

**Financial Globalisation, Derivatives, Volatility and
the Challenge for the Policies of Central Banks**

By C A E Goodhart
Financial Markets Group
London School of Economics

I. Introduction

There is a tendency for each new generation to believe that the extent and complexity of the problems that it faces are unprecedented, and that it has to overcome unique challenges to find new solutions. But, in reality, many of these difficulties are inherent in the system, and both they and the proposed answers, *mutatis mutandis*, often have a common form. So it is with problems of financial stability and control.

Many worry whether financial markets have become more volatile. Yet, in the experience of my own country, the United Kingdom, the volatility of financial markets, (eg the equity market, the foreign exchange market, the property market or the bond market), has not been particularly marked in recent years; at least not by comparison with the severe disturbances of 1929-33, 1971-75 or 1979-82. Indeed the period, of slightly over a decade, from about 1971, when the Bretton Woods system collapsed, till after 1982, (when the industrialised countries restored their grip over inflation at the cost of high real interest rates and the associated LDC debt crisis), was one of almost continuous financial turmoil, after which a considerable degree of order and stability has been restored.

Nevertheless the subsequent period has been punctuated by occasional extreme price movements in financial markets, notably the Stock Exchange crash on October 19th, 1987, the events in the foreign exchange market forcing ERM members off their narrow bands, eg in September 1992 and July/August 1993; the property bubble and bust in Japan and elsewhere 1989-1992; and, some might add, the rise and fall in bond markets in 1993/94, and even the recent disturbances in foreign exchange markets, particularly affecting the yen/dollar rate. Apart from the speculative attack on the ERM, it is difficult to relate these price movements convincingly (especially October 1987) to fundamentals. Consequently, there has been some inclination to ascribe the cause of such extreme price movements to destabilizing internal price dynamics, eg to portfolio insurance in 1987; to hedging of ERM positions in 1992 (I shall discuss this further later); and to a variety of stop-loss and hedging measures in 1989-92, and in the 1993/94 bond market collapse.

But stop-loss strategies have been known and used for decades, if not centuries. The levered, speculative positions perhaps adopted by hedge funds, (perhaps, since the extent of information on them is so limited), was earlier mirrored by speculators borrowing, often at call, to finance share holdings on a margined basis. There is little in the accusations and complaints about the way in which such levered speculators may destabilize markets that one cannot find matched in the annals of the 19th and early 20th centuries, see for example Sprague's (1910) History of Crises under the National Banking System. Financial crises and manias, (as Kindleberger (1989) and others have documented), are hardly novel phenomena: nor is there any evidence that they are increasing in virulence. Rather the reverse. Of the five financial disturbances mentioned above, (October 1987, ERM, the property bubble, 1993/94 bond market, 1995 forex market), only the property bubble and bust left much of an adverse mark on real economies, though it is too early to document the real effects of recent exchange rate shifts.

One feature of these crises that has regularly surprised commentators, (even though that would be an oxymoron in a rational efficient world), has been the extent to which the financial disturbances have been internationally linked; this was even so to some extent with the ERM crises which, once started, reverberated from member country to member country despite their differing domestic conditions. While it is difficult enough to explain the October 1987 Stock Market crash, or the 1993/94 bond market gyrations, at their epicentre in the USA, it is perhaps even harder to understand how and why such price movements were transmitted to other countries, and why such movements were dampened in some cases or aggravated in others; thus the % change in bond prices in the UK in recent periods has been even greater than in the USA.

Financial markets are international, whereas the coverage of news media, and most people's first-hand knowledge, is local and national. Again, however, there is a tendency to believe that this globalisation of financial markets is new, a development of the modern age. In many respects, however, we are just managing to struggle back towards the global market that existed before 1914. By the Feldstein-Horioka criteria, (correlation of domestic investment and savings ratios) capital flows, and associated current account deficits/surpluses, were larger, as a % of GDP, for the major countries of the world prior to 1914, than since. The ease of migration of people, particularly from the Old to the New World, was far greater before 1914 than it has ever been subsequently.

tying international financial markets together was the (trans-oceanic) telegraph. Once this was in place, financial crises and disturbances occurring first in one country, eg 1890 Argentina, 1893 Australia, 1907 New York, would be transmitted rapidly, often via London, to the rest of the world. It is, at least, arguable that it was the separation and division of the world's economies between 1914 and, say, the 1960s by barriers to the movements of goods and capital (and people?) that was special and retrograde. If so, the returning globalisation of financial markets is part of an on-going, and desirable, trend.

A further current trend can be seen in the continuing structural changes in markets and in financial institutions. The growth of the markets in derivative financial instruments, both in organized exchanges and over-the-counter, both absolutely and relatively to the underlying 'spot' markets is, perhaps, the most commonly remarked, and feared, feature of present developments. Possibly as important a structural change, however, has been the effect of increased (international) competition in breaking down artificial barriers between markets and financial institutions both between, and within, countries. Such barriers were partly caused by, and undoubtedly much facilitated, financial regulation and supervision by national authorities within a domestic context. Such barriers, and distinctions, between markets and institutions have become eroded, and fuzzier. As we shall see, this has provided the authorities with a challenge, notably for regulatory control, which has been proving difficult to meet. We shall discuss this further in Section IV.

Yet, this kind of problem is also not new. In the first half of the nineteenth century money predominantly took the form of coin, or of bank notes convertible into coin. The control of the monetary/financial system was for many, including many of the best economists of the day, eg Ricardo, synonymous with managing the issue of such bank notes, (the Currency School). No sooner was this done, eg by centralising note issue in the Central Bank, as was done in Peel's 1844 Bank Act, than the nature of both banks, with the growth of the branch-banking joint stock banks, and of money itself, transmuted. We are not currently facing quite as large a structural change to our concepts and to our institutional system, as occurred then. It is, however, quite possible that such changes may yet occur. For example, there is no inherent reason why the assets, which we can transfer in settlement of payments, i.e. money, need be restricted to bank liabilities, nor need they be in fixed-nominal-value form. In many ways mutual funds would represent a sounder basis for a monetary system than banks (Goodhart, 1993). It would not surprise me if, by the year 2010, we looked back at the decades of the 1980s and 1990s as being one of general stability and relatively little structural change.

It is as well to remind ourselves that many of the problems and disturbances that we face today are neither new, nor by most objective standards particularly virulent. I have highlighted three such

concerns; first the extent of volatility in financial markets; second the increasing internationalization and the global links between such markets; and third the break-down of barriers, resulting in fuzzy boundaries, between markets and financial intermediaries within and between countries. I have also suggested that there is no particular reason for greater concern about these developments now than in earlier decades, perhaps less.

There is, however, one aspect of current developments that may, perhaps, be of increasing worry now, and which is linked to the growth of the new derivatives market. This is whether some of these innovations may have reduced the transparency of market positioning, and hence raised risks, for example by reducing the ability of both regulators and other market agents to interpret market signals, and to control risk adequately.

At the lowest level this syndrome is represented by a concern whether senior managers have sufficient understanding of the potential provided by the ability to deal in derivative markets to assess and to control the assumption of risk within their own institutions (eg Mr. Jett and Kidder Peabody and even more dramatically Mr. Leeson and Barings). Are internal control systems appropriate? At a slightly higher level, the existence of derivative markets allows financial intermediaries both to hedge risk and/or to take speculative positions not only extremely quickly, but also through quite complex mechanisms. Moreover, such financial engineering generates an increasing turnover in financial markets, which has so raised the size and scale of settlement and payments, for example in the foreign exchange market, that there is increasing concern about the dangers of potential failure in such (back-office) parts of the system. This is especially acute where there is no centralised market (eg in the OTC markets), and where netting procedures are not yet (legally) established. Under such circumstances the assessment of (credit) risk may become increasingly difficult. This inevitably raises questions about the adequacy of the traditional forms of (bank) regulation, based on certain, rather arbitrary, ratios for capital, and also perhaps liquid assets, applied against certain specified asset categories - with limited offsets - and checked against infrequent snapshots, (sometimes on preannounced, sometimes on random, occasions), of balance sheets.

