

Obtaining real estate data: criteria, difficulties and limitations

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Ever since a major section in its 60th Annual Report, the Bank for International Settlements has collected data on residential and commercial property prices. These have been consistently published in “raw” form in its Annual Reports, or been used for various studies in the BIS Economic or Working Papers series, and, more recently, the Quarterly Review. This paper examines the criteria used for collecting such data, the difficulties encountered in compiling them as well as their limitations.

Introduction

In June 1989, the Bank for International Settlements (BIS), in its 59th Annual Report,² correlated, in graphical form, the p/e ratio of the Tokyo stock market with the inflation-adjusted price of commercial real estate (land) in six major Japanese cities, noting that Japanese corporations held, at the time, a considerable amount of land. A year later, the BIS devoted a whole section on property markets in its Annual Report,³ and this was to lead to fairly regular annual publication of the data it had collected in this field. By also correlating both residential and commercial property prices with equity prices in the same section, it was the forerunner for its work on aggregate asset prices.⁴ This paper examines the criteria behind collecting and evaluating the data for these real estate data, the difficulties encountered in compiling them as well as the various limitations to the data.

The criteria

There are, generally speaking, for most areas of international data collection, six criteria which need to be satisfied from a statistical viewpoint:⁵ regular availability, representativeness, homogenous comparability, unbroken and unchanging description, length of series and data frequency.⁶ In a perfect world, data would be always available for all countries under review, have identical measurement parameters, not have any breaks in series, go back to an identical (distant) starting point and, finally, be available on a monthly basis. Alas, the art of statistics (at least in this field) has been to overcome the imperfections found in the real world!

Indeed, the IMF established, in 1996, the Special Data Dissemination Standard (SDDS) to “guide members that have, or that might seek, access to international capital markets in the provision of their economic and financial data to the public. Both the General Data Dissemination System (GDDS)⁷ and

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² BIS (1989): Chapter IV, pp 81-2, *59th Annual Report*, June.

³ BIS (1990): Chapter IV, “Property markets”, pp 102-10, *60th Annual Report*, June.

⁴ See also “Experience with constructing composite asset price indices” by the author later in this volume.

⁵ Such a viewpoint may, incidentally, differ from that of an economist who is involved in a one-off piece of research.

⁶ Timeliness is also, usually, an important, if not the most important, criterion for a statistician, but it is not considered here due to the nature of the data. It should nevertheless not be ignored, since even real estate data which is several years out of date is of limited use.

⁷ Established in 1997 (author).

the SDDS are expected to enhance the availability of timely and comprehensive statistics and therefore contribute to the pursuit of sound macroeconomic policies; the SDDS is also expected to contribute to the improved functioning of financial markets.” The subsequent creation, also by the IMF, of the Data Quality Reference Site (DQRS) is intended to, *inter alia*, “foster a common understanding of data quality”.

Regular availability

First and foremost, data of some sort must be available, and, equally important, be regularly updated. It is therefore only of limited use to the statistician to find a (one-off) piece of research containing data: the best that can be hoped for is that the original data sources are given and that such data can be provided by these sources on a regular basis. Unfortunately, for international institutions such as the BIS, such data collection often has to rely on the goodwill and understanding of a commercial data provider or real estate association, and experience has shown that it is here that the greatest likelihood in the disruption in the flow of data can occur.⁸ What sort of data is ideally sought is often tempered by what is found.

By the early 1990s, the BIS had already managed to contact several national statistical institutions and private real estate associations⁹ and was able to publish data illustrating the development in residential and commercial real estate for more than a dozen capital cities.¹⁰ Although this was an important starting point, the obvious disadvantages of such a localised focus required further work.¹¹ In addition, the close correlation between office rents and commercial property prices observed in the 1970s and the early 1980s ended with the office property boom observed in many countries in the late 1980s (and the equally dramatic subsequent decline less than a decade later). The Bank therefore approached other data providers, or went back to its earlier sources, to enquire what else was available.

Representativeness

Data should be representative of present day values, but this is indeed a delicate issue. Just as it is no longer relevant in the industrial countries to include the price of a horse in its consumer price index under the sub-category transport, the price of a house will no longer include an outside toilet,¹² but will probably have several bathrooms, of which at least one may be en suite. Similarly, today’s offices will have IT facilities which were in the realms of science fiction a generation ago. Such “upgrades” to indices is common and correct, but what is seen to be representative in one country may well not be the case in another. With 80% home ownership in Spain, for example, any property survey will reveal a very different distribution of types of dwellings to one conducted in a country like Switzerland, where the majority of the population chooses to remain in rented flats. The distribution of the price of these dwellings will also vary accordingly and affect a resultant global index. Equally, amenities will differ

⁸ Caused, for example, by a change in company policy or by the takeover by another company with a different data dissemination policy.

⁹ *Inter alia*, National Association of Realtors (United States), National Land Bureau (Japan), Ring Deutscher Makler (Germany), Building Societies Association and Department of the Environment (United Kingdom), Associazione Italiana Consulenti Immobiliari (Italy), AN-HYP (Belgium) and Richard Ellis Ltd (for most commercial property prices).

¹⁰ Brussels, Frankfurt, London, Madrid, Milan, New York, Paris, Stockholm, Sydney and Tokyo. For housing prices, Los Angeles and Toronto were also available, and, for office rents, Amsterdam and Lisbon.

¹¹ For example, commercial property in capital cities are likely to have higher architectural standards, greater functionality and larger, more luxurious meeting room facilities than equivalent property in the provinces. They will therefore command disproportionately higher prices which, in turn, are more volatile than would otherwise be the case in a nationwide coverage. Companies’ needs are also subject to greater change, again reflected in commercial property price changes, than is the case for potential homeowners.

¹² Although this was still common in the United Kingdom in the 1950s.

widely: considering the same two countries, the latter will require insulation and heating to keep out the cold in winter, whilst the former will need to provide insulation, and, increasingly, air-conditioning, to keep out the summer heat. Even within a country, what is representative in one region is not at all in another: the majority of housing in the North of England - a traditionally industrial region in the United Kingdom - is terraced, but detached houses are the standard in the South-West - a part of the country to which many retire.

Comparability

It is unlikely that data for a group of countries will be, in all aspects, comparable. First, as explained above, that which is considered to be representative in one country may not be so in another.

Secondly, the method used to collect data may vary and influence the result. For example, a survey can be conducted by approaching those real estate agents who are members of a national guild: this is unlikely to represent, in some countries, the majority of transactions. Alternatively, the registered lending agencies may be asked for information on housing based on the mortgages they grant: here, cash transactions would escape the net. Notaries could also be approached in those countries where their services are mandatory in finalising property transactions: in order to keep fees down, however, part of the agreed price may be paid in cash and another, lower, price communicated to the notary. Finally, government agencies may provide data, but their original source may be any of the above or be a result of calculations stemming from tax returns.¹³

Thirdly, as hinted earlier, the focus may vary considerably. From a macro-economic viewpoint, and, in particular, for the BIS's recent work on a set of indicators to predict financial crises, a nationwide coverage of property prices is clearly the most desirable. However, especially for commercial property, this is not always available,¹⁴ so that, for several countries, the BIS has to fall back on data relating to prime property in a capital city's centre.¹⁵ Nevertheless, the appearance in recent years of nationwide data¹⁶ indicates that a commercial property price index typically has 80% of the total drawn from property in that country's capital.

Fourthly, even a nationwide index can differ in the way in which it is compiled. A simple average of the prices paid in the individual regions may be taken (Canada) or a weighted average (based on, for example, the population) of the regional survey results (Australia). The index may be the price paid by area rather than unit: this often makes sense for commercial property, but is also occasionally true for residential property (eg France, Italy, Spain).

Finally, there is no guarantee that an index is being compiled at all, but that the series is expressed in, for example, national currency. Indeed, this may well be preferable, since there is a clear loss of information in a simple index.¹⁷ Although this is unavoidable for cross-country comparison,¹⁸ data providers would be advised to keep their series in as "original" a state as possible.

¹³ For example, in Switzerland, a tax (the "Handänderungssteuer", literally, change-of-hands tax) is levied on each sale of second-hand property, which is based on the sale price, so that an average price is simple to calculate. However, none is levied on new property which, in an under-developed property market (relative to demand) as currently exists in Switzerland, forms a substantial proportion.

¹⁴ Available in the sense that they also satisfy the other criteria.

¹⁵ For example, as provided by Jones Lang LaSalle. These data, however, are also available for a number of Asian-Pacific cities, of which they are, to the best of my knowledge, the sole providers on a collective basis.

¹⁶ Calculated by, for example, Investment Property Databank Ltd.

¹⁷ For example, a table showing the price of a "standard" dwelling (or, better, the price per square metre) for a group of countries in a given year is clearly better than a simple index value which can, at best, only show the relative position - dependent on the base year chosen - or growth rate from that base year.

¹⁸ This raises an interesting point: no attempt has, to my knowledge, been made in comparing exchange-rate-adjusted data. As the BIS has always concentrated on inflation-adjusted property prices, one would assume that exchange rate changes are at least partly taken into account. However, price indices adjusted by either nominal or real (ie inflation-adjusted) effective exchange rates may reveal some interesting differences.

Kennedy and Andersen¹⁹ extended the BIS's coverage of residential property prices to 15 countries but, more importantly, moved from indices of capital cities to nationwide ones.²⁰ With one exception (Japan: land), the indices referred to real estate (ie the price of building and land). This also reflects the data situation today, but even now, as then, the indices vary in their composition of flats, terraced or detached houses, single or multiple-occupied dwellings etc.

Continuity

This important criteria, for continuous assessment, requires little explanation, but it is, in reality, one of the most common problems facing statisticians. Apart from the possibility (see "Availability" above) that a source may "dry up" and need to be replaced by another which will almost certainly differ in definition (if not frequency, which is another problem, see below), data from the same source may suddenly change. One reason may be that the source is itself not the primary collector of data, but either the collator or just simply the disseminating body.²¹ To be fair, breaks in series often herald an improvement in the data, becoming either more encompassing or moving to a higher frequency (or both). "Splicing" with the previous series, however, remains a difficult problem.

Length of series

This problem is often linked to the previous criteria, since a radical break in series can, if no splicing can be done, considerably shorten a previously lengthy series. Also, when data providers and, by proxy, the Bank, embark on an extended country coverage, it is usually not possible for them to (re)construct a historical series. A table showing the last five years does not, in this respect, pose the same problem as attempts to graph price developments since the 1970s or to carry out historical research analysis (see also below).

Frequency

Precisely in this area of historical analysis, data frequency tends to pose little problem, since most research is done over a fairly long time horizon. Generally speaking, property prices are not thought of as being particularly volatile from one quarter to the next, so that annual data are sufficient. However, a higher frequency is desirable when such indices are used as indicators for monetary or financial stability. In this case, experience has shown that quarterly data best serve the purpose.²²

¹⁹ Neale Kennedy and Palle Andersen (1994): "Household saving and real house prices: an international perspective", *BIS Working Paper*, no 20, January.

²⁰ With the exception of Germany, which was the simple average of four cities (Berlin, Frankfurt, Hamburg and Munich). This has since been replaced by a nationwide index, based on 60 cities.

²¹ This is true, for example, of an increasing amount of the residential property price data used by the BIS. The majority of the countries are now taken directly from its Data Bank, which receives the data from national central banks. They in turn are commonly not the primary sources of this information, but have the data supplied them by the various sources discussed earlier. As a consequence, third-party dissemination can be problematic.

²² As can be seen from the Table in the Appendix, the majority of residential property price data are quarterly, whereas most commercial property price data are still annual. Perhaps surprisingly, and indeed problematic given their economic size, residential property prices for Japan, Germany, France and Italy are only available at a lower frequency.

Summing up

As Borio and Lowe (2002) conclude,²³ “The first is *more and better data*. There is, in particular, a remarkable dearth of data on real estate prices, despite their proven role in the genesis of financial crises and, increasingly, in influencing the business cycle. Data gathering has so far been largely left to the initiative of private firms, which naturally tailor the data to their own requirements. Given the ‘public good’ properties of the data, there seems to be a good case for official authorities to put efforts into this area.”

²³ Claudio Borio and Philip Lowe (2002): “Asset prices, financial and monetary stability: exploring the nexus”, *BIS Working Papers*, no 114, July.

Appendix

The table below show the countries for which the author, in his capacity as statistical analyst, maintains, respectively, residential and commercial property price data, their frequencies, unit (or base period) and start date. Many of the series contain “splices” (see above); where such a link is tenuous (but not necessarily impossible), alternatives are given. Series in square brackets are no longer in use, while those marked with an asterisk are not yet in active production and should be treated with caution.

The Bank’s Data Base, referred to earlier, is supplied many other series on residential property prices for nationally-relevant different property types by the reporting central banks; the country coverage does not exceed, however, the list below. In addition, the table only shows data which are felt to best meet the requirements cited in the paper.

