

Performance measurement and real estate lending risk

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1. Introduction

Real estate's complicity in financial crises has been recognised as far back as the South Sea bubble (Kindleberger (2001)). In the late 1990s, the "Asian Crisis" added many more graphic illustrations to the history of interlocking credit booms and real estate price bubbles in the upswing, followed by the prolonged and damaging impacts of prolonged real estate slumps on the capital adequacy of banks, the availability of credit, and general economic growth.

Through the last decade, the dangerous interdependence between real estate cycles and financial systems has been extensively documented in the real estate literature (for general reviews, see Renaud (1995), Herring and Wachter (1999), European Central Bank (2000), Quigley (2001), Mera and Renaud (2000)). Among real estate specialists, there is a fair degree of consensus as to how positive feedback loops from real estate markets to bank lending generate systemic risks, and how those risks may be amplified by failings in bank governance or financial regulation. At the extreme, real estate has been accorded a fundamental and primary role in Japan's protracted financial crisis and economic stagnation through the 1990s (Mera (2000)).

As long-time observers of the real estate industry, with no qualifications to comment on banking or international finance, our primary point of interest is the real estate cycle itself. Since, in mature economies, real estate (widely defined to incorporate construction, management, rental flows) may account for as much as 15% of GDP, it is like any other major activity in industry in which destabilising booms and slumps are undesirable. Given the lumpiness and long-term nature of real estate investment, the misallocation of resources through bursts of irrational exuberance and subsequent under-utilisation may indeed be especially undesirable.

Within the real estate domain, our primary interest is in the linkage between information and the functioning of the market. On that issue, this paper picks up the policy prescription to be found at the end of most previous reviews of the subject - the suggestion that better monitoring and understanding of real estate markets can make an important contribution to avoiding financial crises in future.

The paper is organised in three parts. Section 2 is a discussion of the linkage between real estate cycles and debt finance. It is intended as a synthesis rather than any advance on existing depictions, and is set out primarily to identify those points of the process on which improved information might, in principle, offer the most effective counter-cyclical tools. In the course of that search, we also make some broad comparisons of the violence of the real estate cycles across a range of markets.

Section 3 moves on from the "what is to be monitored" to "how can we most effectively monitor". Based on experience from a range of countries, it explains how a reliable and cost-effective system of performance measurement and monitoring can be set up, and suggests how such a system impacts upon the behaviour of the real estate sector.

2. Real estate cycles and lending cycles

This section first sets up the "standard model" of connected real estate and bank lending cycles, which run through initial rental triggers to swings in real estate values and development rates, and then into

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the balance sheets of both borrowers and lenders. For brevity, we will call this phenomenon the “real estate credit cycle”. Appendix Table 1 lists the main recent instances of such cycles, with clean-up costs running from 1% to over 30% of GDP. These examples have provided the case studies from which the authors cited in the introduction have drawn the consensus analysis which we also follow.

2.1 The credit cycle

In schematic form (below), the standard model can be split into four major elements - economic drivers in the first column, and the fundamental real estate cycle, and bank lending to real estate set out in the second and third columns. These tendencies may be taken to apply in all markets in all periods. A reading of the literature suggests that the most severe and disruptive real estate credit cycles have come about in the presence of other conditioning factors summarised in the fourth column - factors destabilising the structure of real estate capital markets, or failures in the way in which they are regulated.

Table 1

Real estate cycles and banks

The economy	Real estate	Banking	Added factors
Early upswing: low interest rates, rising demand.	High vacancy. Flat rents from last cycle Falling vacancy rents rise, yields fall. Building upswing. Supply shortages, spike in rents, fall in yields. Boom in development starts.	Low r/e debt.	Pro-cyclical planning/ development controls/ taxation. Slack monetary policy/credit controls. Failures in regulation and supervision. Financial deregulation. Emergence of non-bank financial intermediaries.
Upswing quickens. Rapid rise in demand. Upturn in inflation.	Vacancies rise, rents tail off, yields rise.	Value of bank assets and collateral on existing r/e loans improves. Rising loan book. Competition raises LTV, reduces margins. Ballooning loan book.	
Economic peak. High inflation and rising interest rates. Demand contracts.	Spike in building completions. Rents plummet, yields rise. Fire sales by distressed borrowers and banks.	Value of assets and collateral falls. Bad debts rise. Credit squeeze. Foreclosures and work outs.	
Recession.			

To amplify the schematic picture, the following paragraphs work through its main elements. For illustration, Figures 1 to 6 plot the evolution of a classic real estate credit cycle, the boom and bust in the London office market of the late 1980s/early 1990s. This market does not provide a dramatic example of financial crisis (which was mild and well contained), but is a case for which all the main parameters of the cycle can be tracked reasonably well.

The fundamental driver is fluctuation in the growth rate of the economy - the business cycle - and the amplification of those swings in property demand into larger fluctuations in rental prices. This is a simple cobweb or hog-cycle effect, familiar to students of introductory economics. It is generated by the inevitable planning and construction lag between demand and supply for additions to the real estate stock. In the London case, an economic upswing coupled with deregulation and restructuring of financial markets (known locally as the Big Bang), drove a surge in employment in Financial and Business Services (FBS). From 1985 to 1989, the employment growth was four times its average over the previous 15 years; in 1988 the 56,000 rise in employment was six times that long-run average.

Converted to floorspace (assuming 13 m² per new job), net new demand for office stock in that peak year would have been 728,000 m² against a long-run average of 117,000 m².

Surging demand was followed by an upswing in new office construction. Through the five years to end-1990, the rate of development (measured by value of building contracts adjusted for building cost inflation) was 2.6 times its average over the previous 15 years. In the peak year for building starts - 1998 - development was 3.6 times that long-run average. After lagging the employment upswing in the mid-1980s, most of the development catch-up came in 1987, with double the rate of construction starts of 1985.

At the peak, development starts were quite closely tuned to the turning point in employment growth. Development dropped by 28% between 1988 and 1990 while FBS employment was still expanding, albeit at a reduced rate of 11,000 jobs a year. But, allowing for a completion lag of two years (as shown in Figure 1), the boom in starts through 1987-1988 translated into a peak in completions in 1989-90 as employment growth weakened, before heading for a net loss of 70,000 jobs through 1991-92.

Rental and capital values (Figure 2) form the price signals which mediate between demand and development. In real estate markets, the stickiness of rental prices which prevent market-clearing in the short run (Grenadier (1995)), and supply lags which create cobweb effects in the long run, can create particularly abrupt movements in real estate asset values.

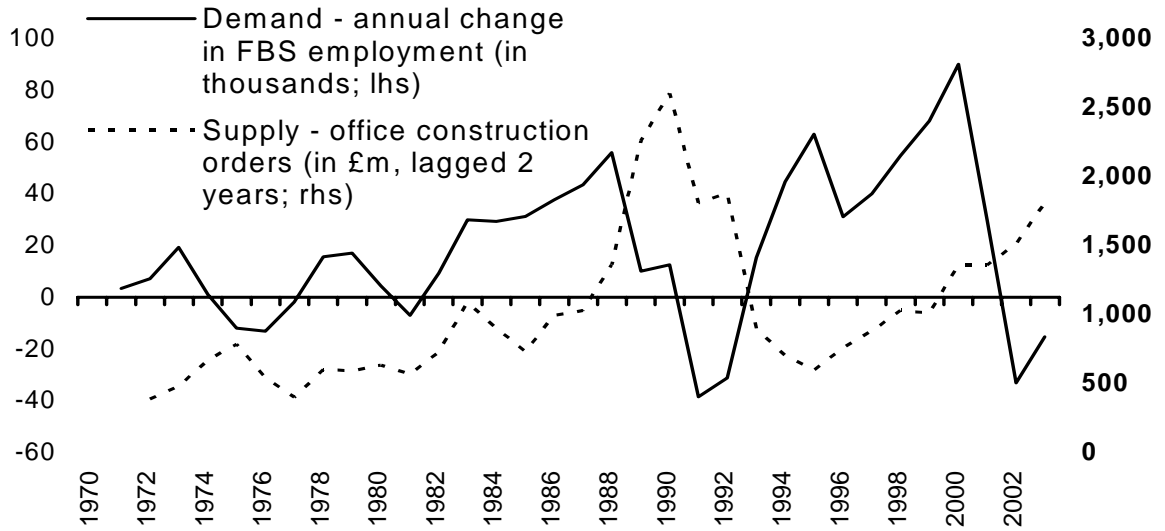
As the chart illustrates, the initial surge in London FBS employment and office demand in the middle-1980s had little impact on rental or capital prices. Through the first two years of the employment surge, rental values rose by only 2%-3% per year, rising to 7% in the third year, as the hike in demand was absorbed by surplus stock left over from the previous recession. In real terms, rental values fell through those three years. Rental value growth ran ahead of inflation only as market slack was absorbed, hitting 14% in 1986 then rising abruptly by 30% in 1987 and 27% in 1988. In micro-economic terminology, the initial rise in demand was absorbed by market slack at a rental reservation price, followed by a rental spike when occupancy reached the capacity of the existing stock and new supply became totally inelastic through the period of the development lag.

