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FINANCIAL STABILITY

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Many computers are not able to process dates around the millennium change. This poses a real threat to business and financial institutions. What are the dangers? What steps must be taken?

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ISSUE FOUR
SPRING 1998

Articles published in *Financial Stability Review*, whether written by the Bank or the staff of the Financial Services Authority or by outside contributors, are intended to add to debate, and are not necessarily statements of the Bank or the Financial Services Authority. Correspondence and comments on articles are welcome and should be addressed to:

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Financial Stability Review aims:

- **to promote the latest thinking on risk, regulation and financial markets**
- **to facilitate discussion of issues that might affect risks to the UK financial system**
- **to provide a forum for debate among practitioners, policy-makers and academics**

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Copies of the Financial Stability Review may be obtained from the Bank at a cost of £10 for a single issue (£5 for students) and £18 for a year's subscription (£10 for students). An extra charge will be made to overseas subscribers to cover postage. All enquiries regarding subscriptions should be addressed to: Subscriptions, Financial Stability Review, Bank of England, Threadneedle Street, London EC2R 8AH (Tel: 0171 601 4439). Back issues are available from the same address.



FINANCIAL STABILITY

review

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London EC2R 8AH

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Printed by Park Communications Limited
40 Clifton Street, London EC2A 4DX



FINANCIAL SECTOR ISSUES

With the commencement of the Bank of England Act 1998 on 1 June, the first stage of the reforms announced by the Chancellor of the Exchequer last May — to the Bank of England, and to the framework of financial supervision in the UK — come formally into effect.

The Bank of England's Monetary Policy Committee will be formally established, with responsibility for setting interest rates so as to achieve the Government's price stability objective. The Bank's Court of Directors will also be reformed, and its finances placed on a statutory footing.

The Financial Services Authority (FSA) will become legally responsible for the supervision of banks, and will take on the staffs of the three self-regulatory organisations (the PIA, IMRO and SFA) and supply services to enable the SRO boards to regulate their firms. The latter development is in anticipation of a regulatory reform bill, to be published this summer, that will transfer the regulation of investment business from self-regulatory organisations to the FSA and so put it onto a statutory basis. This Bill is also expected to transfer to the FSA responsibility for the prudential supervision of insurance companies, building societies, friendly societies and credit unions; and regulatory oversight of Lloyd's insurance market.

In recognition of the need for the two institutions to work closely together the Bank and FSA signed a Memorandum of Understanding along with the Treasury last year. This sets out the basis for co-operation and includes the establishment of a Standing Committee, which now meets monthly to discuss individual cases of significance and other developments relevant to financial stability.

The FSA

In creating the FSA, the Government has made a radical departure in the structure of financial services regulation. Once the legislation has gone through parliament, the FSA will effectively become the UK's sole financial services regulator, responsible for authorising and regulating all financial services where parliament decides regulation is justified

(except exchanges which will retain regulatory responsibilities but where the FSA will continue to have an oversight role.) There is no other example of such a complex financial market where regulation of banking, investment business and insurance has been brought together; nor where one institution is responsible both for prudential supervision and the conduct of business regulation.

In recognition of its wide remit and the need for it to be seen to be accountable, the FSA has set out its work programme for 1998/99 in a Regulatory Plan, and embarked on a series of consultation exercises on the shape of regulation under these arrangements.

When the FSA acquires direct responsibility for banking supervision, its stated aim is to maintain the standards currently practiced by the Bank, and continue to implement changes, designed to improve the overall effectiveness of the system, agreed in 1996 following an Arthur Andersen review. It will continue to develop the risk-based approach to banking supervision, building on the framework set out in the consultation papers that were issued last year — on RATE for UK-incorporated banks, and SCALE for the branches of non-EU banks (see page 82).



At the same time, the FSA has published consultation papers on consumer and practitioner involvement; and on its plans to create a single financial services ombudsman scheme and to rationalise compensation arrangements put in place to offer some customer protection in cases where financial firms fail.

Most recently, it has published a guide to the work it envisages to create a single hand book of regulatory principles, rules, and guidance for the future. In many areas, the FSA envisages carrying existing practices forward, but the creation of a new regulator provides the opportunity for change and rationalisation where there is a strong case for it. A detailed statement of the FSA's regulatory approach will be published with the regulatory reform bill this summer.

Co-ordinating Regulation

As outlined in the last issue of *FSR*, there are strong reasons for moving away from the traditional model of a separate regulator for each different type of financial activity. Innovation and globalisation, driven by information technology, competition and deregulation, are blurring the traditional boundaries between different forms of financial intermediation. Regulation based on particular cate-

gories of institution has increasingly become overlaid by functional regulation, making the regulatory structure increasingly complex, for regulated firms, for the consumer, and for the regulators themselves.

Many firms with complex activities have welcomed the idea of a one-stop regulator, where at present they have to deal with an array of regulators in the UK. Indeed, the FSA plans to take immediate advantage of the new arrangements by creating a "lead regulator" for each financial group (to co-ordinate the FSA's regulatory activities in respect to the firm); and a Complex Groups Division to take the lead in regulating complex financial groups including, in a small number of cases, through piloting multi-disciplinary supervisory teams.

The FSA and the Bank

The Government's reforms will result in a separation of the central bank's responsibility for the stability of the financial system as a whole from the regulator's responsibility for supervising individual institutions. Such a separation will work as long as there is close co-operation between the Bank and the FSA.

The relationship was formalised last autumn in the Memorandum of Understanding (MoU) between the

Bank, the FSA and the Treasury. This defines the respective responsibilities of each, and provides for the Bank and the FSA to exchange information freely and consult where their interests interact or overlap. It also established a high-level Bank-FSA-Treasury Standing Committee, that will provide a forum in which a common position can be developed in relation to emerging problems. This is to meet monthly — its first meeting took place in March.

In the MoU, the FSA's responsibilities are described as:

- the authorisation and prudential supervision of firms;
- supervision of financial markets and the clearing and settlement systems;
- the conduct of operations in response to problem cases; and
- regulatory policy in these areas.

The regulatory reform bill will set statutory objectives for the FSA in five main areas:

- sustaining confidence in the UK financial sector and markets (which involves working on an agreed basis with the Bank);
- protecting consumers by ensuring that firms are competent and financially sound, while recognising consumers' responsibility for their own financial decisions;

- promoting public understanding of the benefits and risks associated with financial products;
- monitoring, detecting and preventing financial crime;
- pursuing objectives in a way that is efficient and economic; facilitates innovation; and takes into account the international nature of financial regulation and financial services business.

The Bank remains responsible for “the overall stability of the financial system as a whole”, including:

- stability of the monetary system;
- financial system infrastructure;
- broad overview of the system as a whole;
- official financial operations in exceptional circumstances; and
- efficiency and effectiveness of the financial system.

Within the Bank, the responsibility for monitoring these issues, particularly systemic risk, is now overseen by a new internal Financial Stability Committee, chaired by the Governor.

The Chairman of the FSA has become a member of the Bank’s Court, and the Deputy Governor responsible for Financial Stability has joined the FSA Board.

What is Systemic Risk?

Sir Andrew Large, former chairman of the SIB (now FSA), has described systemic risk as *the risk that something which goes wrong in one firm or market will, because of linkages which now exist between firms and*

markets, spill over to affect other firms and markets. Failure may spread to perfectly sound firms or markets, with widespread and damaging effects on market participants or the whole economy. It can spread in two ways: through the real financial linkages which tie the firms together like mountaineers, so that if one falls off the mountain the rest go too; or by contagious panic, which sweeps everyone off the mountain.

These dangers still relate mainly to commercial banks. Banks remain at the centre of payments and settlements systems, and they are still relatively heavily engaged in the maturity transformation of liquid liabilities into less liquid assets as an important, and intrinsically risky, part of their core activity. However, increasingly, disturbances that could inflict financial damage, and economic disruption, can be transmitted and focused outside the commercial banking system.

There is much that supervisors and central banks can do to reduce the risks. Central banks, most obviously, can pursue monetary stability, which makes the environment safer and more predictable for everyone. Supervisors can satisfy themselves — through the regulation of individual financial businesses — that firms are adequately capitalised and prudently managed. Clearly if each firm is sound, the system as a whole will be more robust. But no system of regulation can ensure that firms never fail — or that all firms are proof against the ripple effects of a failure.

Risk in Payment Systems

Working together, central banks and supervisors can also turn the information technology to their advantage, using it to track the linkages in the financial system and make those linkages safer. Some of these are described in Ian Michael’s article. Large and semi-voluntary direct exposures between banks have long been a feature of banking business, especially between the major banks. They arise in payment systems, the interbank market, foreign exchange settlement and in over-the-counter (OTC) derivatives markets. In all these areas substantial risks arise and there are major international efforts to identify and control them.

This June the Bank’s annual meeting of central bank governors will consider a paper on the evolution of payment systems. Central banks have many interests in payment systems. They need a reliable mechanism to implement monetary policy. More important, payment system infrastructure is at the heart of a market economy and the public expects it to work — failure can have serious repercussions throughout the economy. In many countries this infrastructure is taken for granted and works well for normal commercial activity. But, in emerging market economies, key choices are now being made about the infrastructure needed to support economic development.

Central banks are typically the settlement agent for payment and securities settlement systems. They are the last economic agents to

balance their books each day, and are the ultimate source of liquidity and of payment finality. Historically it was this role as the settlement agent that made central banks the operators of monetary policy and lenders of last resort.

Many central banks are actually providers of payment systems. In some countries the central bank has become a main agent for clearing cheques or an operator of automated clearing houses. However, central banks more frequently provide high-value payment systems. Real Time Gross Settlement (RTGS) systems, with real-time movements of central bank money, will inevitably involve central banks to some degree.

All these interests may be reduced to two: to reduce risk and promote efficiency. In general these objectives are complementary, but sometimes a trade-off is needed. There is no value in having the world's safest payment system if nobody uses it.

Risk reduction was the original reason for building RTGS systems. The purpose of these is to eliminate interbank receiver risk — the risk that a sender fails in the middle of a day and is unable to honour the payment messages it has sent to recipients.

In a system in which interbank obligations are netted and settled at the end of the day, risks can be very large. Payment messages in an RTGS system are not a promise to pay but a statement that the recipient has already been paid in central bank money.

Foreign exchange

The risk that led to RTGS was easy to identify. More dangerous are those risks which are hidden. In payment systems it is often not possible to monitor or to control precisely the extent of risk run by an individual institution.

Foreign exchange settlement risk is a good example. The forex market creates a significant part of the value of payments in major currencies; each deal requires payments to be made in at least two currencies and for various reasons, particularly time differences, these do not happen simultaneously — eg a seller of pounds for dollars will pay away pounds in London before receiving the dollars in New York.

About \$3,000bn of settlement flows occur every day, and these create huge implicit or explicit exposures between participants. These have often not been controlled, monitored, measured or even in some cases recognised. Banks can lend, involuntarily if not unconsciously, more than their entire capital to single counterparties in the course of the day or longer. Those risks are inherently difficult to control, not least because of the unpredictability and speed with which they arise in the settlement process.

These concerns led to an initiative in 1996, by the G-10. It has three strands: action by individual banks, by the industry collectively, and by central banks. The G-10 has continued to monitor progress by individual banks by direct contact

with them, through surveys of settlement practice and close contact with supervisors.

In the case of industry initiatives to reduce risk, significant progress has been made in the past year as the three main ones, ECHO, Multinet and CLSB, have been brought under common ownership. Multinet and ECHO, as multilateral obligation netting schemes, lessen risk by reducing the amounts that have to be settled. Not only is the market risk from the moment of trade until settlement reduced, but, significantly, the principal risk in the settlement process is also reduced. It is now planned that the two will be merged to form a single FX clearing house.

The Continuous Linked Settlement Bank (CLSB) project will offer payment versus payment — which synchronises the exchange of payments so that principal risk in the settlement process is entirely eliminated. It plans to do this by settling transactions individually across the books of the CLSB in real time, with both legs settling simultaneously. It also plans to be able to settle the netted outputs of the clearing house. The CLSB's funding arrangements are based on the net amounts arising from the total of each day's settlement by each settlement member.

The CLS system still has to be built, and central banks are still discussing some of the operational risk management features — especially liquidity management — with the CLS team, but the prospects are encouraging. Multilateral netting is

available now. In addition bilateral netting is used more extensively. It was pioneered by FXNET and has been adopted by other schemes that offer common contractual arrangements and automated matching and confirmation. These approaches also offer the opportunity for significant reduction in FX risks.

Lender of Last Resort

But however much central banks and supervisors try to prevent accidents, they need to be prepared for them to happen. The concern then becomes to ensure that they do not spread to other parts of the financial system.

For the central bank, this may involve providing liquidity on penal terms, outside normal money market operations, against the security of high quality assets, to a particular institution that does not want to appear in the market. Or it could mean standing between an intermediary and the market place, to facilitate payments or settlements that may not otherwise be completed, which could then cause gridlock. This would not normally involve the central bank in significant financial risk. In rare situations, where one institution failing could bring down other — otherwise viable — institutions, the central bank may need to consider acting as “lender of last resort” to the failing institution, against poorer quality, less liquid, assets which might expose the central bank to financial loss.

The objective of this central bank safety net is not to protect indi-

vidual firms from failure. It is to protect the stability of the financial system as a whole. In the absence of a serious systemic threat, the right course of action would normally be to allow the firm to fail. If any firm felt that it could rely on being bailed out if it ran into difficulty, that would introduce “moral hazard”, encouraging excessive risk-taking and financial fragility in the system as a whole.

“Lender of last resort” assistance involves the commitment of public money — which is ultimately taxpayers’ money — and it needs to be justified in terms of the damage that would otherwise result to the financial system and to the wider economy. For this reason the MoU provides for the Bank and the FSA to inform and consult one another if either identify a problem that might require support, and for the Treasury to be kept informed as well in order to give the Chancellor the option of refusing support action.

Lessons of the Asian Crisis

As the Bank and the FSA prepare for their new roles, a significant financial crisis has been unfolding in the Far East, with lessons both for regulators and central banks — and for the banking system itself.

Turbulence in East Asia’s financial markets of began in Thailand early last summer. The crisis spread to other countries in the region through the summer and intensified when it reached South Korea in late October. The collapse of large

Korean *chaebols* triggered the won’s fall and the failure of Korean banks accentuated banking sector problems in Japan.

The main focus since the New Year has been on Indonesia, where the rupiah and stock markets have been weak, and there has been concern both over the ability of the private sector to repay outstanding short-term debt and the government’s reluctance to follow the conditions attached to its IMF programme. Hong Kong has also seen speculative attacks on its currency and the failure of its largest investment bank, Peregrine.

Domestic banking problems had already made the Japanese financial system fragile. The crisis in emerging markets has accentuated these problems, since up to 45 per cent of unrealised capital gains on equity holdings count towards Japanese banks’ Tier 2 capital and 100 per cent of any fall in market valuations below book value reduces tier 1 capital. The recent fall of the Nikkei 225 will have further reduced capitalisation.

It is not too soon to draw lessons from the crisis and this was a particular focus of the recent international meetings in Washington, where a number of initiatives were put in train.

Assessment of country risk

There remains active debate about the extent to which the difficulties faced by the East Asian countries stemmed from weaknesses in their financial and corporate structures,

macroeconomic imbalances, or from investor panic. But however blame is apportioned, it is clear that background investment decisions would have been improved if lenders and official bodies had had better data, relating to capital account vulnerability and to domestic financial systems. The Interim Committee requested the IMF “to expedite its efforts to broaden and strengthen the Special Data Dissemination Standard (SSDS) to cover additional financial data, including net reserves, debt, particularly short-term debt, and indicators of stability of the financial sector”. Work is also underway to increase the frequency, timeliness and coverage of country exposure data collected from creditor banks and drawn together by the BIS.

There is considerable anecdotal evidence that banks did not pay enough attention, when making their lending decisions, even to the data that was available. As the World Bank’s *Global Development Finance Report* put it: “Foreign lenders and investors were not restrained by inadequate financial statements, high short-term debt, or the unhedged foreign exchange exposure present in the financing structure of east Asian banks and firms”. This may have reflected a belief that Asian counterparties (especially the banks) would be regarded as Too-Big-to-Fail by the domestic authorities and the international community.

These and related issues will be explored by a working group of experts drawn from the industrialised and developing countries.

Among the issues to be considered are:

- What types of information would promote efficient and stable markets: this could lead to an examination of the relevance, coverage, periodicity, integrity, quality and timeliness of data, and access to it by the public.
- How such information can best be generated, including the role of the private and the public sector, the comparability of data, and the appropriate design of incentives and sanctions.
- How to promote the use of available information by banks and other market participants in evaluating risks and taking decisions.

Another issue in country assessment is regulatory risk-weighting of sovereign lending. The OECD/non-OECD distinction cannot be a wholly reliable indicator of country risk; but as it carries through to differential weights for OECD/non-OECD credit institutions, it does affect interbank lending decisions.

International Support

There is a perception that, post-Mexico, discipline in cross-border financing of emerging markets may have been undermined by expectation of a bail-out if foreign-currency debt proved excessive (or if there was excessive short-maturity debt in relation to countries’ liquid external assets). The Asian support packages could reinforce this moral hazard.

The G-10 report on Orderly Workouts provides a starting point

for exploring ways of enforcing on non-bank creditors, as well as banks, a higher proportion of the burden of providing additional external finance, either in the form of the rescheduling of obligations and/or write-downs. The potential for properly articulated bankruptcy procedures for private sector entities in emerging markets to assist with sharing the burden could also be explored.

A key difficulty is that while devices such as moratoria may be effective in bringing creditors to the negotiating table, in themselves they may not provide sufficient financing. For example, a moratorium may make it difficult to roll over trade finance, and new money may be needed to finance a continuing current account deficit (even if this is falling). The Interim Committee conclusion in Washington was that all creditors, including short-term creditors, should share in the burden and that ways needed to be found to involve private creditors at an early stage. A further working group of experts has been formed to consider these issues further.

Supervision

Finally, there is clearly scope to improve the supervision of financial institutions and accounting standards and transparency more generally in emerging markets. The Basle Supervisors Committee has established a series of core principles for the supervising of banks, and there is concern to see these implemented worldwide.

TRANSPARENCY AND THE DESIGN OF SECURITIES MARKETS

By Joe Ganley, Allison Holland, Victoria Saporta
and Anne Vila, Bank of England

Getting the best out of securities markets is a key concern for market authorities. It is also important for public policy and an active area of economic research. Clear objectives and an understanding of the effect of different designs are vital if the right structure is to be achieved. Market transparency is one of the most important design issues, but others can influence market performance: the functioning of the trading platform; the number and role of intermediaries; trading conventions like tick size, membership agreements, settlements and clearing systems. This article concentrates on transparency and looks at wider issues of market design.

There is probably a reasonably high level of agreement on the objectives of a securities market. But it is more difficult to rank them and, where they conflict, strike balance between them. The following five headings provide a framework:

Allocation of capital

The key objective of any securities market is to allocate capital efficiently. It does so by allowing risk to be transferred between individuals and firms with different access to capital and different risk preferences. Efficient risk-sharing results in a lower cost of borrowing for governments as well as for private enterprise.

Efficient prices

Optimal markets provide efficient prices — prices which fully reflect all information about the fundamental value of a security traded on it. Traders typically arrive at a

market with incomplete information about fundamentals. They also have different motives for trading. Efficient prices are a desirable public good: they allow less well-informed investors to make sensible judgments about the true value of a security.

Liquidity

Aspects of a market's liquidity are its ability to accommodate incoming orders in a timely manner — known as “immediacy” — and its ability to satisfy new orders with minimal effect on prices. It is likely that liquidity, by widening the investor base and improving risk-sharing, will in turn create further liquidity.

Investor protection, fairness

The Financial Services Act (1986) requires all recognised investment exchanges to “ensure that business is conducted in an orderly manner and so as to afford proper protection to investors”. This is echoed by the 1995 report of the Securities and Investments Board (SIB) which says the primary objective of regulation is to maintain investor confidence.

To achieve this, markets must operate fairly and be free of abuse. “Fairness” is a very broad objective that encompasses access to information about securities and the trading process, and equal access to trading opportunities. An important aspect of fairness is best execution for investors. This is defined by the SIB as “reasonable care to ascertain the

price which is the best available for the customer in the relevant market”.¹ This need not imply equal prices for all participants, or for all deal sizes.

Price stability

It is often argued that “excess” price volatility — ie volatility that is not justified by fundamentals — disrupts the risk-sharing function of a market by increasing the cost of hedging. But volatility may attract traders that are willing to take greater risk. So attempts to stabilise prices could result in a reduction in market participation — implying less risk-bearing capacity — which could hamper price discovery in restricting information gathering.

Transparency

Thus there is a range of objectives in the design of securities markets. One of the many “tools” that can be used to help meet these objectives is transparency. Just what is “transparency” — and what issues does it raise?

At the most general level, transparency can be thought of as the real-time and market-wide publication of information about the trading process. The accuracy and speed at which information about trading opportunities becomes available to market participants plainly has a potential bearing on their ability to trade, and so on the prices and quantities at which securities are traded. An important distinction is usually made between pre-trade and post-trade transparency.



Pre-trade transparency refers to information about trading opportunities that are available. This includes the public dissemination of market-maker quotes and quote sizes, or public access to prices in a limit order book.

Post-trade transparency is essentially the publication of executed trades. Immediate publication of information about the size and timing of deals allows all market participants to update their estimates of the fundamental value of a security. Access to this information may be important to the trading process.

Price setting

In a system of competing market-makers, prices are governed by the

marketmaker’s desire to remain competitive and to be appropriately compensated for the risks incurred.

Workshop

On 28 November 1997 the Bank of England hosted a gathering of academics, regulators, marketmakers and practitioners to discuss the role of transparency in securities markets. A background paper outlined a framework for the design of an optimal market with the focus on market objectives — the allocation of capital, price efficiency, fairness and the tools, such as transparency, which are available to achieve them. This article is taken from this longer paper, which is available on request.

There are three routes through which the level of transparency may potentially affect price setting in securities markets.

One is through competition for information on the value of securities. Better information is a source of profit, so marketmakers will narrow their bid-ask spreads to attract orders from well-informed clients. If, in this way, a marketmaker succeeded in attracting all the available private information in a market, he would be an information monopolist. But if the level of transparency increases, there will be less benefit to be had from private information. Marketmakers will therefore lose some of the incentive to narrow their spreads, so

as transparency increases, bid-ask spreads could widen.

Transparency may influence prices through two further routes. When trading with a better-informed counterparty, marketmakers will invariably take the “wrong” side of a trade. Once this trade is known to the market, marketmakers will generally be unable to make any money from the information they will have learnt from their intermediation. This risk is often referred to as asymmetric information risk. This risk is higher in an opaque market with limited transparency and marketmakers will try to protect themselves against it by widening their bid-ask spreads.²

Marketmakers incur further risk where they acquire a large, unbalanced holding of a particular security. This is known as inventory risk. Again, they will set their bid and ask quotes to cover the losses that may arise from having to unwind these inventories at unfavourable prices.

Transparency and liquidity

It is frequently said that greater transparency can threaten market liquidity. Yet it is not clear how far this is the case — particularly for changes in the level of pre-trade transparency.

Increases in post-trade transparency will leave marketmakers with less time to unwind their inventory before the rest of the market becomes aware of a trade. This inventory effect is intensified in the presence of asymmetric infor-

CHART 1: IS THE EQUITY MARKET FRAGMENTED?

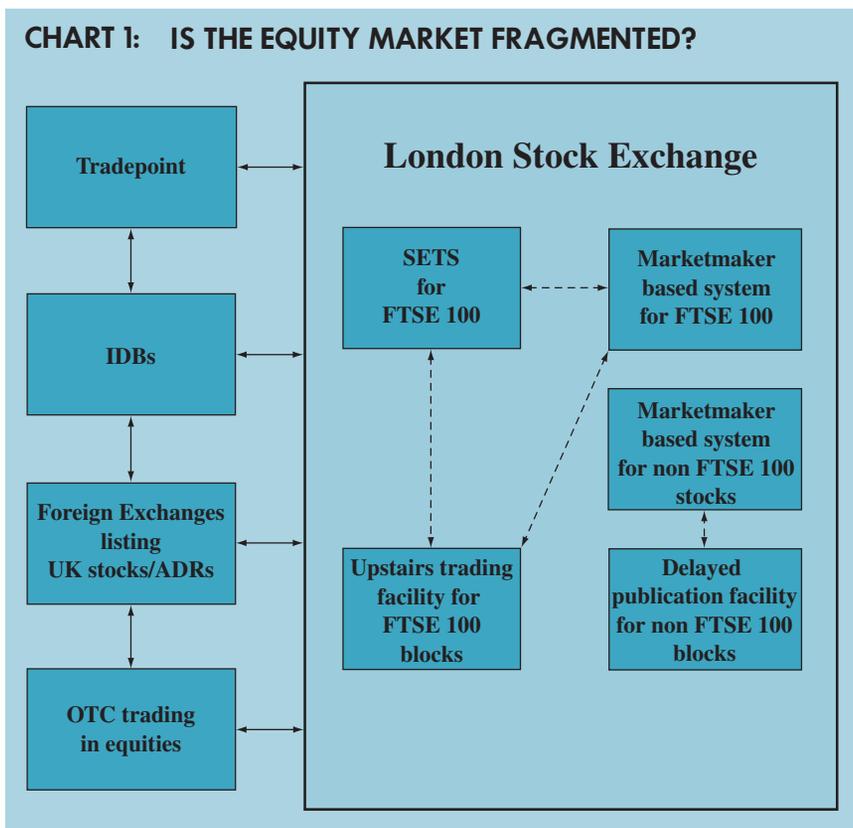


TABLE 1: INSTITUTIONAL FEATURES OF THE LSE EQUITY AND GILTS MARKETS

		SETS	SEAQ	GILTS
Suppliers of liquidity	Marketmakers	No	Yes	Yes
	Posters of limit orders	Yes	No	No
Number of counterparties	Two	Yes	Yes	Yes
	More than two	Yes	No	No
Immediacy		No	Yes	Yes
Automated trading system	Dissemination of quotes/limit orders	Yes	Yes	No
	Order routing	Yes	No	No
	Execution	Yes	No	No
Anonymity	Pre-trade	Yes	No	No
	Post-trade	No	No	No
Transparency	Pre-trade	High: All limit orders with no option for icebergs ¹	Low	Very low
	Post-trade	WPAs. Easier to enforce	Limited by delayed publication of block trades. More difficult to enforce	Very low ²

1. A number of order-driven trading systems allow for “iceberg orders”, ie limit orders which disclose only a portion of the order the poster is wishing to trade in (eg the “quantité caché” of the Paris Bourse).
2. Immediate publication of deals up to and including £50,000. No publication of deals in excess of £50,000.

mation. If a marketmaker suspects his counterparty’s trade to have been motivated by private information, he may be even keener to off-load a trade before the full effect of the price is felt elsewhere in the market. So an increase in post-trade transparency could lower market-makers’ willingness to accommodate new trades, leading in turn to wider bid-ask spreads; that is, to poorer liquidity. But there are several other plausible effects of transparency on liquidity: it is unclear what the net result of these effects might be in practice.

Price stability

It can be argued that the full and immediate disclosure of informa-

tion could lead to an increase in the volatility of market prices, if this enabled marketmakers to update their own quotes and prices more rapidly.

It is also asserted that in a transparent market, small investors can free-ride on large traders and in doing so contribute to excessive price swings, eg if small traders wrongly interpret a liquidity-motivated trade as an information-based transaction and position themselves accordingly. In principle, reducing the level of transparency would limit their ability to do this, and so would prevent the resulting price swings.

However, the net effect of these different influences is hard to predict.

Increases in post-trade transparency enable a greater number of market participants to observe trading outcomes . . . consequently, they should be better able to judge whether the terms of trade they can obtain are “fair”

Increased transparency may attract groups of uninformed investors and deter informed traders. The outcome for price volatility will depend on the relative weight of these groups in the market as a whole.

Fairness

Little research has yet been done on how transparency contributes to investor protection. However, it is clear that increases in post-trade transparency enable a greater number of market participants to observe trading outcomes.

Consequently, they should be better able to judge whether the terms on which they can trade are “fair”, ie similar to those obtained by other participants in the same market. To the extent that increases in fairness ensure better investor protection, increases in post-trade transparency are clearly beneficial.

Market fragmentation

Last October’s introduction of the Stock Exchange Electronic Trading Service (SETS) has raised the profile of market fragmentation as an issue in the London context. (Chart 1, outlines schematically the structure of the London equity markets at the time of publication.)

The new order book is one of the main routes through which FTSE 100 equity trades can now be directed, although investors can still trade directly with a known principal if they wish (albeit now without a SEAQ screen) and worked principal agreements have created an official “upstairs” market for large trades.

The traditional marketmaking arrangements continue unchanged for those shares which are outside the FTSE 100 so that, including over-the-counter (OTC) trading, there are now at least four distinct channels for equity market trades and, in the absence of full post-trade transparency across all these markets, information will reach traders with a time lag. This could hinder efficient price formation.

London’s rules

The transparency rules for London equities and gilts have changed a number of times since Big Bang — the restructuring of London’s securities markets which was undertaken in 1986. The most recent of these changes has been the introduction of the new SETS system, which has effectively replaced the older SEAQ system.

The first four columns of Table 1 compare a number of key institutional features of SETS and SEAQ. A striking difference in the design of the two trading mechanisms is their pre-trade transparency.

On SETS, pre-trade transparency is high because the limit orders submitted to the book are visible to all market participants. Unlike some order books — such as that of the Paris Bourse — SETS does not provide a facility for hiding a portion of the price contingent order (“iceberg orders”). As a result, SETS displays the full current depth of the order book. In comparison, the pre-trade transparency provided by SEAQ was low: although market-

makers quoted prices continuously, these prices were only good for standard (smaller) lots and better prices could often be obtained.