Table 1
Real estate prices maintained by the author

Country	Residential property			Commercial property		
	Frequency	Unit/base period	Start date	Frequency	Unit/base period	Start date
Australia	Quarterly	Fiscal 1989 (89Q3-90Q2)	1960 Q1	Quarterly	AUD/m2	1968 Q1
Austria ¹	Semi-annual	1986	1987 H1	-		
Belgium	Quarterly	1953	1981 Q1	Annual (Brussels)	1980	1980
	Annual	1953	1960	Annual (Brussels) ²	1980	1970
Canada	Monthly ³	CAD	1980 M1	Quarterly (Toronto)	1985	1985 Q1
	Quarterly	1980 Q4	1970 Q1			
China	Annual*	CNR/m2	1987	Annual*	CNR/m2	1987
Denmark	Quarterly	1980	1970 Q1	Annual (Copenhagen)	1984 Q3	1982
				[Semi-annual] ²	1980 H2	1965 H1
Euro area	Annual	2000	1991	-		
Finland	Quarterly	1983	1978 Q1	Annual	pcpa	1998
	Annual	1970	1970	Annual (Helsinki)	EUR/m2	1971
France	Semi-annual	EUR/m2	1995 H1	Annual	EUR/m2	1986
	Annual	1997	1960	Annual (Paris)	1980	1980
Germany	Annual Annual ²	2000 DEM/m2	1975	Annual	pcpa	1996
			1971	Annual (Frankfurt)	1980	1980
				Annual (Frankfurt) ²	1980	1971
Greece	Quarterly*	1997	1997 Q1	-		
Hong Kong	Monthly	1999	1993 M1	Quarterly	1999	1988 Q1
	Quarterly	1999	1980 Q1			
Ireland	Quarterly	IEP	1976 Q1	Quarterly	1982	1994 Q4
	Annual		1970	Annual	1982	1982
Italy	Semi-annual	EUR/m2	1988 H1	Annual (Milan)	1983	1983
Japan	Semi-annual	1990 M3	1955 H1	Semi-annual	1990 M3	1955 H1
Korea	Monthly*	1995	1986 M1	-		
Malaysia	Annual*	1990	1988	-		
Netherlands	Monthly	EUR	1976 M1	Annual	pcpa	1995
	Annual	1980	1965	Annual (Amsterdam)	1980	1980
				Annual (Amsterdam) ²	1980	1970

Table 1 (cont)

Real estate prices maintained by the author

Country	Residential property			Commercial property		
	Frequency	Unit/base period	Start date	Frequency	Unit/base period	Start date
New Zealand	Quarterly Quarterly	1999 Q3 Fiscal 1971 (71Q3-72Q2)	1989 Q4 1962 Q2	Semi-annual	NZD/m2	1980 H1
Norway	Quarterly Annual Annual	2000 2000 1969 (?)	1991 Q1 1980 1970	Annual Annual (Oslo) Annual (Oslo) ²	pcpa 1990 1980	2000 1990 1970
Portugal	Monthly	1988 M1	1988 M1	Annual*	pcpa	2000
Singapore	Quarterly	1998 Q4	1988 Q2	Quarterly	1998 Q4	1988 Q2
South Africa	Monthly ³	2000	1980 M1	Annual	pcpa	1995
Spain	Quarterly Annual (Madrid)	EUR/m2 ESP	1987 Q1 1975	Annual* Annual (Madrid)	pcpa 1980	2001 1980
Sweden	Quarterly	1980	1970 Q1	Annual Annual (Stockholm) Annual (Stockholm) ²	pcpa 1980 1980	1984 1980 1970
Switzerland	Quarterly	1970 Q1	1970 Q1	Quarterly	1970 Q1	1970 Q1
United Kingdom	Quarterly Monthly	2001 Q1 1983	1968 Q2 1983 M1	Annual [Monthly]	1980 1986 M12	1970 1986 M12
United States	Quarterly [Monthly]	1980 USD	1975 Q1 1968 M1	Quarterly	1977 Q4	1977 Q4

¹ Vienna only; discontinued at end-2002. ² Confidential proprietary data. ³ Seasonally adjusted.

Performance measurement and real estate lending risk

Rupert Nabarro¹ and Tony Key²

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.

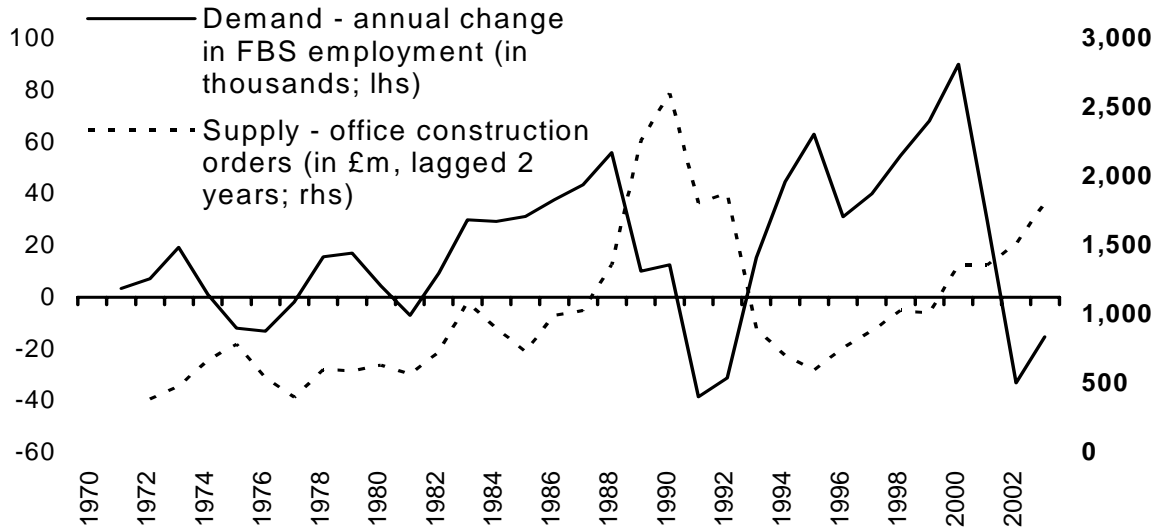
As the chart illustrates, the initial surge in London FBS employment and office demand in the middle-1980s had little impact on rental or capital prices. Through the first two years of the employment surge, rental values rose by only 2%-3% per year, rising to 7% in the third year, as the hike in demand 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.)

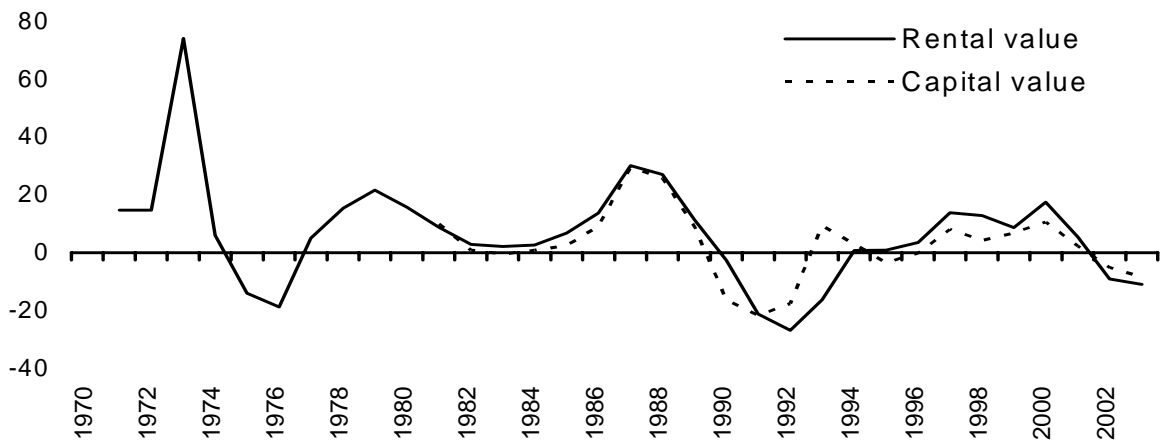
The downswing of the real estate cycle depicted in the charts needs little elaboration. FBS employment swung from a gain of 99,000 through 1987-88 to a loss of 70,000 in 1991-92. Office development completions reach an historic peak in 1990 and ran on at a high level through the employment slump, before 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



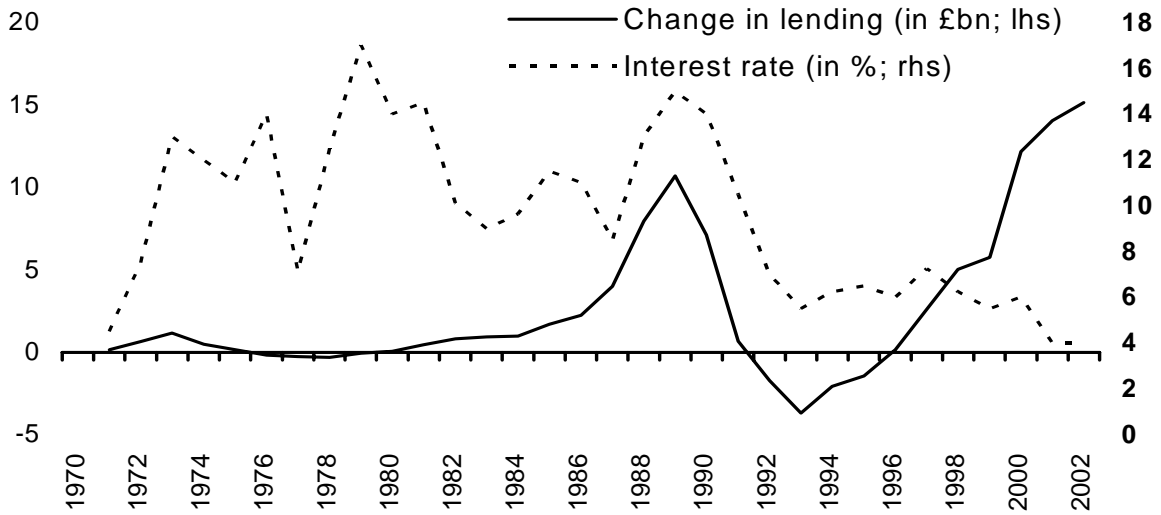
Source: UK Office for National Statistics.

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



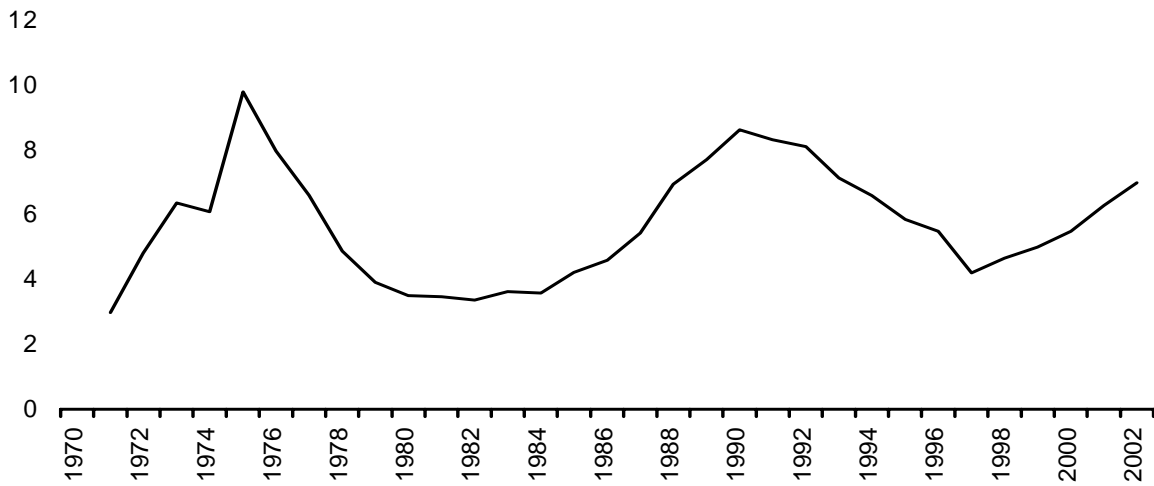
Source: IPD.

Figure 3
UK bank lending on real estate and interest rate



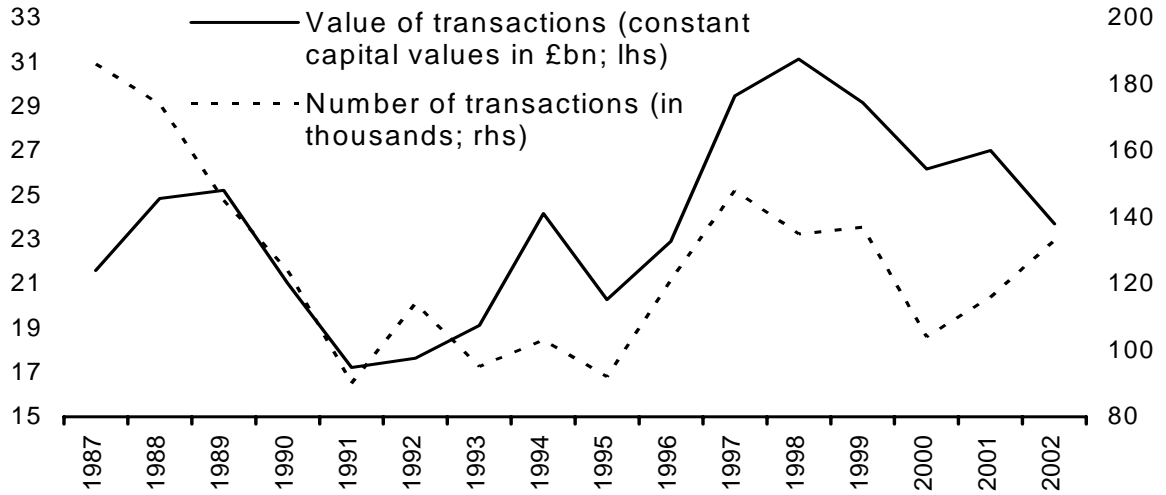
Source: Bank of England.

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



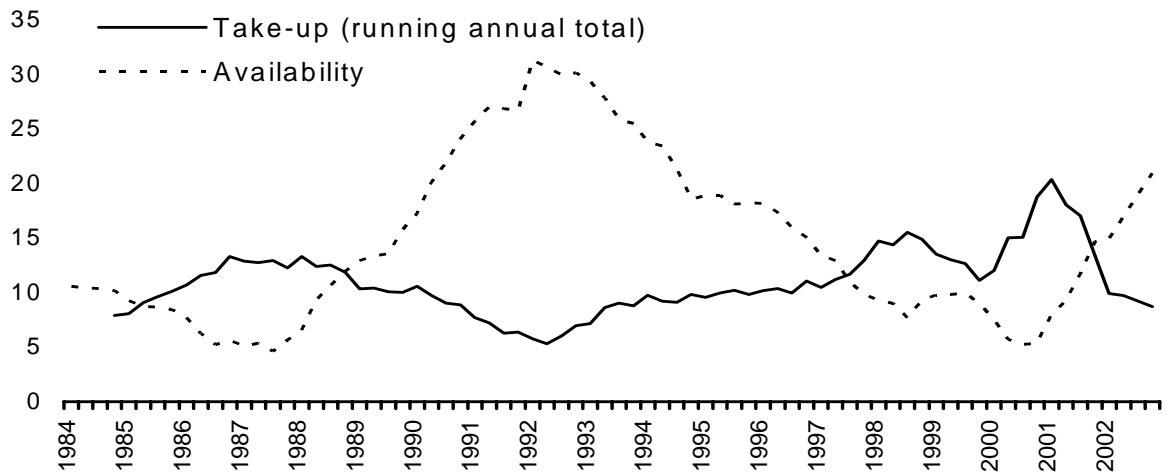
Source: Bank of England.