Under these conditions, an earlier price-moderating supply response may not occur because there is no strong rental signal in the early phases of the upswing. Indeed, if initial rental prices have fallen well below the minimum required to support new development (the cost of construction and finance plus the opportunity cost of sites set by the next-best use), a development upturn may be delayed until the rental spike at full-occupancy (Hendershott (1995)).

Yield pricing may add a further stage of amplification to the cycle in real estate capital values. If the rental upswing is interpreted as a signal of higher long-run rental growth, a mark-down in yields would raise capital values further over the spike in rental values. Figure 2 shows this factor did not apply to London offices in the late 1980s. Yields moved very little, and the shift in capital values did no more than track the rental spike. (In fact, since bond yields fell by 100 basis points from 1986 to 1988, it is more likely than rental growth expectations were being revised down rather than up.)

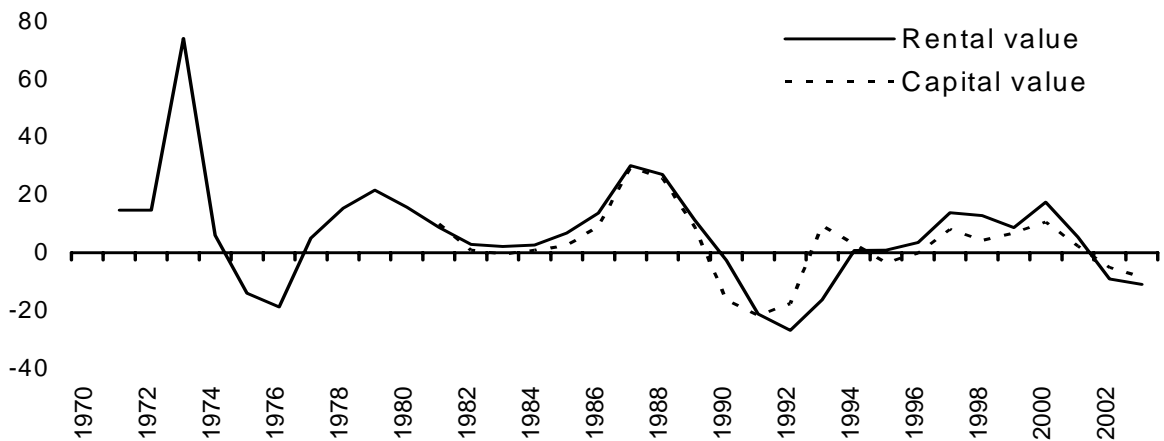
The downswing of the real estate cycle depicted in the charts needs little elaboration. FBS employment swung from a gain of 99,000 through 1987-88 to a loss of 70,000 in 1991-92. Office development completions reach an historic peak in 1990 and ran on at a high level through the employment slump, before collapsing to 40% of the peak level in 1993. Rental values fell by 3% in 1990, despite continued modest growth in FBS employment, then by a cumulative 50% over the following three years.

Figure 1
London office demand/supply indicators



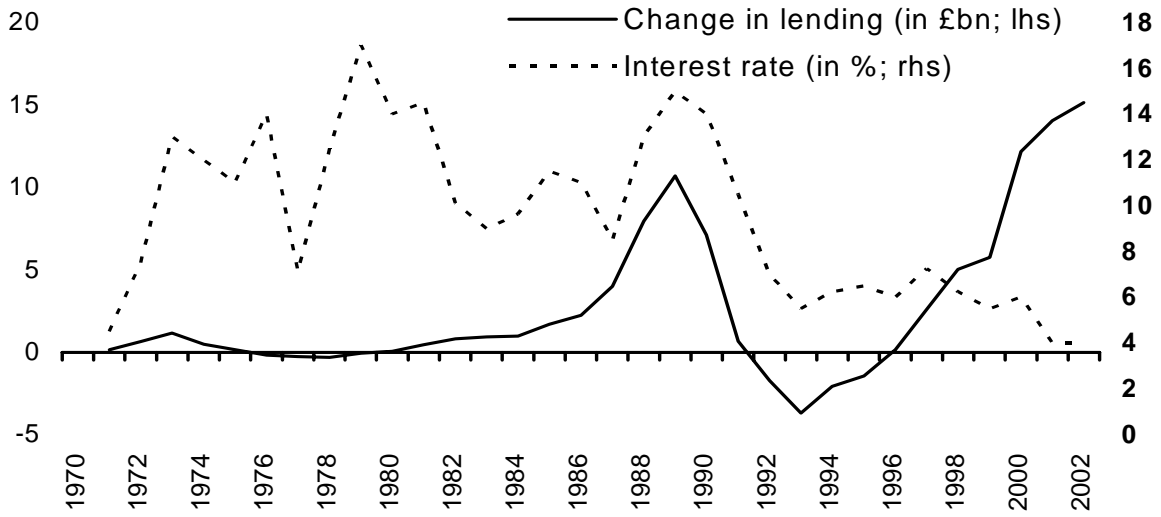
Source: UK Office for National Statistics.

Figure 2
London office market rentals and capital values
 Annual percentage changes



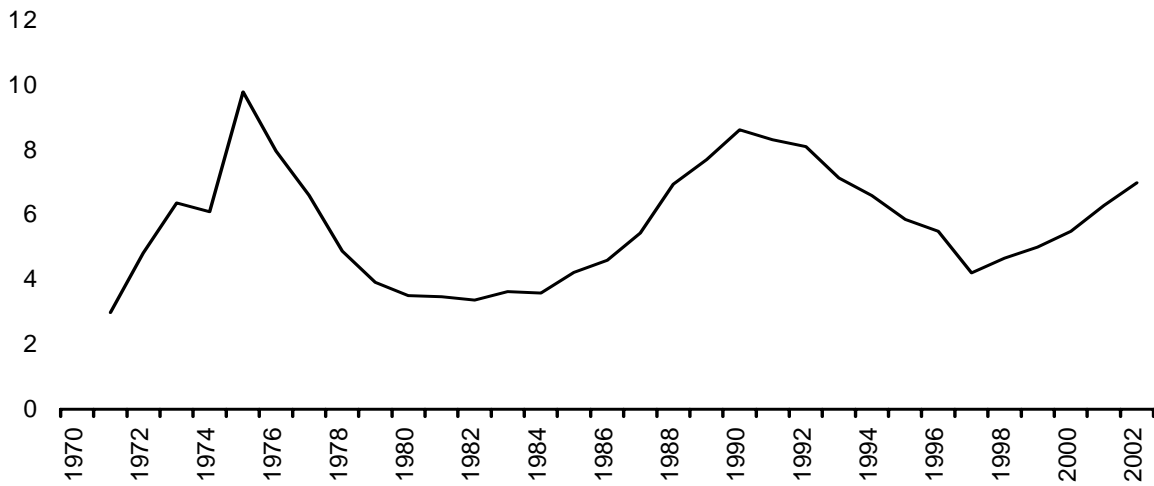
Source: IPD.

