The Changing Nature of Risk and the Challenges to Sound Risk Management in the New Global Financial Landscape*

by

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Introduction: Opportunities and Challenges in the New Global Financial Landscape

The forces shaping the revolution in banking and capital markets have radically changed the new financial landscape. A remarkable feature of this changing landscape has been the astonishing rate of internationalisation of the financial system in the last two decades or so. Chart 1 provides two measures of the development of global finance in the form of foreign exchange market activity during the last ten years.

Dramatic changes in computer and information technology, advances in the theory of finance during the past 25 years, and new financial product and market designs, have made world financial markets far more efficient than ever before.

The new global financial landscape enables an ever-wider range of financial and non-financial companies, as well as individuals, to manage risks more effectively. This more efficient allocation of risk, driven by the incentive to equate risk-adjusted rates of return on investments globally, has led to a strong increase in the creation of value and standards of living.

Innovations in financial-contracting technology (futures, options, swaps and other contractual agreements) have played a central role in this development by expanding the opportunities for risk sharing, lowering transaction costs, and reducing information and agency costs. The extraordinary growth in the use of derivatives and the huge proliferation of new financial products and markets, have made possible the creation of an increasing number of layers of financial intermediation that are required to capture the benefits of advances in finance. Structural changes in financial markets have been credited with underpinning strong growth in the United States economy. By increasing the number of financing channels and better opportunities for swapping, sharing and spreading risks, a more efficient financial system has emerged.

At the same time, it has been argued that the increase in the more efficient functioning of financial markets has been accompanied by the increased likelihood of significant market disruptions. The new global financial landscape is capable of transmitting disturbances or mistakes at a far faster pace throughout the world economy than before. Consequently the increase in systemic risk poses new challenges for financial policy makers.

This paper studies the changing nature of risk as well as the attendant challenges to implementing sound risk management systems in the new global financial landscape. Based on this analysis an outline will be given of the best policies for dealing with risk in this new environment. Risk management will be studied from two angles. First, from the perspective of policymakers by formulating the institutional conditions to sound risk management at the macro level. Second, from the perspective of market participants by focusing on the need for sophisticated risk management systems at the micro level.

I. Key Features of the New Financial Landscape and Its Impact on the Nature of Risk

A. The new financial landscape: increasing complexity

As indicated in the introduction, the structural changes in the past 25 years have enabled a broad unbundling of risks through innovative financial engineering. These changes have resulted in very complex financial products and markets. Common stocks and debt obligations have been augmented by a vast array of complex hybrid financial products, which allow risks to be better allocated and priced. For example, recent hybrid securities are in the border territory between loans and bonds, such as deferred-pay options...
bonds, floating interest rate subordinated term securities and equity linked venture investment securities. Although these hybrids enable in principle a more efficient allocation of risk, at the same time, they have led to an increase in complexity. Even sophisticated market participants might have difficulties understanding the nature of these new products and markets. Consequently, risks may be seriously mis-priced. Unfortunately, these mistakes may only emerge when markets are subject to major external shocks.

The growing importance of derivatives for risk management and the leveraging of investment positions is a driving force behind the stronger and more complex links between cash and derivatives markets. Also the blurring of sectoral and product boundaries is adding to the complexity of financial intermediation. This complex, multi-layered intermediation system is better able than before to not only reward innovation, productive investment and sound public policies but also to more harshly discipline the mistakes of private investors and public policymakers.

The dynamics of the new financial landscape have changed with an increase in the pace of financial innovations, a rapid expansion of cross-border financial transactions, the faster pace of transmitting shocks or mistakes throughout the international financial systems, and greater sensitivity on the part of financial market prices to changes in preferences. This change in dynamics is part of, and contributes to, the increase in complexity and risk in the new financial landscape.

B. How different is international financial integration today from earlier periods with high degree of integration?

In order to gain a deeper understanding of how “new” the new global financial landscape actually is, and how it contributes to the change in the nature of risk, it is instructive to compare the current financial system with that of earlier periods with a high degree of international financial integration. The period 1870-1914, and to a lesser degree 1925-1931, were characterised by high capital mobility. Although capital mobility has significantly increased since WW-II, the current financial landscape is not characterised by an unprecedented degree of capital mobility. Research by Obstfeld (1998) shows that increased mobility is not the key characteristic that uniquely defines the new financial landscape. Today’s global financial system differs from the earlier period of high capital mobility in the form of the following key distinctive features.

C. A much wider array of financial instruments: innovations and a dramatic increase in securities-related activities

In comparison with the very early period of capital mobility, the financial landscape has changed dramatically. Volumes of new securities issues and trading increased rapidly and in all OECD countries financial intermediation through the securities markets gained in importance.

The rapid development of securities-related activity is likely to continue in the 21st century. Financial innovations and structural changes are also expected to continue, although the exact pace and direction of these developments is inherently much more difficult to predict.

