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SHORT PAPER 19

Implications for Property Yields of Rising Bond Yields

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Implications of Rising Bond Yields for Property Yields

IPF Research Programme 2011–2015

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1. EXECUTIVE SUMMARY

- This research suggests that, although a future increase in long-dated bond yields will probably have a knock-on effect on property yields, they are unlikely to increase in parallel, provided that rental growth is accelerating at the same time.
- In a scenario that assumes a recovery in the economy over the medium term, the impact of an increase in 10-year gilt yields from 3% to 4% by 2019 is almost cancelled out by an acceleration in rental growth to 2-2.5% per year (in line with IPF UK Consensus Forecasts), so that the equivalent yield is only forecast to rise by around 0.25%.
- The research also explores two alternative scenarios. The Supply Pessimism or stagflation scenario considers what might happen if economic growth and rental growth were to disappoint, but inflation nevertheless were to accelerate, pushing 10-year gilt yields up to 5%. In this downside scenario, the models suggest that equivalent yields might increase by around 0.6%.
- Conversely, the research also considers a Financial Repression scenario in which the Bank of England re-starts quantitative easing and gilt yields remain more or less fixed at 3% through to 2019. Perhaps not surprisingly, the models suggest that in this environment, equivalent yields would barely change.
- The research also provides an international perspective, looking at how the gap between property yields and conventional bond yields has changed in Australia, the USA and UK over the last 20-30 years. In all three countries the yield gap turned positive in the late 1980s/early 1990s and has since been on a long-term rising trend, reflecting the general slowdown in inflation. Historically, the yield gap has been highest in the USA, perhaps because planning laws there are relatively loose and investors are more concerned about potential obsolescence.
- However, there is also a clear cyclical pattern around the long-term upward trend in the yield gap. Part of this reflects changes in investors' rental growth expectations, but there is also some statistical evidence of structural breaks, which point to more deep-seated changes in investors' attitudes towards commercial property. The most pronounced structural breaks were in the early 1990s downturn and during the global financial crisis, suggesting that investors may ignore certain issues (e.g. the growth of on-line retail, the shortening of lease terms) during the good times, but are then forced to confront reality in the bad times.
- The yield gap between property and 10-year gilts is a useful benchmark, but it incorporates rental growth expectations. A purer estimate of the long-term risk premium for property is given by the yield gap between index-linked gilts and the property equivalent yield because both include inflation expectations.

2. INTRODUCTION

This research considers the implications of a significant rise in long-dated UK gilt yields for UK property equivalent yields and returns. To undertake this task, the report first sets out the fundamental property pricing equation which provides a framework to examine the nature of the gap between property and gilt yields. This is followed by a review of the few studies that have attempted to statistically analyse this phenomenon over time. Although the yield gap between gilts and property has traditionally been seen in terms of 10-year gilts there is an argument that a more appropriate gap is that between the yields on index-linked gilts.

Section 3 considers how these yield gaps have varied since the 1980s in the UK, USA and Australia. Building on this analysis, Section 4 tests the possibility that there are structural breaks in the UK yield gap time series. The authors then investigate forecasts for the two yield gaps/yields to the beginning of 2019, by reference to three potential scenarios for gilt yields, including rapid normalisation of the economy and more pessimistic economic forecasts.

3. STRUCTURE OF THE GILT YIELD GAP AND THE CONCEPT OF A RISK PREMIUM

Fundamentals of Property Pricing

The fundamental investment pricing equation at its simplest is as follows:

$$y + g = r + rp$$

where

y = initial yield
g = expected net rental income growth
r = risk free rate of return
rp = risk premium

The essential arguments for the real estate risk premium relate to property market characteristics relative, in particular, to investing in the bond/stock market. In detail, the justification is seen as a function of higher transactions and management costs, lower liquidity and marketability, and poorer availability of information in the property market. In other words, the premium is based on weak property market efficiency and suggests a degree of constancy over time. Theoretical models of portfolio investment also invariably treat the risk premium as constant and determined by the nature of the markets and the product (Tarbert and Marney, 1999).

The convention or traditional assumption is that this risk premium means that the required rate of return on property is 2% over the redemption yield on long-dated (10-year) gilts, the long-run risk-free rate of return/ cost of capital (Dubben and Sayce, 1991). However, it is recognised that the precise figure is not set in stone, for example Mackmin (1995) quotes a rule of thumb for this risk premium in the valuation literature of 1-2% while Hargitay and Yu (1993) describe 1.5-2.5% as a rough guide.

Sayce et al (2006) note that the underlying influences on the property risk premium also include a tenant not renewing, namely lease risk, and tenant default. They present a notional breakdown of a property yield by reference to the different risk elements. Baum (2009) suggests that indicative risk premiums vary with property type from 2% for standard shops through to 4% for secondary offices and industrials, as well as by town, lease type and building. A similar stance is taken by Wyatt (2013) without quantifying the differential premiums.