The two mechanisms also differ in their post-trade transparency. Since Big Bang the rules governing publication of trades have been the subject of a long debate which has resulted in frequent changes to London Stock Exchange (LSE) rules. Before SETS, the most recent

change to the London Stock Exchange was implemented on 1 January 1996 and involved a significant increase in post-trade transparency: the publication of trades exceeding six times the normal market size (NMS) could be delayed for no more than 60 minutes and all IDB trades were published immediately

Publication rules changed again with the introduction of SETS, but these changes only affect the post-

trade transparency regime of FTSE 100 stocks. For trades exceeding eight times NMS (about 20 per cent of average daily trading volume) a dealer can guarantee a price to an investor and seek to improve it during the day. The trade need not be published until after the dealer has “worked” (unwound) 80 per cent of the original position. Table 2 shows the London Stock Exchange’s different publication regimes since

TABLE 2: POST-TRADE TRANSPARENCY REGIMES ON THE LSE SINCE BIG BANG

Time Period	Rule	Reason
Oct 86 — Feb 89	All trades in α -stocks in 5 minutes. ¹	LSE considers transparency as an important feature of the new trading system.
Feb 89 — Jan 90	Prices in trades > £100,000 in α -stocks in 24 hours. Other trades as before.	To help increase low volumes and mitigate losses made by marketmakers.
Jan 90 — Jan 91	Trades >£100,000 in α -stocks same as before. Other trades in α -stocks in 3 minutes.	To increase transparency.
Jan 91 — Dec 93	Trades > 3x NMS ² in 90 minutes. Other trades in 3 minutes.	OFT report (1990) stated that current regime was uncompetitive.
Dec 93 — Jan 96	Trades > 75x NMS within 5 days or until 90 per cent unwound, whichever is the earliest. 3x NMS - 75x NMS in 60 minutes. Other trades in 3 minutes.	These trades were viewed as particularly informative and immediate publication would harm liquidity.
Jan 96 — Present day	Trades > 6x NMS within 60 minutes. ³ Trades > 75x NMS as before. Inter-dealer trades excluded from publication delay. Other trades in 3 minutes.	OFT Report (1994) reiterated the conclusions of the 1990 report based on the empirical evidence of Gemmill (1996). Also, a SIB report (1995) recognised the possibility of a trade-off between transparency and liquidity.
Oct 97 — Present day	Introduction of WPAs for trades in FTSE 100 stocks > 8x NMS. Publication is delayed until 80 per cent of trade is unwound. WPAs can also be used for portfolios of 20 or more securities which include SETS securities. Publication is delayed until all the portfolio trade is unwound. All trades in non-FTSE stocks as before.	To complement the introduction of SETS for FTSE 100 stocks and after the recommendations of the Oliver, Wyman & Co. report (1997).

1. Publication refers to date, time and the name of the stock, whether the trade was a buy or a sell, its price and volume. Until 1991, publication delays referred to price only. Subsequently, publication delays referred to both price and volume.

2. NMS (Normal Market Size) is given by $(2.5\%/250 \times (\text{customer turnover in the past 12 months}) / (\text{closing mid-price on last day of quarter}))$. The 12 NMS bands replaced α - γ classification of more liquid to less liquid stocks in January 1991, following a recommendation by the Elwes Committee for the LSE in May 1989.

3. The 60-minute rule also ensured compliance with the Investment Services Directive.

Big Bang indicating each time the impetus for change.

Under the terms of the 1995 Investment Services Directive (ISD) the market for gilts is a “regulated market”. This stipulates that information on the price at which trades are done (and the volume traded) should be made available to market participants at regular intervals.

There is some flexibility in the provisions regarding how these recommendations should be applied to bond markets. These recommendations refer only to the degree of post-trade transparency of the market, with the level of pre-trade transparency remaining at the discretion of individual markets. Currently, as the gilts column in Table 1 shows, there is little pre-trade transparency in the secondary gilts market. There is no indication of what depth exists in the market and no obligation to display quotes (indicative or otherwise) although some gilt-edged marketmakers (GEMMs) voluntarily publish indicative quotes on some wire services. But in general, investors who want quotes must ask individual GEMMs.

There is also only limited post-trade transparency in the market (Table 1). Details of retail trades are published immediately on the retail trade ticker (RTT), which is distributed via wire services.

Since the implementation of the ISD, the size of trades included on the RTT has doubled to cover deals up to £50,000 in size. This information is also published by the LSE with a one-day time lag in

its daily *Official List* (DOL). Work is currently in progress to extend the degree of post-trade transparency in the market to include wholesale trades.

Research

Frequent changes in the transparency regime and the availability of high-frequency data sets have allowed a number of researchers to test the effect of post-trade transparency on market quality. (To our knowledge there is no empirical evidence on the effects of pre-trade transparency.) Most of this work has been done on equities, not gilts.

Gemmill (1996) looked at the price impact of block trades on the 50 most active stocks on the LSE for one month in each of the six years 1987-1992.³ He found no evidence of a decrease in the speed of price adjustment following the sharp reduction in transparency which came with the change in the publication regime in February 1989.

Gemmill’s results agree with an earlier study by Breedon (1993) who analysed a small sample of stocks in the two publication regimes in 1989 and 1991.⁴ Overall, these studies appear to be inconsistent with the idea that decreases in post-trade transparency curtail efficient price discovery.

Gemmill (1996) and Breedon (1993) also calculated the relative bid-ask spreads in the two post-trade transparency regimes in their samples. Both found that, on average, the spreads of large trades relative to the spreads of small

Laboratory
experiments
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of new
transparency
requirements

trades were narrower under the regime with the longest publication delay. Gemmill also found that spreads were narrower for three of the four years in the longest publication delay regime (February 1989 — December 1993). Both studies concluded that there was insufficient evidence to support the existence of any systematic trade-off between post-trade transparency and liquidity (measured by the size of relative bid-ask spreads).

Other research finds similar conclusions. For example, Board and Sutcliffe (1996) show the percentage of trades (by value) subject to delayed publication fell from 59.7 per cent, in the first half of 1995, to 27.7 per cent, in the first half of 1996, but this had no apparent effect on the size of their median bid-ask spreads.⁵

Gemmill's study also provides evidence against the hypothesis that increases in the post-trade transparency regime could increase price volatility. He analysed the standard deviation of returns on trades either side of block buys and sells to see how these large trades affected returns under different transparency regimes. He finds no relationship between post-trade transparency regime and volatility.

Although empirical evidence does not reveal any statistically significant effects of post-trade transparency on liquidity, price discovery and volatility, increases in post-trade transparency may nevertheless be desirable. They will, for example, increase the speed at which infor-

It is unlikely
that a trader
will have
superior
information
on gilt
fundamentals
relative to the
market as a
whole

mation is disseminated, thereby enabling investors to ascertain if the prices they can obtain are “fair” relative to prices that others have recently obtained.

Excessively stringent publication requirements may, of course, lead marketmakers to book their trades in markets with looser requirements — “regulatory arbitrage”. Pagano and Steil (1996) suggested that marketmakers on NASDAQ engaged in regulatory arbitrage, booking large trades on SEAQ-International because, until 1 January 1996, there were no publication requirements for individual transactions on SEAQ-International.⁶

The statistical evidence therefore does not appear to support the main theoretical hypotheses on transparency in the equity markets. However, these studies are unable to control changes in other factors which may offset the effects of changes in publication requirements. For example, Gemmill (1996) notes that market volatility was higher in 1990 and this probably explains why the relative spreads in that year were wider than in other years that had the same publication requirements.

If statistical studies are ambiguous, research has to find a cleaner environment in which to test for transparency changes. Fortunately, some help is at hand in the guise of “experimental economics” — laboratory experiments which are used to simulate real markets. They can be used to isolate the impact of new transparency requirements.

It is unclear whether an increase in transparency will lead to prices in the market becoming more or less volatile

This is a new area of research, but some work suggests the effects of post-trade transparency on spreads and on price efficiency might be consistent with theory.

There is very little published research on transparency in the gilts market. But the gilts market — indeed bond markets generally — is quite different from equity markets: transparency rules therefore need not be the same in each of them.

The most obvious difference is in what determines the price of a gilt. This will reflect expectations of macro fundamentals such as future inflation and the size of the government deficit. These expectations will change with announcements of economic “news”, such as the latest figures for the retail price index (RPI), which is public information. It is unlikely, therefore, that a trader can have superior information on gilts fundamentals relative to the market as a whole — unlike the situation in equity markets. This is consistent with Proudman (1995) which found there was no evidence of information in gilt trades.⁷

However, Vitale (1996) found spreads increase for large trades, suggesting that there could be some limited information asymmetries in the gilts market.⁸ So, there might be an improvement in price discovery if post-trade transparency were to be increased.

Of course, gilts investors have access to other sources of information. These include the gilt futures market on LIFFE, from which prices are published immediately on the

wire services, and the gilt repo market, in which some firms publish indicative quotes on an *ad hoc* basis on wire services. These additional sources of information could limit the effect of new transparency rules in the cash market for gilts.

But what of liquidity and transparency, since increasing the level of post-trade transparency could increase marketmakers’ inventory risk leading to wider spreads?

Studies by Proudman (1995) and Vitale (1996) both find that inventory effects are insignificant. There is, however, evidence that GEMMs can take as long as five days to unwind a large position. Full transparency would allow the market to identify this, which might make it difficult for a marketmaker to re-balance his inventory without the price moving against him. So the increase in the required compensation to induce him to undertake this risk might be significant.

If marketmakers thought the increase in inventory risk to be significant, they might decide that the costs associated with being a GEMM outweigh the benefits and withdraw from the market. This would adversely affect competition and liquidity in both the primary and secondary markets and could increase the cost of government borrowing.

It should be noted that inventory re-balancing is facilitated by marketmakers’ access to IDBs and derivative instruments: this weakens the inventory risk argument for reduced post-trade transparency.

As each individual gilt trade contains little news about the true value of the asset, it should have little effect on the equilibrium price of a gilt. Price will move as demand or supply changes, but these movements should only be temporary: as a disequilibrium is observed, investors will enter the market, either supplying liquidity or absorbing it, until the price equilibrium is restored. The current transparency regime — one which allows information on order flow to trickle into the market slowly — may help to maintain price stability.

An increase in post-trade transparency might increase volatility as prices move more quickly away from their equilibrium level (reflecting the price impact of the trade) and then return to the original level (as the effect is unwound). It is also the case, however, that the current opacity of the market increases uncertainty about trading opportunities, which could add volatility to prices.

Given the lack of private information about gilt prices and the existence of complementary markets

which help determine the fair price of a gilt, increasing transparency is unlikely to have a significant effect on price discovery within the gilt market.

Although the gilt market could become “fairer”, it is unclear whether liquidity would in fact be increased or reduced. It is also not clear whether an increase in transparency would lead to prices in the market becoming more or less volatile. If marketmakers withdrew from the market due to a change in publication requirements, this could affect the key objective of keeping the government’s funding costs low.

Conclusion

Transparency is usually thought of as a desirable feature of securities markets. But it is difficult to demonstrate this. Most of the research that has been undertaken so far has been inconclusive. It is likely in practice that there will be trade-offs among the objectives we have suggested for markets, and that the optimal level of transparency will differ for gilts and for equities. ■

Given the lack of private information about gilt prices ... increasing transparency is unlikely to have a significant effect on price discovery

NOTES

- 1 “Regulation of the United Kingdom equity markets”, Securities and Investments Board, November 1995.
- 2 See Maureen O’Hara’s book *Market Microstructure Theory* (Blackwell, 1995) for a comprehensive overview of this field of research.
- 3 See Gordon Gemmill “Transparency and liquidity: A study of large trades on the London Stock Exchange under different publication rules”, *Journal of Finance* 51, pp 1765-1790.
- 4 Francis Breedon “Intraday price formation on the London Stock Exchange”, London School of Economics Financial Markets Group, Discussion Paper No 158.
- 5 John Board and Charles Sutcliffe “The proof of the pudding: The effects of increased trade transparency in the London Stock Exchange”, mimeo, London School of Economics Financial Markets Group.
- 6 Marco Pagano and Ben Steil “Equity trading I: The evolution of European trading systems” in *The European equity markets: The state of the union and an agenda for the millennium*, Royal Institute of International Affairs.
- 7 James Proudman “The microstructure of the UK gilt market”, Bank of England Working Paper no. 38.
- 8 See Paolo Vitale “Two months in the life of two marketmakers on the London Stock Exchange”, mimeo, Bank of England.

COMPUTERS AND THE MILLENNIUM: JUDGMENT DAY

*By John Footman, Bank of England, and
Martin Owen, Financial Services Authority*

The inability of many computers and software packages to react predictably to dates in the next century represents a huge threat to business, and to financial institutions in particular. Remedial action is costly, and is already absorbing much management time; but firms which fail to take the necessary steps put their own survival in doubt. If not identified in time, such firms may put at risk the integrity of London's payment and settlement systems. This article reviews the steps being taken by the FSA and the Bank to ensure that the City is ready for the millennium, describes parallel initiatives in other centres, and discusses some of the issues that arise.

The financial community is heavily dependent on IT processes, and the fact that many computers are not able to process dates around the millennium change correctly is a potential source of disaster.

The problem arises because of the convention of representing the year with only two digits (eg "98" for 1998), which originated in the early days of computing, when both memory and storage space were relatively expensive. The convention is still used, and it is expected that many computer systems will fail, or give unpredictable results, when they process dates beyond 1999, and in particular when their internal clocks change to 2000.

Another concern is whether or not computer software will treat 2000 as a leap year. While years ending in 00 are not always leap years, 2000 will be one; program-

mers may not have understood this. There is also a concern that some software may use the value "99" in a year field to indicate a special condition (eg end of file) rather than the year 1999.

Year 2000 problems will affect every sort of computer system. While older software is more likely to have Year 2000 compliance problems, it cannot be assumed that even the most recently-developed software is compliant. All types of computer hardware are also affected, from personal computers right up to the largest mainframe.

The Year 2000 problem is unique. As well as potentially affecting all computer systems, large and small, whatever their function and wherever they are located, it also has a "fixed end date" that no excuse will move. It highlights the growing interdependence of computer systems. Compliant systems may be brought down by non-compliant systems. The failure of an infrastructure system because of non-compliance would affect many users.

The need to address the Year 2000 problem is therefore urgent. Although the two-digit years in computers' internal clocks may not cause problems until around the turn of the millennium, other problems relating to two-digit years have already begun to appear, and will do so increasingly as 2000 approaches.

Firms and the FSA

Year 2000 is a survival issue for many financial institutions, and is

thus a matter of direct concern to regulators in this country and abroad. Already each FSA constituent, including the Supervision Department of the Bank of England, has pursued the matter individually in their respective fields of regulation. Since October 1997, they have also come together in an “FSA Year 2000 Task Force”. The risks to individual firms include:

- Their own IT systems may not work properly.
- They may be adversely affected by the malfunctioning of IT systems used by other parties important to them (eg counterparties, suppliers of back-office or information services, or utility suppliers).
- They may be adversely affected by a malfunctioning “embedded chips” (eg in time-control devices in safes or other security systems).

The Year 2000 problem also poses risks with regard to markets:

- The quality of an organised market, such as an exchange, may be affected by the malfunctioning of systems — eg for information dissemination, trade reporting or settlement).
- The quality of OTC markets may be affected by systems problems of individual market participants.

Regulators cannot make firms Year 2000 compliant — nor can they directly verify that a firm is compliant. Equally, however, regulators cannot be passive, simply reacting to whatever problem situations arise on 1 January 2000 (or any of the other danger dates). They

BOX 1: THE CHANGEOVER TO THE NEW MILLENNIUM

25 Dec 1999	Saturday	Christmas Day
26 Dec 1999	Sunday	
27 Dec 1999	Monday	UK Bank Holiday
28 Dec 1999	Tuesday	UK Bank Holiday
29 Dec 1999	Wednesday	
30 Dec 1999	Thursday	
31 Dec 1999	Friday	Last Working Day of 1999
1 Jan 2000	Saturday	New Year's Day
2 Jan 2000	Sunday	
3 Jan 2000	Monday	UK Bank Holiday
4 Jan 2000	Tuesday	First Working Day of 2000
5 Jan 2000	Wednesday	
6 Jan 2000	Thursday	
7 Jan 2000	Friday	

This table shows the two weeks around the new millennium. As Christmas Day falls on a Saturday, both Monday 27 and Tuesday 28 December will be bank holidays in the UK. It is reasonable to suppose that the remaining three days will be busy in the financial markets as participants seek to close-out positions before the date change and complete end-of-year procedures.

An important point to note, in terms of bank holidays, is that in a number of countries there is no automatic transfer of the New Year's Day holiday to the Monday when it would otherwise fall at

a weekend. Therefore other financial centres may be open on 3 January — and if two Euro-area countries are open the TARGET system will operate. Under normal circumstances this would mean that CHAPS Euro and the other systems necessary for it to function (such as CGO) would also be operating.

This consideration apart, there will a three-day weekend in the UK at the beginning of 2000. It is expected that institutions will use these three days to test their computers and other systems in a genuine Year 2000 environment. Two suggestions have been put forward for an additional holiday because of the new millennium — 31 December and 4 January — but there are differing views about whether they would be useful or desirable. In particular the TARGET issue will apply in both cases unless the extra holiday is decided in co-operation with other EU states.

have a concern for the continuity and integrity of a firm's business, and with the potential risks to investors, depositors, policy-holders and markets. Where such risks are material, action needs to be taken to address them.

The FSA's strategy at this stage is to promote awareness of the problem and to ensure the adoption and effective implementation by firms of adequate compliance project plans. The typical elements of such

a plan are set out in Box 2. The FSA also intends to track firms' progress, drawing the regulators' attention to the risks in order of importance; and ensuring that firms have contingency plans in place in case, despite all efforts, problems do arise.

A lot of activity is already in progress, absorbing scarce and specialised IT resources and involving, for some firms, substantial expenditure. But many firms have found

BOX 2: ADDRESSING YEAR 2000 COMPLIANCE

The first step in addressing the Year 2000 problem is for senior management to understand the problem, and to accept the importance to their business of addressing it. A Year 2000 programme, usually with a dedicated manager to co-ordinate it, will be put in place, reporting to board level. Senior management should ensure adequate resources are allocated to the work, and that all of their staff are aware of the importance of the issue. As with any large project, Year 2000 programmes require detailed planning; and a process for monitoring progress, and reporting it to the senior management. Internal and external auditors should be involved.

A Year 2000 programme will normally start with the creation of an inventory of every system or service that could be affected. The inventory should include internally and externally-created software and hardware, and items with embedded computer components. It should be created on the basis that every system is non-compliant until proved otherwise and should assign accountability for the compliance of each system. The Year 2000 compliance of every item in the inventory should be assessed, together with the resources required to make it compliant. External suppliers will need to be asked if their products are compliant, or what plans they have to make them so. The importance to the institution of each inventory item should be assessed; together with the priority of making it compliant; some systems will start to fail before others.

Using this information on resources and priorities, a decision has to be made on how to deal with each item. The most cost-effective solution may be to replace the system with a compliant alternative (although the compliance of the replacement item must be tested). It may be that the cost of making the system compliant outweighs its value to the business, and a decision is made to stop using it.

All items in the inventory will need to be thoroughly tested for Year 2000 compliance, whether the system was amended to be compliant (internally or externally), was created or purchased as a compliant replacement, or was assessed to be compliant without further action. Systems supplied by a third party should be tested, even where the supplier has given an assurance of compliance; each installation of a product interacts with a unique combination of hardware, operating systems and other application software, each of which could affect the compliance of the others. This testing will be the most resource intensive part of the Year 2000 programme. It could require the creation of separate testing environments so that the production systems are not affected.

Testing should include all interfaces with other systems, both internal and external, such as those of business partners, customers or the government and with the telecommunications networks used. As different applications and systems will be made compliant at different times between now and 2000, this interface testing will tend to be a cumulative and repetitive process.

Finally, an institution's Year 2000 programme will need to address contingency arrangements, to cover the non-compliance (expected or unexpected) of their own systems, and also of the systems of their suppliers, customers and common infrastructure services.

In March 1997 the BBA published a recommended timetable for Year 2000 compliance which has become the industry standard. The target deadlines for main milestones were:

- 30/06/97 Organise Year 2000 project team. Conduct inventory of affected systems. Assess risks. Plan Year 2000 programme (which might include the remediation, replacement, retention or retirement of systems).
- 31/12/97 Upgrade or modify, as appropriate, relational systems (those involving core transaction processing and other systems with external interfaces). Have such systems available for test. Compliant platforms available to test.
- 30/06/98 Test relational systems and have them available for cross-organisational testing, including those from third parties. Have stand-alone systems available to test.
- 31/12/98 Complete cross-organisational testing for relational systems and implementation of upgraded systems. Test stand-alone systems and implement upgraded versions.
- 30/06/99 All other equipment upgraded and tested.

The key date was seen as being December 1998 to enable 1999 to be available for industry and wider testing. A survey of the BBA's 300 members in December 1997 showed that 96 per cent of banks expect their core systems and external interfaces (the relational systems) to be compliant by the end of 1998.

the task bigger, and more expensive, than they expected. Progressively through 1998 and into 1999 it will become clearer which firms have made good progress and which have not. For most firms, the testing phase will be critical. The regulators will be ready to intensify their supervisory dialogue with any firm whose systems give grounds for concern, and ultimately, if necessary in particular instances, to use the powers available to them.

Systemic interest

The Year 2000 problem can knock on from firm to firm and ultimately to affect the operation of the system as a whole. This concerns both the Bank of England and the FSA. The Bank is also concerned with the preparedness of the City's key infrastructure providers — organised exchanges, payment and settlement systems, and information and dealing systems.

In November 1997, the Bank convened a meeting of financial trade associations, information service providers and infrastructure providers. This meeting had several purposes: to identify the various financial industry groupings considering the Year 2000 problem; to review the Year 2000 initiatives of the institutions represented; to identify some issues of common concern; and to discuss possible roles for the Bank.

It was decided that the Bank should act as a central collection point for information about the preparations of the financial infrastructure for the Year 2000, and the issues to be addressed.

In particular, information about the Year 2000 compliance programmes and testing plans of individual markets and systems would be collated and distributed in order to identify gaps, conflicts or dependencies in the City's preparations, and improve the liaison between the many existing groups addressing the Year 2000 problem.

The initial issue of *Financial Sector Preparations for the Year 2000* was the first result. It is recognised that this may lead to a role for the Bank in promoting co-ordinated activity.

International initiatives

Internationally, central banks and banking supervisors have been working together to raise awareness of the Year 2000 problem, through the Committee on Payment and Settlement Systems (CPSS) and the Basle Committee on Banking Supervision (Basle Committee).

In September 1997, the G-10 central bank governors issued a statement on Year 2000 compliance issues relating to financial institutions and markets. This statement was accompanied by a Basle Committee technical paper which set out a strategic approach for the development, testing and implementation of system solutions. It also defined the role central banks and banking supervisors need to play in promoting awareness of the issue, and enforcing action.

Other international financial supervisory organisations have also been addressing Year 2000 compli-

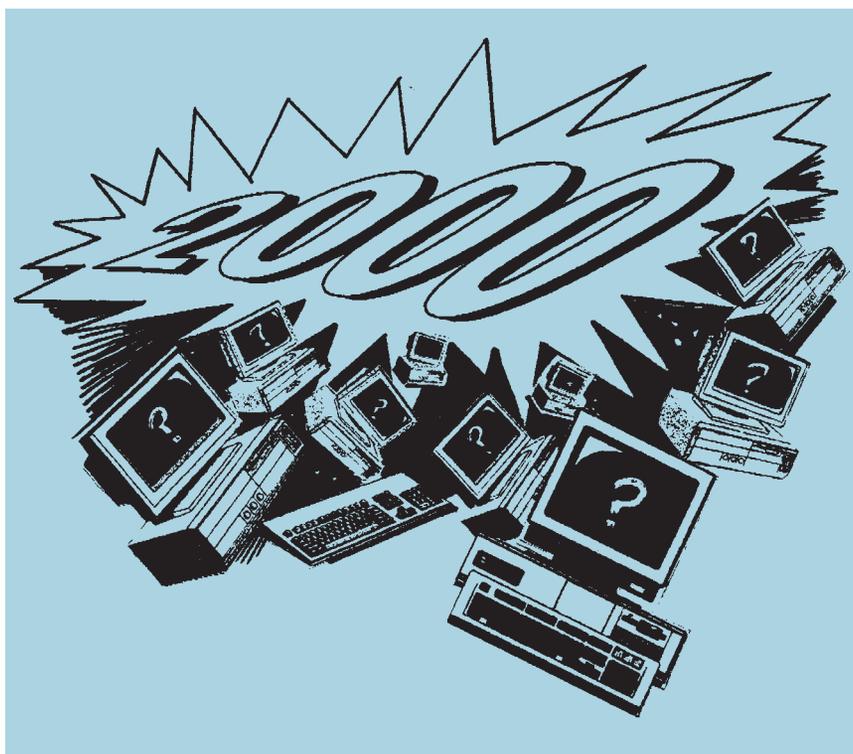
ance issues. In June 1997, the International Organisation of Securities Commissions (IOSCO) issued a statement urging its members and market participants to take appropriate action to address the Year 2000 problem. In November 1997, the International Association of Insurance Supervisors (IAIS) issued a statement focusing on the issues that the Year 2000 poses for insurance companies.

US bank supervisors

Bank supervisors in the US are approaching the Year 2000 issue with a comprehensive plan. This includes: promoting awareness of the problem through industry alerts and presentations; establishing targets for reprogramming software and external testing; and providing feedback to the institutions on their progress and any outstanding issues. Where necessary, bank supervisors are taking action with individual institutions.

Since 1996, bank supervisors have provided critical guidance in the form of periodic policy statements issued through the Federal Financial Institutions Examinations Council (FFIEC).

During the early summer of 1997, banking supervisors surveyed their institutions to find out if they had effective Year 2000 programmes, with appropriate plans and schedules, and whether their plans were on track. The survey indicated that the largest banks were generally well advanced, but that many smaller banks were only at the initial stages.



The bank supervisors plan to conduct reviews of all banking institutions by the middle of 1998 in order to identify areas that are potentially vulnerable.

Other US financial market regulators are also devoting substantial resources to addressing Year 2000 issues. For example, the US Securities and Exchange Commission (SEC) has provided specific guidance to public companies regarding their obligations to disclose information about the anticipated costs, problems, and uncertainties associated with the Year 2000 issue.

The Federal Reserve is also pursuing a comprehensive strategy to achieve and test the Year 2000 readiness of Fedwire, the electronic large-value transfer system for funds and securities that it manages and

operates. It is also developing a contingency plan which includes:

- alternate plans to address the inability of businesses to meet Year 2000 readiness schedules;
- business resumption plans to address any unexpected internal problems with the century date change; and
- system contingency plans to address problems experienced by customers at the date change.

The New York Clearing House has established several committees and task forces to deal with Year 2000 issues. The Clearing House members have been working with the US national group of SWIFT users to establish common test dates across three funds transfer facilities (CHIPS, SWIFT and Fedwire). These common test dates will enable

depository institutions to simultaneously test their systems' interaction with the three services, and with other depository institutions worldwide. In addition to weekday testing, 26 September 1998 has been scheduled for co-ordinated testing, and additional test dates are planned in November 1998 and in 1999.

US securities markets

The US Securities Industry Association (SIA) has established various committees of members to manage its programme, including the question of industry-wide testing.

This industry-wide (or "street-wide") Year 2000 testing aims to provide an opportunity for all firms in the US securities industry to jointly test their applications and interfaces with each other, as well as with the relevant exchanges and payment and settlement utilities.

The industry-wide testing committee, together with the other relevant parties, is currently identifying a set of mutually acceptable testing requirements. The tests will involve a complete trade cycle for equities, options, corporate and municipal bonds, unit investment trusts and mutual funds. About 300 individual securities firms, and between 30-40 exchanges, are expected to take part in this series of tests.

Industry-wide issues

Benchmarking, certification and standards

A common problem has been to know how much weight can be put

on assurances of Year 2000 compliance from suppliers, clients and service providers; and conversely, how to deal with requests for such assurances from others. The first requirement for any kind of Year 2000 compliance statement would be a commonly accepted standard or benchmark.

Existing standards on Year 2000 compliance, such as the BSI DISC PD2000-1, have stated the requirements at a high level. But the BSI standard defines what is meant by Year 2000 compliance, not how it might be measured or audited.

A well-constructed checklist or benchmark can serve a useful purpose to help with internal millennium compliance work. Inevitably a single checklist cannot meet the exact needs of every organisation, but within one class of institution the adoption of a standard list of requirements could be beneficial — not least in giving institutions some idea of the auditors' likely expectations, and in helping to understand exactly what counterparties mean when they say they meet the benchmark criteria.

City-wide testing

Thorough testing will be a vital part of all Year 2000 programmes. This testing should be carried out as soon as is practical; it may uncover problems which need to be rectified and re-tested.

It is vital for market participants to be able to test their systems with all their counterparties — and on a consistent basis. All the infrastructure providers are offering, or

plan to offer, a testing facility to their users. Some infrastructure providers have decided to investigate the Year 2000 compliance of their participants through compulsory testing. In many cases satisfactory completion of tests will be a mandatory requirement for any institution that wishes to use the service concerned post-2000.

A simple exchange of information between two parties is not necessarily a good demonstration of compliance. Although the gateways linking each participant to the network may report that the link is functioning perfectly, such a gateway is not usually the source or ultimate destination of the data being passed between the two organisations. The data may be fed through a number of systems in different ways, and perhaps eventually output to another party over another network. It could be that although a firm's own systems are compliant, and its links to other systems are compliant, the combination still might not work properly.