Figure 5
England and Wales commercial market liquidity



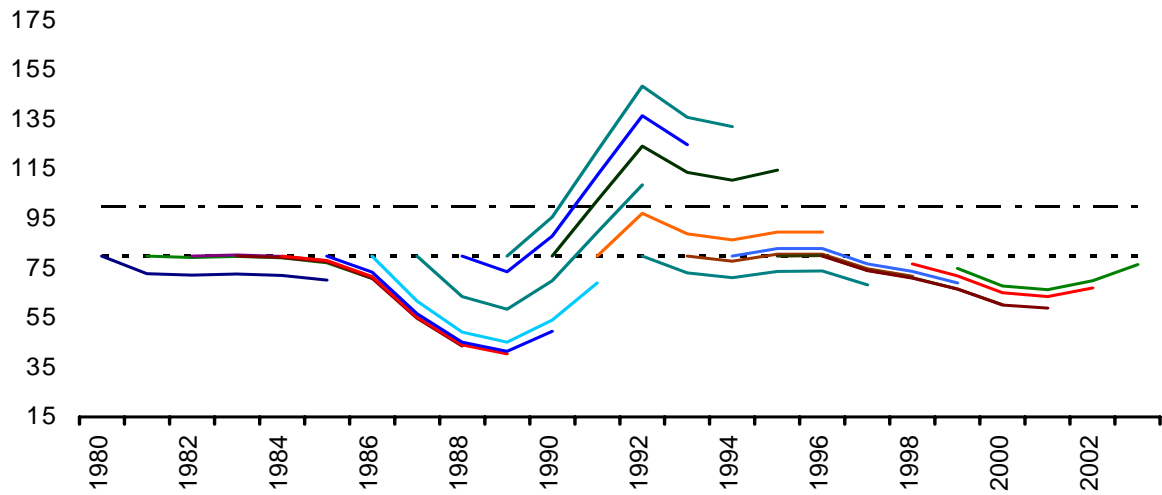
Source: UK Inland Revenue.

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



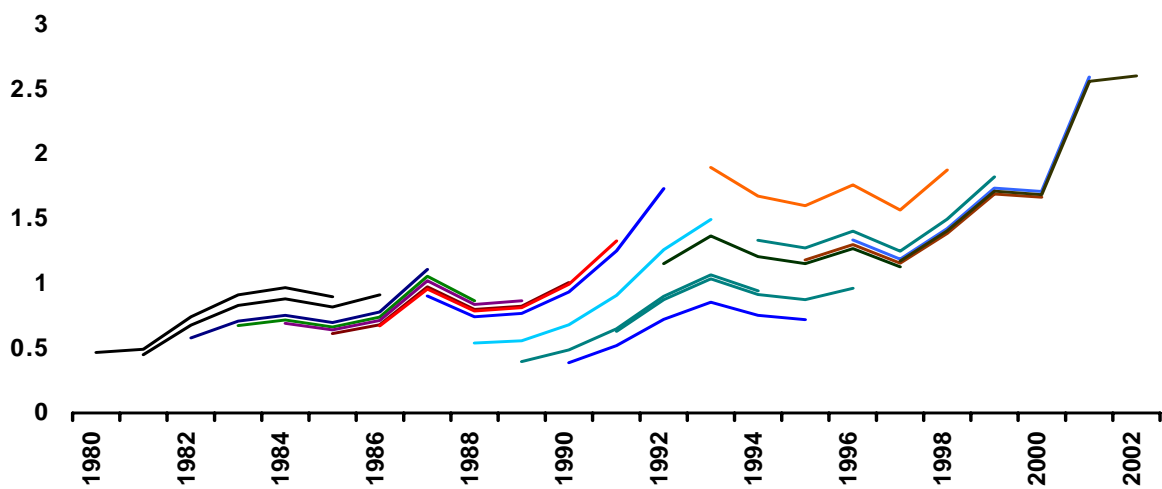
Source: CB Richard Ellis.

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.

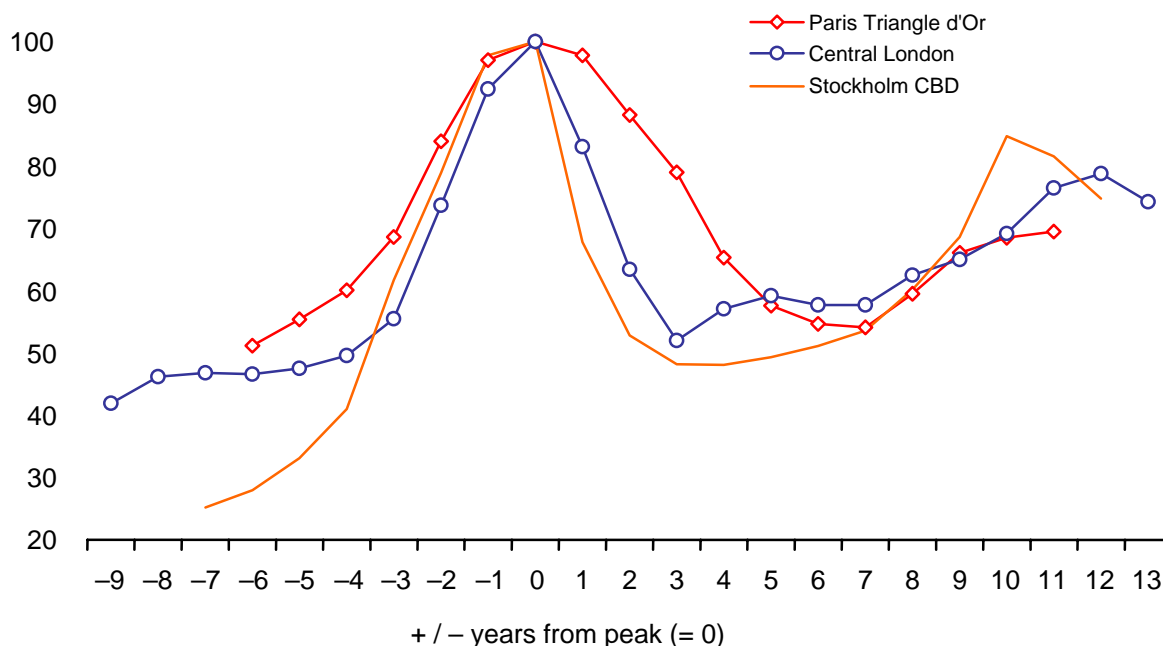
Figure 9 compares the movements in office capital values in two other European markets, aside from Central London, where there were much more severe knock-on effects on the banking system - a systemic crisis in Sweden, more contained but serious problems centred on Credit Lyonnais in France. For the 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**

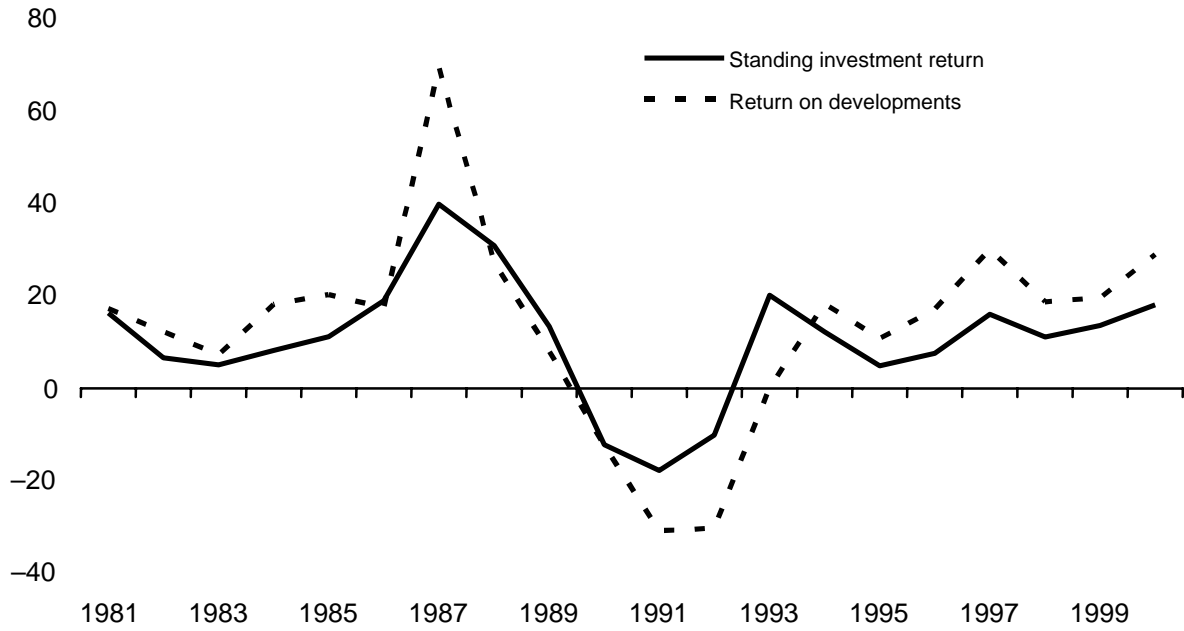
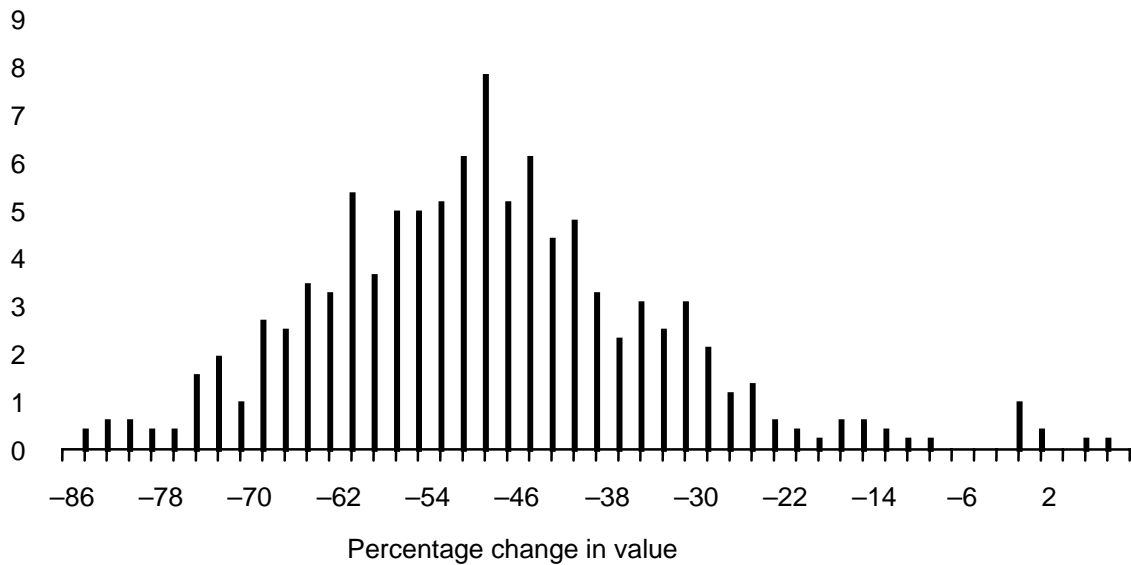


Figure 11

**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.

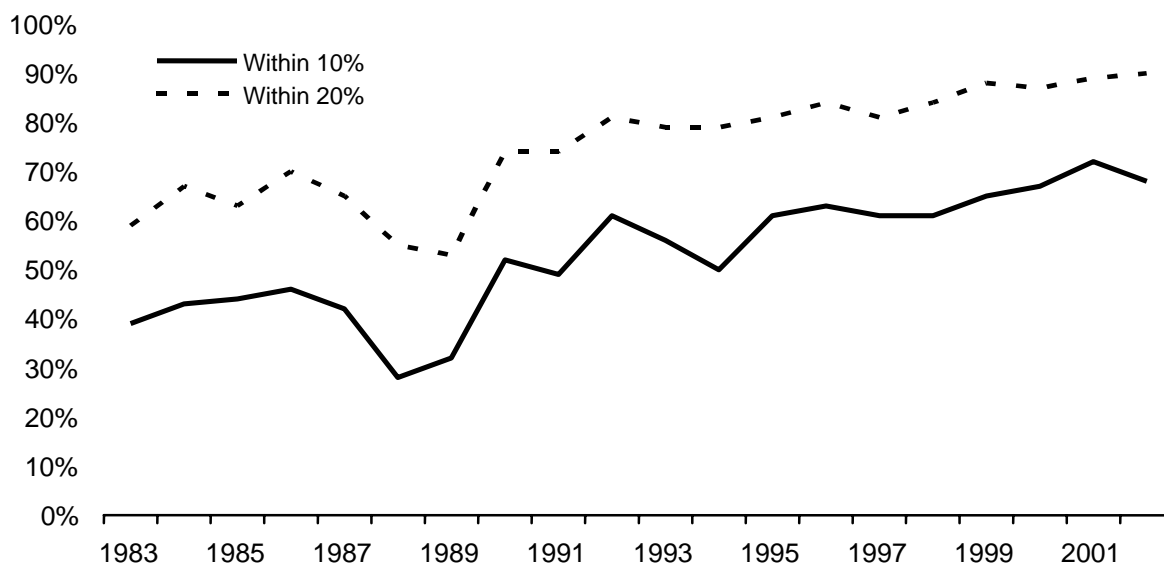
Even beyond that, a performance measurement system is in itself a tool through which many features of appraisals themselves can be documented and analysed. At a descriptive level, IPD's records give a unique account of how appraisals are done in different markets, and the assumptions on which the calculations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

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The availability and usefulness of real estate data in eastern Asia - a user's perspective

Boaz Boon

Executive summary

The challenges of sourcing useful real estate data in eastern Asia are rather similar to that in other parts of the world, ie, transparency of the data collection process, which includes consistency, reliability, adequacy and timeliness. Users of these data need to know its strengths and weaknesses. More often than not, users have to use appropriate proxies in line with relevant research questions to help them make a call on the market. The risks of using spurious data and thus spurious research findings can be mitigated by the proper sourcing and usage of relevant data. This paper aims to help users mitigate development and investment risks by identifying good sources of useful data in Singapore, Kuala Lumpur and Shanghai, as part of eastern Asia.

1. Eastern Asia

Eastern Asia is defined as East and Southeast Asia. According to the Asian Development Bank, this region comprises China (including Hong Kong and Taiwan), South Korea, and the Southeast Asian economies like Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. This region houses about two billion people (one third of the world's population), occupies 14 million sq km (3% of world's land area), and produced about 20% of the world's GDP in 2000. Its GDP grows at an average of 6.4%, faster than the world's average of 4.8% in 2000. In addition, this region is likely to produce four of the seven world mega cities of the near future.

Rising mega cities¹

- Beijing (China)
- Delhi (India)
- Guangzhou (China)
- Mumbai (India)
- Santiago (Chile, Latin America)
- Shanghai (China)
- Shenzhen (China)

2. Real estate data

Real estate market analysis is used to provide potential developers and investors a certain level of comfort before embarking on the development or investment in a particular area within a given time frame. It provides the bigger picture perspective and thus would cover the economy of the area, the supply, demand, rental and yield of the real estate sector in question.

¹ Sources: JLL; CapitaLand Research.

After the real estate market analysis, the developer or investor could drill down to the project-level analysis. This would comprise cash-flow and benchmark analysis of the particular project vis-à-vis competitors.

Real estate data is required in both real estate market analysis as well as project analysis. This paper will focus on the real estate market analysis perspective to highlight the challenges in the availability and usefulness of real estate data in three selected cities in eastern Asia ie, Singapore, Kuala Lumpur (Malaysia) and Shanghai (China).

Real estate market analysis requires the following types of variables. The list is not exhaustive but it helps to highlight the challenges of sourcing and usage of such data.

