IPF Research Programme 2006-2009

Property and Inflation




Summary Report

November 2010

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IPF Investment Property Forum

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This programme supports the IPF's wider goals of enhancing the knowledge, understanding and efficiency of property as an investment class. The initiative provides the UK property investment market with the ability to deliver substantial, objective and high quality analysis on a structured basis. It will enable the whole industry to engage with other financial markets, the wider business community and government on a range of complementary issues.

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PROPERTY AND INFLATION

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1. EXECUTIVE SUMMARY

- While UK property delivers positive long-run real returns, it is not, in most cases, a hedge against inflation, where a 'hedge' is defined strictly as moving at the same time as inflation, or reacting to it, rather than merely keeping pace with it over time. This may depend upon the underlying economic conditions and type of inflation.
- Equities tend to be a far better hedge against inflation.
- Property does hedge against economic growth and, consequently, is useful for matching future assets to liabilities where future liabilities are nominal GDP related (i.e. wages).
- The three key factors in terms of investment performance are position in the cycle at purchase, GDP growth and inflation, in that order. Inflation is an important driver of nominal returns but not the dominant one.
- As income provides all of the real total returns over most years and sub-periods, looking at returns in real terms emphasises the need to and maintain and protect income.
- The importance of the cycle points to 'average cost pricing'. By investing regular sums for long-term investors, through different stages of the market, an investor effectively purchases more when prices are lower.
- Total returns to the different sectors and to alternative assets, and their relative volatility, behave differently in the face of changes to inflation and GDP growth.
- The best scenario for property is the high growth low inflation associated with the NICE era.
- The High Inflation-Low Growth (stagflation) scenario is particularly bad for property. This implies that 'Cost-Push' inflation, such as when commodity prices are rising faster than retail inflation, is not favourable.
- High GDP growth is generally beneficial for property allocations, unless high growth is also accompanied by high inflation. This means that the 'Demand-Pull' Scenario combination (when strong economic growth causes competition for resources and rising prices) does not imply a higher property allocation, except for investors prepared to take on high risk.
- Property should be preferred to equities when low inflation is expected, except for the low inflation-low growth combination where equities should be preferred.
- For very cautious investors, inflation becomes more important than GDP as a driver of property allocations. But for funds prepared to take on more risk, GDP growth is the key driver.
- In most economic environments, the property allocation tends to increase the more risk an investor is prepared to take on. However, the exception is the Low inflation – Low growth situation, where the property allocation is higher for the lower risk portfolios. In other words, in this environment, property becomes a safe haven.
- Within the property sector, offices and industrials are a better hedge against inflation than retail and should be preferred if there is thought to be a risk of high inflation.
- The allocation to offices depends on the amount of risk an investor is prepared to incur, whilst the economic environment tends to influence the allocation of retail and industrial.
- Retail and industrial property tend to be substitutes for one another, with retail being preferred when inflation is low, and industrial (which is a better hedge) when inflation is high.

2. INTRODUCTION

Property practitioners often claim that real estate investment acts 'as a hedge against inflation'. In current markets, it may also be important to consider the effect of deflation.

The purpose of this project is to explore the inflation-hedging qualities of real estate investments, both within the UK and in an international context. The research extends prior work, examines different sectors of the market and considers the inter-relationship of inflation, economic growth and asset returns.

Specific objectives and outputs include:

- A critical review of the existing literature (both academic and international) on the inflation hedging characteristics of real estate
- Creation of an international database of real estate returns, inflation and other relevant macro-economic and financial variables
- Consideration of lease terms in the object countries, to include indexation methods, lease length, review provisions and other contractual characteristics that affect asset risk and return
- Analysis of the relationship between measures of different types of inflation and real estate returns, over different time periods, holding periods and with, where possible, separate analyses by main sectors (industrial, office, residential, retail)
- Consideration of the actual and potential impacts of deflation and testing for the existence of asymmetric behaviour or the existence of 'inflation regimes'
- Comparative analysis of the inflation-hedging behaviour of other asset classes
- Consideration of other measures of inflation (for example, wages or earnings)
- Consideration of the implications of the findings for portfolio strategy, investment targets and performance measurement.

3. UK PROPERTY PERFORMANCE UNDER DIFFERENT INFLATION REGIMES

Over the last 30 years or so there has been an extensive body of work looking at the inflation hedging characteristics of various assets. The origin of much of this work found that US equities were surprisingly a 'perverse' hedge on inflation with equity returns negatively linked to inflation. This was deemed to be a surprise because equities are thought to be a 'real' asset and so in theory should offer a hedge against the impact of inflation in eroding real returns.

The original assumption was that property, like equities, is a real asset, and so should offer a hedge against inflation. However, it will be seen that in practice there is still considerable debate as to whether this proposition holds.

Despite all this work, the most striking conclusion must be that it still remains unclear as to what extent real estate returns do act as a hedge against inflation, or even whether real estate is a superior hedge to equities. Most studies would reject the hypothesis that real estate acts as a compete hedge against all inflation, or even that it offers a complete hedge against anticipated inflation, but that apart there is not widespread agreement.

Studies of the same market have come up with differing conclusions. The most frequently researched markets are the US and the UK, with differing results while seemingly employing similar methodologies.

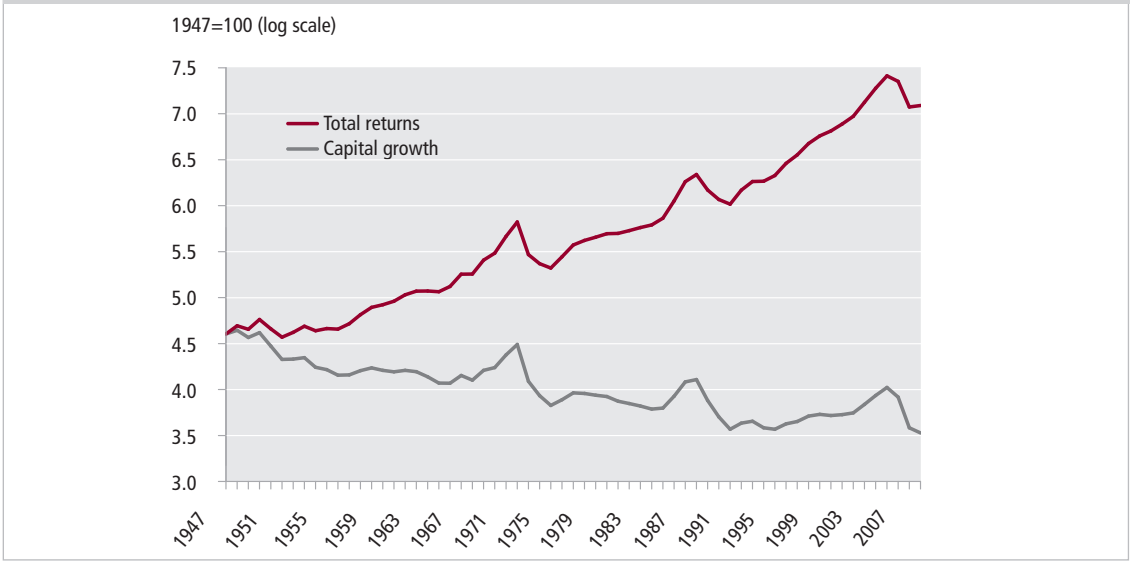
This begs the question whether the relationship between inflation and asset returns varies over time because of one or more structural breaks in the data, or alternatively whether equations are still missing variables that help explain the relationship.

