
Property and inflation

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There is now a substantial literature on the relation between investment returns on commercial property and inflation. This paper makes no claim to bring new empirical evidence to bear on the issue. Rather it aims to summarize the existing evidence and to offer an interpretation of the facts. Its main purpose is to think about how a change in the inflation environment – specifically a move to a world with lower and less variable inflation – might affect the returns on commercial property. How the relative performance of commercial property against other asset classes will change is a crucial question and we consider the issue towards the end of the paper. We also consider whether the returns on one particular alternative asset class – residential property – are potentially sufficiently attractive to warrant institutional investors thinking seriously about aiming to gain exposure to movements in general house prices.

The plan of this paper is as follows. In the next section the evidence on the inflation-hedging characteristics of commercial property is reviewed briefly. In the following section returns performance of a wide range of other assets is considered. The implications of a sustained change in the UK inflation environment are then speculated on. Finally the attractions of investing in UK residential property are considered and some possible methods of sharing in the returns generated by house price changes are discussed.

Commercial property and inflation: the historical record

Figure 1 shows the total annual return on the Investment Property Databank (IPD) index of commercial property (all categories). Figure 1 also shows the annual rate of retail price inflation. Over the past 25 years there does not appear to be a very strong link between nominal returns on commercial property and contemporaneous inflation. The correlation coefficient over that period is actually slightly negative (-0.05) but is so small that the most sensible interpretation is that there is effectively no immediate link between nominal returns on commercial property and general price rises. (This conclusion is also true if one uses the Jones Lang Wooton index of property values.)

More formal analysis of the data by Barber White Property Economics (Barber and White, 1995) confirms the message which comes out of the simple graphs – property is a poor hedge against sudden movements in inflation. But for an investor whose time horizon is longer than a year or so the relevant question is how the real value of commercial property holds up in an inflationary environment over a more sustained period. Once again the answer appears to be “not very well”. Three separate pieces of evidence are relevant here.

First the most simple. Figure 2 shows that in the period 1971-1995 (when inflation averaged 8.5 per cent) the real value of an investment in commercial

Figure 1.
IPD Long Term All
Property Index and RPI
(percentage)

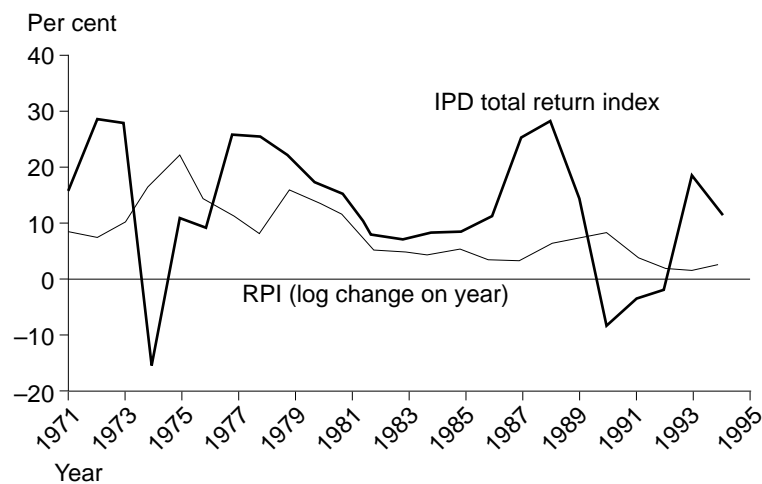
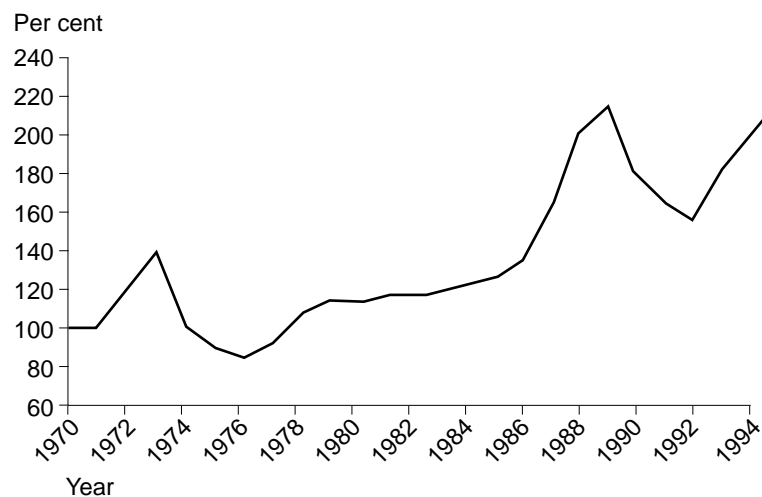