Table 1
Types of data

No	Generic category	Variables
1	Economy	GDP, Inflation, Retail sales index, FDI, Unemployment rate, Interest rate, Exchange rate, Forecast of economic indicators, Sovereign credit risks
2	Politics	Political risks
3	Demography	Population size, Per capita income, Household size, Household income, Living space per capita, Demographic forecasts
4	Real estate information	Existing stock, Historical and forecast of supply, Demand, Vacancy, Rental, Yields and total returns, List of sales transactions and buyers' profile

3. Asking relevant research questions

Before we begin any collection of data, it is vital to ask relevant research questions. Relevant questions will ensure the following:

- (a) Discipline in data collection - types and amount of data;
- (b) Appropriateness of analytical methodologies and tools;
- (c) Focus on the agreed research roadmap; and
- (d) Efficiency and effectiveness in the research process.

Market researchers are tempted to collect as much information as possible just in case they are needed at a later stage. However, in practice, there is a constraint in resources like time and money. Hence, starting with the relevant question will help in the collection of the relevant types and amount of information. It is always important to formulate the research questions together with the clients to ensure there is understanding and acceptance. Otherwise, the entire research process might be a waste of resources.

Understanding the research question will also help the researcher to source data that could be used in appropriate analytical methodologies. Also, certain qualitative information, such as business sentiment, needs to be quantified before analysis.

4. Usefulness of data

Secondary data sources: Most real estate market analysis in eastern Asia use secondary data. Therefore, the users of such data need to test the usefulness based on their consistency, reliability, adequacy and timeliness. If data collected do not pass these tests, then the usefulness of such data would be limited. If the analysts ignore the impediments of the data, the research findings might be flawed or spurious.

Consistency: Consistency implies the same definition of data used throughout a particular time-series. If the definition is changed but ignored, the time-series will be flawed. Hence, it is important for analysts to understand the definitions and compare like with like.

Reliability: Reliability refers to reproducibility or replication of estimates. If the analyst uses two or more techniques to measure the same value (ie, population) and the estimates are close together, the estimates are judged to be reliable. Reliability also implies accuracy and validity. Both accuracy and validity of data should be checked for each group of data being studied. The data must reflect accurately what is taking place. Validation is the process of checking to make sure proper procedures were followed in collecting, organising, and analysing the data. Data that have been validated are considered more accurate because more is known about their origin and characteristics. Consequently, more confidence can be placed in the use of validated data.

Adequacy: Adequacy of data refers to the length of the time-series. If the time-series is too short, it is difficult to understand the historical market behaviour and thus difficult to make reasonable forecasts.

Timeliness: The data must reflect the time period that governs the analysis. If current demand is the issue, then 2000 take-up rate is not timely.

5. Challenges faced in eastern Asia

The three cities chosen as examples are Singapore, Kuala Lumpur (Malaysia) and Shanghai (China). Singapore is the best so far as the availability and usefulness of public data is concerned.

5.1 Singapore

Singapore is a city-state. Hence, the country data is equivalent to the city-specific data. Economic, political and real estate data produced by the public agencies, such as the Department of Statistics (DOS) and the Urban Redevelopment Authority (URA) are consistent, adequate, reliable, and timely. A summary of the availability and usefulness of data is shown in Appendix 1. However, data pertaining to demography (eg, household size, household income, living space per capita) are produced during the census of population, which has a five-year interval. Nevertheless, such data are not highly volatile, and thus an analyst could still use the data with a reasonable level of comfort.

Even though data in the public domain are good, real estate data for specific market segment still have to be sourced from private research houses. Examples are supply, demand, rentals, capital values and yields of investment grade office, retail, residential and industrial space. The performance of specific market segments are tracked differently by different research houses. Hence, the analyst needs to be comfortable with the basket of goods used by the research house and the method by which data are collected before sourcing the data for analysis.

An example of the appropriate market segment is this. If the analyst were to focus on prime retail shopping space, he needs to know if the basket of goods used by the research house accurately reflects the prime shopping space in the Orchard Road belt and distinguish that from the prime retail suburban malls next to MRT stations in the suburb. If the research house only tracks the performance of the Orchard Road prime retail malls, the data might not be useful because it would have missed out an important market segment, ie, prime suburban, which attracts much investment interest in Singapore.

Therefore, analysts need to be careful when comparing different time series sourced from different research houses.

5.2 Kuala Lumpur (Malaysia)

Kuala Lumpur (KL) is the capital city of Malaysia, and the only city in Malaysia worth noting so far as international real estate investors are concerned. However, there are no city-specific data available in the public domain. Hence, analysts must use country-wide or state-wide economic and demographic data to function as proxy to the KL city-specific performance trend. This is far from ideal.

To mitigate this problem, analysts could source KL city-specific real estate data from private research houses. Again, the analyst has to understand the definitions of such data and need to ascertain if they reflect the market segment accurately. A summary of the availability and usefulness of the data for the KL real estate market is shown in Appendix 2.

5.3 Shanghai (China)

The Chinese government knows the challenges in data collation and it has taken steps to adopt better methodologies. But this could take a long time. Hence, analysts need to use proxies carefully.

Real estate market analysis of Shanghai needs to use Shanghai-specific data. This is available in the Shanghai Municipal Statistics Bureau Shanghai Statistical Yearbook. A summary of the availability and usefulness of data used for Shanghai real estate market analysis is shown in Appendix 3.

Like all the other cities, data on specific market segments can be sourced from private research houses. But the analyst has to know the basket of goods that reflect the market segment. This is particularly important in Chinese cities, like Shanghai. For example, the market segment for international grade 'A' office should not be confused with buildings that are merely local grade "A". A mixture of these will dilute the performance of the buildings defined as international grade "A". The analyst might even make a wrong judgment call when recommending to clients to buy or sell.

Furthermore, in such a big city like Shanghai, the analyst needs to know the locations of the buildings within the basket of goods reflecting the market segment. If the analyst focuses on the entire Shanghai city, and the basket of goods only reflects the buildings in Puxi and not in Pudong, the analyst must know that his research findings are based on the generalisation of the performance of buildings within Puxi and applied generally across Shanghai. He needs to highlight this caution to his clients.

5.4 Inter-city comparison

The greater challenge comes when the analyst needs to compare real estate performances across cities in eastern Asia. For example, how do the performances of the office market in Shanghai compared with that in Hong Kong SAR and Singapore? Not only must the analyst ensure that he is using similar definitions of the market segment for comparison, he needs to ensure that the computations of the city-specific data are treated similarly. Otherwise, his research findings will be spurious.

So far, there is only one research house that meets the strict requirements of data comparability across cities in eastern Asia. This set of data is expensive and is produced by the Jones Lang LaSalle Real Estate Intelligence Service. The definitions of their data are shown in Appendix 4. For confidentiality, their data cannot be provided in this paper.

6. Conclusion - the world of second best

There is pervasive information asymmetry in real estate, that is to say, analysts are bombarded with this challenge of incomplete information. Usually, practitioners deal with the issues and situations the best they can, and move on. Real estate is a unique, heterogeneous, long-lived asset involving cross-disciplinary fields. As fundamental real estate researchers are grafting well-established principles in information economics with the unique features in real estate so as to shed new light on extant issues, practitioners will try to source and use consistent, reliable, adequate and timely data to help them make a call on the market as best as they can. As for eastern Asia, there are reliable sources of useful real estate data. However, the analyst needs to do due diligence to ensure the data reflects the market segments he is dealing with.

Appendix 1(a): Singapore

Variables	Main source of information	Usefulness			
		C	A	R	T
<i>Economic</i>					
GDP	Department of Statistics, Singapore (Official website)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inflation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Retail sales index		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foreign direct investment	Economist Corporate Network (Regional Strategic Quarterly Forecast)	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Unemployment rate	Ministry of Manpower, Singapore (Official website)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interest rate	Monetary Authority of Singapore (Official website)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exchange rate		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forecast of economic indicators	Economist Corporate Network (Regional Strategic Quarterly Forecast & Asia-Pacific Executive Brief)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sovereign credit risk indicators eg foreign debt/GDP, reserves/imports and Moody/ S&P ratings	UBS Warburg (Asian Economic Indicators)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Political</i>					
Political risks	Economist Corporate Network (Regional Strategic Quarterly Updates, Asia-Pacific Economic Brief & Country Monitor)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Demographic</i>					
Population size	Department of Statistics, Singapore (Official website)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Per capita income	Department of Statistics, Singapore (Yearbook of Statistics)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Household size	Department of Statistics, Singapore (Census of Population 2000)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Household income		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Living space per capita		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Forecast of demographic indicators	Asian Demographics (Weekly Demographic Insights)	<input type="checkbox"/>		<input type="checkbox"/>	

**Appendix 1(a):
Singapore (cont)**

Variables	Main source of information	Usefulness			
		C	A	R	T
Real estate market information					
All sectors (Residential, Office, Retail & Industrial)					
Existing stock	Urban Redevelopment Authority, Singapore (Real Estate Information System - Web-based)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historical supply		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historical demand		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historical vacancy		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historical rental		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historical price/capital value		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historical yields	CB Richard Ellis (Singapore Real Estate Quarterly Research Report)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Potential supply (except residential)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Office (Grade "A")					
Historical and forecast of demand, supply, vacancy, rental, capital value, yields and total returns	Jones Lang LaSalle (Real Estate Intelligence Services)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Residential					
Potential supply	Urban Redevelopment Authority, Singapore (Real Estate Information System - Web-based)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
List of sales transactions		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buyers' profile - nationality		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note: Criteria used to measure the usefulness of information sources are Consistency (C), Reliability (R), Adequacy (A) and Timeliness (T).					

Appendix 1(b): Sources for information on Singapore

Economic indicators	<p><i>Websites</i></p> <ul style="list-style-type: none"> – Department of Statistics, Singapore (www.singstat.gov.sg) – Ministry of Manpower, Singapore (www.mom.gov.sg) – Ministry of Trade & Industry, Singapore (www.mti.gov.sg) – Ministry of Finance, Singapore (www.mof.gov.sg) – Monetary Authority of Singapore (www.mas.gov.sg) – Singapore Tourism Board (www.stb.gov.sg) – Asian Development Bank (www.adb.org) – The World Bank Group (www.worldbank.org) – International Monetary Fund (www.imf.org) – United Nations Conference on Trade and Development (www.unctad.org) <p><i>Publications</i></p> <ul style="list-style-type: none"> – Ministry of Trade & Industry (Economic Survey of Singapore, Quarterly) – Monetary Authority of Singapore (Macroeconomic Review, Biannually) – Economist Corporate Network (Regional Strategic Quarterly Forecast & Asia Pacific Executive Brief) – UBS Warburg (Asian Economic Indicators) <p><i>Other information providers (Subscription basis)</i></p> <ul style="list-style-type: none"> – Bloomberg LP – Thomson ONE Analytics (contains analyst reports on Singapore economy) – Factiva (contains information from newspaper, magazines and reports)
Politics	<p><i>Websites</i></p> <ul style="list-style-type: none"> – Institute of Policy Studies (www.ips.org.sg) <p><i>Publications</i></p> <ul style="list-style-type: none"> – Economist Corporate Network (Regional Strategic Quarterly Updates, Asia-Pacific Economic Brief & Country Monitor)
Demographic indicators	<p><i>Websites</i></p> <ul style="list-style-type: none"> – Department of Statistics, Singapore (www.singstat.gov.sg) – Asian Development Banks (www.adb.org) <p><i>Publications</i></p> <ul style="list-style-type: none"> – Department of Statistics, Singapore (Yearbook of Statistics & Census of Population 2000) – Asian Demographics (Weekly Demographic Insights) – Economist Corporate Network (Regional Strategic Quarterly Forecast)
Real estate market information	<p><i>Websites</i></p> <ul style="list-style-type: none"> – Urban Redevelopment Authority of Singapore (www.ura.gov.sg) – Housing & Development Board, Singapore (www.hdb.gov.sg) – Central Provident Fund Board, Singapore (www.cpf.gov.sg) – Real Estate Developers' Association of Singapore (www.redas.com) – CB Richard Ellis (www.cbre.com.sg) – Chesterton International (www.chesterton.com.sg) – Colliers International (www.colliers.com/singapore) – Cushman & Wakefield (www.cushwakeasia.com) – DTZ Debenham Tie Leung (www.dtz.com.sg)

**Appendix 1(b):
Sources for information on Singapore (cont)**

Real estate market information (cont)	<p><i>Websites (cont)</i></p> <ul style="list-style-type: none">– Jones Lang LaSalle (www.joneslanglasalle.com.sg)– Jones Lang LaSalle Hotels (www.joneslanglasallehotels.com) <p><i>Publications</i></p> <ul style="list-style-type: none">– Urban Redevelopment Authority of Singapore (Property Market Information)– CB Richard Ellis (Singapore Real Estate Research Report, Quarterly)– Jones Lang LaSalle (Singapore Quarterly Property Market Review, Singapore Property Market Monitor, Asia Pacific Property Digest & Asia Pacific Property Investment Guide) <p><i>Other information providers (Subscription basis)</i></p> <ul style="list-style-type: none">– Jones Lang LaSalle (Real Estate Intelligence Services)– Thomson ONE Analytics (contains analysts' reports on property sector)
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**Appendix 2(a):
Malaysia (Kuala Lumpur)**

Variables	Main source of information	Usefulness			
		C	A	R	T
<i>Economic</i>					
GDP	Asian Development Bank (Key Indicators 2003)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inflation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unemployment rate		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
External trade		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exchange rate		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interest rate	Bank Negara Malaysia (Official website)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foreign direct investment	Economist Corporate Network (Regional Strategic Quarterly Forecast)	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Forecast of economic indicators	Economist Corporate Network (Regional Strategic Quarterly Forecast & Asia-Pacific Executive Brief)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-performing loan	Ernst & Young (Non-Performing Loan Report: Asia 2002) - Ad hoc report			<input type="checkbox"/>	<input type="checkbox"/>
Sovereign credit risk indicators eg foreign debt/GDP, reserves/imports and Moody/S&P ratings	UBS Warburg (Asian Economic Indicators)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Political</i>					
Political risks	Economist Corporate Network (Regional Strategic Quarterly Updates, Asia-Pacific Executive Brief & Country Monitor)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Demographic</i>					
Population size	Department of Statistics, Malaysia (Official website)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demographic characteristics (Age distribution, etc)	Department of Statistics, Malaysia (Population & Housing Census 2000)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Forecast of demographic indicators	Asian Demographics (Weekly Demographic Insights)	<input type="checkbox"/>		<input type="checkbox"/>	

**Appendix 2(a):
Malaysia (Kuala Lumpur) (cont)**

Variables	Main source of information	Usefulness			
		C	A	R	T
<i>Real estate market information</i>					
<i>Investment grade office & luxury residential</i>					
Historical and forecast of demand, supply, vacancy, rental, capital value, yields and total returns	Jones Lang LaSalle (Real Estate Intelligence Services)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Luxury residential</i>					
Affordability index	Straits-GK Goh Research Sdn Bhd (Analysts' reports on Malaysian residential market)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Note: Criteria used to measure the usefulness of information sources are Consistency (C), Reliability (R), Adequacy (A) and Timeliness (T).					