3.1 Analysis: Lessons from IPD data

Long-run real returns

The chart shows real returns to UK property investment in the UK since 1947. It is benchmarked to 1947=100 (or ln (100) in the chart) and is based on the IPD All Property Index plus analysis from Messrs Scott et al, deflated by the ONS' consumer spending deflator. What it shows is the hypothetical value of an investment in 1947 with all returns re-invested year-by-year and all expressed in 1947 prices.

Fig 3.1: UK property: real returns and capital values



Source: IPD, ONS, Oxford Economics

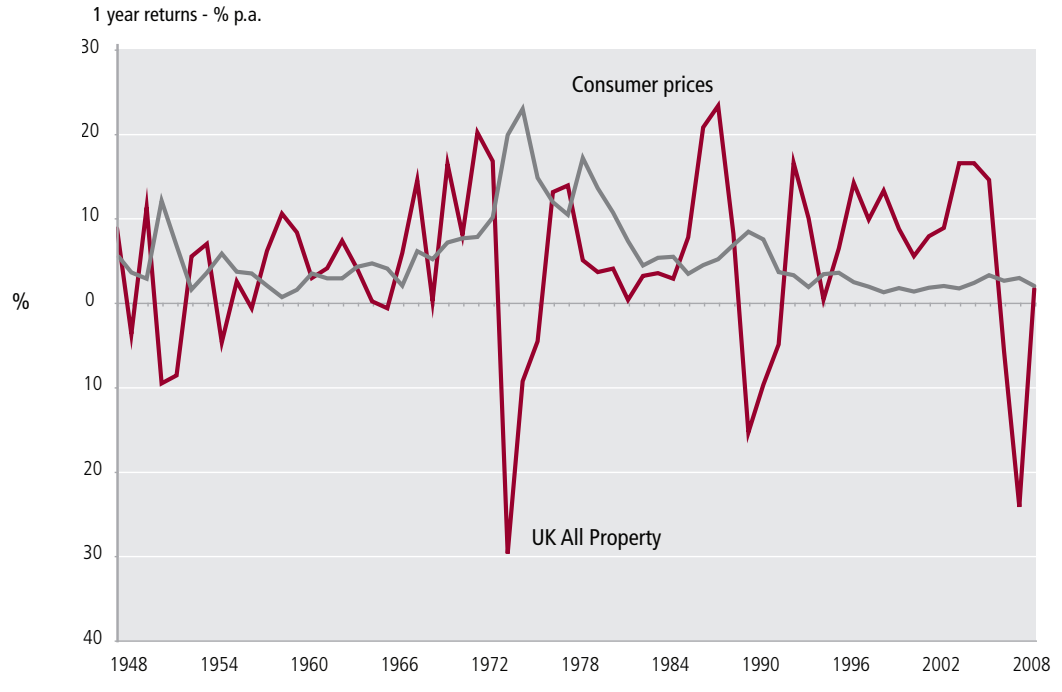
3. UK PROPERTY PERFORMANCE UNDER DIFFERENT INFLATION REGIMES

This analysis exhibits a number of very marked features:

- There is a strong upward trend in real total returns but…
- a number of very pronounced booms and busts produced some major fluctuations with peaks in 1973, 1989 and 2006;
- Taking the period from 1947 as a whole, all of the real returns came from income rather than capital growth as real capital values actually fell and…
- all of the volatility also appears to have come from capital growth.

The observation of positive long-run real returns is not, however, sufficient evidence to be able to say that property investment acts as a hedge against inflation (that is, it reacts to inflation, even though it may perform better than inflation long-term). As the literature shows, if property acts as a hedge against inflation, we would expect that nominal total returns, all other things being equal, would move broadly in line with inflation and that real returns would vary steadily with inflation in the long-run.

Fig 3.2: Real property returns vs inflation



Source: IPD, ONS, Oxford Economics

The chart plots annual real total returns for the IPD All Property index against consumer price inflation. The coincidence of sharply negative real property returns and spikes in inflation in 1974 and 1990 stand out clearly, but year-to-year fluctuations mask the relationship for much of the rest of the period.

The next chart attempts to iron out short-term variation by showing the long-run real rates of return between various benchmark years referred to earlier, together with the average annual rate of consumer price inflation between the same benchmark years.

3. UK PROPERTY PERFORMANCE UNDER DIFFERENT INFLATION REGIMES

The period from 1967–81 was chosen as these were the years characterised by cost-push inflation; oil prices trebled in 1973 and doubled again in 1980. (There are parallels in 2010 with world commodity prices to November up; oil +10%, food +25% and non-food agriculture – including cotton – +70%). Monetary policy has arguably been most effective in eras of Demand-Pull inflation, where higher GDP has lifted retail prices.

Fig 3.3: Nominal returns and consumer price inflation

Source: IPD, ONS, Oxford Economics

There is some relationship between nominal total returns and inflation. Both are low in the beginning and end periods and high in the middle, although simple observation is not enough to prove that property is an inflation hedge. What is interesting, however, is how capital growth appears to respond strongly to inflation while there is little relationship between income and inflation. This is consistent with the idea that property is a real asset.

Income does not keep up with inflation in periods of high inflation. An obvious conclusion is that the income from property investment in the UK fails to keep up with unusually high bouts of inflation because of the UK's long lease structure (though even in the long-run rental growth does not tend to match inflation). This would be consistent with the finding of earlier research that property returns, as a whole, hedge against expected inflation but not against unforeseen inflation.

4. INTERNATIONAL COMPARISONS: IPD DATA

It might be thought that the apparent negative long-run correlation between inflation and real income returns in the UK was largely a function of UK lease structures. There are, unfortunately, no long-run data sets for IPD comparable with that available for the UK. The longest series available are for Australia, Ireland and Canada and these are summarised below. The table shows average real returns between 1985 and 2009, the standard deviation of real returns (as a measure of volatility) and the correlation between five-year moving averages of real returns and inflation.

Table 4.1: Real IPD All Property returns & inflation: International comparisons

	Average annual real total returns*	Volatility**	Correlation with inflation**	Inflation coefficient	GDP growth coefficient
UK					
Total returns	5.6	4.7	-0.7	-0.49	1.92
Capital growth	-1.1	4.5	-0.7		
Income return	6.6	0.8	-0.2		
Australia					
Total returns	6.2	4.9	-0.2	-0.63	4.13
Capital growth	-1.2	4.8	-0.2		
Income return	7.4	0.4	-0.8		
Ireland					
Total returns	8.1	7.0	0.4	-0.43	2.91
Capital growth	1.8	6.6	0.4		
Income return	6.6	1.2	-0.2		
Canada					
Total returns	6.5	5.4	-0.4	-0.32	1.90
Capital growth	-1.3	4.9	-0.4		
Income return	7.8	0.8	-0.5		

* 1985-2009
** based on five year averages 1990–2009

The table also shows the estimated response or 'coefficient' for real total returns with respect to changes in both inflation and GDP growth. The inflation coefficient, for example gives the estimated impact on real returns of a one percentage point increase in inflation having allowed for changes in other variables (chiefly GDP growth) in a regression framework (the full report gives full details). This is in contrast to the simple correlation which just looks at real returns and inflation in isolation. As the analysis is concerned with real returns, a negative inflation coefficient means that real returns fall if inflation increases. In other words, that property is not a technical hedge against inflation.

