatives. Basel II, quite obviously, is the key example in this regard.

Even abstracting from Basel II, however, I think it fair to argue that advances in risk measurement have enabled market participants, including the BIS, to better differentiate among different types of risk, “slice and dice” them, and spread these risks more widely and in ways that are likely to better align risk exposures and the actual risk-bearing capacities of those who assume these risks. Not for no reason, therefore, is better risk measurement credited with having helped to enhance the resilience of the global financial system in the face of the many challenges encountered in recent years.

Yet, the notion of “systemic risk” and the nature of the challenges posed in safeguarding financial stability have themselves been subject to change over time – indeed, the pursuit of this stability seems akin to “shooting at a moving target”. Let me address this topic next.

The central banker’s view: the changing nature of systemic risk

Drawing on my experience, I would now like to spend some time going through parts of the evolution of the “systemic risk” concept. In other words: what are the questions that have occupied us over the past two decades or so?

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In the mid-1980s, a more or less explicit assumption behind the concept of systemic risk was that systemic disturbances would essentially arise and spread within the banking sector. Progressively, however, the attention shifted away from bank lending, ie dependencies on common risk factors, and interdependencies between banks, to also include banks’ reliance on financial markets and market infrastructure, such as payment and settlement systems.

While there have certainly been earlier crisis episodes, a defining event was the Latin American debt crisis of 1982-83. Simply speaking, this crisis was about large and growing bank exposures to a relatively narrow set of sovereign borrowers that had accumulated increasingly unsustainable external debt positions. Much has been written about whether or not the amount and concentration of banks' exposures as well as their maturity profile was known before the crisis actually erupted. For the purpose of this speech, it suffices to say that the CGFS (then called the Euro-currency Standing Committee) actively helped – even before the crisis – to quantify the growing external indebtedness of the crisis countries. Indeed, the BIS banking statistics have been in the public domain since end-1975 and the growing exposures were there for everyone to see. Yet, this didn't help to avoid the crisis – but that is another story.¹

What I would like to emphasise on this occasion is merely that concerns at the time of the Latin American crisis mostly rested on international banks' joint exposures to particular borrowers. However, after the Latin American crisis, attention shifted, first in reaction to the growth in interest and foreign exchange derivatives markets and the increasing involvement of international banks in capital market activities. The CGFS's so-called "Cross Report" (1986) put some emphasis on risks associated with off-balance sheet as well as securities market exposures. A few years later (1990), another central bank report, which bears Alexandre Lamfalussy's name, placed the focus on interbank exposures and the idea that netting can reduce the size of credit and liquidity positions incurred by market participants – which, in turn, should help to contain systemic risk. At the same time, however, it was recognised that netting may also obscure exposure levels and that multilateral netting may concentrate risks, while raising legal enforceability issues – possibly increasing the likelihood of multiple failures.

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But the story didn't end there: financial and technological innovation have continued to foster the growth of risk transfer markets, such as derivatives and structured products, while deregulation has helped to further increase the growth of cross-border activity and the entry of new market participants. As a result, financial systems overall have become more competitive, less bank-based and more market-based. Indeed, when comparing the 1982-83 Latin American crisis to the 1994-95 "tequila crisis", the debtors had not fundamentally changed, but instruments and lenders had. Loans had been replaced by bond securities, while the creditors were no longer exclusively banks, but more generally bondholders. In the case of the Asian crisis (1997) then, banks – though local ones – again took centre stage, this time as

¹ See the BIS's 1982 Annual Report for more detail. An "eye witness" account of this and three other financial crises, as well as lessons for crisis prevention and management, can be found in Lamfalussy, *Financial crises in emerging markets: an essay on financial globalisation and fragility*, 2000.

borrowers in the international debt market and lenders to an excessively leveraged corporate sector.

The consensus view, therefore, is that systemic disturbances are now more likely than in the past to erupt outside the international banking system and to spread through market linkages rather than lending relationships. LTCM is the most prominent example of how this might happen. Indeed, the Russian crisis of 1998, which is so closely linked to the LTCM episode, also marked a new experience in that a “regional event” on the periphery spread through global bond, credit and equity markets.

The concept of systemic risk has thus been broadened along several dimensions: (1) it has come to explicitly include non-banks along with banks; (2) the concept has moved beyond traditional lending to include all sorts of financial activities and resulting exposures, including exposures to operational and reputational risks; while (3) the focus is now firmly on interdependencies between market participants as well as their exposures to common risk factors, including institutions’ reliance on core parts of market infrastructure.

The last point is of some importance, as a relatively small number of institutions has become key to the integrity and smooth functioning of quite a number of markets. As these players combine various forms of intermediation activities, on and off balance sheet, it is conceivable that problems in one of these activity areas could affect the activity of other parts of the firm, and thus spread across various markets. Idiosyncratic shocks to key bank or non-bank institutions, particularly when coinciding with *systematic* factors, could thus become *systemic*. Indeed, the concentration phenomenon that I identified in the first part of my talk as a feature of the BIS’s risk exposure reappears here as a potential concern about the system’s “plumbing”.

Let me give you one example: the recent troubles at Refco, an important futures broker. The dust has not yet settled, making an in-depth analysis difficult. However, it seems that the discovery of a serious case of accounting-related fraud at one of its subsidiaries, while relatively minor in absolute terms, has in practice led to the collapse of that company.

While big, Refco was probably not big enough to matter in any systemic sense, and its crucial futures brokerage continued to be operational. But the events surrounding its demise offer a taste of how the proverbial “flap of a butterfly’s wing” could cause repercussions throughout the financial system by affecting parts of the market infrastructure. What if a bigger broker with more of a presence in OTC instruments had been hit by the same event? At the risk of overemphasising the point, I find it relatively easy to imagine that cases involving bigger institutions with more complex net positions would have much broader implications.

The role of research

In closing, let me briefly answer one last question: how is all this related to research and, hence, this conference?

Structural change, though a good thing in general, also means uncertainty. While there is agreement that most of the structural developments observed since the first Latin American crisis have in fact been efficiency- and stability-enhancing, the increasing interaction of markets and institutions has also meant that the financial system has become more complex. This complexity, in turn, has resulted in more uncertainty as to the origin and nature of shocks to that system and how these will actually play out.

This is where research can help. Again, there are two dimensions. The first relates to the need to better understand the interactions between different market participants as well as the implied interaction of idiosyncratic and systematic risks in the event of shocks.

The second dimension is closely related and calls for research to help in improving practical risk measurement solutions – at both the individual firm and system levels. A key challenge in both cases is to operationalise any findings for the use of policymakers, regulators and practitioners.

There is, thus, plenty of scope for research to continue contributing to ongoing policy discussions, and it is on this note that I now formally end the first day of this conference.