My own econometric work into high frequency foreign exchange market data (Goodhart, 1989 and Goodhart and O'Hara, 1995) has led me to believe that relatively little of market movements were in direct response to specific economic 'news' announcements, and that much seemed to be in response to inter-actions among market agents. A market transaction is itself treated as significant 'news' by others perceiving that transaction, unless there is a known reason to regard it as 'liquidity' or 'uninformed' trading with no implications, or relevant information, for the market more broadly.

Hayne Leland, one of the founding fathers of portfolio insurance, likes to distinguish between the effect that a few billion dollars of sales from portfolio insurance may have had on October 19th, 1987, and the virtually zero effect on markets of a vastly larger sale of shares a few months later. He then reveals that this latter was the new issue of NTT shares in Japan, which had been pre-announced and known well in advance, so that everyone could take their positions in response to it. Of course, major movements in prices have always triggered quasi-automatic reactions by stop-loss sales and margin calls, as already noted. But there may now be a qualitative change as the volume of quasi-automatic transactions, eg from option hedging, portfolio rebalancing, portfolio insurance, may be larger in relative amount or may, as we shall discuss in relation to exchange rate bands, be bunched together and triggered by a more particular event than in the past.

Markets, especially financial markets, work better when they have sufficient information. One of the questions raised by the growth of derivative markets is whether these have led to the generation of certain key bits of information, in particular sales/purchases that are quasi-automatically programmed to occur under certain specified market conditions, which should, perhaps, be more widely known to all market participants, but which data are not currently collected, collated and made publicly available. At least, following the Brockmeijer Report, Central Banks are now planning to collect a snapshot of commercial bank activity in derivatives markets, alongside their current BIS survey of foreign exchange activity.

With these rather general thoughts as background I shall now turn to an analysis of the effect of current financial dynamics on the problems for Central Bank policy-making. I shall review these, starting with domestic monetary policy, where the problems are, to my mind, least pressing; and concluding with regulation, where the current structural developments outlined in this Introduction are causing fundamental difficulties for present regulatory methods.

II. Monetary Policy

The main instrument of monetary policy consists of the Central Bank's ability to control the general level of short-term interest rates. It does so through having effective (monopsonistic) control over the outstanding volume of legal-tender, base money, (currency and deposits at the Central Bank), which it can manipulate on a short-term basis through open-market operations.

The main constraints on the proper operation of such monetary policy have been political. This has frequently taken the form of political pressures to keep interest rates lower than would be consistent

with price stability. In unsettled circumstances such political imperatives have also adopted the guise of enforced emissions of monetary base to help finance public sector deficits, as is currently occurring, for example, in many of the Republics of the former USSR. There is, of course, nothing new about this. Indeed, the current fashion for the legislative adoption of Central Bank independence in many countries, as for example required for the member Central Banks of the European System of Central Banks under the Maastricht Treaty, indicates a desire to avoid such political interference in future.

Should those Central Banks given a statutory mandate to achieve price stability and effective autonomy to vary interest rates to that end nevertheless fail in that endeavour, [which we must hope will not be the outcome], then commentators may conclude that Central Banks may be congenitally incapable of delivering price stability. In that hypothetical circumstance there could be an upsurge of support for Free Banking, a system based on each bank keeping its note and deposit liabilities convertible into an asset of real value, eg a notional basket of goods or an index of equities or whatever. But that (still unlikely) outcome would have relatively little relationship with the problems of private-sector financial dynamics discussed in the Introduction.

There have been a few futuristic suggestions that the development of a cash-less society ('smart' cards, etc.,) might so reduce, or somehow, alter the demand for cash that the Central Bank's control over short-term interest rates would be compromised. Such fears are unwarranted. Banks, and other financial intermediaries, will always want to settle in the unquestioned, 'good' funds of their Central Banks, rather than extend credit to counterparties. Moreover, alternatives to currency usually require electronic identification and hence lose anonymity. Alas, much of the demand for cash in many countries is already related to illegal and black economy activities, but such activities may be as stably related to (calculated) nominal GDP as those activities becoming progressively cashless. It is, I believe, true that if the Central Bank did not have a monopoly on note issue, competition among commercial banks to issue their own notes would lead to a resolution of the problem of paying interest on such notes, (ending seigniorage and several arcane features of monetary economics at one swoop). Even then, I have argued (Goodhart, 1993) that the Central Bank could still control the general level of interest rates, by fixing the rate that it would pay on its own (note) liabilities. But this again takes us some distance from the main issues of this paper.

Thus I start from the presumption that there is no current serious threat to the Central Bank's traditional ability to direct monetary policy via its command over short-term interest rates, whether from private financial dynamics or otherwise. Where, instead, such structural changes have caused problems for monetary control relates to questions of how to decide on which interest rate(s) to

focus¹, and how to monitor the effects of such interest rate changes, and through what transmission routes, on the economy.

The best known example of the resulting (control) problems caused by such structural changes has been the collapse of the stability of most demand-for-money functions, generally (though uncertainly) attributed to financial innovations, such as the payment of (market-related) interest rates on a widening category of (sight) deposits, the growth of money market mutual funds, etc., etc. The gyrations in M3 in Germany in 1993/94, and the Bundesbank's decision to lower nominal interest rates there in line with prospects for declining inflation, and nominal GDP, despite a surge in M3, provide a recent example. In earlier years, eg 1975-1982, it had been thought that intermediate monetary targets would, through a predictable link to subsequent movements in nominal incomes, provide a basis for informing Central Banks when to vary interest rates, so as to control monetary growth². So far has fashion changed since then, owing in some large part to the apparent unpredictability of velocity, that the rates of growth of the monetary aggregates are not now given much weight by many Central Banks as information variables, among many other information variables (eg commodity prices, wages growth, etc.). For example, the rate of growth of bank lending and of broad money collapsed dramatically in several countries in 1990-92, including the UK and Japan, without producing any concerted campaign for a much greater counter-vailing reduction in interest rates, than was actually adopted. In the UK, of course, the conduct of policy was constrained first by ERM membership, and thereafter by a need for a strategic policy re-think.

Such structural changes have not only impaired the stability of demand for money functions, but they also have tended to alter the transmission mechanism whereby interest rates affect the economy. For example, constraints on the interest rates set by certain financial intermediaries, and associated limitations on the permitted activities of, and competition between, certain groups of intermediaries meant that policy-induced increases in interest rates would often lead to (somewhat) predictable shifts of funds, (eg away from housing finance specialists, such as UK building

¹ Many academics, eg McCallum in his papers for the Bank of Japan (1993a and b), would argue that the Central Bank should determine a growth rate for the monetary base rather than interest rate levels. This is a long-running argument, which I address in several papers elsewhere (eg Economic Journal, November 1994). For present purposes, my claim is that, in practice, Central Banks have, and will continue to, set policy on the basis of interest rate, not monetary base, control, so that the discussion should proceed on this realistic, practical basis.

² This practice used to infuriate monetarist economists, who argued for the superiority of monetary base control as the operational technique. As already noted, in footnote 1, Central Banks never accepted the arguments or precepts of monetarists in this respect.

societies), and an associated rationing of loans to borrowers from those intermediaries. Thus persons, especially when borrowing on mortgage, and small companies could be rationed out of the market by tightening monetary policy: the authorities used the imperfections in financial markets to reinforce their grip.

