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IMPLICATIONS OF THE GROWTH OF INSTITUTIONAL INVESTORS FOR THE FINANCIAL SECTORS

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Introduction

This article assesses the broad implications of the growth of institutional investors for the financial sector. It focuses in particular on the effects of “institutionalisation” on market behaviour, the efficiency of the financial sector and financial stability. It should be borne in mind throughout that, abstracting from implications arising from the relative size of financial institutions, increased institutionalisation will have implications for the development of the financial sector if asset allocation differs from that which would occur in the case where individuals invested. This will in turn link inter alia to differences in motivation, and perceptions of risk and reward, between individuals and asset managers. The article is subdivided into implications for capital markets, for banks and for financial stability.

As an introduction it may be worthwhile to sketch in a stylised manner how financial markets develop over time, and the roles of institutional investors and banks in the process. The processes whereby an economy develops from an informal financial system through banking to securities markets can be analysed by use of the theories of corporate finance. Whereas an entrepreneur can begin a firm by relying on his own funds and retained earnings, rapid growth of his enterprise requires access to external finance. The simplest form of this is from his family, who will be able to monitor him closely and hence protect their own interests. Beyond this, banks tend to be the first to offer funds, as they have a comparative advantage in monitoring and control of entrepreneurs lacking a track record, for example in terms of access to information, ability to take security and to exert control via short maturities. Obviously, they are also able to offer benefits to depositors in terms of pooling across investments and 'liquidity insurance', that is, ability to offer access to deposited funds at any time, at a positive interest rate. This may then dominate the alternatives of extremely undiversified finance of enterprises or hoarding.

Share issuance becomes important when bank debt becomes sizeable in relation to existing own-funds, as the high resultant level of gearing gives rise to conflicts of interest between debt and equity holders, as for example owner-managers have the incentive to carry out high risk investments. Banks may also protect themselves by means of covenants or even the acceptance of equity stakes, which internalises the associated agency costs. Apart from banks, at the initial stages of development of share markets, securities are typically held by wealthy individuals as an alternative, diversifiable, liquid, higher return albeit riskier alternative to bank deposits.

Corporate bond markets are only viable when firms have a very high reputation, as this then constitutes a capital asset, that would depreciate if the firm engaged in opportunistic behaviour. High credit quality is needed because bond market investors are likely to have less influence and control over management than equity holders or banks, even if one allows for the existence of covenants. Rating agencies help to alleviate associated information problems, and may thereby open the bond market for firms with poor reputations or volatile profitability ("junk bonds").

The pattern is completed by development of institutional investors, demand for whose services links to growing wealth of the population and desire for long term saving for retirement. They will typically grow to dominate securities markets and challenge banks' roles in intermediation

Alternatively, following Rybczynski (1997), the evolution of the financial system can be divided into three phases, bank-oriented, market-oriented and the securitised phase. In respect of the "functions of the financial system", in all phases of evolution banks are largely responsible for the functions of provision of payments services and liquidity. But on the other hand, there is an adjustment in the locus of collection and allocation of saving; monitoring and disciplining users of external finance; and assumption, measurement, pricing and management of risk.

In the bank-oriented phase, the external funding of non-financial firms is obtained from banks in the form of non-tradable bank loans, with banks monitoring the performance of borrowers and disciplining them as necessary. Banks also collect the bulk of savings of the economy. Money markets are not very developed and are almost exclusively interbank. During this phase, the banks play a dominant role in the economy; most financial intermediation goes through banks and shows up in their balance sheets. They may even, if permitted, hold equity stakes in non-financial firms. This dominance of financial flows as well as of balance sheet components reinforces banks' position as they are uniquely placed to access private information about borrowers, evaluate risk of prospective borrowers and price and diversify risks.

During the so-called market-oriented phase, banks face more competition from other providers of savings media and financing products (in particular reflecting the growth of institutional investors as well as direct holdings of securities by households). But banks remain the major source of external funding to the non-financial sectors. Meanwhile the size of money markets increases, although they are still dominated by interbank activities. Capital markets start to develop, but they mainly provide bond financing to government as well as a certain number of new issues of equity. Nevertheless, this phase is characterised by a relative decline in the traditional direct role of banks, be it in terms of the importance of deposits as an asset for households, loans as a source of external finance to companies and on-balance sheet versus market financing activities. Monitoring begins to be shared with other financial institutions (via the rise of the take-over mechanism). In respect of financial innovations, other market participants may take a leading role and new products emerge, which compete with traditional banking products. In the banks' balance sheets this will lead to a decline in the share of traditional bank lending and increase in holding of tradable assets on the assets side, and a shift from retail to costlier wholesale liabilities. Consequently the income structure shifts towards a larger share of trading and underwriting income, while the impact of competition from other financial institutions means cross-subsidisation has to diminish.

In the third, securitised phase, the market provides the bulk of financing to the non-financial and also financial sector. Corporate bonds and commercial paper substitute for bank loans, while mortgages and consumer credit may be securitised. Collecting and allocating savings, monitoring and disciplining is undertaken mainly by financial markets (in the form of rating agencies, investment banks and institutional investors) rather than banks, with financial assets held increasingly on the balance sheet of institutional investors. In this context, new financial products develop, such as derivatives, which allow for pricing and trading of various risks, and new expertise and institutional players emerge in the financial markets. From banks' point of view this means that trading, underwriting, advisory and asset management activities come to centre stage while traditional banking loses importance.

Evidence from history suggests that the progress of an economy through these stages depends on a number of preconditions. Partly these relate to macroeconomic and structural factors. But they also require a satisfactory regulatory structure and a sound banking system. Without a satisfactory framework for enforcing property rights and financial contracts, as well as for providing public information, securities markets will not tend to develop; forms of relationship banking with equity stakes held mainly by banks in borrowers are likely to be the limits of financial development². Institution of limited liability for equity claims, a structure for collateralising debt, satisfactory accounting standards and appropriate protection against securities fraud (listing requirements and insider trading rules, for example) are also important for public securities markets (see Stiglitz 1990). Moreover, the development and satisfactory regulation of the banking system may be a precondition for growth of securities markets, given the role of banks in providing credit to underwriters and market makers, even when they do not take on security positions themselves.

1 Implications for capital markets

1.1 Institutional investors and the growth of capital markets

In recent years, consistent with the stylised descriptions above, securities markets have tended to grow in terms of market capitalisation quite significantly, entailing a rise in the ratio of securities to bank deposits and loans (compare Table 1), and even more in terms of turnover (Table 2). But in addition there has been a change in their nature, in the case of securities markets from purely retail markets to a form of polarisation between retail and wholesale/institutional business, while in foreign exchange markets the importance of institutions has increased. There has been a sharp increase in innovations and technological advances in trading systems.

These developments strongly reflect the growing size and activity of institutional investors. As an indicator of their increasing role in securities markets, it may be stressed that the ownership of shares

² This point raises the issue of whether financial systems are "self perpetuating" or what shocks could lead to structural change. One current issue is whether EMU will radically change EU banking sectors (Davis 1999a).

and bonds has changed sharply from being the province of individuals to holdings via institutions, with such holdings often concentrated in rather few hands (although the ongoing shift from defined benefit to defined contribution pension funds constitutes a partial return to control via individuals). Such changes may have broader implications - explored elsewhere in this article - given the importance of capital markets for the real economy and corporate finance as well as indirect effects on banks.

It is relevant first to ask how the growth of institutions relates to that of capital markets in general terms. Securities markets are conceptually means whereby claims may be subdivided to facilitate diversification and transfer between holders. Despite the general trend for size of institutions to increase, the contrasts between countries in the size of both institutional sectors and securities markets (Table 3³) raises the issue whether securities markets are a precondition for development of institutional investors or whether institutions may emerge first, and then stimulate capital market development. Note that these arguments are broadly "closed economy" based, a bias that may be justified given the tendency of institutions to invest domestically even in globalised financial markets.

In fact, there would appear to be a two way relationship. Although institutions could develop on the basis of loans or property investment, their greatest comparative advantage is in the capital market. Loans require monitoring so the customer relationship may give banks a comparative advantage there. Trading and risk pooling are more efficiently undertaken in the capital markets where transactions costs are lower. Hence capital markets facilitate growth of mutual funds, and may encourage development of funded pensions.

But institutions may also spur further growth of capital markets, as the recent example of Chile has confirmed, be it in terms of market structure, the role of fund management strategies liquidity and volatility of markets and demand for capital market instruments. Unlike pay-as-you-go social security schemes, where there can be an immediate transfer of income to those who have not contributed (who are old at the outset), in funded pension schemes, or life insurance saving the assets are built up while they are maturing, and this stimulates investment and the development of securities markets. Given the long term nature of the risks they face, institutions should be particularly beneficial to development of equity markets. Certainly there seems to be a correlation in OECD countries between equity market capitalisation and the size of institutions (the data in Table 3 imply a correlation of 0.97). Equally, institutions are ready customers for bonds and securitised debt instruments.

A further view of developments over time is shown in Table 4 for the G-7⁴ countries. The tables show data for end-1997, drawn from National Flow of Funds Balance Sheets, and comparative data for

³ The data in Table 3 should be treated as only indicative, given the many difficulties in comparing data on a cross-country basis (e.g. treatment of corporate cross holdings, market versus book valuation, cross border claims).

⁴ UK data exclude offshore bank loans and deposits (i.e. the eurocurrency market)

1980. Table 4.1 shows that the volume⁵ of financial claims relative to GDP has grown sharply in all of the G-7, albeit varying in terms of levels. This has coincided in most cases with an increase in financial intermediation - the proportion of claims held indirectly in banks or institutional investors as opposed to being held directly. In other words, the growth of financial markets has not led to a fall in intermediation, indeed quite the contrary. But the locus is changing - of the intermediated claims, a growing proportion has been in the form of institutional investment (including life insurance and mutual funds as well as pension funds). It is noteworthy that this tendency is apparent across all countries shown and not just the so-called Anglo-Saxon ones, although differences in levels are still marked. It is consistent with the stylised picture of financial market development given in the introduction.

As noted, these changes have coincided with in most cases a sharper rise in securities (i.e. bonds and equities) than in deposits and loans, implying that bank assets and liabilities have declined relative to the total (Table 1). Meanwhile, households have tended to shift the composition of their balance sheets to institutions and away from deposits as well as directly-held equities and bonds (Table 4.2), although again levels still differ. Patterns for companies are less clear, but there would appear to be a tendency for them to reduce their dependence on loans and increase their reliance on equities, as shown in Table 4.3 (it being borne in mind that the balance sheet composition reflects capital gains as well as new issuance). On the other hand, in levels terms, the table still shows the expected difference between Anglo Saxon and other countries in terms of the importance of bank loans to companies, it being below 20% in the former and above it - at times well above - in the latter. Finally, use of corporate bonds is particularly low in all the EU countries shown – including the UK.

We now go on to use the data on financial structure indicators for the G-7 countries shown in Tables 1 and 4 to investigate further the potential effects of growth in institutionalisation on capital markets. The simple estimates shown utilise the data on financial structure indicators using 5 yearly observations over the period 1970-95 as a panel (pooled cross section and time series) dataset. An additional variable was monthly equity market volatility averaged over quinquennia. There are in effect 42 observations for each series, with 6 observations each for 7 countries. We then regressed various indicators of the size of the institutional sector on the indicators of financial structure. We used both of the standard panel data estimation techniques, namely testing for random and fixed effects. The latter being considered more appropriate, we only report results of this (while noting the random effects results are very similar). The work thus differs from otherwise-comparable work such as Demirguc-Kunt and Levine (1996), which estimated correlations on purely cross sectional data. It should be emphasised that the results will not have any causality implication, but rather show what patterns or changes in financial market structure and behaviour has accompanied institutionalisation. It cannot be ruled out that other causes have affected both dependent and independent variables (such

⁵ The size indicator shows the total value of all financial assets of the conventional economic sectors in the System of National Accounts (household, corporate, banks, non-bank financial institutions, government, foreign).

as liberalisation generally and technological change). As the time series observations are not independent, "t" values will be overstated. Finally, the datasets are small so again conclusions must be drawn cautiously; outliers may have a disproportionate effect. More generally, further and more systematic investigation is needed.

With these caveats in mind the results for the G-7 (Table 5) tend to indicate the following: higher levels of institutionalisation (measured by the share of total financial assets) accompanies a larger size of the financial superstructure (total financial assets/GDP), even when national differences in levels of the latter are taken into account by the dummies. Second, higher institutionalisation accompanies a higher share of equity in total financial assets. Third, there is no significant link of the level of institutionalisation to volatility. Of course, as noted above, average volatility may still be consistent with occasional, disruptive, peaks of volatility.

Concerning household sector portfolios, the share of institutional investment in households' portfolios appears to be negatively related to the share of deposits and bonds, suggesting some substitution. Looking finally at company liabilities, the share of institutional investment in total financial assets tends to accompany higher levels of the share of equities in corporate liabilities and lower levels of loans. Concerning bonds, the coefficient is insignificant. It is notable that strong substitution is indicated for both key elements of banks' balance sheets, namely household deposits and company loans.