Some markets are therefore considering “end-to-end” tests — tests not just of one link in a chain of operations, but of the whole chain, covering the entire transaction process. This kind of testing is of most use to systems providers and participants alike, although it is more difficult to carry out because it requires the co-ordinated testing of systems by different parts of the business.

A natural extension of this is the US “streetwide” or “Citywide” test. This involves all of the infra-

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structure providers, and all other institutions wishing to take part.

A group of trade associations, exchanges and regulators led by the Futures and Options Association has examined the concept of Citywide testing in some detail and devised the following useful definitions to describe the various levels of co-operative testing:

- 1 Unit test (an internal test within an organisation);
- 2 Integration test (a test between organisations A and B);
- 3 Point-to-point (a test between organisation A and organisation C via a provider organisation B);
- 4 Beta test (a small defined group test);
- 5 Industry test (a group test of any size between the Beta group and 100 per cent);
- 6 Street testing (a test between different industry groups or geographical locations).

If it is decided that Citywide testing would be a valuable exercise, the Bank would be willing to provide any guidance or help with co-ordination.

Business dependencies

Alongside the specific financial infrastructure providers, and an institution's particular counterparties, there are a number of system and product providers whose services are used by large numbers of institutions in the financial sector. The compliance of these systems and products will be a key element of the overall Year 2000 performance of the UK, and the City.

In one group — telecommunications operators — performance is critical. Every major system in the UK's financial architecture makes use of lines leased from the telecommunications companies. Failure in their systems would cause extensive

Although a firm's systems are compliant, and its links to other systems are compliant, the combination might not work properly

disruption. Other providers, such as electricity suppliers and public transport suppliers, could also have a significant effect on the London markets' ability to operate.

Information technology companies are another area of common

dependency. Within the financial sector the markets for hardware and operating systems are dominated by just a few companies, and there are a number of standard software packages in use. Being able to certify the compliance of a set of the most popular equipment and software would seem to be a large step towards overall compliance.

However, this might not be feasible. Compliance depends on the exact combination of hardware, software and operating system in use. Hardware with the same model number may well use components that are sourced at different times, from different factories, each with a different status. This, combined with myriad documented upgrades and undocumented in-house work on software, means that very few organisations are using exactly the same systems. In such circumstances each institution must make careful judgments about the reliance it can place on compliance testing by other institutions.

IT resources and conflicts

This year and next will be a time of unprecedented demand for skilled IT staff — not just for the latest systems but also to deal with "legacy systems" built many years ago. These latter skills in particular may be at a premium; older systems, built when computer memory was expensive and the millennium far away, are the most likely to suffer from Year 2000-related errors.

Small institutions relying on PC-based computers and off-the-shelf

software may be in a relatively strong position as long as they can obtain the relevant upgrades from their suppliers. For companies which use bespoke systems, particularly old ones, there is no real alternative to thorough examination, rectification and testing.

The cost of suitable IT staff and of the new equipment which may be necessary will be relatively high for some of the smaller users of such systems.

Contingency planning

Even when an institution finishes its Year 2000 project, successfully completes internal and external tests, and has satisfied the regulators and its auditor, things could still go wrong at the start of the new millennium.

A system or an embedded chip may have been overlooked, or one of the suppliers may have let the institution down; whatever the cause there is no way to guarantee 100 per cent compliance for 4 January 2000.

Individual firms must think about the contingency measures they must take in the event of failure of their own systems, or those of the company's trading partners and infrastructure providers.

The British Bankers' Association has set up a working party to look into contingency planning within the banking sector. The working party intends to analyse potential systemic risks to the banking industry as a whole, and consider what contingency planning — or perhaps risk mitigation — the industry should undertake. The working party will

build on the methodology which the big banks are using for their own contingency plans and produce a common standard. In this, the group will be working closely with the Bank of England, which is a member of the working party.

Hardware with
the same model
number may well
use components
sourced at
different times,
from different
factories, each
with a different
status

The Bank of England, along with the regulators and HM Treasury, is itself looking into contingency procedures in the case of widespread disruption. Existing contingency procedures concentrate on containing potentially systemic disturbances

within the institution in which they arise. But, the Year 2000 problem has the unique feature that a number of unrelated institutions could be affected simultaneously. This could potentially trigger a more widespread disruption in markets, which would require direct intervention in various forms.

Summary

The Year 2000 problem is easy to describe. Putting each manifestation of it right is relatively simple, like swatting a mosquito. What is so difficult is that there is not one single mosquito but a large swarm, and each one has to be individually identified and swatted.

For system users there is no alternative to painstakingly preparing an inventory of applications and operating systems, checking each one, mapping all the dependencies, rectification, and then repeatedly testing — coupled with contingency planning for the possibility that one will get away.

Awareness of the problem is now high, and action, both domestic and international, is in train. There is a welcome acceptance that this is an issue on which firms have to cooperate rather than compete. The Financial Services Authority and the Bank of England will be monitoring progress closely, and stand ready to intervene as necessary to ensure a smooth transition to the next century. But neither will want to risk a millennium party until the City is safely open for business on 4 January 2000. ■

FINANCIAL INTERLINKAGES AND SYSTEMIC RISK

By Ian Michael, Bank of England

The financial exposures among banks and other financial institutions in the UK are an important part of any consideration of systemic risk. Some key risks in high-value payments arrangements have been reduced in recent years but foreign-exchange settlement risk still looms large. Exposures in the interbank and derivatives markets are also important. Most exposures are among an “inner ring” of big UK banks, internationally active banks and securities houses.

The UK banking system is highly concentrated. The “high street” banking groups account for some 90 per cent of all assets in UK-owned banks and play a key role in the sterling money and interbank markets. In the course of their business, they also acquire significant exposures to each other and to other financial firms through payments and securities settlement systems, foreign-exchange settlement and in OTC-derivatives, especially swaps.

Sixteen institutions make up the core of the high-value payments system and provide the “assured payment” mechanism in settlement of both UK government bonds and equities.

There are more than 300 overseas banks in London. In total their balance sheets exceed those of all British banks combined. They play a significant part in the foreign-exchange, interbank and derivatives markets. There are no large British free-standing securities dealers along the lines of the American and Japan-

ese houses: this business is, however, done on the balance sheets of the banks.

Institutional investors such as life assurance and pension funds have large balance sheets (life assurance and pension fund assets currently amount to some 135 per cent of GDP), but comparatively modest exposures to each other: their key interlinkage is the capital market through the prices of their assets (equities, bonds etc).

Direct financial exposures

Large direct exposures between banks have long been a feature of banking business. There are four main sources of these exposures.

Payments systems

Until recently, many countries (including the UK until 1996) operated the high-value payment system on the basis of multilateral netting of payment obligations at the end of the settlement day. Payment instructions were sent among the banks throughout the day. At close of business the net amounts owing to or from each bank in the system would be moved across the banks’ accounts at the central bank.

Were a member bank to become insolvent during a business day there was significant risk to the other clearing banks, especially as banking practice has been to allow customers to treat incoming payment messages as good funds immediately: that is, before they had been received with finality at the end of the day. The timing of intraday

payment flows could be such that some banks, had they been declared insolvent during a working day, would have left others with exposures equivalent to their entire capital base, given that funds would have been advanced to customers on the basis of payment instructions from the insolvent bank which it was then unable to match with actual funds. This risk has now been addressed through the establishment of a real-time gross settlement system (RTGS).

In a RTGS, high-value payments are made between clearing banks across accounts at the central bank throughout the business day. RTGS arrangements do not, however, eliminate credit risk for banks that are not direct members of the high-value system: these banks must keep balances at, and make payments through, a member bank.

Furthermore, real-time gross settlement does not eliminate the risk inherent in bankers' willingness to allow some customers (including other financial intermediaries) to make payments in anticipation of funds being received later that day. This is a legitimate service to customers, provided systems to monitor the intraday credit are adequate.

Finally British banks are not, in general, members of overseas payments systems: instead, they make their currency payments through "nostro" accounts at overseas banks. Exposures that arise from nostro accounts are not collateralised.

In most countries, including the UK, settlement in the wholesale

securities markets does not occur against flows of central bank money throughout the day. In the UK, delivery of government bonds and equities is made against "assured payments" by the settlement banks that offer payment services to the members of the settlement system. Assured payment banks guarantee that the seller of securities receives cash in exchange; thus they take the credit risk on purchasers of securities. The settlement systems allow assured payment banks to limit their exposures to securities purchasers arising from these arrangements.

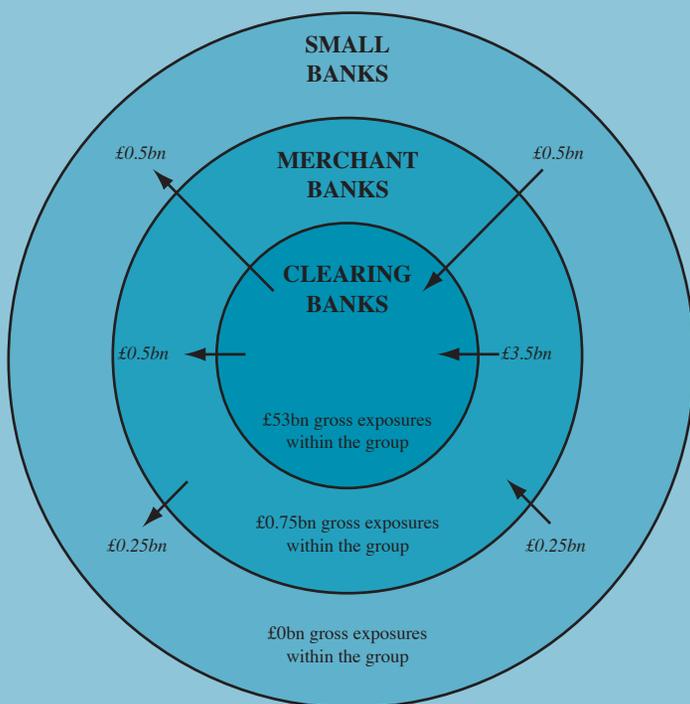
These banks settle the net payment obligation generated by the assured payment system at the end of the day: in other words, this is an area where the risks of end-of-day net settlement have not yet been eliminated. Funds that are transferred through the UK securities settlement systems taken together are of the same order as those through the RTGS payments system — about £150bn daily.

Interbank placements

The interbank market exists to allow a bank to place surplus funds in a particular currency with banks in deficit and to borrow funds where it has a deficit itself. The ready movement of surpluses and deficits is essential for the smooth operation of money markets and the effective implementation of monetary policy. There has been some growth in UK banks' use of collateralised funding recently but the interbank market remains primarily unsecured. A bank

... would have
left others with
exposures
equivalent
to their
entire capital
base ...

CHART 1: FLOWS WITHIN THE INTERBANK MARKET, MID-1997



other — in aggregate more than £50bn. The merchant banks place appreciable sums with the clearers, but the absolute scale of other flows within the system is quite small. Smaller banks do not place funds with each other on any significant scale.

The clearing banks form an “inner ring” and deal with most of the imbalances in the UK interbank market. Relatively small groups of large participants is a feature of other markets such as the over-the-counter (OTC) derivatives markets.

From a prudential point of view it is important to look at the size of placements with other banks as a proportion of the placing bank’s capital base. Table 1 summarises data on this for the four largest clearing banks. Data on the mean size of each of these banks’ exposures to individual members of the group of eight “major banks” are averaged over the four largest banks. The gross figures show the size of placements with other large UK banks. It is, however, common practice in the interbank market for placements between large banks to flow in both directions simultaneously. This reflects differences in currency or maturity. Banks with appreciable amounts of two-way business with individual counterparties would, in general, have a legal deposit-netting agreement in place because of the reduction in both counterparty risk and regulatory capital. The average of net exposures of the largest banks is shown in the second column. The

can therefore be highly exposed at times to one or more institutions through this market.

Chart 1 shows the size of exposures between eight clearing banks, seven merchant banks and six smaller UK banks in mid-1997. (Bear in mind that exposures in financial markets change constantly so these and other data show no more than the broad orders of magnitude typically involved.)

The clearing banks make large interbank placements with each

... this is an area where the risks of end-of-day net settlement have not yet been eliminated ...

TABLE 1: EXPOSURES OF FOUR LARGEST BRITISH BANKS TO EIGHT INDIVIDUAL MAJOR UK BANKS, MID-1997

(Average of the four largest banks’ exposures to individual major UK banks as a percentage of capital base.)

GROSS	NET
11½%	-3½%

fact that this figure is negative shows that, on a net basis, the very largest banks were not taking credit risk: others were taking credit risk on them.

It is also important to take into account interbank placements by UK banks with banks overseas. In June 1997, the four largest UK banks on average had 10 exposures to such banks which individually exceeded 10 per cent of the UK bank's capital base. Just as there is an inner ring in the domestic market, so there is an inner ring of international players which includes the largest banks.

Another factor is the role of overseas banks in the sterling market: sterling deposits at overseas banks are as much as 30 per cent of the total of such deposits with British banks.

Credit risk in the interbank market is mitigated by two factors:

- Most interbank placements are of relatively short maturity: about three-quarters of placements are for less than three months duration;
- The main UK banks' exposures of material size are only to highly-rated counterparty banks.

Foreign-exchange risk

Turnover in the foreign exchange market continues to grow. Surveys by the Bank for International Settlements (BIS) show that global daily turnover rose from just over \$600bn in 1989 to about \$1,200bn in 1995: it has almost certainly grown further since then. (About one-third of these transactions take place in London.)

These figures imply daily average foreign-exchange related flows of \$3-4tn. The sterling leg of foreign-exchange transactions account for about half the daily flows through the sterling high-value payments system.

Settlement exposures do arise because the two legs of a foreign exchange transaction can seldom be synchronised — time-zone differences between financial centres is the reason most commonly given. This implies an upper limit for the Tokyo to New York time discrepancy of nearly 24 hours. But a BIS report¹ published two years ago noted that, in fact, the exposures are often for longer periods. There is a period before FX payments are physically made during which they are effectively not revocable unilaterally: there is also, typically, a delay in reconciling incoming payments to establish that they have been received. The report says that because of these factors, the amount which an active foreign-exchange trading bank has at risk each day to a single counterparty could exceed its entire capital base.

A large UK bank's exposure to an individual bank from foreign-exchange settlement can equal its credit exposure to that institution in the interbank market. A high proportion of these exposures is between the inner ring of large international banks.

As envisaged in the BIS report, initiatives to address foreign exchange risk have taken place under three broad headings. Individually,

banks are tightening their monitoring and controls — such as tightening payment timetables and applying credit control processes which recognise that a settlement exposure equates to a credit extension for the equivalent period. Bilateral netting is now applied to about one-quarter of the large banks' gross settlement flows, reducing the settlement risk involved by about half.

Industry initiatives to reduce risk include schemes for multilateral netting through a central clearing house, with each participant making or receiving just one payment in each currency on a particular day (ECHO and MULTINET) and for synchronising payments through continuous-linked settlement (CLS): all of these schemes now operate under common ownership. Central banks have contributed to risk reduction by increasing the opening of domestic payments systems.

Derivatives markets

The growth of derivatives markets has been a feature of financial innovation. Exposures in the derivatives markets do not only occur between banks. Some non-bank firms, especially the large securities houses, use these markets extensively, and exposures to end-users such as large companies and (where relevant) to central clearing houses, need to be taken into account.

Most derivatives market-makers are banking groups and derivatives have become a feature of banks' approach to risk management. Van-

TABLE 2: FOUR LARGEST BRITISH BANKS: CREDIT EXPOSURES THROUGH LOANS AND OTC DERIVATIVES, END-1996 (£ BN)

	Loans		OTC derivatives with positive market value	
	To customers	Interbank	Gross	Net
Barclays	89	29	19 ⁽¹⁾	11 ⁽¹⁾
Lloyds	86	15	4	—
Midland	39	16	8	—
National Westminster	81	35	12 ⁽¹⁾	8 ⁽¹⁾

(1) in trading book

Source: The banks' annual accounts for 1996.

illa interest-rate swaps are important in banks' risk management — they account for nearly half the market value of the books of London-based dealers in OTC-derivatives.

Linkages between financial institutions differ according to whether the derivatives are traded off or on-exchange. Financial firms and end-users transact directly with each other on the OTC derivatives market. When the trade is undertaken OTC derivatives have zero value, but as factors such as interest and exchange rates evolve, they can exhibit positive or negative value to the holder, leading to a pattern of credit risk exposures.

As end-users shift market risk to core market-makers (who then need to hedge their exposures) the market-makers can acquire large amounts of credit risk exposure to their counterparties, particularly to other members of the inner ring of OTC derivatives dealers.

According to a 1995 BIS survey, three-quarters of the \$320bn of outstanding contracts held by financial firms in London was held by the 10 largest dealers. Nonetheless, as shown in Table 2, such credit exposures remain small in relation to credit risk stemming from interbank placements and traditional loans, although the degree of concentra-

tion would generally be higher in an OTC-derivatives book than in traditional loan or interbank books.

OTC-derivative credit exposures raise a number of issues. In general, OTCs, especially those with durations measured in years rather than months, are traded only among highly-rated counterparties, which clearly mitigates credit risk — this is one factor which concentrates exposures in the inner ring.² But any prudent policy for addressing credit risk will have some upper limit on an institution's exposure to another institution. Institutions increasingly find their credit lines are full, and have therefore sought to reduce credit risk from OTC derivative transactions through two principal routes: netting and collateralisation. *Netting* Where this is legally robust, the net exposures between two counterparties can be used in assessing credit risk. Between some pairs of counterparties, net exposures can be just 10 per cent of the gross amounts. *Collateralisation* Pressure on credit lines has raised interest in collateralising credit exposures from OTC derivatives with, for example, high-quality government bonds. The Bank of England estimates that probably only 10 per cent of the value of OTCs in the London market is now collateralised, although this figure will certainly increase, as it will in the US. A future concern is likely to be the availability of sufficient high-quality collateral. As Table 3 shows, the gross — and even net — market values globally of OTCs are now material even in relation to the

TABLE 3: GLOBAL SIZE OF GOVERNMENT BOND MARKETS AND MARK-TO-MARKET VALUE OF OTC DERIVATIVES

	1995
Total value of government bond markets (\$, tn)⁽¹⁾	16.4
Gross market value of OTC derivatives (\$, tn)⁽¹⁾	2.2
Estimated global credit exposure on OTC derivatives markets after netting and collateralisation (\$, tn)⁽²⁾	1.0

Sources: (1) BIS (2) Federal Reserve Bank of New York



total of all domestic public-sector debt outstanding.

A further way of addressing credit risk in OTC-derivatives is through provisions to close-out particular contracts after a certain period or, in some cases, once their mark-to-market value reaches a pre-specified level.

On organised exchanges such as LIFFE, at the end of each working day the exchange's clearing house becomes the central counterparty to the two exchange members that have bought or sold derivatives contracts. Thus, the clearing members (broadly the firms at the centre of derivatives markets) do not take credit risk on each other, but on the clearing house. Clearing houses

manage the risks which they assume as central counterparty by asking for initial margin when contracts are taken out, and by daily flows of margin between the clearing house and members as contract values change.

Table 4 shows that daily money movements to the London Clearing House can be substantial. During the 1987 equity market crash, smooth flows of money to US derivative clearing houses were threatened, not because significant numbers of member firms had become insolvent, but because of general uncertainty about the solvency of many firms. For a brief period this reduced the commercial banks' willingness to provide the necessary liquidity.

TABLE 4: MONEY SETTLEMENTS AT THE LONDON CLEARING HOUSE (£M)

Daily Average	Peak Settlement	Largest collection from a single member	Total margin deposits	Largest ever daily money settlement	Largest ever collection from a single member
585	1,901	306	3,800	2,327 ¹	589 ¹

All figures are 1995 except (1) 16/11/94

Source: Clearing Arrangements for Exchange-Traded Derivatives, BIS 1997

Non-banking activities

Banks may acquire exposure to non-banking activities in two main ways:

- First, they may deal with non-banks as counterparties in a variety of markets, not just in traditional lending but also, for example, in the swaps market.
- Second, banking groups are themselves increasingly undertaking activities beyond the realm of traditional banking.

UK banks' exposure to non-banking institutions in aggregate is substantial, currently amounting to some 20 per cent of total lending. However, this exposure is well spread among classes of institution, such as investment/unit trusts, insurance companies and so on.

Moreover, British banks have sought collateral for exposures to individual non-bank institutions where these exposures are large or perceived as relatively risky. Bank lending to securities houses is always collateralised using the securities the firm is holding, but other exposures (especially in the case of foreign-exchange settlement) will generally not be.

The growth of capital markets in the UK during the past 10-15 years has not lead to a higher share

of British banks' lending to non-bank financial firms being advanced to securities dealers.

UK banks have built up businesses outside the area of traditional banking, for example life assurance, pensions and general insurance. The demand for traditional bank deposits and loans may be falling as a share of total financial intermediation (a trend which has already been seen in the US) and such developments diversify earnings. Empirical evidence shows that the development of *bancassurance* has reduced earnings volatility. In one banking group, Lloyds-TSB, the life assurance fund amounts to 12 per cent of consolidated assets.

International exposures

UK-owned banks' exposure overseas is substantial, with lending alone totalling some \$375bn. Much of this — some \$220bn — is to banks, public-sector bodies and other borrowers in G-10 countries.

The total exposure of British banks to emerging markets is smaller as a proportion of their balance sheet than it was on the eve of the 1980s' debt crisis — currently about \$55bn, some 3 per cent of assets. However, this exposure is quite concentrated — the five largest

exposures to individual emerging market borrowers account for half of the total claims on emerging markets.

British investment institutions have acquired substantial international exposure, particularly since the abolition of exchange controls in 1979 and the development of a more liberal climate for international capital flows. For example, overseas securities have accounted for 15-20 per cent of the assets of life/pension funds during the past decade.

Capital markets

In the main industrialised countries, including the UK, there has been a gentle, but perceptible, trend towards banks holding a higher proportion of their balance sheet in traded securities, as opposed to typically illiquid loans. It is generally not the case, however, that banks or other core market-makers in traded instruments run large open exposures to market movements.

This was underlined by a recent survey of stress testing within the large banks and securities firms in London. The survey suggested that in no realistic stress scenario would a firm experience losses greater than 10 per cent of its capital base (the

largest exposures were to emerging markets).

That said, it would be very resource-intensive to calibrate in detail the full range of possible stress scenarios, and this can lead to gaps in the analysis: relatively few banks appeared to anticipate the recent turmoil in south-east Asia, for example.

Institutions such as pension and life funds that perform non-banking intermediation are more exposed to capital markets because a much higher proportion of their assets are held in traded form than is the case for banks, and these are generally outright — unhedged — holdings.

In most cases market risk is not borne by these intermediaries themselves. For example, in pensions it is borne by both employers and employees (in defined contribution plans); in life assurance it is primarily borne by the policy-holders.

Dynamic linkages

The above describes the pattern of exposures typically found in normal market conditions. Such exposures — and market participants' attitudes towards them — can and do alter very quickly where a crisis is perceived, and indeed once such a crisis has crystallised.

In the Bank's experience, counterparties' approaches — which are justified in their own commercial interest — can significantly complicate the resolution of institutions in crisis. Much of the difficulty relates to the dynamic nature of finance: for example, funding typically needs to

be rolled-over, and some derivatives books require constant re-hedging.

Counterparties often become reluctant to deal with an institution that is clearly in difficulties. This may be true even on a fully-collateralised basis. There is an aversion to being caught up in a liquidation or other difficulties.

This was one reason why Salomon Brothers had to shrink its balance sheet by about one-third in the early 1990s, following the reputational damage it suffered from infringing US Treasury auction rules. Providers of funding became nervous, even though it was mainly on a collateralised (repo) basis.

In some instances where counterparties have been unwilling to deal, the Bank has been prepared — at no risk to itself — to stand as a counterparty between the ailing institution and its counterparties.

It can be difficult for an institution in administration to use its nostro accounts: monies flowing through them may be seized by correspondent bankers to set off against funds owed. The Bank has — again at no risk to itself — made account facilities available to institutions in difficulties to alleviate this problem.

Contagion

The discussion above concerned the pattern of exposures within the financial system. It is also important to keep in mind the possibility of contagion — that problems in one area of the financial system will spread over to others even where

there is no clear reason for this to happen.

Shocks to confidence can spread widely, for example because of less than complete information about the condition of financial institutions at all points in time, and problems in one area of the financial system can lead to unjustified concern — or at least exaggerated concern — about other parts which are in fact healthy. This was seen in the UK following the closure of BCCI. The closure was an important factor behind major financial firms being less willing to lend to small UK banks, despite these banks having very little in common with BCCI.

Conclusion

A number of initiatives to reduce the extent of exposures between institutions have been taken. However, from the perspective of systemic risk, it is notable that exposures from foreign-exchange settlement continue to loom large. Moreover, exposures arising from derivatives, especially swaps, are growing, and exposures between banks in the interbank market continue to be important. These exposures tend to be concentrated in the “inner ring” of major UK banks and internationally-active banks and securities houses. ■

NOTES

- 1 *Settlement Risk in Foreign Exchange Transactions (the Allsopp Report)*, Bank for International Settlements, March 1996.
- 2 Interest rate swaps often have an original maturity of as much as 10 years.

FINANCIAL REGULATION AND INCENTIVES



IN NOVEMBER 1997 a conference, Financial Regulation and Incentives, was held in London, hosted by the Bank of England's Regulatory Policy Division and the Financial Services Authority. It provided an opportunity to discuss how incentives can best be set within firms, and externally by regulators, to minimise the risk of undesirable outcomes, such as large losses or financial fraud.

Papers were presented in two main sessions. The first, covering incentives and remuneration, included discussion of the use of market information in banking supervision, the design of remuneration schemes for fund managers and for bank management, and the use of penalties in combating securities fraud. The second session, on pre-commitment and risk-based capital, considered factors affecting the strength of market discipline in conglomerate financial firms, the influence of payments systems on systemic risk, and the pre-commitment approach to capital (in which banks themselves have front-line responsibility to ensure capital adequacy, with penalties applied by regulators if capital proves inadequate).

Three main themes emerged from the papers and discussions:

- the importance (and difficulty) of providing employees with the right incentives;
- the effectiveness of market discipline in providing these incentives; and
- the role and approach of regulators.

The aims of regulation are to maintain the stability and soundness of the financial system, and protect consumers. For these to be achieved, financial institutions must give their employees the right incentives. Ideally, market discipline alone would generate the right incentives, without the need for any intervention by an external regulator — but market mechanisms may not be enough, particularly in a world of deposit insurance and public concerns about systemic risk. Regulators must then play a role, not in displacing market mechanisms, but in complementing them.

Incentives

The control environment within the firm is set not by the shareholders, but by managers. Firms can try to overcome this principal/agent problem through the careful design of compensation schemes — but this is not simple. As Demsetz and Saldenberg show, incentive-based pay schemes (which are intended to encourage managers to generate high profits) are more commonly seen in larger financial firms. They are more common for chief executive officers than for other executives. Also, inadequately-designed schemes can create perverse incentives: Naik and Maug suggest that fund managers' contracts (which are commonly based upon performance relative to a benchmark) affect their asset allocation decisions, and lead to undesirable "herding behaviour".

Market discipline

Market mechanisms can be effective. Flannery suggests that there is evidence that market information about changes in bank condition is accurate and timely: he suggests that market information should be incorporated more formally into supervision procedures. However, market discipline alone may not provide sufficient incentives for management to create a fully effective control environment:

- if the private cost of failure (borne by shareholders) is lower than the social cost, then shareholders will tend to under-invest in monitoring activities;
- the sanctions available within firms (eg dismissal of employees) or between firms (which might withdraw business, or sue each other if they have a case) to punish inadequate monitoring may be less effective than those available to external regulators (Instefjord, Jackson, and Perraudin point out that even when shareholders may be victims of frauds, they may not have sufficient incentives to monitor and discipline managers);
- the structure of the firm may make market discipline less effective (Boot and Schmeits suggest that conglomeration erodes the disciplinary effect of cost of capital, and invites free-riding between divisions);
- it may simply not be possible for shareholders to put in place appropriate incentive structures for management (Daripa and Varotto show that if managers are interested in non-pecuniary benefits such as status as well as salary and bonus, it may not be possible to write contracts that provide managers with appropriate incentives);
- it can be difficult for shareholders to obtain accurate information on risk management within the financial institutions in which they invest. Greater disclosure of information could improve market discipline in these cases. Mayes considers the New Zealand approach: banks must disclose information on assets, liabilities and exposures to risks, and directors must attest that the bank is applying appropriate risk management techniques — so directors are more accountable to shareholders, and market discipline is made more effective.

Role of regulators

Even with increased disclosure, market discipline may not provide sufficient incentives for firms or managers to create adequate control environments. Regulators must then play a role. Instefjord, Jackson, & Perraudin compare the various approaches available to regulators in combating fraud. They suggest that *ex-ante* actions (for example the issuance of guidance concerning systems and controls, inspections of systems and controls, and increases in capital requirements to reflect higher risks) are more likely to be effective in preventing fraud than relying upon *ex-post* actions (such as penalties on the individual, the management or the firm).

Of the *ex-ante* actions available to regulators, however, capital requirements are currently causing the most lively debate. How should they be calculated?