That grip has been weakened by the undermining of such imperfections through the forces of competition and structural innovation. When the Central Bank now raises the general level of short term interest rates, it can no longer be confident of the effect on certain key interest rate differentials, (as it could in the past because of the imposed stickiness of competing bank/housing finance deposit rates). There is less, quasi-automatic rationing effect. In order to have the same overall impact on the economy the (relative) price effect of interest rate changes has to be greater.

One problem, of course, is that the price effect of interest rates depends on the relative expected change of other prices, i.e. on 'real' interest rates. But it is not the general level of prices of goods and services (eg the RPI, CPI or GDP deflator) that matters to borrowers, but the prices of those goods and assets that are being purchased, and held, with the borrowed funds. Not many borrowers seek finance, or would be allowed to borrow by banks, in order to finance current consumption. Instead, most borrowing is to finance the purchase of assets, notably real property, houses, offices, factories, etc. Borrowers are, therefore, predominantly concerned about such asset prices, rather than the RPI. The rate of inflation that is relevant for the assessment of 'real' interest rates on bank, and housing finance companies', lending is that on such real assets, rather than that on goods in general.

Whether, or not, it was consistent with rational expectations, the view took hold in many countries by the end of the 1980s that property/housing prices would rise consistently faster than the RPI. Consequently 'real' interest rates, assessed on an RPI basis, were then overestimated. The reverse has occurred since that bubble burst, and 'real' interest rates, eg in Japan, have been underestimated. This leads on to difficult questions of what is meant by 'price stability'; what index should the authorities seek to stabilize; how, if at all, should the authorities react to movements in asset price inflation out of line with goods' price inflation? In particular, asset prices are much more volatile, and perhaps more subject to changing fads, than goods' prices. If the equity market should bound upwards, would that be a good enough reason by itself to induce a tightening of monetary policy? A discussion of such issues at the Bank of Japan Conference on 'Financial Stability in a Changing Environment' in October 1993, (now published, Sawamoto et al 1995) revealed that few economists wanted to incorporate asset prices formally into an index, or measure, which the monetary authorities should aim to stabilize, but, per contra, that almost all of them would advocate using data on asset price movements as 'information variables' that should be considered as guides

to the decision on how to adjust short-term interest rates.

The current situation, in those countries without exchange rate commitments, (either closed economies by benefit of size, eg USA, or protected by exchange controls, and/or with floating rates), is to vary interest rates in a discretionary fashion, with the aim of achieving medium-term price stability, on the basis of a melange of information variables, including a variety of direct measures of inflation itself, capacity and unemployment variables, the exchange rate, monetary aggregates, etc. The weights attached to the various information variables are entirely subjective. It is not an intellectually tidy method of operating, but in a complex and structurally evolving world the resulting flexibility may be an operational advantage, particularly if the monetary authorities are rigidly precommitted to the goals to be achieved, eg a numerically specified inflation target, and given appropriate (pecuniary) incentives to meet their objective.

Even for a country with floating exchange rates, external influences are bound to have a major effect on the authorities' current decisions about the appropriate level of short term rates, and the market's expectations of future probable domestic short-term rates. I shall shortly be discussing the authorities' ability to influence, control or peg exchange rates in the next Section III. So, longer-term interest rates, and the yield curve, in countries with floating rates are bound to be influenced by market assessments of (the domestic impact of) external forces. Beyond that normal effect of external factors on domestic interest rates, there has been some question in the course of last year whether international capital flows had led to a worldwide adjustment in bond yields, that would seem in a number of countries to have driven some shorter-term (3 to 5 year) bond yields beyond the level that would seem reasonably explicable on the basis of plausible implicit forward shorter-term interest rates. Once again the readjustment in bond yields appears to have been initiated in the USA, with its effects radiating out from New York. The extent of the price/yield change was somewhat difficult to explain even in the USA, but considerably more so in Europe, wherein many countries, eg Germany and France, had hardly yet begun to recover.

Perhaps the above is nothing more than a fancy way of expressing a personal view that short bonds in several European countries had become, by mid-Summer 1994, a good buy, (as also the US\$ may have become now on the forex market). There is just a suspicion that we have seen an internationally co-ordinated over-reaction, perhaps driven in part by financial dynamics. Was the combined effect of the Basle capital adequacy risk ratios, and the bad debts on property loans in 1989-92, such as to make banks, and other financial intermediaries then overload their portfolios with government bonds? Was this driven-on further in 1993 by the actions of (inappropriately termed) hedge funds? Did an increasing proportion of these players put in place various forms of portfolio insurance policies to protect themselves against interest rate risk? How far does the

insurance, risk-hedging, behaviour of the individual fund manager worsen aggregate risk, (especially where such individual strategies are not transparently revealed in advance to the market) by increasing the weight of trend-following, as compared with contrarian, market behaviour?³

While these concerns may, or may not, have some validity within a single country, they still do not address the question of the apparent international co-ordination of bond price/yield adjustment. But one of the features of derivative markets is that they can allow the differing kinds of risk inherent in a position to be separated, and either individually hedged or consciously assumed. A resident purchasing a foreign bond would, in the past, have simultaneously had to accept a currency, exchange rate, risk, as well as an interest rate risk. In so far as that currency risk can now be separately, and relatively cheaply, hedged, does it mean that foreign bonds have become much closer substitutes for domestic bonds? If so, will the course of bond yields around the world become much more sensitive to movements in the New York bond market? But, as I indicated earlier, there are no greater external constraints, assuming free floating exchange rates, on domestic Central Bank control of short-term money market rates than in former years. Does this, perhaps, mean that there will be a greater tension in future between international pressures and domestic factors, (eg the expected time path of future short rates), in the determination of bond yields in countries outside the USA? If so, the ability of domestic Central Banks to control, or even to predict, the movement of longer term bond yields, (despite their continuing control over shorter-term money market rates), may have become somewhat further impaired. Time will tell. But it would, perhaps, be as well not to become too excited about recent events in world bond markets. We do not fully understand what happened; it may prove to have been a once-off development that will not be closely repeated in future; it is doubtful whether the gyrations in these markets, unduly buoyant in late 1993, unduly depressed in the second quarter of 1994, actually had a seriously adverse effect on the world economy.

In short, so long as they do not commit themselves to trying to peg their exchange rate, Central Banks remain the masters of their own money-markets. It is just that knowing how best to exert such mastery becomes even more difficult in a changing structural environment.

III. Exchange Rate Policy

³ When markets move extremely sharply, this is frequently attributed to speculation. In practice, hedging strategies are just as, or more likely, to exacerbate trends. Be that as it may, it takes detailed knowledge of an agent's portfolio position to be able to distinguish between a speculative, and a hedging, transaction.

We should attempt to clarify why Central Banks might want an exchange rate policy in the first instance, before discussing whether recent structural and market developments may have complicated the operation of such a policy. In particular, the two main, canonical, regimes for exchange rates, free-floating or completely fixed, do not require any such conscious policy. In the first the two Central Banks set their domestic monetary (interest rate) policies (independently) and the market fixes the exchange rate. In the second there is one single focus for the determination of monetary policy (interest rates), and the subservient Central Banks accept and implement this policy quasi-automatically. The extreme form of this is when there is a single currency, but several member regional/national Central Banks, as in the Federal Reserve System and ultimately in the European System of Central Banks. A weaker form of the fixed rate system is a Currency Board format, as in Hong Kong, Estonia or Argentina, where the local Central Bank organizes the issue of local, national notes, but ensures that the marginal⁴ note issue is backed one-for-one with claims on the centre country to which it has linked its currency. If there is a balance of payments deficit, and the Central Bank loses reserves, the note issue must be reduced. If this does not happen quasi-automatically, as it usually will, it must be achieved through open-market operations. Either way, interest rates would be forced upwards. In practice, countries on a Currency Board scheme have to adjust their interest rates in line with those of the centre country, usually plus a time-varying risk premium, depending on perceived political and economic circumstances.