We split the sample between the "Anglo Saxon countries" i.e. the UK, US and Canada (with 18 observations) and "Continental Europe and Japan", i.e. Germany, France, Italy and Japan (24 observations) see Table 6. Were the results for the G-7 "driven" by only one group, bearing in mind that institutional growth has been much more marked in the Anglo Saxon countries? If so this would raise the issue of whether the results are only applicable to a certain type of financial system. In fact, there are a number of results that appear consistently for both groups examined separately. In each case, the rise of institutions in total financial assets has accompanied a larger overall financial superstructure as shown by total financial assets/GDP; the growth of institutions' share of household portfolios has accompanied a decline in deposits; and a higher level of institutional assets as a proportion of total assets has accompanied a higher level of corporate equity and a lower level of corporate loans. Interesting "idiosyncratic" results are that in the Anglo Saxon countries, a larger institutional sector is indeed associated with a lower level of capital market volatility; that there is strong substitution from equities and bonds to institutions in households' portfolios in the Anglo Saxon countries; and some evidence of higher bond shares in company liabilities in Continental Europe and Japan as institutions increase in size and importance.

1.2 Institutions and market structure

The development of institutional investors has had a pervasive effect on capital market micro structure. Their key demand is liquidity, i.e. ability to transact in large volume without moving the price against them⁶, anonymously and at low transactions costs. Liquidity may be defined in terms of four dimensions; width, which is the bid-offer spread between buying and selling prices for securities transactions; depth, the amount of securities that can be traded at given bid and offer prices; immediacy, the time needed to carry out a transaction; and resiliency, the time the market needs to return to previous prices after absorbing a large trade.

Note that besides market structure per se, liquidity may also be linked to the activities of institutions themselves, in that their own activity in arbitrage, trading and diversification helps increase liquidity further. More generally, liquidity is a form of economy of scale, as larger markets generate more trading, and hence such markets may have an advantage over small ones even with the same technology. Liquidity of wholesale capital markets may be aided by deregulation and reduction in commissions, that institutions have proven well-placed to press for. Increases in liquidity should in turn be beneficial more generally to the efficiency of capital markets, and lead to a reduction in the cost of capital.

Essential complements are advanced communication and information systems, reliable clearing and settlements systems, and efficient trading systems, all of which help to ensure that there is efficient arbitrage between securities and scope for diversification. As noted, given the role of banks in providing credit to market makers, and to underwriters, they are also essential features for sound capital markets (see Blommestein and Spencer 1996). Adequate public disclosure of information, a market-oriented accounting system and a proper legal framework for the institutional and financial sectors are also important features of markets if they are to attract institutional trading⁷.

Institutions are relatively unconcerned by the firmness of investor protection regulation, as they have sufficient countervailing power to protect their own interests against market makers and other financial institutions. But they are also extremely footloose and willing to transfer their trading to markets offering improved conditions. In effect, this feature renders the market for securities trading services "contestable", regulation permitting (i.e. any excess profitability is vulnerable to new entry).

As regards equity markets, the growth of institutions in the US and UK has led to development of an off-exchange upstairs market - a network of trading desks of large securities firms and institutional investors. These carry out "block trading" (requiring trade of a large number of a given stock) and "programme trading" (requiring execution of a trade in a large number of different stocks at or around the same time). They disintermediate the traditional specialists, who continue, however, to exist. But

⁶ Whether they also require immediacy is open to dispute (Schwarz and Steil 1996).

⁷ These features will also attract retail investors, but they may have a greater preference for trading off investor protection for some of these features.

they may also help sustain the functioning of the capital markets overall by providing liquidity so institutional trades can be executed smoothly and by arbitrage between fragmented markets.

In Europe, specialised wholesale markets which focus transactions and increase liquidity, usually centred on well-capitalised position-taking market makers ready and able to facilitate large trades, have historically tended to benefit from institutions' activity (see Benos and Crouhy 1996). They were certainly more attractive than highly regulated call-auction markets that used to exist in many European countries.

London's SEAQ International is an example of a specialised wholesale market. It was introduced following the "Big Bang" reform of 1986 which introduced dual capacity, permitted entry of banks and foreign institutions and abolished restrictions on commission charges. In the late 1980s and early 1990s it benefited relative to competitors in Continental Europe from continuous trading, capitalisation of market makers and lack of transaction taxes on non-UK stocks. Its initial success was marked; in the early 1990s it carried out 50% of French and Italian equity trading, 20% of Japanese and 30% of German, for example. SEAQ handled 64% of global cross border equity transactions, and 95% of European ones, were handled by SEAQ⁸. Its relative liquidity was reflected in transaction sizes - \$275,000 compared with \$25,000 in Paris and \$50,000 in Frankfurt.

More recently, there has been some movement to electronic order books (that can automatically execute orders entered by exchange members) for trades in the most liquid stocks. Although they provide immediacy, market maker systems were considered to be costly in terms of dealing costs to compensate market makers for putting their capital at risk (estimates suggest that the average spread⁹ in London was 0.6%¹⁰ against 0.2% in Continental Europe). Price transparency may be made deliberately imperfect in order to protect the market makers after they have accepted large institutional trades. Institutions often find immediacy less important than certainty that block trades can be settled efficiently. Also, price transparency is needed to implement indexation and other portfolio strategies.

As well as more autonomous changes such as institutional growth, the increase in privatisations and their initial public offerings, this shift was aided by the fact that SEAQ stimulated deregulation and shifts from open-outcry call-auction markets to electronic¹¹ continuous auction markets in Continental Europe. Reforms occurred in markets such as Paris, Madrid, Brussels, Frankfurt and Milan (Pagano

⁸ Howell and Cozzini (1992). Note, however, that not all the trade was diverted, some was new trade generated by the rise of international portfolio investment by US institutions.

⁹ Such estimates must be treated with caution, since they may not be good for large volumes.

¹⁰ This may not be the right measure. Since the dealer profits are low or zero, the width of the spread is compensated by inventory gains accruing to the investors (on this argument the effective spread is close to zero).

¹¹ Note that in such markets information systems, routing of orders queuing and execution systems are all automated, whereas in SEAQ only the dissemination of dealer quotes is automated; execution requires bargaining on the phone with dealers.

and Steil (1996), Benos and Crouhy (1996)). Their competitiveness in trading domestic stocks was helped by their inherent informational advantages, as well as liberalised commissions, abolition of transactions taxes¹², block trading as in the US, and dual-capacity intermediaries. These developments eroded SEAQ's comparative advantage and, combined with a lesser willingness of London market makers to commit capital to their operations following some major losses, led to a decline in liquidity. Nevertheless SEAQ remains popular for block and programme trades, and still accounts, for example, for 25% of French share trading.

London has now introduced an order book trading system (SETS), partly in response to institutions' demands, which automatically executes orders entered by or via exchange members. The evidence is that trading costs on SETS are about unchanged, except for the very largest stocks¹³. In effect, a form of convergence on a combined system of exchange trading and off-exchange block trading is discernible. (Investors want different systems for different trades in different stocks.)

A further change to market structure induced by development of institutional investors is cross-border listing of companies. Whereas this represents partly a quest for new sources of financing, notably by expanding the investor base (see Table 3) in export markets and to enhance public image, it also linked strongly to the growing international diversification of institutional investors who were eager to minimise the cost of portfolio rebalancing by trading foreign stocks on their home exchanges¹⁴.

An emerging challenge to all traditional exchanges is posed by off-market trading via proprietary trading systems (such as Instinet and Optimark in the US), which enable direct and anonymous trade to occur among institutions and broker-dealers. In principle, institutions via such systems may provide their own liquidity in periodic call markets in such systems. In practice, these systems have not yet achieved their aims - Instinet is mainly an inter-dealer system and other US systems are mainly for retail investors. Nevertheless, their development further illustrates that trading is a type of contestable activity. Profitability of market making is hence under further pressure, encouraging "proprietary trading" by investment banks as was evident in the 1998 Russia/LTCM crisis. Meanwhile, the growth of institutions may entail a tiering of markets, with order-driven and more heavily-regulated domestic markets retained for retail investors or for small company stocks.

This section focuses on equity markets, but as discussed in IMF (1994), governments have also sought to modernise the infrastructure of bond markets, driven by the need to make their debt more attractive to international institutional investors (in effect, emulating US market practices). Historically they hoped thereby to reduce costs, in the context of abolition of exchange controls, which mean domestic

¹² For example, in France the transactions tax that used to penalise execution of orders in Paris was abolished in 1993.

¹³ SETS is used more for the largest stocks. For less liquid stocks with less public information, order books can exhibit a wide spread on account of adverse selection risk.

¹⁴ Hence for example 31 French companies are listed on 17 foreign stock exchanges and 46 are regularly traded on SEAQ.

funding would only be available at damagingly high interest rates. But governments also thereby provide infrastructure which private issuers could utilise. Measures taken by OECD governments included primary dealer systems; auctions; issue calendars; vehicles for financing positions (such as repos); abolition of withholding taxes¹⁵; STRIPS; derivatives markets; tailoring of issues; benchmark issues; improvements in clearing and settlement systems; and "global bonds" (including use of international syndicates). For example, the modernisation of the French government bond market, innovations such as OATs and the futures market MATIF were motivated by the need to attract foreign institutional investors by offering them suitable, highly liquid instruments for hedging against interest rate risk and foreign exchange risk (Benos and Crouhy 1996).

The advent of the Single Currency for Europe will simulate development and integration of bond markets across the Union, which will promote also private issuance by providing benchmarks off which they can be priced (Davis 1999a). However, horizontal integration of securities settlement is needed to allow full integration of e.g. repo markets.

1.3 Institutions and financial innovation

Financial innovation has been rapid in the 1980s and 1990s. Particularly noteworthy is the growth of derivatives markets, and development of commercial paper (Table 7) but one could also instance the expansion of securitised debt, notably in the US.

As regards risk management, the focus of many analysts has been on "Recent Innovations in International Banking". BIS (1992), for example, showed how swaps, FRAs, interest rate options and short term interest rate futures have complemented and substituted for traditional international interbank deposits, in the context of volatile interest rates and asset prices. However, the process of financial innovation - the invention and marketing of new financial instruments which repackage risk or return streams - has also been closely related to the development of institutional investors. On the liabilities side of their balance sheet, institutions may provide forms of insurance to clients (life insurance, defined benefit pension funds); we do not develop this point further here (see Davis 1995a).

The general process of securitisation, which itself may be seen as a means of pricing and trading risks of the securities markets, is discussed below; first we highlight use of derivative securities and innovative investment strategies. However, a general point to note before focusing on particular issues is the effect of institutional demand on the dynamics of innovation generally. Prior to the mid 1980s, most innovation originated in the euromarkets, after that in the US domestic market. But increasingly over time, in cases where innovations proved essential to fund management, institutional investors have tended to press other markets to adopt similar innovations (equity and bond futures markets etc.).

¹⁵ When New Zealand abolished withholding taxes, the immediate fall in the bond yield was reportedly more than sufficient to cover the loss of tax revenue.

Immunitisation strategies of pension funds - themselves partly a consequence of the nature of (minimum-funding) regulation, are linked to securitisation as they ensure a demand for fixed duration securities. In the US and Canada, they also spurred development of markets for index options and futures, which in turn facilitate unbundling and reallocation of risk. For example, pension funds writing call options on equities can be seen as converting them into short-term fixed-income securities for matching purposes. Another strategy is holding assets in excess of the legal minimum in equities, as long as their proportion is reduced when the market value of pension assets falls. This strategy is known as portfolio insurance or *contingent* immunisation, and has stimulated development of index options and futures markets and of programme trading more generally. It may be noted in this context that access to liquidity through the banking system is essential to the delivery of cash associated with the execution of these techniques. This underlines the need for a sound banking system as a component of a securitised and institutionalised financial system.

The differing valuation methods of pension funds in the UK - currently based on valuation of income streams rather than market values per se - mean that these forms of operation to protect the market value of assets - are less prevalent. There, use of derivatives is more for controlling risk by increasing or reducing exposure to an asset class; and cutting costs especially in index funds, where a large change of asset allocation is anticipated. These uses are illustrated in UK institutions' use of derivatives in international investment. Whereas equity holdings are often left unhedged, bond investments are routinely hedged against currency risk. As discussed in Davis (1995a), stock index futures are seen as particularly useful in tactical asset allocation, facilitating rapid shifts between different national markets, which would later be translated into stocks. Derivatives might also be used for long term strategic movements into markets or stocks, if they enable such shifts could occur without moving the market against the fund. This will be the case if the derivatives markets are more liquid than the underlying (as, for example, in Japan, where in the 1990s, outstanding futures contracts often represented three times the daily number of shares traded on the stock market).

Also temporary adjustments in exposure could be obtained by purchase and sale of index futures without any transaction in the underlying (overlay strategies), thus avoiding disturbance of long-term portfolios, see Cheetham (1990). Such strategies facilitate 'unbundling' of fund management into currency, market and industry exposure. Finally, institutions might invest cash flow awaiting long term investment in derivatives, as it ensures the manager is always invested and will not miss an upturn. As noted, demands of these type by international investors have encouraged the development of options and futures markets to accompany domestic markets, which have themselves further encouraged international investment. The recent introduction of a minimum funding rule for UK pension funds (effective 1997) in conjunction with new accounting standards which introduce a greater element of market valuation, may increase use of derivatives for hedging against shortfall risk as outlined above.

According to a survey by Intersec, 61% of EU pension funds and insurance companies use derivatives directly or via their external fund manager, although there are sharp cross-country differences. Of those using derivatives, 75% use them for tactical asset allocation as noted above, 50% to hedge currency risk and 33% to take positions on interest rates.

An emerging development of interest in the context not only of innovation but also cross border investment and corporate finance is the creation of synthetic shares which replicate dividend and price behaviour of existing shares (but circumventing foreign ownership restrictions). These can increase liquidity for issuers without changing control structures. Other innovations enable investors to create and unwind controlling blocks of shares at low cost; this would reinforce destruction of existing control structures (Berglöf 1996).