Figure 3
UK bank lending on real estate and interest rate



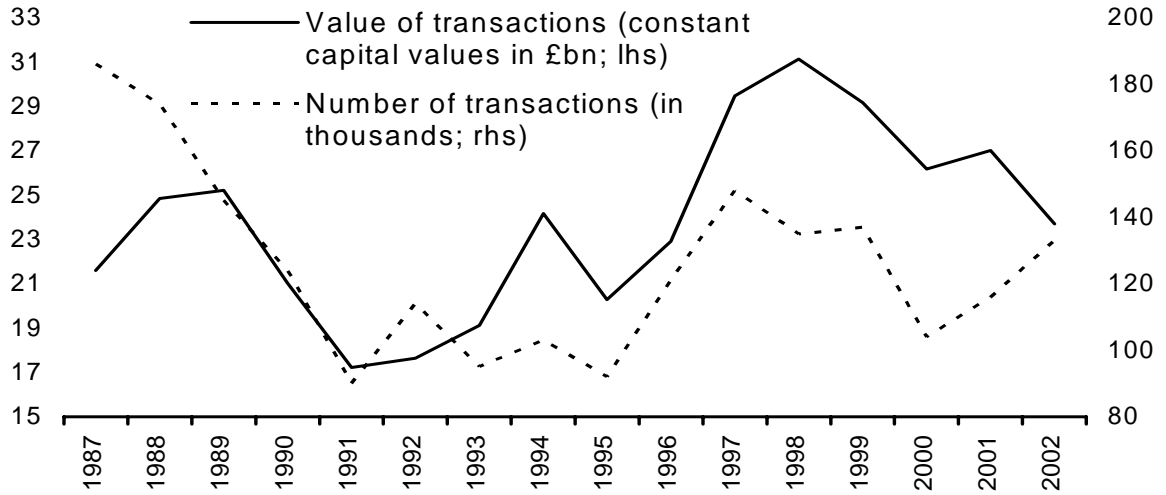
Source: Bank of England.

Figure 4
UK real estate lending
 As a percentage of total bank lending



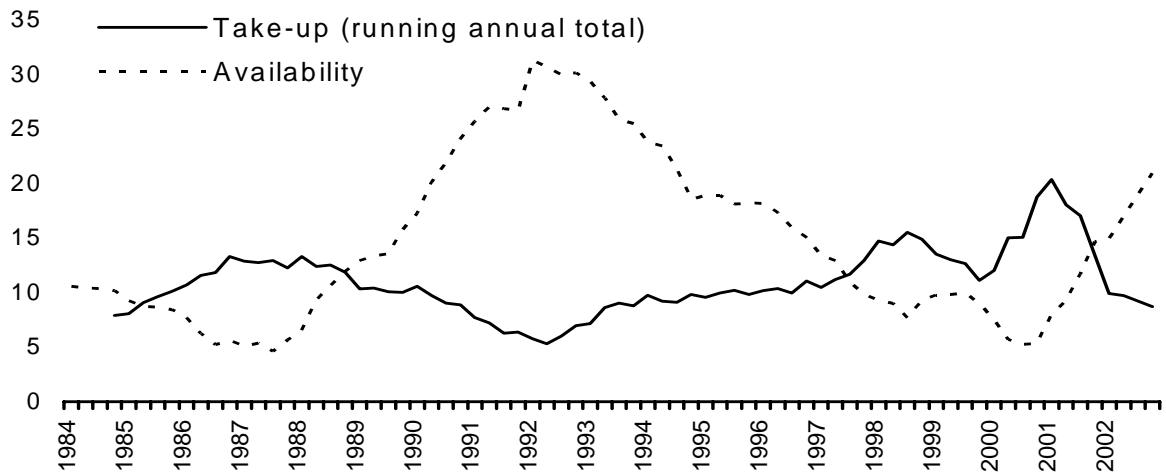
Source: Bank of England.

Figure 5
England and Wales commercial market liquidity



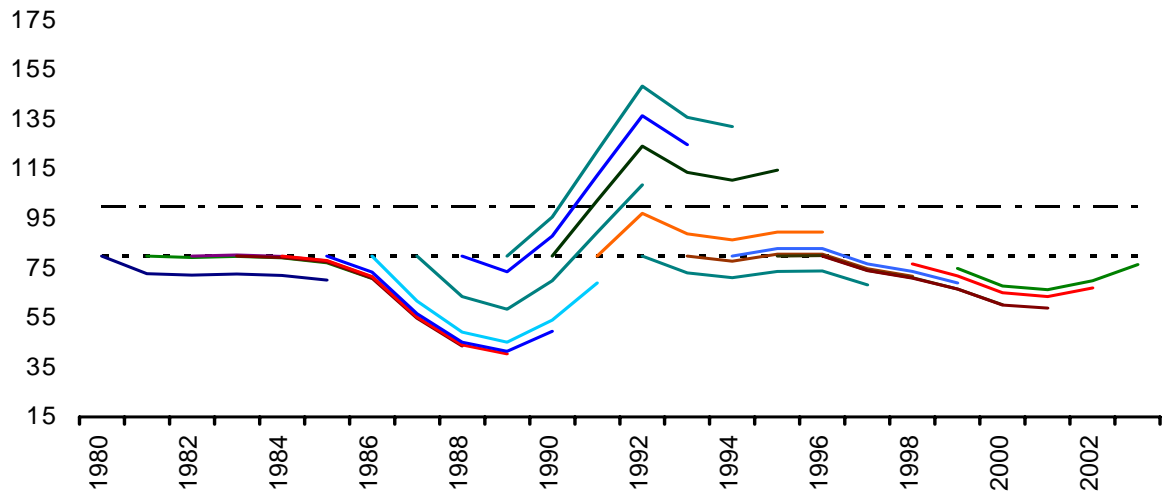
Source: UK Inland Revenue.

Figure 6
Central London office take-up and availability
 In millions of sq ft



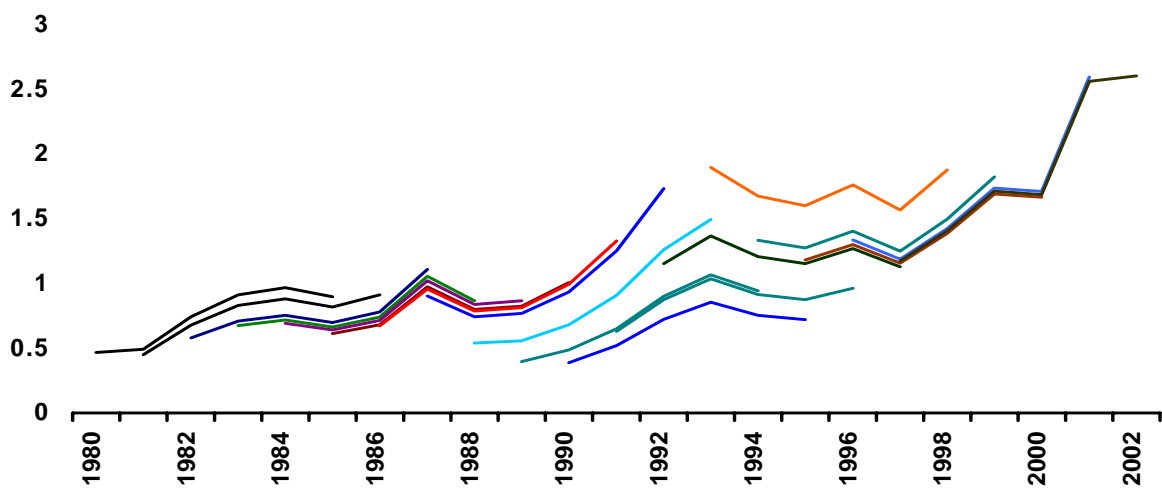
Source: CB Richard Ellis.

Figure 7
London office loan to value
 By year of origination



Sources: UK Office for National Statistics; IPD estimates.

Figure 8
London office debt service coverage
 By year of origination



Sources: UK Office for National Statistics; IPD estimates.

Yields moved out in the first year of rental fall, but moved in again by roughly the same amount in the final year of rental decline. As in the upswing, therefore, changes in yields added little to the severity of the rental cycle, with a peak to trough fall in capital values close to 50%.

Mechanical and ex-post descriptions of real estate cycles may convey the implication that they are fairly predictable. Quite apart from the unpredictability of the macroeconomic demand-side drivers, the internal mechanics of cycles are highly sensitive to many initial conditions. The extent of initial vacancy, the relationships between the reservation price in a slack market, the rent at minimum replacement cost, and the costs of construction and finance will all influence the path of rentals and building through an individual cycle. (A glance at the later sections of the London office market charts is enough to show that, despite a larger demand surge, the building cycle of the late 1990s has had a very different character.)

The literature on real estate cycles, furthermore, adds more counts on which successive rental cycles may be highly irregular and unpredictable. An interaction between development lags of around 2-3 years and a classic business cycle in demand of 4-5 years may result in a tendency for alternating strong and weak development cycles, with major booms created gluts which satisfy much of the demand in a subsequent cycle. Short-period demand-supply cycles may also interact with longer-period asset-replacement cycles, or longer waves in urban and technological development. In the long-run, evidence from the United Kingdom suggests that major, classic cycles like that described in the London office market may be fairly low-frequency events, interspersed with long periods in which cycles are muted or quiescent (Barras (1994)).