Why, then, are Central Banks not content to adopt one, or other, of these canonical forms, which involve them in no exchange rate policies as such, but instead do they seek some half-way house requiring a conscious attempt at exchange rate management? A major problem with free-floating has been that real exchange rates have proven not only extremely volatile, but also subject to apparent serious medium-term misalignment; the worst case of this was the appreciation of the US\$ in the mid-1980s, but recent developments in the yen, mark and dollar are also unsettling.

As the example from the 1980s suggests, there is no evidence, known to me, that recent market developments, eg the still increasing size of the foreign exchange (forex) market, the growth of derivative markets, etc., etc., have led to any worsening in the proclivity of the forex market to behave in a way difficult to explain in terms of fundamentals. Indeed, compared to the 1970s and 1980s, the forex market in the 1990s has, perhaps, been more responsive to fundamentals, [and that includes the recent debacle of the ERM in Europe].

Some aspects of the recent appreciation of the Yen are hard to comprehend. But most speculative money was, so my casual evidence goes, betting on a \$ appreciation early in 1994. Reasons why

⁴ In such systems there may also be a limited, unbacked fiduciary issue of local notes.

the \$ instead depreciated have tended to stress real factors, such as the cessation of Japanese long-term capital flows to the USA, and perhaps their reversal and repatriation more recently, and the continuing US current account deficit, only perhaps slightly exacerbated by the covering of the bull positions previously built up by speculators in \$. Be that as it may, while the forex market does remain unpredictable, and capable of delivering rates undesired by the monetary authorities, there is no evidence of such perversities worsening over time.

Nevertheless, the monetary authorities may still, from time to time, wish to intervene in the forex market, to influence its level, rate of change or volatility. But the ratio between the size of the reserves which the authorities can deploy for this purpose and the extent of the market as a whole continues to move against the Central Banks. However, it has been many years since commentators thought that Central Bank intervention could move markets significantly, or for long, by sheer weight of funds.

Instead, the argument is made that such intervention could have an effect by 'signalling' the monetary authorities' future intention. This line of argument is, however, a bit double-edged. The strongest signal that a Central Bank could make would be to vary its interest rate now. To intervene instead is rather to announce that, whereas forex market developments are viewed with concern, they are not sufficient to cause an immediate change in interest rates. Whether such a signal is perceived as one of weakness, or of potential strength, by markets is, therefore, ambiguous. So, it is hardly surprising that studies of the effects of intervention, eg by H. Edison (1990) and by Dominguez and Frankel (1990 and 1993), have mixed, and somewhat uncertain, conclusions. In any case there has been so much written in recent years on intervention that it does not seem necessary or useful to discuss this further.

With intervention providing relatively little control over free floating exchange rates, the monetary authorities may feel a need for some greater stability in exchange rates, vis à vis some neighbouring country, or set of countries, while not feeling prepared to abandon the option to undertake an independent monetary policy altogether: that is to move to a pegged, but adjustable, exchange rate.

The desire to peg may arise for several reasons:- because the country is small, (relatively to its trading neighbours); has an increasing interpenetration of trade and/or factor mobility with its neighbours, (i.e. approximates to an optimal currency area); wishes to use an exchange rate peg as a precommitment device for achieving contra-inflationary monetary policy; sees such a peg as a stage along the way to full monetary union; or, no doubt, for a variety of other reasons. The desire nevertheless to be able to re-adjust the peg on occasions may remain:- because the local economy has not converged sufficiently to the centre economy; because it does not form an optimal currency

area (eg too little factor mobility) with the centre country; because of a lack of community with the centre country on political, trade and fiscal, (inter-regional fiscal transfers), matters; because of the likelihood of asymmetric local shocks; and, no doubt, for a variety of other reasons. Thus some countries may feel that neither a free float, nor a currency board/currency union, is best-suited to their own condition, but a half-way house of a pegged, but adjustable system.

A main disadvantage for a local/regional economy within a currency board/currency union system is that asymmetric shocks may make the single interest rate, imposed at the centre, inappropriate for the region. This disadvantage is, however, made considerably worse by the dynamics of a pegged, but adjustable, system, for reasons that have become known in the UK as the Walters' critique, after Sir Alan Walters, Mrs. Thatcher's adviser in the 1980s. When a country first enters such a system, or after a peg readjustment, the expectation is usually that the peg will be made to hold, if only for political credibility reasons, for, say, a year at least. Given that expectation, short term interest rates will be driven down by capital inflows until they are only just above those in the centre country. But the country initially adopting, or readjusting the peg, is likely for a variety of reasons to have an inflation rate significantly above that of the centre country. Hence the first effect of pegging, somewhat paradoxically the more so the greater the credibility of that peg, is to introduce excessively low local real interest rates, a large capital inflow, and a further inflationary impulse. The experience of India over the last year or two is a recent example of this syndrome.

One way to try to deal with the inflationary effect of too lax monetary policy in the early months/years of a pegged system is to counterbalance this with extremely tight fiscal policy. But this is usually politically not feasible. Instead, the norm unfortunately is for the inflationary gap between the peripheral and central country to remain, or worsen. This causes over time an appreciation of the real exchange rate, a worsening trade balance, and a weakening competitive position in the tradeable goods industry, as for example happened recently in Mexico. Eventually the continuation of the peg is perceived to be no longer credible. Once an expectation arises that the peg may be re-adjusted in the near future, the interest rate that becomes needed to prevent such speculation, and outward capital flows, becomes very high indeed. In such speculative crises in Europe, Sweden in 1992 resorted to overnight rates well in excess of 100% p.a., as did Greece more recently (and for the time being successfully) in 1994.

There is, indeed, a further problem. If the country, whose pegged rate is suspect, also has high unemployment, a rise in interest rates may be perceived in the market as politically untenable, even if the Central Bank expresses its willingness to impose such high rates. So a rise in interest rates, under such circumstances, may, at any rate initially, reinforce rather than quell speculation. This syndrome was believed to have been a factor both in the attacks on £ in September 1992, and on

the French Franc in Summer 1993.

Moreover, this possible perverse effect of raising interest rates, to defend the peg, has probably been exacerbated by internal financial dynamics, as analyzed in the paper on 'Dynamic Hedging and the Interest Rate Defence' by Garber and Spencer (1994), and emphasized by the discussant's comments by Paolo Kind, (Perugia Conference, NBER, July 1994). Essentially, portfolio managers will shift funds between national bond markets (as already noted in Section II) to take advantage of local interest rate differentials. They will simultaneously hedge their currency risk by taking out a put option, with that option coming into the money once the local exchange rate falls below the weak band limit. A rise in interest rates, to protect the currency, will tend to force the forward rate, assuming that the spot rate is near the lower limit, below that level. This will cause those intermediaries who have written the put options to undertake hedging sales. If there has been a large volume of prior capital inflows, on a pure comparative interest-rate play, there could be a massive volume of puts, requiring hedging sales when, and if, an interest rate hike (to protect the currency) drives the forward rate below the lower band. So a Central Bank, which has raised its interest rate, in the expectation that this should strengthen the spot exchange rate, might instead be faced with an unexpected wave of hedging-driven sales. It was suggested by Paolo Kind at Perugia that this had, indeed, played a role in driving the Italian Lira out of the ERM in September 1992.

The initial Krugman smooth-pasting model of currency movement within bands was attractive for its academic elegance, not for its realism. The reason for adopting a band system, rather than a currency board/currency union regime, must be because of a desire to be able to readjust the parity, at least in some circumstances. Hence the bands cannot be fully credible. For the reasons already outlined, the partial and time-varying credibility of such bands may lead to certain severe dynamic problems. There is no great enthusiasm now within the ERM to return to narrow bands. Indeed, it is not clear why it is desirable to go beyond an announcement of an intended pegged, central parity.