Furthermore, one should note a new type of risk transfer technique which is arousing interest among institutions, namely credit derivatives, which enable credit risk to be transferred separately from bonds or loans and may be attractive to institutions as they are well-placed to accept credit risk at an appropriate price. Conceptually, securitisation is another form of risk transfer, but it also entails transfer of market risk.

Trading techniques such as portfolio insurance put heavy demands on liquidity in the securities and derivatives markets; such liquidity is at times vulnerable to collapse, see Section 3. As was the case for market makers, (Section 1.2), access to cash through the banking system is a vital backup for such strategies. We now turn to the effect of institutionalisation on the banking sector.

2 Implications for banks

Growth of institutions has led to increased competition for household savings and affected profitability of traditional financial instruments. These have had a marked effect on the banking sector, forcing adaptations towards e.g. investment banking and other forms of non interest income (as outlined in the paradigms in the introduction). In some cases, especially where regulation constrained banks from such adaptation as in the US, institutional competition may lead to heightened risk taking on the part of banks as they sought to maintain profitability on traditional lending business. In this section we deal successively with trends in banking, and institution-bank competition on the liabilities and the assets side.

2.1 Trends in banking

To begin with some stylised facts, data show that banks' balance sheets tended to grow rapidly in the 1980s, but levelled off in the 1990s. Interest-margins narrowed; banks' income stream has tended to shift towards fee income, while major increases in bad debts were apparent in the late 1980s and early 1990s (Table 8).

Meanwhile, as regards instruments, we saw in Table 1 that as a share of total financial claims, the volume of securities outstanding has risen, notably in terms of bonds and money market paper, while the share of deposits and loans has declined¹⁶. Reflecting the growth in the overall financial superstructure, all types of financial claim have risen relative to GDP. Such patterns are widely taken as indicators of a "decline of banking". However, the size of the balance sheet is a poor measure of the output of banks as institutions, since it excludes off-balance sheet items and fee-earning services, which also contribute to banks' functional importance to the economy.

Kaufman and Mote (1994) show that the simple addition of trust services, non bank subsidiaries and bank-operated mutual funds to balance sheets goes some way to eliminating the decline in banks' share of financial services in the United States. In addition, there are sources of bank income which are unrelated to owning or managing assets, but nonetheless often related to banks' traditional advantages in credit evaluation, such as lines of credit, letters of credit, futures, options and swaps, as well as activities based on 'unbundling' of financial assets, including origination of loans which are later securitised. The increasing importance of these is reflected in an increase in the share of bank income accounted for by non-interest income.

Boyd and Gertler (1994) sought to adjust US bank assets systematically for off-balance-sheet activities. One method is to transform those services involving credit risk - loan commitments and letters of credit - into asset equivalents using their Basle risk weights, thus giving a level of assets that would give the same risk exposure. An alternative is to assume all sources of non interest income offer the same rate of return as net interest income, and calculate implicit non interest earning assets which may be added to the balance sheet. Using these methods, virtually all the decline in bank 'assets' share in the United States disappears. Of course, to gain an accurate picture, a similar approach should be adopted for other financial institutions. Alternatively, it can be argued that stock based measures using actual or estimated balance sheets are in any case inferior to flow based ones as measures of output¹⁷. In fact, calculation of both total receipts of banks and of total receipts net of interest payments (a proxy for value added) as a share of similar measures for the financial sector give a constant share of banks in the *rising* share of value added of the financial sector in GDP.

On the basis of these measures, Kaufman and Motte (1994) conclude that there is little evidence of a decline in banking, though they acknowledge that the sector might have grown faster in the United States had it not been restricted from certain activities by regulation. So although it is clear that banks' share of traditional intermediation has declined relative to institutions, banking is shown to be in a state of evolution rather than outright decline. We now go on to probe the developments underlying this in more detail. Competitive pressure is exerted by institutions on banks both on the liabilities and on the assets side.

¹⁶ There was a similar period of disintermediation in the 1920s.

¹⁷ For a discussion of the difficulties of measuring banking output, see Colwell and Davis (1992).

2.2 Competition on the liabilities side

On the liabilities side, money market funds are diversified open-end investment companies that invest in short-maturity and highly-rated debt securities. They seek to maintain a stable asset value per share of par, which is facilitated by the type of money-market securities in which they invest. Shareholders are allowed to redeem funds by use of cheques, thus giving transactions services identical to bank accounts. Besides being a major financial innovation per se, money market funds have two important effects on financial structure, providing competition to banks and spurring the growth of money markets. Their growth has been a particular feature of countries such as the United States and France, see Table 9 (it is of interest that their development has been much less marked elsewhere, to date).

The development of money market mutual funds in the US in the 1970s, a period of high money market rates, took the form of massive disintermediation of bank deposits, whose interest rates were subject to control, unlike the return on money funds. This development led to a crisis of profitability followed by abolition of controls on rates for banks and thrifts in the early 1980s. But growth of money funds continued, since yields remained higher than banks would offer, due to the effect of reserve and capital requirements on banks' spreads. Moreover, Mack (1993) argues that even longer term mutual funds may provide effective competition for banks, given their liquidity, despite capital uncertainty. Fortune (1997) notes that cheques may be written even on equity or bond funds in the US. Similarly in France there has been a major expansion of money funds, stimulated partly by tax incentives. Competition on the liability side is an important aspect of the competition faced by banks in these countries which has led to a narrowing of profit margins, higher deposit rates and greater risk taking, see Section 2.3 below. In Japan, medium term bond funds (Chikoku) have competed with banks with their liquidity and higher yields than deposits.

Besides the direct effect on banks, one may highlight the effect on wholesale money market of these developments. These markets have been a crucible for many of the financial innovations of recent years, notably CDs, Commercial Paper (CP), deposit notes and repurchase agreements (Stigum 1990). It is notable that in the US money market mutual funds hold 34% of the CP outstanding. Meanwhile, there is a debate about possible risks of "runs" from money market funds in the event of sharp price changes and a decline in market liquidity (see section 3.6). Other institutions may prefer money markets instruments to bank deposits for the liquidity they offer.

2.3 Competition on the asset side

Disintermediation on the asset side of banks' balance sheets can be viewed in various ways. One point is that institutions have broadened the scope of borrowing options. A second is that they raised the efficiency of intermediation as loan and deposit rates became tied more closely to capital market rates. But equally, the story of securitisation and of the banking difficulties of the 1980s - and the intense

competition that still characterises banking markets - are intimately linked, and institutional investors were crucial players in the overall developments that occurred, of "competition-driven disintermediation into securitised money and capital markets" (IMF 1991).

The process of bank-institution competition on the asset side developed from the long term growth of pension funds and mutual funds. Notably, the beginning of securitisation - a process whereby credit and market risk of assets are packaged and transferred - was in 1975, when the US government sponsored the packaging of illiquid individual mortgage loans held by thrifts to sell to institutional investors. This was intended to raise the flow of funds to the housing market, but it also furthered the process of disintermediation. An explanation of balance sheet developments which led to major losses by banks in many OECD countries at the end of the 1980s and in the early 1990s must also highlight the Ldc debt crisis. This led to a reduction in banks' credit ratings, and hence increased their cost of funds, vis-à-vis their major corporate customers, as well as leading to a need for wider spreads in order to rebuild capital bases. Such pressure on spreads was aggravated by tightened regulation of capital bases - which itself promoted securitisation by putting the heaviest risk weights on bank loans, and the lowest on government bonds, as well as requiring less capital for trading than banking.

Loss of credit rating and wider spreads both reduced banks' competitiveness as suppliers of funds to highly-rated companies as compared with institutional investors operating via the securities markets. Companies accordingly switched part of their demand for funds to the money¹⁸ and bond markets. In parallel, as noted above, depositors often found their needs could be served more cheaply by use of money market instruments and money market mutual funds. Note that in the absence of institutions and securities markets, banks' customers would simply have had to pay higher spreads. This was indeed the case for small companies, for whom capital markets were not accessible, either directly or via pooled loans.

The loss of rating by banks is only half the story, however. Competitiveness of the securities markets was sharply improving, partly due to the growth in institutional investors themselves, following a shift by the household sector away from deposits (which led to a boost for money market funds on the one hand and expanded the supply of long term funds for insurance companies and pension funds on the other)¹⁹, but also due to supply side factors such as large government deficits and privatisation, improved distribution technology (e.g. for CP) and other developments partly related to institutionalisation such as improved trading technology (see Section 1.2), deregulation of domestic securities markets and growth of information services and rating agencies (which supplanted banks' role of credit assessment for many borrowers, thus reducing the value of bank relationships).

¹⁸ Note that whereas initially money market funds tended to invest heavily in bank CDs, by the 1980s and 1990s they were mainly invested in commercial paper and other short term credit instruments, disintermediating banks, see Edwards (1995), Wojnilower (1997).

¹⁹ Hargraves et al (1993) trace this pattern in the United Kingdom, United States and Japan in the 1980s.

Financial innovations to service need of institutions has played a key role in this process; with financial products in effect migrating from banks to markets once they prove sufficiently standardised and high-volume (although the higher costs of banks as outlined above also proved to be an important incentive). Such migration has been accompanied by an increasing focus on public information disclosure (Bisignano 1995). For example, low grade bond and medium term note markets have enabled a broader range of companies than before to benefit from securities market financing - and have facilitated highly-leveraged corporate restructurings. A further innovation was the expansion of packaging and securitisation of loans (from mortgages to consumer debt), which besides involving institutions as investors, led to competition for banks from investment banks for origination and servicing fees. The growth of money markets as highlighted above has in turn encouraged corporations to switch to money markets for their short term financing needs, thus disintermediating banks also on the asset side and undermining the profitability of their short term business lending. Commercial paper could be issued directly by large and creditworthy companies, while lower quality credits could borrow from finance companies, which themselves would be financed by commercial paper issue.

These developments, putting pressure on banks' profits, coincided with deregulation and technical advance which entailed increased competition by foreign banks and non-banks even in areas where securities issuance was less viable (such as for small-to-medium size business loans) and from money market funds on the retail deposit side.

Besides the general demand of institutions for securitised assets, demand for some securitised instruments which disintermediated banks is closely linked to specific regulations. For example, as noted above, minimum funding requirements for US and Canadian pension funds sharply increased demand for hedging (Bodie 1990). This stimulated the development of immunisation strategies (to match assets to liabilities) based on long-term bonds. The requirement of a fixed duration²⁰ for investment instruments in the context of such strategies in turn stimulated innovations in the US and Canada tailored to funds' needs such as zero coupon bonds²¹, STRIPS, collateralised mortgage obligations and guaranteed income contracts (GICs) offered by life insurers. This in turn spurred the overall process of securitisation; of mortgages in the case of collateralised mortgage obligations and of loans and private placements in the case of GICs.

Commercial banks' responses to these challenges, effectively increasing competition and lowering returns on traditional loans, and in the context of deregulation of their own activities and difficulty of restructuring to remove excess capacity²² were twofold.

²⁰ Bodie (1990) suggests that fixed duration securities (and associated strategies) have little role in terms of household utility maximisation, as they are unable to hedge against the inflation risk to future consumption. US (and Canadian) defined contribution funds nonetheless tend to hold significant quantities of fixed duration instruments, partly due to the risk aversion of the members.

²¹ Note that taxation was the initial stimulus for zeroes.

²² Bisignano (1995).

First, there was a much greater focus on off-balance-sheet and fee-earning activity, in order to economise on capital and share in the increase in securities market activity, taking advantage of their distribution networks and customer relationships. The activities in question included underwriting, broking, market making, insurance business, as well as institutional investment and fund management itself. Banks themselves are becoming active in terms of purchasing or launching their own insurance companies (where regulations permit²³) and selling their own mutual funds and setting up or purchasing fund managers. They also benefit from the growth of fund management in terms of custody²⁴, payment and foreign exchange services. In effect, institutionalisation gave a spur to the 'universalisation' of banking even in countries such as the UK and US where activity of banks has been traditionally restricted (Rybczinski 1995). There was also increased penetration of previously segmented lending markets, particularly where their branch networks could be used (e.g. for mortgage lending).

Second, there was increased balance sheet growth, focusing particularly on higher risk borrowers, in order to maintain profitability. These included lending to property companies, to finance leveraged take-overs and in foreign markets. Often these patterns accompanied a shift from relationship to transactions banking (in parallel to the trend towards transactions-driven securities finance). In principle, shifts to higher-risk and unfamiliar markets should have been possible without major increases in solvency risk to the banks if the associated credit risk had been priced accurately and reserves built up accordingly. The fact that major losses have been made by banks in many OECD countries suggests that risk pricing - or quantity rationing - were not accurate, although the fact that many banks lost capital and became vulnerable to shocks as a consequence of competition from institutional investors should not be disregarded.

Three main cases can be outlined as to how this could come about, namely accurate risk pricing ex-ante, but unexpected developments generating losses ex-post; deliberately inaccurate risk pricing to generate competitive advantages and thus profits in the future; and inaccurate risk pricing due to errors in credit assessment. Experience suggests the second and third played an important role (Davis 1995b); mispriced safety-net protection may have encouraged such errors, as they meant the cost of funds did not rise with risk.