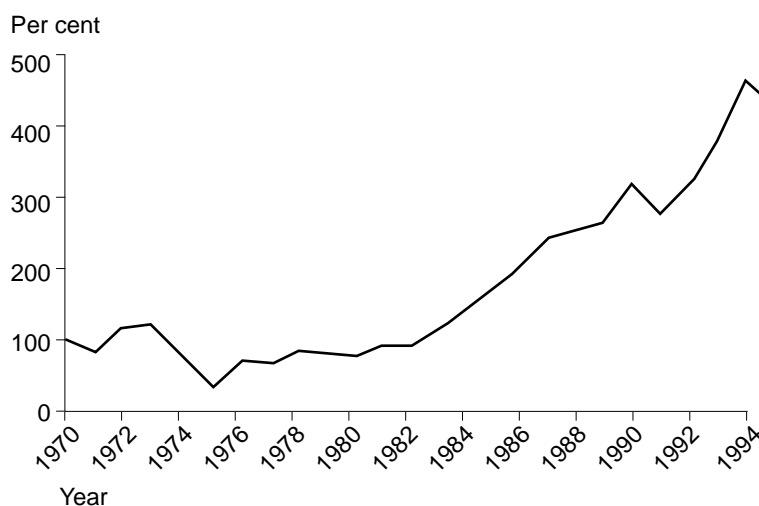
Figure 2.
Real return on
commercial property



Note: 1971 = 100

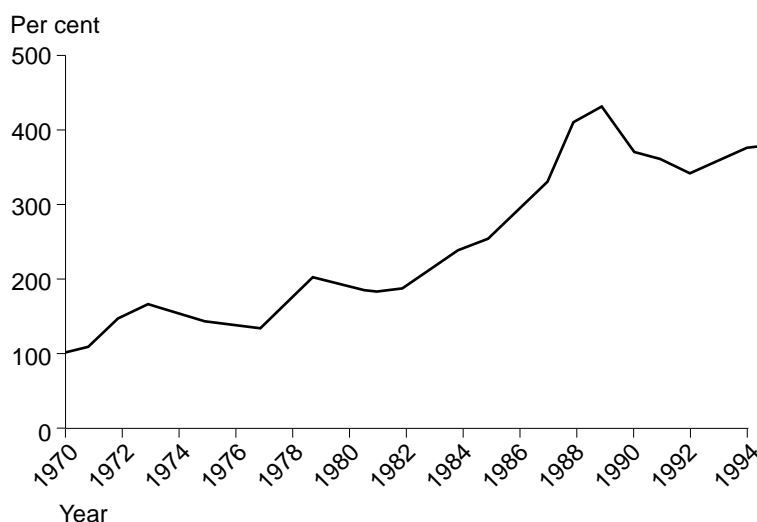
property would have risen by an average of about 3 per cent a year. Money invested in 1970 would, in real terms, have doubled in value by the start of 1995. Over the same period the real returns on a diversified portfolio of UK equities would have averaged about 6 per cent a year (Figure 3). The real return on residential property (making a conservative estimate of the net of costs rental services to owner occupiers of 5 per cent of home value each year) averaged just under 6 per cent a year (see Figure 4).

So over a quarter century when inflation was substantially higher – on average – than would have been predicted at the outset, returns on commercial property were only one half those on the assets of UK companies or on the tangible assets of home owners.