Studies Estimating the Risk Premium

There have been only a few other attempts at measuring the risk premium from published data series. Baum (2009) reports on a study by Property Funds Research that estimates a long-term risk premium of 2.5% as a historic mean with a tolerance of 1% either way. Detailed results are presented in Table 1, which suggest that the risk premium is falling over time, although the individual study periods reflect the use of different data sources/variables. The table also shows considerable variation in these ex-post premiums from year to year.

Table 1: Estimated Risk Premium 1921–2004

Period	1921-1938	1947-1970	1971-2002	1981-2002	1921-2004
Risk premium	3.84	3.69	3.12	1.43	3.65
Minimum	-7.11	-4.69	-28.51	-24.31	-28.51
Maximum	27.15	17.15	23.98	18.58	27.15
SD	10.34	6.22	11.88	9.94	9.79

Study periods are defined by data source availability. Source: Baum (2009).

3. STRUCTURE OF THE GILT YIELD GAP AND THE CONCEPT OF A RISK PREMIUM

Blundell (2009) more recently estimates the risk premium based on long-term averages from IPD data for 1981-2008 by breaking down the components of the fundamental pricing equation as follows:

Table 2: Risk Premium Components

Component	%
All-property initial yield	6.4
Plus income growth	6.3
Less depreciation	2.3
Less gilt yields	7.3
Risk premium	**3.1**

However, he argues that the evidence suggests the risk premium fluctuates significantly around this 3% level depending on how expectations for income growth inflation and other factors vary. Hence, at the mid-point of 2007, following the same basic research method incorporating an estimate of expected income growth, Blundell estimates that the implied risk premium is only 1.6%. Subsequently, the IFA Census survey (2008-2014) indicates an average expectation of a margin of circa 3.5% return over the risk free rate. Besides the cyclical dimension, Blundell (2009) also points to changes in property as an investment class that are likely to raise the risk premium in the future.

Tarbert and Marney (1999) ostensibly undertake a more formal statistical analysis of the realisable risk premium, based on JLW quarterly and annual returns indices and conventional gilt yields over the periods 1978-1996 and 1968-1996 respectively.

The traditional measurement of the risk premium is relative to long-dated gilt yields but there is also a view that it should benchmarked against an alternative risk-free rate of return, i.e. the yields of index-linked gilts – introduced in 1981 (Goobey, 1989; Scott, 1992). The essential argument is that, as rents should logically keep pace with inflation, the difference between the yields on property and index-linked gilts would be a long-term risk premium. Short-term variations in this index-linked gilt yield gap would, therefore, reflect deviations in expected rental growth from general inflation. Very little research has been undertaken on this 'index-linked gilt yield gap'. Tarbert and Marney (1999) examine this gap but for a very short period, 1985-1996, reflecting data availability.

The results of Tarbert and Marney's quarterly time series results can be summarised as follows:

- The mean excess property return and risk premium over conventional gilts was zero over the study period.
- There was a negative property risk premium over index-linked gilts of 1.3%.
- There was a negative property risk premium over equities of 1.4%.

However, there are very different results for annual data:

- The property risk premium over conventional gilts was 2.9%, although there is considerable volatility.
- There was a tendency for the premium to decline through the study period and to be less than 2% after 1978.

3. STRUCTURE OF THE GILT YIELD GAP AND THE CONCEPT OF A RISK PREMIUM

The variation in the statistical results for both quarterly and annual series casts some doubt on their reliability. However, they suggest that the variation in the risk premium oscillates around a mean (except for the quarterly risk premium series linked to index-linked gilts). This variation around a mean is not easily explained but seems consistent with Fraser's ideas (Fraser, 1985, 1986a, 1986b), and the tendency for a declining premium also fits with Fraser's arguments and the research by Baum. However, the conclusions of Tarbert and Marney are essentially dependent on the time period studied, which is quite short for the quarterly series, and certainly the declining risk premium is challenged by Blundell (2009).

All these studies use different statistical approaches that are not fully documented and a range of data sources, so it is difficult to verify and compare the results. Some of the empirical results are questionable and seem intuitively debatable. However, these studies all suggest that the risk premium is variable over time despite the traditional convention. In support of this conclusion, Tarbert and Marney (1999) argue that theoretical investment models do not provide any substantive case for a constant risk premium.