The Value at Risk (VaR) approach involves calculating the capital necessary to cover market losses that could occur with a given frequency over a set time horizon. The capital requirement is then a multiple of this figure (Basle uses a minimum factor of 3). Too many exceptions (ie dates on which the model under-forecast losses) would lead to an increase in the multiplying factor. However, there has recently been discussion of more “incentive-compatible” approaches to supervision of financial institutions’ market risks such as the pre-commitment (PCA) approach. Banks themselves decide how much capital they need to back their trading book, and are penalised if losses exceed this level at any time. The threat of penalties provides the incentive to commit capital commensurate with the intended market-risk exposure and the firm’s risk management capabilities — and to develop risk-management systems which can encompass risk sources such as operational and legal risk, which could not be explicitly incorporated in *ex-ante* risk-based capital approaches such as VaR. Kupiec and O’Brien suggest that if this approach can be successfully applied, supervisors can focus on systems and control issues rather than setting capital standards. However, if (as Daripa and Varotto suggest) shareholders cannot control the managers running the bank, then the pre-commitment approach will not be workable. ■

Papers and panel sessions

USING MARKET INFORMATION IN PRUDENTIAL BANK SUPERVISION: A REVIEW OF THE EMPIRICAL EVIDENCE

Mark Flannery (University of Florida)

Discussant: Oliver Page (Bank of England and Financial Services Authority)

HERDING AND DELEGATED PORTFOLIO MANAGEMENT: THE IMPACT OF RELATIVE PERFORMANCE EVALUATION ON ASSET ALLOCATION

Ernst Maug (London Business School) and Narayan Naik (London Business School)

Discussant: James Dow (European University, Florence)

CAN RELATIONSHIP BANKING SURVIVE COMPETITION?

Arnoud Boot (University of Amsterdam) and Anjan Thakor (University of Michigan)

Discussant: Arupratan Daripa (Birkbeck College)

EXECUTIVE COMPENSATION AT BANKS: LOOKING BEYOND THE CEO

Rebecca Demsetz and Marc Saidenberg (Federal Reserve Bank of New York)

Discussant: Todd Milbourn (London Business School)

SECURITIES FRAUD

Norvald Instefjord (Birkbeck College), Patricia Jackson (Bank of England) and William Perraudin (Bank of England and Birkbeck College)

Discussant: Colin Mayer (Oxford University)

INCENTIVES FOR BANK DIRECTORS AND MANAGEMENT: THE NEW ZEALAND APPROACH

David Mayes (Bank of Finland)

Discussant: Masaaki Shirakawa (Bank of Japan)

PANEL SESSION: DEALER REMUNERATION AND INCENTIVES WITHIN FIRMS

Chaired by Howard Davies, Financial Services Authority; Dick Brealey, London Business School; Christine Cumming, Federal Reserve Bank of New York; Jan-Peter Onstwedder, Royal Bank of Scotland; Guy Whittaker, Citibank

MARKET DISCIPLINE IN CONGLOMERATE BANKS: IS AN INTERNAL ALLOCATION OF COSTS OF CAPITAL NECESSARY AS AN INCENTIVE DEVICE?

Arnoud Boot (Amsterdam University) and Anjolein Schmeits (Tilburg University)

Discussant: Sudipto Bhattacharya (London School of Economics)

CONTAGION AND EFFICIENCY IN GROSS AND NET INTERBANK PAYMENT SYSTEMS

Xavier Freixas (Pompeu Fabra University) and Bruno Parigi (University of Venice)

Discussant: Elu van Thadden (Lausanne University)

BANKRUPTCY PRIORITY FOR BANK DEPOSITS: A CONTRACT THEORETIC EXPLANATION

Urs Birchler (Swiss National Bank)

Discussant: Sandeep Kapur (Birkbeck College)

REGULATORY CAPITAL REQUIREMENTS FOR MARKET RISK AND THE PRE-COMMITMENT APPROACH

Paul Kupiec (Federal Reserve Board) and James O'Brien (Federal Reserve Board)

Discussant: Elroy Dimson (London Business School)

AGENCY INCENTIVES, REPUTATIONAL DISTORTIONS AND THE EFFECTIVENESS OF VALUE-AT-RISK AND PRE-COMMITMENT IN REGULATING MARKET RISK

Arup Daripa (Birkbeck College) and Simone Varotto (Bank of England)

Discussant: Jean-Charles Rochet (University of Toulouse)

PANEL SESSION: PRE-COMMITMENT AND RISK-BASED CAPITAL

Chaired by Michael Foot, Bank of England and Financial Services Authority; Edward Ettin, Board of Governors of the Federal Reserve System; Robert Gumerlock, Swiss Bank Corporation; Eckhard Oechler, Bundesbank; Barry Schachter, Chase Manhattan Bank

**THE SUMMARIES OF PAPERS REPRODUCED HERE WERE PREPARED
BY THE SPEAKERS. THE DISCUSSIONS WHICH FOLLOW THESE SUMMARIES WERE PREPARED
BY THE BANK TO PRESENT THE VIEWS OF THE DISCUSSANTS AND ATTENDEES**

Using market information in prudential bank supervision: A review of the US empirical evidence

Mark J Flannery
University of Florida

ALL FIRMS REQUIRE a system of “corporate governance” through which various claimants balance their conflicting incentives and goals. In most industries, private market forces are left to design and implement suitable corporate governance arrangements. For banking firms, however, national governments have instituted non-market regulatory systems, which specify (*inter alia*) corporate structure, permissible activities, ownership, and maximum leverage ratios. To an important extent, this regulatory oversight reflects government’s frequent role as *de facto* guarantor of financial system solvency. In addition, some analysts argue that market-based mechanisms cannot adequately discipline banks. Although a more market-oriented approach to prudential regulation has considerable appeal on theoretical grounds, many regulators bring to this issue a substantial suspicion about the usefulness of market prices and market assessments. But what evidence supports this scepticism? Why must governments assure bank solvency, but not the solvency of other firms? Are market assessments of bank condition reliable?

Any supervisory (governance) system must both assess bank condition and promptly implement disciplinary actions when they are required. The basic policy question is whether government or market agents — or, perhaps, both — can best provide these governance services. Numerous studies have evaluated whether bank credit quality is accurately reflected in uninsured certificate of deposit (CD) rates, the rates paid on bank holding company debentures, equity returns, and the behaviour of retail financial customers. A more limited volume of literature compares the timeliness of private versus governmental assessments of bank condition.

The paper reviews the existing literature on the market discipline of banks. It focuses on three main questions:

- Are market valuations of banking firms accurate?
- Are market valuations of banking firms irrationally

contagious? That is, do investors infer inappropriate things about one firm from another firm’s experience or condition?

- Do investors identify important changes in bank condition or risk exposure more slowly than government supervisors?

The available empirical research indicates that market assessments have at least a plausible chance of providing timely, accurate assessments which supplement the supervisory agencies’ traditional means of gathering and assessing information about the quality of a bank.

The evidence indicates that bank share prices behave similarly to the equity prices of non-banks: they adjust promptly to new information, and reflect rational inferences about the implications of that information for related firms. Bank liability investors also behave rationally: large CD rates sensibly reflect bank risks, and bank holding companies’ debenture rates came to reflect bank condition once these instruments’ conjectural guarantees weakened (in about 1989). Even small, retail depositors have been shown to behave rationally when confronting insolvent financial institutions. None of the existing studies supports the notion that broadly contagious “runs” would be a problem for banks, even in the absence of today’s extensive federal safety net.

Market assessments also exhibit a timeliness that compares well with supervisory assessments. Bond ratings are particularly complementary to supervisory ratings of bank condition, and equity market variables provide relatively good predictions of bank holding company performance. Given the limited incentives under which private analysts have operated to date, it seems plausible that they could do an even better job if they were more subject to default losses. This is not, however, a one-way street: the evidence indicates that greater access to regulators’ confidential information would also improve market analysts’ assessments.

Government and market systems for banking firms share many goals and methods. Accordingly, government oversight activities (and guarantees) can materially affect private incentives to investigate and discipline banks. If market and government assessments are both reasonably accurate, and complement one another, the optimal regulatory system should probably incorporate both types of information. How, then, might market information be incorporated into the bank supervisory process?

A radical reform of US financial supervision would have the federal agencies withdraw entirely from the oversight and insurance of banking firms which are judged to have “sufficient” market oversight. Credibly withdrawing safety net protections would enhance investors’ incentives to control banking firms. Bank corporate governance would become less homogeneous, as individual banks and market investors negotiated freely over capital adequacy, internal risk control procedures, corporate structure, and permissible activities.

Regulators should be unconcerned by such innovations provided that they have withdrawn all implicit guarantees. But this is a big proviso! Continuing concern about systemic risks and *ex post* political pressure for supervisors to “do something” about major financial failures will make it rational for investors to incorporate some type of conjectured government support for large financial firms into their corporate governance structures. Government cannot, as a practical matter, withdraw completely from prudential supervision because it cannot credibly shed all contingent obligations to the banking sector.

We can still use market information to complement existing procedures for monitoring and controlling large financial firms. The paper argues that market information should potentially improve two aspects of government oversight: it may permit regulators to identify developing problems more promptly, and it may provide regulators with the incentive and justification to take action more quickly once problems have been identified.

Conclusion

As financial markets become increasingly global and complex, government regulators’ ability to provide sufficient oversight to banking firms has been called into

question, particularly for large, complex banking organisations. Whether market forces can supplement government efforts to supervise financial firms is therefore an extremely relevant policy question.

The evidence reviewed in this paper supports the idea that regulators could expand their reliance on market discipline for large, publicly-owned institutions. The financial market’s information flows seem sufficient to warrant greater reliance on private analysts’ judgments, particularly if regulators continue to curtail *de facto* guarantees of individual financial firms. Although this trend has begun in recent years (at least in the US), regulators should more substantially substitute private for public oversight at large banking firms. The next logical step in designing an optimal public/private oversight structure is to commission some targeted research, designed to confirm the studies reviewed here and to determine their practical implications. The paper includes a list of such policy-related questions.

Discussion

The discussant, Oliver Page, questioned the author’s suggestion that market valuations of banking firms are not irrationally contagious (ie that investors do not infer inappropriate things about one firm from another firm’s experience or condition).

As evidence, Dr Flannery proposed that option adjusted spreads of subordinated debt over treasury bills can be taken as an approximation of a “risk premium” on banks. He then argued that if the market reacts rationally and acts as a source of discipline, then the “risk premium” should vary inversely with banks’ condition: he suggested that the observed spreads support this hypothesis.

If it is indeed the case that market valuations of banks are not irrationally contagious, then regulators could expand their reliance on market discipline, at least for large, publicly-owned institutions. Oliver Page, however, proposed that empirically separating “rational” market reaction from “irrational” reactions is rather more complex than the author suggests.

Mr Page suggested that the increased availability of market information could improve the effectiveness of market discipline, and he encouraged the inclusion in the supervisory process of such information as is available. ■

Herding and delegated portfolio management: the impact of relative performance evaluation on asset allocation

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THIS PAPER INVESTIGATES the effect of fund managers' performance evaluation on their asset allocation decisions. An increasing proportion of assets are managed by large institutions, in particular pension funds and mutual funds. Hence, a large proportion of shares and other assets traded on public exchanges are managed by fund managers who are employees and therefore subject to continuous appraisal by the market. This is reflected in the compensation they receive from the owners and trustees of the funds they manage.

In many cases this has introduced strong elements of either explicit or implicit relative performance evaluation into their compensation. Explicit relative performance assessment typically takes the form of benchmarking of returns on the portfolios under management with the return earned by an index or the median fund in the industry. Implicit relative performance evaluation, on the other hand, comes into play when decisions of contract renewal and reallocation of assets under management take into account the performance of other funds over the same period.

This has given rise to a general impression that because the fund managers are evaluated against their peers, they tend to ignore their own information and "go with the flow". We show that the relative performance element in the fund manager's contract induces them to neglect a part of their own information and adjust their portfolio allocation to that of other funds. In the UK there exists some evidence of remarkable similarity of asset allocations of actively managed portfolios.

One may argue that ignoring one's own information and mimicking the trades of others may not be too bad if others have superior information. The important question seems to be whether this happens even when one's information is superior. To capture this notion, the paper considers a case when the fund manager is better informed than the agent he is benchmarked against. If

one draws upon the well-accepted terminology in the herding literature, one can think of this as the case where the fund manager is "smart" while the agent is "dumb". It is shown that with a relative performance contract, it is optimal for the smart manager to neglect his superior information and herd with the dumb — ie mimic the trades of the agent against whom he is benchmarked, even if that agent is less-well informed.

This paper shares some similarity with the work of Froot, Scharfstein and Stein (1992). In Froot *et al*, investors with a short horizon seek information held by other traders. They ignore information about the fundamental value of the asset and herd on a subset of information. In their work, this happens because fundamental information (which has a long-term horizon) may not be incorporated into prices before the end of their investment horizon. Whereas they assume exogenously given investment horizons, this paper derives the optimal contract which gives rise to this sub-optimal behaviour endogenously.

This paper differs from the previous theoretical work and argues that herding arises because of the relative performance nature of the compensation contract offered to the fund managers. It shows that the apparently sub-optimal herding behaviour of fund managers arises from a rational response to their compensation contracts.

In this spirit, the approach of this paper turns out to be similar to that of Dow and Gorton (1997). It is also consistent with the observation made by Lakonishok, Shleifer and Vishny (1992) in their empirical investigation of US pension fund data that "Managers are evaluated against each other. To avoid falling behind a peer group by following a unique investment strategy, they have an incentive to hold the same stocks as other money managers".

Unlike previous work, this paper analyses the economics of asset allocation decisions in the context of

a model where the optimal contracts of fund managers are derived explicitly in a principal/agent framework.

It shows that optimal contracts contain a relative performance evaluation element and concludes that the relative performance element turns out to be an important factor influencing the fund managers' asset allocation decisions.

Discussion

The discussant, James Dow, was pleased to see principal/agent theory being applied to the study of fund managers' incentives: he noted that, unlike previous studies, Naik and Maug's model produced contracts that significantly changed managers' behaviour, by inducing herding.

As Dr Dow pointed out, if fund managers are being evaluated on a relative performance basis, their herding behaviour can be seen to be a simple consequence of risk aversion. It is harder to see why employers would want to offer contracts that induce herding. The standard

answer in economic theory is that, since portfolio managers are risk averse, inducing herding is a cheap way of giving them the remuneration they need. However, it was suggested by a member of the audience that encouraging managers to herd makes it easier to distinguish their relative abilities. Dr Dow responded that theoretical models fail to capture the complexities of the contracting environment: he suggested that the need to design relatively robust, as well as relatively simple, contracts leads to the choice of relative performance measures. This will in turn distort behaviour in a number of ways, of which herding may be one.

Dr Dow then cautioned against indiscriminate application of the model: the narrow financial factors modelled in principal/agent theory are not the only ones which motivate people, and may often not be the best way to motivate them. One reason for this is that attitudes toward risk differs from the extreme Bayesian rationality (ie expected utility maximisation) modelled in principal/agent theory. ■

Can relationship banking survive competition?

Arnoud W A Boot and Anjan V Thakor
University of Amsterdam and University of Michigan

THE HISTORY of the financing of corporations by banks reveals that traditionally, transactions have frequently involved "relationship banking" — banks provide their borrowers with funds as part of long-term relationships. The virtue of such relationships is that banks are not constrained to at least break even on their financing in every period, and they provide valuable qualitative asset transformation (QAT) services that help enhance the borrowers' payoffs. This stands in contrast to "transactional financing", whereby the borrower is extended "arm's length" credit and there is no contribution of any significance by the financier to enhancement of the borrower's payoff.

Relationship banking involves intertemporal taxes and subsidies in loan prices. This can lead to better

intertemporal risk-sharing than is possible with capital market financing, which is transactional. Such a tax-subsidy scheme may be sustained in a competitive market as the generation of an informational monopoly for the incumbent bank permits it to earn rents in later periods when it knows more about the borrower than others do.

However, when intertemporal information reusability is low, the tax-subsidy schemes that characterise relationship banking can be easily unravelled in competitive settings. The increased likelihood of a customer defecting to a competing bank in a future time period also diminishes the current incentives the bank has to invest in customer-specific capital. This is just a particular example of the general result that competition dilutes the incentives for relationship-specific investments.

As banking in particular and financial services in general become increasingly competitive worldwide, two questions arise:

- What do these competitive developments portend for the future of relationship banking?
- What are the implications of the future of relationship banking for bank regulation?

Our main observations are that for moderate increases in competition, relationship banking will increase relative to transaction lending: for very high degrees of competition, however, relationship banking will decline.

As relationship banking declines, the need for core deposits by banks will also diminish. This will lessen the demand for federal deposit insurance and call for a smaller role for traditional bank regulation.

Relationship banking and competition

What should a bank's optimal decision be with respect to the choice between relationship banking and transaction banking? This paper focuses on the manner in which interbank competition and competition from the capital market impinge on this (interim) decision as well as the *ex ante* decision of how much lending service capacity to invest in.

The main result of this paper is that the effect of competition varies. At low levels of competition the bank is interested only in extending the transaction loans. Extending relationship loans requires investing in customer-specific (or sector-specific) expertise. If the rents on transaction loans are high enough — and they will be when competition is sufficiently weak — banks find it best to avoid the incremental costs of relationship finance.

As competition reaches moderate levels, banks switch all their lending to relationship lending. The reason is that the bank's sector-specific expertise in relationship banking acts as a deterrent to competition. In other words, the bank's rents on lending are less vulnerable to competition with relationship lending than with transaction lending. Thus, when competition is sufficiently high, relationship lending becomes optimal for the bank. The first effect of more competition is a switch from transaction lending to relationship lending.

However, further increases in competition cause the bank to reduce its *ex ante* investment in total lending

capacity. The result is a decline in all forms of lending, including relationship lending.

Transaction lending includes loans in which the bank's participation does not result in any payoff enhancement for the borrower. Examples are credit card loans, mortgages, and some types of syndicated C&I loans. Examples of relationship loans are revolving lines of credit secured by receivables and small business loans. The analysis prescribes a greater focus on the latter form of lending as competition increases.

Regulatory implications

The analysis suggests clear regulatory implications. Since relationship loans are typically more opaque to outside investors than are transaction loans, banks engaged extensively in relationship lending will wish to finance themselves largely with (insured) core deposits. A significant part of bank regulation is motivated by government insurance of deposits. Thus, the "need" for bank regulation is itself likely to be linked to the mix of relationship and transaction lending in a bank's portfolio.

When interbank competition is relatively low, there is little need for bank regulation as banks find it best to engage mostly in transaction lending. For this form of lending, there is a low "natural" demand for government deposit insurance. Governments could let banks finance themselves with uninsured liabilities and impose minimal regulation.

For moderate levels of competition — where relationship lending is maximised — there is likely to be the greatest demand for insured deposits. Thus the need for regulation of banking is likely to be the greatest when competition is moderate.

At very high levels of competition, banks lend very little in any form. Thus, there is once again a low "natural" demand for insured deposits and a minimal need for regulation.

It is therefore suggested that the need for insured deposits and for regulation of banks is least at very low and very high levels of competition.

This suggests that as financial markets become more global and interbank competition increases, regulators should re-examine the usefulness of government deposit insurance. Banks may not need it as much — an opportunity to dismantle this safety net and, along with it, a host of bank regulations.

Discussion

The discussant, Arupratan Daripa, emphasised the importance of this paper's examination of the role of bank lending in a setting of interbank as well as capital market competition. Dr Daripa questioned two assumptions of the model used by the authors. The first — that relationship lending adds more value to lending on poorer quality projects — is crucial to the results concerning relationship and transaction lending. The second — that the credit quality of the borrower is public knowledge — seems to contradict the ideas supporting relationship lending.

He proposed a modified model — one in which borrowers' incentives to make an effort depend on how

much of their own wealth is invested in the projects. Borrowers with low wealth would have no access to capital market lending. Banks with a better knowledge of borrower-quality could add greater value for low wealth borrowers.

The authors suggest that relationship lending is less influenced by competition than is transaction lending, because of “lock-in” effects. But Dr Daripa pointed out that these are not explicitly included in the present model. He suggested that the incorporation of some reputation parameter for banks might take account of this: banks with a higher reputation would add greater value in relationship lending. ■

Executive compensation at banks: looking beyond the CEO

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THE EMPIRICAL LITERATURE on executive compensation focuses on the structure of compensation for chief executive officers (CEOs) and the extent to which compensation structures alleviate owner/manager agency problems. However, two strategies for aligning executive and shareholder incentives — performance-based pay and tournament pay — have implications for non-CEO executive compensation as well as CEO compensation. Theories of performance-based pay predict that pay should be particularly performance sensitive when an executive's individual output is difficult to monitor and when his effect on a firm's profitability is strong. The conventional wisdom is that these conditions are more likely to be met at large firms than small firms and for CEOs rather than lower ranking executives.

A substitute for performance-based pay is tournament pay, where compensation for top executives (the tournament “winners”) far exceeds individual productivity, providing incentives to those competing for scarce top-level positions. Since only non-CEO executives can be motivated by intra-firm promotions, firms should rely more heavily on performance-based pay for CEOs than

for non-CEOs. Among CEOs, pay-performance sensitivity should be stronger at larger firms, since the CEOs of smaller firms continue to compete in a labour-market tournament for “promotion” to positions at larger firms.

Hence, both performance-based pay and tournament pay suggest that the structure of compensation and pay-performance sensitivity will differ across firms of different sizes and among executives at different positions in the firm's hierarchy, with the strongest pay-performance relationships found among CEOs at the largest institutions. This leads us to challenge the assumption, implicit in the extant empirical literature, that pay-performance relationships among executives can be adequately characterised by a single elasticity. Instead, we analyse the components of compensation (base pay, annual bonus, deferred compensation, and the value of options granted) at over 500 publicly traded banks, allowing for differences across executive positions. We then determine whether and how variability in the structure of compensation translates into differences in pay-performance relationships by regressing option-adjusted compensation growth on measures of current and lagged firm performance.

It is found that the structure of compensation varies significantly across firms, with firm size being an important explanatory firm characteristic. The structure of compensation also varies across executive position, but only after controlling for cross-firm differences. Within firms, annual bonuses, deferred compensation, and option-based compensation are relatively more important for CEOs than for non-CEOs. A significant pay-performance relationship is found when all firms and executives in the sample are examined jointly, though that relationship is driven by the larger banks. For the larger banks, a significant difference is found between the pay-performance relationship for CEOs and other executives, with stronger pay sensitivity for CEOs.

These results are consistent with conventional wisdoms arising from theories of performance-based pay and tournament pay. While no formal test of either theory is provided, the analysis suggests that both may be used to alleviate agency problems among the banks in our sample, with the mix between performance-based pay and tournament pay reflecting firm and executive characteristics.

Discussion

The discussant, Todd Milbourn, questioned the authors' inclusion of stock ownership in incentive-based pay: the influence upon a CEO's total compensation of an increase in value of stock options (the result of an improvement in firm performance) is relatively small.

Furthermore, stock options may be offered, not as an attempt to deal with the principal/agent problem, but as a means of increasing the total compensation of CEOs without increasing the level of base pay — which could be controversial for a public firm. On the other hand, other forms of incentive had been excluded from the study, such as the terms of employment, labour market conditions, and the prestige both of the individual and of the firm.

In considering possible extensions of the present study, Dr Milbourn suggested that the nature of a bank's activities should be considered in addition to its size: the structure of compensation packages would be expected to differ between, say, a modern financial trading institution and a more traditional lending bank. A member of the audience suggested that a study of the sensitivity of CEO compensation to firm performance would be of interest.

Dr Milbourn suggested that the results could be equally consistent with some kind of "bidding battle" for top executives. He argued that there may be implicit or explicit caps on CEO pay, and that stock options may only be used as the vehicle for increasing the overall level of pay to win the executive auction.

Furthermore, Dr Milbourn pointed out that the top chief executive officers were likely to hold shares in their own firms anyway and if they did, stock-option plans may not be as strong an incentive as had been thought. ■

Securities fraud

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FRAUD AND BREACHES of securities laws have been contributors to a number of large financial failures in recent times, for example, the cases of Barings and Drexels. This paper examines what can be done to combat fraud or irregular activity inside financial firms and, in particular, what action could be taken either by

companies' top management or regulators to ensure that dealers and their managers have the right incentives to prevent or avoid illicit activity in securities trading.

The paper looks at the extent to which policy makers should rely on *ex ante* intervention to check control structures, and how much on *ex post* penalties

in cases in which fraud is discovered. It also looks at whether firms or individuals should be penalised, and the degree to which greater disclosure could be a substitute for regulation.

The paper seeks to answer these questions by:

- formulating and analysing simple principal/agent models of firms and dealers; and
- drawing on studies of seven prominent cases of fraud or other types of irregular activity in the UK, US and Japan.

The case studies illustrate a wide range of types of securities fraud or illicit activity. Common features of the cases were inadequate control systems or an inappropriate culture in the firm. In three of the cases, losses were not uncovered and spurious profits were recorded, boosting dealers' bonuses in two instances. In other cases individuals in financial firms attempted to deceive or manipulate other market participants to gain an advantage, or aided and abetted clients in such deceptions, leading to reputational damage to their firms.

One issue is why the market alone may not provide sufficient incentives for management to create a fully effective control environment.

First, the private cost of failure to the shareholders may be lower than the social cost, and therefore there may be social reasons for tightening the controls further than shareholders might think necessary. Even if shareholders want a tight control environment they may find it difficult to put in place contracts which will ensure that managers (interested in status, for example) create an adequate control environment.

Another factor is that shareholders have limited sanctions available once a problem has been uncovered — little can be done beyond dismissing the individual, who may well be rehired by another firm.

In contrast, regulators have a wider range of civil and criminal sanctions available. Although firms can suffer reputation damage, withdrawal of business by other counterparties may be limited if the firm has market power. Greater public disclosure could increase market incentives but would not overcome all these difficulties.

If the market does not provide appropriate incentives for firms or managers to create adequate control environments, regulators must play a role in providing the right incentives. The regulators can intervene *ex ante*

CASES

**The Collapse of Barings
Salomons and Treasury Auctions
Kidder Peabody and Joseph Jett
Morgan Grenfell Asset Management
Morgan Grenfell and Guinness
Daiwa and Toshihide Iguchi
Drexel and Milken**

by, for example, inspecting systems and controls, or *ex post* by fining or de-authorising the firm, and by penalising the management for not supervising the trader as well as penalising the trader for carrying out the activity.

One of the principal/agent models developed in the paper looks at a management hierarchy within the firm where each individual can choose whether or not to enhance the control environment by monitoring subordinates — if not they may or may not choose themselves to become part of a fraud.

The results indicate that the firms can reduce the incidence of fraud by, for example, rewarding whistle blowers. This may have implications for the way in which control systems are structured to prevent the control functions from being overridden by line management. The results also point to the importance of action by regulators to improve the general control environment. But the model also shows that *ex post* penalties on managers for not monitoring and on those who commit frauds could help to increase the payoff from monitoring (with *ex post* penalties, a given level of fraud could be achieved with less monitoring) which would create efficiencies in terms of firms' costs. The best way forward therefore seems to be a combination of *ex ante* action by the regulators and *ex post* penalties.

In several recent fraud cases, internal bonus structures appear to have provided a disincentive for senior management to exercise control over star players, because their bonuses depended on the profits generated by the star. This problem is also examined in a simple principal/agent model with three agents — a trader, a manager and a regulator. It is possible for the effect of inappropriate bonus schemes to be offset by the level of *ex post* fines. The same is also true of the traders. However, there is a significant caveat: the size of the bonus payments may well be so large that it may not be feasible to offset the effect completely with *ex post* fines.

Discussion

The discussant, Colin Mayer, highlighted several important features of the case studies presented in the paper. The loss of economic rents had often been substantial, particularly in the cases of Barings and Drexel. Systems and controls had commonly proved inadequate. Even in cases in which members of senior management had been involved directly, or they had

knowingly “turned a blind eye”, few had in fact been penalised.

Dr Mayer suggested that the model described in the paper could be enriched by incorporating a more detailed representation of the layers of corporate structure. Further evidence on the costs of fraud and regulation would also be of value in developing any conclusions on regulatory policy. ■

Incentives for bank directors and management: the New Zealand approach

David G Mayes
Bank of Finland

THIS PAPER SETS out the new system of banking supervision introduced in New Zealand in 1996 following a four-year period of review. This has attracted considerable interest, and the author argues that it represents a major step away from the prescriptive and intrusive systems normally been implemented elsewhere.

The system puts the responsibility for the prudent management of banks firmly on the directors and management of the banks themselves.

It is the responsibility of the supervisor to concentrate on the stability of the financial system as a whole, not on the viability of any individual bank. Under this view, the “moral hazard” present in banking systems should be reduced and taxpayers’ money should not be put at risk. Individual banks should expect to fail if they become insolvent, whatever their size.

This system therefore entails a network of incentives to ensure that appropriate attention is paid to the management of risk by bank shareholders, directors, management, depositors, analysts and competitors. These incentives are applied by an extensive regime of quarterly disclosure of the banks’ assets, liabilities and exposure to risks, backed up by an attestation by all the directors (including the non-executive directors which each bank must have) that the bank is applying appropriate risk management procedures. Directors are liable to stiff fines and periods of imprisonment for false or

misleading statements and have unlimited personal civil liability for losses incurred by others as a result of these statements. The New Zealand system in effect requires that the information which would have normally been disclosed in private to the supervisory authority — the end-quarter financial position, peak exposures and the attestations that the registered bank is applying all the necessary risk management — be publicly disclosed. Publication is in the form of a detailed General Disclosure Statement aimed at analysts and a Key Information Summary, available from any branch, which shows the bank’s credit rating, capital ratios, peak exposure concentration, asset quality, and any shareholder guarantees and profitability. All involved with the bank therefore have the same opportunity as the supervisor to draw conclusions about the strength and prudential management of the bank. All banks have to disclose similar information so there is no competitive disadvantage and comparison is easy.

The Reserve Bank of New Zealand, which is the supervisor, has tried to avoid laying down a set of standards which might be taken as indicating approval of a bank’s actions but it has set out a basis it finds acceptable for measurement of value-at-risk for the whole of the bank’s activities and not just the trading book. However, the registered banks are allowed to implement adequate schemes better adjusted to their specific busi-

nesses. The pressure on banks to run themselves well will come from depositors, who can take their funds elsewhere, from analysts and from competitors, who will be eager to point out items of relative weakness.