As Branson stated in the discussion of the Garber/Spencer paper, an announced band may act as a (fatal) attractor rather than a repeller. The authorities may decide to have unannounced, fuzzy bands for internal decision-making reasons, but setting publicly-announced narrow bands for pegged, (but adjustable), exchange rates is now increasingly perceived as undesirable and counter-productive.

Much of the earlier success of the ERM is put down now to the use of exchange controls. Eichengreen, Rose and Wyplosz, in one of a series of papers, the latest, July 1994, at the Perugia Conference, have argued that, if a reversion to a narrow-band ERM should be desired, it would be best to buttress this with a version of exchange controls, to wit controls over non-resident

borrowing of domestic currencies. This proposal received a quite hostile reception from its discussants at Perugia, and indeed from most other economists there and elsewhere. It was attacked both on the grounds that such controls were inherently undesirable, and that they would not work in any case. It was argued that it would be possible to avoid the particular control suggested by persuading a resident to intermediate between the bank and the non-resident. Hence exchange controls would have to be pervasive to have much chance of success. Even then, the general view is that the market has become sufficiently adept at avoiding, or evading, exchange controls to limit their effectiveness, unless hermetic and extensive bureaucratic controls are introduced; and in this latter case the costs to the country involved may well exceed the benefits.

To summarise this Section, there is no need for specific Central Bank exchange rate policies if a free-floating or, at the other end of the spectrum, a completely fixed, currency board/currency union regime is adopted. Intervention is a weak reed. There are reasons why a country might want a half-way house of a pegged, but adjustable, currency but, particularly if narrow bands are put in place, that can lead to adverse dynamic processes, which may have been worsened by recently developed techniques of international portfolio management. An attempt to respond by re-introducing exchange controls might well be circumvented and fail, and even to the extent that it 'worked' the 'cure' might be worse for the patient than the speculative disease.

IV. Regulation

Almost by definition regulation seeks to force (some of) those regulated to undertake actions that they would not do voluntarily, (otherwise the regulation would be otiose). Regulation will, therefore, be perceived as generally burdensome. People try to avoid burdens. The structural developments of recent years, both the globalisation of financial markets, the growth of derivatives and the erosion of barriers between financial institutions and markets, have provided many patent opportunities for regulatory arbitrage and avoidance. Unlike the subjects covered in the previous two Sections, on monetary and exchange rate policies, where such structural changes have not greatly altered the inherent problems facing Central Banks, these developments have driven, and continue to affect, the form and conduct of regulation and supervision.

Until the 1970s, financial regulation was essentially an exercise done domestically by each nation individually, and according to its own traditions. In the UK this tradition was one of constrained, cartelized, self-regulation. Each group of financial intermediaries, (eg building societies, finance houses, discount houses, merchant banks, etc., etc.), was allocated a particular part of the financial

field, in which they were granted an effective, but constrained, monopoly. They were encouraged to form an Association, whose Officers would consult with the monetary authorities. Entry was limited, and rule-books limited price (interest rate) competition. The existence of such cartelized advantages provided an incentive for self-regulation, and the Bank of England could, and did, expect 'good behaviour', i.e. in accordance with the unwritten rules, despite the absence of any statutory backing and with only one official, the Principal of the Discount Office, working part-time on the supervision of the Bill market, and of the main intermediaries, the Discount Houses and Merchant Banks, within that market.

The disadvantage of such a cosy, cartelized system was that it became rigid, high-cost and uncompetitive. Competition sprung up domestically in the 1960s from intermediaries, eg the 'fringe' banks and markets, eg the Local Authority market, which were not so regulated; more important, competition emerged internationally, especially in wholesale markets, such as the euro-markets and euro-bond markets from the 1960s onwards. Whereas the authorities in London, notably the Bank of England-

assess the true riskiness of their own position.

What is hard to dispute is that moral hazard, and the likelihood of the adoption of high risk strategies, worsens as the own capital available to a bank, its capital adequacy, declines. When its own capital shrinks, the potential loss to owners, (and, though to a lesser extent, to managers also) from bad outcomes is shifted onto other shoulders, (the deposit insurance scheme, the Central Bank, or taxpayers), whereas the upside remains with them. In principle such a higher risk might be balanced by a higher cost of funds and/or insurance services, but in practice this does not happen.

Anyhow the authorities in several of the major (USA and UK) countries observed with growing concern a decline in the average capital adequacy of their own (main) banks through the 1980s, and by the latter half of this decade clear evidence of an increasing financial fragility, in the guise of an increase in the rate of bank (and housing finance, eg S & L) failures to an intensity last seen in the Great Depression of the early 1930s.

So something needed to be done to maintain, indeed to restore, systemic stability. The obvious answer seemed to be to apply more satisfactory (ie higher) capital adequacy ratios, CARs⁵. The immediate problem with that was that an increasing proportion of many countries' major banks' business was wholesale, in the international arena. Moreover, were discriminatory burdens to be placed on the operations of domestic banks, a considerable volume of activity, that was currently classified as retail and domestic, would rapidly transfer itself offshore, more easily so in the absence of exchange controls. So, any move by a major country individually to impose tightened CARs on their own domestic banking system would be largely avoided by a transfer of business

⁵ In prior decades the main instrument of regulatory control had been the imposition of reserve, or liquidity, ratios, which had for the authorities the added advantage of providing the government with cheap finance and - in some models - giving the authorities a (stronger) fulcrum for monetary control. Indeed, it was rarely clear, even to those in charge in Central Banks, whether such ratios were being maintained, and adjusted, for regulatory, seigniorage or monetary control purposes. Following the growth of deep and efficient money and inter-bank markets, reserve and liquidity ratios are seen as of limited prudential value, though maturity mis-match does engender interest rate risk. Furthermore, the move to RTGS (Real Time Gross Payments Systems) will increase the need for banks to have immediate intra-day access to good funds. The use of such ratios as a source of cheap funding (seigniorage) to governments has, meanwhile, fallen into some disrepute, eg in the context of the campaign for Central Bank independence, (n.b. the Maastricht Treaty). On the other hand the role of reserve ratios, if any, in the conduct of day-to-day monetary policy and control remains a bone of contention in Europe, particularly in the run-up to European Monetary Union (EMU), see Monticelli and Viñals (1993) and Goodhart and Viñals (1994). So, the future use, if any, of reserve ratios in Europe remains unsettled and uncertain.

off-shore to their international competitors, thereby weakening the competitive position of the national banking system. Thus, the growing globalisation of the world's wholesale financial markets meant that there were pressures for regulation similarly to be applied on a world-wide basis, in particular to achieve a level-playing-field. Indeed, by the mid-1980s there were already strident complaints from American and British banks that banks from some other major countries, notably Japan and France, had an 'unfair' advantage in such wholesale, international markets, because, so it was argued, the authorities in those countries were prepared to tolerate lower capital ratios.

The first problem relates, therefore, to competition between banks head-quartered in separate countries. The second problem relates to competition between banks and other financial intermediaries within (and also to a lesser extent, between) countries. As earlier noted, the previous rigid demarcation lines between the fields of financial operation of the various financial intermediaries, e.g. in the U.K., have become eroded and fuzzy. This has happened in many countries. Moreover, the range of permissible activities, and hence the potential extent of competition, for banks has varied widely between those countries which had sought to limit their banks to a more narrow commercial-banking operational remit, such as the U.S.A. with its Glass-Steagall Act, and those, such as Germany, which have allowed, or even encouraged, universal banking. This often causes problems for the regulators. If they seek to impose the higher, more-burdensome CARs to banks across the whole range of bank activities, they may well weaken the competitive position of banks vis-à-vis their non-bank competitors in the areas of over-lapping competition. If they seek to protect and maintain the banks' competitive position in these areas, it will usually involve a somewhat arbitrary division of banks' activities into separate parts, with separate regulatory arrangements. This will usually provide fertile ground for regulatory arbitrage.