There are a range of reasons why the real estate risk premium could change over time, including structural changes to the investment sector, such as liquidity, risk of obsolescence, shortening lease structures, pre-pack administrations and the abolition of exchange controls in 1979. Fraser (1985, 1986a, 1986b) also linked variability in the risk premium to inflation. More generally, there are cyclical influences linked to (increased) macroeconomic volatility and inflation/interest rates that create uncertainty about expected rental growth. This is illustrated with international investment in the emerging markets of central and eastern Europe from the 1990s onward, where information performance constraints and other uncertainties meant initially high risk premiums (Adair et al, 2006).

A further factor is investment sentiment. The required rate of return is not simply a function of the risk-free rate of return and a risk premium linked to property market characteristics but also to the relative returns from alternative investments, notably company shares traded on the stock market. In reality the risk premium is therefore also potentially a function of the returns from the alternative investments on the stock market. Put another way, there is clearly an identification problem between a risk premium that relates to inherent property market characteristics and dynamics and the relative returns from the stock market. In addition, it is important to note that fixed coupon gilts are no longer seen as risk free because of the inception of large-scale quantitative easing in the aftermath of the global financial crisis. Arguably they now represent 'return-free risk' rather than a 'risk-free return'.

British econometric studies have applied different stock market indicators to capture this 'indirect' effect of stock market returns on yields but have not found a strong statistical relationship (Dunse et al, 2007; Hendershott and MacGregor, 2004; McGough and Tsolacos, 2001; Watkins et al, 2013). It seems that while there is some consensus that stock market returns affect property yields, the relationship is not easy to quantify. Baum (2009) sees investment sentiment as influenced, say, by a specific event rather than attributable to precise relationships between the relative returns of asset classes. In econometric terms, this could be seen as equivalent to structural breaks in yields or risk premium time series. In broad terms, Baum, for example, points to historic shifts in the relative yields of property and gilt yields, known as the yield gap. Historically, the yield gap was positive, i.e. gilt yields were higher, but it became negative from the latter half of the 1990s. This could be due to a fundamental reappraisal of property's risk premium.

3. STRUCTURE OF THE GILT YIELD GAP AND THE CONCEPT OF A RISK PREMIUM

Summary

There has been only one recent study (Blundell, 2009) that has statistically evaluated the property risk premium, whilst the links to index-linked gilts have received very limited scrutiny. Valuation text books tend to view the risk premium as determined from the underlying characteristics of the property market that are implicitly constant. But even these characteristics are changing over time. For example, greater liquidity in the sector (Jones et al, 2012; Schofield 2013) would imply a falling risk premium. On the other hand, shorter leases would have the reverse effect, as would an increased risk of obsolescence. The statistical analyses generally suggest that the premium is on a falling trend, although most of these studies are based on data up to 2004.

The risk premium is not just a function of property market investment characteristics, as in the original definition, but also has what can be described as a 'cyclical component', including uncertainty about rental growth expectations. The yield gap between property and 10-year gilts is a useful benchmark to look at the variation but this difference incorporates rental growth expectations. A purer estimate of the (long-term) risk premium is given by the yield gap between index-linked gilts and the property equivalent yield because both include inflation expectations.

Econometric studies of yields have incorporated a stock market returns variable but have not been able to establish a clear relationship with the stock market, although the relative investment sentiment between shares and property is an accepted factor. Such sentiment probably reflects events and cyclical influences and, so, the results from statistical studies will depend on the period under review. It is likely that there are structural breaks in risk premium patterns over time. The authors now analyse recent statistical trends to assess these issues.

4. STATISTICAL TRENDS

This section compares the trends in the differences between government bond yields and property equivalent yields (capitalisation rates) in three countries: the UK, USA and Australia. The analysis considers both the differences (yield gaps) between 10-year and index-linked bond yields and equivalent yields. The data are drawn from IPD for the UK and Australia and NCREIF for the USA. The analysis is dependent on the availability of time series, which vary with country:

- The longest time series are available for the UK – annual series of equivalent yields start in 1981 but detailed analysis is focused on monthly data that begin in 1987 through to 2013. The monthly time series is chosen for the econometric analysis because it gives more data points (allowing analysis of sub-periods) while still encompassing two major downturns. Index-linked gilts were established in 1981 and the yield series begins in 1983.
- In the USA, annual capitalisation rates data begin with the fourth quarter of 1982 but index-linked bond yields are only available from 1997. The data series is available through to 2013 quarter 3.
- Australian data relate to 1994 through to 2013 quarter 3.

The analysis is presented on an annual basis for each country, with additional insights on the UK from monthly data.

UK Experience

Figure 4.1 shows that UK equivalent yields for the all-property index were at their highest through the 1980s and the first half the 1990s, reaching a peak following the recession at the juncture of these two decades. There is then a modest downward trend through to the global financial crisis in 2007, when the average yield shoots up to a level not seen since the early 1990s. However, the upturn is relatively short-lived, with a peak in 2008.