Note: 1971 = 100

Figure 3.
Real return on UK
equities



Note: 1971 = 100

Figure 4.
Real return on owner-
occupied property

Second, we have the evidence from the vector autoregressions estimated by Barber White. These are simple statistical models designed to reveal the short run and long-run reaction of returns on commercial property to inflationary shocks. Their results suggest that even after three years – by which time one would expect much of the reaction in commercial property values to have come through – less than 40 per cent of the erosion in real values caused by inflation has been recaptured.

Third, we followed a slightly different statistical technique to that used by Barber White and focused on the relatively short period from 1985 to 1995. Using monthly data we first estimated a simple model of inflation where the expected component of price rises is given by the fitted value of a regression where past values of inflation, wage rises, changes in the exchange rate and changes in total output are used to predict retail price increases. The unexpected component of inflation is then constructed and is used to help explain monthly commercial property returns. Two results emerged. First in the short run commercial property returns do not respond at all to unexpected inflation. But even after 24 months nominal returns are only slightly higher; barely 50 per cent of the increase in inflation is matched by higher commercial property return even in the very long run.

Why is commercial property such an imperfect hedge?

Because investment in commercial property, like equity investments or wealth held in the form of owner-occupied housing, are backed by tangible assets, it might seem reasonable to expect their real value to be immune to changes in inflation, at least in the longer run. In contrast to conventional bonds – whose capital values and coupon payments are generally fixed in nominal terms and whose values are completely unhedged against inflation risks – commercial property, owner-occupied housing and equities might be expected to provide a high degree of protection against unanticipated price rises.

But while this is a reasonable argument to make with equities it is less so for commercial property because rents are often set for lengthy periods and are generally not indexed to prices. Thus a substantial part of the value of commercial property – the present discounted value of the future rental payments whose values have already been set – is completely unhedged against inflation risks. Only when rental agreements are renegotiated might the stream of payments which gives property its value come to reflect price rises in the economy. In contrast, the stream of income from which equity derives its value is more likely to move up with general increases in prices because those price movements themselves will immediately have increased company revenues from which dividends are paid.

Thus, commercial property might be expected to lie somewhere between equities (well hedged against inflation) and conventional bonds (not hedged at all) as regards its risk characteristics. In the next section we consider whether the long-run returns performance of these, and other, assets is consistent with this simple idea.

Returns on a broad range of assets

Figures 5 and 6 and Table I provide a summary of the overall real returns on various types of investment over the past 50 years. (The exact definitions of the rates of returns and data sources are described in the Appendix.) Over that period investments in UK equities have generated average pre-tax real returns of 6.7 per cent a year (making no allowance for transactions costs). The average