Many of the coefficients on inflation are not significantly different from zero. In technical terms, this means that a negative coefficient does not prove that property is not an inflation hedge but this is not the same as saying that property is an inflation hedge. Given the sensitivity of the results to the time period considered, and noting that the analysis of the long run UK data argues strongly against the hedging powers of property, the international IPD evidence does not support the view that property investments in other countries do particularly better as an inflation hedge.

4. INTERNATIONAL COMPARISONS: IPD DATA

Property fails to hedge against inflation in each of the countries concerned and not just the UK. This is even the case in Ireland where, at first sight, there is a positive simple correlation with inflation, but once variations in GDP growth are allowed for, another negative relationship is evident. The importance of GDP growth as a driver of real total returns also shows for each country.

A major issue with the international IPD returns analysis is the length of the data series available. Other than for the UK, none of the series goes back before the mid 1980s, and the longest non-UK series are for English speaking countries with historical links to the UK (although Australian and Canadian leases do commonly have rent escalation clauses in leases). IPD data for other countries have an even shorter time span and are not particularly useful for analysing the impact of inflation, as all of the period covered was a low inflation environment.

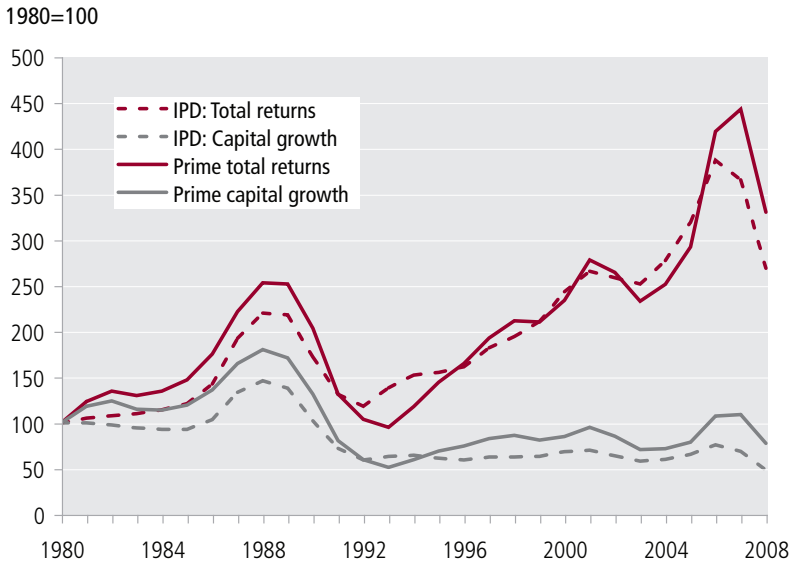
5. FURTHER EVIDENCE FROM PRIME DATA

Why look at prime data?

IPD data have the advantage of a more comprehensive definition (e.g. it takes proper account of depreciation) and are based on actual data on income received (taking into account vacancies as well as any variations from the headline rent). The main drawback, however, with IPD data is the length of the time series available, apart from in the UK.

Prime data are of interest in their own right but they are of added interest if prime returns bear some resemblance to market averages as measured by IPD. This section explores the relationship between prime and IPD data for City offices and then goes on to look at a broader selection of the inflation hedging characteristics of a wider range of international prime data.

Fig 5.1: Prime and IPD returns compared: The City offices example



Source: IPD, Oxford Economics

Table 5.2: Real returns: 1980-2009

	IPD (% pa)	Prime (% pa)
Total returns	3.3	4.1
Capital growth	-2.4	-0.9
Income return	5.8	4.9

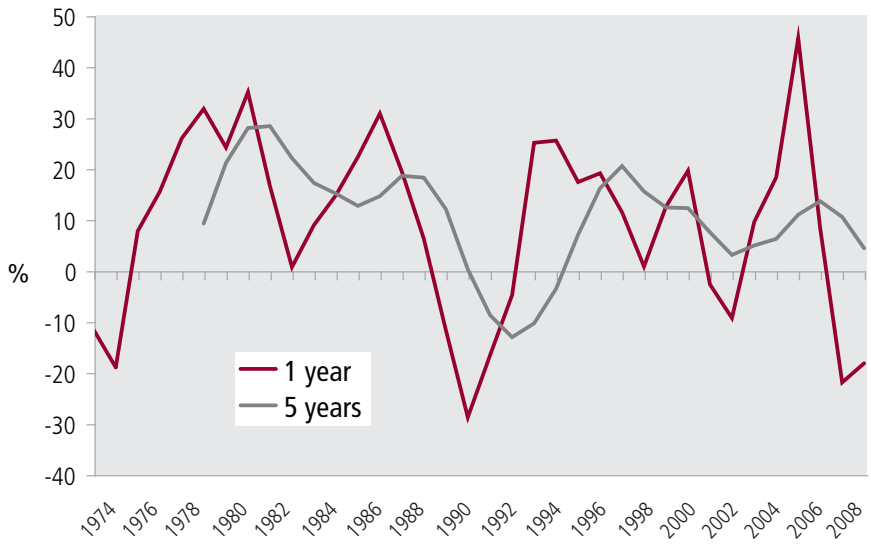
A number of similarities and differences are immediately observed:

- Total returns for prime outstrip IPD, at least over the period considered
- The contribution of real capital growth is negative for both prime and IPD but prime is substantially less negative than IPD
- Real income is lower for prime than for IPD, presumably as a consequence of yields on prime properties being lower
- In both cases, more than 100% of the real total return comes from income rather than capital growth. In other words, income compensates for a real capital loss in both cases

5. FURTHER EVIDENCE FROM PRIME DATA

Figure 5.2 shows the relationship between one and five year (nominal) total returns for City offices. The income element of five-year returns series has been calculated on a cash flow basis with rents being unchanged over the five-year period and the income not being re-invested.

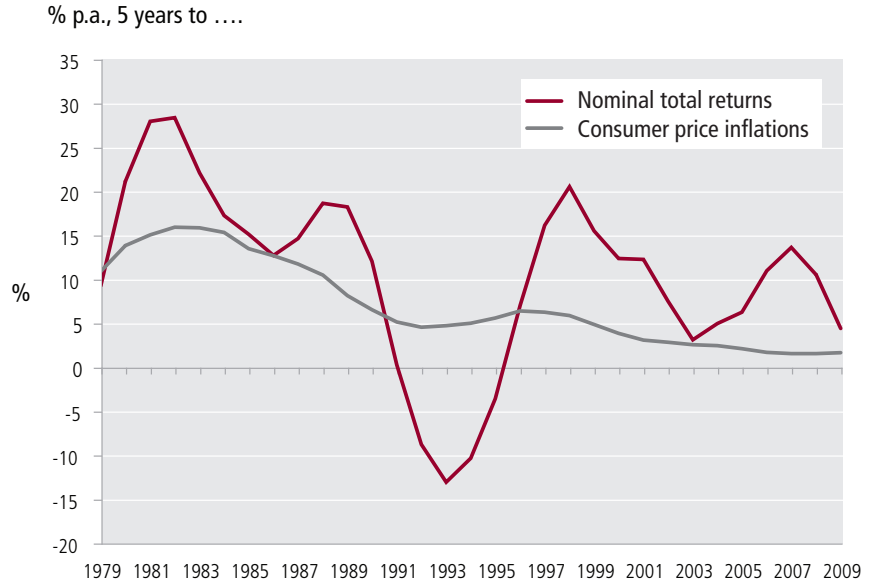
Fig 5.2: City offices: nominal total returns



Source: Oxford Economics

Figure 5.3 shows the five-year total returns for City offices alongside consumer price inflation. The main observations are that nominal total returns for prime city offices are generally higher and more volatile than inflation.