Appendix 2(b): Sources for information on Malaysia (Kuala Lumpur)

Economic indicators	<p><i>Websites</i></p> <ul style="list-style-type: none"> – Department of Statistics, Malaysia (www.statistics.gov.my) – Ministry of Domestic Trade & Consumer Affairs (www.kpdnhq.gov.my) – Malaysian Industrial Development Authority (MIDA) (www.mida.gov.my) – Bank Negara Malaysia (www.bnm.gov.sg) – Asian Development Bank (www.adb.org) – The World Bank Group (www.worldbank.org) – International Monetary Fund (www.imf.org) – United Nations Conference on Trade and Development (www.unctad.org) <p><i>Publications</i></p> <ul style="list-style-type: none"> – Department of Statistics, Malaysia (Monthly Statistical Bulletin, Yearbook of Statistics & Business Expectation Survey of Limited Companies) – Bank Negara Malaysia (Monthly Statistical Bulletin, Quarterly Bulletin & BNM Annual Report) – Economist Corporate Network (Regional Strategic Quarterly Forecast & Asia Pacific Executive Brief) – UBS Warburg (Asian Economic Indicators) – Ernst & Young (Non-Performing Loan Report: Asia 2002) <p><i>Other information providers (Subscription basis)</i></p> <ul style="list-style-type: none"> – Bloomberg LP – Thomson ONE Analytics (contains analyst reports on Malaysia economy) – Factiva (contains information from newspaper, magazines and reports)
Politics	<p><i>Publications</i></p> <ul style="list-style-type: none"> – Economist Corporate Network (Regional Strategic Quarterly Updates, Asia-Pacific Economic Brief & Country Monitor)
Demographic indicators	<p><i>Websites</i></p> <ul style="list-style-type: none"> – Department of Statistics, Malaysia (www.statistics.gov.my) – Asian Development Banks (www.adb.org) <p><i>Publications</i></p> <ul style="list-style-type: none"> – Department of Statistics, Malaysia (Yearbook of Statistics, Malaysia & Population & Housing Census 2000) – Asian Demographics (Weekly Demographic Insights) – Economist Corporate Network (Regional Strategic Quarterly Forecast)
Real estate market information (Kuala Lumpur)	<p><i>Websites</i></p> <ul style="list-style-type: none"> – CH Williams Talhar & Wong (www.wtw.com.my) – Cushman & Wakefield (www.cushwakeasia.com) – DTZ Debenham Tie Leung (www.dtzresearch.com) – Jones Lang LaSalle Hotels (www.joneslanglasallehotels.com) <p><i>Publications</i></p> <ul style="list-style-type: none"> – National Property Information Centre (Property Market Report & Property Overhang Quarterly Report) – CH Williams Talhar & Wong (WTW Market Report) – Cushman & Wakefield (Kuala Lumpur Office Snapshot) – DTZ Debenham Tie Leung (Property Times) – Jones Lang LaSalle (Asia Pacific Property Digest & Asia Pacific Property Investment Guide)

**Appendix 2(b):
Sources for information on Malaysia (Kuala Lumpur) (cont)**

Real estate market information (Kuala Lumpur) (cont)	<i>Other information providers (Subscription basis)</i> <ul style="list-style-type: none">- Jones Lang LaSalle (Real Estate Intelligence Services)- Bloomberg LP- Thomson ONE Analytics (contains analysts' reports on property sector) Factiva
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Appendix 3(a): Shanghai

Variables	Main source of information	Usefulness			
		C	A	R	T
Economic					
GDP	Shanghai Municipal Statistics Bureau (Shanghai Statistical Yearbook)	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Inflation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unemployment rate		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
External trade		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Retail sales		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foreign direct investment		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Forecast of economic indicators	Economist Corporate Network (Regional Strategic Quarterly Forecast & Asia-Pacific Executive Brief)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business Confidence Index	Shanghai Municipal Statistics Bureau (Official website)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Non-performing loan	Ernst & Young (Non-Performing Loan Report: Asia 2002) - Ad hoc			<input type="checkbox"/>	<input type="checkbox"/>
Interest rate	UBS Warburg (Asian Economic Indicators)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exchange rate		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sovereign credit risk indicators eg foreign debt/GDP, reserves/imports and Moody/S&P ratings		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Political					
Political risks	Economist Corporate Network (Regional Strategic Quarterly Updates, Asia-Pacific Executive Brief & Country Monitor)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demographic					
Population size	Shanghai Municipal Statistics Bureau (Shanghai Statistical Yearbook)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demographic characteristics (age distribution, etc)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Income per capita		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Living space per capita		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Household formation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 3(a): Shanghai (cont)

Variables	Main source of information	Usefulness			
		C	A	R	T
Demographic (cont)					
Household characteristics (size, income distribution, etc)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forecast of demographic indicators	Asian Demographics (Weekly Demographic Insights)	<input type="checkbox"/>		<input type="checkbox"/>	
Real estate market information					
Overall property sector					
Construction statistics	Shanghai Real Estate Trading Centre (Official website)	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
New completions		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Registered area for sales		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Registered area sold		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Mortgage amount		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Resettlement statistics		<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Buyers' profile (income bracket, floor area requirement, nationality)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Investment grade office & luxury residential					
Historical and forecast of demand, supply, vacancy, rental, capital value, yields and total returns	Jones Lang LaSalle (Real Estate Intelligence Services)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Luxury residential					
Affordability Index	Bank of China (Ad hoc report on Shanghai residential market)		<input type="checkbox"/>	<input type="checkbox"/>	
Note: Criteria used to measure the usefulness of information sources are Consistency (C), Reliability (R), Adequacy (A) and Timeliness (T).					

Appendix 3(b): Sources for information on Shanghai

Economic indicators	<p><i>Websites</i></p> <ul style="list-style-type: none"> – Shanghai Municipal Statistic Bureau (www.stats-sh.gov.cn) – The Peoples' Bank of China (www.pbc.gov.cn) – Soufun (www.soufun.com) <p><i>Publications</i></p> <ul style="list-style-type: none"> – Shanghai Municipal Statistic Bureau (Shanghai Statistical Yearbook) – Economist Corporate Network (Regional Strategic Quarterly Forecast & Asia Pacific Executive Brief) - <i>China statistics</i> – UBS Warburg (Asian Economic Indicators) - <i>China statistics</i> – Ernst & Young (Non-Performing Loan Report: Asia 2002) <p><i>Other information providers (Subscription basis)</i></p> <ul style="list-style-type: none"> – Thomson ONE Analytics (contains analyst reports on Shanghai economy) – Factiva (contains information from newspaper, magazines and reports)
Politics	<p><i>Websites</i></p> <ul style="list-style-type: none"> – Shanghai Municipal Government (www.sh.gov.cn) <p><i>Publications</i></p> <ul style="list-style-type: none"> – Economist Corporate Network (Regional Strategic Quarterly Updates, Asia-Pacific Economic Brief & Country Monitor) - <i>China information</i>
Demographic indicators	<p><i>Websites</i></p> <ul style="list-style-type: none"> – Shanghai Municipal Statistic Bureau (www.stats-sh.gov.cn) <p><i>Publications</i></p> <ul style="list-style-type: none"> – Shanghai Municipal Statistic Bureau (Yearbook of Statistics & Shanghai Fifth Population Census 2000) – Asian Demographics (Weekly Demographic Insights) Economist Corporate Network (Regional Strategic Quarterly Forecast) - <i>China information</i>
Real estate market information	<p><i>Websites</i></p> <ul style="list-style-type: none"> – Shanghai Real Estate Exchange Centre (www.shfdz.gov.cn) – SouFun (www.soufun.com) – CB Richard Ellis (www.cbre.com.cn) – Colliers International (www.colliers.com/china) – Cushman & Wakefield (www.cushwakeasia.com) – DTZ Debenham Tie Leung (www.dtzresearch.com) – Jones Lang LaSalle (www.joneslanglasalle.com.cn) – Jones Lang LaSalle Hotels (www.joneslanglasallehotels.com) <p><i>Publications</i></p> <ul style="list-style-type: none"> – Shanghai Municipal Housing, Land and Resources Administration Bureau & Shanghai Municipal Statistical Bureau (Shanghai Real Estate Market) – Shanghai Real Estate Exchange Centre (Shanghai Real Estate, Shanghai Land, Shanghai Housing, Shanghai Property Market & Shanghai Quarterly Property Market Analysis) – SouFun (Shanghai Quarterly Property Market Report) – Jones Lang LaSalle (China Property Market Monitor, Greater China Property Index, Asia Pacific Property Digest & Asia Pacific Property Investment Guide) – CB Richard Ellis (PRC Market Index Brief) – DTZ Debenham Tie Leung (Property Times & Property Market Review)

**Appendix 3(b):
Sources for information on Shanghai (cont)**

Real estate market information (cont)	<p><i>Publications (cont)</i></p> <ul style="list-style-type: none">– Cushman & Wakefield (Shanghai Office Snapshot)– Bank of China (Ad-hoc report on Shanghai residential market) <p><i>Other information providers (Subscription basis)</i></p> <ul style="list-style-type: none">– Jones Lang LaSalle (Real Estate Intelligence Services)– Thomson ONE Analytics (contains analysts' reports on property sector)– Factiva
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Appendix 4(a): Definitions of property submarkets

(A) Investment grade offices

The office stock tallied in this report is defined by two elements: quality of the property and its geographical location.

Quality of the property

Investment grade offices are defined according to their structural/physical qualities. The following aspects of a premise are examined for the purpose of classifying investment grade office premises:

- Overall internal and external finishes
- External façade, lobby, and circulation areas
- Layout of floor plate
- Air-conditioning
- Lift services for passengers and goods deliveries
- Building management
- Parking facilities
- Accessibility

The above classification criteria are applied in assessing office buildings in all the markets that are examined in this report. As such, any building included in our calculation of office stock would meet the above criteria and therefore would be of comparable quality from market to market.

Geographical location

Investment grade offices are geographically defined by the developed and developing business districts in each city. Generally, the districts can be categorised into Central Business Districts (CBD) and decentralised districts.

(B) Central Business District (CBD) offices

Investment Grade Office space in the main or traditional business centre(s) of a metropolitan area.

Beijing CBD

The Beijing CBD includes the following districts:

- Chaoyang: Along East Third Ring Road
- Dongcheng: Along East Changan Street and Jianguomenwai Street
- Xicheng: Fuxingmennei Street and Finance Street

Shanghai CBD

Shanghai CBD is sub-categorised into two centres east (Pudong) and west (Puxi) of Huangpu River:

- (1) **Puxi:** The Puxi CBD includes four districts:
 - Huangpu: Along Nanjing Road East and Yanan Road East
 - Jingan: Along Nanjing Road West and Yangan Road Central

- Luwan: Along Huai Hai Road Central
- Hongqiao: Along Yanan Road West

(2) **Pudong:** The Pudong CBD comprises the Lujiazui Finance and Trade Zone.

Hong Kong SAR CBD

The Hong Kong SAR CBD is sub-categorised into four districts:

- Central: Along Queen's Road Central and Des Voeux Road Central, including the fringe area of Admiralty in the east and Connaught Road Central in the west
- Wanchai/Causeway Bay: Eastward of Central along Hennessy Road and Gloucester Road
- Tsimshatsui: The tip of Kowloon Peninsula south of Austin Road
- Hong Kong SAR East: Bounded to the west by Hing Fat Street, including North Point & Quarry Bay

Manila CBD

The Manila CBD comprises the Makati CBD: bounded by Sen. Gil Puyat Avenue, EDSA and Amorsolo, encompassing Ayala Triangle, Salcedo and Legaspi Villages.

Bangkok CBD

The Bangkok CBD includes:

- CBD South: Sophraya / Surawongse / Silom / Sathorn / Charoenkrung / Rama IV Areas
- CBD North: Wireless / Lang Suan / Rajdamri / Phayathai / Rama IV / Sarasin / Ploenchit / Rama I Areas

Kuala Lumpur CBD

There are two major business districts in the CBD: Golden Triangle (GT) and the CBD in Kuala Lumpur CityCentre:

- GT: Stretches along Jalan Ampang, Jalan Sultan Ismail, Jalan Bukit Bintang and the Kuala Lumpur City Centre (KLCC) site
- CBD: The older commercial area at the heart of the city (known as the Central Planning Area as defined in the Federal Territory Kuala Lumpur Comprehensive Development Plan no 1040 & 1041)
- Decentralised: Fringe of offices at Damansara Centre & Bangsar Pantai

Singapore CBD

The Singapore CBD is sub-categorised into three districts:

- Core CBD (Raffles Place): Including Raffles Place and China Square, bounded broadly by Boat Quay, South Bridge Road, Cross Street, Cecil Street and Collyer Quay
- Core CBD (Shenton Way): Bounded by Maxwell Road, Cecil Street, Shenton Way, Raffles Quay and Collyer Quay
- Marina Bay: Bounded by Nicoll Highway, Raffles Avenue and Republic Boulevard

Jakarta CBD

The Jakarta CBD is comprised of the **Golden Triangle**, which stretches along the triangular area formed by Jalan H R Rasuna Said, Jalan Jenderal Sudirman (up to the southern tip of Jalan M H Thamrin) and Jalan Jenderal Gatot Subroto.

(C) Luxury residential properties

Luxury residential properties refer to high-end luxury residential premises such as apartments, condominiums, detached or semi-detached housing that are located in traditional prime areas.

Geographical location

Beijing:	Dongcheng, Chaoyang and Shunyi
Shanghai:	Puxi (Changning, Xuhui, Jingan, Luwan, Huangpu, Zabei and Hongkou)
Hong Kong SAR:	Hong Kong SAR Island (Peak/Mid-levels/Island South)
Manila:	Makati CBD
Bangkok:	<i>CBD:</i> Saphraya / Surawongse / Silom / Sathorn / Charoenkrung / Rama IV Areas / Wireless / Lang Suan / Rajdamri / Phyathai / Rama IV / Sarasin / Ploenchit / Rama I Areas. <i>Sukhumvit:</i> Sukhumvit Soi 1 to Soi 63 / Rama IV / Petchburi Areas
Kuala Lumpur:	Ampang Hilir, Taman Tun Dr. Ismail, Damansara, Bangsar, and Bukit Tunku.
Singapore:	Districts 9, 10, and 11
Jakarta:	CBD

(D) Residential property type

Condominiums:	Refers to strata-titled residential units available for sale or for sale and lease.
Apartments:	Refers to residential units for lease only, which are typically apartment buildings under single ownership. The apartment market is relatively well defined and developed in Bangkok and Jakarta. As such, they are presented separately from the condominium market.
Detached houses:	Refers to landed properties either standalone (single family homes) or semi-detached (townhouses).