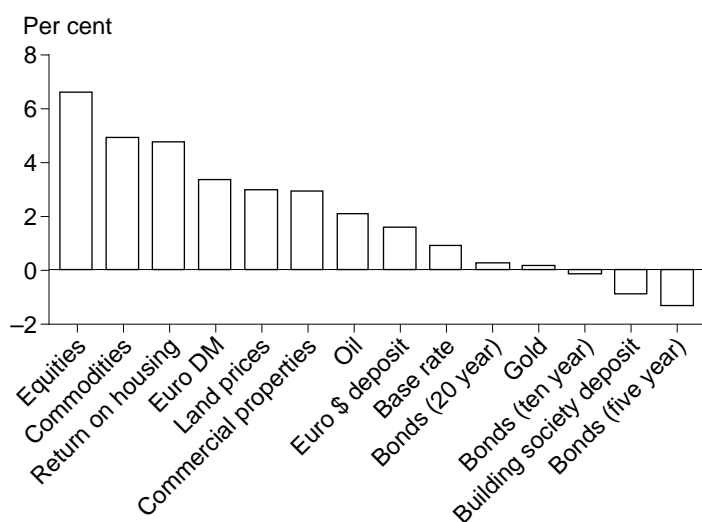


Figure 5.
Rates of return

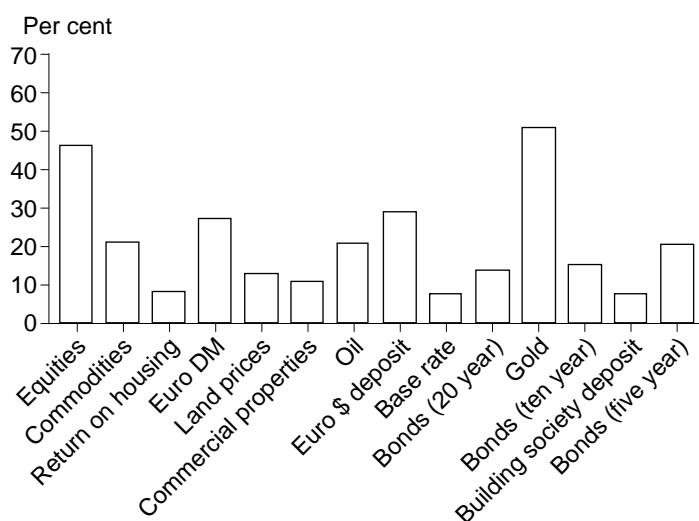


Figure 6.
Volatility of rates of
return (standard
deviation of real
returns)

return on government bonds varies between about -1 per cent (for shorter dated gilts) to just over 0.3 per cent (for longer dated gilts). Deposits with building societies have generated pre-tax returns which in the post-war era have generally failed to keep up with inflation; in the 50 years since 1945 the average annual real return is -0.75 per cent. An asset which earned bank base rate would have slightly outperformed a portfolio of longer dated government bonds and generated average real returns of about 1 per cent.

Real commodities – oil, gold and raw materials – have on average generated positive real returns but these have fallen well short of the return on equities

	Average period return ^a	Standard deviation	Period
<i>(Based on monthly data)</i>			
Equities	6.69	52.53	Apr 1946-Jun 1995
Gold	0.21	57.70	Jan 1950-Jun 1995
Euro DM	3.52	31.08	Jul 1963-May 1995
Bonds (20 yr)	0.34	15.7	Jan 1945-Apr 1995
Bonds (10 yr)	-0.11	17.6	Jan 1945-Jun 1995
Bonds (5 yr)	-1.15	23.6	Jan 1945-Jun 1995
Base rate	1.09	8.44	Jan 1945-Jun 1995
Building society deposit	-0.79	8.49	Jan 1945-Jun 1995
Euro \$	1.72	33.11	Jan 1957-Jun 1995
<i>(Based on quarterly data)</i>			
Return on housing ^b	4.89	9.5	1953 Q1-1995 Q2
Commodities	5.07	23.98	1965 Q1-1995 Q2
Oil	2.17	23.99	1963 Q1-1995 Q2
Land prices	3.14	14.94	1964 Q1-1994 Q4
<i>(Annual)</i>			
Commercial properties	3.10	12.14	1971-1995
Monthly change in log RPI (at annual rate)	6.54	8.03	Jan 1956-Jul 1995

Notes:

^a Expressed at an average annual rate

^b The return on housing is constructed using the following formula:

$$(R + \pi - \lambda r(1 - t) - (1 - \lambda)d - \delta - m)PH/RPI$$

where

r = building society mortgage rate

d = building society deposit rate

λ = average gearing rate

t = product of marginal tax rate of home owner and proportion of mortgage which gets tax relief (assumed to be 0.16)

δ = depreciation rate (assumed to be 0.01)

m = maintenance rate (assumed to be 0.005)

π = percentage increase in nationwide house price index

R = value of rental services of housing; assumed to be 6 per cent of house value

PH/RPI = nationwide house price index relative to RPI index; relative index 1.0 in 1990

Table I.
Average real holding
period returns

and for most investors would represent a much less liquid investment. Residential property has generated significant real returns which, for comparable periods, are only slightly beneath the return on equities. Real returns on land and commercial property have been lower but significantly positive. Investments in dollar and DM denominated deposits have also

generated significant real returns (in sterling terms) over the past 30 years. These returns have significantly exceeded the returns on sterling deposits as the pound has declined substantially in value, and to an extent that has probably exceeded expectations. The decline has been more marked against the DM than against the dollar and returns on Euro-DM deposits have been correspondingly higher.