The response to the losses that have been incurred in terms of further loss of competitiveness has included a wave of mergers, as excess capacity is removed (Berger et al 1995). Wojnilower (1997) argues that as well as the period immediately following the Idc debt crisis, the introduction of the Basle capital ratios gave a strong additional impetus to the process of securitisation. Given the coincident recession of 1990-1 and existing asset-quality problems, US banks in particular found it

²³ It should be emphasised that regulations limit the scope for diversification in countries such as the US. Consolidation via merger or failure is of course the alternative.

²⁴ In the US, pension funds are obliged to sub-contract custody, and in the UK the proportion is rising from 28% in 1992 to 38% in 1996 (British Invisibles 1997).

hard to raise additional capital either from the public or increased earnings. The response was to reduce risk assets, notably loans. "The sale of securitised packages of consumer and other loans, which improved capital ratios by removing these assets from balance sheet totals, accelerated greatly. Since they were trying to reduce rather than expand assets, banks also bid much less aggressively for deposits and other funds, opening the wider the door for mutual funds" (ibid., p8)

Further such waves of securitisation and institutionalisation can be envisaged, following further the lines set out above. One point to note is that now that market making itself is becoming less profitable (see Section 1), proprietary trading is becoming more important to both commercial and investment banks, which as observed in the Autumn of 1998, will increase risks.

2.4 The future of banking

The assumption of most financial market analysts has been that although there may be excess capacity in the banking sector, there will remain a role for depository institutions making non marketable loans at fixed terms. Some economists would by contrast suggest that *all of banks' functions could be taken over by institutions* such as pension funds, life insurers and mutual funds operating via securities markets (together with rating agencies and other specialised monitors). They would point to the successful securitisation of personal loans, the ability of bond and commercial paper markets to serve an expanding range of companies, the development of corporate banking and treasury operations, and the success of money-market mutual funds in countries such as the US, in providing market-based means of transactions as well as saving.

One counter argument would point to the shift of banks into fee earning business noted above. This includes not only their traditional role in the payments system, but also provision of back up lines of credit, broking and market making fees and commissions, credit assessment, underwriting, forex, advice on mergers, proprietary trading in capital markets, custody, income from origination and servicing of securitised loans, and institutional fund management itself. It was noted that derivatives markets require access to liquidity through the banking system to ensure timely delivery of cash.

Indeed, analysts such as Boyd and Gertler (1994) show that if balance sheets are adjusted to allow for some of these services, much of the decline of banks in the US disappears. A further counter argument, asserting a continued role in banks traditional business, must rely on banks' advantages in overcoming asymmetric information, such as for small firms as outlined above, that rules out securities market intermediation. Recent studies of banks' uniqueness would seem to underpin this suggestion.

Emerging direct evidence of comparative advantages of banks over other forms of finance include signalling effects of bank lending relationships on the cost of other forms of finance, as other providers of external finance appear to take existing lending relationships and the associated

agreement on the part of the firm to be monitored as a positive signal about firm quality (James and Wier (1990)). Fama (1985) and James (1987) show that borrowers and not depositors tend to bear the tax of reserve requirements. This suggests that borrowers obtain services from banks which are not obtainable elsewhere, otherwise they would shift to avoid the burden of the tax. Elliehausen and Wolken (1990) show the importance of bank lending relations to small firms and reliance of such firms on banks which are geographically close, see also Hannan (1991). This implies that imperfect substitutability is an important empirical phenomenon. Regarding the value of banking relationships, Slovin, Sushka and Polonchek (1993) found that borrowers from Continental Illinois bank, had negative excess stock returns during its crisis and positive returns during the bank's rehabilitation. The size of the excess returns varied with the importance of the relationship between the bank and the borrower. Petersen and Rajan (1994) similarly found positive effects of close and committed banking relationships on firms' value. Meanwhile, Berger and Udell (1992) show that securitisation has not changed the importance of banks as monitors of debt claims holding illiquid assets, partly because the loans which are securitised are often held by other banks rather than direct investors. These studies suggest that banks do have a clear comparative advantage over other sources of finance, for certain types of transaction.

Although focus is on commercial banks, one may add that investment banks had to adapt their business to cope with the fact that the retail investor wishing to invest directly in stocks and bonds has begun increasingly to switch to institutional investment. This reduced the profitability of specialised intermediaries in retail brokerage with large research departments, particularly once securities commissions were abolished owing to pressure from institutions (in New York in 1975 and in London in 1986). Consolidation and diversification was the consequence. The winners were the discount brokers and those seeking to specialise in wholesale business serving pension funds and mutual funds. Skills required included trading expertise, product advice and development of financial innovations and strategies to control risk for pension and mutual funds.

Life insurers, even where they were hindered from competition with pension funds and mutual funds via asset restrictions, were widely able to develop asset management for segregated pension funds. In many countries, they would set up their own mutual funds, which might be marketed separately or used as a component of life policies. Introduction of personal pensions would give a ready market for life companies. And in some countries they might purchase investment banks.

One may add that many ancillary services to the financial sector are heavily used by institutional investors, notably information providers (online services, newspapers etc.) as well as researchers, analysts, custodians, actuaries and auditors.

3 Institutionalisation and financial stability

3.1 Institutions and securities market turbulence - general considerations

The tendencies for important changes to occur in the structure of capital markets as a consequence of institutional development have implications equally for their pricing behaviour. It is often suggested that the growing dominance of financial markets by institutional investors has led to heightened volatility.

Such hypotheses must, however, be formulated with care. In normal times institutions, having good information and low transactions costs, are likely to speed the adjustment of asset prices to fundamentals; this should only entail price volatility to the extent fundamentals are themselves volatile. Moreover, the growing diversity in types and sizes of institutions, in their liabilities, incentives and consequent attitudes to risk, should be stabilising to financial markets. In the words of BIS (1998), a financial system's stability depends on "the coexistence of participants with divergent objectives and mutually complementary behaviour". Diversity should be increasing as ultimate responsibility for asset allocation is handed back to individual investors in the context of defined contribution pension funds and mutual funds.

Certainly, superior information of institutions is underpinned by studies showing that initial public offerings that are largely subscribed by institutions tend to do well, while those largely purchased by the general public tend to do badly. This suggestion is also supported by econometric analysis (Davis (1988)) of the portfolio distributions of life insurers and pension funds, which show asset holdings at a sectoral level relate strongly to relative asset returns, particularly where there are few regulations governing portfolio distributions and low transactions costs, as in the UK and the US. Adjustment to a change in such returns is generally rapid. Assuming adequate information and appropriate incentives to fund managers, this should imply an efficient allocation of funds and correct valuation of securities. In Davis' research, these results did not all hold where transactions costs are high and regulations are strict - e.g., in Germany, Japan and Canada. In these countries adjustment to a change in returns is somewhat slower²⁵. It need hardly be added that market sensitivity generates an efficient allocation of funds and also acts as a useful discipline on lax macroeconomic policies. Institutions are also to some extent attracted to more volatile securities as they are likely to offer higher returns to accompany higher risk.

The liquidity that institutional activity generates may dampen volatility, as is suggested by lower share price volatility in countries with large institutional sectors. Evidence on average month-to-month asset price fluctuations shows no tendency for such volatility to increase (Table 10). It can be argued that securitised financial systems have important stabilising features (ease of marking to market, distance from the safety net, opportunities to diversify and spread risk).

²⁵ The results also contrast with those for households and companies (Davis (1986)) where adjustment to changes in returns tends to be slow, due to higher transactions costs and poorer information.

Meanwhile, in a global context, cross-border portfolio investment should enhance the efficiency of capital markets, by equalising total *real* returns (and hence the cost of capital) between markets. Such a process occurs as investment managers shift between over- and undervalued markets. Increased efficiency enables capital to flow to its most productive use and for savers to maximise their returns²⁶. It is aided by the increase in speed of information flows and the ability of institutions to conduct cross border arbitrage using derivatives markets (stock index futures for equities, FRAs for money markets and swaps for bond markets).

We now go on to assess how the picture above, of stability as a consequence of institutional investor development, could be controverted. This could occur in particular if there is herding, where the risk and reward structures in a delegated portfolio management relationship could impair managers' ability or willingness to adopt contrarian positions.

3.2 Asset price volatility

Overall price volatility (Table 10) has not shown a marked increase in bond, equity and forex markets (there is rather a correlation with fundamentals such as industrial production). Some results of financial economics analysis nonetheless suggest that securities markets - dominated by institutional investors - show excess volatility.

For example, Shiller (1990) and Leroy and Porter (1981) show that stock prices are too volatile to be justified by the volatility of cash flows²⁷. And Roll (1984) finds that futures prices for orange juice are too volatile to be justified by the volatility of temperature - the main determinant of price - although they do predict temperature better than the US Weather Service.

Second, French et al (1987) and Haugen (1997) report that the rate of return in any market is negatively related to the unexpected change in market volatility. When volatility increases, the price falls thus increasing future returns and vice versa. Price changes thus appear to not anticipate future returns but rather react to changes in volatility.

Third, Cutler et al (1990) argue that unexpected changes in economic and financial variables only explain 18% of differences in monthly market returns, while the other 82% do not react to measurable factors. But this may neglect the possibility for risk compensation to vary over time in a predictable

²⁶ There is some evidence (Howell and Cozzini (1990)) that international investment has tended to reduce the dispersion of real returns, although a longer run of data and more disparate economic performance between countries would be needed to prove it. It is clearer that *nominal* covered returns have tended to equalise, notably as capital controls are abolished (Frankel (1992)). Indeed Bisignano (1993) argues that gross flows alone will only tend to equalise nominal returns; net flows of saving and investment are needed to equalise real returns. But net flows have been common for some time, as highlighted above in d(ii), such as the flows between Japan and the US.

²⁷ Ackert and Smith (1993) counter that if merger premia are included in cash flows, then the excessive volatility result disappears.

manner. Ferson and Harvey (1992, 1993) argue that when this is allowed for, stock returns do become predictable relative to economic variables.

Fourth, the activity of noise traders may undermine market efficiency and generate volatility. An efficient market relies on arbitrage by informed investors to return the price of securities to equilibrium levels. Transactions costs and risk aversion may limit this activity if prices may be driven far from equilibrium values by traders which are irrational and think prices should differ from equilibrium levels. Evidence is scant, although Lakonishok et al (1991) argue that the discount in closed end funds links to the demand by the market for compensation from risk generated by noise traders. Other interpretations are possible however.

Sias (1996) examines directly the relationship between the volatility of securities returns and the level of institutional ownership. He finds a positive contemporaneous relation between institutional ownership and securities market volatility after accounting for capitalisation²⁸. This is surprising given that institutions are subject to prudent man rules, and seem to avoid the more volatile smaller stocks. The relationship could be consistent either with institutions seeking high volatility stocks owing to the high return they offer (and because informed trading is easier to conceal for large stocks), or because higher volatility results directly from institutional ownership. He suggests that the latter is the case, contrary to the view that institutions play a stabilising role owing to their superior information (also because higher institutional involvement may generate more interest among analysts) and "rationality" as compared to individual investors. Possible reasons may include the larger trades of institutions, which may induce volatility, because of use of program trading, and because institutions may engage in noise trading or herding, as discussed in the next section.

3.3 Herding by institutional investors

This section seeks to highlight recent research on the implications of outstanding principal-agent problems, to which institutions are prone. In effect, this literature suggests that institutional investors may be subject to rational herding, all seeking to buy or sell assets at the same time. As discussed in the following section, although institutions are usually best seen as merely a conduit through which investors' changing moods are transmitted to financial markets, in exceptional circumstances such "herding" behaviour by asset managers may induce capital market volatility beyond that which would be generated by similar reactions in a more traditional investor base composed of individuals. In other words, the hypothesis is that institutionalisation, in the context of modern capital markets, may amplify market dynamics by virtue of institutions' size and common behaviour. Such herding may be a periodic rather than continuous phenomenon, being much more marked in periods of market stress than in the case of normal market conditions, which in turn makes it more difficult to detect using standard statistical techniques.

²⁸ The adjustment is needed since institutions focus on larger stocks; the result is that within each decile of size, the stocks most held by institutions are also the most volatile.

Fund management is a service involving management of an investment portfolio on behalf of a client. Unless the manager is perfectly monitored and/or a foolproof contract drawn up, she may act in her own interests (e.g. in generating excessive commission income) and contrary to those of the fund. Various features of fund management can be seen as ways to reduce principal-agent problems. For example, pension fund managers in countries such as the UK and US are offered short (3-year) mandates, with frequent performance evaluation;²⁹ fees related to the value of funds at year-end and/or performance related fees. At least in countries where performance figures are widely used, open-ended mutual-fund and life insurance managers will suffer loss of new business if they underperform, while closed-ended mutual funds may be taken over.

These means used to resolve principal-agent problems give rise to institutional behaviour which *could* induce capital market volatility. One is the *desire of managers to show they are of good quality*, for example in the context of short mandates. In the model of Scharfstein and Stein (1990), herding - whereby all managers move in the same direction to buy or sell assets - occurs because the market for fund management skills takes into account both the success of investment strategies and the similarity to others' choices. The first is not used exclusively, since there are systematically unpredictable components of investment, while good managers are expected to receive correlated signals (they all observe the same relevant pieces of information); hence all good managers may be equally unlucky. On the other hand, a manager who alone makes a good investment may be a lucky but poor quality manager. So mimicking others is the best way to show quality.