The attempt to deal with competition between banks and non-bank investment firms within Europe is a case in point. Here the attempted solution has been for the authorities to divide bank' books into two parts, under the Capital Adequacy Directive (CAD 1993), to wit a "trading book" subject to the more permissive capital adequacy rules considered appropriate to securities trading, and the remainder of bank business. This approach achieves broad competitive equality between banking and investment institutions, but it also creates a number of other problems. These latter have been enumerated⁷ by Richard Dale in his (1994) paper on "The Regulation of Investment Firms in the

two countries. Third, differences in legal regimes and capital markets between two countries can provide significant advantages in utilizing various capital instruments and in holding assets of different risk-weights. Fourth, differences in the public enforcement of capital requirements have not been remedied by the Accord. It would be an accident, we believe if the Accord made even a modest contribution to diminishing competitive inequality between U.S. and Japanese banks."

⁷ He sets out the problems, as follows:-

"Firstly, the tug-of-war between bank and securities regulators has resulted in compromise capital requirements for the trading book that, in terms of (a) the definition of capital, (b) the treatment of underwriting, (c) the large exposure rules and (d) position risk requirements is much closer to the regulatory model of securities markets than banking. Since banks must ultimately bear the risks associated with their own trading books or securities subsidiaries, this could mean some dilution of the solvency protection afforded to banks. The CAD imposes only minimum capital adequacy requirements and it is, of course, open to national authorities to apply higher requirements where these are felt to be necessary. Nevertheless,

European Union".

But the main problems of the CARs are caused, not so much by competitive overlaps, (between banks in different countries, and between banks and non-banks), but by the deficient design of the CAR itself. Capital is needed as a protection against the risk of loss. There are a variety of concerns and potential disputes about the definitions, and required totals, of capital enshrined in the Basle Accord. The division into Tiers 1 and 2, the choice of the 8% level, etc., etc., are all

competitive concerns will tend to discourage unilateral prudence of this kind.

Secondly, because banks are free to use their deposit base to fund securities operations - whether undertaken on their own balance sheet or through subsidiaries - the moral hazard problems associated with banking are carried over into securities markets. Deposit funding of securities business also gives banks an important competitive advantage over non-bank investment firms - a major source of unevenness in an otherwise level playing field.

Thirdly, by conferring on investment firms the same privileged credit standing as that accorded to banks - automatic 'qualifying' status for their debt issues and concessionary risk weightings for institutions incurring counterparty risk or large exposures to investment firms - the message may be conveyed to financial markets that investment firms enjoy the support of official safety net and lender of last resort arrangements that traditionally have been confined to banks.

Finally, it is a remarkable paradox that in seeking to establish a level playing field between banks and investment firms, the CAD severely tilts the playing field when it comes to banking and securities business. As explained above, the capital requirements applicable to bank loans are much higher than those applicable to debt securities of equivalent default risk and maturity held on the trading book (a factor of no less than 32 x in the case of short-term 'qualifying' securities). And while it is true that in countries such as the UK a differential capital requirement has previously existed in favour of securities business when undertaken by investment firms, under the CAD regime banks will have a powerful incentive to shift their business from traditional banking to securitised lending. This added impetus to securitisation may or may not be a desirable outcome, but it is surely unsatisfactory that such an important market development should be the unintended by-product of a new regulatory frame work rather than the result of a conscious policy decision.

All these difficulties are rooted in EU market structures which permit banking and securities business to be freely intermingled within financial conglomerates. It was suggested earlier that the case for comprehensive official regulation of investment firms is much weaker than that for banks. This is, firstly, because the investment industry itself has both the incentive and the capacity to impose relatively straightforward 'liquid capital' rules that minimise the risk of default (as distinct from closure) and, secondly, because the spillover effects of the failure of an investment firm are small compared with the social costs of bank failures.

However, once investment firms become connected to banks, the systemic risks associated with banks are extended to securities markets. Furthermore, if, as under the CAD, bank deposits can be used to fund securities activities, the moral hazard problem that has plagued bank regulators is also carried over into securities markets. It is these bank/deposit linkages, rather than the characteristics of investment firms per se, that create the need for comprehensive official regulation of securities business."

somewhat arbitrary and debatable.

But these concerns pale into relative insignificance compared with the problems inherent in the Basle (CAD) assessment and treatment of risk. This is done on a very simplistic, and (as increasingly perceived) unsatisfactory manner. Instead of an attempt to measure the overall risk of a complete portfolio, using the best available models of finance theory, the Basle approach applied a 'building block' approach. Under this method, credit risk weightings were applied, en bloc, to certain categories of assets, e.g. (OECD) government debt, mortgage lending, other commercial loans, etc. The weightings were to be applied, irrespective of the credit standing of the particular borrower within that class. Thus, holding Turkish government debt has a zero-weighting, whereas commercial loans to General Motors have a 100% weight. Apart from separate attempts to discourage, and prevent, large exposures, there was little effort made to measure, or encourage, prudent diversification within blocs. Much of the exposure of banks at any time relates to interbank deals, and in the course of the payments' systems. The questions of appropriate offsets, and allowable netting arrangements, remains complex and largely ad hoc.

The risk weightings were, almost inevitably, arbitrary. This means that there will be an incentive for banks to take those assets, where the weightings are (unduly) generous, onto their balance sheet, (e.g. government debt⁸, mortgage lending), and to encourage the shift of those assets, where the weightings are unduly severe, (e.g. loans to large private-sector bodies), off the balance sheet. This latter has, of course, been facilitated by the development of new markets and instruments, such as swaps of various kinds. Much of the recent shifts in the structure of bank portfolios in countries such as the USA is in some large (but uncertain) part driven by regulatory arbitrage.

The Basle CARs concentrated initially on only this one kind of risk, credit risk. There are, however, many other kinds of risk, e.g. interest rate risk, liquidity risk, exchange rate risk, etc., etc., not to speak of risk of fraud. The current tendency of the authorities appears to be to stick with the building block approach, i.e. to assess each kind of risk separately, to measure the extent of each risk inherent in certain blocs of assets and/or liabilities, and to allow only limited and usually ad hoc offsets within and between blocs. Moreover, the capital requirements for these differing kinds of risk are, it appears, to be treated as additive, despite the fact that such different risks are not

⁸ Under the Maastricht Treaty, the European System of Central Banks is forbidden to finance their own public sector, government, entities directly. This implies that such bodies, including Central Governments, could now be forced into bankruptcy. It is remarkable that European Central Banks could simultaneously be involved in the preparation of the Maastricht Treaty, and at the same time maintain a zero credit risk weighting on government debt. There were, no doubt, some political sensitivities in coming to the latter decision.

necessarily positively correlated.

At the same time as the attempt to extend the Basle building-block approach to cover a wider range of risk is increasing the complexity of the system, and further weakening whatever intellectual underpinning it once may have had, the development of the derivatives markets has been allowing banks to adjust their overall positions, vis-à-vis certain of these risks, either to hedge or to speculate, very rapidly, often through a rebalancing of their off-balance sheet position. It has become much more difficult to assess a bank's overall riskiness from a snap-shot of its balance sheet; the interaction of on and off-balance sheet positions need to be properly reviewed; and the latter, if not the former, can be swiftly changed once the snap-shot has been taken, so the adequacy of the snap-shot itself as representative of a bank's 'normal' riskiness is subject to greater doubt.

Against this background there is an increasing chorus of voices arguing for a radical reconsideration and recasting of The Basle CAR approach. Thus the lead article in the July/August 1994 Financial Regulation Report, (Financial Times Business Information), has opined that:-

"The debate over regulating derivatives activities has highlighted the complexity of banks' risk-management techniques and the crudity of the existing (and proposed) Basle capital adequacy guidelines.