The trend for yields of 10-year gilts is more markedly downward, reflecting the long-term trend in inflation. The yield on 10-year gilts begins well above property yields, at almost 15%, but by the end of the period is only just over 3%. There is a major spike in gilt yields in 1990 when the yield rises to 11% but after this peak there are only minor modest upturns. Even during the immediacy of the global financial crisis, the yield creeps up to just above 5%.

4. STATISTICAL TRENDS

Figure 4.1: UK Property Equivalent Yields, 10-Year and Index-linked Gilt Yields compared on an annual basis, 1981–2013

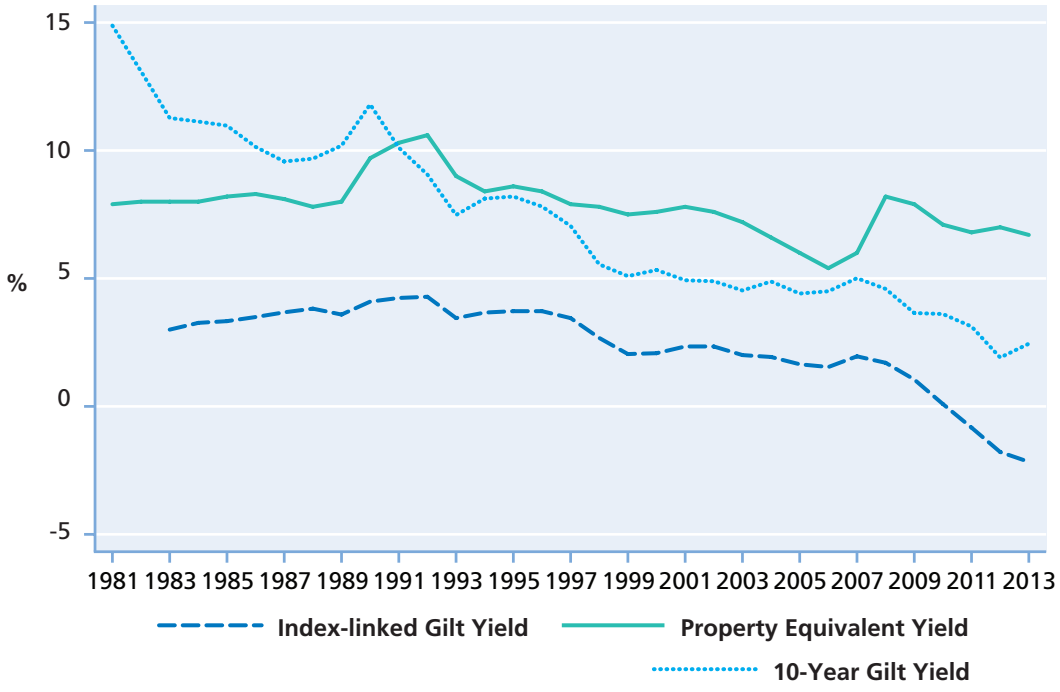
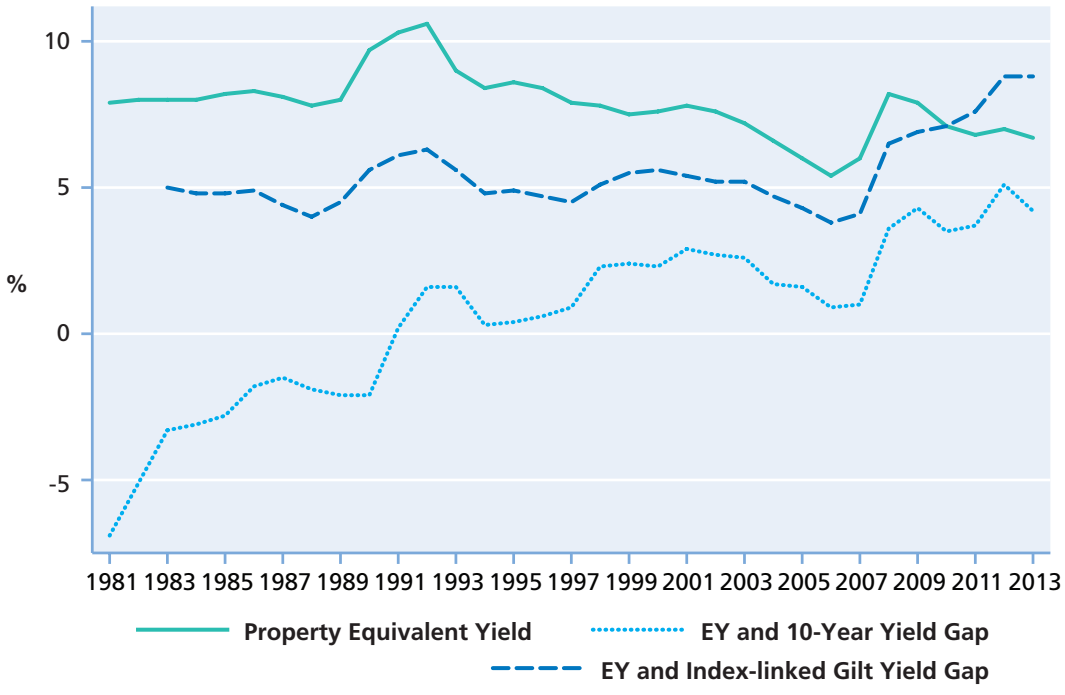