Fig 5.3: City offices: Total returns (five years) and consumer prices

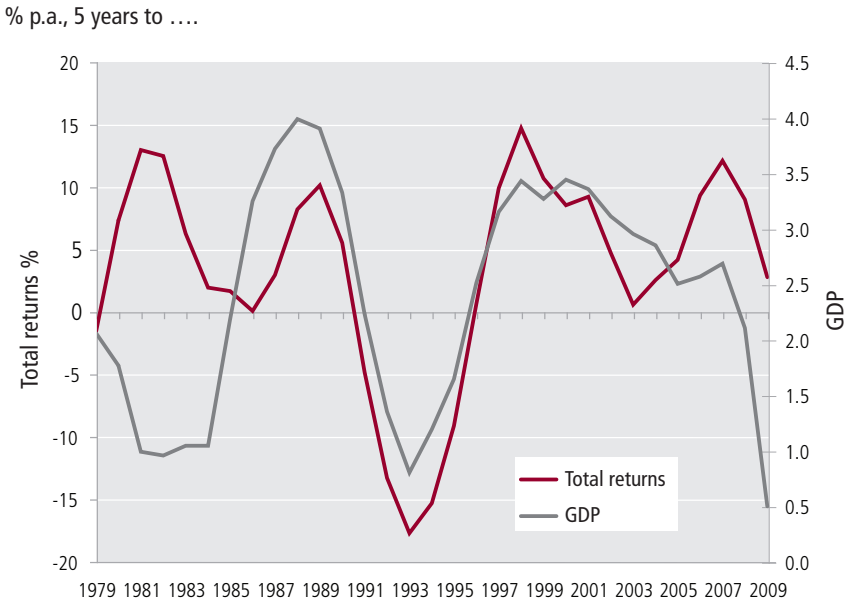


Source: Oxford Economics/ONS

5. FURTHER EVIDENCE FROM PRIME DATA

A very marked feature of real five year total returns is the link with UK GDP growth over a similar five year period, especially for the period from the late 1980's onwards. The UK GDP/real total returns relationship for prime city offices is even stronger than the UK GDP/IPD UK offices relationship.

Fig 5.4: City offices: Real total returns and UK GDP



Source: Oxford Economics/ONS

Statistical analysis of the prime City offices data shows:

- There is a negative relationship between real total returns for prime City offices and inflation. In other words, the data indicate that prime city offices are not a hedge against inflation although the coefficient is not statistically significantly different from zero
- There is a very positive, very significant relationship with UK GDP growth
- There is a strong mean reversion effect (similar to that found in the analysis of IPD data). The negative coefficient on the lagged dependent variable means that several years of above average real total returns tend, all else being equal, to be followed by several years of below average returns

The following table summarises the statistical analysis for prime real total returns data for a selection of international markets and sectors. The time series for this analysis varies, and in some cases contains a mix of high and low inflation years while in other cases it covers predominantly low inflation years.

The 'mean reversion' coefficient is the estimated relationship between five-year real total returns in one year and five-year real total returns five years earlier. It reflects the effect of the property cycle, whereby high returns lead to new developments, which eventually force down rents and capital values. The choice of a five-year span is arbitrary to some extent, but it does capture the main cyclical effects for most markets.

5. FURTHER EVIDENCE FROM PRIME DATA

Table 5.3: Prime data: Responsiveness of real total returns

	Estimation period	Inflation coefficient	GDP growth coefficient	Mean reversion coefficient
Office				
Amsterdam	1981	-0.53	4.74	-0.19
Frankfurt	1983	-0.03	7.77	-0.49
London City	1984	-0.37	8.80	-0.30
London West End	1984	4.50	10.43	-0.30
Paris	1983	0.35	6.54	-0.23
Sydney	1991	-0.78	14.22	-0.32
Tokyo	1990	0.48	4.81	-0.57
Retail				
Amsterdam	1990	-0.78	1.04	-0.31
Frankfurt	1990	5.47	1.70	-0.43
London	1990	-1.14	4.51	-0.27
Paris	1990	0.35	5.73	-0.39
Industrial				
Amsterdam	1990	-1.34	1.95	-0.09
Frankfurt	1990	5.28	2.63	-0.73
London	1990	1.29	5.08	-0.01
Paris	1990	2.60	6.02	-0.42

This international prime analysis indicates:

- Most markets show a negative link between inflation and real returns (i.e. property fails to hedge against inflation) but there are some notable exceptions, particularly West End offices and retail and industrial in Frankfurt, which appear to act as 'super-hedges' against inflation
- In all markets there appears to be a positive correlation with economic growth
- Three of the four industrial markets considered show incidences of being a hedge against inflation
- The mean reversion tendency is apparent everywhere except in London industrials
- Although all incomes used have been adjusted for the lease terms for each market (where there is inflation indexation to the next break point this is calculated), there is no obvious pattern to suggest it changes the results, one city versus another.

The reason why West End offices appear to act as a super-hedge against inflation is that the West End is a prime location with a very limited capacity for speedy supply adjustment. The same might also apply to Paris offices which also hedge inflation. Also, the dynamics between the property values (capital and rental) and land value as a proportion of total value may vary from one city to another, influencing the results.

Frankfurt retail and industrials there do appear to be a hedge against inflation, unlike the office market, but this may be due to the shorter time period, and relate to the background economic market conditions.

Overall, the prime analysis tends to show property in a slightly more favourable light than the IPD analysis. In general, the inflation coefficients (or responses) are negative but not significantly different from zero, and some centres even show up as super-hedges. Some of this, no doubt, is due to the greater importance of capital growth to total returns when compared with the IPD data, and some may be still be due to the period analysed.

6. ANALYSIS OF ALTERNATIVE ASSETS AND PROPERTY SECTORS

The following analysis gives some idea of the relative real rates of return on different classes of property investment (IPD based) and on alternative assets in the UK.

Table 6.1: Real total returns: Alternative assets and property sectors in the UK

			Sensitivity to:	
	Volatility	Simple correlation with inflation	Inflation	GDP growth
All Property	5.0	-0.6	-0.44	1.93
Offices	5.2	-0.5	-0.35	2.52
Retail	4.4	-0.5	-0.75	2.14
Industrials	4.4	-0.3	-0.40	1.75
Equities	8.2	-0.2	0.00	0.00
Gilts	4.7	-0.6	-0.66	-1.03

Volatility and inflation correlations are based on 5-year moving averages. Note that asset class volatility and correlation calculations are based on1975-2009 data. Sector volatility and correlations are based on 1985–2009 data.