Although it is post-tax returns that are more relevant for investment decisions the difficulties in deciding how to make tax adjustments are severe. We expect that most reasonable adjustments for tax would not change the ranking of assets much and would probably increase the gap between high yielders and low yielders. The tax rates on returns on equities, for example, are likely to have been below those on bank and building society deposits because capital gains have been taxed at relatively generous rates.

These average returns mask very substantial differences in relative performance over subperiods. Table II shows the levels and variability of real returns over various ten-year intervals. What emerges from this table is that all asset classes have generated negative average real returns over at least one ten-year period in the last 50 years. Furthermore, the variability of returns, even within ten-year periods, is dramatically different across assets. The month by month real returns on building society deposits, on gilts and on assets paying returns that move in line with base rate have been less than one-fifth as variable as the returns on equities. Returns on real commodities and on deposits denominated in dollars and in Deutschemarks have also been much more variable than the returns on sterling denominated debt and deposits. But this month to month (high frequency) volatility is not very relevant for investors aiming to invest for long periods. There is evidence that for equities in particular, returns are proportionately far more variable over short periods (month to month or even year to year) than over long periods. So the risk of equity returns for people saving for retirement is probably overstated by the figures in the table which just look at month to month volatility.

Overall what the tables reveal is that equity investments have significantly outperformed most asset classes over the post-war period. But this outperformance has been less marked in the last five years than in earlier periods. The relative outperformance of equities over bank and building society deposits and over gilt investments has, not surprisingly, been greatest when inflation has been highest. In the ten-year period 1975-1985 inflation averaged 12 per cent – almost double the post-war average. In that period equities generated average annual real returns which were over 13 per cent *above* the returns on medium dated gilts and more than 18 per cent higher than the returns on building society deposits. Over the period 1985-1995 inflation has averaged under 5 per cent; the excess return on equities over medium dated gilts was much lower at just under 4 per cent.

Returning to the longest period over which returns could be measured is probably the best way to assess the overall way in which different asset classes have generated returns over the last 30 years or so – a period when inflation

Table II.
Real holdings period
returns: sub periods

	1945-1954		1955-1964		1965-1974		1975-1984		1985-1995	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Monthly series										
Bonds (5 yr)	-2.21	15.7	-0.94	14.55	-2.56	17.51	-0.53	25.11	3.88	19.8
Bonds (10 yr)	-1.70	15.1	0.30	11.20	-3.19	15.32	0.51	20.12	4.33	17.51
Bonds (20 yr)	-1.21	13.4	0.97	9.87	-3.18	14.36	0.68	22.38	4.31	15.04
Base rate	-1.41	10.20	1.87	7.48	0.04	6.83	-0.35	9.56	5.04	5.86
Building society deposit	-0.80	10.21	0.36	7.55	-2.33	7.02	-3.67	9.75	2.33	5.91
Gold	-4.28 ^a	11.44 ^a	-3.04	8.31	10.29	64.19	2.03	87.52	-5.88	54.09
Equities	6.06	42.41	6.77	44.64	-3.99	56.96	14.81	62.98	9.58	49.98
Euro \$			0.99	6.80	1.33	22.82	6.30	39.18	-1.72	44.65
Euro DM					4.34	24.76	-0.50	37.63	6.49	29.70
Change in log RPI (annual rate)			2.79	5.91	7.19	7.08	11.21	9.75	4.68	6.12
Oil					4.27	14.12	6.39	27.80	-4.15	27.57
Commodities					7.51	25.35	9.57	22.50	-1.56	22.57
Houses			0.98	1.12	2.84	3.47	2.01	3.52	-2.29	9.78
Land					4.28	4.97	2.74	11.77	1.84	23.0
Note: ^a 1950-1954 average										

shocks have been substantial and overwhelmingly positive. Figure 5 reveals that most tangible assets – commodities (with the exception of gold), houses, land and equities – have generated returns above the average for all asset classes; the highest return is on equities. Assets whose returns are set in nominal terms – bonds, bank and building society deposits – have done least well. Commercial property occupies a half-way position between the two classes of assets, confirming our view that its inflation-hedging characteristics are somewhere between the two.