Figure 4.2: UK Property Equivalent Yield and Yield Gap Trends on an annual basis, 1981–2013



4. STATISTICAL TRENDS

The implications for the yield gaps between gilts and property yields are seen in Figure 4.2. Ten-year gilt yields fall below equivalent yields for the first time in 1991 and the gap remains not only positive henceforth but on a rising trend. Nevertheless, there are periods when it narrows. It is only marginally positive between 1994 and 1997, whilst looking on a monthly basis reveals brief episodes when there were negative gaps again during this period.

As property yields fall to their lowest level in the mid-noughties, the gap almost disappears again but is marginally positive. Indeed, the monthly perspective reveals a brief negative gap in 2007. With the impact of the credit crunch, the gap widens again and stabilises around 3.8%. This is a historically high yield gap.

The yields on index-linked gilts rise through the 1980s, peaking in 1992 before a gradual decline to 2006. An upward correction in 2007 is followed by a sharp fall in yields which are increasingly negative from 2011 (see Figure 4.1). The yield gap with property equivalent yields is relatively stable, usually between 4.3% and 6%, centring on 5%. This is because, statistically, property yields and index-linked gilt yields have similar 'cyclical' patterns in the sense that there tend to be matching peaks and troughs to each time series. However, since 2007 the gap has become much wider, at over 7%, as Figure 4.2 demonstrates, suggesting investment risk aversion.

US Experience

In the USA, property capitalisation rates have been more stable than equivalent yields in the UK. In fact, as Figure 4.3 demonstrates, capitalisation rates are on a plateau of around 9% through the 1980s and 1990s before a substantial fall from 2003 onwards. There is an abrupt rise with the onset of the financial crisis until 2009, then another sharp downward adjustment occurs in 2010 that continues through 2012.

The trend for yields on 10-year government bonds is more markedly downward, reflecting the long-term worldwide trend in inflation, including in the UK. The yield on these 10-year bonds begins well above capitalisation rates, at almost 15%, but by the end of the period is only just over 3%. There is a modest plateau in bond yields in the late 1980s around 8%, but after this pause there are only minor modest upturns in a long downward trend. Even before the global financial crisis the yield creeps up to only just above 5%.

The greater fall in government bond yields relative to property capitalisation rates over the thirty year period results in the yield gap not only moving from negative to positive in 1992 but the long term trend is for the yield gap to widen. The major exception to this trend is the mid-2000s, just prior to the global financial crisis, when capitalisation rates are at an all time low. It is noticeable that, in the post credit crunch period, bond yields have fallen while capitalisation rates have shown a modest rise.

4. STATISTICAL TRENDS

Figure 4.3: US Property Capitalisation Rates and 10-Year and Index-linked Government Bond Yields compared on an annual basis, 1982–2013