A related factor that could induce volatility is *regular performance checks against the market*. This may induce similar behaviour, and hence 'herding' to avoid performing significantly worse than the median fund, not least because fund managers' bonuses, like performance checks, are typically provided annually.³⁰ For mutual funds, the incentive arises from the desire of managers to be the best performer and hence attract high volumes of inflows (Brown et al 1996). The consequences for an asset managers' income - or even continued employment - of net cash outflows from the fund may be severe. Overall, the result of monitoring may be for a preference to follow the leadership of the successful managers, with the danger of a contrarian bet going wrong being much more severe than the danger of performing badly along with the rest of the market. In each case, such monitoring may, as a corollary, lead to short time horizons (Benartzi and Thaler 1995). As a consequence, institutions may, for example, adopt similar portfolio shifts even if their own information suggests a different pattern could yield better returns. This may in turn amplify shocks to prices.

²⁹ Note that performance evaluation over a short period contrasts sharply with the nature of liabilities, whose maturity may extend to 25 years or more for life insurers and pension funds.

³⁰ See Davis (1995a), who, after interviewing 12 fund managers on international investment strategies in London in 1991-93 found "Most of the managers, but particularly those who are external managers, felt some pressure not to underperform relative to their peers, for fear of losing the management contract. Managers who could afford to act more freely, perhaps because of their firm's reputation, still felt a need to know the consensus in order to act in a contrarian manner."

Short time horizons may affect *information acquisition* and hence market dynamics (Froot et al 1992). If assets were to be held forever, it would be rational to seek to gain information not held by others, but with a short time horizon - for reasons as above - it may be rational to concentrate on the same information as others, even if it is extraneous to fundamentals. This is because the larger the number of investors who study the information, the more quickly it enters the market, and the greater the benefit from early learning. Use of chartism may be a case in point.

Alternatively, mutual fund managers may *transact repeatedly* to generate commission income, thus generating market volatility³¹. Other reasons for herding by institutions could include institutions' *inferring information from each others' trades*, about which they are relatively well informed, and herding as a result (Shiller and Pound (1989)). Moreover, they may be *reacting to news*, which they all receive simultaneously, in a similar manner; such news may cause sizeable portfolio shifts in a world characterised by *uncertainty* and it causes funds to change their views about the future.

The *risk management framework* may also play a role. If defined benefit pension funds have strict minimum funding limits, they are subject to heightened shortfall risk if asset values decline (Davis (1995a)). This may encourage “herding” either via direct sales of equities for bonds or by the effects of hedging in so-called contingent immunisation or portfolio insurance strategies on market prices. More generally, as shown by Frijns et al (1995), tighter solvency requirements will shorten time horizons, with possible consequences as noted in this section. Credit quality standards, that may be imposed by regulators or by the institution itself, may limit the scope for taking contrarian positions. Hence, a downgrading of a certain borrower may lead to a liquidation of positions even if the risk of default is considered remote - and such a withdrawal may itself worsen credit quality.³²

There may be aspects of the overall behaviour of asset allocation dominated by institutional investors which, while not strictly herding, may still give rise to positive feedback mechanisms which increase market price momentum. A simpler mechanism may underlie sharp movements by open-ended mutual funds, namely simple *purchases and sales* by households, which oblige the manager to liquidate assets immediately in order to redeem the units, or in an upturn to purchase stocks. This may be a powerful mechanism if households are risk adverse and subject to major shifts in sentiment. It may be increased by the shift to defined contribution pension funds; the assets are typically held in mutual funds and their disposition is often at the discretion of the individual investor. Risk-averse investors may sell funds in response to short run moves, contrary to appropriate long-run time horizons of their (retirement) assets.

The increasingly narrow “style” distinctions being employed by mutual fund managers as a means of communicating with investors may make swings in investor sentiment lead to more leverage on

³¹ Certainly, De Bondt and Thaler (1994) observe that the turnover rate for institutional investors exceeds that of individual investors.

³² See also Schleifer and Vishny (1990).

market prices, as funds switch between such narrowly defined asset classes. The increasing focus on the "best performing fund" over a recent period, combined with managers' desire to stick to a narrowly defined style can lead to disproportionate rewards for good performance, which lead on to sharp price rises in the asset class concerned.

There may also be multiplier effects from contribution holidays for defined benefit pension funds, which are taken when investment performance is sufficiently good to avoid the necessity of further contributions. This would be the case if they lead to higher corporate earnings and thereby boost share prices.

The existence of benchmarks may also have a destabilising consequence. If asset managers are seeking to replicate the benchmark, and benchmarks are based on capitalisation weights, then there may again be self reinforcing tendencies. For example, the IFC index for Latin America and emerging Asia was 34% and 45% in January 1997, whereas in the wake of the Asian crisis they were 41% and 24%. This may explain why there were no rapid reflows back to Asian markets when prices fell.

Herding by institutions need not always be destabilising, it may speed the market to a new equilibrium price. What is needed is for institutions also to follow strategies which may be contrary to fundamentals and profit maximising - buying high and selling low - so-called *positive feedback trading*. Cutler et al (1990) suggest that institutions may *themselves* act in this manner. This may be a consequence of biases in judgement under uncertainty by fund managers, which leads to extrapolative expectations or trend-chasing rather than focus on fundamentals. Certain investment strategies may also induce such behaviour, such as stop-loss orders, purchases on margin and dynamic hedging strategies. These may be common when there are minimum funding limits. Institutions may also seek *indirectly* to provoke positive feedback trading (De Long et al (1990)), since in the presence of irrational investors such as households it is rational for institutions (such as hedge funds) to buy in the knowledge that their own trades will trigger further feedback trading by irrational investors, thus amplifying the effect.

The effects of herding are discussed below, namely heightened volatility of market prices and quantities, and/or liquidity failures at specific times. But one might add that herding may also entail a loss of diversification benefits (as markets move together) and expose institutions themselves to major losses as prices deviate from fundamentals. They also pose major problems to monetary policy makers, in that loss of liquidity caused by herding may engender systemic risks. In effect, central banks have to consider whether large shifts in securities prices are the consequence of a well-functioning market responding to a change in fundamentals, or whether they arise from liquidity problems, that could in extreme circumstances be a matter of serious policy concern.

3.4 Capital market instability

There have been periods of instability whereby relatively thin securities markets have tended to undergo crises of illiquidity while liquid markets have undergone large perceived deviations of prices from fundamentals. These both appear to be linked to occurrence of episodes of "one way selling" by institutions, which may generate securities market instability. In the context of increasingly integrated markets in which institutions are active, such volatility may readily spread between markets and cross-border. Although there have also been major banking crises, the types of crisis generated by institutions has become more common in recent years (recent episodes of instability are listed in Table 11 (see Davis 1994, 1995b, 1995c)).

BIS (1986) for example suggests the key reason for one-way selling to occur is the increasing concentration of portfolios in the hands of few institutional investors, which may react similarly and simultaneously to news, transmitted increasingly rapidly by global telecommunication links; the fiduciary role of such investors; the fact they see their holdings of money market and debt instruments as short-run, low-risk, high-liquidity assets; that they may have less detailed information than would a bank on which to base a credit decision, and less of a relationship reason (than banks) to support a particular borrower or keep a particular market functioning³³. In Section 3.3 above, we assessed various incentive-based reasons why institutions may "herd". Note that other complementary explanations - which may in effect amplify the effect of such herding - are that buying or selling pressure may overwhelm the available liquidity in the market and/or sophisticated trading and investment strategies using derivatives and leverage - which often programme in identical responses to a given price change³⁴ - may lead changes in expectations to generate large price shifts.

One consequence of such behaviour seems to be the observation of occasional sharp price shifts following medium-term deviations of asset prices from levels consistent with fundamentals, generally in highly liquid financial markets, which raise concerns for monetary and financial stability (Davis 1996). Examples are the stock market crash of 1987, the ERM crises of 1992-3, the global bond markets in 1993-4, the Mexican crisis of 1994-95 and – to a lesser extent - the East Asian crises of 1997. Common features of these events included heavy involvement of institutional investors in both buying and selling waves³⁵; bank lending being rather subordinate; cross border investment flows; signs of overreaction to the fundamentals and excessive optimism prior to the crisis (i.e. herding); at times, inappropriate monetary policies; a shock to confidence which precipitated the crisis, albeit not necessarily sufficient in itself to explain the scale of the reaction; and rapid and wholesale shifts between markets, often facilitated by derivatives. Such volatility may have important macroeconomic consequences of concern to monetary policy makers, raise borrowing costs for companies and the

³³ Because of the loss of positive externalities from liquid markets, they may be induced to display club-like supportive behaviour.

³⁴ Wojnilower (1997).

³⁵ For example, Wojnilower (1997) notes that the key propellant for the stock market crash was selling by fifteen portfolio insurers, institutional investors following a programme of selling futures automatically in response to falls in market prices.

government, increase uncertainty and thus reduce investment³⁶, generate inefficient resource allocations and lead to systemic risk via losses incurred by leveraged investors.

As an example of systemic risk, one may cite the 1987 stock market crash (Edwards 1995), when on October 20, traders of equity futures and options contracts had to meet massive margin calls. Largely because of timing problems associated with these margin flows, some large brokers experienced a liquidity squeeze, which threatened to send the clearing and settlement system into gridlock. Because it was unclear whether firms were illiquid or insolvent, banks were unwilling to extend credit. So to avoid a systemic collapse, the Fed announced its readiness to "serve as a source of liquidity to support the economic and financial system".

A second consequence of herding behaviour on the part of institutions is the tendency of financial markets which are rather thin and illiquid to face complete liquidity failure when institutions begin to sell heavily (Davis 1994). Examples are the ECU bond market crisis of 1992, the FRN market in 1987, junk bonds in 1987, Swedish commercial paper in 1990 and the Penn Central crisis in the US commercial paper market in 1970 as well as the Russia/LTCM crisis of 1998. Note, however, that the episodes mentioned above were not exempt from liquidity problems, with in particular the stock market crash leading to sharp changes in market liquidity, the ERM crisis entailing sharp falls in liquidity in certain derivatives markets and in the 1994 bond market break there were a number of financial failures owing to a panic and liquidity failure in the market for mortgage backed securities.

In general, market liquidity depends on all other holders not seeking to realise their assets at the same time, in other words there are externalities to individual behaviour. If doubt arises over the future liquidity of the securities market for *whatever* reason (it could be heightened credit risk or market risk), it is rational to sell first before the disequilibrium between buyers and sellers becomes too great, and market failure occurs (i.e. yields are driven up sharply, and selling in quantity becomes extremely difficult). The associated decline in liquidity of claims is likely to sharply increase the cost of raising primary debt in such a market (i.e. there will effectively be heightened price rationing of credit), or it may even be impossible to gain investor interest at any price (quantity rationing).

The nature of such liquidity failure may be clarified by analysis of the role of *market makers*, who buy and sell on their own account, increasing or reducing their inventories in the process³⁷, at announced bid (buy) or ask/offer (sell) prices. A market maker provides (to buyers and sellers) the services of immediacy and a degree of insurance against price fluctuations. To be able to satisfy buyers of the asset, the market maker may have an inventory of the asset in question (although the securities may be borrowed rather than purchased), together with access to finance for such inventories; the spread must obviously cover the cost of finance. There is a risk of a capital loss on the inventory through unforeseen changes in prices. Accordingly, the response of market makers to "one

³⁶ See Hu (1995).

³⁷ Unless they are able to "cross" individual buy and sell orders.

way selling" where the new equilibrium price is uncertain is often simply to refuse to quote firm prices, for fear of accumulating stocks of depreciating securities, which itself generates a collapse of liquidity. Uncertainty is crucial; if there is a clear new market-clearing price at which buyers re-emerge, the market-makers will adjust their prices accordingly, without generating liquidity collapse.

Market collapse in dealer markets, even in the absence of generalised uncertainty, may also result from perceptions of asymmetric information (Glosten and Milgrom (1985)). Market makers face a mix of investors who are more (insiders) or less (liquidity traders) than they are. A relative increase in "insiders" leads market makers to widen spreads to avoid losses. This discourages "liquidity" traders, who withdraw, increasing adverse selection. Some dealers may cease to operate. Once the insiders are too numerous and if their information is too good, bid and ask prices may be too far apart to allow any trade. Since a wide spread in turn prevents the insider from revealing his information by trading, shutting down the market will worsen subsequent adverse selection (i.e. the proportion of insiders relative to liquidity traders) and widen the spread further

Bingham (1992) argues that such liquidity collapses are particularly likely when returns to market making are low, and hence investment banks are unwilling to devote large amounts of capital to it. In such cases, the secondary market, in effect, ceases to function. These patterns pose major risks to securitised financial systems given the central importance of liquidity to financial institutions (such as banks' funding via CDs, companies via CP, dealers/brokers via repos, money market funds on the asset side, etc.)

One reason which securities market liquidity is of greater concern than in the past is that banks are more actively engaged in securities business, including not only issuance but also trading, underwriting and providing backup facilities. Hence a securities market collapse could lead to a liquidity crisis for a bank, either directly (if it relies on the relevant market for funding, or is unable to meet commitments to provide backup facilities due to "contagious" illiquidity in its own wholesale markets) but also indirectly (if suspected losses from underwriting or market making, as clearly occurred for the FRN crisis and the ECU market collapse, lead to doubts on the part of depositors regarding its solvency). Bank failure may in turn lead to contagious runs and a systemic crisis.