An important structural change that encourages the development of securities-related activity concerns the demand of investors for a broad range of assets with different risk-return characteristics. This in turn has led to a marked acceleration in the creation of asset-backed (ABS) and mortgage-backed securities (MBS) (see OECD Financial Market Trends 74). Securitisation plays a key role in (re)packaging and (re)selling risks, including insurance liabilities.
This securitisation trend would be also strengthened by the desire of banks to bring under better control the size of their balance sheets. At present, this technique is widely used in only a handful of OECD countries and, therefore, there is a vast potential for an expansion of securitisation throughout the OECD area.

The markets in derivative products are likely to expand at least as fast as the underlying cash markets. Derivative instruments are major tools for the management of risk by market participants, in particular the larger professional investors. These markets will continue to be both an indispensable complement and substitute for cash markets. In fact, the growing use of repurchase agreements, along with other risk management instruments, is an indication of the continued integration of cash and derivatives markets.

In both cash and derivative markets, the traditional exchanges are likely to be challenged by alternative systems for trading, including the over-the-counter (OTC) markets (Table 1).

D. Changes in market volatility, contagion and market discipline

The sensitivity of market responses under the new regime has been underscored by the startling declines of exchange rates of some emerging market economies against the dollar, and most other major currencies, of 50 per cent or more in response to what at first appeared to be relatively modest problems and/or underlying economic weaknesses (Table 2). Also periods with extreme stock market volatility seems to have become more frequent (see Chart 2).

These violent moves in exchange rates and other financial asset prices are *prima facie* indications that market discipline appears far more draconian than twenty or thirty years ago.

Contagion seems stronger and, in part also different, than in earlier periods. The new global financial landscape is capable of transmitting disturbances or mistakes at a far faster pace throughout the world economy than before. The globalisation of finance has resulted in an unprecedented number of financial institutions that are active internationally, highly leveraged and, in many cases, using new financial technologies and instruments. Traders and investors base their actions on frequent benchmark assessments of market fundamentals. The collective outcome of these actions can induce sharp breaks in asset prices leading to very high short-term volatility. Large leveraged positions magnify these price swings. The use of new instruments, in turn, has facilitated the built-up of these leveraged positions (see point F. below). Changes in expectations and perceptions may, therefore, easily lead to a very rapid and widespread re-assessment and re-pricing of financial risks. This process is further accompanied by de-leveraging and re-balancing of global portfolios, resulting in extreme price movements in markets around the world. For these reasons, *traditional* contagion channels, such as trade links and world interest rates, do not explain fully the contagion in 1998 after the Russian and LTCM events. The increase in correlation in spreads seems to point at the increasing importance of *financial* contagion.

E. Increased competition

The competition for capital has increased dramatically, both in national markets and globally. This fiercer competition for the allocation of savings means that investment projects and public policies are more strictly scrutinised. It also means that this capital, in times of stress, also flees more readily to securities and markets of high quality and liquidity. The new financial landscape is defining a *more competitive beauty contest among countries and markets* with greater rewards for good policies and projects but also greater punishments for mistakes.
Competition in the financial services industry around the globe has increased strongly as a result of the following structural forces:

- The removal or weakening of barriers to entry.
- The liberalisation of diversification activities.
- The removal or reduction of restrictions on ownership structures.
- Globalisation of business activities.
- Innovations and technological advances (e.g. electronic trading).

Increased competition has resulted in a lower cost of financial services and an increase in the expansion of the range and quality of financial services. For example, the Internet offers investors unprecedented access to financial tools and services world-wide at relatively low cost and relative ease. Asset management services are now being offered at low costs with a wide range of choice of products and other modalities.

Institutional manifestations of the increase in competition have been the growth in the number of financial conglomerates (i.e. a blurring of traditional sectoral boundaries – banking, insurance, asset management, security market operations), the blurring of the boundaries between products, and changes in distribution channels (including new channels such as the Internet).x

Competition among trading systems will intensify because of advances in information and communication technology and also due to the aggressive policies of institutional investors to direct orders to the cheapest trading systems. This trend has put additional pressure on the profitability of the brokerage business. As a result of these trends, the major intermediaries are likely to de-emphasise secondary market brokerage activities. Instead, they seem to focus more attention on proprietary trading in both cash and derivative markets, by temporarily taking large net positions using the institution’s own capital and often employing highly leveraged investment strategies. In pursuing this strategy, the intermediaries are in many cases opting to deal in the lower-cost, less regulated environment of OTC markets rather than trading on the exchanges.

Intense competition from OTC markets, the introduction of the euro, and the growing use of electronic trading systems are contributing to the ongoing restructuring and transformation of the financial landscape.

F. Highly leveraged investment strategies and financial markets

A key feature of the new financial landscape is the higher leverage of financial institutions in comparison with earlier episodes and the ease, low cost and rapidity in which leveraged investment positions are being built-up. Financial institutions use a number of techniques to achieve leverage, including the use of repurchase agreements (repos) and swaps, options, futures and other structured products. Of these instruments, repos are perhaps the biggest source of secured funding, but derivatives contracts are also used extensively to boost leverage.