The impact of lower and less variable inflation

It is sometimes argued that returns on property will be lower if inflation remains subdued. But the track record of returns on commercial property is hard to square with this view. We have seen that there is substantial evidence that real returns on commercial property do not keep up with inflation when prices rise unexpectedly fast. In fact the nominal return on commercial property is all but invariant to changes in inflation in the short term.

The Barber White evidence shows that returns on commercial property are much more sensitive to changes in real economic conditions – movements in total real incomes – than to movements in inflation. It follows from this that *if* lower and less variable inflation were to mean less volatility in fiscal and monetary policy, which brought with it less variability in total output and allowed production to remain nearer to the productive potential of the economy, then that could be positive for the commercial property sector. Less volatility in economic activity would not follow automatically from success in keeping inflation within a relatively narrow range. But less variable inflation would probably mean less volatile real interest rates and it is hard to see this as anything other than positive for the property market.

In short, the argument that investment in commercial property becomes less attractive in a time of low inflation is consistent neither with the historical record nor with analysis of the economic forces at work.

Commercial property and residential property

Returns on residential property have been substantially higher than those on commercial property over the past 25 years. If one simply compared the appreciation on residential property with the total return (capital gain plus rental income) from commercial property the two returns would be close. But this omits a large part of the effective return on residential property. The effective rental income from a residential property – net of repairs and depreciation on the house – is unlikely to be under 4 per cent. This alone is greater than the real annual average total returns on commercial property. Adding real housing capital gains would generate an overall return on residential property of about *double* the return on commercial property.

In the light of this it is interesting to speculate on the potential of residential property as an investment class. But first it is worth considering why direct

ownership of residential property has not been popular for institutional investors over the past few decades.

Institutional investors may well have found it unattractive to own directly a portfolio of residential property. Uncertainties over rent controls and legislation on rental agreements may have made investors willing to forfeit gains from sharing in the rise in residential property prices. The adverse publicity from evicting tenants who fall behind with rental payments may also have been an important factor.

These are powerful factors and unlikely to change in the near term. So it is interesting to consider alternative investment vehicles that would allow institutions indirectly to build up a stake in residential property without becoming landlords.

Two schemes are worth considering. First, one could imagine home owners financing a substantial part of the cost of house purchase by issuing equity in the home as opposed to debt (which has been traditional). The occupier would pay a regular dividend to the provider of outside equity who would own a percentage of the value of the house. When the house was sold the proceeds would be split between the occupier and the equity provider in ratios depending on the initial investment. Miles (1994) considers these types of arrangements in more detail. For analysis of the nuts and bolts of this type of contract see Barkham (1995).

The attractive thing about such a scheme is that home owners would be able to reduce their debt gearing and reduce their exposure to interest rate risk. They would also reduce the sensitivity of the value of their overall wealth to movements in local house prices. An investor who acquired a portfolio of equity stakes in property from several regions would also be hedged against region-specific price shocks. Ultimately, what could make these kinds of contract attractive to both sides is the scope for mutually beneficial trade which allows households to be owner-occupiers at less risk and institutional investors to take a stake in residential property without becoming conventional landlords.

A second type of contract would not involve any rental, or dividend, payment from the occupier, thus removing all elements of landlord/tenant in the relations between investor and occupier. Instead, in return for the potential of sharing in the capital gains on a property, it is the investor who would make a fixed payment to the owner-occupier (either as a lump sum or else as a continuing annual, quarterly or monthly payment). Essentially the owner of the property would sell options on their own property. The strike price could be set at the market value of the home at the time the contract was agreed. In this case the acquirer of the option is simply buying the right to take some of the up-side to house prices. If house prices fall the holder of the option gets nothing but the home-owner will still have received the regular flow of payments from the investor.