Equally, failure of a major securities house could occur during a market liquidity crisis. There could be withdrawal of bank credit lines as a consequence of perceptions of exposure to the market concerned, loss of confidence in the wholesale money markets where such firms obtain much of their funding, collapse of liquidity in those markets or demands by banks for greater collateral at a time when its asset value is falling sharply. As noted by OECD (1991), investment banks may be particularly vulnerable because of their heavy and ever-changing demand for credit, sole reliance on wholesale sources, lack of access to a lender of last resort, and multiple credit and counterparty exposures, such that solvency may be difficult to judge. Sale of assets to cover funding needs may itself depress the value of other holdings, or be impossible due to the market liquidity crisis. Note

also that net liquidity requirements imposed on such institutions by regulators to ensure investment banks survive such crises assume a reasonable amount of market liquidity is maintained (capital requirements are of course an additional line of defence). The collapse of Drexel in 1989 is a classic example of the way an investment bank may collapse. Failure could in turn lead to further defaults, given the varied and sizeable exposures of firms to each other in several markets. Such failures may extend not only to other investment banks but also to banks and the payments system. This was the fear that led the Fed to offer liquidity to the markets - in effect, to support the investment banks - in the wake of the 1987 stock market crash (Davis (1995a)).

A second reason for concern is that securities markets are increasingly relied on as repositories for liquidity, with liquid securities acting as a substitute for lower-yielding cash or demand deposits and a complement to matching of liabilities by assets over the longer term. Such liquidity may be sold to provide funding, or instead used as collateral for loans. Sharp declines in liquidity may lead to cash-flow difficulties due to inability to sell, or increased difficulties obtaining credit due to the lower value of collateral. Bankruptcies and defaults may ensue.

Third, the process of securitisation has entailed a much greater reliance on securities markets by a range of institutions. Banks may rely on ability to securitise assets in order to realise liquidity as well as holding larger securities portfolios themselves. Money-market mutual funds find liquidity of money markets essential in order to maintain ability to offer fixed-price liabilities - as tends to be the case. The fear is that a departure from fixed prices would lead to an immediate "run" on the fund which would itself aggravate a market liquidity crisis by forcing the fund to seek to sell its assets. There are a wide range of non-bank financial institutions such as finance houses, whose funding (as in Sweden) relies mainly on securities markets, and whose default following securities market collapse may lead to wider difficulties in the financial sector. And, there is the increasing reliance on securities markets by non-financial companies, which may have reduced the scope of their links with banks and hence find it difficult to obtain alternative forms of credit (the fear of the Fed at the time of Penn Central), as well as being a threat in 1998 after Russia/LTCM.

Fourth, liquidity difficulties may arise just as readily in derivatives markets as in underlying securities markets. Such markets have grown rapidly in recent years, generating concerns, for example, over the lack of experience of the behaviour of such markets under stress, the complexity of the instruments and hence difficulty in understanding the risks, as well as the lack of transparency regarding exposures and the possible links between firms that derivatives transactions may generate. Trading has tended to concentrate in a few institutions, heightening the risk to market liquidity from problems at one of them. Meanwhile, as noted by IMF (1993), of credit, market and liquidity risk in derivatives markets "the most difficult to counter is liquidity risk". They note that demands made on derivatives for hedging can easily make liquidity disappear. For example, market makers for OTC derivatives -

who tend to be banks³⁸ - seeking to cover open positions find it difficult to do so in their own markets, because such tailor-made instruments lack liquidity almost by definition. On the one hand, they may try to take an opposite position in organised derivatives markets - which assumes that liquidity is there. Alternatively, they may synthesise an opposite position in cash and underlying securities by using dynamic hedging techniques. But these techniques may generate liquidity problems in the exchange or the often-thin market for the underlying securities, as they mandate sales when prices fall and vice versa, leading to risk of a collapse of the price or a breakdown of trading. Second, banks are tending to use markets in derivative products, notably forward rate agreements and swaps, to manage their own interest rate risk, instead of the traditional interbank markets. Besides exposing banks to interest rate risk, the collapse of liquidity in derivatives markets may entail heightened uncertainty over banks' exposures (given that derivative exposures are in any case off-balance sheet) and thus heighten the potential for runs. Finally, to the extent derivatives have tended to benefit the price of the underlying instrument, given heightened confidence that exposures may be hedged, a collapse in derivatives market liquidity would be likely to have deleterious consequences for the market for that instrument.

There appears to be a case for arguing that the financial market turnaround seen in 1998 in OECD countries, which led to both types of difficulty outlined above, namely sharp price falls and declines in liquidity, was heavily influenced by institutional investor behaviour. Over the period of upturn in the bull market there appeared to be an increase in risk tolerance, manifested in a willingness to hold equities on much lower required returns than had hitherto been the case as well as a narrowing of credit-quality spreads on bonds. Certainly, share prices rose at rates far in excess of the traditional indicators of valuation, namely projected corporate earnings growth. This may have been influenced by over-optimism on the part of asset managers (belief in a new era of growth) albeit possibly to a greater extent by retail investors in mutual funds.

More generally, the decline in supply of both bonds and equities in the mid-1990s owing to fiscal retrenchment and share buybacks at the same time as institutional portfolios were growing rapidly may also have played a role in boosting prices. These may have led to an increase in demand for riskier and less liquid assets independently of risk tolerance per se. Surveys show that leveraged buyout funds, international private equity and venture capital rose considerably in importance in pension funds portfolios, with assets in the US and Canada being over \$70 billion in 1998. Hedge funds, often speculating on a leveraged manner on "renormalisation" of spreads, were very active market participants. Corporate bonds and emerging markets also increased in attraction.

Be these factors as they may, it is clear that the severe financial market turbulence which shook the OECD financial markets in late 1998 in the wake of the Russian default was linked to a reversal from

³⁸ Banks are reportedly attracted to dealing not just by the direct returns to such activity but also by the ability it gives to increase the menu of interest- rate and currency risk management instruments that they can offer to their clients.

risk tolerance to extreme risk aversion, with severe falls in share prices and corporate bond prices, further turbulence in emerging markets and a contraction of liquidity. Systemic risks were linked to the failure of the leveraged hedge fund LTCM.

We do not cover the crisis in detail here, (see IMF 1998, Davis 1999b), but one area worthy of note is that whereas institutional investors (other than hedge funds) were rather inactive in the crisis, their role as stock lenders was important to the crisis. They create a pool of lendable securities, which through custodian banks usually, provide liquidity to leveraged players (broker dealers, and via main dealers, hedge funds) that take short positions. These positions may be outright bear strategies or relative value/arbitrage strategies. So institutions may facilitate such leveraged position taking by providing liquidity to securities markets in this manner. Markets as a consequence become more efficient, and perhaps more volatile. Certainly, IMF (1998) highlighted the fact that it was simultaneous sales by leveraged players that helped to precipitate such large and wide ranging price and liquidity changes in the wake of shocks such as the Russian default.

3.5 Institutional behaviour and emerging markets

There was a large overall increase in capital flows to emerging markets in the 1990s, driven by mutual funds and other institutional investors. Such investment was expected to bring increased liquidity and reduce price volatility, but instead the result appears to have been heightened volatility, with speculative-bubble like behaviour or booms and crashes. This was particularly apparent in the wake of the Mexican crisis, when a number of other emerging markets whose fundamentals had not apparently changed also experienced sharp price falls. Similar patterns were observable in the Asian crisis of 1997, although in this case the role of institutional investors appeared to be less central.

Consistent with this, Aitken (1996) found that the degree of autocorrelation of total returns in the overall emerging market index (the IFC index for all emerging markets, for Latin America and for Asia), as indicated by the variance ratio³⁹ increased sharply in the period of increased capital inflows (1992-5) compared with the previous period (1989-91). This is contrary to the movement that would be expected if inflows had led to greater liquidity, longer investment horizons and market efficiency. Moreover, the composite indices showed larger increases in variance ratios than the individual national markets, suggesting that such indices have a separate importance from their components. The estimate of the variance ratio of the composite index was 3.7 over 1992-5, where any ratio above 2 shows that excess rates of return increase or decrease in an accelerating manner.

³⁹ In an efficient market where asset prices reflect all available information about fundamentals, prices will tend to follow a random walk, with the current price being the best forecast of the future price. A random walk generates actual future prices which are within a range that widens linearly over time. The variance of the rate of return increases proportionally with the time assets are held. The variance ratio tests whether this is the case. A positive variance ratio shows positive autocorrelation and a negative variance ratio a negative one. Positive autocorrelation indicates that conditions for bubble-like behaviour are present, that is, whether price increases or declines would signal further increases or declines in the future.

On balance, the underlying factor is that institutional investors treat emerging markets as a separate asset class. This is indicated by research by Buckberg (1996), who, assessing emerging markets stock returns data over 1989-95, shows that a standard one factor model of asset returns (where returns on the asset relative to the global portfolio is the only relevant factor) is dominated by a two factor model including also the return on emerging market stocks. The implication is that investors indeed follow a two step portfolio allocation process, they first determine the share to allocate to emerging markets as a whole, then allocate it to individual markets within that group.

Portfolio managers who are uninformed about individual countries may allocate funds evenly across emerging markets to ensure diversification. Inflows thus tend to lead to increases in stock prices across all emerging markets regardless of the variation in underlying macroeconomic performance. Judgements seem to have been made on the basis of historical evidence of correlations and returns, without reference to the effects of recent inflows on such patterns. As inflows themselves generate price rises, the process may become self generating, destabilising the market. The corollary is that when there is a crisis in one emerging market such as Mexico in 1994, a "reassessment" occurs and the allocation across the asset class as a whole is reduced. Given the size of institutional investors relative to the emerging markets, this generates volatility across the sector as a whole. Such behaviour is contrary to the efficient markets hypothesis, with allocation not following fundamentals of an individual asset but rather investor sentiment about the class of assets as a whole. Indeed, such behaviour is likely to drive prices away from fundamentals in many markets.

There is an important asymmetry between the size and location of institutional investors - very large in cash terms and mainly in OECD countries - and the emerging markets and their relatively small size (BIS 1998). In the context of the cyclical nature of investment in emerging markets, a marginal portfolio adjustment in the institutions can thus be a first order event for the emerging market. According to 1995 data, a 1% shift in equity holdings by institutions in the G-7 countries away from domestic equities represents slightly over 1% of global stock market capitalisation, but would be equivalent to 27% of market capitalisation of the emerging Asian economies and 66% of Latin American ones.

It is interesting to note that similar behaviour did not obtain in the 1997 crisis in the Far East; rather a degree of "learning" has taken place. The institutional investors appear to have read the signs aright well ahead of the banking sector and had already reduced their exposure when the crisis began in Thailand in July 1997. As noted by BIS (1998), portfolio allocation data for the Netherlands, the US and UK showed that pension fund managers from these countries had embarked on a reduction of their Asian exposures as early as the last quarter of 1996. Meanwhile, banks continued to invest heavily in the sector until the second quarter of 1997. Some commentators have pointed to the fact that institutional investors are typically not covered by any form of safety net⁴⁰ and hence were not

⁴⁰ Banks may have anticipated safety net assistance by local governments on behalf of the banks in the Far East they lent to, or the willingness of the international community to bail out the countries concerned.

subject to moral hazard in the way that banks were, although desire on the part of banks not to disrupt customer relations may also have played a role. Meanwhile there was little evidence that hedge funds as a group were heavily involved in triggering or intensifying the series of Asian currency depreciations. According to BIS (1998), although there was considerable exposure of hedge funds in early 1997, long positions were substantially reduced in the months preceding the crisis. On the other hand, exposures to Latin America were built up. Nevertheless, there is certainly evidence that South East Asia underwent a generalised withdrawal of funds by both banks and non-banks in the second half of 1997. The severe consequences for financial stability in the region showed again how given the size of institutional portfolios, combined one-way shifts of this nature could lead to sharp adjustments or even dysfunction of the market price mechanism in financial asset markets. Equally, it was seen that in late 1997 mutual fund investors also began to sell Latin American funds, thus generating contagion across emerging markets in a way that was not present in 1994

Meanwhile, the use of managers with “general” expertise in emerging markets rather than “specialists” in individual countries is reportedly partly⁴¹ driven by the difficulty of comparing the performance of such narrowly-defined specialists. In contrast, general or "balanced" expertise in emerging markets may be readily compared. But the latter may generate herd behaviour as managers seek not to diverge from mainstream asset allocation for fear of performing below the median. The behaviour thus stems directly from the fundamental need for monitoring in the portfolio management process. It may be added that such "bloc" behaviour is not limited to emerging markets, with interviews that the author conducted with portfolio managers in 1991-5 (Davis 1995a) showing that Europe, for example, is also commonly treated as a "bloc". Equally, as noted by Wojnilower (1997), selling of government bonds in the 1994 market break led to distress selling worldwide with little respect for the fundamentals underlying each market.

3.6 US mutual funds and financial stability

So far this section has focused mainly on fund managers' behaviour and its potential for triggering asset price volatility. But households, the ultimate owners of institutional assets, may also by their behaviour induce financial instability. A current concern in the US is whether the boom in mutual fund ownership is leading to overshooting of equilibrium levels of share prices. Such a situation could, it is argued, culminate in a market collapse that could be damaging to the real economy. Note that although asset manager behaviour may have an impact, the mutual funds are largely a transmission mechanism for the increased enthusiasm among the public for the seeming high returns and low risk that equities have offered in recent years⁴². In particular, Fortune (1997) shows that the

⁴¹ Other reasons may include restrictions on asset allocations to emerging markets and strong risk aversion which leads investors to avoid high-risk assets.

⁴² The mutual fund boom is certainly not the only reason for the bull market of the mid-1990s. Until Autumn 1998, the configuration of world interest rates with low Japanese rates led hedge funds and other institutions to borrow heavily in yen and invest globally, unleashing funds which helped to boost asset prices worldwide.

rise in equity holdings by mutual funds results from a portfolio shift by investors into mutual funds rather than increased saving or a shift into equities by mutual funds independently.