However, the system does not rest on disclosure alone. It has three principal pillars of which disclosure (so that market disciplines can be applied) is only one. The second is that the structure, ownership and management of the banks should be such as to encourage prudential behaviour. There is thus a series of wide-ranging conditions that must be met before a bank can be registered: these relate to capital adequacy as laid down by the Basle criteria: size, standing and corporate governance.

Lastly, the Reserve Bank has extensive powers to act swiftly and effectively in a crisis, including the ability to place an insolvent bank under statutory management. The disclosure regime itself encourages banks to act early and convincingly in the face of emerging difficulties.

The cost of supervision is substantially reduced. The disclosure requirements have been developed hand-in-hand with the accounting financial reporting standards (FRS33) and as far as possible should coincide with the sorts of information that the banks themselves wish to collect to ensure prudent management. Despite prior reservations the banks have found them straightforward to implement and the Reserve Bank has been able to abolish charges for supervision.

New Zealand, being a small country, with a small number of banks, almost all of which are foreign-owned and which undertake only limited business overseas, is not typical of many of the other OECD countries. In particular it is unusual in having no deposit insurance.

However, while having deposit insurance may limit the bite of the market discipline, it does not invalidate the applicability of any of the main principles. These principles can be readily applied in the EU countries, consistent with their existing directives, including the directives on capital adequacy and protection of depositors.

Indeed the idea that market discipline can place a substantial incentive on banks to run themselves prudently will have a significant appeal as regulators struggle to keep pace with the rapid internationalisation of banking operations and with the rapid growth and rate of innovation in financial products and IT systems.

Discussion

The discussant, Masaaki Shirakawa, mentioned that the market could be irrational (and exhibit “herding” behaviour). In particular, the market can come to expect periods of growth to continue indefinitely, as in the case of the property boom in Japan in the late-1980s. He also said that it is difficult for market participants to know what risks a bank is taking, and that an analysis of how the banking industry as a whole was affected by the macro-economy would be important.

The New Zealand regime depends very much on the incentives that managers and directors face. Indeed, even with a high level of market discipline, a director may not be prevented from adopting a “go-for-broke” strategy. Alternatively, the knowledge of how risk may affect the share price and market funding may make directors too risk averse (as suggested by Daripa and Varotto in their paper on the pre-commitment approach).

A member of the audience noted that the result of continuing with the Basle criteria for credibility purposes is very unsatisfactory, since they appear rather arbitrary. Therefore, it seemed that New Zealand’s new regime has not resulted in a dramatic improvement.

Another attendee noted that credit ratings take into account the “too big to fail” (TBTF) phenomenon: if a bank is perceived to be TBTF normal market discipline will not prevail. This would not be overcome by the New Zealand regime.

A member of the audience thought that the New Zealand approach seems to advocate value-at-risk measurements for the whole bank, but found this strange since it is not clear how all risks that a bank faces can be modelled in this way: it has been found far from straightforward to model even interest rate risk in the banking book by VaR methods.

The discussion turned to the frequent criticism that New Zealand was free-riding on the supervision of banks carried out by other countries. It was suggested that this type of supervision may work well in a boom, but its effectiveness during a recession might be questionable. Nevertheless, given that the banks have been given a lot of freedom, they have chosen to maintain the Basle requirements for purposes of credibility. The action of getting the directors to publicly assume responsibility for ensuring that controls are in place is expected to generate a new culture of prudent risk management. ■

Panel session on dealer remuneration and incentives within firms

Chaired by Howard Davies, Financial Services Authority.

Dick Brealey, London Business School; Christine Cumming, Federal Reserve Bank of New York; Jan-Peter Onstwedder, Royal Bank of Scotland; Guy Whittaker, Citibank

***Howard Davies introduced the session by indicating that the incentives that dealers face, and their effect upon the risk profiles of firms, are a legitimate matter for concern. Rewards for risk-taking behaviour may not be aligned with a bank's overall appetite for risk.

Dick Brealey pointed out that whereas pay levels in financial services as a whole have not increased more rapidly than in manufacturing, payments to skilled labour in the City have grown unusually fast. This suggests that a higher proportion of rents in the City now accrues to individuals rather than to the institutions. There has been an increase in the level of bonus payments relative to base salary, which suggests that either the rewards to effort have increased or it has become easier to identify individual contributions. The direct effect of bonus schemes is to transfer risk from the firm to the individual. The indirect effect is that the employee gains from large profits and is not affected by large losses. This has led to the worry that employees have an incentive to take excessive risks. He was sceptical as to how far this was a problem. The typical City bonus is based on performance over a short interval. If a trader takes very large risks, he increases the chance of a very large bonus. However, he is also more likely to be fired and therefore may not have the chance to earn future bonuses. Therefore, it is not the case that there are rewards for good performance but no penalties for bad performance.

The serious dangers occur when the trader has accumulated large unobserved losses over the first part of the year and therefore has an incentive to follow a strategy of double-or-quits. This problem is not limited to schemes with a large bonus element.

Christine Cumming discussed efforts to incorporate customer satisfaction and operational risk into performance-related pay schemes. What is the level of risk taken to generate the profit (and did the profit warrant the risk taken)? Innovations in performance

measurement and pay schemes reflect the belief that making senior managers more accountable for the control environment in their businesses partially resolves tensions between profit generation and adherence to controls. Pressures in the market for traders and specialists, difficulties in assessing controls, and investor difficulty in identifying the potential for control breakdown from available information present limitations in aligning internal incentives with risk-return objectives of the firm.

Jan-Peter Onstwedder presented the internal risk management perspective. What was the evidence that dealers are induced to take more risk than they would otherwise? He stressed the importance of relating this to the bank's appetite for risk, and of relating pay to economic profit rather than accounting profit. There is the question of how frequently a dealer's performance should be reviewed: perhaps annual reviews are not frequent enough.

Guy Whittaker said that compensation for senior management at Citibank is based on the "balanced business scorecard" which considers not only financial performance but customer franchise development, people management, risk management, controls and community contributions. Dealer remuneration is not based on contribution to profit alone: teamwork and support for sales are taken into consideration. It might be possible to incorporate some VaR measure.

One advantage of performance related pay is that bonuses need not be paid when the firm is in financial distress. The return on risk-adjusted capital could be factored into the compensation scheme. Also, theory suggests that performance related pay may induce an individual to be more risk averse. Most of the discussion focused on how, if externalities are generated, an internally optimal compensation plan may not be socially optimal. A difficulty arises in considering the design of compensation packages from the fact that while some realised payments become public knowledge, ex ante contracts are

Market discipline in conglomerate banks: is an internal allocation of cost of capital necessary as an incentive device?

Arnoud Boot and Anjolein Schmeits
Amsterdam University and Tilburg University

THE DESIRABILITY of conglomeration in banking is a heavily debated issue. Recent trends in banking point to an accelerated consolidation, often involving broadening of scope. An important issue is whether banks should diversify their activities. Although few would readily deny that some diversification is necessary, banks seem to engage in a broad variety of activities. The question that arises is:

What is the optimal conglomeration of bank activities?

In this study the focus is on internal incentive problems that may arise from interactions between different divisions in a conglomerate bank.

Combining bank activities may reduce transparency and therefore diminish the effectiveness of market discipline. That is, outsiders may not be able to assess the performance of a conglomerate bank sufficiently and, more important, may have little control over the bank, whereas bank managers may have excessive discretion.

The primary mechanism for market discipline is its effect on the banks' cost of capital. Banks should face a cost of capital reflecting the riskiness of their activities.

Conglomeration, however, obscures this process and invites cross-subsidisation and free-riding between divisions, because each division does not fully internalise the consequences of its own actions. As a consequence of this, therefore market discipline might become ineffective.

A recent example of free-riding (and cross-subsidisation) was the Barings debacle. In this example the costs of not inducing market discipline on the proprietary trading department turned out to be almost prohibitive.

Some interpret this debacle as a meltdown caused by a clash of cultures between proprietary trading activities and traditional relationship banking, and

suggest better internal controls and external supervision as remedies.

In this study it is argued that while internal controls and supervision may indeed control incentives, they do however not align incentives, but merely "brute force" desired behaviour.

In the case of Barings, (relationship oriented) corporate banking activities in the UK were effectively underwriting the risky proprietary trading activities in Singapore. Barings Singapore therefore faced an artificially low cost of capital and could free-ride on Barings United Kingdom. This interpretation highlights the potential divergent incentives of different organisational units when combined in one institution.

The analysis in this paper goes far beyond the specifics of the Barings example. Modern commercial banking has slowly been transformed from a purely relationship-type business into one where a transaction-orientation — with proprietary trading as a prime example — has become more prevalent. Incentive problems as discussed in the context of Barings may therefore have become very important.

Consequences for the organisational structure

These internal incentive problems have implications for the optimal organisational structure and scope of a bank's activities. While the internal incentives that we have discussed so far emphasise the cost of conglomeration, some distinct benefits exist as well.

One argument in favour is that separate (market) financing of different activities may suffer from informational problems and adverse selection premiums elevating funding costs. Combining different divisions within a bank may lead to diversification benefits in funding — effectively "washing out" information asymmetries. Thus diversification could reduce adverse selection (lemons) premiums in the funding costs.

Another argument relates to the potentially distortive effects of limited liability. As is well known, limited liability of shareholders may invite risk-taking behaviour. Diversification through (implicit) co-insurance reduces these incentives. The analysis presented in this paper primarily incorporates the latter effect.

It is found that explicitly considering internal incentive problems and the potential mitigating effects of co-insurance has implications for the optimal organisational structure of a bank's activities. Insights are:

- The effectiveness of market discipline for stand-alone activities (divisions) is of crucial importance for the potential benefits of conglomeration.
- It is found that effective market discipline reduces the potential benefits of conglomeration.
- With ineffective market discipline of stand-alone activities, conglomeration would further undermine market discipline but may nevertheless be beneficial. In particular, when rents are not too high the diversification benefits of conglomeration (co-insurance) may dominate the negative incentive effects. A more competitive environment therefore may induce conglomeration.
- It is also shown that introducing internal cost of allocation schemes may create "internal" market discipline that complements the weak external market discipline of the conglomerate. In this context it is shown that these schemes should respond to actual risk choices, rather than be limited to anticipated risk choices.

The applicability of the analysis reaches further than banking and transcends to a long-standing issue in industrial economics concerning the determinants of the boundaries of firms. These contributions to industrial economics generally focus on synergies (ie complementary or joint production). A related literature focuses on the co-insurance benefits of conglomeration in absence of synergies. These papers show that the resulting lower variability of cash flows may increase the value of tax shields, increase the effectiveness of debt as a bonding device or improve investment incentives.

Regulatory implications

The analysis demonstrates and highlights the shifting importance of the four primary mechanisms that aim to

alleviate prudential concerns in banking. These four primary mechanisms are:

- external supervision;
- internal controls;
- incentives; and
- market discipline.

The more competitive environment of banking has made external supervision and internal controls more important, but simultaneously less effective. Internal incentives (and market discipline) therefore have become of eminent importance. This has implications for the organisational structure of banking.

It is shown that, in a more competitive environment, conglomeration may improve incentives and therefore from a prudential point of view could be advocated. However, if market discipline and transparency could be improved sufficiently, de-conglomeration becomes more desirable.

Discussion

As the authors demonstrate using their model and the particular example of Barings, a division of a conglomerate bank such as proprietary trading may, in the absence of internal cost of capital allocation, suffer from a lack of market discipline. The division may free-ride on the other divisions, which undermines more relationship-type banking operations, and reduces future rents.

If an internal scheme could be devised for the dynamic allocation of costs of capital, this might complement the weak external market discipline: this should create internal discipline by aligning incentives such that free-rider problems are mitigated, thus reducing the need for external regulation.

The discussant, Sudipto Bhattacharya, pointed out that since the authors have modelled the dead-weight costs of bankruptcy as the future rents of one division alone, the diversification effect of co-insurance may not be as strong as the paper suggests.

Furthermore, it is assumed that a division manager's incentive to under-invest in effort to control risk can be anticipated and incorporated in the contract terms: it is not clear that this is realistic. Further, in comparing monitoring costs for stand-alone and conglomerate operations, the authors have assumed that the level of future rents can be treated as an externality, rather than an endogenous variable. ■

Contagion and efficiency in gross and net interbank payment systems

Xavier Freixas and Bruno Parigi

Universitat Pompeu Fabra, CREF, and University of Venice

INCREASED FRAGILITY of the banking industry has generated growing concern about the risks associated with payment systems. Although in most industrial countries different interbank payment systems co-exist, little is known about their properties in terms of risk/efficiency.

The two main types of interbank payment systems, netting and gross real-time systems, differ sharply in their exposure to contagion risk (the risk that failure of a large institution to settle payment obligations triggers a chain reaction that threatens the stability of the financial system). In the former, netting the positions of the different banks through compensation of their claims only at the end of the day implies intraday credit by one bank to another, and exposes them to contagion. In the latter, transactions are typically settled irrevocably on a one-to-one basis in central bank money: thus banks may have to hold large reserve balances in order to execute their payment orders. This paper compares the net and gross payment systems in a framework in which the differences between gross and net settlement systems are modelled as analogous to the distinction between payments within a single bank as opposed to payments between banks at different locations. The model extends the Diamond-Dybvig classical framework by introducing, in addition to liquidity shocks, location shocks, resulting from the decisions of some agents (“travellers”) to travel from one location to another. It is assumed that uncertainty arises from several sources: the time of consumption, the location of consumption and the return on investment.

Payments across locations can be made either by directly transferring liquidity or else by transferring claims against a bank in the other location. The two mechanisms are interpreted, respectively, as the gross and net settlement systems in interbank payments. In our model, there is an opportunity cost of maintaining reserves. Thus, if investment returns were certain, net

settlement would always be preferred to gross settlement (which requires the bank to hold a higher level of reserves).

When uncertain returns on which depositors may have some information are introduced, the effects are more complex. Depending on the state of nature (which is known only to the depositors of each bank), the long-run technology (ie investment in real assets) may have a positive or a negative return. In the stylised model considered here, if the latter occurs, it is efficient to close down the bank. In the absence of any payment systems, bank closure would occur as the result of a bank run: this would have a disciplinary effect. Bank closure as the result of a run would also occur if there is a gross-settlement system in place, since the agents’ incentives to run would be exactly the same. Yet, when a net payment system is considered, it may be the case that the disciplinary effect of bank runs is lost, because instead of causing a run on a bank by withdrawing deposits as cash, depositors may obtain a higher returns by transferring their deposits to another bank. The recipient bank will honour the travellers’ deposits while obtaining low quality assets from the bankrupt originating bank. Thus, the netting settlement system may provide an incentive for banks’ forbearance (ie keeping an inefficient bank open) through the loss of the disciplinary effects of bank runs. For these reasons, neither of the two payment systems considered may achieve efficient outcomes.

This leads to a consideration of the trade-offs between the two systems. These trade-offs will depend on the importance of the cost of forbearance of poorly performing banks (affecting the net payment system) compared with the opportunity cost of liquidating (and thus not being invested in) the long-run technology (affecting the gross-payment system). As a consequence, a gross-settlement system is preferred when there is a high expected cost of forbearance, when the

probability of a bank obtaining poor returns is high, and when the number of travellers is small.

These findings are of interest when current trends within the banking industry are considered. In recent years, the reduced cost of processing and transferring information, the increased incidence of bank failure, and the increased concentration of the banking industry have all favoured gross payment systems. Meanwhile, however, the number of transactions processed through the payment system has increased, and liquidity management methods have improved (thus increasing the opportunity cost of holding reserves): these factors favour net payment systems.

Finally, the model allows improvements upon net payment systems to be considered. First, peer monitoring in the model implies that the recipient bank would always be able to reject the movement of deposits from a poorly performing bank, and thus be unable to purchase its assets, hence forcing the bank's liquidation and thereby restoring efficiency (in the sense of market discipline). Since this implies that the inefficiency of netting disappears, gross payment systems become dominated by netting. Second, if suspension of interbank payments could be introduced, it would also prevent contagion, since contagion can be identified by the large amount of deposits transferred from a poorly performing bank. Third, collateral can also be used to restore efficiency in netting systems provided there is over collateralisation and the long-term technology assets are

used as collateral. Indeed, in this case a poorly performing bank facing a large deposits outflow will be unable to provide sufficient collateral. Finally, the coexistence of net and gross payment systems is also a way to solve the forbearance problem of netting systems. The only condition required is that when a poor performance is observed, the run from the gross payment system may be sufficient to generate a bank run, thus forcing the efficient liquidation of the bank.

Discussion

The discussant, Elu van Thadden, questioned the modelling framework presented in the paper. This considers discrete events over a long time period, whereas in actual payment systems, decisions are taken in continuous time. Although gross real-time systems are well known to reduce risk, their disadvantage is that they can require either that excessive liquidity be kept at the central bank (if that bank is not prepared to grant credit to investors), or that firms keep securities on their balance sheets to collateralise credit. However, as Dr van Thadden pointed out, this latter condition would not necessarily be a difficulty for financial institutions, which may keep substantial holdings of securities on their balance sheets in any case. Dr van Thadden also suggested that, although Dr Freixas had considered the relative risks of alternative payment systems, there still remained the substantial area of risk on foreign exchange settlement. ■

Bankruptcy priority for bank deposits: a contract theoretic explanation

Urs W Birchler
Swiss National Bank

RULES GRANTING BANKRUPTCY priority to bank deposits have experienced a revival over the past few years. In Switzerland legislation has been enacted that extends deposit priorities existing since 1934. In the US, depositor preference was introduced at a Federal level in 1993, having previously been in force in some individual

states. Interestingly, some emerging markets — such as Hong Kong, Malaysia, and Argentina have recently introduced new deposit priority rules. Renewed interest in bankruptcy priority for deposits reflects the tremendous problems caused by deposit insurance. In many countries insured banks took excessive risks that were ultimately

borne by tax-payers. The high final bill to tax-payers has kindled political interest in more incentive-compatible measures to protect the depositors of a failed institution.

Bankruptcy priority for bank deposits is one such measure. Under this scheme some (or all) deposits are senior to all the other liabilities of a bank. In the case of bankruptcy of a bank, senior deposits have to be fully paid off before any other claims are honoured. The holders of senior deposits therefore are insured by junior lenders to the same bank, rather than by a third party. Preservation of private discipline led Hong-Kong to introduce priority for bank deposits instead of deposit insurance, while in the US, priority for deposits (and thus to claims of the insurance fund) was enacted in an attempt to decrease the value of the insurer's implicit liability.

Despite the recent political success of deposit priority, little attention has been paid to such rules by academic economists. This led some critics to warn against "the dangers of enacting important legislation ... without exploring potential longer-run implications" (Shadow Financial Regulatory Committee, 1996). Indeed, it seems important to understand priority rules better.

Legal priority rules can be viewed from two angles. They are (potentially costly) government interventions: by giving priority to some claims, the legislator restricts contracting options of market participants which may prevent them from reaching optimal arrangements. From another viewpoint, legal priority for some deposits is a substitute for private contract covenants that would be costly to write in the presence of transaction costs. This is particularly relevant for banks with large numbers of unsophisticated depositors. Therefore, it may be cheaper to define deposit priority in the law.

Proponents of this "transaction cost view" of priority rules should, however, be able to show that debt priorities can be features of optimal contracts. It follows from the Modigliani & Miller irrelevance theorems that in perfect markets a firm should not be able to reduce its cost of finance by defining a particular hierarchy of claims against its assets. Under asymmetric information, however, there is some scope for priority rules.

The most convincing explanation of debt priorities in a banking context is based on individual differences in monitoring costs. Among the numerous lenders to a bank, only a minority can be expected to have the ability, or enough money at stake for a sufficiently long period, to

find monitoring the bank worthwhile. Bankruptcy priority for deposits helps concentrate monitoring incentives with such potential monitors. This can be shown in a simple three-period hidden-information model. In a first period the bank knows of a profitable project it can finance only by borrowing from many investors. Prior to borrowing, however, the bank has to announce the contracts under which it is ready to do so. Investors, at individually different costs, can then gather information about the distribution of the bank's observable but uncertain future returns. Contingent on their information, they decide in the second period whether or not to lend to the bank. Pay-offs occur in the third period. The bank cannot distinguish sophisticated from unsophisticated investors. However, it may offer deposits with different priority in bankruptcy to screen individual characteristics. Sophisticated investors prefer junior debt characterised by a high yield in a good state of nature and a low yield in a bad state, while unsophisticated (or small) investors prefer the less risky senior debt. If returns to a firm's assets cannot be observed freely by lenders, priority rules may reduce the cost of finance.

It is concluded that: debt priority provisions can be features of optimal contracts; the rationale behind bankruptcy priority provisions is to optimise the level of monitoring effort by (potential) bank depositors; legally standardised priority provisions are particularly important for firms with many heterogeneous lenders, ie for banks. Priority rules, therefore, seem to be an interesting substitute for, or complement to, deposit insurance schemes. These findings may help in understanding their recent introduction or extension in several countries.

Discussion

The discussant, Sandeep Kapur, emphasised the importance of careful modelling of the information structure. Access to low cost information would be a problem as potential investors who buy cheap information would not necessarily invest in the project, constraining the bank's choices. Access to very revealing information would also be a problem, since few who received a bad signal would invest.

Dr Birchler pointed out that the model can be applied to debt versus equity (which can be regarded as the residual claim), and noted this could be made more explicit by assuming that the project's return is not wholly observable, or is subject to some effort on the part of the bank. ■

Regulatory capital requirements for market risk and the pre-commitment approach

Paul Kupiec and James O'Brien
Federal Reserve Board

This paper compares the efficacy and economic efficiency of alternate approaches for setting market risk capital requirements for bank trading account positions. It develops a theoretical model that is used to analyse the consequences of adopting both the Federal Reserve Board's proposed pre-commitment approach (PCA) and the Basle supervisors' Internal Models Approach (IMA) for setting capital requirements for the market risks of bank trading account positions.

Under the PCA, a bank sets its own market risk capital requirement with the knowledge that it will face regulatory penalties should its trading activities generate subsequent losses that exceed its market risk capital pre-commitment. The IMA bases capital requirements on estimates of potential trading account losses. The results show that the PCA potentially can control excessive market risk-taking behaviour at a substantially smaller economic cost than that imposed by the IMA.

Using a fixed monetary penalty rate, the PCA imposes a contingent liability on the bank. The value increases with the market risk in a bank's trading account and decreases with the size of a bank's pre-commitment. Through its incentive effects, the PCA has the potential to control excess bank market risk-taking, while imposing economic costs that are substantially lower than those of the Basle Internal Models Approach. Moreover, unlike the IMA, the PCA sets regulatory capital requirements with minimum intrusion into the bank's affairs.

The analysis suggests that the pre-commitment approach can create incentives that discourage banks from using their trading account activities to exploit the deposit insurance guarantee. Numerical examples demonstrate that the PCA with only a modest penalty rate can substantially decrease excessive market risk-taking activities that are generated as a consequence of fixed rate deposit insurance and related bank safety net

provisions. If banks are engaged in profitable market-making operations, the PCA encourages them to pre-commit capital to reduce the probability of incurring a PCA penalty. Moreover, the analysis suggests that the PCA can control excess market risk-taking without imposing large costs on bank shareholders.

While the IMA can also be very effective in controlling bank market risk-taking activities, it potentially imposes large costs on bank shareholders. The IMA can generate substantial economic costs by requiring a capital-constrained bank to issue substantial amounts of costly equity or abandon positive NPV market risk-taking activities. Unless a bank is likely to be managed as a high risk "go-for-broke" institution, the large capital requirements generated by the IMA are not necessary to control moral hazard incentives. For banks that are run as going-concern firms, the IMA is likely to impose significantly larger economic costs than would a pre-commitment approach for setting capital requirements.

Although the PCA has important advantages over the IMA, it shares the shortcomings inherent in a "piecemeal" approach to bank capital regulation that has been adopted by regulatory authorities. All regulatory approaches to market risk apply only to the risks in banks' trading activity without regard to the risks in other bank activities. While the present analysis indicates that the PCA can reduce the distorting effects of flat rate deposit insurance when viewed from a whole-bank perspective, all piecemeal approaches share two critical shortcomings. Piecemeal approaches create category capital charges that are additive across bank activities while the risks themselves are not additive. Piecemeal capital schemes are susceptible to circumvention through regulatory arbitrage in which equivalent risks are renamed and shifted among regulatory risk categories to minimise the bank's cost of capital regulation. In these regards, the PCA is no better than existing regulatory capital requirements for market risk.

Discussion

The idea behind the PCA is to create a less intrusive regulatory regime in which banks can use their expertise in assessing market risk to determine an appropriate level of capital. If the approach produced the desired results, capital would be allocated more efficiently and regulators would enjoy lower supervisory burdens. For instance, under VaR the regulator has to “recognise” the model that institutions intend to use for their risk measurements and periodically should validate the model’s accuracy through backtesting. This under PCA would no longer be necessary. Simulations run by the authors have shown the PCA would lead to less conser-

vative capital requirements than VaR, when the latter is implemented using the parameters laid down by the Basle Supervisors’ Committee. The discussant, Professor Dimson, argued that the analysis of the pros and cons of the two regulatory frameworks should focus on their core features. The difference in the capital level from the two approaches could well be because of the level of the VaR multiplier, and this was not central to the approach — parameters could easily be changed. As PCA penalties would be applied *ex-post* and only when a bank incurred losses exceeding the capital set aside, their application would exacerbate the financial strain that the bank would already be experiencing. ■

Agency incentives, reputational distortions and the effectiveness of value-at-risk and pre-commitment in regulating market risk

Arupratan Daripa and Simone Varotto
Birkbeck College and Bank of England

A key aim of bank regulation is to limit the risk exposure of credit institutions to a level compatible with their capital.

The ownership of most large banks is diffuse, so managers often have a high degree of discretion in day-to-day decisions. This separates ownership from effective control and potentially creates a corporate control problem. This implies that capital and risk are chosen by separate interests — shareholders choose the capital level, and managers run the bank and thus determine its risk profile.

The effect of asymmetric information on corporate control problems has been widely explored. A large body of theoretical and empirical papers point out that to achieve effective control of the firm, owners should design a system of incentives — including rewards and career advancements — which aligns managers’ objectives with their own. If the system fails to deliver the convergence of such objectives, the choice of risk might be excessive, given the capital set aside. This could jeopardise the purpose of regulation.

The paper compares the effectiveness of two methodologies used to determine regulatory capital for banks’ trading book risk — Value at Risk models (VaR) and the pre-commitment approach (PCA) — in a context of information asymmetries between shareholders and managers.

In general, two kinds of regulatory framework can be identified: *ex-ante* and *ex-post* regulation. In *ex-ante* regulation, of which the VaR and the Basle Standard Approach (BSA) are examples, risk is measured using forward-looking forecasts of the trading book returns. *Ex-ante* rules specify a hard link between the amount of capital in place and the maximum expected risk the bank can take. That is, managers have to comply with this limit whenever they undertake a new trading position. Provided that the bank abides by the limit, there will not be any regulatory penalty for the bank, even if the actual risk turns out to be higher than predicted, and materialises into high losses.

Ex-post regulation, such as the pre-commitment approach, does not directly link capital to risk, but penalises banks in the event of a loss exceeding their

capital. The threat of penalties creates the incentive for banks to choose sufficient cover for any risk exposure. Thus a soft link is created between risk and capital.

The paper argues that regulation by penalties on *ex-post* losses might fall prey to the control problem discussed earlier. For instance, in the pre-commitment approach, penalties take the form of extra capital charges or fines. In both cases it is the shareholder who bears the cost; injecting more capital would mean higher opportunity costs, and fines would mean a lower dividend.

But, as mentioned, banks' risk-taking is mainly influenced by managers. So, for penalties to work, shareholders would need to find a way to construct an appropriate incentive mechanism, for instance through a compensation scheme, which aligns managers' aversion to penalties with their own. This is likely to prove difficult. The sensitivity to a given pay structure may vary significantly for different individuals and for the same individual over time.

Other problems arise when setting the penalty schedule. The regulator should make sure that it generates the right incentives for shareholders. But, it is difficult to predict what their reaction would be. Their attitude would probably depend on many factors such as:

- the degree of concentration of the ownership structure (which conditions owners' ability to impose their policy decisions on managers);
- the owners' risk preferences; and
- the position of the bank in the market in comparison with its competitors.

In sum, in the pre-commitment approach, and more generally in soft-link regulation, the right transmission of the capital-risk regulatory constraint presupposes that shareholders know managers' preferences and the regulator knows shareholders' preferences. In practice, these assumptions might not hold.

On the other hand, *ex-ante* regulation is not based on any of the above assumptions. Hard-link regimes, such as the Basle Standard Approach and Value at Risk model, are insensitive to any information asymmetry among regulators, owners and managers (except, of course, the hiding of positions by traders, which is a separate issue). Given any level of capital the corresponding risk limit can be directly determined and enforced.

The paper looks at a specific case in which shareholders do not have an exact knowledge of managers' preferences. In this framework, managers care about salary and career opportunities. It is shown that a case of asymmetric information between shareholders and managers regarding the value that managers attach to each of these two elements, causes a control problem that could lead to a significant increase in banks' risk-taking under soft-link regulation. It is concluded that, even though soft-link rules have some interesting features and promote more hands-off regulation, the underlying assumption on which they are based may not be fulfilled.

Hard-link rules, on the other hand, restrict the set of investment opportunities by imposing an exogenous link on capital and risk. Thus, they are more intrusive tools of supervision but they are safer in the sense that they provide a mechanism for controlling risk which does not hinge upon how shareholders and managers interact.

Discussion

Information asymmetries between shareholders and managers are the cause of the corporate control problem that would compromise the efficacy of the pre-commitment (in its current formulation) as a tool for regulating market risk.