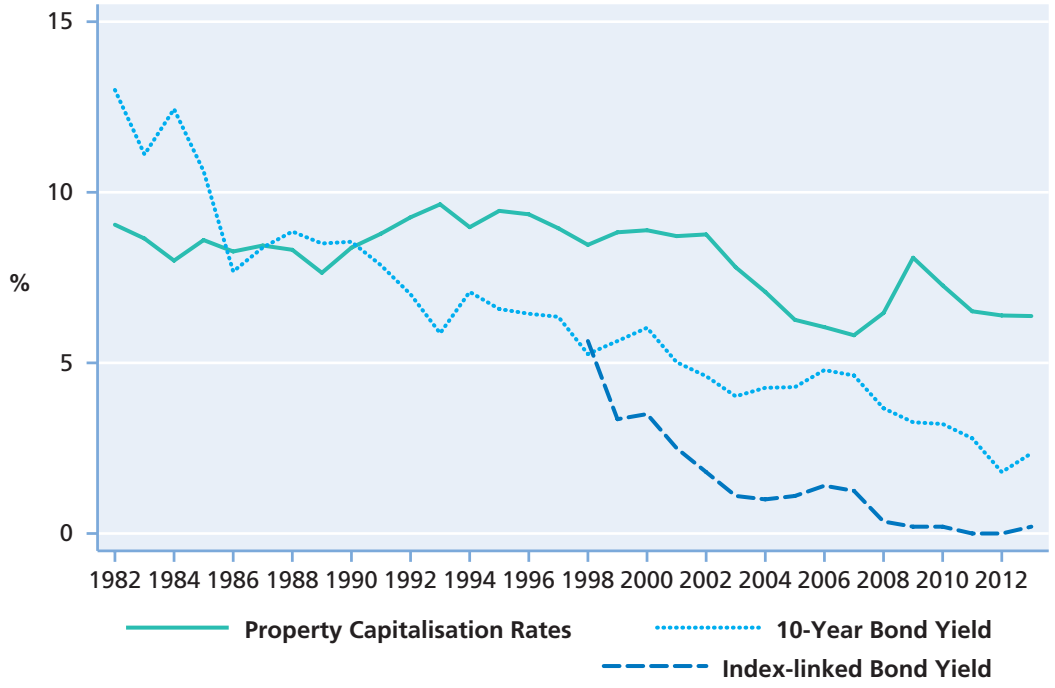
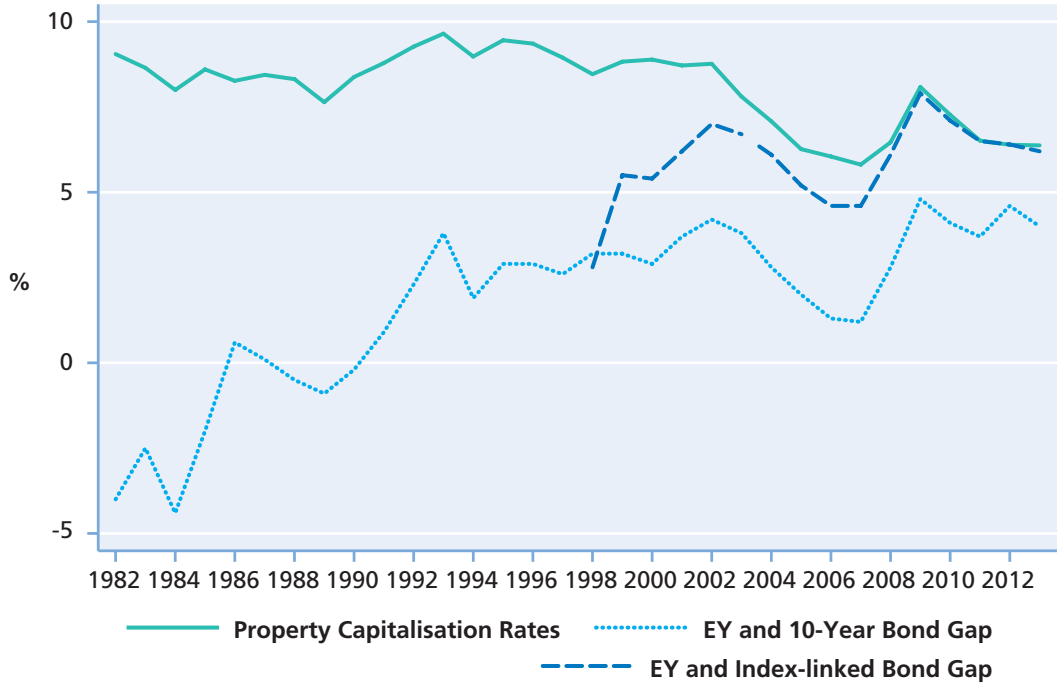


Figure 4.4: US Property Capitalisation Rates and Yield Gap Trends on an annual basis, 1982–2013



4. STATISTICAL TRENDS

The yields on US index-linked bonds (Treasury Inflation Protected Securities) have shown very little variation since they were introduced in 1997. There is, therefore, little relationship with property capitalisation rates. As a result, the relationship between the yield gap between index-linked government bonds and capitalisation rates shown in Figure 4.4 is almost parallel to capitalisation rates.