The gap between the redemption of units and receipts from sales of securities, could pose stability problems for mutual funds. Default of a large number of mutual funds on their implicit obligation to repay in cash could clearly lead to a financial panic. Fortune (1997) points out that there are three ways of bridging the gap, namely holding of cash-equivalent assets like short term bonds for sale or repurchase; credit lines with banks (either committed, where the bank is obliged to make a loan in certain circumstances, or standby lines, where there is a willingness but not an obligation to lend); and credit from within a family of funds (where for example if individuals are switching from the equity to the money market fund some temporary recycling may be appropriate to cover the payments gap). Last, funds have the possibility to redeem in shares rather than cash.

In each case, there are limits to the availability of the facility; the scope of liquidity depends on prior portfolio decisions; and in a highly-competitive environment there is an incentive to reduce such holdings to a minimum, lest performance decline (although there is a limit on explicitly illiquid assets, which cannot be sold at net asset value in seven days, to 15% of the portfolio). Another factor may be greater size of mutual funds, which enables economies of scale in cash balances (a tendency that may be partly justified given the "law of large numbers". And indeed, Fortune (1997) shows that whereas US equity mutual funds held 10% of their portfolios in liquid form in the early 1990s, this fell sharply to reach 5.5% at the end of 1996 (although this was partly justified by a reduction of settlement periods from 5 days to 3 days). Bank credit lines will depend on the health of the lending institution, and as noted are only wholly reliable in the case of committed lines. Inter fund-family lending is severely restricted in the US, owing to the risk of inappropriate loans with insufficient collateral and return. The option of in-kind redemption is felt dangerous for a firm's future reputation and future business; many funds have committed themselves (under a 1971 rule of the SEC) to redeem in cash⁴³ and hence do not have this route available.

Certainly, one protection against massive redemptions that could threaten the financial stability of mutual funds is that investors are in most countries rather financially sophisticated, with sizeable incomes and assets. Assets in mutual funds are transparent, unlike those of banks, which reduces the overall risk of "runs". Investors also are subject to inertia, and seek to avoid selling units till prices have recovered. Third, the increased use of mutual funds for retirement saving (36% of the US total in 1995) is considered to make a large proportion of mutual fund assets unlikely to move out of the sector as a whole in response to short term market movements. On the other hand, the ease of switching within families of funds, e.g. from the equity to the money market fund, may attenuate this third effect.

⁴³ Redemption in kind remains possible for individuals wishing to redeem over 1% of net assets or whose redemptions over 90 days exceed \$250,000.

One can envisage a scenario where heavy redemptions may exhaust liquidity, leading to securities sales, even ahead of redemptions to rebuild liquidity. Drawing on credit lines, mutual funds could become highly leveraged, and hence net asset values become more sensitive to securities market fluctuations. In a sharp decline in securities prices, with heavy redemptions, there may be a higher proportion of failed or misrecorded trades, for which mutual funds themselves might ultimately have to accept responsibility.

Experience of the 1987 crash (Fortune 1997) was favourable, in that there were no major problems of financial difficulty among funds, although some did adopt delays in repayment. Sales of equity mutual funds accounted for only 3.2% of equity transactions on 19th October, and only 2% of equity mutual funds were redeemed (most of which were exchanges into other funds)⁴⁴. On the other hand, there is an apparent tendency for US mutual fund investors to invest in a "positive feedback" manner (a correlation of new money flows to capital value as high as 0.5 for equity funds) which if amplified in a crash could be highly-destabilising. Moreover, as noted by Wojnilower (1997), Japanese mutual funds were decimated in the 1990s bear market in that country.

A second possible reason for concern is that losses on money market mutual funds could lead to a run by money fund shareholders. As noted by Edwards (1995), money funds in the US are highly exposed to the commercial paper (CP) market, which accounted for 38% of their assets in 1995. Defaults in CP, particularly if they lead some funds to "break par" and redeem shares for less than a dollar, could lead to investors redeeming their shares. This would force money funds to liquidate their assets, including CP, entailing a drying-up of liquidity in the CP market, more "breaking of par" and further redemptions. Commercial paper issuers would find it hard to rollover their paper, leading potentially to more defaults. The cycle would also lead to price falls in CP, leading to more losses for money fund shareholders.

Edwards (1995) points to the fact that whereas there were rather few CP defaults from the time of the Penn Central crisis of 1970⁴⁵ to 1989, since then there have been a significant number. In 1989-92, 26 issuers defaulted on \$2.4 bn. in CP in the US and Europe, and 9 in the US alone, accounting for \$1.0 bn. Following CP defaults, losses were recorded by two money funds in 1990 (Value Line Cash and Liquid Green Trust), but neither broke par, as the advisors injected funds by buying the defaulted paper at par value rather than market value. Similar bailouts occurred for derivative based losses by other funds. Moreover, Gorton and Pennacchi (1990) found no evidence that money fund shareholders responded to defaults in CP by selling their money fund shares. The US regulator the SEC responded to defaults by tightening portfolio regulation of money funds, so that a single issuer may not account for more than 5% of assets, nor may paper of below the highest rating be over 5%, or a single issuer of this type over 1%. The weighted average maturity of fund assets may not exceed 90 days. The CP

⁴⁴ Edwards (1995) notes similar patterns of low redemptions for the 1994 bond-price collapse and the Mexican crisis of 1994.

⁴⁵ See Davis (1994)

market is characterised by backup lines of credit, meaning that rollover difficulties are unlikely to entail failure.

Edwards contends that despite these changes the stability of money funds "remains an issue". Nevertheless, he concludes that proposals to extend bank-like regulation to money funds (D'Arista and Schlesinger 1993) are misconceived. As noted, the history of money funds suggests a marked degree of stability. Also the transparency of money funds makes bank runs based on uncertainty about solvency unlikely. Third, money funds are not vulnerable to the moral hazard that the so-called safety net has created for banks.

Conclusions

In this article, it has been shown that institutional development may have a major impact on capital market size, micro structure and innovation. Institutionalisation may by this route make a contribution to the broader efficiency of the economy, by ensuring that the functions of the financial system are carried out in an effective manner.

However, there may be an effect not just on capital market structure per se but also on the banking sector and on the dynamics of capital markets. We have examined in particular the hypothesis that the banking sector has been weakened by the development of institutional investors, and found that heightened competition on both the asset and liability side has intensified. We note, however, that heightened risk taking is not the only feasible response, and many banks have taken the route of offering profitable services to institutions themselves.

Concerning capital market volatility, while an increase in average volatility is not detectable with institutionalisation, some features of capital market performance may be linked to institutions, such as a rise in volatility for stocks held by institutions. Moreover, one-way selling by institutions appears to occur quite commonly. In liquid markets this may lead to sharp price fluctuations, while in less liquid markets illiquidity may be the consequence. Such patterns may be linked in turn to herding behaviour by institutions, induced by the types of incentives that portfolio managers face. Some special issues are raised by the development of mutual funds in the United States and by the effects of institutional investment on the emerging markets.

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Table 1: Volume of financial instruments outstanding (% of GDP)

		1970	1975	1980	1985	1990	1995	1996	1997	Change 1970-97
UK	Deposits	0.87	0.72	0.64	1.20	1.50	1.36	1.49	1.58	0.71
	Equities	0.83	0.51	0.43	0.84	1.14	1.82	1.90	2.29	1.46
	Bonds	0.37	0.26	0.30	0.50	0.32	0.49	0.49	0.51	0.14
	Loans	0.66	0.43	0.44	0.71	1.16	0.94	0.96	1.05	0.39
US	Deposits	0.65	0.71	0.67	0.71	0.64	0.55	0.55	0.55	-0.10
	Equities	0.85	0.54	0.58	0.64	0.63	1.15	1.32	1.60	0.75
	Bonds	0.68	0.69	0.69	0.93	1.19	1.39	1.41	1.41	0.73
	Loans	0.80	0.86	1.00	1.09	1.17	1.11	1.14	1.15	0.35
Germany	Deposits	0.89	1.01	1.08	1.16	1.21	1.25	1.32	1.40	0.51
	Equities	0.28	0.27	0.23	0.41	0.47	0.49	0.56	0.72	0.44
	Bonds	0.23	0.29	0.35	0.57	0.62	0.93	1.00	1.06	0.83
	Loans	0.97	1.11	1.27	1.43	1.44	1.54	1.63	1.71	0.74
Japan	Deposits	0.97	1.17	1.44	1.72	2.12	2.12	2.03	2.09	1.12
	Equities	0.27	0.40	0.40	0.44	0.75	0.71	0.75	0.59	0.32
	Bonds	0.26	0.40	0.64	0.88	0.77	1.05	1.03	1.04	0.78
	Loans	1.13	1.36	1.54	1.87	2.23	2.19	2.04	2.03	0.90
Canada	Deposits	0.74	0.80	0.99	0.90	0.92	0.95	0.97	0.98	0.25
	Equities	0.94	0.71	0.82	0.90	1.07	1.60	1.70	1.80	0.86
	Bonds	0.77	0.65	0.70	0.82	0.79	1.12	1.14	1.15	0.38
	Loans	0.79	0.90	1.04	0.94	1.04	1.10	1.10	1.11	0.33
France	Deposits	1.05	1.37	1.62	1.69	1.77	1.73	1.72	1.83	0.78
	Equities	0.92	0.63	0.69	1.09	1.77	2.36	2.89	3.58	2.66
	Bonds	0.15	0.19	0.23	0.42	0.51	0.75	0.81	0.83	0.68
	Loans	2.10	1.94	1.94	1.95	2.05	2.21	2.24	2.30	0.20
Italy	Deposits	0.95	1.21	1.17	0.97	1.08	1.05	1.05	1.01	0.05
	Equities	0.37	0.27	0.61	0.92	0.81	0.85	0.87	1.09	0.72
	Bonds	0.45	0.53	0.41	0.58	0.71	1.06	1.13	1.24	0.79
	Loans	1.19	1.36	1.16	1.10	1.05	1.20	1.18	1.22	0.03
G7	Deposits	0.9	1.0	1.1	1.2	1.3	1.3	1.3	1.3	0.47
	Bonds	0.6	0.5	0.5	0.7	1.0	1.3	1.4	1.7	1.03
	Equities	0.4	0.4	0.5	0.7	0.7	1.0	1.0	1.0	0.62
	Instits	1.1	1.1	1.2	1.3	1.4	1.5	1.5	1.5	0.42
Anglo	Deposits	0.8	0.7	0.8	0.9	1.0	1.0	1.0	1.0	0.29
Saxon	Bonds	0.9	0.6	0.6	0.8	0.9	1.5	1.6	1.9	1.02
	Equities	0.6	0.5	0.6	0.8	0.8	1.0	1.0	1.0	0.42
	Instits	0.7	0.7	0.8	0.9	1.1	1.0	1.1	1.1	0.35
CEJ	Deposits	1.0	1.2	1.3	1.4	1.5	1.5	1.5	1.6	0.61
	Bonds	0.5	0.4	0.5	0.7	1.0	1.1	1.3	1.5	1.03
	Equities	0.3	0.4	0.4	0.6	0.7	0.9	1.0	1.0	0.77
	Instits	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.8	0.47

Source: National balance-sheet data

Table 2: Capital Market Turnover

(percent of GDP)

	1977	1980	1985	1990	1993
UK	70	50	70	160	220
US	110	130	420	430	620
Germany	10	10	30	70	110
Japan	20	50	320	320	220
France	10	10	20	60	120
Italy	10	10	20	50	290+
Euromarkets*	10	10	30	40	130

Estimates of the annual value of secondary market transactions in equities and bonds, including OTC transactions. A purchase and corresponding sale count as a single transaction.