Most hedge funds use derivatives as sources of both liquidity and leverage. For the large, global-macro funds, whose sheer size makes liquidity of paramount importance, their use of derivatives in some markets is focused primarily on liquidity rather than on leverage per se. However, for other hedge fund
strategies. Use of leverage is a mainstay, with the degree of leverage a function of the manager’s appetite for risk, the riskiness of the bets involved, and the “costs” of leveraging. The hedge fund sector is far less leveraged, on average, than other parts of the financial services sector. For example, trading arms of internationally active commercial banks and proprietary desks of investment banks have net assets-to-equity ratios around 20-to-1; the gross ratios are far higher (see OECD Financial Market Trends, No. 73). These institutions also tend to make much greater use of derivatives to leverage their bets than the typical hedge fund.

Hedge funds, with higher performances for risk than some other market participants, are important participants in the new financial landscape because they contribute to a more efficient allocation of risk. In particular, their activities are part of the re-allocation of risk from financial intermediaries to investors who are holding a wide range of tradable securities. In addition, hedge funds provide liquidity and their trading activities also promote price efficiency. For example, convergence or “arbitrage” trades eliminate or reduce anomalous variations in the prices of related assets. In doing so, they are providing liquidity to markets and contributing to financial market efficiency.

II. Policies for Dealing with Risk in the New Financial Landscape

Failures in dealing with risk in this new, complex financial structure have resulted in major financial crises. However, what is not a priori clear is whether recent crises are deeper than in the past, or just triggered more readily. As noted above, the new financial system has the capability to rapidly transmit the consequences of errors of judgement in private investments and public policies around the globe at historically unprecedented speed. In contrast to earlier contagion or crisis periods, the form and structure of global finance — in particular the existence of complex, sometimes highly-leveraged positions on underlying market instruments, the widespread use of derivative technology and margin calls in response to rapid price movements in financial market instruments — had, and are having, a major impact on the dynamics of more recent crises. Nonetheless, these features do not sufficiently explain the severity of financial market turmoil in the last five years or so.

The Mexican crisis of 1994-1995 can be characterised as the first crisis of this new international financial system, preceded perhaps by the 1992-1993 ERM crisis and the generalised turbulence in 1994 in the major OECD bond markets. The crisis that started in East Asia in July 1997, is its second. The Russian crisis of August 1998 as the third, while the rescue of LTCM in September 1998 can also be considered as another defining moment in the manifestation of extra-ordinary financial turmoil in the global financial landscape.

Since the Mexican and Asian crises, policy makers have been forced to engage in an accelerated learning process of how to deal with and/or to prevent crises in the new financial landscape. The LTCM debacle re-enforced this point in a dramatic fashion. There are disagreements among policy makers and market participants, often related to the fact that the dynamics of the new financial system and its ramifications for financial institutions and policies are not fully understood. This uncertainty among policy makers and financial markets participants alike increases the challenges for risk management. In this section we will focus on the institutional macro conditions for sound risk management and, in the next section, on the challenges to the implementation of risk management systems in the new global financial landscape by market participants.
A. Institutional macro conditions to sound risk management from the perspective of public policy makers: linkages between banks and capital markets

A key insight for formulating the institutional macro conditions to sound risk management is based on the very practical and analytical considerations of the relationships between banks and securities markets and of how to ensure that the financial system intermediates funds as efficiently as possible, accepting that informational asymmetries cannot — indeed, should not always — be eliminated. As an antidote to the argument that banks and securities markets can be developed independently — so that, for example, if the banking system is rife with problems, securities markets can be developed to replace banks as a source of capital — it should be noted that securities markets generally depend upon banks to provide key services. In many countries, banks or their subsidiaries act as brokers or dealers in which case the link between securities firms and banks is very direct.

Clearly, the development of securities markets cannot be considered in isolation of the health of the banking sector. In the extreme, the introduction of securities markets and the necessary creation of lines of immediate credit will greatly increase systemic risk if the banks providing these credit lines are themselves under-capitalised and illiquid.

Soundness of the banking system

A fundamental problem concerns the financial fragility of the banking sector caused by the legacy of bad assets and the concentration of risk with relatively few large borrowers on the one hand and the low level of bank capital on the other. This situation may worsen as long as the causes of moral hazard (i.e. implicit or explicit deposit insurance and other implicit government guarantees; asymmetric information) are not eliminated, while inadequate supervision may enable the banks (and their customers) to exploit the existence of moral hazard.

Major factors hampering the effectiveness of banking supervision include the lack of reliable information about the financial condition of enterprises and banks due to inadequate accounting systems, limited experience in risk-analysis of potential borrowers by banks, inadequate tax regimes for making loan-loss provisions, lack of experienced supervisors and auditors, and inadequate prudential regulations. While ineffective banking supervision may be an additional cause of financial fragility, the weak balance sheets of the banks in turn narrow the scope for proper enforcement of prudential regulations. Thus, the recapitalisation of the banking sector and the restructuring of substandard loans are key elements of building a robust financial sector.