Mr Kupiec suggested that for banks to which the pre-commitment approach would apply (that is, banks with high going-concern value) internal risk management would be effective in monitoring managers and traders' risk-taking activities. He added that in those banks, managers would have less incentive to undertake risky investments because they would not want to lose their status and long-term compensation. This would probably make the control problem highlighted in the Daripa-Varotto paper less serious.

The discussant, Prof Rochet, said that before a choice between VaR and PCA could be made, one would have to gain more insight into who was in the best position to control bank managers. If the answer were the regulator, then VaR would be more effective than PCA in generating adequate bank capital. On the other hand, if the equity holder could exert higher control then the pre-commitment approach would dominate. ■

Panel session on pre-commitment and risk-based capital

Chaired by: Michael Foot, Bank of England and Financial Services Authority.
Edward Ettin, Board of Governors of the Federal Reserve System; Robert Gumerlock, Swiss Bank Corporation; Eckhard Oechler, Bundesbank; Barry Schachter, Chase Manhattan Bank

THERE WAS A LIVELY discussion of the pre-commitment approach (PCA). It generates a mechanism that allows more hands-off regulation. This is achieved through a system of penalties triggered if trading losses exceed the level of capital to which banks have pre-committed. Penalties, if appropriately chosen, should have the effect of enhancing self-discipline in banks.

Barry Schachter reported that the New York Clearing House Association set in train a pilot project in October last year to look at the effect of using pre-commitment. Ten banks (both US and non-US based) agreed to pre-commit to the capital they would need to back their trading book.

None of the banks tested had needed more capital than had been set aside. Mr Schachter said that they had been very conservative and that risk managers were very concerned about the impact of losses greater than the pre-committed level of capital on the reputation of the bank. He noted that such pre-commitment violations could be interpreted as implying weakness in the bank as a whole. He then claimed that even if high, the capital set aside had been lower than it would have been under the Basle VaR approach.

Some potential drawbacks were pointed out, however. The pre-commitment approach has been designed for banks which have a trading book that is small relative to the banking book, and which have high going-concern value. If one of these two conditions were not satisfied then the PCA could generate wrong incentives. The bank might be tempted to take on very high risk because it would have nothing to lose and might find it convenient to “gamble for resurrection”.

Eckhard Oechler said that it would be difficult to separate those banks for which those conditions held from the others. He added that even though it would be possible to set up objective criteria to identify all banks eligible for the pre-commitment approach, the

schedule of penalties would probably not achieve the same disciplinary effect in different countries. Depending upon the characteristics of each national safety net, the regulatory response to banks incurring losses above their pre-committed capital would vary. This would be likely even if regulatory intervention could be completely harmonised, due to the fact that each regulator would always retain, to some degree, discretion to adjust their regulatory action to the contingent situation of their local financial market.

Furthermore, Mr Oechler said that PCA would hardly motivate banks to set aside a capital cushion for systemic risk. To do so it would be necessary to have different penalties for different banks, with higher penalties for those which might have greater systemic impact.

Another issue was introduced by Patricia Jackson (Bank of England) who argued that it is difficult for shareholders to exercise tight control on managers' investment decisions. At times, huge positions are undertaken and traded out intraday (ie underwriting of new securities issues). This could have serious consequences if, due to a crisis, markets suddenly became illiquid and the bank did not have sufficient capital to back the position. Whereas under VaR portfolio risk must be consistent with the bank's capital at all times, under PCA no explicit regulatory constraint would be in place. It would be possible for traders to argue that the risk in any large position was low because the position would be offloaded quickly and therefore that a very large position could be taken relative to capital.

In general, the attendees saw advantages in exploring routes to setting capital that put more emphasis on regulatory incentives than on detailed capital requirements: it would be worthwhile exploring ways to build on both VaR and incentive-compatible approaches. ■

MANAGEMENT BUY-OUTS

By Claire Jackson-Cookland, Alex Crowe and Mark Pratt, Bank of England

Rivalry among equity investors has driven management buy-out (MBO) prices to historically high levels. Competition between banks and other lenders to finance these transactions has increased the risk of this type of lending. It is said that the current boom is comparable to that in the late 1980s, which was followed by a series of failures of highly-g geared structures when interest rates rose sharply and the economy entered a recession. This article examines recent developments in the financing of MBOs. It is based largely on discussions with market participants. The term MBO is used to describe investor buy-outs and management buy-ins, as well as conventional management buy-outs.

The prices being paid for bought-out businesses, expressed as a multiple of their earnings, are historically high and rising. Deals are becoming larger, often with a greater overseas involvement. More venture capitalists and banks are entering the management buy-out market, with increasingly large amounts of finance at their disposal. There have been suggestions that new entrants may be unfamiliar with some of the risks they are assuming. In addition the response of some banks to narrower margins on senior loans has been to supply higher risk instruments such as mezzanine finance and to move into the nascent European buy-out market.

Equity investors have countered suggestions that MBO prices are excessive. They argue that they are better able to assess the risks they are assuming than they were in the late 1980s. Market participants claim due diligence is more thorough and

effective, with, for example, greater emphasis on cash flow. They are also paying more attention to the quality of management and market potential. However, some concerns have been expressed about the increased use of auctions to select a preferred buyer for businesses, as initial bids are made on the basis of incomplete information. This development has also probably helped push up the prices that have been paid.

The MBO market

MBOs have, over the past 15 years, become important vehicles for corporate restructuring and a significant class of leveraged transaction.

Chart 1 shows that the market has grown steadily since the recession of the early 1990s, with growth accelerating in the past three years. In 1997, the value of transactions completed rose by 33 per cent to £10.4bn, exceeding the previous peak in 1989. The volume of transactions was also at a record level, 660 compared with 522 in 1989.

In a traditional management buy-out, a company's management and one or more venture capitalists jointly bought a company from its owners. Venture capitalists provided most of the equity, but the bulk of the purchase price would be financed by borrowing.

There are often two layers of borrowing; banks provide senior debt that is usually secured on the assets of the business, while mezzanine finance is obtained from banks, venture capitalists or other financial

The influx of new entrants to the market has squeezed lending margins, especially as some new entrants have reportedly been prepared to lend on very fine terms as a way of gaining “credibility” with investors and the lead arranging banks.

institutions. It can be secured, but the security stands behind the senior debt.

In recent years, the scope of the MBO market has widened and the nature of many MBOs has changed. The growth of the market and the generally high returns that have been earned have attracted more interest amongst venture capitalists, banks and other financial institutions in financing MBOs.

Increased competitive pressure has driven venture capitalists to become more pro-active in seeking out businesses that might be bought. Indeed, many transactions are initiated and then closely controlled by venture capitalists. These transactions, sometimes called “investor buy-outs” (IBOs), are essentially the acquisition of an industrial or commercial company by a financial institution. Their main difference from traditional MBOs is that the management of the businesses that are bought play a relatively passive role.

Another increasingly common class of transaction are management buy-ins (MBIs) where an external management team combine with financial supporters to buy control of a business.

MBOs are no longer confined to the subsidiaries of larger businesses, but they now also include privatisations and listed companies. Indeed, buy-outs of smaller listed companies have become increasingly common, motivated by a belief that they were being undervalued on the listed market.

Financial structures

Banks are active in arranging and providing finance for MBOs. In terms of numbers of deals arranged, five dominate the market, accounting for almost 80 per cent by number of the deals completed in recent years (Table 1). The clearing banks provide most of the finance for smaller buy-outs, whilst other banks, notably overseas banks, specialise in larger buy-outs. The financing of larger deals is more complex and relatively more dependent on debt.

Many banks advance finance for MBOs, but do not normally arrange buy-outs. As well as senior debt, subsidiaries of banks provide equity and mezzanine finance, investing their own capital as well as funds they manage on behalf of others.

Lending for MBOs has become more competitive as more banks have entered the market (with some 50 now being active compared with 30 in 1996). The new entrants have been attracted by substantial returns earned from this category of lending in recent years. Banks arranging the financing of MBOs have consequently faced little difficulty in assembling syndicates of lenders, and indeed have reported frequent approaches from banks asking to be involved in syndicates.

The influx of new entrants to the market has squeezed lending margins, especially as some of the new entrants have reportedly been prepared to lend on very fine terms as a way of gaining “credibility” with investors and the lead arranging banks.

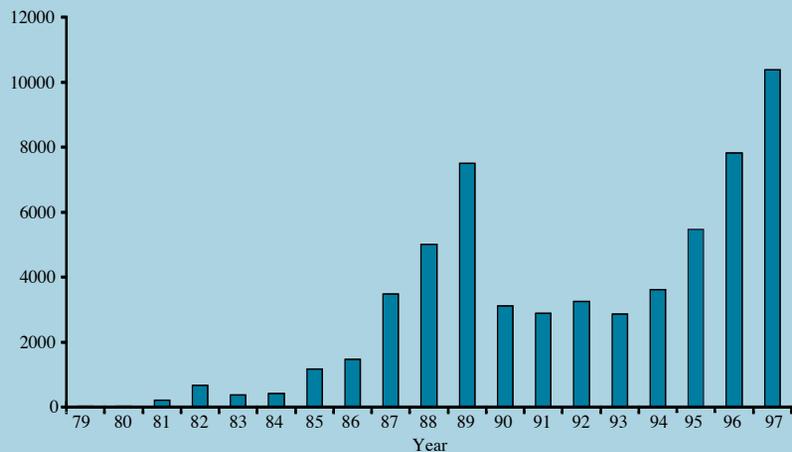
Some of the established market participants have suggested that new entrants to the market are ill equipped to assess the risks they are taking on. In some cases, MBO lending units are lightly staffed. MBOs also require more attention to be given to the evaluation of cashflow, the quality of management and business strategy than mainstream lending. Experience is crucial in developing such skills.

The MBO market, in both the UK and in Europe, has displayed a number of innovative financing techniques. The overall effect has been a layering of risk and reward within complex financial structures. New products include high yield bonds and “B” and “C” notes — debt ranking *pari passu* with the main (“A” tranche) senior debt, but with a longer maturity and without amortisation. They tend to command a margin 50-75bp above that of the senior debt.

In principle, such innovations are to be welcomed, since they allow a more efficient allocation of risk and reward to those most willing and best able to hold it. This may facilitate buy-outs which otherwise might not have been possible.

However, it is important that banks providing higher risk forms of credit recognise that they also need additional skills to those required for senior lenders. If they continue to provide only senior debt, and additional debt is inserted below the senior level (eg high yield bonds), the direct effect on banks would be minimal. But there may be reputa-

CHART 1: TOTAL VALUE OF MBO MARKET



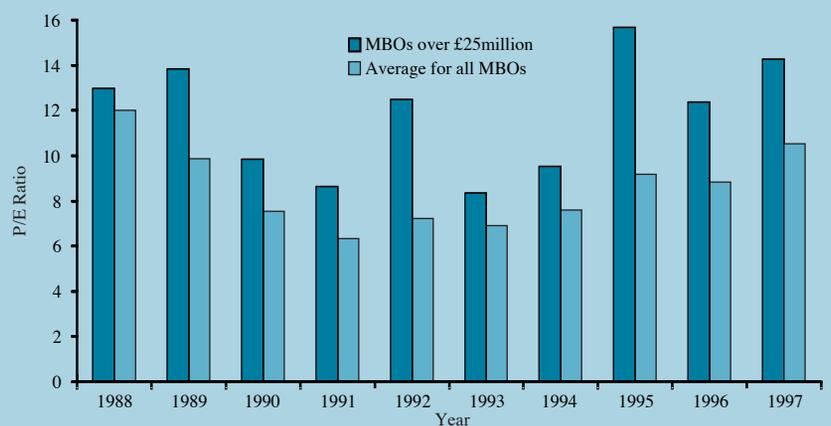
Source: CMBOR/Barclays Private Equity/Deloitte & Touche Corporate Finance

TABLE 1: TOP FIVE BANKS PROVIDING FINANCE FOR MBO

Bank	Number of Deals Over £10mn Arranged in 1996/97
Bank of Scotland	73
Royal Bank of Scotland	31
NatWest Markets Acquisition Finance	28
Barclays Acquisition Finance	21
Midland Bank/HSBC	15

Source: CMBOR/Barclays Private Equity/Deloitte & Touche Corporate Finance

CHART 2: P/E RATIOS OF MBOs



Source: CMBOR/Barclays Private Equity/Deloitte & Touche Corporate Finance

The increasing returns on investments, which have attracted more investors into the market, have increased prices

tional risks from arranging complex products, and if banks hold or underwrite risky MBO securities, there would be a direct effect.

Pricing

Chart 2 shows that prices paid for businesses, expressed as a multiple of their earnings, have been on a rising trend since the early 1990s and have reached the levels seen in the late 1980s.

Price/earnings ratios for the very large (above £25m) buy-outs have been higher than for smaller buy-outs and, in recent years, appear to have exceeded the levels seen in the late 1980s. Given the wider competition between financiers to participate in large MBOs, it is unsurprising that their prices have been most buoyant.

The highest prices appear to have been paid for buy-outs of listed companies which were becoming private. This is perhaps not surprising as the businesses involved have established track records. William Cook, the steel castings firm, which was bought out in February 1997, with a price/earning ratio (p/e) of 15.9, was a high-profile example of this kind of MBO.

Two factors are pushing up MBO prices. The first is increased competition among equity providers with ever-larger amounts to invest. The impressive returns earned on MBOs in recent years — one estimate is that they have been almost 40 per cent — have attracted more investors.

The amount of new money raised for UK and pan-European

buy-outs in 1997 was £8bn, and, on past patterns, around three quarters of this will be invested in MBOs. One contact suggested that there was potentially up to £50bn available for investment in MBOs with keen interest from US investment funds. The supply of funds available for MBOs has also increased as fund managers have liquidated earlier investments.

The second factor pushing up the prices of MBOs has been the buoyancy of the economy and of equity prices. The bull market run may also have made the funding of acquisitions by trade buyers easier, further increasing competition for buy-outs. The rising price of equities have also encouraged sales as selling companies can achieve higher proceeds.

Risks and rewards

The increasing returns on investments, which have attracted a greater number of investors into the market, have increased prices. At the same time the higher gearing of some MBOs has increased the risks of providing finance to MBOs.

Market participants had mixed views on whether current prices for MBOs are “excessive”: ie higher than warranted by underlying assets or projected cashflows. Market practitioners argued that, compared with the late 1980s, investors are better equipped to recognise and assess risks, are using more effective modelling techniques and also paying much closer attention to the quality of a company’s management.

Investors are also more exacting in the information they require to evaluate MBO proposals. They now demand fuller accountants' reports to verify and extrapolate financial trends, and they also commission specialist consultants to assess business strategies, the marketplace, the position of competitors and possible technological change.

Second, it is argued that the quality of the management teams involved in MBOs has improved. It is suggested that, in part, this is because better training has improved management generally in the UK and because of the participation of "serial entrepreneurs", who already have experience of at least one buy-out. However, it seems unlikely that there are enough serial entrepreneurs to participate in more than a few buy-outs.

Venture capitalists argue that they now add more value to the businesses they invest in. They are able to use their networks of City and industrial contacts and their deal-making expertise to assist the development of newly bought-out businesses. As active investors they can offer a breadth of experience of investing in companies generally, and some specialise in buy-outs of companies in particular sectors. Some financial institutions have sought to create value by amalgamating complementary businesses that offer the scope for economies of scale.

The margins on senior debt for MBOs appear to have fallen over the last two years, from about 2 per

cent to 1.75 per cent. They are, however, not as narrow as they were in the late 1980s. Arrangement and participation fees have also been under pressure. According to one estimate they have fallen from 1.75-2 per cent to 1.25 per cent since the beginning of 1996. Average loan maturities have stuck at around seven years, but there have recently been cases of extensions to eight years or longer. Covenants by contrast have generally held up.

A particular concern for some banks has been the prevalence of early exits. This is where MBOs have performed better than expected, allowing the equity investors to realise their investment earlier than planned. In recent years, this has sometimes been within two years. Such exits can take the form of a sale to another business or a listing. Usually, it precipitates a refinancing of the bank debt. Early exits have been highly profitable for equity investors, but not for the debt providers insofar as their lending becomes profitable only after they have recovered the up-front cost of making their loans. Banks try to impose pre-payment penalties, but their ability to do this has been eroded by competitive pressure.

According to CMBOR figures, the debt/equity ratio in the financing of MBOs is below the levels of the late 1980s (see Chart 3). While larger MBOs are relatively more dependent on debt for their financing, there has been a small upward trend in the relative use of debt in their financing during the last four years. Market

Early exits have been highly profitable for equity investors, but not for debt providers as their lending becomes profitable only after they have recovered their up-front costs

CHART 3: GEARING IN MBOs



Source: CMBOR/Barclays Private Equity/Deloitte & Touche Corporate Finance

participants argue that this illustrates their cautious approach to financing risk. The leveraging of smaller MBOs has, however, been rising more sharply.

Investors outbidding trade buyers

A number of market commentators have cited instances where investors (“financial buyers”) have outbid trade buyers as providing evidence

of overheating, particularly as trade buyers are able to exploit opportunities for reducing overheads not available to financial buyers.

However, the argument that trade buyers are better able to value businesses than financial buyers is disputed by the latter. Indeed financial buyers argue that they have greater experience of, and expertise in, making a rigorous assessment of business prospects than trade buyers.

CHART 4: MBIs AS % OF MBO/MBI MARKET



Source: CMBOR/Barclays Private Equity/Deloitte & Touche Corporate Finance

As has been mentioned, it is now standard practice for an investor to commission a thorough market report before a purchase, whereas a trade buyer’s knowledge of the market may be out-of-date or unrealistic. Financial buyers may have also been preferred by a seller because they are able to offer the vendor a quick and certain sale. This is especially the case where a sale to a competitor business might be delayed by a reference to the Office of Fair Trading.

Market developments

The market has undergone various structural changes in recent years.

Auctions

Auctions, in which groups of investors and/or trade buyers competitively bid for a business, have become an increasingly common method of selling businesses over the last three years. Originally used only in large buy-outs, they now are a feature of smaller transactions as well. They have almost certainly exerted an upward pressure on prices.

They may restrict the amount of information on which buyers base their bids and therefore increase the risks assumed. In a traditional MBO, the management of the business being bought-out would have close contact with the investors from an early stage. Discussions with the management, with their inside knowledge of the business, would enable the investors to make a well-informed judgement about the business and the management team.

In an auction, the release of information is carefully controlled to ensure that each bidder receives the same. In the initial stages, bids might be requested on the basis of accountants' reports and due diligence commissioned by the vendor, with little or no access to management. Later, when most bidders have been eliminated or one has obtained exclusivity, more information is made available.

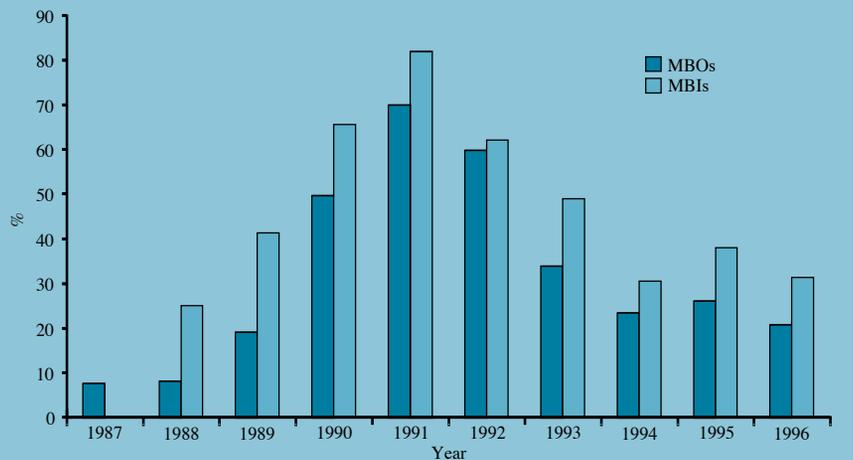
But the banks and investors may have access to management only during the exclusivity period, which can be very short — for example a few weeks. In this way, auctions may have increased the risk associated with MBOs, because they can hinder a full evaluation of the quality of incumbent management, whose performance is crucial to the success of an MBO.

The rise of MBIs

Management buy-ins, where external managers actually replace the incumbent management of a business, have become increasingly common in recent years (Chart 4). They have had a consistently higher failure rate than that for conventional MBOs (Chart 5). This is probably due to the incumbent management having a better understanding of the business and its markets than outsiders.

MBIs have not, however, been priced lower than MBOs (Chart 6). This would, at first sight, suggest that investors have been willing to accept more risk on MBI transactions and that the market, as a whole, has become more risky.

CHART 5: RECEIVERSHIPS AS % OF EXITS



Source: CMBOR/Barclays Private Equity/Deloitte & Touche Corporate Finance

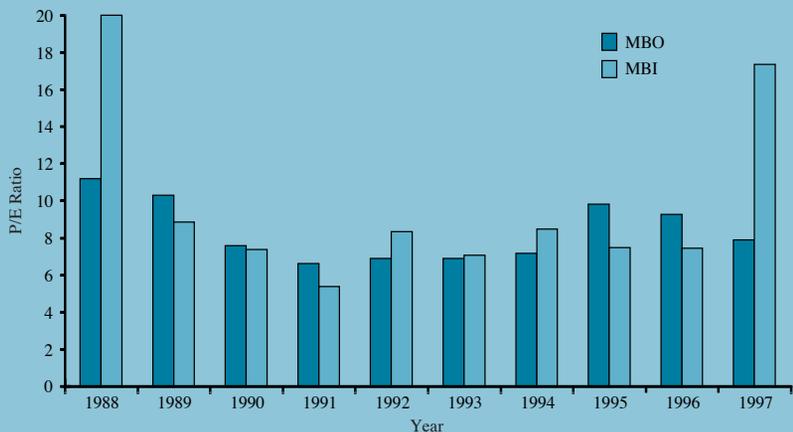
The difference between MBOs and MBIs is, however, not clear-cut, because many MBIs involve the retention of some of the internal management in order to try to ensure a degree of continuity. Also, the additional risk which has been associated with MBIs may be reducing. MBIs have in the last two years become larger, on average, than MBOs, whereas in previous years they had been roughly the same

size. Larger buy-outs are generally considered to be less of a risk than smaller ones.

Moves into Europe

The buy-out market in the UK is larger and more highly developed than that in continental Europe. There were 390 buy-outs worth a total of £6.1bn in 1996 in Europe, compared with 640, worth £7.8bn, in the UK.

CHART 6: P/E RATIOS OF MBOs AND MBIs



Source: KPMG

The gearing levels for MBOs have been steadily rising since 1994 ... the trend has been most evident for smaller transactions

Some UK-based investors have been investing in European buy-outs for a while, and already have perhaps 30 per cent of their buy-out portfolio in Europe. Both existing investors and others are increasing their presence in Europe, as it is thought to offer the prospect of a significant rate of growth in the next few years.

Opportunities in Europe have also appeared attractive because its markets have been less competitive, with lower prices for MBOs. Another attraction for investors, for reasons previously outlined, of increasing the focus on Europe is that auction sales are less frequent in Europe than in the UK.

Expansion into Europe does, however, have its risks. It requires UK-based institutions to become familiar with the legal structures and other practices overseas if they are correctly to assess and price the risks they assume. There may also be difficulties in exits as stock markets in Europe are not as well-developed as in the UK: furthermore, restructuring costs are higher.

It is, however, likely that intensifying competition will erode the current attractiveness of the European markets. Competition for deals over £100m is probably already as marked as in the UK, with participation by a wide range of lenders.

It is also uncertain how quickly European markets will in fact grow. There have been predictions for many years that they were about to take off but this has not happened so far.

Conclusion

The MBO market has become a widely-used vehicle for changing corporate control. The number of transactions has grown significantly in the past few years to levels last seen in the late 1980s.

Finance, both debt and equity, is readily available from a range of financial institutions. The increase in competition has pushed the prices paid for businesses to historically high levels and they would seem to be increasing. The picture on the proportion of the financing taking the form of debt is mixed: it has been rising for smaller transactions, but not for larger deals.

Lending has increasingly been on terms favourable to borrowers. Auctions have also come to be widely used as part of the process of selling businesses.

In short, competition is compelling investors and lenders in MBOs to assume more risk. However, the returns have been exceptionally attractive in recent years, and this would seem to be part of the process of the market working to restore a more normal return/risk ratio.

The general economic situation also has a significant effect on the probability of success or failure of a transaction. As long as the economic environment remains stable, highly leveraged transactions will face fewer problems than they did in the early 1990s. Nevertheless, history has shown that market participants must always be wary of the risks of having a heavy dependence on borrowed funds. ■

CHALLENGES OF THE PENSIONS REVOLUTION

By Michael Lyon, Bank of England

State pay-as-you-go pension systems are vulnerable to problems of long-term solvency and are under review around the world. Unreformed, they threaten to distort labour markets and saving behaviour. Many countries are considering radical solutions such as the replacement of pay-as-you-go by privately funded provision despite the potentially heavy transitional costs. UK experience shows, however, that funded provision is also not without problems. Traditional occupational pension schemes are criticised by many as unsuitable to modern flexible labour markets; and personal pension schemes have been caught up in the mis-selling scandal. This article discusses the challenges of pension reform in both the public and private spheres of provision.

Central banks have an interest in a broad range of issues concerning pension provision. State pension systems play a big role in governments' finances. In the UK privately financed pensions are the largest single vehicle for personal sector saving in the economy. Changes in the pension regime can have significant effects on how the economy works, on how pension funds affect the financial markets and on how monetary conditions are interpreted.

The worldwide trend among governments to reassess the role of traditional social security pension systems raises many challenges. As demographic trends lead to older populations, many governments are planning to switch, at least partially, to privately funded schemes.

Challenges are also raised by privately funded pensions. Are such pension arrangements efficient and transparent? What impact do they

have on risk distribution in the economy? The UK has a long practical experience of gradual change, growth and reform in this field.

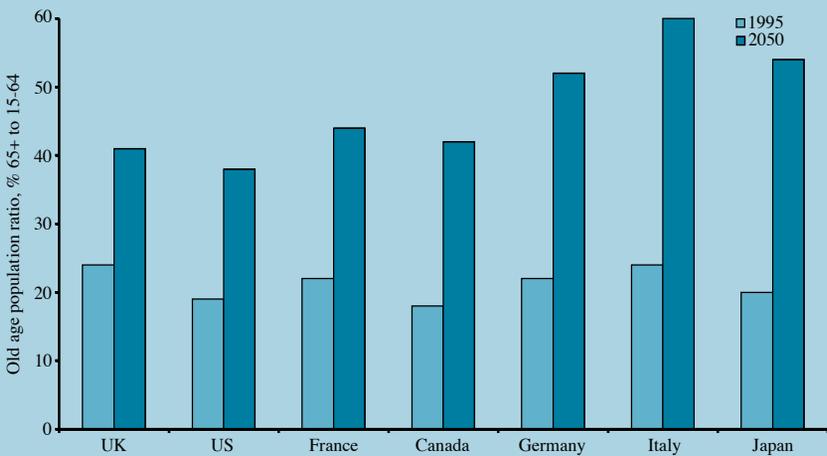
Common themes

The common underlying factors driving policy change in different countries are:

- a recognition that demographic changes such as falling birth rates and greater longevity will lead to substantial increases in the ratios of elderly to working-age populations over coming decades (see Chart 1); and
- a desire to stimulate financial market infrastructure development, especially in emerging and transitional economies which are currently under-developed.

The common challenges to be addressed are how to effect reforms while minimising losses to the current working generation, and how to maintain the social and private risk insurance offered in social security systems. For the continental EU states, pension reform has been given added urgency by the fiscal convergence criteria of the Maastricht Treaty and the fiscal stability pact. Existing social security systems implied large and widening fiscal deficits on unchanged policies.

An OECD study in 1996¹ made estimates, depending on particular economic assumptions, of the net present liabilities of public pension schemes. Some were of the order of 100 per cent of GDP, although the figure for the UK was much smaller than the average (see Chart 2). While

CHART 1: CHANGES IN OLD AGE POPULATION STRUCTURES, 1995-2050

Source: World Bank estimates and Government Actuary's Department (UK only)

contribution rates could be raised for a given level of benefits, it is unrealistic to expect higher contributions to take all the strain. Such rises, on top of already high payroll tax rates, could have serious consequences for competitiveness and labour supply.

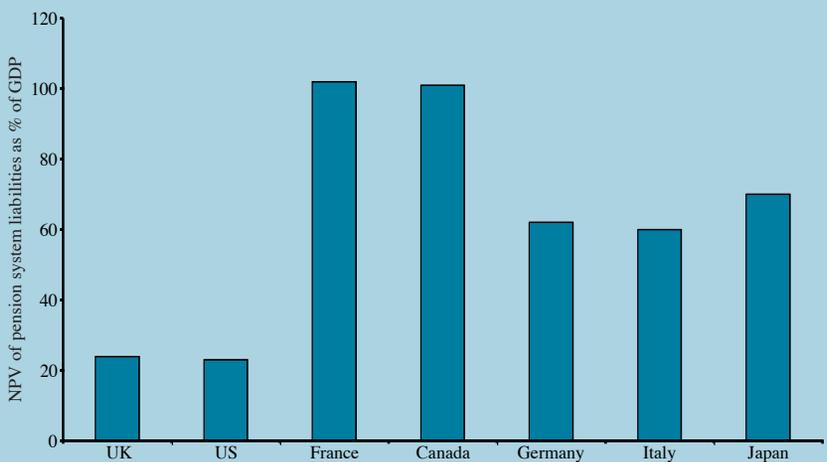
The transitional economies of eastern Europe and the former Soviet

Union are also looking to the partial dismantling of state pension systems, both for fiscal reasons and as a means of generating the flows of private saving essential to the development of active domestic capital markets.