* Total transactions settled through Euroclear and Cedel as a percentage of total GNP of G-10 countries in US dollars

+ 1992 Source: BIS

Table 3: European Union and G-7, financial structure indicators end-1996, \$ billions/% of GDP

	Equities	% GDP	Govt bonds	% GDP	Private bonds	% GDP	Bank assets	% GDP	Total	% GDP	Institutional assets (1995)	% GDP	Listed domestic companies	Listed foreign companies
EU-15	4518	55	4617	56	2945	36	18066	207	30146	345	6214	74	3997	2972
EU-11	2447	35	3818	55	2391	34	14321	206	22976	331	4041	59	2769	2115
Belgium	120	48	282	113	133	54	846	326	1381	532	156	58	146	145
Denmark	71	42	118	69	175	103	196	109	560	313	116	67	237	12
Germany	667	29	857	39	1034	46	4556	200	7113	312	1113	46	681	1290
Greece	24	22	99	90	1	0	103	85	227	188	na	na	217	0
Spain	244	37	286	43	45	7	962	172	1537	274	215	38	357	4
France	591	37	708	45	573	36	3471	205	5343	315	1159	75	686	187
Ireland	35	54	28	43	1	3	166	229	230	318	na	na	61	10
Italy	259	24	1277	119	401	37	2065	169	4002	327	223	20	244	4
Lux	33	181	1	6	11	61	602	3625	647	3897	369	1942	54	224
Neth	378	103	205	56	66	18	775	204	1426	376	626	158	217	216
Austria	33	15	75	35	71	33	516	233	695	314	82	35	94	35
Portugal	25	28	45	51	18	20	227	212	315	293	35	34	158	0
Finland	61	53	54	46	38	32	135	110	288	233	63	50	71	0
Sweden	243	97	150	60	163	65	259	105	815	332	267	116	217	12
UK	1733	146	434	36	216	18	3187	253	5569	442	1790	162	557	833
Canada	366	65	581	103	93	16	516	91	1556	275	493	87	na	na
US	8458	117	6965	96	4327	60	5580	73	25330	331	10501	145	7755	708
Japan	3003	71	3409	81	1453	34	160	62	8026	311	3035	59	1766	67

Source: Dermine (1998); OECD (1998); BIS (1998)

Table 4.1 Aspects of financial structure 1997 (1980)

	Size indicator (total financial assets/GDP)	Financial intermediation ratio	Of which: Bank intermediation	Of which: Institutional intermediation
Germany	6.1 (3.6)	47 (45)	75 (86)	22 (12)
France	10.0 (4.8)	35 (62)	73 (68)	27 (4)
Italy	5.3 (3.9)	32 (32)	91 (98)	9 (5)
United Kingdom	11.4 (4.2)	42 (34)	42 (64)	38 (26)
Canada	7.1 (5.1)	41 (34)	46 (55)	33 (19)
Japan	8.5 (5.1)	45 (42)	34 (36)	19 (10)
United States	7.7 (4.1)	38 (37)	26 (58)	52 (31)

Source: National balance-sheet data

Table 4.2: Household sector assets 1997 (1980)

	Equities	Bonds	Deposits	Institutional investment
Germany	8 (4)	14 (12)	40 (59)	30 (17)
France	32 (12)	3 (9)	31 (59)	29 (9)
Italy	25 (10)	22 (8)	23 (58)	10 (6)
United Kingdom	20 (12)	1 (7)	21 (43)	53 (30)
Canada	28 (24)	5 (8)	30 (38)	32 (21)
Japan	5 (7)	3 (9)	62 (69)	31 (13)
United States	24 (21)	7 (10)	14 (33)	47 (28)

Source: National balance-sheet data

Table 4.3: Corporate sector liabilities, 1997 (1980)

	Equities	Bonds	Loans
Germany	32 (20)	2 (2)	46 (52)
France	72 (34)	4 (4)	23 (60)
Italy	53 (52)	1 (4)	38 (43)
United Kingdom	69 (37)	1 (2)	11 (22)
Canada	37 (41)	17 (8)	17 (22)
Japan	20 (22)	7 (3)	45 (45)
United States	58 (49)	13 (17)	12 (13)

Source: National balance-sheet data

Table 5: Results of correlation analysis for the G-7
(fixed effects regressions; variables significant at 95% level)

Dependent variable	Independent variable(1)	Co-efficient (t value)
Size indicator	Institutional assets/total financial assets	47.9 (9.1)
Equity/total financial assets	Institutional assets/total financial assets	0.8 (2.8)
Volatility of share prices (monthly s.d.)	Institutional assets/total financial assets	
Household equity/ household financial assets	Household institutional assets/household financial assets	
Household bonds/ household financial assets	Household institutional assets/household financial assets	-0.13 (2.0)
Household deposits/ household financial assets	Household institutional assets/household financial assets	-0.63 (4.4)
Corporate equity/corporate liabilities	Institutional assets/total financial assets	1.8 (3.4)
Corporate bonds and market paper/corporate liabilities	Institutional assets/total financial assets	
Corporate loans/corporate liabilities	Institutional assets/total financial assets	-1.4 (2.9)

Table 6: Results of correlation analysis for sub-groups
(fixed effects regressions; variables significant at 95% level)

Dependent variable	Independent variable(1)	Anglo-Saxon	Continental Europe and Japan
Size indicator	Institutional assets/total financial assets	42.5 (5.6)	54.3 (7.5)
Equity/total financial assets	Institutional assets/total financial assets		1.28 (3.2)
Volatility of share prices (monthly s.d.)	Institutional assets/total financial assets	-35.2 (3.7)	
Household equity/ household financial assets	Household institutional assets/household financial assets	-0.4 (3.4)	
Household bonds/ household financial assets	Household institutional assets/household financial assets	-0.24 (3.8)	
Household deposits/ household financial assets	Household institutional assets/household financial assets	-0.45 (4.0)	-0.9 (3.4)
Corporate equity/corporate liabilities	Institutional assets/total financial assets	1.1 (1.9)	2.6 (3.2)
Corporate bonds and market paper/corporate liabilities	Institutional assets/total financial assets		0.35 (1.8)
Corporate loans/corporate liabilities	Institutional assets/total financial assets	-0.56 (2.0)	-2.3 (2.8)

Table 7: Indicators of financial innovation

(a) Commercial paper outstanding/GDP

	Market Opening	1986	1988	1990	1992
UK	1986	0.1	0.6	0.7	0.7
US	1960	7.5	9.0	9.9	8.8
Germany	1991	0	0	0	0.6
Japan	1987	0	2.4	3.6	2.6
Canada	1960	3.2	4.0	4.6	4.4
France	1985	0.4	1.0	2.3	2.3

Source: IMF

(b) Financial derivative instruments traded on organised exchanges (trillions of US dollars)

	1992	1993	1994	1995	1996	1997	Notional amounts outstanding at end-1997
Interest rate futures	141.0	177.3	271.7	266.3	253.5	274.6	7.5
On short term instruments	113.3	138.9	222.1	218.2	204.8	223.2	7.1
<i>Of which:</i>							
3-month eurodollar rates	66.9	70.2	113.6	104.1	97.1	107.2	2.6
3-month euroyen rates	14.0	24.6	44.2	46.8	34.7	29.9	1.6
3-month euro-DM rates	7.5	12.9	18.5	18.4	23.9	25.3	1.0
3-month PIBOR	5.8	10.4	12.0	15.9	13.7	12.3	0.2
On long term instruments	27.7	38.5	49.6	48.2	48.7	51.4	0.4
<i>Of which:</i>							
US Treasury bonds	7.1	8.0	10.1	8.7	8.5	10.1	0.1
Japanese govt. bonds	9.7	14.2	13.8	16.2	12.3	10.6	0.1
German govt. bonds	3.2	5.1	8.9	9.3	12.3	14.5	0.1
French govt. bonds	2.8	3.2	4.6	3.4	3.4	3.1	0.0
Interest rate options	25.5	32.8	46.7	43.3	41.0	48.6	3.6
Currency futures	2.3	2.8	3.3	3.3	3.0	3.5	0.1
Currency options	1.4	1.4	1.4	1.0	0.9	0.7	0.0
Stock market index futures	6.0	7.1	9.4	10.6	12.9	16.4	0.2
Stock market index options	5.7	6.3	8.0	9.2	10.1	13.0	0.8
Total	181.9	227.8	340.5	333.9	321.5	356.8	12.2
In North America	102.1	113.1	175.9	161.1	154.2	182.7	6.3
In Europe	42.8	61.4	83.9	87.5	100.1	114.9	3.6
In Asia	36.9	53.0	77.8	81.1	63.8	56.3	2.2
Other	0.1	0.4	2.9	4.2	3.4	2.9	0.1

Source: BIS

Table 8: Banking sector developments

(a) Change in lending/GDP ratio

	1970-1975	1975-1980	1980-1985	1985-1990	1990-1994
UK	-0.22	0.00	0.28	0.44	-0.10
US	0.06	0.15	0.08	0.09	-0.07
Germany	0.14	0.16	0.15	0.01	0.20
Japan	0.23	0.18	0.33	0.36	0.11
Canada	0.11	0.14	-0.09	0.10	0.05
France	-0.16	0.00	0.02	0.10	0.11
Italy	0.17	-0.20	-0.06	-0.05	0.14

(b) Non interest income/total income (percent)

	1979-1984	1985-1989	1990-1992	1993-1996
UK	31	37	41	42
US	24	30	34	36
Germany	19	21	25	21
Japan	18	32	20	-1
Canada	22	27	31	35
France	15	16	26	43
Italy	27	29	24	24

(c) Interest margins/assets (percent)

	1979-1984	1985-1989	1990-1992	1993-1996
UK	3.2	3.0	2.8	2.3
US	3.0	3.3	3.6	3.8
Germany	2.2	2.1	1.9	2.1
Japan	1.1	0.9	0.8	1.4
Canada	2.5	2.9	3.0	2.5
France	2.5	2.3	1.7	1.2
Italy	2.7	2.9	3.2	2.8

(d) Provisions/assets (percent)

	1979-1984	1985-1989	1990-1992	1993-1996
UK	0.41	0.86	1.2	0.43
US	0.35	0.83	0.89	0.36
Germany	0.41	0.37	0.38	0.43
Japan	0.02	0.04	0.08	0.33
Canada	0.49	0.74	0.64	0.45
France	0.55	0.53	0.54	0.56
Italy	0.66	0.48	0.52	0.76

Source: OECD Bank Profitability

Table 9: Open Ended Mutual Funds' Portfolio Distributions, 1996

Percent	Equities	Bonds and loans	Balanced funds	Money market funds	Of which(1): foreign assets	Net assets (\$ billion)
UK	89	4	6	1	38	181
US	48	23	3	26	9	3180
Germany	24	56	2	17	35	134
Japan	28	45	2	24	n/a	420
Canada	58	11	15	16	32	116
France	10	28	13	48	9	547
Italy	20	39	7	33	12	108

Source: FEFSI. (1) Included in data to the left

Table 10: Market price volatility

(standard deviation of monthly percentage changes)

		65-70	70-75	75-80	80-85	85-90	90-95	96-99
UK	Bond total returns	1.2	3.4	3.5	2.6	2.4	1.9	2.8
	Share prices	4.0	8.7	5.1	3.3	5.2	3.3	3.4
	Exchange rates	1.2	1.3	1.9	2.0	1.8	1.7	1.7
	Memo: Indl. prod.	1.0	2.4	2.1	1.3	1.3	1.0	0.7
US	Bond total returns	2.0	1.7	2.5	3.0	2.3	1.8	3.8
	Share prices	3.4	4.3	3.2	3.5	3.9	2.2	3.6
	Exchange rates	0.2	1.3	1.2	1.8	1.6	1.6	1.6
	Memo: Indl. prod.	0.8	1.2	0.8	0.9	0.6	0.5	0.5
Germany	Bond total returns	1.1	1.4	1.7	1.6	1.5	1.4	3.3
	Share prices	4.3	4.3	2.5	3.2	6.0	3.6	5.1
	Exchange rates	0.9	1.6	1.1	1.1	0.8	1.0	0.6
	Memo: Indl. prod.	2.0	1.7	1.7	2.5	1.6	1.4	1.4
Japan	Bond total returns	0.1	0.6	2.1	2.1	3.5	1.9	14.6
	Share prices	3.3	4.7	1.9	2.8	5.2	5.0	4.9
	Exchange rates	0.2	1.6	2.6	2.1	2.5	2.5	2.9
	Memo: Indl. prod.	1.1	1.5	1.3	1.2	1.4	1.6	2.2
Canada	Bond total returns	1.2	1.5	1.9	3.4	2.1	2.0	4.0
	Share prices	4.0	5.1	5.1	5.2	4.7	3.0	4.6
	Exchange rates	0.5	0.7	1.3	0.9	1.1	1.1	0.6
	Memo: Indl. prod.	0.9	1.4	1.2	1.5	0.9	0.7	1.0
France	Bond total returns	0.7	1.0	1.6	1.9	2.2	1.7	2.8
	Share prices	3.9	4.0	4.2	4.8	6.2	4.0	4.7
	Exchange rates	1.1	1.3	1.1	1.2	0.7	0.9	0.5
	Memo: Indl. prod.	6.1	2.0	1.7	1.3	1.5	1.2	1.1
Italy	Bond total returns	0.9	1.8	1.9	2.0	1.9	2.6	3.3
	Share prices	3.8	7.3	6.2	7.0	7.0	5.7	6.3
	Exchange rates	0.3	1.3	1.7	0.7	0.6	2.2	0.8
	Memo: Indl. prod.	2.3	3.9	3.0	2.5	3.2	3.5	1.4

Source: BIS macroeconomic database

Table 11: Selected episodes of financial instability 1970-98

Date	Event	Main feature
1970	US Penn Central Bankruptcy	Collapse of market liquidity and issuance
1973	UK secondary banking	Bank failures following loan losses
1974	Herstatt (Germany)	Bank failure following trading losses
1982	Ldc debt crisis	Bank failures following loan losses
1984	Continental Illinois (US)	Bank failure following loan losses
1985	Canadian Regional Banks	Bank failures following loan losses
1986	FRN market	Collapse of market liquidity and issuance
1986	US thrifts	Bank failures following loan losses
1987	Stock market crash	Price volatility after shift in expectations
1989	Collapse of US junk bonds	Collapse of market liquidity and issuance
1989	Australian banking problems	Bank failures following loan losses
1990	Swedish commercial paper	Collapse of market liquidity and issuance
1990-1	Norwegian banking crisis	Bank failures following loan losses
1991-2	Finnish banking crisis	Bank failures following loan losses
1991-2	Swedish banking crisis	Bank failures following loan losses
1992-6	Japanese banking crisis	Bank failures following loan losses
1992	ECU bond market collapse	Collapse of market liquidity and issuance
1992-3	ERM crisis	Price volatility after shift in expectations
1994	Bond market reversal	Price volatility after shift in expectations
1995	Mexican crisis	Price volatility after shift in expectations
1997	Asian crisis	Price volatility following shift in expectations and bank failures following loan losses.
1998	Russian default and LTCM	Collapse of market liquidity and issuance

For detailed accounts see Davis (1994, 1995b, 1995c, 1999)