The heightened sensitivity of exchange rates and other financial asset prices would be of less concern if banks and other financial institutions were strong and well capitalised. Banks in the more advanced markets are highly leveraged, but generally subject to sufficiently effective supervision so that, in most countries, banking problems do not escalate into international financial crises. However, the complexities of the new financial landscape are generating new risks and challenges for supervisors in advanced markets. The LTCM debacle and its links to the banking system is an example (see Financial Market Trends, 73).

The weakness in banking supervision in emerging market economies has been a major problem for the rest of the world. The growing participation of the economies in the international financial system over the past decade or so has led in quite a few cases to serious financial crises because of banking systems that were insufficiently robust to handle large unanticipated withdrawals.
A strong capital market infrastructure

In addition to a robust banking sector, participation by emerging and mature market economies in the international financial system requires both macroeconomic stability and a proper capital market infrastructure, which entails:

- An adequate legal framework.
- Efficient and reliable clearing and settlement systems.
- An adequate accounting system.
- An efficient microstructure for trading securities.
- A proper regulatory and supervisory framework.
- The proper market-based framework (legislation, supervision, disclosure requirements, a professional asset management industry, etc.) for institutional investors (pension funds, insurance companies, mutual funds, hedge funds).

In many countries in Latin America and Asia, fixed-income securities markets are missing or underdeveloped. This, in turn, has led to an excessive reliance on foreign and domestic bank financing, making the participation of these countries in the global financial system more vulnerable to shifts in expectations and perceptions. In sum, both a sound banking system and a liquid domestic capital market are key elements of a robust financial infrastructure. This will enable emerging financial markets to participate in the international financial system without making them excessively vulnerable to large, unanticipated withdrawals and speculative attacks. They are key institutional elements of a solid macro framework for managing risk.

The key role of standards for sound finance

Internationally acceptable standards for participation in the new highly sensitive international financial system are also essential ingredients of this framework. There is a need to establish at the international level the discipline that has increasingly come to prevail in the domestic markets of advanced economies.

Greater transparency in the way financial intermediation operates and the quality of its supervision is crucial for a sound international financial system. Markets cannot work efficiently, and they will remain vulnerable to major disruptions in the absence of adequate, timely and reliable information. Considerable progress has been made in the last few years in defining new standards and establishing new practices. Codes of good practices and standards on transparency in monetary, financial and fiscal policies have been established under the auspices of the IMF. Moreover, much work has been or is being done on standards, principles, or good practices in the following areas: accounting, auditing, payment and settlement systems, insurance, bankruptcy and corporate governance.

Standard setting by supervisors

Important progress has been made in recent years by supervisors in setting standards. These standards relate to principles of supervision (the “Core Principles” of Basle and IOSCO), to rules of
disclosure, to risk management, to accounting standards, to minimum capital standards and so on. A very important exercise currently underway is the design of a new capital adequacy framework by both the Basle Committee on Banking Supervision and the European Commission. The key objective of this work is to improve the way regulatory capital requirements reflect underlying risk, taking into account the changes in the financial landscape and in risk management by financial institutions. The proposals consist of three pillars:

- Minimum regulatory capital requirements.
- Supervisory review of an institution’s capital adequacy and internal assessment process of risk.
- Greater market discipline.

Supervisors try to ensure that Pillar 1 will relate capital more closely to the reality of risk. At the same time, individual minimum capital ratios will be assessed by supervisors to check whether financial institutions have adequate capital to support their risks, as well as to encourage institutions to develop and use better risk management techniques in monitoring and managing these risks (Pillar 2). Supervisors are also supporting efforts to increase disclosure to enhance marked discipline (Pillar 3).

**Sound debt management: the need to avoid currency and maturity mismatches**

Sound debt management is part of a proper risk management system. The effective management of the domestic and external debt of both the private and public sectors is of great importance for the successful participation of countries in the international financial system. Mismatches of maturity and/or currency have been identified as an important reason why countries experienced financial crises. Some countries in which the private sector or government issued large quantities of short-term maturity, foreign-currency denominated debt, became very vulnerable to sharp swings in the sentiment of foreign investors. Either maturity or currency mismatches create the potential for sudden reversals of capital flows on a large scale. Proper risk management would have prevented that emerging market economies would have solely focused on the minimisation of the current borrowing costs of their external debt, thereby incurring the build-up of high ratios of short-term debt to foreign exchange reserves. An effective framework for the management of risk would therefore ensure that governments and private sector participants would avoid a situation in which they would become very vulnerable to debt runs, either via a self-fulfilling debt crisis or a debt run due to adverse fundamentals. Liquidity runs, reflecting mismatches in national balance sheets, did play a major role in recent crises. Debt runs and speculative attacks on exchange rates can be linked via a dramatic loss in foreign exchange reserves or via the large unhedged foreign exchange liabilities of domestic banks. Rogoff (1998) concludes that countries with intermediate fixed rate regimes run a significantly greater risk of triggering off a debt run or a general financial market panic than countries with a fully floating exchange rate regime.