Funding of pensions is an objective distinct from the privatisation and deregulation of savings for old

age, although both themes feature in most reform plans. Whereas it had been held that the deregulation of saving should wait until active capital markets had satisfactorily emerged, increasingly the view is that deregulation can play an important role in stimulating such development. In Latin America many countries are following Chile's 1981 restructuring. Chile replaced PAYG by compulsory private provision at the same time as embarking on a programme of industry privatisation. The assets are largely domestically invested.

In a wide range of economies, the recognition of the need to reform state pension structures has reflected growing actuarial deficits. Governments have also been concerned that high contribution rates may have discouraged labour supply and job search; that depends on whether benefits are closely linked to contribution records and how much value workers place on those benefits, including their insurance element.

CHART 2: OECD CALCULATIONS OF PAYG PENSION DEFICITS

Source: OECD (1996) — Assumes 1.5 per cent productivity growth and 5 per cent real discount rate.

PAYG and funded provision

Established models of social security provision for retirement income have relied on the "pay-as-you-go" (PAYG) principle according to which, in its purest form, those currently employed make compulsory contributions that directly finance the pensions paid to the currently retired. Such contributions are usually levied on labour income and therefore acquire the form, if not the substance, of labour payroll taxes. Under this system there is no need for a separately established investment funds.

As the system is designed to be in current balance, so that total contributions pay total pensions, there is no surplus to accumulate. In practice, actual PAYG systems may involve some elements of smoothing from year to year, or net transfers to or from the government's accounts.

A key issue in PAYG is the rate of return on contributions, implied or explicit, represented by the anticipated pension. For individuals that can only be gauged from the administered rules of the system and each person's life expectancy. Over time, however, the arithmetic of PAYG equilibrium demands that average real returns will be determined by the rate of growth of the contributions base, usually labour income. In the long run, that rate of growth is likely to be close to the growth rate of GDP.

The alternative to PAYG is "funded" provision, whereby contributions are invested in a fund of assets which finances contributors' future pensions. The link between contributions and pensions may be a collective arrangement, as in occupational schemes, or an individualised one, such as a personal pension, and the fund's assets may comprise either private sector investments or government debt, or some mixture of the two. The defining characteristic is that the benefits paid out are determined by the rates of return received on the assets purchased with the contributions made earlier. These rates of return are determined in financial markets. They typically exceed GDP growth

rates, at least over the longer term. It follows that funded pension provision is capable of yielding higher pension outcomes or cheaper pension financing than PAYG. This, however, is achieved at the cost of exposure to financial market investment risk which is absent in PAYG.

Viability of PAYG

The continuance of PAYG systems rests on a social contract — that social security legislation will persist so that the currently employed enjoy in their retirement similar benefits as they finance for the currently retired. For that to be viable, the social contract must be sustainable over time. This in turn can depend on, among other factors, how the ratio of beneficiaries to contributors changes between generations.

For given benefit levels and contribution rates, as populations age the solvency of a PAYG fund will deteriorate; or, if solvency is to be maintained, either benefits must be reduced or contributions increased. Conversely, if the present population structure is relatively young, but is expected to age over the medium term, then contribution and benefit levels appropriate to long-term balance can be allowed to generate short-term surpluses. A possible forward-looking strategy would be to accumulate reserves during the period of surplus to smooth the transition to the future.

Population projections usually change only gradually, so in theory prompt but gradual adjustments to PAYG conditions should be possible

Over time, the arithmetic of PAYG equilibrium demands that average real returns will be determined by the rate of growth of the contributions base, usually labour income

Population projections usually change only gradually, so prompt but gradual adjustments to PAYG conditions should be possible as soon as new demographic and economic trends are discovered

as soon as new demographic and economic trends are discovered.

It is evident, however, that many governments, especially those in continental Europe, have in practice failed over time to adjust their PAYG systems so that current levels of contributions and pension payments remain sustainable.

Some explanations, based on theories of political decision-making, imply that PAYG pension design is fundamentally prone to instability. These theories hold that governments are inherently biased towards short-term solutions which favour current generations of citizens — who can vote — at the expense of future generations — who cannot.

Just as the creation of a PAYG system benefits the first generation of recipients because they do not have to make any contributions, enhancements of existing schemes will benefit the currently retired and workers anticipating retirement, who can vote. Retrenchments, on the other hand, impose costs on current voters (pensioners and contributors) before future voters can experience improved benefits.

This can mean that the required PAYG corrections are simply postponed until they cumulate to such a size that no single working generation will be willing to bear the cost. Or worse, governments could deliberately pursue a secondary policy objective, the cost of which is borne by the social security system; for example subsidising early retirement as a means of alleviating high youth unemployment.

Social insurance and redistribution

State pension systems are more than simply mechanisms to provide the retired with an income: they also have important redistributive and social insurance objectives, such as alleviating income inequality in old age when earning opportunities have become limited. Some redistribution is inevitable in any system in which the benefits are not proportional to contributions (eg where a minimum level of benefit is promised regardless of contributions made).

In practice, however, schemes do not always meet their desired objectives for redistribution, nor even redistribute from rich to poor. The World Bank has noted that, especially in the case of developing countries, where there are large variations in mortality, social security benefits have benefited the wealthy simply because they enjoy longer life expectancies.

Redistribution can distort incentives in labour and saving markets. Labour supply may be inhibited, pay schemes distorted, and the incidence of evasion increased, the higher are payroll contribution rates in relation to individuals' valuations of accruing pension benefits. But in some state schemes, pensions and contributions are closely related to earnings, so this problem is reduced.

Distortions will also occur to the extent that income-contingent, or "means-tested", retirement benefits inhibit voluntary saving. Such distortions can contribute to the problem of "welfare dependency".

PAYG solvency is damaged by lower contributions and greater take-up of benefits. That in turn leads to higher contribution rates and further distortions.

Reform of PAYG

Any reform of a PAYG social security system ought to reduce the net present value of projected fiscal deficits associated with the scheme. Reform can be gradual, the PAYG structure is retained but the terms and conditions altered — for example increasing the retirement age or reducing the benefits formula. This type of reform is sometimes termed “parametric adjustment”, and it is the strategy which has been pursued in the UK since the early 1980s. Alternatively, more radical adjustment can involve the stopping of PAYG contributions and the benefits linked to them from some announced date in the future.

Transition Costs

Radical reform of PAYG introduces the “transition problem” of financing accrued pension liabilities after the move to full funding takes place. The risk arises that on transition to a funded system, one generation of workers would either be denied their entitlement to future benefits, or be required to pay for them twice over. Is it possible to smooth transition costs over several generations?

One approach would be for governments to borrow more as accrued pensions became due. This would lead to a permanently higher level of public debt in exchange

for the annihilation of accrued and future PAYG liabilities. By itself, such a strategy would amount to no more than a refinancing of existing obligations, and in theory it need not result in any net gain or loss to the economy as a whole. In practice, the large size of measured public deficits over the transitional period could prove to be unattractive to governments if, for example, they induced unwelcome pressures to make fiscal adjustments elsewhere in budgets; and actual measures of public sector debt would almost certainly breach the Maastricht Treaty or similarly expressed criteria.

The effects of a switch from PAYG to funding would depend on the impact of the new regime on macroeconomic conditions and on overall financial flows — in particular whether it resulted in an increase in privately invested capital. If the switch yielded positive net gains to the economy it would be possible to amortise the transitional costs over time. For this to be possible, and for transitional generations to be fairly compensated, at least one of two conditions must be obtained. The first is that risk-adjusted returns on investment assets must exceed the interest rate on government debt — that is, that pension investment managers must achieve returns that are demonstrably higher than on government debt whilst maintaining an acceptable measure of control of the financial risks ultimately borne by pension scheme members and sponsoring employers. The second condition is that there should be

Distortions will occur to the extent that income-contingent, or “means-tested”, retirement benefits inhibit voluntary saving ... such distortions can contribute to the problem of “welfare dependency”

UK pension funds managed £640bn of assets at the end of 1996, while personal pensions accounted for another £190bn

material whole-economy efficiency gains arising from the removal of PAYG labour and saving market distortions, or from any positive externalities associated with deeper financial markets and greater private investment.

The transitional costs of reform and the adequate accounting of PAYG pension schemes are connected. Proponents of radical reform argue that the transition problem is no more than a recognition of liabilities already incurred, so that reform should not represent an incidence of new costs. Equally, supporters of the status quo argue that a more transparent accounting of the state's pension liabilities, eg in the form of net present value estimates, would bolster their security with respect to future government cuts.

Capitalisation of accrued PAYG liabilities may introduce new problems. Present value calculations are sensitive to parameters such as the discount rate and the assumed future economic growth rate, which are subject to change. A policy assessment which locked into current assumptions could crystallise the effects of temporary deviations from the long-term norm. Also, inter-generational risk would persist if, after liabilities have been capitalised, governments pursued current fiscal strategies which more than offset the pensions impact on evolving public debt. This could happen, for example, if the visible size of capitalised pension debt encouraged a form of "fiscal illusion", by inducing a sharper fiscal

policy adjustment than would have occurred had the same obligations remained off-balance sheet.

UK pensions experience

There are several distinctive aspects of the UK's experience in pension provision. For example, background demographic changes, although qualitatively similar, are quantitatively less pronounced in the UK than in many other developed economies. The UK currently has a relatively more aged population than the principal EU states, but by 2051 it is expected to be relatively less aged.

The scope of the state system is more limited in the UK than in many other countries, and it is set to decline due to the long-term linkage of the basic pension and SERPS earnings limits to prices rather than earnings. The basic single person's pension in 1997-98 was equivalent to 17 per cent of national average earnings. For employees contracted into the State Earnings Related Pension System (SERPS), full contribution records can provide an extra pension of 20 per cent of career-averaged earnings calculated between the lower and upper earnings limits.

As the basic pension is a flat rate, and the SERPS element is subject to an upper earnings limit, the pensions-to-earnings "replacement ratio" drops off sharply for above-average earners. The state pension replacement ratios in many European states tend to be higher than in the UK not only at average levels of earnings, but especially so at above-average earnings.

State pension reforms

The UK embarked on reform of its state pension system earlier than most countries. Legislative changes since the present framework was established in 1978 have reduced, rather than increased, its scope and generosity to pensioners.

Key changes have included:

- Replacement of indexation to earnings by indexation to prices in the early 1980s.
- Changing the SERPS pension formula from 1988 from 25 per cent of best 20 years' earnings to 20 per cent of lifetime average earnings.
- Increasing the normal retirement age for women from 60 to 65, to take effect between 2010 and 2020.

Such changes have been made, if not without political opposition, then certainly without the scenes of widespread popular agitation witnessed in other countries where PAYG schemes have recently been cut back.

The UK's experience represents a counter-example to the theory that political short-termism will necessarily drive PAYG systems to unsustainable levels of generosity. It also demonstrates the "political risk" to the security of long-term state pension commitments.

UK funded provision

The corollary of the state's modest and decreasing pension responsibilities within the UK has been the size and growth of funded pension provision. Occupational pension scheme

coverage of employees grew strongly in the post-war era of stable employment, and in 1991 they covered some 49 per cent of the working population, compared to 12 per cent who were in SERPS only. Personal pensions grew rapidly after their introduction in 1988, accounting for another 23 per cent of employees.

Government Actuary Department estimates, commissioned by the Association of British Insurers, show UK pension funds managed £640bn of assets at the end of 1996, while personal pensions accounted for another £190bn. Such holdings comfortably exceeded the sizes of, for example, personal sector holdings of cash and M4 deposits (£443bn), or retail unit trusts (£61bn). Occupational pension schemes held over a quarter of the quoted UK equity market and about a fifth of the outstanding stock of gilts at the end of 1996.

Consequences of institutional investors for financial markets

The size of institutional investors such as pension and life assurance funds has contributed to active UK securities markets, especially in equities. Institutional funds employ professional fund managers who, in principle, can reap economies of scale in information gathering, analysis and in transactions.

The existence of such agents in financial markets should help financial asset prices to be set more efficiently, although problems such as "herding" and appraisal over excessively short time hori-

zons could still be present. They should also help reduce the cost of finance to businesses.

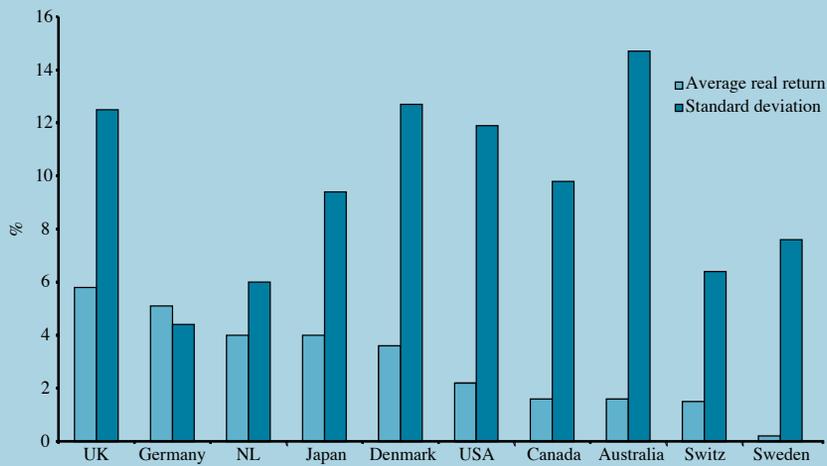
Institutional investors have become an important force underpinning the City's equity culture. The development of funded pension provision in other countries can likewise offer a stimulus to equity market growth.

Corporate governance

The trend towards larger, more powerful, institutional investors is not without its problems. One question that arises is the issue of corporate governance. Diversified institutional investors in the UK and US have historically been "outsider" rather than "relationship" investors. They have avoided close engagement with company management and access to inside information in order to preserve the ability to trade out of troubled companies and maintain the liquidity of their portfolios. As their portfolios have grown, so that larger individual positions are taken in particular stocks, the simple "exit" option has become increasingly less tenable. For indexed-portfolio managers, by definition, it is not an option.

This has led to the identification of the importance of good corporate governance, the development of codes of conduct successively by the Cadbury, Greenbury and Hampel Committees, and examination by institutional investor associations of the most appropriate ways in which large shareholders should articulate their concerns.

CHART 3: PENSION FUND PERFORMANCE, IN MAJOR ECONOMIES 1966-1990



Source: Davis²

Herding

A second issue lies in the impact of structural changes in the asset management industry, which might undermine the diversity of investment approaches available to institutional investors. The fear at the systemic level is that this could increase the risks of herd-like investment behaviour or of excessively volatile asset prices.

Structural changes include the consolidation of independent fund managers through merger and acquisition, and client-driven movements of investment business from smaller to larger managers. These are driven in turn by competitive pressures to exploit the economies of scale and greater ability to withstand commercial risks that go with size. At the same time, the emphasis on market benchmarks in the assessment of investment management performance, and perceptions that trustees and their advisers are sensitive to

short-term under-performance, can inhibit fund managers from straying too far from the norm in their investment strategies.

The risks of being out of line in the management of other people's money can be punishingly high.

Flexible investment rules

Funded pension provision has been encouraged as a means of saving in the United Kingdom by favourable tax treatment. It has thrived on the liberal "prudent person" regime for investment management, and on the existence of open and competitive capital markets.

The "prudent person" rule is that trustees should manage a fund's investment with the same care as would be expected of a typically prudent individual when acting on their own behalf. It permits investments in individually risky assets but requires that the overall portfolio should be suitably diversified.

It is therefore a qualitative approach and is to be contrasted with systems which impose binding quantitative restrictions, eg minimum holdings of government bonds or high degrees of domestic currency matching of assets and liabilities. The prudent person framework has allowed UK pension funds to adopt investment strategies appropriate to their long-term liabilities, and in particular to hold weightings in high-risk, high-return assets such as equities.

UK pension funds have in fact achieved strong performance in both equity and bond markets. They have benefited from supply-side improvements in the UK economy, control of inflation, the success of privatisation issues, and the freedom to diversify into overseas assets once exchange controls were lifted in 1979. Real rates of return on pension fund investments averaged over 11 per cent during the 1980s compared to 8 per cent growth in average earnings. Over longer periods of time, UK pension fund performance has usually exceeded earnings growth, and has done well by international standards (see Chart 3).

Evolving benefit structures

Legislation concerning occupational pensions has gradually increased the security of employees' prospective entitlements and enhanced their flexibility of options, in contrast to the case with social security benefits. Measures since 1975 include:

- Introduction and extension of preserved rights to members who leave before retirement.

- Limited price indexation of preserved pensions, and of pensions in payment accruing from 1997.
- Equal access and treatment provisions arising from the “Barber” judgement of the European Court of Justice on sex discrimination.
- The right to opt out, and transfer out accrued benefits from company pension schemes in 1988.
- Establishment of a compensation fund to cover losses from fraud.
- The prescribed solvency and contribution schedules of the Minimum Funding Requirement.

Past enhancements have generally been readily financed out of the strong long-term performance of pension fund investments. But they do represent a greater regulatory burden on employers.

Enhanced members’ rights mean that the protection against financial risk offered by defined benefits has hardened, with greater risk for the sponsoring employer. These changes have occurred while demographic trends and industrial down-sizing have made pension fund membership profiles more mature, adding again to employer risk.

Defined benefit occupational schemes

Design and job flexibility

A “final salary” occupational pension is by far the most common arrangement among occupational schemes. Its advantages are: it is simple from the point of view of the employee; pension payments are not subject to

financial market volatility (as long as the scheme remains solvent); and it is a means of providing employees with an incentive to stay with their firm.

Its disadvantages lie precisely in the fact that it is an inflexible means of achieving these secondary

The “prudent person” rule ... permits investments in individually risky assets but requires that the overall portfolio should be suitably diversified

objectives, and it is therefore open to financially inefficient side-effects.

For a given level of employer and employee contributions, final salary occupational schemes tend to favour those employees who are older, longer-staying or who have above-average earnings growth, at the expense of younger and shorter-

serving employees, and those with below-average earnings growth (See Box 1). In addition, scheme rules often implicitly reward early retirement, by making it available without proportionate actuarial reduction, but they may also punish very early job leavers by stipulating minimum service requirements.

Final salary schemes make older workers relatively more expensive to their employer because the cost of their accruing pension entitlement is higher. The dependence on employment tenure is often justified as a way of encouraging workers to acquire firm-specific skills, or to reward loyalty generally, but the promotion of greater labour market flexibility and the spread of temporary and short-term employment contracts suggest that the relative importance of these objectives has declined. In such circumstances the final-salary design may act as an obstacle to labour market flexibility.

Some have advocated an alternative to final-salary pensions based on career-averaged earnings which would accord an equal accrual factor to each working year. Such a scheme would, for example, remove the biases towards long service and fast growth of salary; reduce, but not wholly eliminate, the age bias; and it would remove one element of actuarial uncertainty, a factor which inhibits transfers of pension benefits, by eliminating the dependence of future earnings on liabilities associated with a given length of past service. But it has achieved little success in practical application.

BOX 1: FINAL SALARY PENSION DISTORTIONS

CHART 4: EFFECT OF AGE ON FINAL SALARY PENSION COST

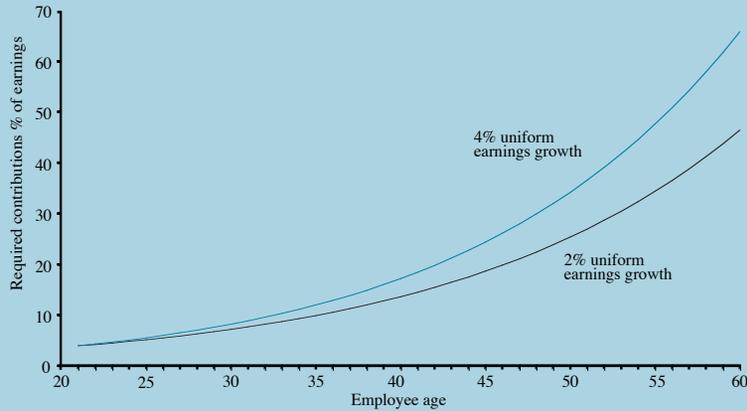


CHART 5: EFFECT OF SALARY GROWTH ON PENSION COST

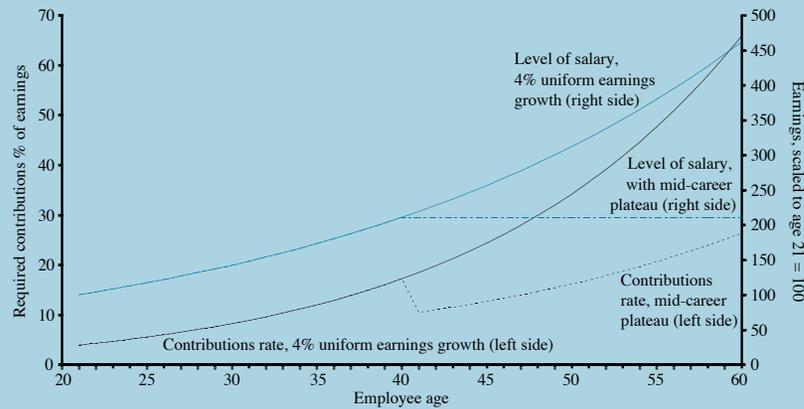
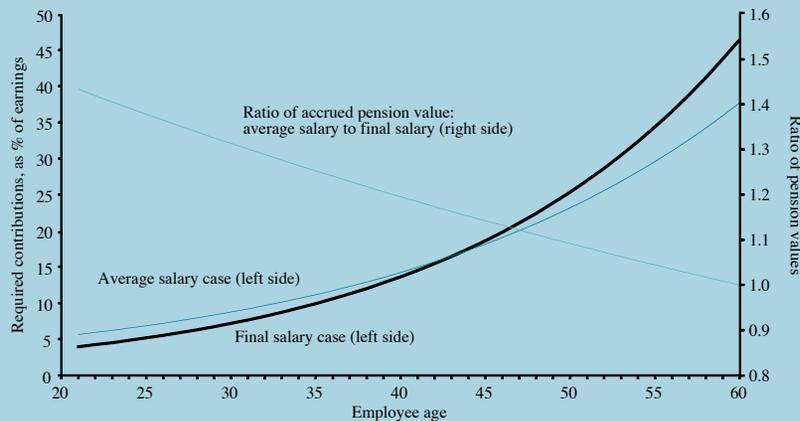


CHART 6: FINAL AND AVERAGE SALARY PENSION COSTS



The focus of this box is to consider the profile of the economic costs of a pension scheme by attributing the value of accruing pension rights to the employment periods in which they are accrued.

Future pension entitlements are financed by employee and employer contributions, and by the investment returns on assets. From an economic perspective, the cost of an accruing pension obligation can be represented by the current contributions required to finance it. Required contributions when scaled as a fraction of current earnings are equivalent in actuarial terminology to the standard contributions rate of the current unit method. Actual rates of pension scheme funding will differ from this if they are smoothed over time in accordance with one or other standard actuarial methods; but this is more a matter of the timing of funding rather than of the rate of accrual of pension liabilities.

Actuaries compute contribution rates by making projections of future variables such as investment yields, earnings growth, inflation, life expectancy of pensioners, and employee length of service. The charts and comparisons here are based on a particular set of plausible assumptions.

Final salary pensions

In the typical final salary scheme the accrued pension is calculated as a fraction, for example $N/60$, of the member's final salary, where N is the number of

years of service. An employee who leaves service before retirement will receive a “deferred pension” based on leaving salary. This will be increased according to “limited price indexation” (the lesser of RPI inflation and 5 per cent) between leaving employment and starting retirement, but any linkage with future earnings growth which would have occurred had the employee remained in service will be lost.

Transfer values (eg for opting out into personal pensions or joining a new employer’s scheme) reflect this fact. The anticipated rate of growth in real terms of future earnings is therefore a key factor in determining the prospective attractiveness to the employee — and the cost to the pension fund — of continuing membership in the scheme. It follows that the value for money represented by a final salary pension will depend on the pattern of career earnings, and it will vary from individual to individual.

Gainers and losers

The following value for money comparisons are presented in terms of “gainers” and “losers”. This is a reasonable approach to take if it is supposed that employers and employees are concerned about the levels of overall pension costs.

- Final salary pensions cost relatively more for employees with faster than average career growth of real earnings, and correspondingly are worth relatively less to employees with slower than average earnings growth. In traditional language, they are better

value for white-collar than blue-collar workers. Chart 4 demonstrates how the profile by age of the required contribution rate is higher in the higher-earnings growth than in the lower-earnings growth case, where in each case it is assumed that real earnings growth occurs uniformly over the individual’s working lifetime. Chart 5 shows the drop in the contributions rate which occurs under an alternative, perhaps more realistic, assumption that real earnings level out in mid-career.

- They cost relatively more for longer-serving employees and are worth less to shorter-serving employees. This arises because of the long-term trend for the real level of earnings to grow faster than inflation, reflecting productivity growth and individual salary progression. The longer a period of employment, the more this effect builds up.
- They cost relatively more for older employees and are worth relatively less for younger employees. This effect occurs on top of the length of service effect, and it arises simply because of the shorter investment horizon left to retirement age. To fund a given year’s worth of pension benefit, a larger contribution is required nearer to retirement date, since there is less time for investment returns to accumulate.

The upwardly sloping profiles in all three charts reflect the dependence of contribution rates on age and length of

service. These effects are combined in the charts as they assume common employment service start dates.

The charts also depict how much of a pension’s value is accrued in the final years of employment before retirement. Conversely, they illustrate the costs incurred by premature retirement from employment — in terms of either lost pension or of the additional employer subsidy required to make it up.

Average salary pensions

Final-salary is not the only calculation within the class of defined benefit pension plans. One alternative, prevalent before the 1970s, is the average-salary calculation, in which each year of employment earnings would contribute the same fractional element to the pension, for example one-fiftieth. Such accruals could be price-indexed in order to take account of inflation.

As the pension is no longer specially dependent on the final level of salary, it follows that the value for money of an average salary pension would be independent of rate of salary growth and of length of service. It would still retain a dependence on age.

Chart 6 shows the smoother profile of average-salary contribution costs, conditional on an equivalent final pension outcome to final salary, under one particular earnings growth assumption. It shows that early leavers would generally get a better deferred pension under average-salary than under final salary pension schemes.

Defined-contribution schemes ... offer, in principle, the cleanest solution to the problems of bias and a lack of portability of defined-benefit schemes

The impact of defined-contribution schemes

In defined-contribution schemes, such as money purchase occupational schemes and personal pension plans, benefits are linked directly to contributions. They offer, in principle, the cleanest solution to the problems of bias and a lack of portability of defined-benefit schemes.

In defined-contribution schemes the individual rather than the sponsoring employer bears the financial risk underlying the fund's investments, and this can have significant consequences for asset allocation and expected long-run returns. They tend to have higher administrative costs than defined-benefit schemes, and in practice these are also often borne directly by employees.

As the incidence of financial risk is on the individual, the advantages of the pooling of investment risk across different age groups, as achieved in on-going defined-benefit pension funds, are less accessible to defined-contribution plans. Under defined-benefit plans, pension funds are usually able to hold relatively larger proportions of high-risk, high-return assets such as equities, and correspondingly smaller proportions in low-risk, low-return assets such as bonds, even when they have quite mature membership profiles. They can do this because the size and long duration of their liabilities means that the cost to sponsoring employers of underwriting investment risk is relatively low.

Individuals are more risk-averse than companies, so switches from

defined-benefit to defined-contribution schemes, which in many cases allow individuals some element of investment strategy discretion, will tend to increase the demand for investment in safe assets, such as bonds or deposits. There is some evidence of this from US experience with money purchase plans, and in early UK experience with personal pensions. The concern is that prospective benefits in these schemes may be considerably lower, for the same contributions, than under defined-benefit schemes. If defined-contribution is introduced as a cost-saving replacement of a final salary scheme, then the overall profile of contributions may also be lower.

In defined-contribution plans, the accumulated pension capital (excluding the lump sum which can be taken) must be used to purchase an annuity on retirement, transferring investment and longevity risk to the annuity provider. Insurance solvency regulations have the effect of requiring marketed annuities to be backed by a predominantly gilts-based investment strategy. Standard "life-cycle" money purchase products now anticipate this with a gradual phasing-in of the required share of assets that must be held in gilts. This process normally begins between five and ten years before retirement. Defined-benefit plans escape such requirements as they are not compelled to secure annuitised pension promises via the annuity market, nor are they constrained by the insurance solvency rules.

Personal pensions and mis-selling

The market response to the problems of the defined-benefit occupational scheme has been the growth of the personal pension. This was encouraged by the Government's introduction of the SERPS and employer scheme opt-outs, and the ability to invest the national insurance contracted-out rebate into a personal pension plan.

These features, plus the additional incentive, encouraged large numbers to open personal pension plans. Over 3 million plans were opened for the first eligible year, 1987-88, rising to 5.3 million by 1991-92. Numbers then stagnated, first because of economic recession and then because of the discovery of widespread mis-selling. There were 5.6 million plans in operation in 1994-95.

Personal pensions can be the wrong choice for particular individuals; alternatives, such as staying in employer occupational plans, may be better. They can be expensive in terms of the level and structuring of costs, and the individual may be exposed to an excessive financial risk. When there are sizeable fixed and front-loaded elements to charges, personal pensions become especially unsuitable for low earners and for those with interrupted earnings patterns, such as women taking career breaks to raise families.

The incidence of such disadvantages became spectacularly manifest as the extent of personal pension mis-selling became known. People

who opted out of occupational schemes typically lost the benefit of employer contributions — the major cost — and took on financial market risk they would not otherwise have borne. Individuals that transferred their accumulated pension entitlements sometimes lost out because cash transfers represented the value of statutory but not discretionary benefits, or because expected investment performance failed to be realised.