Real estate cycles are linked into the banking system through the asset prices determined by both rental prices and capitalisation rates. The standard model of real estate credit cycles suggests debt flows and lending rules may add a further layer of amplification to the fundamental real estate cycle. An upswing in rentals and asset prices, first of all, improves the credit quality of existing loan books collateralised against real estate: their loan to value (LTV) ratios, debt service coverage ratios (DSC), default rates and losses on default will all improve, and reduce the risk in the banks balance sheets. To the extent that banks themselves are significant owners of real estate, they will see a more direct improvement in their balance sheet positions.

An increased capacity to lend comes at a point when further lending to real estate looks particularly attractive, as projects realised in the early stages of the upswing show high profits and sound loan quality. Through an upswing, as rental and capital prices accelerate, demand from real estate owners seeking to borrow against the rising values of their assets, or developers seeking to launch new projects, will encounter banks with a high capability and willingness to lend. Both the strong trends in real estate prices and competition between lenders may, indeed, lead them to relax lending criteria - higher LTV and lower DSC ratios, reduced margins and so on.

Though UK statistics do not run to specific figures on lending against London offices, Figure 3 shows how overall bank lending to real estate companies responded to the real estate cycle. In 1980, total real estate debt stood at GBP 2.2 billion - a low point reached following a debt burn-off in the mid-1970s. By the end of the decade, debt had multiplied by a factor of 17. In 1989 alone, the GBP 11 bn rise in debt was more than five times the total of outstanding loans at the start of the 1980s. Banks had more than doubled their exposure to real estate - to 9% of total lending in 1990 - although this was still a little way off the peak reached in the previous cycle.

Though there are no rigorous measures of the lending terms on which this balloon of debt was being advanced, accounts of the period are replete with descriptions of the "generosity" of banks toward property, with non-recourse lending and off-balance sheet financing taken as commonplace (Goobey (1993)).

At this point, there is the risk of a purely speculative cycle fed by feedback between rising asset prices and rising availability of credit which in turn increases the demand for real estate assets. A purely speculative market, which has become detached from the fundamentals of demand and supply in the occupier market, might be indicated by an extreme divergence between rental prices and asset values - in other words, a fall in capitalisation rates is unlikely to be supported by long-term rental prospects. In the London market, positive feedback did not extend quite this far. Yield pricing effectively endorsed heady rates of rental appreciation as durable, rather than temporary as they appear with the benefit of hindsight.

Positive feedback loops between real estate asset prices and bank credit are, of course, likely to turn sharply negative around the peak of the economic cycle. At the macro-economic level, interest rates

may be rising to choke off overheating, increasing the cost of variable rate debt or the ultimate refinancing cost of fixed rate debt. Within the real estate market, occupancy and rentals stop growing and may fall, while capitalisation rates are rising. Falling real estate asset prices and/or incomes push loans into technical default. Forced disposals by distressed borrowers, foreclosures on non-performing loans by banks, bankruptcies among developers whose schemes have failed to find occupiers and whose lines of credit have been cut off may all contribute to the classic downward spiral in asset prices and availability of credit. Given a severe impact of real estate losses and provisions on banks' capital adequacy, a credit-crunch limits lending to all forms of borrowers, and itself deepens the economic downturn.

In the London office market, the deceleration and downswing was rapid. After coming off the peak in 1989, rental values fell by 3% in 1990, and capital values by 16%, with further falls of 43% and 36% respectively through the following two years. Financing and refinancing difficulties were exacerbated by a rise in short-term interest rates from 8.5% in 1987 to 15% in 1989 - although the hike was fairly short-lived, with rates back down to 5.5% by 1993. Despite the crash in the market (reflected, though less dramatically, throughout the other UK property markets), real estate debt continued to rise until well into the downturn, growing by GBP 8 bn (24%) through 1989 and 1990 when the real estate downturn was well-established. A further twist to the tail of distressed borrowers came with a fall in market liquidity (Figure 5), with a 50% fall in the number of commercial property transactions between 1987 and 1991.

The progress of the cycle can also be tracked through the direct measures of market conditions typically produced by brokers. Figure 6, for example, shows that rates of take up fell by nearly two-thirds from peak to trough, while the combined fall in demand and surge in supply raised availability by a factor of six.

The denouement to the story of the London office market was, as would be expected, disastrous for the UK real estate industry. There was a string of bankruptcies among developers and traders - most notably that of Olympia & York, developers of Canary Wharf. Ten-year rates of return on UK real estate investment fell below the risk-free rate in 1991 for the first time in their history, and stayed there almost to the end of the decade. Institutional weightings in real estate were slashed from 12% in 1989 to 5% ten years later. Rental and capital values for London offices are, a decade on from the slump, still around 30% below their 1989 levels in *nominal* terms.

Despite the severity of the collapse, the impacts on the banking sector were, in this case, serious but not critical. There were no bank failures (as there were at the equivalent point in the 1970s), and no government-assisted bail outs. All major lenders were, unsurprisingly, drawn into protracted work outs - again most notably at Canary Wharf, taken over by a consortium of its lenders - which hauled back outstanding real estate debt by GBP 9 billion (13%) through the first half of the 1990s. Although the most exposed UK lenders were undoubtedly seriously strained by the scale of their real estate write-downs and provisions, the shocks were absorbed internally, without any public intervention or bail-outs.

2.2 Impacts on loan quality

Taking data used in the last section, we can estimate how the quality of loans advanced against London offices changed through the cycle. Figure 7 shows how a five-year loan originated each year at 80% loan to value (LTV) ratio would have changed in collateralisation through its life, assuming the underlying property followed IPD's average London office capital value. For simplicity, no provision is made for either amortisation or total outstanding value of debt including interest charges. Using IPD figures to represent the underlying asset simulates a loan against institutional grade properties, largely let, and secured by upward-only rent reviews.

The chart highlights the "comfort zone" for lenders in the run up to the cycle. All loans advanced before 1987 - only a year from the market peak - would have at least maintained the initial LTV ratios. Those issued in 1987 would have shown a 100% LTV in 1992. Loans issued in 1989 would have deteriorated to an average LTV of 150% by 1992. On average, all loans originated between 1987 and 1991 would have been in breach of initial lending terms at some point in their life. On average, all loans issued from 1987 to 1990 would have been in technical default - LTVs of more than 100% - at some point in their life.

An extension of this simulation to loans against each of the individual IPD properties in the Central London office market suggests that 96% of all loans issued in 1989 would have been in technical default by 1992, with an average loss on default against original advances of 30%.

This measure suggests a far larger disaster for borrowers and lenders than turned out to be the case. A simulation of the debt service coverage ratio (DSC) for loans originated each year (Figure 8) helps explain why. Here we have estimated the DSC for loans at 80% LTV assuming variable lending at 150 bp above short-rates, given the initial income cover provided by average income return on IPD London offices at the point of origination, and changes in that cover generated by average net income growth through the life of the loan.

Given the crash in rental values through the slump, the results may seem counter-intuitive. Throughout the 1980s, the balance between real estate income return (averaging 6%) and borrowing costs (averaging 13% and never below 10%) held initial DCS's on our assumptions to levels between 0.5 and 1 - ratios which would certainly not be held as prudent in today's market. In an inflationary environment, lending assumed rental and capital appreciation would cover the advances. Even for loans originated at the peak of the cycle saw no more than a mild deterioration from their initial DSC ratios (inadequate though they may have been). Even advances at the peak of the cycle achieved *improved* DSC ratios from their initial condition through the life of the loan.

The UK's long leases and upward-only rent reviews - clearly an international anomaly, and now in a process of decay - gave lenders a far larger degree of comfort on income security than would apply in other markets. This underpinning meant that average net incomes fell by no more than 2% in the worst year of the slump, and by no more than 8% between 1991 and 1995. That stability in income for investment (clearly not development) properties, coupled with a halving in floating-rate interest charges from 15.5% in 1990 to 1993 meant that income cover eased through the worst years of the slump, and encouraged long debt work outs rather than fire sales and the lenders' preferred solution to market stress. (Even for fixed rate loans, DSC ratios would have remained constant for loans issued at the peak of the cycle.)

The plot of DSC's also gives a very clear illustration of the dramatic shift in character of real estate lending in the 1990s from that in the 1980s. With, in 2002, London office income returns at 6.5%, and borrowing rates at 5.5%, a loan at 80% LTV against the average let property offers an initial DSC ratio close to 1.5. Rising incomes and falling borrowing costs since the mid-1990s have set DSC ratios on recent advances rocketing - and provided the primary point on which bankers can claim that even more spectacular rises in real estate debt since the mid-1990s is well-secured. (Whether or not that claim survives the prospect of higher interest rates and soft lettings markets when those advances need to be refinanced remains to be seen.)