This shows the negative relationship between real property total returns and inflation observed earlier and also shows that while equities hedge inflation, gilts fail to. Real equity returns are also unaffected by the rate of GDP growth while equities have a negative relationship with GDP growth.

Within the property sectors, the main differences are that retail is the worst inflation hedge and offices are most sensitive to GDP growth.

7. IMPLICATIONS FOR INVESTMENT STRATEGY: MODERN PORTFOLIO THEORY

Modern Portfolio Theory (MPT) looks at the relationship between expected returns and volatility to determine optimal portfolio allocations for a given level of acceptable risk. This project has highlighted the relationship between expected returns and inflation and GDP growth, but there is reason to believe that volatility is also responsive to variations in inflation and GDP. The volatility of property returns is not sensitive to inflation but increases with GDP growth.

The volatility of gilts is also found to be insensitive to the rate of inflation but in this case it is negatively related to GDP growth. The reason for the negative link between GDP growth volatility in real gilts returns is not obvious although it is very apparent in the data, with the period of high growth in the late eighties (especially) and 1998–2007 being associated with low volatility.

There is a question of whether low gilts volatility promotes GDP growth or the other way around. Causality tests indicate that it was GDP growth that was the instigator, rather than the reverse. The reason for the link appears to be that percentage changes in interest rates, which drives the capital growth for gilts, are more volatile when growth is weak which, in turn, is related to sharp falls in interest rates in the early stage of the recession and a sharp increase towards its end.

The link between volatility in equity returns and inflation and growth is even more complicated. A negative relationship exists between equities volatility and inflation but there is a positive relationship with inflation volatility.

Given the well known positive relationship between inflation and inflation volatility the interactions are potentially quite complex. An increase in inflation will, on the one hand, decrease equities' volatility but the associated increase in inflation volatility will produce an offsetting increase in equities' volatility.

This is of key importance for the portfolio analysis. The total returns analysis implies that higher inflation does not affect real equity returns but reduces real property returns. The volatility analysis now shows that higher inflation will reduce equities' volatility while leaving property volatility changed, which will further enhance the performance of equities in a high inflation environment (and vice-versa).

7.1 Lessons from Modern Portfolio Theory

This report has focussed on the returns to property investment and alternative assets and how they respond to fluctuations in inflation (i.e. their hedging properties). The results indicate that UK property on the whole (industrials and prime property may be an exception) is not a perfect hedge against inflation whereas equities are a much better hedge, and property performs better than gilts. In addition, real property returns have been found to be positively related and gilts to be negatively related to real GDP growth. Investment strategy, however, has to take account of factors other than the expected return on alternative assets.

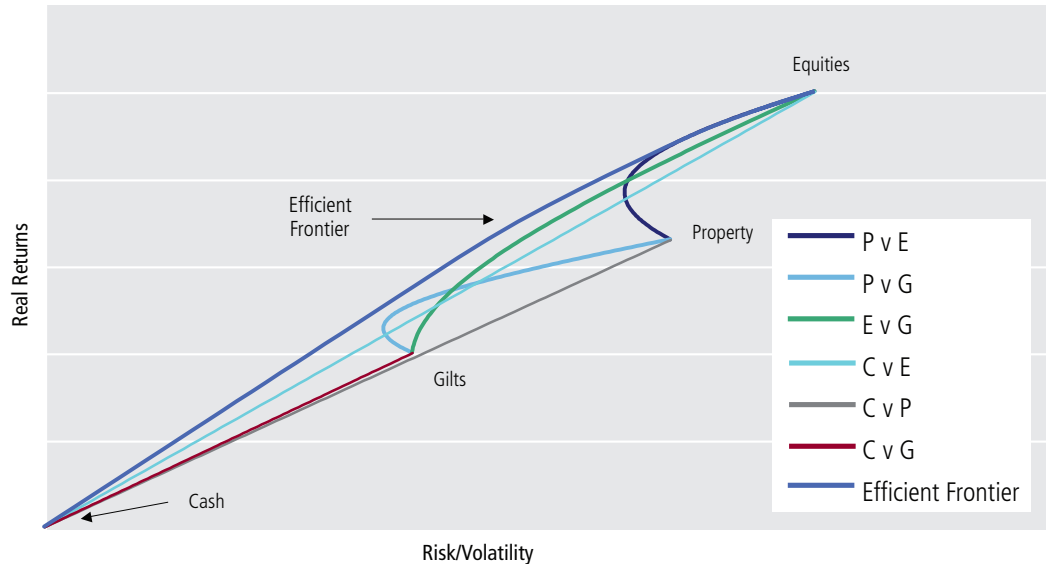
The optimal mix of assets in a multi-asset portfolio depends on the aim of the investor, the nature and duration of their liabilities, and the risks the investor is prepared to take.

The chart shows the cross-correlations for the four asset classes–cash, gilts, property and equities, based upon historical relationships and the assumptions detailed above. The cash return is at the origin; each asset class is compared with cash and then with each other.

We can use these relationships to construct the efficient frontier, representing portfolios for which there is the lowest risk for a given level of expected return.

7. IMPLICATIONS FOR INVESTMENT STRATEGY: MODERN PORTFOLIO THEORY

Fig 7.1: Cross-correlations of risk and real returns between asset classes



Using this framework, an investor who is happy to accept an elevated level of risk (for example, three-quarters of the way along the risk axis) as a trade off for higher expected real returns would heavily bias their portfolio towards equities and, to a lesser extent, property, while having little, or no, cash or gilts.

No relationship between inflation and volatility was found for property or gilts, though there was a significant and positive relationship between GDP growth and the volatility of real returns for property, and a negative relationship with the volatility of real total returns for gilts.

No relationship was found between GDP growth and the volatility of real equity returns, but a negative link was found with inflation and a positive link with inflation volatility.

To summarise, inflation has a negative impact on real returns for property and gilts and a negative impact on volatility for equities, while GDP growth has a positive relationship with both real returns and volatility in property and a negative relationship with gilts' returns.

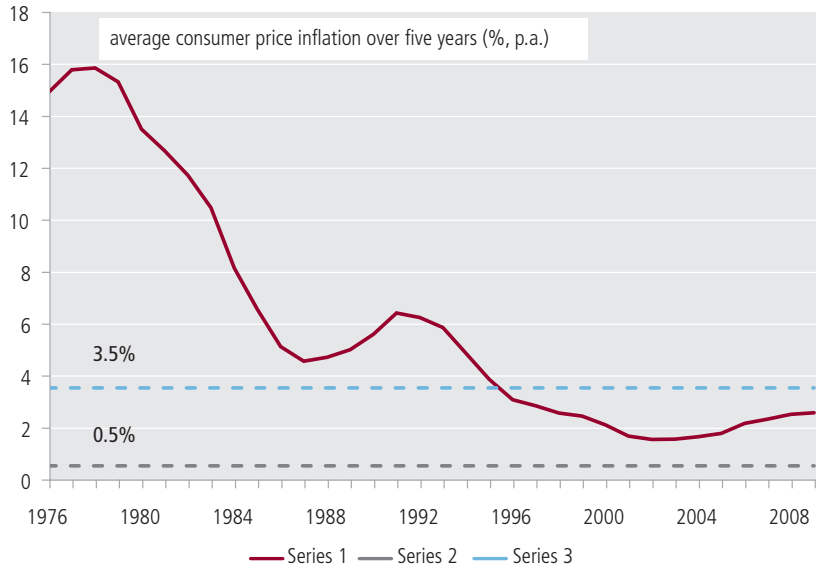
7.2 Scenario analysis

Defining the scenarios

The observations on implications of portfolio theory for portfolio composition, together with the results shown, imply that variations in the inflation/GDP growth mix have implications for optimal portfolio composition.