III. **The Changing Nature of Risk and Sound Risk Management Systems**

Efficient market-based financial systems require that the institutional macro conditions to sound risk management mentioned above are in place. Sound risk management itself has become a more challenging activity than ever before. Risks in financial markets have changed in the past two and a half decades reflecting the changing nature of financial intermediation. Banks (and other depository institutions) began to engage in activities for which they were sometimes ill-prepared, a problem aggravated by the relatively low level of bank capitalisation in some countries. Simultaneously, other fundamental structural changes
occurred in financial markets, including: the abolition of exchange controls in many OECD countries and
deregulation of domestic financial markets, more active asset and liability management, changes in the
type of financial assets held by households, a more prominent role of institutional investors, the use of
derivative technology and greater importance of the treasury function for companies. Financial
liberalisation and advances in information technology increased the integration of financial markets which,
in turn, has increased the likelihood that markets will move in similar directions in response to shocks. The
challenges to risk management in this new financial environment will be analysed in this section from the
perspective of market participants.

A. Risk management in the new financial landscape

The need for sophisticated risk management systems

New risks, associated with desegmentation, securitisation, financial innovations, globalisation, and
increased competition, have emerged. Increased volatility, greater interdependence, and new risks have
also made the structure of the risk exposure of banks and other financial institutions more complex. For
banks the traditional activity was “on balance sheet” lending, and the associated risk management
technique was credit risk analysis. However, lending now accounts for a smaller share of total activity than
in the past for many banks. Newer activities are investment banking, origination, trading (agency and
proprietary), mergers and acquisitions and information systems – where the risks are different. The fact
that banks will increasingly hold a wider set of instruments (money market assets, bonds, derivatives,
forward contracts) and that some of the risks in these assets will be retained while others are passed on
implies that risks must continually be identified and quantified and systems must be set in place to offset
risk or to hold sufficient capital against any risk that is retained. Also, OECD capital markets have changed
beyond recognition. Domestic deregulation and external liberalisation have resulted in major changes in
competitive conditions. Advances in communications and information systems enhanced the capacity of
financial market participants to use the opportunities offered by the new financial environment.

There is general agreement that structural changes in financial systems have accentuated the need for
a more effective framework for management risk. In particular, since it is now accepted that financial
institutions should have greater leeway to make their own decisions without direct government
interference, one is implicitly accepting the eventuality that financial institutions will take more risk and
occasionally will suffer losses. It should be noted, however, that although new risks have emerged, the so-
called “old” forms of risks — including “Herstatt risk” (defined as the risk connected with cross-currency
settlement) and traditional credit risk — have not disappeared. Despite the growing complexity of risk, the
greatest problems in bank solvency in the past two decades have come from credit risk (mainly associated
with traditional lending).

Proprietary trading has become an important activity of financial institutions meaning that in
addition to the risks regularly assumed in the business of intermediation or “underwriting”, banks will have
to take operational views about the direction of markets. Meanwhile, the product cycle in financial
services is operating at a faster pace. New financial services require constant innovation with constant
pressure on margins.

These developments have increased the need for better risk management. Financial institutions must
improve their capabilities for defining, managing and pricing risk. The general objective is to build and use
systems for the disciplined management of credit risk, market risk and liquidity risk. The primary
components of a sound risk management process are: a comprehensive system for measuring the different
types of risk; a framework for governing risk taking, including limits, guidelines, and other relevant
parameters; and an adequate management information system for monitoring, reporting and controlling risks.

As noted in the previous section, policy makers can contribute to these objectives by encouraging the implementation of the institutional macro conditions to sound risk management and by establishing efficient regulatory and supervisory systems for managing risks. In this context, efforts by the authorities in making capital requirements for financial institutions more risk sensitive will be important in encouraging the adoption of risk reducing procedures and in using proper quantitative risk management models by market participants.

The need for proper risk accounting

The implementation of risk management systems requires the adoption of a proper risk accounting framework. This will require more sophisticated investment guidelines based on sound risk management standards that take into account the unique characteristics of pension funds and other institutional investors. In this context, it has been suggested that financial accounting needs fundamental revisions to develop a specialised new branch called “risk accounting”. Traditionally, the financial accounting system focuses on value allocations (e.g. on the balance sheet of a hypothetical bank the accounting system indicates the value of assets on the left-hand side, and the value of deposits and the bank’s capital on the right-hand side). Conventional financial assets (equity, bonds, loans, etc.) can be measured in a traditional accounting system (book or market valuation). However, swaps and other off-balance sheet contractual arrangements cannot be incorporated in a similar value framework. The traditional accounting system is therefore not very suitable to identify risk allocations. Although contracts like interest-rate swaps and future contracts have no initial value, they can have an immediate and significant impact on the risk exposure of the various assets and liabilities on the balance sheet of pension funds and other institutional investors. Changes in accounting structure and methodology are required to address this inadequacy by developing risk accounting standards.