2.3 Some international comparisons

The London office market has been used as an exemplar of the real estate credit cycle because it is one for which a fairly full set of the relevant indicators is available. As an exemplar, it lacks the drama of a real banking crisis as conclusion. Where such a crisis did occur in the early 1990s, accounts tend to stress the extreme movements in real estate asset values as an ineluctable cause.

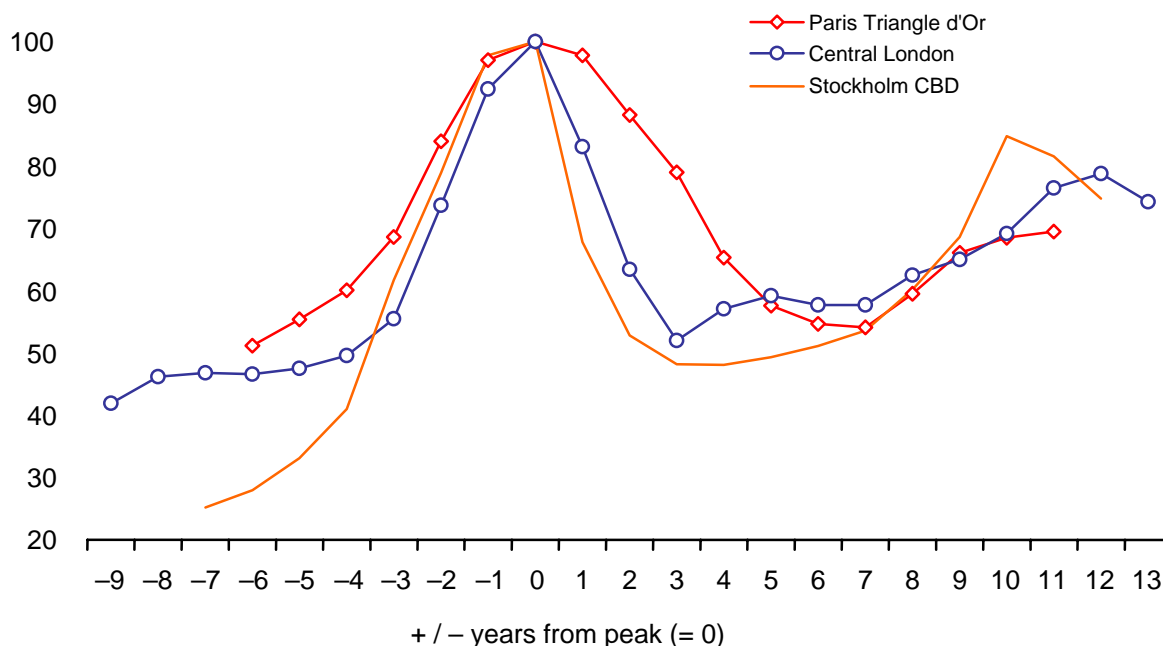
Figure 9 compares the movements in office capital values in two other European markets, aside from Central London, where there were much more severe knock-on effects on the banking system - a systemic crisis in Sweden, more contained but serious problems centred on Credit Lyonnais in France. For the dominant core office markets in each country, capital values are indexed to 100 at their peak year (falling in 1989 in London, 1990 in Stockholm and 1991 in Paris). It does not appear that the range in severity of financial problems across the three countries were a simple product of differences in the amplitude of their real estate cycles. In the run-up to the peak, all three markets saw asset values rise by at least 100%. Though with differences in duration, their downswings saw around 50% wiped off peak capital values.

As others have observed, whether or not real estate cycles ramify into financial crises depends less on their severity than on a range of conditioning or contributory factors (Herring and Wachter (1999)). Within the real estate domain, history is likely to be particularly important. Where there has been a long run of rising real estate asset values, without significant shocks within the recall of market actors and lenders, "disaster myopia" is more likely to take hold in the upswing of a major cycle. In this respect, the United Kingdom had the advantage of a major London office development cycle and banking crisis in the early 1970s to restrain market exuberance (perhaps evident in stable rather than

falling yields through the upswing), and sharpen the attention of bank regulators. It is also highly probable that shorter leases in Sweden and France did not afford the same coverage to debt charges as in the United Kingdom.

Figure 9
IPD office capital values

Index peak year = 100



3. The role of performance measurement

A description of the real estate credit cycle has been given at some length not primarily for its intrinsic interest, but to establish the point that there are many indicators which can be used to track the course of real estate markets, their linkages with fundamental economic drivers and with real estate credit. As other analyses have concluded, at least with the benefit of hindsight, simple monitoring key indicators for real estate markets and the banking system could go a long way towards increasing sensitivity to the risks of real estate credit cycles.

The policy prescriptions suggested in the literature may be classified under three main headings:

- First, improved monitoring and understanding of real estate markets themselves - to pick up phenomena such as spikes in development rates, rental values and asset values.
- Second, improvements in the breadth and depth of real estate capital markets, to create a range of investment vehicles and investor interests to diversify the exposure to risk flowing from the cycles, and reduce the probability of liquidity collapses in market downturns.
- Third, improvements in the governance and oversight of lenders to cut out bad lending practices.

The remainder of this paper will focus on the first two of these points, in particular the multiple contributions of well-founded performance measurement systems to both greater transparency and greater maturity in real estate capital markets. The next section sets out the essential features of a robust performance measurement system for real estate markets, followed by the effects we believe such systems can have on the behaviour of those markets.

3.1 Real estate performance measurement

Objective measurement of real estate markets is, of course, much harder to achieve than for the other asset classes which dominate the base of institutional and private investor portfolios. Real estate markets lack a central “trading floor” through which transactions information flows (despite the growing use of internet-based information and trading systems for both leasing and capital transactions). Even if a central location through which deals were realised existed, the low liquidity and high heterogeneity of non-residential real estate makes it implausible that transactions flows alone can give a consistent and reliable picture of fundamental trends in the market. Information which is available to actors in the market - either as principals or intermediaries - is, moreover, commonly regarded as commercially sensitive, creating barriers to information-sharing and a suspicion (unjustified or otherwise) that what information is released by such participants is open to manipulation to serve their own interests.

Under these conditions, we believe a credible real estate performance measurement system has to rest on the following central principles:

- Drawing its primary data from the most comprehensive and accurate store of information on real estate markets - the building by building records of major real estate investors who uniquely have a strong interest in complete, accurate cash flow and value information across a large fraction of the property stock.
- Credibility in the marketplace arising from an independent status, and strict adherence to an “open standard” on control of data quality, rigour in performance measurement, and objectivity in interpretation.
- A close engagement with major investors and intermediaries in the market to secure a commitment to data sharing, and an industry-wide effort to define measurement standards.

The fundamental need, in mature real estate markets, for systems with these characteristics is demonstrated by the fact that they have emerged in almost 20 countries, by a variety of routes, and in the majority of cases within the last 10 years (Table 2). In the main, these services are operated by Investment Property Databank, a UK-based commercial provider (in association with local partner organisations in most countries, often involving trade associations of property owners). Those originating from other sources - PCA in Australia, KTI in Finland, NCREIF in the USA - are based on industry associations rather than a commercial service. Though the financing basis varies, all providers follow the same approach on the essential features listed above.

In terms of procedure, these systems again share a common approach:

- A large-scale data-assembly process, drawing large volumes of building-level information from the accounting, management and valuation systems of property owners at least once a year - a process which inevitably involves some commitment of resources from both the suppliers and processors of data, though at costs which can increasingly be reduced by automated data transfer.
- An intermediate stage of quality control and data processing, with a wide range of controls to trap errors and ensure consistency in reporting, and to build up from individual building records measures of real estate performance which can be sub-divided by building type, owner, location etc.
- The delivery of outputs ranging from “headline” indices of overall real estate returns for comparison with equities, bonds and other investments through the analysis of components of those returns (capital appreciation, income return, rental values and incomes, yields and yield movements) for individual markets, to benchmarking and portfolio analytic services to individual real estate investors.

Generally,³ the charges made for the outputs of these systems are sufficient to cover their costs of operation.

³ Further information on the methods and outputs of these performance measurement services is available from www.ipdindex.co.uk, www.ncreif.org, <http://www.kti.fi/eng>, <http://www.propertyoz.com.au>, and <http://www.propertynz.co.nz>.