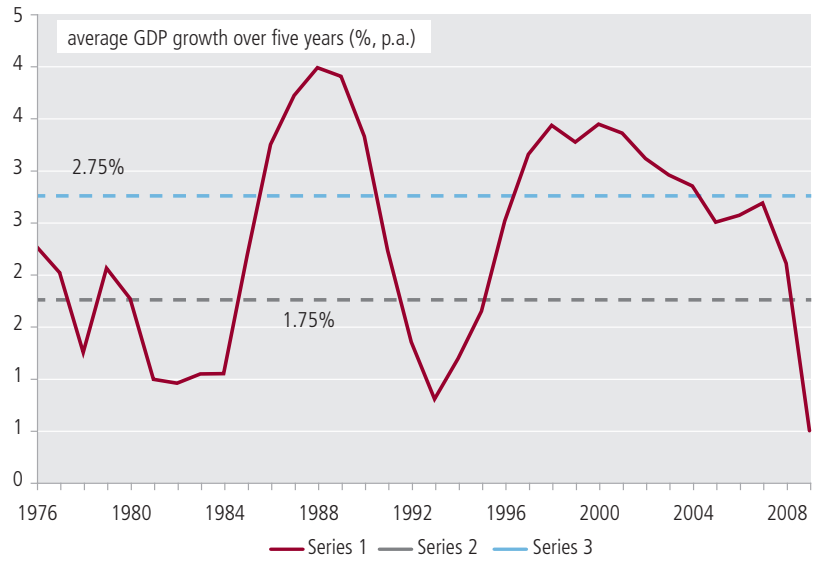
The scenarios are all expressed relative to base, where the base is a broadly consensus view of sustainable growth and inflation outcomes of around 2.25% per annum for GDP growth and 2.0% per annum for inflation over a five-year period. The precise values do not matter as the point is to analyse variations around the base, although the baseline GDP/inflation combination should be broadly consistent with the baseline real returns and volatility assumptions (see below). Comparisons of the scenario values for inflation and GDP growth are shown.

Fig 7.2: UK inflation: history and scenarios



Source: Oxford Economics, ONS

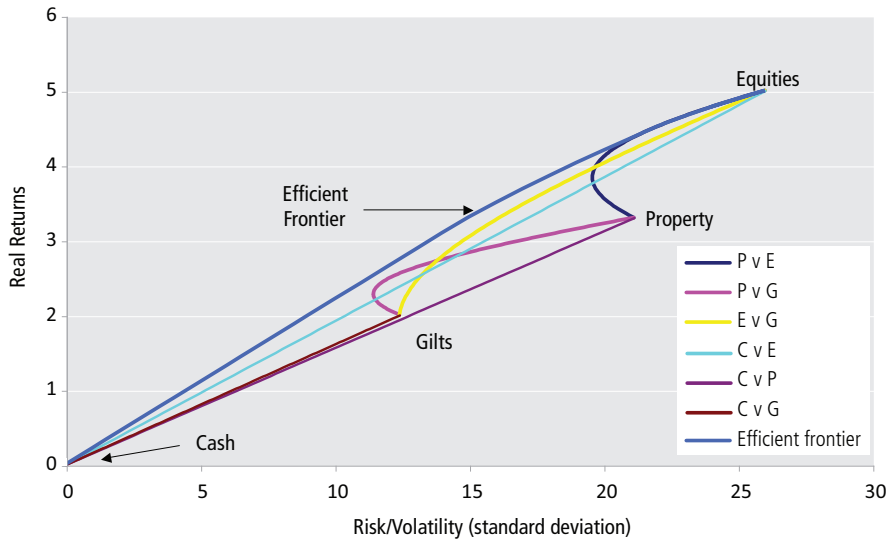
Fig 7.3: UK GDP Growth: history and scenarios



Source: Oxford Economics/ONS

7. IMPLICATIONS FOR INVESTMENT STRATEGY: MODERN PORTFOLIO THEORY

Fig 7.4: The Efficient Frontier - the base case

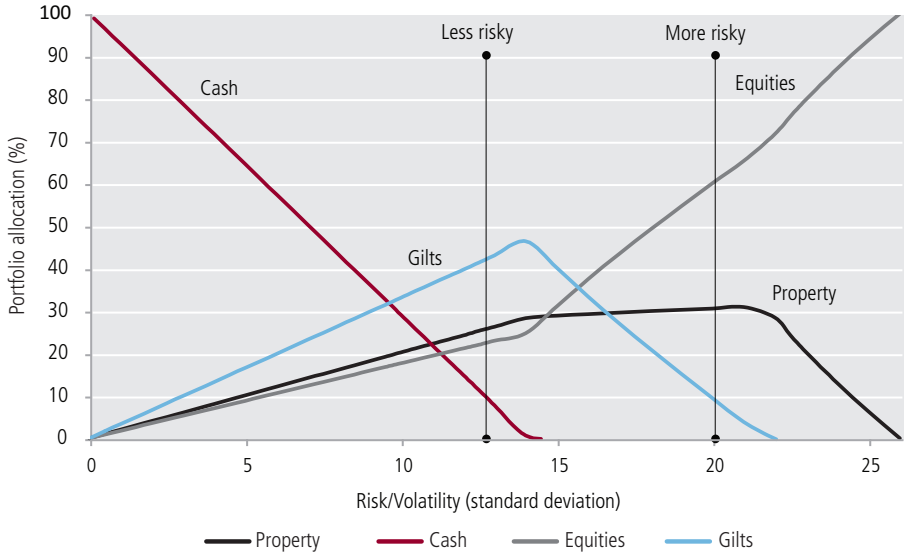


Investors willing to accept maximum risk would hold 100% equities, which would provide an expected return of 5.5% per annum (on the chart this is 5% plus the 0.5% available on cash). At the other extreme, completely risk-averse investors would only hold cash. At all other points between these two extremes, investors would hold a combination of two, three or four of the alternative assets depending on the level of risk that they are prepared to accept.

Cash has been deemed as the 'safe' asset, even in real terms. Its high correlation with inflation, and the fact that it has offered a 0.5% real return over the long term, support this assumption.

The next chart shows the combination of assets at different levels of risk that produce the maximum real returns for a given level of risk on the efficiency frontier. They are all 'efficient' points, as defined by that criterion, and the chosen combination depends on the desired level of risk.