Problems in using quantitative risk management models

A potential problem concerning the use of risk models is the possibility of herd behaviour due to the use of similar risk management models that operate on the basis of international variance-covariance matrices of market prices or macroeconomic variables. They imply that a jump in volatility in one country will automatically generate an upward re-estimate of market and credit risk in a correlated country, mechanically triggering margin calls and tightening credit lines. Thus, the widespread and mechanical use of risk management may become a source of contagion. The seriousness of the problem needs to be further examined.

In extreme situations, VAR (Value-at-Risk) models do not function very well. That is why these models have been supplemented with “scenario” or “stress” testing. However, this approach may not be adequate to control risks. A first, obvious limitation is that important extreme scenarios will be excluded from the analysis. For example, it seems doubtful that risk managers in their stress scenarios foresaw the extreme “LTCM 1998 episode”. A related problem is that since stress scenarios are conducted outside the model, they are not assigned objective probabilities as within a VAR framework. Consequently, there is no statistical guidance how to treat the relevance of the results from stress scenarios. Berkowitz (1999) proposes, therefore, to fold the stress scenarios into the risk model. This unified stress-testing approach would allow backtesting of the risk model. It also imposes the discipline on the risk manager to assign probabilities to the stress scenarios.
An even more serious problem in extreme situations is that the use of similar risk management systems may lead the dominant suppliers of risk (mainly banks) to withdraw their capital from the market at the same time. VAR models can in principle deal with liquidity risk. However, these procedures can only be applied in situations with normal liquidity problems. It is highly unlikely, however, that simple VAR systems, integrated VAR models or even more recent techniques such as the Extreme Value approach (EV) will be able to deal in a satisfactorily fashion with crisis liquidity risk situations.

A fundamental limitation of the current generation of sophisticated risk management models is that they are based on the probability calculus of “a game against nature”. In other words, these risk management systems neglect strategic factors in the behaviour of market participants. Unfortunately, there are no straightforward technical solutions available yet.

Some analysts such as Myron Scholes are arguing in favour of making markets more complete by introducing liquidity options. Clearly, the price of liquidity would need to reflect market conditions. A crucial issue is whether this new market for liquidity options would function well under all circumstances. An options market is like an insurance market. In order to function properly this market should not suffer unduly from adverse selection at the demand side and other market imperfections such as moral hazard and very high transaction costs. In addition, there should be a robust supply of liquidity. At present, banks are the dominant suppliers of liquidity. This is in accordance with their comparative advantage. However, it has been argued that banks have a very short time horizon because of mark-to-market practices, leading to sharp reductions in the supply of liquidity in times of market turmoil. The market for liquidity — including the one with liquidity options — would function better if the supply would be provided by financial institutions with a longer time horizon such as hedge funds, and other institutional investors.

Another complication in the use of quantitative risk management models, including VAR systems, is that they may create the illusion that risks are sufficiently under control (while they are not). In addition, there is some evidence that sophisticated risk control systems such as VAR models could encourage, perversely, excessive risk-taking by traders. Lo (1999) concludes that current risk management practices such as VAR capture only one dimension of risk: the probability of monetary losses. He argues that “Total Risk Management” must include two additional dimensions: prices for assessing how much one must pay for hedging the various risks; and preferences concerning how much risk to bear (and thus how much to hedge).

IV. Concluding Remarks

The dynamics of the new financial landscape have changed with an increase in the pace of financial innovations, a rapid expansion of cross-border financial transactions, the faster pace of transmitting shocks or mistakes throughout the international financial systems, the growing participation of emerging markets in the global financial system and greater sensitivity on the part of financial market prices to changes in preferences. These changes have contributed to the increase in complexity and risk in the new global financial landscape.

Recent financial crises, while sharing many, if not most, of the characteristics of past episodes, appear different. The vastly accelerated pace of financial activity — its complexity and its volume — has created a very challenging environment for both market participants and policy makers, especially during slumps in asset prices. This raises fundamental questions about how best to respond to the challenges of the new brave world of finance. The new global financial landscape has at times experienced severe bouts of stress. In this context, a key challenge for policy makers is market participants’ use of leverage. Volatility and contagion are clearly enhanced by leverage. Supervisors need to determine the proper balance between the benefits leverage confers to markets and the potential systemic risk posed by high
levels of leverage. If financial asset prices are more volatile and financial contagion more frequent, market participants need to protect themselves against unexpected adverse market conditions by having more robust financial structures. Sound risk management systems are a key part of this infrastructure for dealing with the greater complexity of risk. The discussion in this paper shows, however, that the design and implementation of these systems is a very challenging task for policy makers as well as for market participants.