Table 2

Real estate performance measurement systems

Country	Supplier	Index starts in:	No of investments
Australia	Property Council of Australia	1985	n/a
Canada	Investment Property Databank	1984	1,000
Denmark	Investment Property Databank	2000	1,700
France	Investment Property Databank	1986	3,600
Germany	Investment Property Databank	1996	3,600
Ireland	Investment Property Databank	1984	330
Italy	Investment Property Databank	..	370
Finland	Finnish Institute for Real Estate Economics	1998	2,200
Netherlands	Investment Property Databank	1976	6,700
New Zealand	Property Council of New Zealand	1989	320
Norway	Investment Property Databank	2000	350
Portugal	Investment Property Databank	2000	250
Spain	Investment Property Databank	2000	250
South Africa	Investment Property Databank	1995	1,900
Sweden	Investment Property Databank	1983	2,400
Switzerland	Investment Property Databank	..	1,600
United Kingdom	Investment Property Databank	1971	14,000
United States	National Council of Real Estate Investment Fiduciaries	1978	3,800

3.2 Applications: market monitoring

Section 2 used IPD rental and capital value series on one market - London offices to track the real estate cycle. This is a specific illustration of a general case: a robust and widely-based performance measurement system brings to real estate markets the transparency which equity and bond indices convey to other asset classes.

This benefit accrues at all levels. A top level "all-property" index provides for each national market the basis for comparison of returns and risks across asset classes, and the inputs to quantitative models of asset allocations across asset classes. Similarly, on a global scale, a headline index allows the comparison of performance characteristics across countries, and the basis for international portfolio diversification increasingly being pursued by major investors.

Within national markets, performance measurement is the basis for the on-going analysis of markets that drives development and investment decisions, and for econometric forecasting of rental values, yields, capital values and returns. In the United Kingdom, where real estate performance measurement is perhaps most extensive and most widely used, the IPD system can track the key components of value and return over more than 20 years from all-property level down to (for example) individual retail markets in 170 cities and towns, and within major cities down to individual streets and postal codes. Table 3 is an example a standard performance history, for offices in the West End of London.

Table 3

UK IPD West End office performance 1981-2002

Annual percentage changes (for the continuous yield index, 1988 = 100)

	Total return	Income return	Capital growth	Rental value growth	Yield impact	Income structure residual	Equivalent yield	Continuous yield index
1981	16.7	5.9	10.8	7.4	4.3	-1.3	7.6	95.8
1982	4.8	5.5	-0.7	1.2	-3.6	1.7	7.7	99.4
1983	3.8	5.8	-2.0	-0.3	-2.5	0.8	7.9	102.0
1984	7.1	6.4	0.7	2.8	-2.1	0.0	8.1	104.2
1985	9.8	6.8	3.0	5.8	-2.3	-0.4	8.1	106.6
1986	15.6	6.9	8.7	11.6	-0.9	-1.9	8.2	107.5
1987	37.7	7.4	30.3	29.1	4.3	-4.4	7.9	103.1
1988	45	7	38	40	3	-6	8	100
1989	20.8	4.9	15.8	18.1	0.4	-2.8	7.5	100.0
1990	-9.2	4.3	-13.5	-2.4	-12.4	1.0	8.6	114.1
1991	-18.1	5.3	-23.4	-22.9	-12.6	9.2	9.8	130.6
1992	-13.0	7.3	-20.3	-28.1	-7.1	12.9	10.4	140.5
1993	20.5	10.6	9.9	-14.0	21.4	5.5	8.6	115.8
1994	13.3	8.1	5.2	1.0	7.7	-3.6	8.1	107.5
1995	5.1	7.2	-2.1	3.7	-2.4	-3.3	7.8	110.2
1996	9.7	7.4	2.3	5.5	0.0	-3.2	7.7	110.1
1997	17	7	9	14	3	-8	7	107
1998	13.1	6.9	6.3	12.9	-0.1	-6.6	7.4	107.1
1999	16.0	6.9	9.1	11.5	0.6	-3.1	7.4	106.4
2000	19.0	6.7	12.3	20.0	-2.5	-4.7	7.6	109.2
2001	7.8	6.1	1.6	4.9	-2.1	-1.1	7.8	111.5
2002	2.3	6.0	-3.7	-8.3	2.7	2.1	7.6	108.6

Performance measurement systems, though primarily focused on equity rather than debt-financed investments, can be adapted to cast light on the relative levels of risk in development as against let properties, in the market risks of different types of building and location, and the specific risk arising from the deviation of individual buildings from market averages.

Figure 10 indicates overall returns and risks for let properties and development properties in the Central London office market. Overall, developments have a mean return above let buildings (11.3% p.a. against 9.9% p.a.), with close to double the risk (a standard deviation of 21.6% p.a. against 13.4% p.a.). For a specific period, Figure 11 shows the building specific risk around the market average for let properties, showing that 25% of properties saw capital values fall by more than 60% against the average of 40%. These results (allied with further indicators for rental values and capital values), built into forecasting models, can provide input to simulations of loan security for different types of lending, different markets, and different numbers of loans.

Figure 10

**IPD Central London offices -
let versus development properties**

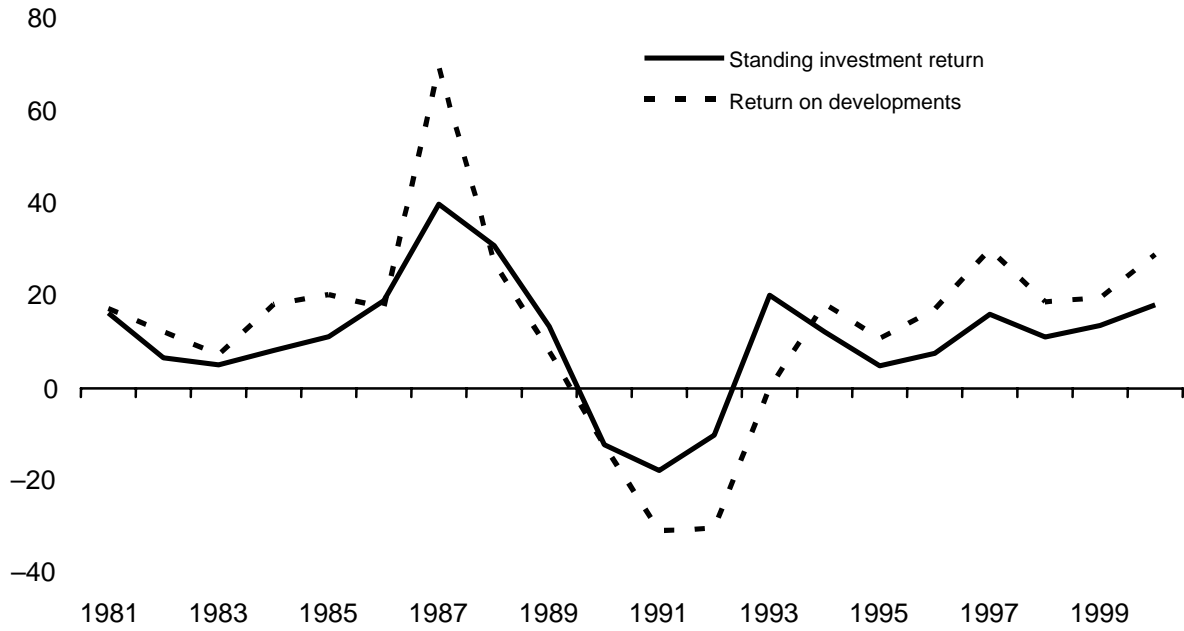
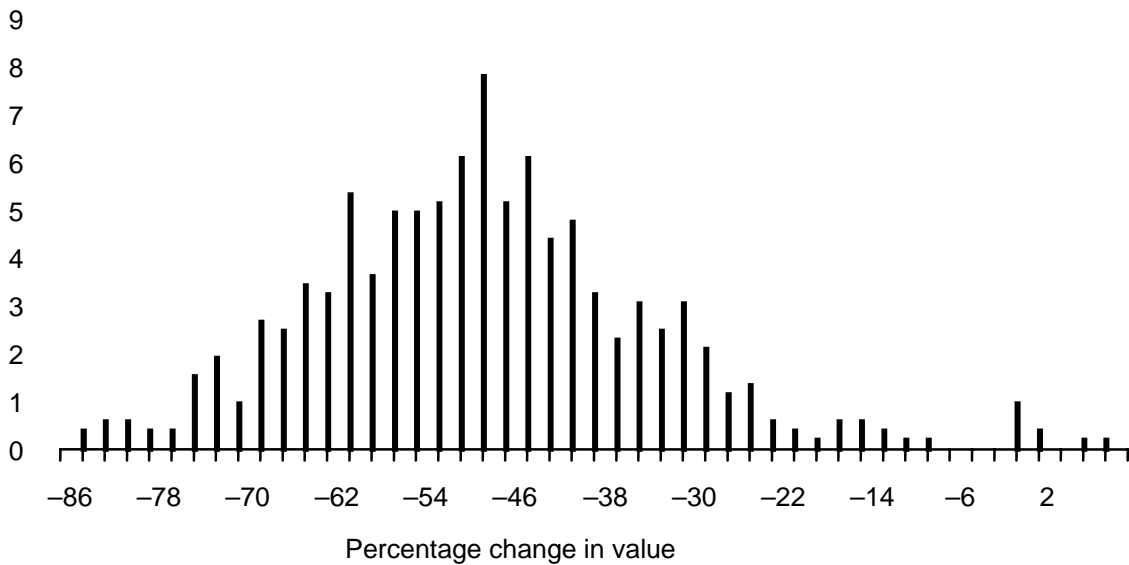