In Beijing, since a relatively well-defined market for detached housing properties (Villas) has emerged with both rental and sales activities, the Villa market in Beijing is presented as a separate market from the condominium market.

(E) Prime retail centres

Prime retail centres refer to retail shopping centres/complexes built either exclusively for retail purpose or as part of a mixed-use project.

Quality of the property

Prime retail centres are defined according to their structural/physical qualities. The following aspects are examined for the purpose of classifying prime retail centres:

- Overall internal and external finishes
- External façade and internal arcade area
- Availability of dining and entertainment facilities
- Service area for merchandise and goods deliveries
- Management of the centre
- Parking facilities
- Accessibility

Geographical location

Prime retail centres are generally dispersed around the metropolitan area of a city. Prime retail centres are considered to be major shopping complexes built to international standards. Geographically we define prime retail centres by:

- Beijing: City-wide, predominantly on (but not limited to) the East Third Ring Road, East Second Ring Road, Jianguomenwai Street, Wangfujing Street and in the Finance Street area to the west of the city.
- Shanghai: City-wide, predominately on (but not limited to) Nanjing Road, Huaihai Road, Xijiahui, Hongqiao and Lujiazui
- Hong Kong SAR: *Prime retail malls:* Centres located in Central, Causeway Bay & Tsimshatsui.
Decentralised malls: Centres located along the KCRC/MTRC lines.
High street shops: Street front units along the main shopping thoroughfare in Causeway Bay & Tsimshatsui.
- Manila: The entire Metro Manila Area with centres generally focused in Makati CBD, Ortigas Center, Manila Bay area and Alabang.
- Bangkok: City-wide, including city centre schemes in Silom Road, Ploenchit Road and Sukhumvit Road as well as suburban area schemes.
- Kuala Lumpur: *City-centre:* Includes schemes in and close to the Bukit Bintang Precinct, in the Central Business District and Golden Triangle.
Suburban: Schemes located in Bangsar, Damansara, Petaling Jaya, and elsewhere in the Klang Valley including Shah Alam.
- Singapore: *City-centre:* Quality schemes along Orchard Road corridor.
Suburban: New generation shopping malls, typically located at or close to MRT stations, or elsewhere held in single ownership.
Marina centre: Malls include those in the Marina Bay vicinity, as well as those in Bugis Junction and Raffles City.
- Jakarta: *City-wide:* Including schemes in the Golden Triangle CBD, and in suburban areas.

Appendix 4(b): Stock absorption index

The SA Index is defined as a measure of the intensity of the absorption or take up of all of the available property stock in a market at any point in time. The total available stock is defined as the sum of vacant stocks (in the previous period) with the new stocks (in the current period).

The SA Index measures net absorption on a scale of 0-100, using the formula below:

$$\text{The SA Index} = \frac{A_t}{V_{t-1} + N_t} \times 100$$

A_t = Net absorption in current period t

V_{t-1} = Vacant Stock in period $t - 1$ (ie, previous period)

N_t = New Stock that were completed in period t

As the SA Index is a relative measure, it can be interpreted as an interval scale. Hence, not only can we use the SA Index to rank the strength of absorption across different markets, it also measures the difference in the strength of absorption between those markets.

The SA Index does not measure negative absorption because by its definition, it measures positive net absorption. Therefore, whenever absorption turns negative, the SA Index is arbitrarily set at zero. To compare cities with zero SA Index values, we suggest that vacancy rates be used in conjunction with the SA Index.

The SA Index is intended to provide an alternative way of examining the demand in the market by analysing the net absorption of space. We recognise that neither SA Index nor the Net Absorption indicators are complete by themselves when used to assess the scale of demand in any particular market. Taken together, we believe that they give a deeper understanding of the markets when comparing across different cities in the region.

Housing valuations: no bubble apparent

Kathleen Stephansen and Maxine Koster

This analysis focuses on cross-country comparisons of housing valuations. Our main findings are:

- Housing markets have been generally strong, and in the case of the United States, a major countercyclical force. Asia shows a weaker profile.
- There does not appear to be a major misalignment in house values in the United States and the euro area. Recent central bank action in both the United Kingdom and Australia suggests rising valuation concerns. While in the United Kingdom, the economy's structural changes over the last five years should attenuate somewhat this concern (hence a gradual interest rate response), in Australia the housing cycle is seen as the central driver of the domestic economic cycle and thereby monetary policy.
- In the United States and the United Kingdom, if a housing bubble develops, we think it is more likely to be in turnover than in prices.

Housing investment

Housing investment ratios have evolved during the past four decades (see Chart 1). In the United States, low interest rates helped housing investment run countercyclically to the 2001 recession, and in the recovery have been contributing more to gross domestic product (GDP) growth than its historical average. In the United Kingdom, housing investment remains well below its late-1980s peak despite the sharp rise in activity over recent years. The euro area displays relatively high housing investment ratios, although the ratio is lower when Germany is excluded. Germany has seen an ongoing correction from its excessively high rate of housing investment, initially fuelled by the tax incentives in the early 1990s, with the ongoing contraction having resulted in a small negative impact on total euro area GDP growth in the past two years. Excluding Germany, the euro area has received no net contribution to GDP growth from the housing sector.

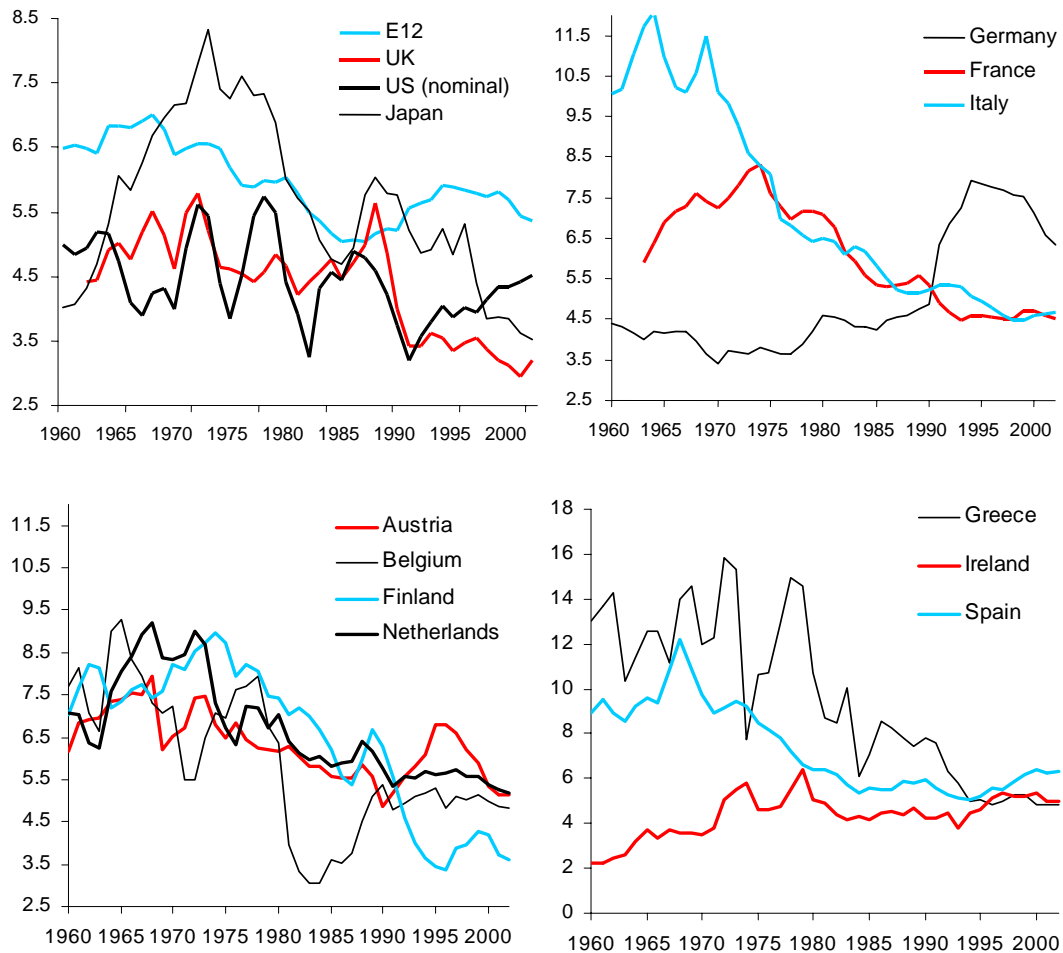
In Japan, housing investment is still adjusting from the boom in the late 1980s. Similarly, in Asia ex-China and Japan, housing investment is by and large below its share-to-GDP reached prior to the 1998 Asian crisis, with the exception of Hong Kong SAR, where the peak occurred in 1999 (see Chart 2). In Australia, dwelling investment has been a positive contributor to the domestic cycle.

House prices/values

Aggregate house prices have risen strongly in the United States, the United Kingdom (see Chart 3) and Australia (see Chart 4) for several years now, while they are still declining in Japan and Germany, reflecting the ongoing housing investment adjustment in these two countries. The stronger housing market performances have led some observers to express the concern that housing may be in a "bubble". The concept of an asset bubble has a meaning only if there is some disparity between the price of capital and some measure of its underlying value. An international comparison of whether house prices are "appropriately" valued shows cross-country disparities, with the underlying difficulty being the availability and comparability of data. For example, property prices in Asia pertain to a narrow segment of the housing market and thus tend to be vulnerable to wide swings (see Charts 5 and 6). Corrections from 20%-plus value growth rates have occurred in the aftermath of the Asian crisis, with the exception of Indonesia, where the correction occurred more recently. Most Asian markets remain sluggish. In Australia, strong incentives during 2000-02 have contributed to a sharp rise in demand.

Chart 1

Real housing investment as a percent of real GDP



Sources: CSFB; OECD; national statistics.

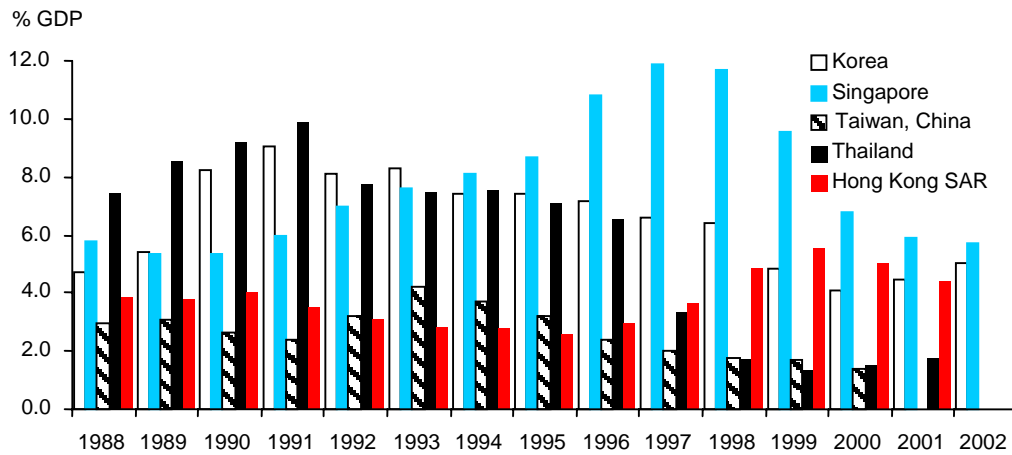
P/E ratios

CSFB's US economics team has used the concept of price-earnings ratio (P/E) for America's residential housing stock that is calculated by combining the flow-of-funds data on residential real estate values with the national income accounts data on the consumption of housing services. The latter is measured as actual rents paid by renters and imputed rents of homeowners. These rental payments can be thought of as the earnings of the housing stock.

The main findings of our analysis are:

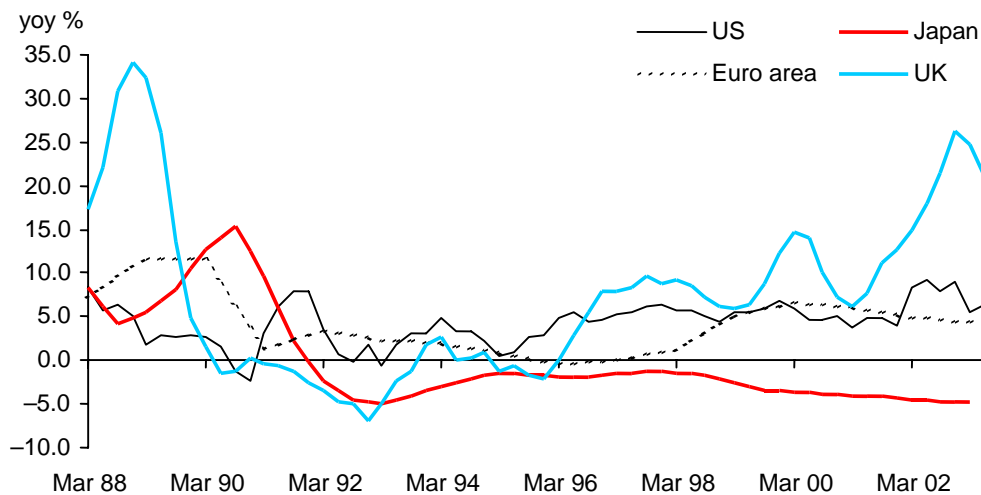
1. The moon-shot that began in 1995 shows no signs of being over just yet. Foreign capital inflows, falling interest rates, and mortgage market financial innovations have raised the residential sector's P/E ratio from 13.5 in 1995 to a new record of 16.1 as of second quarter 2003 (see Chart 7).

Chart 2
Asian residential construction
 % GDP



Sources: CEIC; CSFB.

Chart 3
House price growth in the G3+



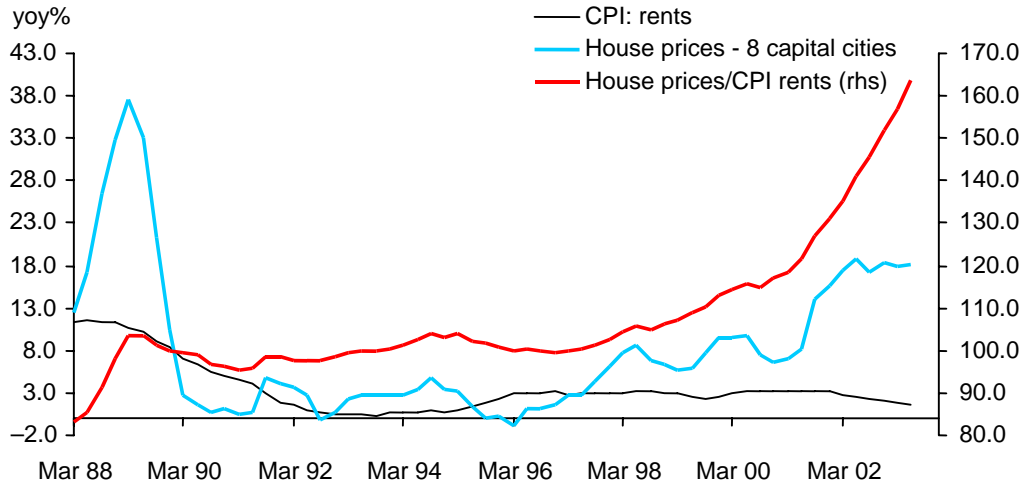
Sources: Central banks; CSFB estimates; Datastream International Limited; BIS.