There is now a real issue as to whether regulators can hope to capture the risk profile of individual institutions through the application of simple, static capital rules and whether it might be better to leave the task of risk measurement to banks themselves.

It is against this background that Charles Taylor, Executive Director of the Group of Thirty, has proposed a radical overhaul of the way in which regulators approach their task. He argues in "A New Approach to Capital Adequacy for Banks", Centre for the Study of Financial Innovations, July 1994, that the present Basle régime is fundamentally flawed because it measures risk by focusing on the classification of instruments rather than risk types and by failing to take account of the sophisticated risk-management models currently employed by major financial institutions. As a result it discourages rather than promotes good risk management."

Many of the critical comments on the present regulatory system have suggested that, rather than attempt to impose a common, and inevitably simplistic, [since it must be capable of application to the smallest, least sophisticated banks], system of ratios, the supervisors should instead assess, and try to build on, banks' own risk management schemes, possibly with a fall-back system to be imposed on (small) banks with inadequate systems of their own. Thus, in the same Financial

Regulation Report, as above, Patrick Fell of Coopers & Lybrand argued that:-

"Historically most banks and brokers worldwide have had to comply with externally determined capital regimes which have little in common with the way in which management monitors risk. The obvious example is the Basle agreement framework, which looks only at credit risk, and even in this area applies a much more simple régime than that which banks should normally put in place.

In the last couple of years supervisors have started to focus on the growing complexity of instruments (notably derivatives) whose risks are far less susceptible to assessment through mechanistic techniques than, for example, simple lending business. Supervisors are beginning to realize that such risks can only be understood when viewed through the microscope of the firm's *own* risk management system. Use of any other less sophisticated approach merely gives a result which is incorrect (rather than one which is necessarily prudent).

In conclusion he states that:-

"The move towards the use of risk models for supervisory assessments and capital calculations is inevitable, and in general is highly to be recommended. Supervision and management control can then move along the same path, rather than along linked, but not necessarily parallel paths. Supervisors will have a greater incentive to encourage good management practice, while management will feel that supervisory compliance is not merely a bureaucratic overlay, but rather something which can assist the company in meeting its own control objectives"

Many of the senior officials involved in bank regulation, especially in the U.S.A., and reputedly including Alan Greenspan, are coming to the opinion that, rather than the Regulators trying to impose a common set of ratios on (all) banks *ex cathedra*, much more weight has to be placed on assessing, and seeking to build on and to improve, banks' own internal risk-control methods. Thus, in the Interview with Eugene Ludwig, the U.S. Comptroller of the Currency, in the Financial Times, July 29th, 1994 (p.12), it was noted that:-

"... his office has been trying to devise separate approaches for small community banks, and the large banks that operate sophisticated trading operations. The examiners will remain on-site at the latter, but will examine management controls and technology, not individual loans.

He supports the idea mooted by the Basle Committee of banking supervisors from the Group of Ten leading industrial nations, that banks should use their computer

models to allocate capital to cover the risks of trading securities and foreign exchange. "We are recognising the modern world, and taking advantage of a private sector capability.""

While trying to build on the basis of banks' own internal risk control models would seem preferable to attempting to impose a single, common and simplistic model from outside, nevertheless it is not sufficient. However good the (internal) control system may be, losses can still be made, and capital impaired⁹. In particular banks may fail to monitor and enforce their own internal risk management systems, however good these may be on paper. This appears to have been the problem in the case of Barings. The willingness of the Bank of England to see Barings fail, rather than bail it out, should help to reinforce in commercial bank managers' minds the importance of adequately maintaining their own internal control systems. Beyond that, it is difficult to see what lessons the Barings disaster may have for the external system of supervision and regulation. The external supervisor cannot possibly oversee all internal operations; to make the internal audit a formal document for presentation to the external supervisors would probably so change its very nature that there would be no advantage gained. A recent paper (March 1995) by Board, Goodhart, Power and Schoenmaker, prepared for the Select Committee on the Treasury and Civil Service of the House of Commons, on the regulation of derivatives in the light of the Barings collapse, discusses these issues at greater length.

So, however good a bank's own internal control system may be, serious losses can still be made. Once capital is impaired, the danger of loss, perhaps from the conscious assumption of riskier strategy by management, loss to depositors, deposit insurance or taxpayers, increases.

Thus, in addition to providing an outside overview, almost a form of consultancy, on banks' internal risk control models and methods, the supervisors will want to impose increasing constraints on bank activities *pari-passu* with a worsening decline in its capital, with a view to closure, or enforced take-over, before its capital is exhausted. For this purpose capital can be defined quite widely,

⁹ Moreover, some (small) banks may not have developed (sufficiently good) internal risk control models of their own. In such cases the supervisors will probably feel the need for a (relatively simple) fall-back risk control system which could be imposed on those banks. An adaptation of the present Basle system might fill such a need.

Alternatively there could be a (partial) private sector solution. Perhaps partly to prevent some less satisfactory and binding set of official control mechanisms, J.P. Morgans have made publicly and freely available their risk-metric system. It may be in the interests of large and successful private sector institutions to develop and to market proprietary risk control systems which smaller banks may be encouraged to adopt.

including subordinated debt, and should be measured, as far as possible, in terms of market or current (present) values, rather than at historical accounting cost.

Probably the best approach along these lines is the proposal developed by George Benston for Structured Early Intervention and Resolution (SEIR). In his 1993 paper, (published 1995) on 'Safety Nets and Moral Hazard in Banking', he wrote that:-

"Structured early intervention and resolution calls for explicit rules that govern when and how the bank supervisory authority first may and then must impose sanction should a bank's capital decline below prespecified percentages of total assets. Benston and Kaufman proposed this system in 1988*. Since then, it has been endorsed and improved by a panel of economists sponsored by the Brookings Institution[†], and by the Shadow Financial Regulatory Committee (1989). A modified version is included in the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA). In particular, FDICIA imposes lower capital/asset ratios and harsher penalties against bank officers for operating banks in an unsafe manner^{††}.

SEIR is based on the belief that banks would voluntarily maintain their non-burdensome capital or go out of business before their capital was depleted, if faced with prespecified sanctions. Should capital-short banks not take advantage of these options, the deposit insurance fund would incur but small losses if they were closed before their capital declined to the point where losses to the fund would exceed the banks' remaining capital. However, this point rarely should be reached, as structured early intervention mimics the actions that would be taken by market participants in the absence of deposit insurance, with one exception. Bank examinations would continue to be made (although less often for adequately capitalized banks), which should reduce losses from fraud and gross mis-management. With SEIR in place and capital measured at current values, banks can and should be permitted to provide any product or service, because bank owners would have sufficient capital to absorb almost all of the losses that might result.

[†] Brookings Institution Task Force (1989).

^{††} See Benston and Kaufman (1993) for a comparison of the proposal and the provisions of FDICIA.

* The Benston-Kaufman Proposal Bank capital should include equity and all debt that is explicitly not guaranteed by the deposit insurance agency or government and that cannot be redeemed by the bank before the supervisory agencies can act. Subordinated debentures with present maturities of at least one year fit this requirement. Capital should be measured in terms of the economic market values of a bank's assets and liabilities. However, the proposed scheme also can be effective when capital is measured according to traditional accounting values. [See Benston (1989b) for an analysis of the difference between traditional and current value accounting.]

Four explicit, predetermined ranges or tranches of capital-to-asset ratios are specified. [The material that follows is taken largely from the Shadow Financial Regulatory Committee (1989).] Assets include off-balance sheet accounts. Assets are not classified according to risk because of the difficulties in measuring ex ante risk accurately. The capital/asset ratios shown below are not based on research findings; hence, they are arbitrary. If traditional accounting values rather than current values are used to measure capital, the required ratios should be higher to compensate for overstated capital.