Figure 11

**IPD Central London offices -
distribution of capital growth**

As a percentage of total building, 1989-92



3.3 Performance measurement and professional practice

Benefits from performance measurement to the quality of professional practice are most obvious in investor relations and fund management. As in any asset class, the existence of general market performance indices and manager benchmarks can provide the foundation for decisions on manager selection, and a rational basis for performance-related rewards. These can be regarded as part of the outputs of a performance measurement system.

There are less obvious but equally important benefits from performance measurement on the input side of the process, and in particular on the quality of appraisals (in UK terminology, valuations). Unreliable or inconsistent appraisals undermine the foundations of investment or lending in real estate. Even in many of the more mature European real estate markets, the appraisal industry is not subject to standards of educational qualification, professional accreditation or regulation, or testing in courts as in the United States and the United Kingdom.

In these countries, the establishment of performance measurement systems has given a strong impetus to the codification, standardisation and scrutiny of appraisal practice. In the development phases, it has typically been the case that panels of investors and appraisers have been formed to produce guidelines for the appraisals to be supplied to the system - covering methodology, the required qualifications of appraisers, and the supporting evidence to be supplied. In countries such as the Netherlands, Sweden, and France, this has been the first time that standardised appraisal guidelines have been adopted across the investment industry. In these guidelines, specific appraisal methods (whether income capitalisation, discounted cash flow or comparable sales) are of less concern than adherence to an underlying principle of open market value, consistency of practice across investors, and the provision of sufficient supporting evidence (current and prospective cash flows, yields applied) to justify the calculation of value.

The beneficial interplay between performance measurement and appraisal practice does not end with codification. The process itself raises the status of regular appraisals of entire portfolios. Where previously such appraisals may have been conducted only to meet accounting or regulatory requirements, with performance measurement they become a principal basis for investment decisions, client reporting and (perhaps) the determination of performance related rewards. As with any information source, increased usage of the data for real management decisions will raise the attention paid to the appraisal process by both investors and valuers.

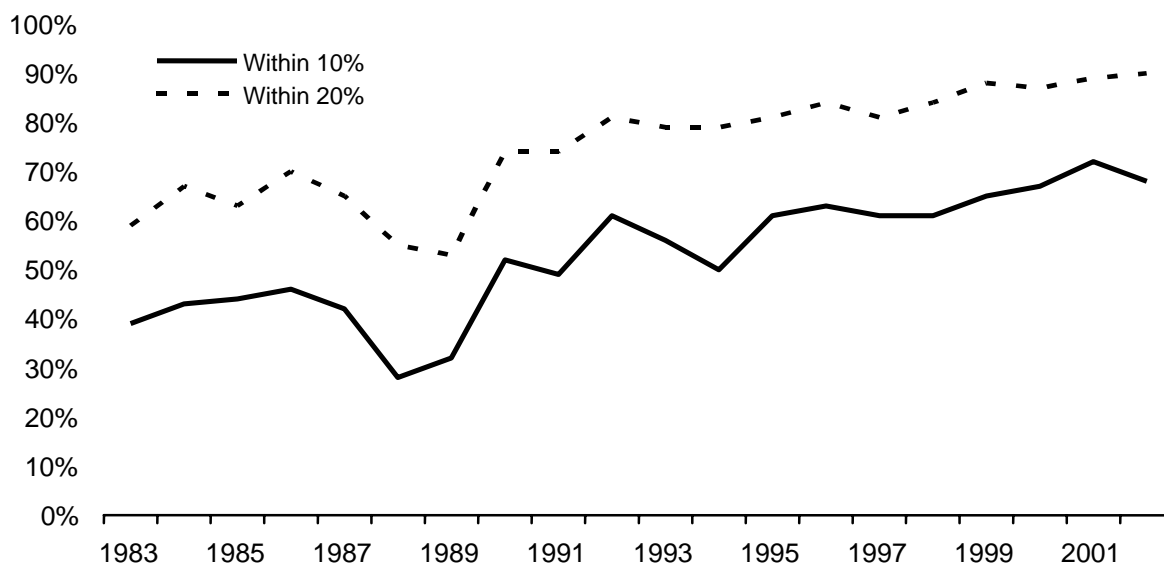
Even beyond that, a performance measurement system is in itself a tool through which many features of appraisals themselves can be documented and analysed. At a descriptive level, IPD's records give a unique account of how appraisals are done in different markets, and the assumptions on which the calculations of value rest.

Fuller analysis can extend the scrutiny of appraisals to key industry issues like the "accuracy" of appraisals measured against subsequent sales prices (Mokrane (2002)). In several countries, performance measurement systems are being actively used by the appraisal profession to increase transparency, raise confidence and improve practice in the appraisal process. Even in the United Kingdom, where appraisal standards are long-established and highly regulated, the Carsberg Committee of The Royal Institution of Chartered Surveyors has recommended that annual reviews of appraisal ranges and accuracy against sales prices should be drawn from IPD's performance measurement records, to produce a rigorous assessment of appraisal accuracy (illustrated in Figure 12), and "benchmarks" against which further improvements in practice can be measured.

In short, credible and consistent appraisals are a critical input to a reliable real estate performance measurement system. But the creation and operation of such a system itself creates both strong pressures and a mechanism through which the appraisal process becomes more transparent, credible and consistent.

Figure 12

Percentage of UK valuations within 10% and 20% of their sale price



3.4 Performance measurement and capital markets

Broader and deeper real estate capital markets clearly have a role to play in reducing the risk of real estate credit cycles. Widening the range of investors and vehicles through which they can invest may make it more likely that there will be differing views on the market through the cycle, and that capital will continue to be available through downswings in the market. A narrow base of local institutional capital and bank debt undoubtedly contributed to the depth of the early 1990s crisis in some markets (eg Sweden). Inflows of foreign investment also played an important role in recapitalising distressed markets in other countries (eg German investors into the United Kingdom, and US investors into France) in trough of that cycle.

For real estate lenders, the possibility of securitisation through Mortgage Backed Securities (MBS) offers a direct means of reducing exposure to the real estate cycle. Some commentators suggest that the transparency and discipline of the large CMBS market created in the US since the early 1990s may account for the absence of a serious debt-funded overbuilding through the “missing” real estate cycle of the late 1990s (Zhu (2002)). Others suggest that derivative instruments would offer a mechanism through which the risks of real estate cycles could be more accurately priced and diversified (Shiller (1998)).

The possibility of broadening and deepening capital markets in these ways depends to varying degrees on the existence of robust, generally accepted measures of real estate investment performance. At its broadest, improved information on investor returns is, in principle, likely to increase the volume and reduce the cost of capital by removing uncertainty. On an international scale, for example, some global investors have made the existence of real estate indices and local benchmarks a pre-condition for investment in a national market.

More specifically, the availability of standardised performance measurement and benchmarks has become essential infrastructure for effective markets in investment vehicles, either public or private. In Europe, the European Public Real Estate Association (EPRA) and the European Association for Investors in Non-Listed Real Estate Vehicles (INREV) have followed the long-standing example of the US National Association of Real Estate Investment Trusts (NAREIT) in placing an emphasis on codes of performance measurement, standardised investor reporting and robust indices high on their agenda.