2. E (ie, Earnings P/E) has a very strong tendency to grow. As long as the population is growing and the economy avoids a catastrophic depression, the amount we spend on housing (outright and by imputation) continues to go up. The speed of that rise seems to be related to inflation, but the record of the last 43 years shows not a single quarterly decline in the housing E.
3. P (ie, Price in P/E) has been, remarkably, almost equally reliable. In only three calendar quarters out of the last 43 years of data did the aggregate market capitalisation of the housing stock go down. The most severe decline in dollar terms was \$35 billion in the first quarter of 1993. This represents a mere 0.4% of the starting value. Even that dip was more than made up by a very substantial \$115 billion increase the following quarter, suggesting the possibility that the decline itself involved measurement error.

4. The evidence suggests that when P/E's in housing on an economy-wide basis get "too high" and "need to come down" the adjustment occurs by rising E's growing into a level of P that itself is still going up, albeit at a slower pace. The adjustment is much more visible in the volume of housing turnover than in house transaction prices.
5. Local markets have shown much greater cyclical fluctuation in price than the national figures reported here.

Chart 4

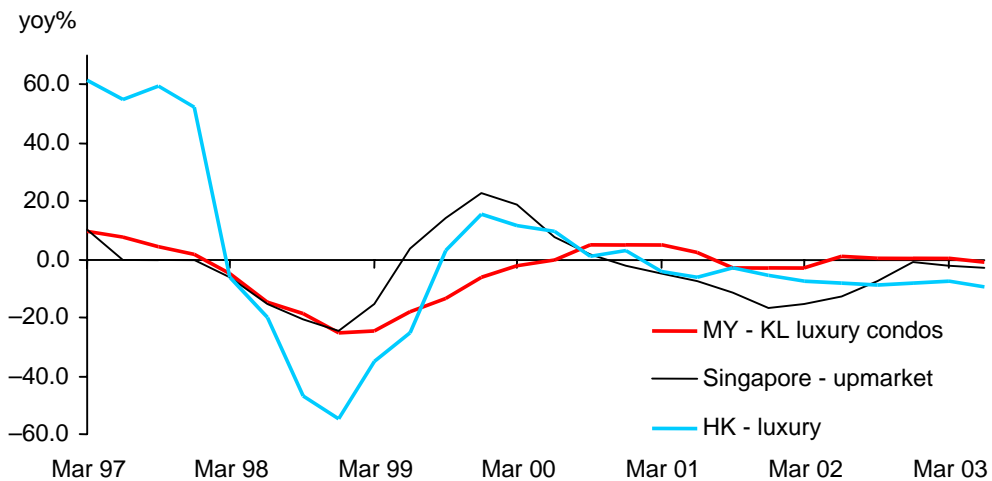
Australia: house price environment



Sources: ABS; CSFB; Datastream International Limited.

Chart 5

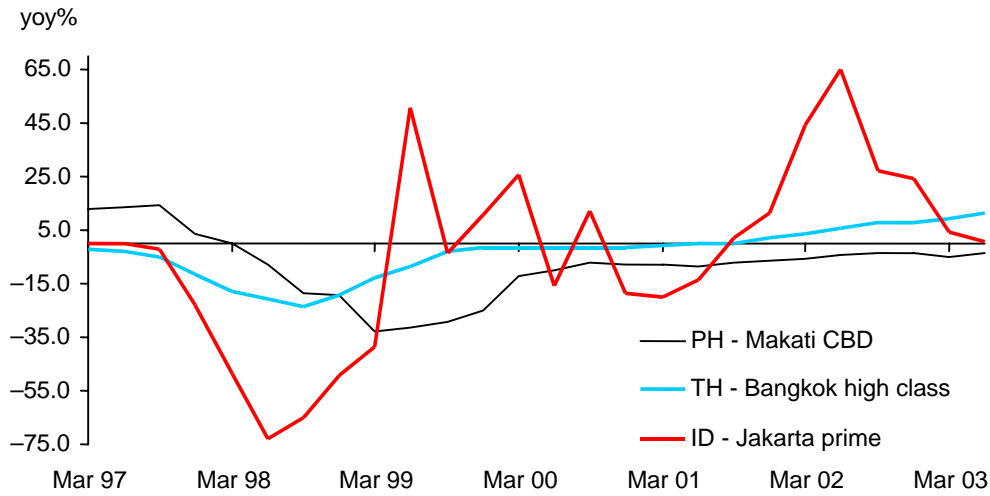
**Asia: residential property prices -
Malaysia, Singapore and Hong Kong SAR**



Sources: CEIC; CSFB; Datastream International Limited.

Chart 6

**Asia: residential property prices -
Philippines, Thailand and Indonesia**

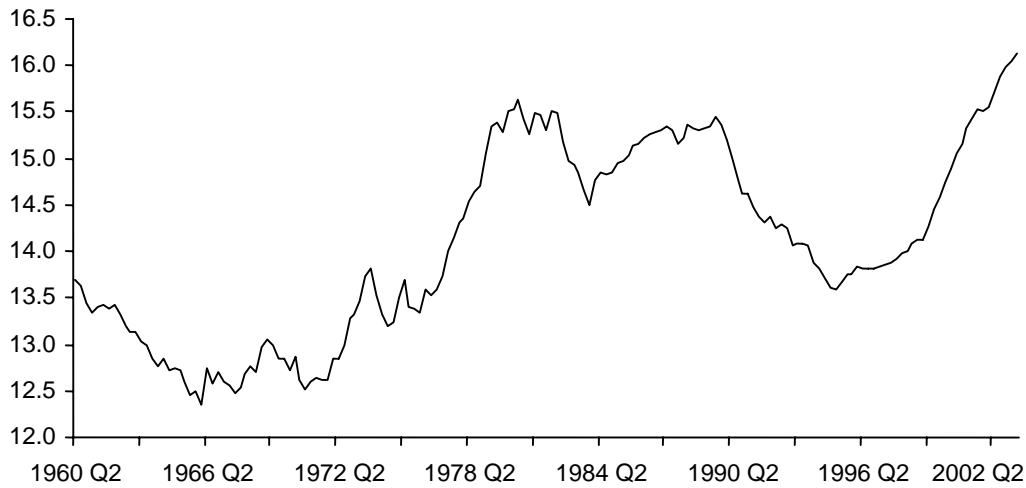


Sources: CEIC; CSFB; Datastream International Limited.

Chart 7

A US P/E ratio for housing

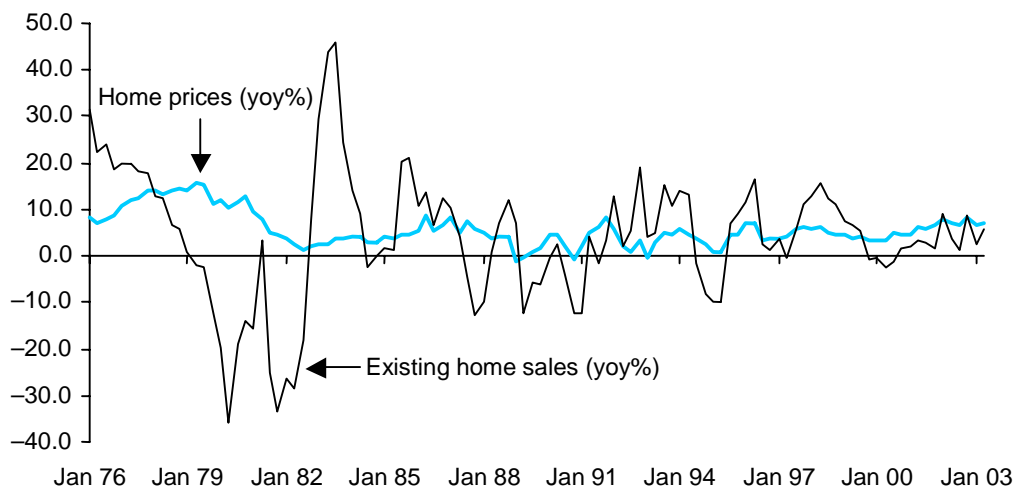
Market value of residential real estate divided by
personal consumption of housing services



Sources: Bureau of Economic Analysis; CSFB; Federal Reserve.

6. The US housing market is distinctive in the sense that volume tends to be much more sensitive than price to changing economic conditions. There are plenty of episodes during postwar business cycle experience when housing turnover fell outright, sometimes dramatically. When interest rates rise or incomes fall, housing turnover tends to get hit hardest. Price adjustments are much less noticeable, particularly at the national level (see Chart 8).

Chart 8
US housing turnover and home prices
 yoy%



Sources: Credit Suisse First Boston; OFHEO; National Association of Realtors.

Calculating the volatility of transaction volume and transaction prices reveals that turnover is almost 25 times as volatile as price. Regression analysis suggests that housing turnover is at least twice as sensitive as housing prices to fluctuations in interest rates and cyclical variables like unemployment.

If there is a housing bubble, then, it is more likely to be in turnover than prices, at least in the United States. This suggests that any eventual housing downturn would not be associated with a mortgage credit loss catastrophe on a national scale. Losses from interest rate risk are a much bigger issue at the aggregate national housing market level.

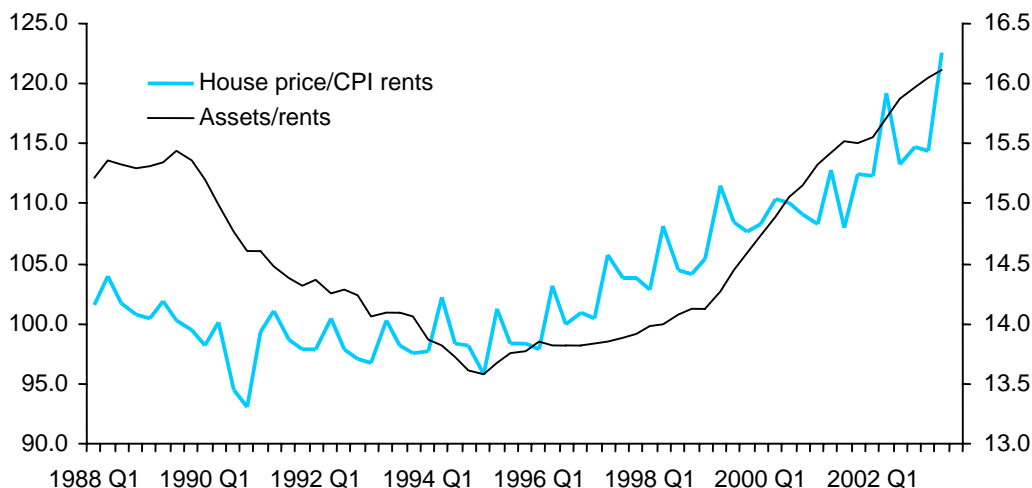
For international comparisons, data on consumption of housing services are not readily available. Tracking the long-term affordability of homes and assessing whether house prices are appropriately valued may be achieved with additional measures, one being the ratio of house prices to rents and one being the ratio of house price levels to national per capita disposable income. A P/E ratio can be calculated on the basis of house prices as a proxy for the asset values and the rent component of the consumer price index (CPI) as the proxy for earnings on the housing stock. For the United States, a similar profile to the P/E ratio derived from asset values and consumption data emerges (see Chart 9), even though the CPI data for rents (rent of primary residence), which represents a very small portion of the CPI (6% weight), have not been consistent over time, given changes in the samples used. (In 1997, the BLS started to develop a new housing sample to replace the one that had been in use since 1987, and began using it with the index for January 1999.)

Internationally, the ratio of house prices to rents has risen over time, with the exception of Japan where the ratio is declining. In the euro area, the rental market is heavily regulated and, as a result, may skew the P/E ratio based on rents as a proxy for earnings. Chart 10 does not show any major distortion in the euro area ratio, but that is because in two of the largest economies house prices are either below the rental price series (Germany) or in line (Italy). For the remainder, house prices have moved well ahead of rental prices.

The rise registered in the UK P/E ratio has been spectacular, attesting to the Bank of England's concern about overvaluation, particularly taken in conjunction with their concern that there is not a significant amount of spare capacity in the UK economy as the global economy starts to accelerate. However, structural changes in the UK economy would argue against the notion of a speculative bubble. Over the last five years, the UK economy has moved from a high inflation/high short-term interest rates economy to a low inflation/low short-term interest rate economy. The Bank of England has suggested that demand for housing has risen thanks to sustained low inflation and rising housing affordability. In a high inflation/high interest rates environment the burden of mortgage payments as a share of income tends to be tilted toward the early years of the mortgage. Admittedly this burden falls

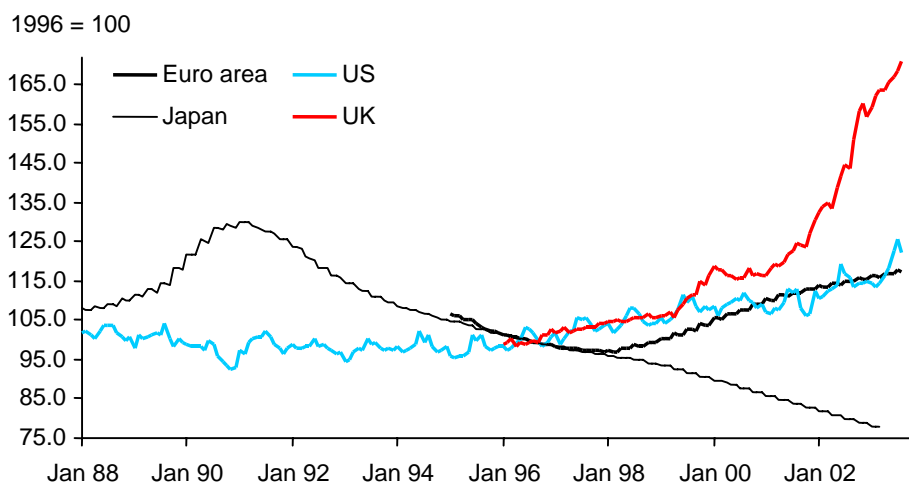
over time as inflation erodes the real value of the debt, but could bring cash flow problems for some households during the early years of the mortgage, thereby inhibiting households taking out large mortgages. A low inflation/low interest rate environment reduces this initial burden and set the stage for increased demand for mortgages. This being said, the Bank does acknowledge that not all is positive with low inflation. For example, tax advantages of owning a house relative to other assets are reduced under low inflation, as the primary residence of households is not subject to capital gains tax, a form of taxation that is more attractive when inflation is high.