Sellers of the options receive regular payments – effectively allowing them to reduce their housing costs (thus reducing the burden of mortgage interest payments) – and reduce the sensitivity of their wealth to movements in house prices. Again on risk and return grounds this is, at least in principle, an attractive opportunity. Holders of options can take a highly geared bet on house

price appreciation without becoming owners of a large stock of residential property.

I should make it clear that I believe that there are substantial practical problems involved in the design and trading of these type of contracts. To list just some of the issues that would need to be addressed.

- How are house values to be determined in the absence of a transaction?
- How does one ensure that occupiers have the appropriate incentives to keep the property in good order?
- How would dividend payments to outside equity stakes be treated for tax purposes (might a fraction be tax deductible as is interest on mortgage payments)?
- How would home improvement, or repairs that left the property in better condition, be handled? If they were financed wholly by the occupier they would be effectively benefiting the outside investor at no cost. If they were jointly financed, then agreement would need to be reached over all home improvements.

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The scale of these problems is substantial; but we are impressed by the excess returns performance of residential property over commercial property. Those excess returns have (at least in the past) been so large as to provide a substantial buffer out of which to handle transaction costs and legal problems that undoubtedly arise with either of the types of contract outlined above.

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Appendix

The returns on assets were calculated as follows:

- (1) Ten and 20-year bonds: nominal holdings period returns are based on the following approximation first developed by Campbell and Schiller;

$$Y_{jt} = r_{jt+1} + \left[1 - \left[\frac{1}{(1 + r_{jt})} \right]^j \right] \left[r_{jt} - r_{jt+1} \right] / \left[1 - \left[\frac{1}{(1 + r_{jt})} \right] \right]$$

where y_{jt} is the gross redemption yield at time t of a bond with j periods to maturity and r_{jt} are the average (par) yields on UK government bonds with $j = 5, 10$ or 20 years to maturity (Source: Bank of England, reported in *Financial Statistics*, Table 7.1E). Campbell (1986), Shiller *et al.* (1983) and Hall and Miles (1992) show that the approximation to holding period returns is very accurate.

y_{jt} is then used to define the log real holding return (h_{jt}) using:

$$h_{jt} = (\log((1 + y_{jt}) / ((RPI_t / RPI_{t-1})^{1/2}))) \times 100.$$

- (2) Building society deposit rates: the nominal holding period return in period t is the log of the current average building society share rate (Source: *Financial Statistics*, Table 7.1K).
- (3) Base rate: the nominal holding period return is the log of the base rate of large UK banks (source: *Financial Statistics*, Table 7.10).
- (4) Gold: the nominal holding period return on gold is calculated as the change through the month in the log of the dollar gold price (source: *Financial Statistics*, Table 7.1C), adjusted for the percentage change in the dollar sterling rate.
- (5) Equities: the nominal holding period return is the change in the log of the FT all share index plus the current dividend yield on the index (sources: *post-1963 Financial Statistics*, Table 7.1G; *Pre-1963, Actuaries Investment Index*, Institute of Actuaries).
- (6) Euro \$: the nominal holding period return is the log of the (last working day of month) Euro \$ deposit rate adjusted for £/\$ exchange rate changes (source: *Financial Statistics*, Table 7.1C and Table 7.1B).
- (7) Euro DM: the nominal holding period return is the log of the (last working day of month) Euro DM deposit rate adjusted for £/DM exchange rates changes (sources: Bank of England (BIS), and *Financial Statistics*, Table 7.1B).
- (8) Oil: the nominal holding period return is the change in the log (dollar denominated) oil price index (source: *Financial Times*; London spot markets – Dubai and Brent Bland) adjusted for the change in the £/\$ exchange rate.
- (9) Commodity prices: the nominal holding period return is the change in the log of the commodity prices index (metals and agricultural non-foods) adjusted for the change in the £/\$ exchange rate (source: *UN Monthly Bulletin on Statistics*).
- (10) Houses; the return calculation is described in a footnote to Table I.
- (11) Land: nominal returns are the change in the log of the Department of Environment quarterly index of residential land prices with planning permission.
- (12) Commercial property: the nominal return is the change in the log of the Jones, Lang and Wooton overall performance property index of commercial property values.