The new financial landscape is generating many benefits. It is a fact of life in a market environment that these benefits can only be obtained by undertaking risky activities and projects. A fundamental and constant challenge for policymakers is to assess what the “normal” risks (volatility, contagion, etc.) are in an evolving financial environment. There are no easy answers and supervisors and regulators are involved in a continuous learning process. Moreover, to the extent that policy makers and market participants are unable to anticipate or evaluate the types of complex risks that the newer financial technologies are producing, it creates a fundamental uncertainty in the financial system. A rational response to this increase in uncertainty is the following rule-of-thumb: the higher uncertainty, the lower leverage, i.e. less debt, more equity, and, hence, a larger buffer against adverse circumstances and stresses in the financial system.
Bibliography and key references


Chart 1

Summary of global activity in foreign exchange markets*
(average daily turnover in billions of US dollars)

* Adjusted for local and cross-border double-counting (“net-not”). Includes estimates for gaps in reporting.

Source: BIS
Chart 2

Stock market volatility index

Table 1

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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange-traded instruments</td>
<td>4,634.5</td>
<td>7,771.2</td>
<td>8,862.9</td>
<td>9,188.6</td>
<td>9,879.6</td>
<td>12,207.3</td>
</tr>
<tr>
<td>Interest rate futures</td>
<td>2,913.1</td>
<td>4,958.8</td>
<td>5,777.6</td>
<td>5,863.4</td>
<td>5,931.2</td>
<td>7,409.2</td>
</tr>
<tr>
<td>Interest rate options²</td>
<td>1,185.4</td>
<td>2,362.4</td>
<td>2,623.6</td>
<td>2,741.8</td>
<td>3,277.8</td>
<td>3,639.9</td>
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<tr>
<td>Currency futures</td>
<td>26.5</td>
<td>47.1</td>
<td>40.1</td>
<td>38.3</td>
<td>50.0</td>
<td>51.9</td>
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<tr>
<td>Currency options²</td>
<td>71.1</td>
<td>75.6</td>
<td>55.6</td>
<td>43.5</td>
<td>46.5</td>
<td>31.2</td>
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<td>Stock market index futures</td>
<td>79.8</td>
<td>110.0</td>
<td>127.7</td>
<td>172.4</td>
<td>195.9</td>
<td>216.6</td>
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<tr>
<td>Stock market index options²</td>
<td>156.6</td>
<td>239.7</td>
<td>238.4</td>
<td>339.3</td>
<td>378.0</td>
<td>776.5</td>
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<tr>
<td>OTC instruments¹</td>
<td>5,345.7</td>
<td>8,474.6</td>
<td>11,363.2</td>
<td>17,712.6</td>
<td>26,453.1</td>
<td>28,132.4</td>
</tr>
<tr>
<td>Interest rate swaps</td>
<td>3,850.8</td>
<td>6,177.3</td>
<td>8,815.6</td>
<td>12,810.7</td>
<td>19,170.9</td>
<td>22,171.5</td>
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<tr>
<td>Currency swaps⁴</td>
<td>860.4</td>
<td>899.6</td>
<td>914.8</td>
<td>1,177.4</td>
<td>1,559.6</td>
<td>1,804.8</td>
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<tr>
<td>Interest rate options⁵</td>
<td>634.5</td>
<td>1,397.6</td>
<td>1,572.8</td>
<td>3,794.5</td>
<td>4,722.6</td>
<td>5,033.1</td>
</tr>
</tbody>
</table>

¹ For OTC instruments, end-June 1997  
² Calls and puts  
³ Data collected by ISDA only; the two sides of contracts between ISDA members are reported once only  
⁴ Adjusted for reporting of both currencies; including cross-currency interest rate swaps  
⁵ Caps, collars, floors and swaptions

Source: BIS
### Table 2

<table>
<thead>
<tr>
<th>Country</th>
<th>Interest rates</th>
<th>Exchange rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Overnight rate</td>
<td>Three-month rate</td>
</tr>
<tr>
<td></td>
<td>Peak</td>
<td>Date</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>100.0</td>
<td>23.10</td>
</tr>
<tr>
<td>Taiwan</td>
<td>11.5</td>
<td>7.10</td>
</tr>
<tr>
<td>Indonesia</td>
<td>300.0</td>
<td>25.8</td>
</tr>
<tr>
<td>Korea</td>
<td>27.2</td>
<td>30.12</td>
</tr>
<tr>
<td>Malaysia</td>
<td>50.0</td>
<td>10.7</td>
</tr>
<tr>
<td>Philippines</td>
<td>100.6</td>
<td>6.10</td>
</tr>
<tr>
<td>Singapore</td>
<td>50.0</td>
<td>23.10</td>
</tr>
<tr>
<td>Thailand</td>
<td>27.4</td>
<td>5.9</td>
</tr>
</tbody>
</table>

Note: Dates refer to 1997 unless otherwise indicated.