Derivative instruments, opening the way to hedging and diversification of risk from market principles to wider public markets, are the final stamp of maturity and sophistication in any investment market. They are also the ultimate test for a real estate performance measurement system, since regulators and capital markets have to accept the credibility and reliability of the indices on which derivatives rest.⁴

3.5 Adaptation to emergent markets

In summary, experience from a large and growing number of countries demonstrates the feasibility of building credible real estate performance measurement systems. The ramifications of such systems go well beyond the immediate function of market monitoring - which can be served by less extensive systems such as the rent and yield "barometers" typically produced by firms of brokers. In the most mature markets, performance measurement systems have been a powerful agent not only for establishing overall market performance, but also for increased transparency and sophistication in fund management, appraisal practice, and the structure of capital markets. We would argue that the *process* of establishing and operating a sound performance measurement system, and not just the outputs of the system, makes an important contribution to those benefits.

It has been easiest to set up performance measurement systems in markets where there is a well-established base of long-term equity investors (especially institutional investors) who can provide both the source data for a system and the demand for its services. Regular open-market appraisals, conducted to a high professional standard, might be regarded as the second necessary pre-condition for such a system.

For transitional and emergent real estate markets, the risks of real estate credit cycles are likely to be greater. Faster economic growth raises the rate at which stocks of real estate have to be incremented, and the severity of any downward shock on growth rates and market surpluses. At the same time, national and local government agencies may be anxious to maintain a ready supply of real estate to support growth and inward investment, and less inclined to support real estate values through planning controls.

In the absence of one or both of a developed institutional market and a strong appraisal practice, it may appear that the approach to real estate performance measurement set out in this paper is premature. It is certainly the case that a system cannot aim for the same extent of market coverage and length of time series as in more mature markets, so that the performance measurement *outputs* of the system are less valuable.

A performance measurement culture is, however, already spreading to relatively immature real estate markets in developed economies - such as Southern Europe and Japan. In these instances, the base and demand for performance measurement is likely to arise either from overseas investors, or through the creation of new real estate investment vehicles such as unitised funds or listed trusts, which require international standards of measurement and benchmarking. In their early stages, the *process* benefits of these performance measurement systems - establishing a commitment to market transparency, setting standards for accounting and appraisals - are as strong as in more mature markets. They establish the information infrastructure and industry culture from which longer-term improvements in maturity will flow - perhaps surprisingly quickly. Given the presence of significant international investment across many emergent markets in Central and Eastern Europe and South East Asia, and the strong interest in the creation of information-driven investment vehicles in those markets, the initial basis for viable performance measurement exists in a much larger number of countries than are currently covered.

⁴ In this area, the United Kingdom has a well-established lead through Property Index Certificates and Property Index Forwards, based on IPD's UK Monthly Index and which have been available since the mid-1990s - the first ever synthetic instrument in real estate.

4. Summary

The paper has aimed to establish three main points.

First, through an account of the UK real estate credit cycle of the late 1980s/early 1990s, to demonstrate that the key elements of such cycles can be quite easily tracked. Ramps and spikes in indicators of fundamental real estate demand, rental and capital pricing, and volumes of lending look like valuable warning indicators of rising real estate credit risk. As applied in Section 2, general real estate market information can be adapted to estimate market and specific risk for real estate lenders.

Second, we suggest that real estate performance measurement systems can play a critical role in the development of mature real estate markets. This goes beyond their primary ostensible purpose as an information source for direct participants in the real estate market. The process of creating performance measurement systems itself lends impetus to improvements in real estate management, and especially to the quality and credibility of appraisals.

Third, performance measurement systems create the primary information inputs on which broader and deeper real estate capital markets can be based. Ultimately, the solution to real estate credit risks is not the rationing of credit by regulators. Given the highly unpredictable nature of the real estate cycle, and its changes in character from one cycle to the next, such interventions will run a high probability of mis-timing. A market-based solution rests in an improved understanding and pricing of real estate risk, and the availability of instruments which allow those risks to be appropriately distributed. In the long-run, the greatest value of credible measures of real estate values and returns will rest on their critical role in the development of these markets.

Appendix 1: Real estate and banking crises - a selective listing

Financial crisis/stress	Consequences	Contributory factors
1973-75 UK secondary banks. Speculative development boom, largely in London offices.	Rash of failures and weakness among secondary banks. Bail out by group of clearing banks at a total cost of GBP 1.2 billion, equivalent to half their shareholder's equity, or 1.5% of GDP.	Preceding planning restrictions on supply. Extreme credit boom. Financial intermediaries.
1984-91 USA Savings and Loans. Speculative development boom in South West.	1,400 savings and loans, 1,300 banks failed. Clean up costs estimated at USD 180 bn, 3.2% of GDP.	Inexperienced lenders through deregulation of savings and loans. Moral hazard through deposit insurance.
1987-93 Norway. Bank crisis.	State took control of three largest banks with 85% of banking system assets. Recapitalisation costs estimated at 5%-8% of GDP.	Combined oil boom and problem real estate loans.
1991 Swedish banks. Lending boom for domestic and overseas investment/development.	Two of six major banks, 22% of banking system assets, insolvent. Three further banks in difficulty. Non performing real estate in special vehicles. State recapitalisation costs estimated at 4%-6% of GDP.	Deregulation of domestic and international investment. Credit boom. Financial intermediaries.
1991-94 Finland. Savings bank crises.	State took control of three banks accounting for 31% of bank deposits. Non performing real estate in special vehicles. Recapitalisation costs estimated at 11%-15% of GDP.	As Sweden.
1990s-ongoing Japan. Systemic banking crisis.	Non performing loans estimated at up to 25% of GDP. Bank nationalisations, closures, mergers. Clean up costs by late 1990s around 12% of GDP. Liquidation of intermediaries (Jusen) at a cost of USD 6.3 bn.	Long preceding land price boom. Special real estate financial intermediaries (Jusen). Moral hazard through state support for large banks.
Mid-1990s France. Bank crisis.	Stress bordering on insolvency in several major banks. Range of government support measures, final costs estimated at the equivalent of 1% of GDP.	Unreliable valuations. Bank exposure to real estate through shareholdings in development and construction subsidiaries.
1997-2000 Asian crisis, Malaysia, Thailand, Korea ... Systemic banking crises linking asset price and real estate bubbles with foreign capital flows.	Malaysia: two banks insolvent, non-performing loans 25-35% of banking system assets. Thailand: state intervention in 70 finance companies and six banks. Non-performing loans 46% of total loans. Net losses equivalent to 42% of GDP. Korea: Two banks nationalised, 5 closed, 7 under special supervision. Non-performing loans 30-40% of total. Fiscal costs estimated at 34% of GDP.	Long preceding land price booms. Extreme credit booms and deregulation of international capital flows. Financial intermediaries (especially Thailand).

Source: Mostly from Barth, Caprio and Levene, *Banking systems around the world*, World Bank.

References

- Barras, R (1994): "Property and the economic cycle: building cycles revisited", *Journal of Property Research*, 11, pp 183-97.
- European Central Bank (2000): *Asset Prices and Banking Stability*.
- Goobey, A R (1993): *Bricks and Mortals: The Dream of the 80s and the Nightmare of the 90s - the Inside Story of the Property World*, Random House Business Books.
- Grenadier, S (1995): "Valuing lease contracts: a real options approach", *Journal of Financial Economics*, 38, 297-331.
- Hendershott, P (1995): "The use of equilibrium models in real estate research", The Cutting Edge Conference, 351- 58, London, RICS.
- Herring, R and S Wachter (1999): "Real Estate Booms and Banking Busts", *Wharton Financial Institutions Centre Working Paper*, 27.
- Kindleberger, C (2001): *Manias, Panics and Crashes*, Wiley Investment Classics.
- Mera, K and B Renaud (eds) (2000): *Asia's Financial Crisis and the Role of Real Estate*, M E Sharpe.
- Mera, K (2000): "Land Price Ascent and Government Response in Japan", in K Mera and B Renaud (eds), op cit.
- Mokrane, M (2002): *A New Methodology for Testing Property Valuation Accuracy and Consistency*, paper to European Real Estate Society 9th Annual Conference, Glasgow.
- Quigley, J (2001): "Real Estate and the Asian Crisis", *Journal of Housing Economics*, 10, 129-61.
- Renaud, B (1995): "The 1985-94 Global Real Estate Cycle", *World Bank Policy Research Working Paper*.
- Shiller, R (1998): *Macro Markets: Creating Institutions for Managing Societies Largest Economic Risks*, Oxford University Press.
- Zhu, H (2002): "The case of the missing real estate cycle", *BIS Quarterly Review*, September.