Chart 9
US comparison of P/E measures



Sources: BEA; CSFB; Federal Reserve.

Chart 10
Ratio of house prices to rents



Sources: Central banks; CSFB estimates; Datastream International Limited; BIS.

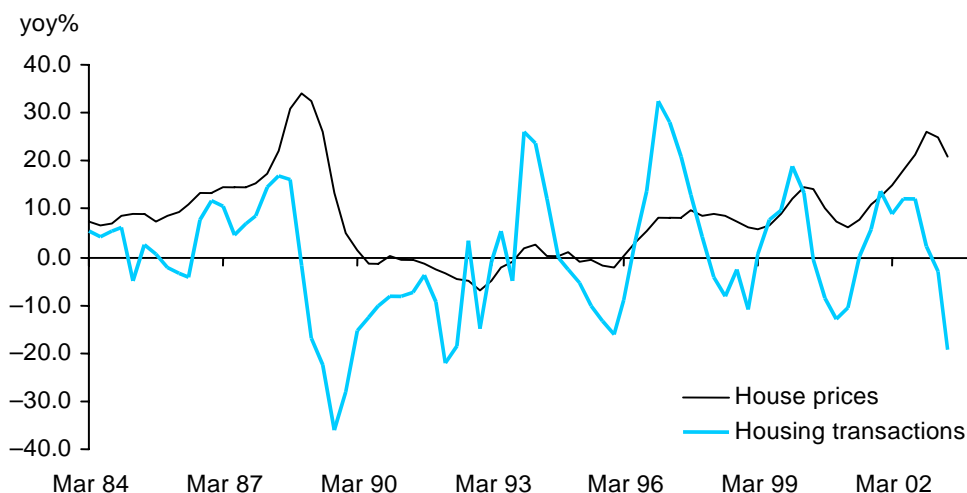
Other factors, such as increased participation rates and higher employment, also have raised the demand for housing, while supply clearly has lagged. Barring an interest rate or labour market shock, there is little scope for forced selling and falling prices. The P/E ratio, therefore, will likely adjust down by E growing into the level of P that would be growing at a slower rate. And, similar to the dynamics

governing the US housing market, the burden of the adjustment lies in turnover rather than in prices. UK housing market turnover has already slumped this year (see Chart 11), suggesting that affordability has become stretched and new buyers are no longer willing or able to come in at these levels.

In Asia, the ratio of house prices to CPI rentals confirms what is depicted in the property values, namely that the housing sector is still adjusting to the Asian crisis shock (see Charts 12 and 13).

Chart 11

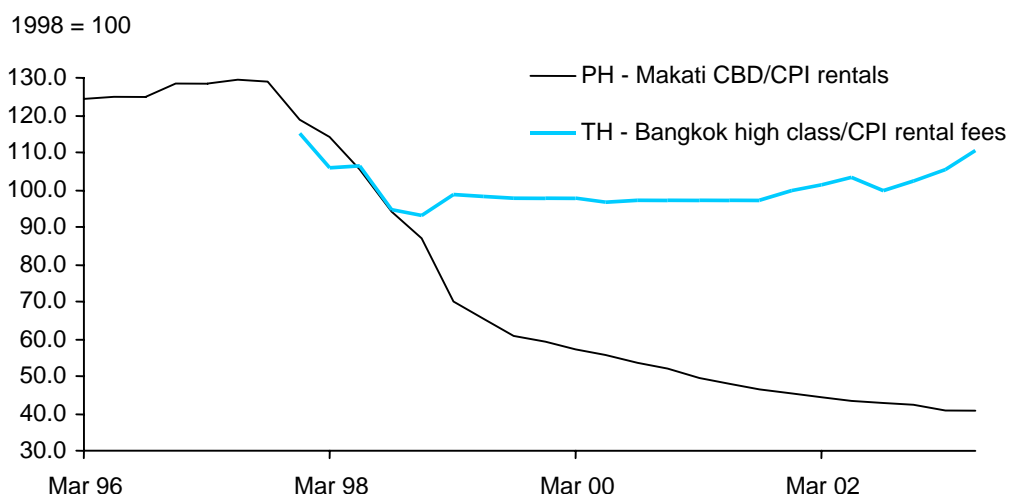
United Kingdom: housing prices and housing...activities



Sources: CSFB; Datastream International Limited.

Chart 12

Asia: house prices to CPI rentals - Indonesia and Thailand

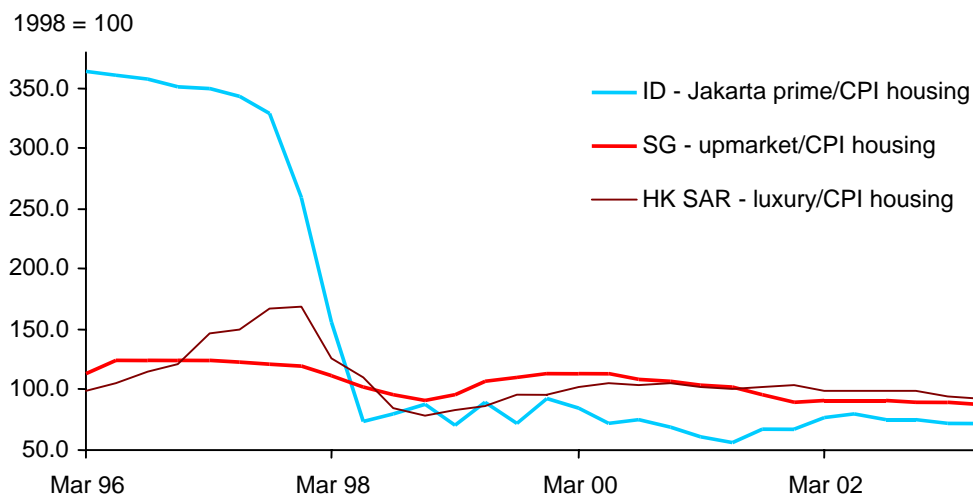


Sources: CEIC; CSFB; Datastream International Limited.

The second P/E measure, namely the ratio of prices to per capita personal disposable income, shows a rising ratio for the euro area but still slightly below its long-term average (see Chart 14). Again, this masks national disparities and arises from the historic downtrend in the German ratio. The Dutch, Irish

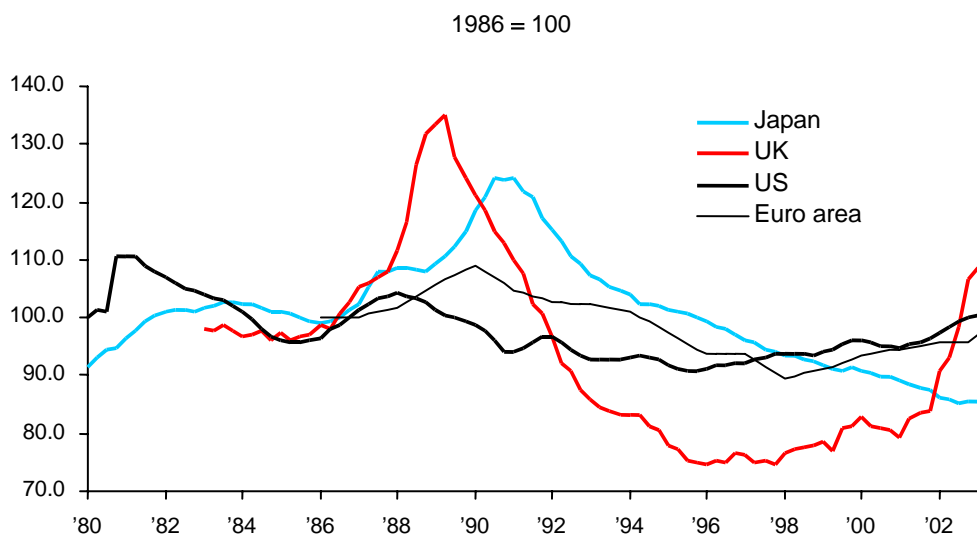
and Spanish housing markets appear highly valued in relation to personal disposable income, while, in addition to the German market, the Greek market appears inexpensively valued. Belgium, Finland, France and Italy appear moderately valued.

Chart 13
**Asia: house prices to CPI housing -
 Indonesia, Singapore and Hong Kong SAR**



Sources: CEIC; CSFB; Datastream International Limited.

Chart 14
**Ratio of house prices to per
 capita disposable income**



Sources: Central banks; CSFB estimates; BIS.

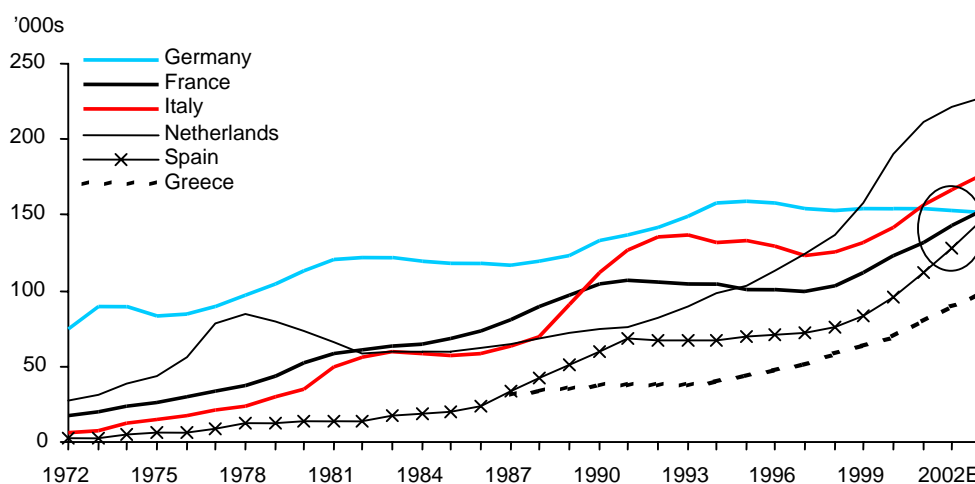
There has been a convergence in housing prices across the euro area (see Chart 15). This is mainly attributable to the convergence in per capita disposable income but is also the result of the convergence in real interest rates, following the monetary union. In dynamics similar to what we described for the United States and the United Kingdom, the fast rising markets are set to correct, with growth in housing prices slowing (for example, they have already stalled in the Netherlands), while the

markets that appear inexpensively valued (eg, Greece) could still post a rise toward the average as economic convergence proceeds. Germany is a special case, as the ratio of average German house prices to incomes has steadily declined during the past thirty years, which has enabled house price convergence to occur at the euro area level.

The ratio appears relatively stable historically in the United States and still adjusting downward in Japan. For the United States, this long-term stability contrasts with the recent rise in the P/E ratios discussed above, but generally supports the conclusion that there is no fundamental valuation problem on an economy-wide scale.

Chart 15

Convergence of euro area house prices

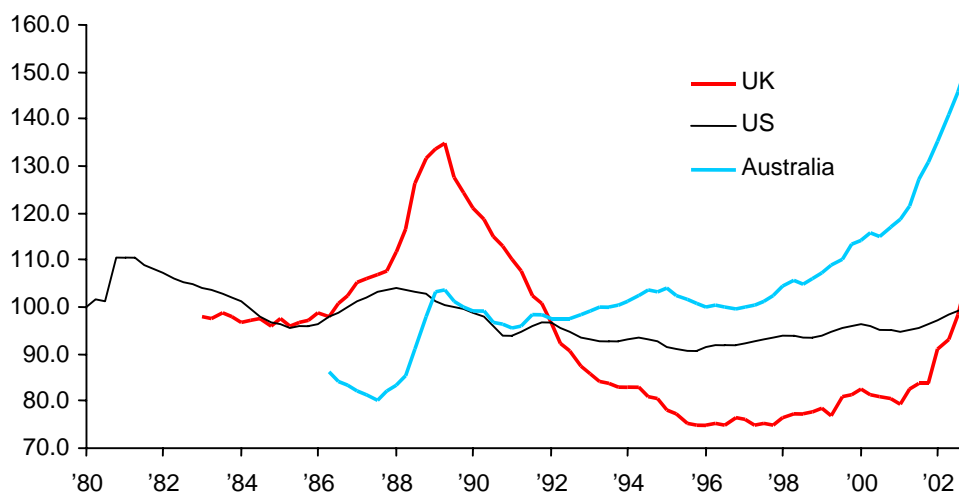


Sources: Central banks; CSFB estimates; BIS.

Chart 16

Ratio of house prices to per capita disposable income

1986 = 100



Sources: CSFB; Datastream International Limited; BIS.

The ratio of house prices to per capita disposable income has posted sharp rises in both Australia and the United Kingdom (see Chart 16). But while affordability had improved in the United Kingdom in the mid-to-late-1990s and is still below the late-1980s peak, in Australia the ratio has risen to a multi-year high and affordability appears very stretched (see Chart 16). This points to a downturn in residential construction, possibly by mid-next year.

Conclusion

In conclusion, housing markets have been strong across major regions. In the United States and the euro area there does not appear to be a major misalignment in house values. Housing values in the United Kingdom suggest some misalignment, were it not for the economy's structural changes over the last five years. More severe signs of value misalignment have emerged in Australia and are a key driver to the shift in the monetary cycle, while Asia is still adjusting from the high pre-1998 valuations. Finally, in the United States and the United Kingdom, if there is a housing bubble, we think it is more likely to be in turnover than prices. Historically, major housing market corrections have been preceded by a sharp rise in interest rates and/or labour market shock, neither of which currently appears to be a strong possibility.

Appendix

Euro area

House prices are sourced as CSFB based on national data and the BIS house price database. The historical data uses the BIS database and it has been updated and extended with national data.

Disposable income per capita (ie, income and population data) is nominal and sourced from the OECD.

United Kingdom

House prices are a simple average of the Halifax and Nationwide indices (UK banks).

Nominal gross disposable income from the household accounts is used.

Japan

Nationwide residential area land prices are sourced from the Japanese real estate institute.

The ratio to rents uses the rent index from the CPI. The ratio is then indexed so that 1996 = 100.

Worker's household disposable income is sourced from the Statistics Bureau of the PM's Office.

United States

The house price series is a three-month moving average of the weighted average (by number of houses sold) of average prices for existing and new one-family homes sold. The houses sold series comes from the Department of Commerce Bureau of Census and the house price series is sourced from the National Association of Realtors.

Nominal disposable personal income is sourced from the Bureau of Economic Analysis.