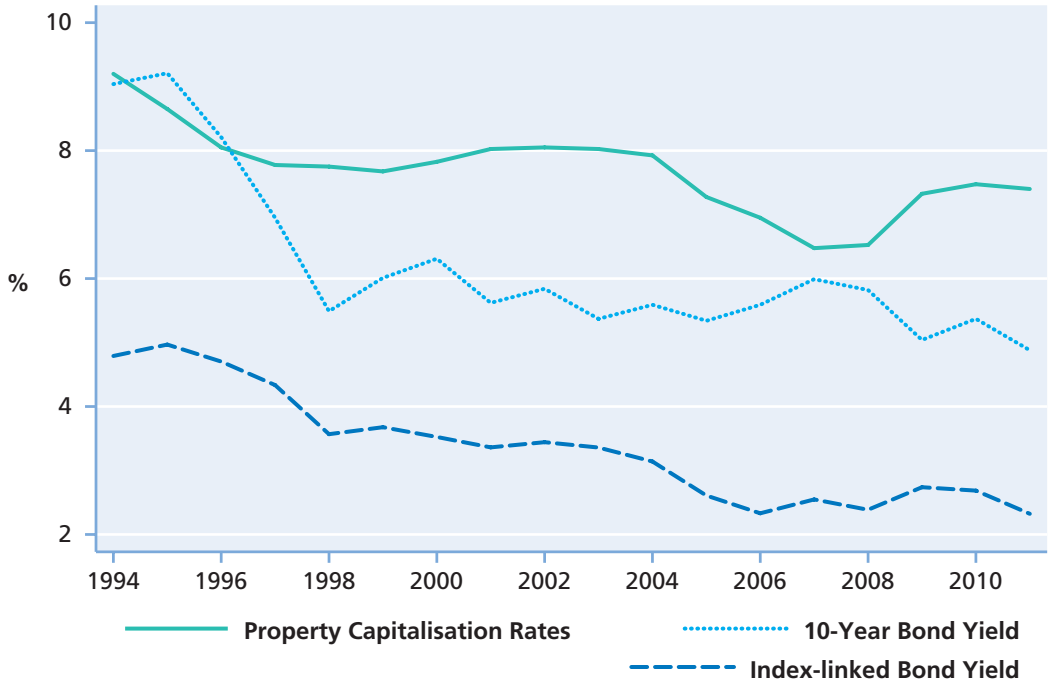
Australia

Australian property capitalisation rates are available from 1994 and, as Figure 4.5 shows, exhibit an overall downward trend. There are two periods when the capitalisation rate fall relatively sharply: between 1995 and 1998, and 2004 and 2007. Interestingly, as Figure 4.5 shows, the first of these periods coincides with falling bond yields but the second significant fall occurs partly against a backdrop of rising bond yields. This illustrates the importance of expected rental growth trends on the yield gap.

Bond yields are broadly stable from 1997 to 2010, in the range 5-7%. Property capitalisation rates are only briefly below bond yields, so the yield gap is only negative in 1995 and 1996, as shown in Figure 4.6. The gap almost disappears again in 2007 and 2008. Interestingly, the gap is normally around 2% and its maximum value is 2.7%. It has been on an upward trend since the global financial crisis.

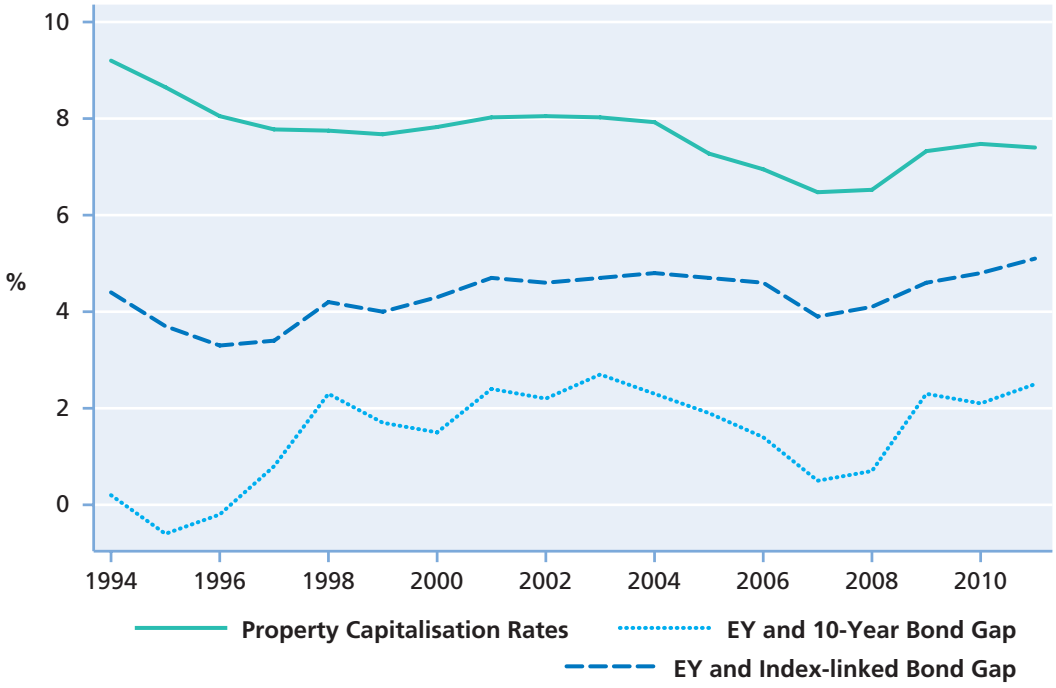
Figure 4.5 also shows the relationship between index-linked bond yields and capitalisation rates. With long-term falling yields on these bonds, the index-linked bond yield gap has risen over time, particularly again after the global financial crisis. Nevertheless, the range of this yield gap is only between 3.3% and 4.8%, except for 2011 when it reaches 5.1%, as shown in Figure 4.6.