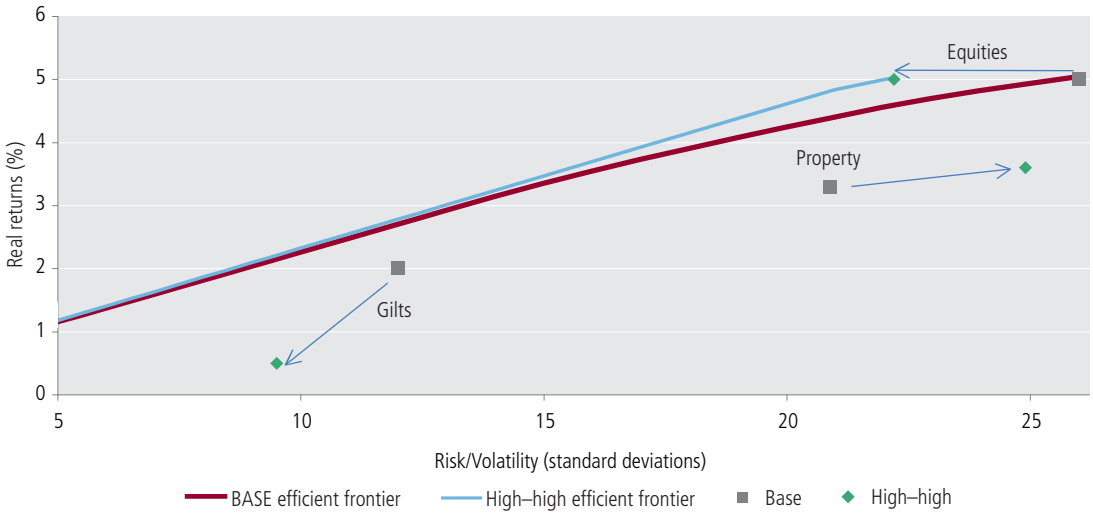
Fig 7.5: Asset Allocation - the base case



In the base case, a less risky investor content with volatility of 12.5% would opt for a mix of 25% property, 22% equities, 41% gilts and 11% cash, while the more adventurous investor content to accept volatility of 20% would opt for 31% property, 60% equities, 9% gilts and no cash.

In the following chart, the yellow squares show the relative risk-return positions of the alternative assets in the base case. In the high inflation/high GDP growth scenario, the returns and volatility alter and the position of the three assets moves in the direction of the arrows to the position marked by the green diamonds. This can have a considerable effect on both the efficiency frontier and optimal asset allocation.

Fig 7.6: Risk and return - base case vs the high inflation/high growth scenario

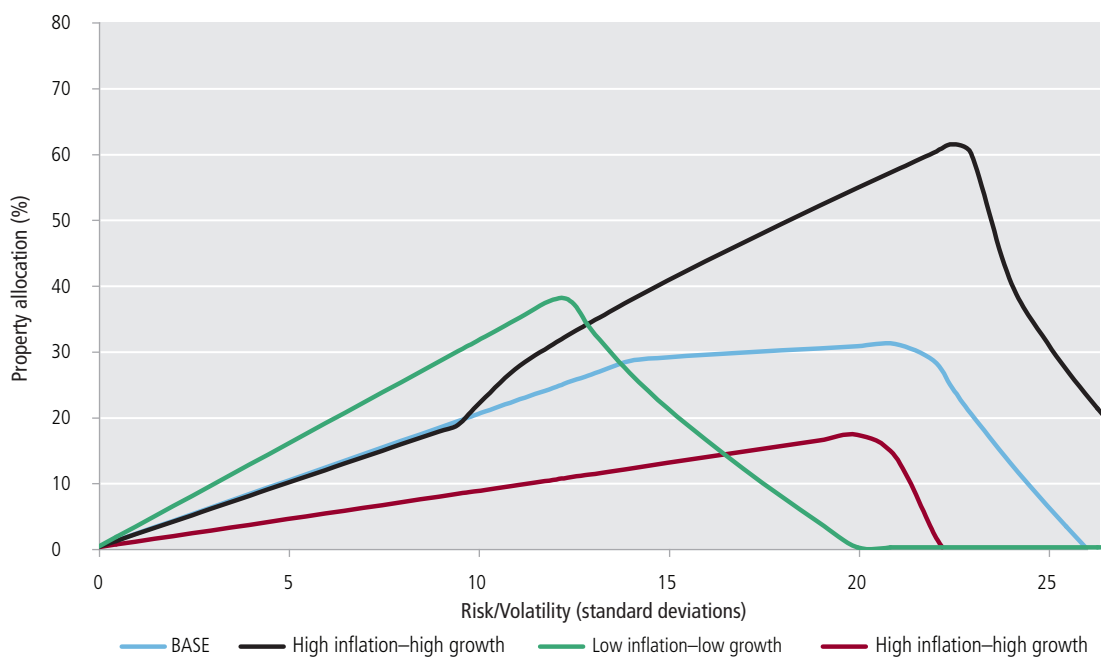


7. IMPLICATIONS FOR INVESTMENT STRATEGY: MODERN PORTFOLIO THEORY

The main conclusion from looking at different scenarios is that it is the combination of inflation and GDP growth which is an influence on property allocation in the base case, with lower inflation and higher GDP being ideal, and higher inflation and lower GDP growth leading to little or no allocation. This reflects both property's weak hedging (against inflation) properties and the negative correlation between inflation and equities' volatility.

The high inflation/low growth (stagflation) scenario is particularly bad for property with the model indicating a zero allocation for both the low and high risk portfolios. This is because expected returns from property in the stagflation scenario are low, and although volatility is lower, the volatility of equities falls further still. Gilts also do badly in this scenario due to a combination of lower returns and higher volatility.

Fig 7.7: Property allocations under different scenarios



Note: High inflation and low growth leads to a zero allocation to property

High GDP growth is generally beneficial for property allocations unless high growth is accompanied by high inflation. This means that the 'demand-pull' scenario combination of high inflation and high GDP does not imply a higher property allocation than the base case, even though the expected real returns for property are higher because of the major link between GDP growth and real property returns. The reason for this is that high GDP growth increases the volatility of real property returns and the gap between the volatility of equities and property is further narrowed by the negative relationship between inflation volatility and the volatility of real equity returns. As might be expected, equities are the major winner in terms of predicted allocation in the 'demand-pull' inflation scenario.

Rather than consider the asset split directly, a typical approach of many mixed asset portfolios is to consider the desired split between fixed assets (cash and gilts) and growth assets (equities and property), depending on the level of risk they are prepared to take. Only then will they go on to consider their allocation between equities and property (for growth assets) and gilts and cash (for nominal assets). What this does is to take the split between

growth and nominal assets as a fixed input (for the level of risk) and goes on to determine the allocation within these broader classes. This is an important distinction, as it differs from reading off a fixed (and arbitrary) point on a chart of optimal allocations. This method therefore takes into account the practical constraints of the decision making process, rather than considering the optimal theoretical outcomes. It is effectively defining risk in a slightly different way.

With that in mind, and the need to incorporate the fact that (as identified earlier in the report) GDP is an important factor, as well as inflation, we have broken down the analysis into low and high risk funds. This leads to the following analysis, which considers appropriate weights under different scenarios:

Table 7.1: Low risk

	High inflation high growth	High inflation low growth	Low inflation high growth	Low inflation low growth
Growth assets	50%	50%	50%	50%
Nominal assets	50%	50%	50%	50%
Split of growth assets:				
Property	10%	0%	35%	5%
Equities	40%	50%	15%	45%

Table 7.2: High risk

	High inflation high growth	High inflation low growth	Low inflation high growth	Low inflation low growth
Growth assets	80%	80%	80%	80%
Nominal assets	20%	20%	20%	20%
Split of growth assets:				
Property	15%	0%	50%	0%
Equities	65%	80%	30%	80%

The conclusions for a high risk fund, prepared to commit as much as 80% of its portfolio to growth assets, are as follows:

The low inflation-high growth scenario remains (as in the previous analysis) the ideal economic environment. However, where GDP growth is low, little or no weighting would be given to property. High inflation and high growth would lead to a moderate investment in property. Therefore good GDP growth becomes crucial, and is (in fact) a prerequisite to property investment, in a mixed asset portfolio.