- (1) Banks are considered to have adequate capital when capital is, say, 10 per cent or more of their total assets, measured in terms of market or current values. Banks falling into this first tranche would be subject to minimum regulation and supervision.
- (2) Banks with capital-to-asset ratios of, say 6 to 9.9 per cent are at the first level of supervisory concern. A bank in this second tranche is subject to increased regulatory supervision and more frequent monitoring of its activities. It is required to submit a business plan to raise more capital. At its discretion, the bank supervisory authority could require the bank to suspend dividend payments and obtain approval before transferring funds within a holding company system and could restrict the bank's asset growth.
- (3) The third tranche is the second level of supervisory concern; it is reached when a bank's capital ratio falls below 6 per cent and is at least 3 per cent. Banks in this range are subject to intense regulatory supervision and monitoring. The supervisory authority is required to suspend dividends, interest payments on subordinated debt, and unapproved outflows of funds to the bank's parent or affiliates. The institution must submit an emergency plan for its immediate recapitalization to the tranche one level.
- (4) When a bank's capital falls below 3 percent of its assets, it is in tranche four -- mandatory recapitalization and reorganization. The supervisory authority is required to quickly recapitalize the bank, merge it, or liquidate it in an orderly fashion by the sale of individual assets. The present owners and subordinated debt holders (who might, by then, be the owners) have two options; they may implement quickly the plan submitted when the institution moved into tranche three, or they could elect not to inject additional funds into the bank. If the owners and debt holders chose not to recapitalize the bank, any residual value from its sale or liquidation of its assets would be returned to them, after allowing for costs incurred.

In conclusion, the complexity and range of different strategies made possible for banks by the advent of information technology, new instruments and markets (e.g. derivatives), and competitive pressures on many fronts, have made it almost impossible to construct a single model or mechanism for risk control that is applicable to all banks. Instead, the authorities should seek to build on, and support, banks' own individual internal risk control models and systems, imposing an alternative, simplistic model from outside only when they can demonstrate that a bank's own internal risk control system is unsatisfactory. Even with a good internal risk control system in place, banks may, from time to time, find their capital impaired. In such cases the authorities should bring a structured early intervention and resolution mechanism into play, based on a simple ratio of capital to assets (marked to market value).

BIBLIOGRAPHY

Benston, G.J. (1993), 'Safety Nets and Moral Hazard in Banking', paper presented at the Bank of Japan Conference, Tokyo, Oct 28-29, on Financial Stability in a Changing Environment, now published, eds. K. Sawamoto, Z. Nakajima and H. Taguchi, (Macmillan: London, 1995).

Board, J., Goodhart, C., Power, M. and Schoenmaker, D., (1995), 'Derivatives Regulation', LSE Financial Markets Group, Special Paper No. 70, (March); also presented to House of Commons Select Committee of the Civil Service and the Treasury enquiry into the regulation of financial derivatives.

Dale, R. (1994), 'The Regulation of Investment Firms in the European Union', Department of Accounting, University of Southampton, draft Working Paper, July.

Dominguez, K. and Frankel, J. (1990) 'Does Foreign Exchange Intervention Matter? Disentangling the Portfolio and Expectations Effect for the Mark', NBER Working Paper, No. 3299, March.

Dominguez, K. and Frankel, J. (1993) Intervention Policy Reconsidered (Washington, D.C.: Institute for International Economics).

Edison, H.I. (1990) 'Foreign Currency Operations: An Annotated Bibliography'. International Finance Discussion Papers of the Board of Governors, No. 380.

Eichengreen, B., Rose, A. and Wyplosz, C. (1994), 'Is there a Safe Passage to EMU? Evidence from the Markets', paper presented at the Perugia Conference, July 1-2, on Microstructure of Foreign Exchange Markets, organized by J. Frankel, G. Galli and A. Giovannini, (proceedings forthcoming).

Fell, P. (1994), 'Capital Adequacy' Financial Regulation Report, Financial Times Business Information, July/August: 2-7.

Financial Regulation Report, (1994) 'Re-casting financial regulation', Financial Regulation Report, Financial Times Business Information, July/August: 1-2.

Garber, P. and Spencer, M. (1994) 'Dynamic Hedging and the Interest Rate Defense', paper presented at the Perugia Conference, July 1-2, on Microstructure of Foreign Exchange Markets, organized by J. Frankel, G. Galli and A. Giovannini, (proceedings forthcoming).

Goodhart, C.A.E. (1989) '"News" and the Foreign Exchange Market,' Manchester Statistical Society, pamphlet, October 17.

Goodhart, C.A.E. (1993) 'Can we improve the structure of financial systems?', European Economic Review 37 (2/3) (April): 269-91.

Goodhart, C.A.E. (1994) 'What should Central Banks do? What should be their macroeconomic objectives and operations?' Economic Journal, Vol. 104, No. 427, November, pp 1424-1436.

Goodhart, C.A.E., Ito T. and Payne R. (1994) 'One day in June 1993: A study of the Working of Reuters 2000-2 Electronic Foreign Exchange Trading System', paper presented at Perugia Conference July 1-2 on Microstructure of Foreign Exchange Markets, organised by J. Frankel, G. Galli and A. Giovannini, (proceedings forthcoming).

Goodhart, C.A.E. and O'Hara, M. (1995), 'High Frequency Data in Financial Markets', Paper presented at Olsen & Associates Conference in Zurich, March.

Goodhart, C.A.E. and Viñals, J. (1994), 'Strategy and Tactics of Monetary Policy: Examples from Europe and the Antipodes', paper presented at the Federal Reserve Bank of Boston Conference at Cape Cod on June 20-21 on Goals, Guidelines and Constraints Facing Monetary Policymakers, now published, ed. J.C. Fuhrer, (1995), Federal Reserve Bank of Boston, Conference Series, # 38.

Kindleberger, C.P. (1989) Manias, Panics and Crashes, 2nd Edition (London: Macmillan).

Ludwig, E. (1994), Interview in Financial Times, July 29:12.

McCallum, B.T. (1993a), 'Specification and Analysis of a Monetary Policy Rule for Japan', Bank of Japan Monetary and Economic Studies, 11:1-45.

McCallum, B.T. (1993b) 'Monetary Policy Rules and Financial Stability', paper presented at Bank of Japan Conference, Tokyo, Oct 28/29, on Financial Stability in a Changing Environment, now published, eds. K. Sawamoto, Z. Nakajima and H. Taguchi (London: Macmillan, 1995).

Monticelli, C. and Viñals, J. (1993) 'European Monetary Policy in Stage 3: What are the issues?' in The Monetary Future of Europe, eds. de la Dehesa et al. (London: Centre for Economic Policy Research, Chapter 11); and also CEPR Occasional Paper (12), March 1993.

Morgenstern, O. (1959) International Financial Transactions and Business Cycles, National Bureau of Economic Research, (Princeton, N.J.: Princeton University Press).

Sawamoto, K., Nakajima, Z. and Taguchi, H., eds., (1995), Financial Stability in a Changing Environment, Proceedings of a Bank of Japan Conference held in Tokyo, 1993, (London: Macmillan).

Scott, H.S. and Iwahara, S. (1994), 'In search of a level playing field: The implementation of the Basle Capital Accord in Japan and the United States', Group of Thirty, Occasional Paper, # 46, (Washington, D.C.: Group of Thirty).

Sprague, O.M.W. (1910) History of Crises under the National Banking System, National Monetary Commission (Sixty First Congress, Second Session, Senate Doc # 538; Washington, D.C; Government Printing Office).

Taylor, C. (1994), 'A New Approach to Capital Adequacy for Banks', Centre for the Study of Financial Innovations, London, July.