Personal pension mis-selling occurred because of widespread, bad or inadequate advice. Why individuals were susceptible to such advice is a more subtle question. It is clear that aside from the marketing and incentives pressures at the occasion of sale, people who were members of occupational schemes simply did not appreciate the true value of the benefits they were giving up, nor the risks of the products they were subscribing to. It seems reasonable to consider whether this was, at least in part, a consequence of the lack of transparency and inflexible design characteristics of final salary occupational pension schemes, and what questions it raises for future pension reform.

Challenges to funded pensions

Looking forward there are challenges to the design of UK funded pension arrangements. Are they now well adapted to both employers' and employees' needs, or do structural inflexibilities persist which might

Individuals are more risk-averse than companies, so switches from defined-benefit to defined-contribution schemes will tend to increase the demand for investment in safe assets

impede optimal outcomes? Or, in more concrete terms, does the choice between final salary occupational pensions and front-loaded personal pension plans, represent the best solutions that can be arranged in a competitive and innovative financial system?

Benefit security

The capacity of employers to bear risk under defined-benefit schemes is not infinite; some risk ultimately resides with the employees — the employee is always subject to the risk of having to change jobs, reducing the final pension they will receive under final salary schemes. Recent pension legislation, ambiguity over the “ownership” of fund surpluses, and the abolition of repayable Advanced Corporation Tax credits have sharpened awareness of the risks that companies bear in sponsoring defined-benefit schemes. Other factors include the gearing effects which occur as pension fund membership profiles mature, or when a sponsoring company’s level of trading activity declines.

In practice, therefore, members of defined-benefit schemes do not escape risk: pension schemes can exercise discretion over the award of particular benefits (eg the difference between full and limited price indexation); or, employees may find that their pay awards are constrained if pension contribution costs become excessive. In the extreme, individuals bear the risk that they could belong to an underfunded pension scheme of an insolvent

company, and thereby experience a pension shortfall.

Comparing pension fund and life assurance pension liabilities

There is limited freedom of choice within defined-benefit occupational pension arrangements. Employees can transfer the actuarially computed cash equivalent of their occupational pension entitlements into a personal pension, and ultimately into a purchased annuity; or they can transfer occupational pension entitlements to a new employer, on actuarially fair terms and subject to agreement by trustees, on a change of job.

Employees do not, however, enjoy the general freedom to choose occupational pension arrangements independently of their employers. Nor are employers able to exploit a free market in occupational pension provision, whereby more efficient company pension schemes could bid to assume the assets, obligations and risks of the less efficient.

Unlike final salary pensions, annuity rates vary with market interest rates. Insurance solvency rules mean that annuities have to be backed by more secure but, on average, lower yielding assets than do the pensions paid out by occupational pension funds. Pension schemes themselves vary in their characteristics of risk and return, but as there is not an open “market” in which pension liabilities can be traded, these characteristics are not readily observable.

Calculations of scheme valuations and current contribution rates are therefore determined not by reference to market-clearing prices but on the basis of actuarial techniques embodied in prescribed rules and professional judgement. The danger when a market is absent is that there will be no mechanism for ensuring the equilibration of supply and demand. Absent markets can also have knock-on effects in corporate finance, for example in the accurate accounting of pension fund assets and liabilities to shareholders and potential acquirers.

Actuarial assumptions

The 1995 Pensions Act clarified trustees’ responsibilities and highlighted the importance of actuaries and other professional advisors. The Minimum Funding Requirement exposed to critical appraisal the technical assumptions underlying the discounted-cash-flow approach which has been standard actuarial practice in the UK.

This issue has gained added relevance with the long duration of stock market growth and the abolition of ACT credits, which have caused actuarial valuations of equity portfolios to depart markedly from market valuations, and with the International Accounting Standards Committee decision to recommend market valuation and other changes in the treatment of employee benefit costs.

Too much caution in the long-term assumptions of actuaries can be costly, just as too little can be

negligent. Companies and insurers would, for example, be dissuaded from offering efficient pension arrangements which they would otherwise willingly contract with employees; while individuals transferring pension benefits and annuity purchasers would be faced with sub-optimal quotations.

It is important therefore that actuarial assumptions are seen to be robust to changes in economic circumstances.

Efficiency and transparency of pension arrangements

Individuals' financial planning is made easier if regulatory and tax structures avoid undue distortions of markets or restrictions of choice in achieving their aims, and if the pattern of expected costs and benefits is transparent.

In almost all forms of pension provision, however, there are serious problems of transparency in at least one of the key areas — administrative costs, extent of risk, implied contributions, rates of return and ultimate benefits — against which such decisions must be made. Such problems encompass: the average yield in the state retirement system and in SERPS; perceptions of unfairness within defined-benefit pension outcomes; and sensitivity of the size of charges in personal pension plans on ability to maintain premiums over time.

Costs

Administrative costs tend to have relatively higher fixed elements,

and to be higher overall, in personal pension plans than in occupational schemes. In occupational schemes, they tend to be higher in money purchase schemes than in defined-benefit plans. This reflects factors such as the individual nature of defined-contribution plans, and the impact of overheads such as advertising, commission structures and the provision of advice that is associated, in particular, with personal pensions.

Costs are also influenced by how complex and expensive a product providers judge consumers to be willing to purchase. Costs will fall if financial services innovators succeed in developing simpler and cheaper products that remain appropriate to consumers' needs.

The administrative costs of personal pension products have tended to be concentrated around the time of origination and this has been reflected in the charging structures. There can be heavy penalties for early termination of saving plans. For consumers who terminate their personal pension plans early, such penalties can act to neutralise the advantages of portability and subjectively greater fairness which defined-contribution offers over the defined-benefit arrangement.

Summary

Internationally, governments face important demographic and fiscal challenges in their pay-as-you-go state pension systems. Such systems have often demonstrated chronic problems of long-term insolvency.

They also threaten growing distortions in labour markets and saving decisions caused by the need for high contribution rates.

They raise important fiscal and social policy challenges. For many countries the answer lies in radical solutions, including the replacement of PAYG by privately funded provision. The transitional costs of such solutions, however, can be difficult to accommodate.

The UK's long and extensive experience with funded pension provision shows the capacity for long-term investment gains to be achieved in a framework of liberalised financial investment markets.

Equally, however, the UK's experience demonstrates the need for the design of pension benefits to evolve with changing needs and requirements. Issues such as equity in pension outcomes, portability of benefits, transparency of outturns, optimality of tax and regulatory environments, and the structuring of charges all influence the efficiency and adequacy of outcomes within funded provision.

There are as difficult and important challenges in the efficient design of funded pension systems as there are in the maintenance and reform of established PAYG social security systems. ■

NOTES

- 1 Roseveare, Liebfritz, Fore and Wurzel, "Aging populations, pension systems and government budgets; simulating for 20 OECD countries", OECD Economics Dept Working Paper No 168, 1996.
- 2 EP Davis "Pension funds — An international perspective", pg 150, 1995.

DISCLOSURE FRAMEWORK FOR SECURITIES SETTLEMENT SYSTEMS

By Helen Allen, Bank of England

A new international exercise to ensure that the risks associated with participation in securities settlement systems are clearly understood by current and potential members.

Understanding the risks involved in securities settlement systems (SSSs) can be difficult, particularly when a firm is considering participating for the first time. Operators of systems keep their members informed — via rulebooks, operational circulars, etc — but there has been no standard format for setting out basic information on the risks of participation, including the rights and obligations of members and the nature of Delivery versus Payment (DvP) provided by the system. Moreover, growth in global settlement volumes, greater numbers of cross-border transactions and the complexity of securities settlement mechanisms are contributing to making it more difficult for SSS participants to understand and manage the risks.

To assist participants in this task, a joint initiative by the G-10 central banks' Committee on Payment and Settlement Systems (CPSS) and the International Organisation of Securities Commissions (IOSCO) has led to the development of a *Disclosure Framework* for securities settlement systems. This takes the form of a detailed questionnaire covering the key information about



settlement systems. Operators of individual SSSs worldwide have been asked to provide responses and to make them available to participants more widely. Their answers will include a description of each system, its rules, membership arrangements, links with other systems and its risk control policies (see Box 1).

A considerable body of work by the CPSS and IOSCO lies behind the development of the disclosure framework (see Notes). This has highlighted the risks that arise in the settlement of securities transactions and the differing approaches that are taken in existing systems to manage them. It underlines the importance of transparency in this area.

The objective of the disclosure framework is to build on this work by providing participants with the material they need to make informed

assessments of the risks associated with using SSSs.

It is hoped that a result of the exercise will be to expose what is best practice in areas such as DvP and risk management and encourage system operators to move towards these best practices as far as possible.

G-10 central banks are encouraging participants to study responses and to urge those system operators which have not already done so to make the information available.

Comparison of the responses of different systems can be highly informative and can indicate further questions participants should ask operators. To date over 45 responses from SSSs in some 35 countries have been completed, covering both private and public sector settlement systems for instruments ranging from government debt to corporate bonds and equity.

For the UK, responses to the disclosure framework are available for the Central Gilts Office, Central Moneymarkets Office and CREST. These, and other SSSs' responses, can be obtained as indicated in Box 2. ■

NOTES

- 1 Including the reports *Delivery versus Payment in Securities Settlement Systems*, CPSS 1992 and *Cross-Border Securities Settlement*, CPSS 1995. The full report on the disclosure framework project is published as *Disclosure Framework for Securities Settlement Systems*, CPSS/IOSCO 1997.

BOX 1: CONTENTS OF THE DISCLOSURE FRAMEWORK FOR SECURITIES SETTLEMENT SYSTEMS

The following are the nine sections of the questionnaire and the key aspects covered within each.

1. Basic information: functions of the SSS, types of securities settled, legal basis.
2. Rules and procedures of the SSS: including the process for making rule changes.
3. Relationships with participants: types and requirements of membership, termination of membership and its consequences.
4. Relationships with other SSSs and commercial intermediaries: linkages with other settlement systems, use of custodians, measures to protect against failure of other SSSs.
5. Securities transfers, funds transfers and linkages between transfers: the mechanics, procedures and timings of the settlement process, including the nature of the Delivery versus Payment (DvP) arrangements provided by the system.
6. Default procedures: what constitutes default, whether certain transactions might be unwound, any bankruptcy procedures specific to the SSS's jurisdiction.
7. Securities overdrafts, securities lending and back-to-back transactions: the availability of securities lending facilities, whether a participant can enter into an overdraft on its securities account.
8. Risk control measures: internal risk management systems, audit arrangements, monitoring of exposures.
9. Operational risks: information on the reliability of the system, disaster recovery procedures, etc.

BOX 2: HOW TO ACCESS THE DISCLOSURE FRAMEWORK

- Responses for CGO and CMO are available via the Bank of England's website: <http://www.bankofengland.co.uk/cgmo.htm> or from Public Enquiries Group, Bank of England, Threadneedle Street, London EC2R 8AH, UK.
- The response for CREST is available via its website: <http://www.cresto.co.uk> or from Publications, CRESTCo Ltd, Trinity Tower, 9 Thomas More Street, London E1 9YN, UK.
- A list of which system operators have supplied responses is available on the website of the Bank for International Settlements: <http://www.bis.org> (or from CPSS Secretariat, BIS, CH4002, Basle, Switzerland). All responses are available directly from the individual system operators and many are also available on the BIS website (as above).



REGULATORY DEVELOPMENTS

Compiled by the Bank of England and the Financial Services Authority

UK SUPERVISORY DEVELOPMENTS

Banking Supervision

RATE AND SCALE

The Bank's response to the comments received on its consultative paper entitled "A Risk Based Approach to Supervision of Non-EEA Banks (the SCALE framework)" was published in February.

The SCALE framework, together with the RATE framework for the supervision of UK incorporated banks, has been trialled on a number of banks during the latter half of 1997 and the results of this prototyping exercise are now being evaluated. Initial feedback has been positive, so it is unlikely that there will be any radical changes to the frameworks. The intention is to issue a revised policy paper on risk-based supervision during the late spring.

In parallel with the evaluation of the prototyping exercise, the Bank has completed a desk-top risk assessment of all banks (excluding UK branches of EEA banks) using the new evaluation factors set out in RATE/SCALE frameworks. This exercise has been done to draw up supervisory programmes for each bank to ensure that the work undertaken this year will be risk focused. The provisional risk assessment and an outline of the supervisory programme for 1998 is being communicated in a letter to each bank.

Trading Losses and the Role of the Market Risk Management Function

The Bank's Traded Markets Team (TMT) recently set out examples of significant trading losses which it has seen

and the lessons to be drawn from those losses for banks and for supervisors. Based on this experience TMT has also drawn up criteria which it would expect a bank's market risk management (MRM) function to meet.

All banks with significant treasury operations — including branches of overseas banks — are expected to have an independent MRM function. This function should ensure that the trading risk profile is consistent with a bank's overall market risk appetite by establishing, and monitoring adherence with, market risk policies and procedures, including exposure limits.

The criteria allow banks, as well as supervisors, to assess whether MRM functions are:

- adequate for the business undertaken;
- independent of the trading operations whose market risk is measured, monitored and controlled; and,
- efficient and effective in their role.

Section 39 Revised Notices

The Bank is in the process of implementing changes to the reporting accountants' Section 39 regime, following the 1998 consultative paper on "Banks' Internal Controls and the Section 39 Process". Revised versions of two of the Bank's Section 39 notices — "The Bank of England's Relationship with Auditors and Reporting Accountants" and "Reporting Accountants' Reports on Accounting and Other Records and Internal Control Systems" — are due to be finalised shortly, and will incorporate the changes including new requirements for routine bilateral (Bank of England — accountant) meetings, rotation of partners responsible for Section 39 work, and accountant's statutory duty confirmations.

Revised Approach to Liquidity Reporting

In June 1997, the Bank issued a consultative document on a revised method for measuring liquidity in order to: reduce the number of reporting forms used for liquidity measurement purposes; dovetail data required by the Bank with that used by banks for internal management information purposes; and improve the scope, coverage and quality of liquidity data by including a measurement of inflows and outflows of cash and off-balance sheet items.

After discussions with the British Bankers' Association and a panel of representative banks, revised proposals were issued in February 1998. The key changes are that:

- banks will initially be required to report on a cashflow only basis to the first month (but to be able to extend this to six months by the end of 2001); and
- banks need use only one form to report all currencies combined (although they should maintain management information on individual currencies regarding short-term liquidity positions).

It is hoped to introduce the form from the first reporting date after the end of November 1998.

Basle Supervisors' Committee

The Committee's current work includes three main areas:

- helping to improve prudential standards worldwide by developing a programme, in close co-operation with the IMF and World Bank, and with non-G-10 supervisors, to put into practice the Core Principles of Banking Supervision; and by establishing an institute for financial stability in Basle, to include supervisory objectives for training and technical assistance;
- progress on current supervisory issues. These include risk management, especially in the areas of credit and operational risk, and market transparency. Work on Year 2000 issues featured in a Basle conference in April; and a paper on electronic money was issued in March;
- international regulatory co-operation continues to gather pace, through the Joint Forum, closer co-operation with emerging markets supervisors over the Core Principles, and a number of bilateral consultations between supervisors on operational and policy issues.

Basle Committee papers are made available on the internet (address: www.bis.org).

Securities and Investment Regulation

Introduction of individual registration by PIA

In January 1998, the PIA launched its arrangements for individual registration. Principals, managers and advisers will need to apply to be registered.

The new PIA arrangements will come into force on 18 May 1998 for principals of life offices, banks, IFA networks, IFAs with 26 or more financial advisers, marketing associates, and those friendly societies subject to EC Life or Non-Life Directives. For other individuals the new arrangements will come into force on 1 October 1998.

The introduction of individual registration will:

- enable the PIA to prevent an individual from taking up a registrable position, where the PIA is not satisfied that he or she is fit and proper;
- enable the PIA to intervene or take disciplinary action against an individual, where appropriate, as well as against a regulated firm; and
- reinforce good management and underline the responsibilities of those working in the industry for the proper conduct of investment business.

Review of pensions mis-selling

On 12 March the FSA and the PIA published a joint consultation paper on the next phase ("phase 2") of the review of pensions mis-selling. This will focus on younger investors — those who are still a number of years from retirement. Research commissioned by the FSA indicates there are an estimated 1.8m such investors. The total redress due to them may be between £3,350m and £5,800m.

The FSA and PIA are proposing that the relevant firms should send investors in the phase 2 categories a letter inviting them to request a review of their case, and that these invitations should be backed up by a high profile publicity campaign. Copies of the consultation paper can be obtained from the FSA's publications department (Telephone: 0171 676 1000) Representations are sought from all interested parties by 15 May. In the meantime, the review of "priority" cases — involving investors who are at or near retirement and those who have died — continues. The target for completing this stage of the review is end December 1998, and overall good progress

is being made towards this deadline. By the end of January this year assessments had been completed for more than 65 per cent of all priority cases. The Economic Secretary to the Treasury continues to publish monthly individual progress statistics for the 41 firms with the most to do.

CRESTCo developments

CRESTCo and the LSE entered into a new Memorandum of Understanding on 10 March this year, clarifying their roles in facilitating settlement of transactions in UK equities conducted on the LSE. CRESTCo has also sent to member firms a note on the improved procedures for obtaining regulatory data.

In July CRESTCo will implement a contractually-based system of settlement discipline. This follows a consultative process that led to a consensus between the various CREST member groupings and other market organisations. The discipline is based on fines for late matching and late settlement and is applicable to all transactions settled through CREST.

LIFFE

In February LIFFE announced the recommendations of its working party which had been reviewing the governance of the exchange. The recommendations are now in the process of being adopted, and can be summarised as:

- the chairmanship should be a full time executive post;
- the board should be reduced in size from 24 to 18 or 19;
- the number of independent directors should increase from one to two, and their tenure should be restricted to six years.

Further recommendations are intended to clarify the roles of the board and the executives and to enable the board to make fullest use of its committees.

In early March, LIFFE announced the recommendations of its wide-ranging strategic review. This was designed to ensure that LIFFE continued to meet the needs of the international financial community and maximised the commercial attraction of access to its trading systems. The proposals, which cover all major LIFFE contracts trading both on an automated system and on the floor of the Exchange, as well as a revision of the corporate structure, will be put to the membership at an EGM on 12 May.

SFA's Penalty Policy

The Securities and Futures Authority (SFA) is consulting with its regulated community on proposed changes to its penalty policy and procedures relating to disciplinary action. The purpose of the policy is to shift penalties and costs in such a way that the emphasis is on "polluter pays" and at the same time to encourage the disclosure of problems by firms. The underlying message is that good compliance means good business.

The SFA has identified certain criteria that can compound any failure and therefore attracts a more severe action. These include failure by the firm to detect internal problems, failure to rectify past problems or to pay compensation (where appropriate), and failure to cooperate with the SFA. These can all increase the severity of the disciplinary action.

Additionally, the consultation paper spells out the offences by an individual which would generally result in expulsion from the SFA's registers. The consultation period ends on 30 April 1998. Copies are available from the SFA.

Disciplinary action by FSA

On 21 October 1997, the SIB (just before changing its name to the Financial Services Authority) issued a public statement as to misconduct by the Prudential Assurance Company in relation to its failure to meet its target date for completion of 90 per cent of its priority pensions review cases. The firm admitted that it had "departed from the basic tenets of clarity of accountability and responsibility, and robust management information".

On 16 December 1997 the FSA issued a public statement as to misconduct by the Prudential Assurance Company in relation to contraventions in the management and the operation of its direct sales force. The public statement also related to continuing, persistent and serious breaches by Prudential across major areas of its business.

On 13 January 1998 Jeremy Bartholomew-White, former managing director of Scandex, was fined for being in breach of court orders not to dispose of his assets. Jeremy Bartholomew-White had previously been found by the High Court (as confirmed by the Court of Appeal) to have been knowingly concerned in the conduct of unauthorised investment business.

On 20 March 1998, the FSA brought proceedings in the High Court against Steven Rhodes to restrain him from conducting unauthorised investment business in the UK (being the sale of shares in a US company to a number of South African and Irish investors for which he failed to pay). The FSA also obtained *ex parte* injunctions freezing his assets worldwide. On 1 April, these orders were continued by consent until trial.

Disciplinary action by FS Act regulators

IMRO fined BAii Asset Management Limited (BAM) £50,000, on 4 November, for failures in its internal organisation and for not having effective procedures to record all relevant information about its customers. In addition, the firm agreed to pay compensation totalling \$807,773 (about £502,000) to 24 customers and to pay IMRO's costs of £47,850. IMRO also announced the termination of Omar John Khayat's individual registration. He was formerly employed by BAM as part of its fund management team. The charge related to the circumstances surrounding deals carried out in the secondary market of a new issue in August 1995 on behalf of customers of BAM and its parent company. These deals led to losses being incurred by customers and compensation payments as detailed above.

On 5 March 1998, IMRO fined Quilter Fund Management Limited (QFM), formerly Foster & Braithwaite Fund Management Limited, £125,000 and ordered the firm to pay IMRO's costs of £55,636. The rule breaches related to widespread inadequacies in controls, resources and procedures. As a consequence, QFM paid compensation totalling approximately £55,000 to 651 customers.

Failure properly to supervise one of their staff has resulted in Swiss Investment Corporation being reprimanded and fined by the SFA. Routine inspection work by the SFA's surveillance staff uncovered equities trading by an employee of the firm who was not authorised to trade. The individual concerned had previously been refused registration by the SFA (a pre-requisite for entering into deals or advising clients) and Swiss Investment Corporation had given an undertaking that he would not engage in activities that required him to be registered. The firm admitted its failing and the SFA took into account the fact that no clients were disadvantaged as a result of the unauthorised trading.

Capel Cure Myers (CCM) has been fined £150,000 and ordered to pay a substantial share of the SFA's tribunal and prosecution costs. The action relates to CCM's management of the portfolio of securities held by the Mirror Group Pension Scheme. The firm was penalised for transferring securities without the instructions of the client. It also failed to make proper arrangements to ensure the recovery of dividends and tax. The tribunal also found that CCM's records were ineffective for the purpose of ascertaining who had custody of what stock.

Between October 1997 and March 1998, the PIA disciplined 21 firms and levied fines totalling nearly £2m. It rejected applications from 13 firms, suspended the business of 13 firms, and expelled 9 firms from membership.

London & Manchester and Britannic both received record fines of £525,000 for serious compliance failings in relation to the review of personal pensions mis-selling. In Britannic's case, the identification of priority cases was incomplete and communication with investors unsatisfactory. The under-resourced pensions review teams within London & Manchester failed, *inter alia*, to make contact with nearly 6,000 of its investors.

Albany Life missed its first deadline for completion of its most urgent pensions review cases and was fined £375,000. Countrywide received a £250,000 fine for its failure to conduct its pensions review properly.

Some of the other larger disciplinary fines include: Buck Investment Consultants (£32,000), Duncan Lawrie Pension Consultants (£30,000), Financial Strategy Limited (£25,000) and Ward Consultancy (£20,000).

EU SUPERVISORY DEVELOPMENTS

Amendment to the Capital Adequacy Directive

Work is continuing on the amending directive to the current Capital Adequacy Directive. This will enable regulators to allow firms to use Value at Risk (VaR) models to calculate capital requirements for market risk and introduce a framework for allocating capital to capture commodities risk.

The European Council of Finance Ministers (ECOFIN) reached agreement on the draft directive towards the end

of last year, at which stage the European Parliament had its first reading, suggesting some amendments. A revised text was again considered by ECOFIN in early March and it is anticipated that the European Parliament will soon start its second reading.

In January the Bank issued consultative documents on its proposed implementation of the new policy and asked for comments by early March. In addition, the Bank's Traded Markets Team has begun visiting banks seeking VaR model recognition. The Bank is working to an implementation deadline of end-September 1998 for the amending directive and the Basle market risk amendment, but this timing is dependent on progress of the draft European directive.

New Forum for European Securities Supervisors

The Forum of European Securities Commissions (FESCO) was launched in Paris in December. This new group was established by chairmen and senior officials from the chief securities supervisory bodies of the 17 Member States (including the FSA) as a development and formalisation of regular meetings they have held over the past eight years to discuss European regulatory issues of mutual interest.

The chairman of FESCO for the first two years is Mr Tommaso Padoa-Schioppa, Chairman of the Italian CONSOB. The secretariat, based at the COB in Paris, will draw on staff from six of the member organisations including the FSA.

As well as providing a forum for the discussion of issues within securities regulation in Europe, FESCO will pursue a number of specific projects through working groups, to strengthen co-operation in a number of areas, and to explore the scope for agreement on certain EU regulatory standards to elaborate on the requirements in existing Directives. Areas being explored include the assessment of fitness and properness to carry on investment services, aspects of market integrity, and the regulation of cross-border investment services.

Proposed Distance Selling Directive

The European Commission is understood to be in the final stage of preparing a draft Directive to regulate the

distance selling of financial services to consumers. In order for the Directive to proceed to negotiation, it needs to be adopted by the Commission and proposed formally. Formal proposal is expected some time in the spring and negotiation of the Directive could start before the end of the UK presidency in June 1998.

The Directive is expected to cover the offering for sale of any financial service where the service provider and the consumer do not meet before or at the conclusion of the contract. As such, it will probably deal with the provision of pre-contractual information to consumers, written confirmation, rights of withdrawal and possible redress mechanisms. Once the Directive is formally proposed, it will become a public document. Under current UK arrangements no distinction is made between the regulation of financial services and products sold at a distance and those sold face to face.

The FSA is monitoring this work closely, with a view to assessing the implications for UK regulation and developing an appropriate response.

Developments in Other International Fora

Preparations for Birmingham Summit

Enhancing global financial stability, in the light of the Asian crisis, will be one of the concerns of this Summit in May. Among the issues expected to be covered are: promoting the markets' contributions to avoiding and resolving crises; strengthening financial supervision and corporate governance; working to achieve better co-operation and information sharing among supervisors, and between supervisors and law enforcement agencies; and encouraging better risk management by firms.

Joint Forum (of Banking, Securities and Insurance Supervisors) on Financial Conglomerates

Consultation papers on capital adequacy, the mapping of conglomerates, fit and proper principles and on supervisory co-ordination were published in February on the internet (address: www.bis.org). Practical testing of the proposals on capital adequacy and co-ordination will follow soon. ■

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THE FOLLOWING TOPICS WERE COVERED:

ISSUE 1

Culture of regulation

Successful supervision depends not only on having the right rules and tools, but also on getting the culture right. The Deputy Governor of the Bank of England looks at the lessons learnt from the Bank's review of supervision.

Building society conversions

Some building societies are becoming banks. What are the motives and mechanics of changing status and what supervisory issues arise?

SIB review of the metals markets

The London Metal Exchange is the largest exchange trading metal derivative contracts. It is different in some key respects from other derivatives exchanges.

Electronic money: public policy issues

Many types of "electronic money" are under development, promising more convenient and efficient ways for consumers to pay, but also with potential risks.

Rating sovereign risk

The managing director of sovereign ratings at IBCA describes the risks in sovereign lending, and how rating agencies try to measure them.

Deposit protection and bank failures in the United Kingdom

Bank failures are usually big news. But UK banks that have gone under were mainly small, with a low payout from the Deposit Protection Fund.

International regulatory co-operation

Banks and securities firms are becoming more global, and the distinction between their business more blurred. How can regulators respond?

CREST: its recognition and approval

London's new equity settlement system was launched on 15 July 1996. As well as the work on design and implementation, CREST posed issues for regulators.

Bancassurance: European approaches to capital adequacy

Banks and insurance companies are increasingly getting involved in each other's business. What capital treatment is appropriate for the banks?

ISSUE 2

The efficiency of regulation

The chief executive of the SIB explains why the SIB and SROs will be giving efficiency of regulation a high priority this year.

Modelling and pricing credit risk

Many banks are focusing on developing credit risk models as a method of pricing loans.

Remuneration and risk

How does the structure of staff remuneration packages affect a firm's risk profile and what can firms do about it?

Operational risk management: where to start?:

There is a growing recognition of the need for financial firms to manage their operational risks. Why has operational risk become more important and what steps can firms take to control it?

Fraud: a personal view

The retiring head of the Bank's Special Investigations Unit shares his personal view on the nature of financial fraud.

UK mortgage margins

How have developments in this competitive market affected mortgage margins and do the changes represent a prudential concern?

Beyond Glass-Steagall: regulatory change in the United States

How will changes in the regulatory framework affect the US financial scene and what issues need to be addressed?

Lloyds: current developments and the challenges ahead

Few institutions have survived losses on the scale of Lloyd's of London in recent times — what challenges lie ahead for Lloyd's and its regulators?

Credit exposure in OTC derivatives: a risk management challenge

How can firms model and manage the credit exposures that arise when they trade in over-the-counter derivatives?

Regulation and market design: the Stock Exchange's order book

Forthcoming changes to the London Stock Exchange potentially herald a second "Big Bang" for the City. What issues has the SIB had to address as regulator?

ISSUE 3

Controlling securities fraud

The market may provide inadequate incentives for firms to avoid fraud.

The valuation of options

An account of the Bank of England's second survey of options.

The genesis of regulation

How has regulation developed in the UK and what are the new arrangements?

The pre-commitment approach to setting capital requirements

The pre-commitment approach has been put forward as a possible alternative to the Basle Standard and the Value at Risk methodologies.

Reflections on financial regulation

During the past 15 years, banking problems have been worse than in any period since the 1930s' depression. External supervision must be improved: internal controls reinforced.

The UK market for high-yield debt

The role that high-yield debt can play in the UK and the market's development to date.

Regulation of custody in the UK

Following a review by the Securities and Investments Board, anyone who provides custody services in the UK must be authorised under the Financial Services Act.

Market manipulation

Market manipulation must be addressed by the appropriate regulatory response.

Global institutions, national supervision and systemic risk

An industry initiative is necessary for high standards of risk management.

The UK credit card market

The development of the UK market has attracted interest recently due to strong growth and the behaviour of new entrants. Characteristics of the UK market are examined and comparisons made with the US.

Mutuality at the cross-roads

The demutualisation of UK institutions raises many issues.