The conclusions for a low risk fund, only prepared to commit 50% of its portfolio to growth assets, are as follows:

The low inflation-high growth scenario remains the ideal economic environment, and high inflation-low growth remains an environment where little or no weighting would be given to property. For ranges of outcomes in between these extremes, it appears that property is more sensitive to GDP growth, than inflation.

In particular, using this analysis would suggest that a high inflation–high GDP growth scenario would be preferable to a low inflation–low growth scenario. This was not evident from previous analysis, where (for a low risk portfolio) the low inflation–low GDP growth scenario looked attractive. This is due to the fact that the equities weight is so

low, at low risk, that it growth assets do not reach a 50% weighting at low levels of risk. For ultra low-risk portfolios, this remains the most attractive economic scenario for property.

Table 7.3: Ultra low risk

	High inflation high growth	High inflation low growth	Low inflation high growth	Low inflation low growth
Growth assets	30%	30%	30%	30%
Nominal assets	70%	70%	70%	70%
Split of growth assets:				
Property	5%	0%	30%	30%
Equities	25%	30%	0%	0%

For ultra low-risk funds, therefore, it is low inflation and not high GDP that is a key driver for property allocations. High inflation favours equities and low inflation favours property.

Fig 7.8: Property weights for different portfolio types

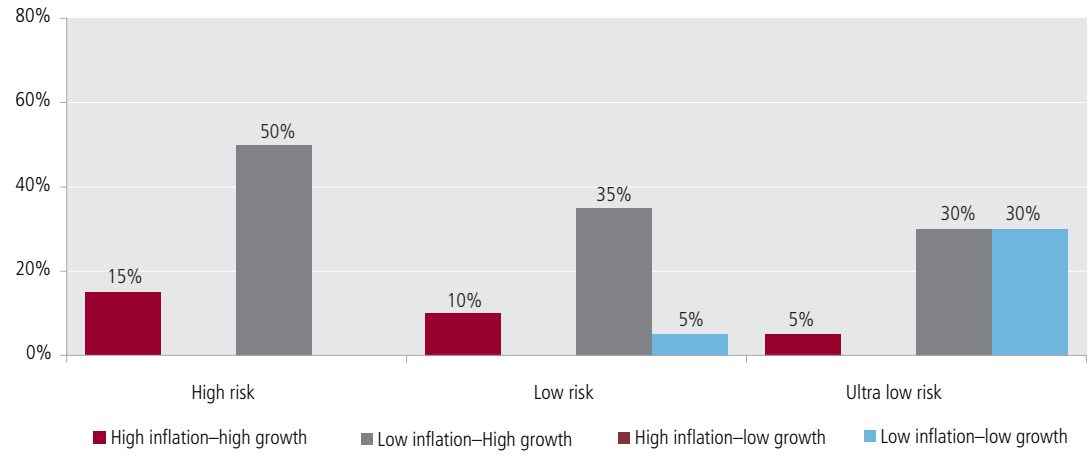
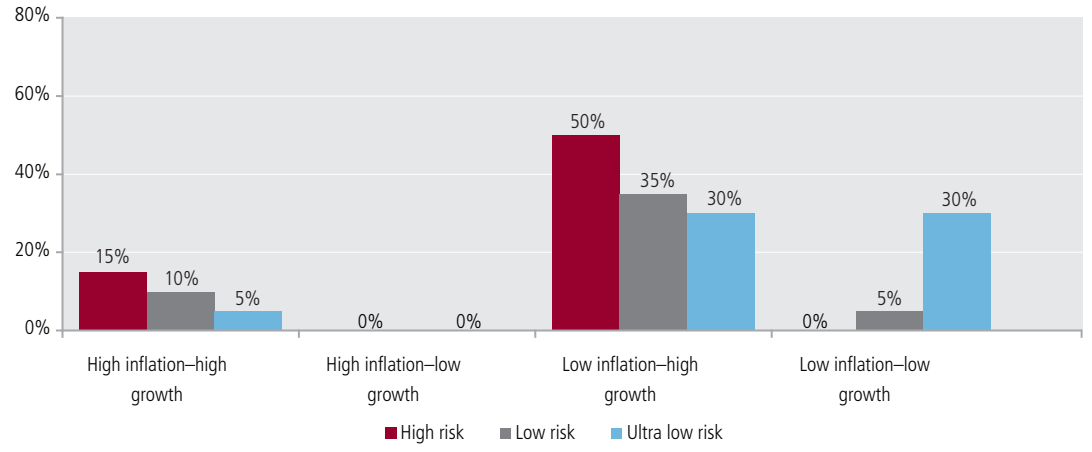


Fig 7.9: Property weights for in different economic scenarios



7.3 Implications for sectors

By using similar methods, we are able to analyse the appropriate splits between sectors, within commercial property. Here, there is no risk free asset, and the analysis is carried out using absolute (real) returns and deviations. By choosing different weights in portfolios (see example below) depending on whether inflation is high or low, you can either generate the same return (broadly) for a significantly reduced risk, or an increased return with no additional risk. Either selection is more efficient than the IPD weights.

Table 7.4: Low risk portfolio

	Low inflation	High inflation
Retail	75%	30%
Office	20%	20%
Industrial	5%	50%

Table 7.5: High risk portfolio

	Low inflation	High inflation
Retail	45%	5%
Office	50%	50%
Industrial	5%	45%

The analysis shows that, given the assumptions used, the appropriate office weight depends on the tolerance to risk, the appropriate industrial weight depends on inflation, and the appropriate retail weight depends on both inflation and risk tolerance

Whilst it might perhaps seem surprising that the retail weight falls with higher inflation, and the industrial weight rises, it is a direct result of the fact that industrial property is a better hedge against inflation than retail. The fact that retail is such a poor hedge against inflation may be partly due to the data, being all retail and comprising retail warehousing and shopping centres, which had their own distinctive trends, during the past. A more detailed breakdown is outside the scope of this report, but further analysis in this area may be appropriate.

Analysis by GDP growth did not, in the sector case, yield very different allocations. This is due, in part, to the fact that, although office returns benefit more than other sectors from high GDP growth, the volatility also increases, leaving the allocation broadly unaltered. It is also influenced by the definition of risk and the point on the efficient frontier along which high or low risk is identified.

7.4 Implications for benchmarks

Benchmarks and performance targets are usually, although not exclusively selected based on IPD indices, either IPD, or IPD +1% or some comparable benchmark for small/large funds. It may be that these benchmarks focus on the 'norm', rather than the efficient and it might be appropriate in future for funds to consider efficient benchmarks, rather than the 'herd'.

One possibility is for benchmarks to be set depending on the levels of risk tolerance of the fund. Another might be to vary benchmarks, depending on economic conditions. The issue of benchmarking deserves a far more detailed airing than can be achieved here and there is further work to be done in this area.

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