1. Closing rate.
2. Percentage change in the US dollar/local currency exchange rate since June 1997.

Source: BIS

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vi. Greenspan, ibid.


xi. Lumpkin and Blommestein (1999).

xii. It should be noted, however, that this particular measure of leverage is not very refined, as it ignores the nature of underlying securities. From a credit risk perspective, there is a big difference, for example, between a leveraged position in United States Treasuries and a comparably leveraged position in emerging market issues. Thus, if one were concerned about the riskiness of leveraged positions, one would have to look at a more sophisticated measure of risk than balance-sheet leverage. One alternative is an estimate of potential gains and losses for a given portfolio, scaled by net worth with adjustments for obvious shortcomings in traditional statistical measures (e.g. ratio of adjusted value-at-risk to net worth).
Blommestein and Spencer (1996).

Obstfeld (1998) argues that the greater transparency is a public good in situations where investors can allocate resources over risky foreign assets and where they face a fixed cost of obtaining information about each country. [See Calvo and Mendoza (1997) for a formal model with these characteristics in which investors diversify globally without bothering to inform themselves.]


A government with high short-term debt has the same kind of maturity mismatch as in the classic Diamond-Dybvig bank run model because most of its assets (the present value of future tax payments) are fairly illiquid. (See Rogoff, 1998.)

Rogoff, ibid.

More recently, there have been reports that many investment banks have reduced their proprietary trading activities. It has been argued that on a risk-adjusted basis, proprietary trading business has become less attractive (due to falling spreads and increasing risks). At the same time, however, investment banks need to provide (increasingly?) liquidity to their clients and the distinction between making markets for clients and proprietary trading is not very straightforward. [Economist (1999), The Trader’s Lament, 16 October 1999.]

The author is indebted to Zvi Bodie for pointing to his work on this policy issue.

The prospect for such development is not just prospective and theoretical. Pressed by the reality of the marketplace, financial firms that deal extensively in complex securities have already developed risk accounting protocols as part of their internal risk management systems. With the benefits of real-world experience, these protocols could serve as prototypes for standardised risk accounting.


Berkowitz (1999).

The standard VAR model can be modified by incorporating a measure of market illiquidity (see Dowd, 1998).

Crisis liquidity risk situations are characterised by widespread turmoil in markets leading to severe liquidity crunches such as during the funding and asset liquidity problems surrounding LTCM in August/September 1998 and the stock market break in 1987.

This is a serious limitation since strategic factors may play a crucial role. For example, in the recent past, hedge funds with huge losses blamed part of their problems on the copy-cat investment behaviour of competitors.

See Blommestein (1999).

See Economist (1999), When the Sea Dries Up, September 25th. This raises the issue whether this is just a US phenomenon or not. For example, in the context of the discussion on corporate governance practices banks, in particular in bank-based countries such as continental Europe and Japan, have been credited with
a long-term horizon. This in contrast to the alleged short-term horizon of financial institutions in countries dominated by capital markets such as the USA.

xxix. Roth (1999) argues — based on research by Ton Vorst at Erasmus University — that the use of VAR models tends to increase exposure by traders to extreme (and catastrophic) events.


xxxiii. The Counterparty Risk Management Policy Group — a group of 12 major commercial and investment banks — has argued that the definition and interpretation of leverage pose difficulties for risk management. The Policy Group believes therefore that leverage is not an independent risk factor whose measure can provide useful insights to risk managers and supervisors. Instead, leverage should be assessed by its impact on market risk, funding liquidity risk and asset liquidity risk (see Counterparty Risk Management Policy Group, 1999). However, it should be noted that in making this recommendation, the Policy Group makes the tacit assumption that all risks can be properly measured. This is, by definition, not the case in a situation with an increase in uncertainty.
The changing nature of financial activity is illustrated by developments in credit derivatives markets. The availability of these instruments is enabling a change in the nature of banking itself towards business models based on origination and distribution rather than the retention of credit risk. More recently global financial systems and the newer asset markets appear also to have withstood several recent shocks, such as September 11, the Dotcom bubble, the GM related wobbles in May 2005, Refco, and the Iraq war. The fact that some investors, such as hedge funds, are willing to take on greater risk does not necessarily give rise to system-wide concerns. The financial system cannot reduce the amount of risk in the economy, but only repackage and transfer it. Geneva, Switzerland, 17 October 2018

The changing nature of economic competitiveness in a world that is becoming increasingly transformed by new, digital technologies is creating a new set of challenges for governments and businesses, which collectively run the risk of having a negative impact on future growth and productivity. The new tool maps the competitiveness landscape of 140 economies through 98 indicators organised into 12 pillars. For each indicator, using a scale from 0 to 100, it indicates how close an economy is to the ideal state or “frontier” of competitiveness. The report notably finds that attitude towards entrepreneurial risk is the most positive in Israel and tends to be negative in several East Asian economies.