Figure 4.5: Australian Property Capitalisation Rates and 10-Year and Index-linked Government Bond Yields compared on an annual basis, 1994–2011



4. STATISTICAL TRENDS

Figure 4.6: Australian Property Capitalisation Rate and Yield Gap Trends on an annual basis, 1994–2010



Summary

All three countries have experienced similar falling trends in bond yields since the 1980s. There are some differences in property equivalent yield/capitalisation rate trends but the first half of the last decade sees them falling then rising in the aftermath of the global financial crisis. The yield gap with 10-year bonds becomes positive for the first time in all three countries in the late 1980/early 1990s. Over the study periods, the gap, while exhibiting cyclical tendencies, is on a long-term increasing trend in all three countries, contrasting with some previous studies, over either shorter or different periods, suggesting the risk premium had been falling. This trend implies that lower expectations about inflation/rental growth have been a persistent influence on the yield gap. This view is affirmed by the coefficients in the regression forecast models for the UK presented later (see Appendix). The gap narrows/disappears in the mid-noughties, just before the global financial crisis, but the subsequent impact of the credit crunch is to widen the gap substantially to a historic high in each country.

The yield gap is highest in the USA, although the analyses are based on different periods. The crude means are 0.78% in the UK, 1.5% in Australia and 3.3% in the USA. Given that levels of market information and transparency in each country are similar, the differences may be the result of weaker planning/supply constraints in the USA increasing real estate investment risk. However, there are other contributing factors, such as the differential spatial distribution of investment properties within national urban systems.

4. STATISTICAL TRENDS

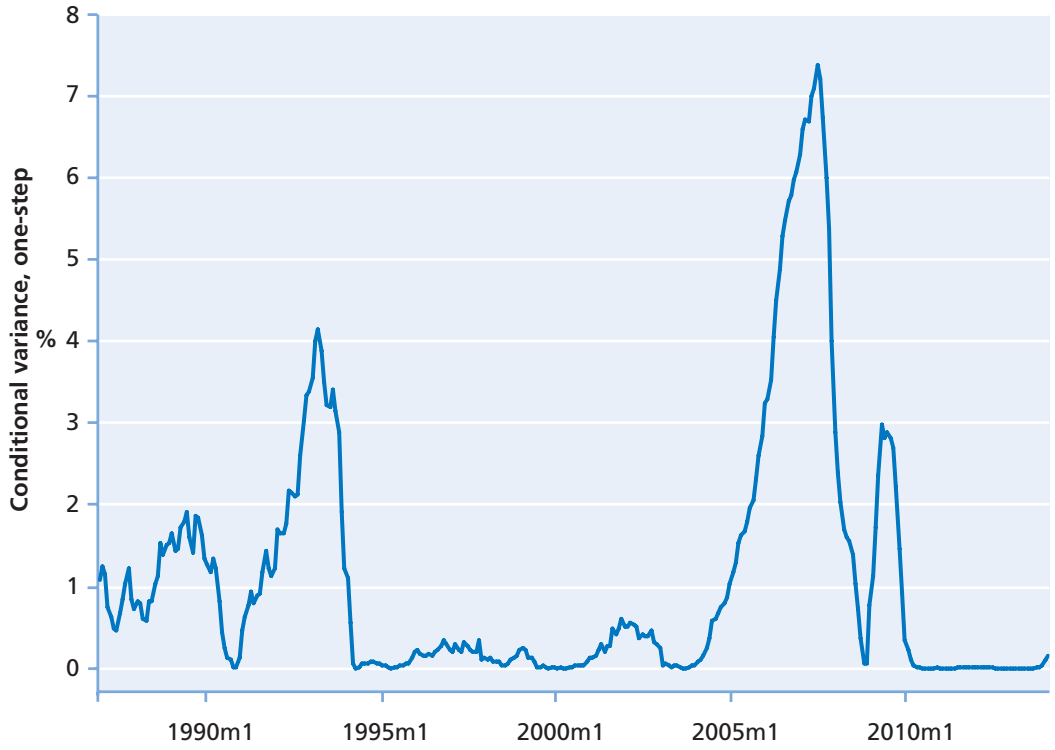
The index-linked bond yield gap is more stable in the UK and Australia than the 10-year bond yield gap. In the UK it varies between 4.3% and 6%, centring on 5%. The range in Australia is mainly between 3.3% and 4.8%. The respective means are 5.2% and 4.3%. The gap has risen substantially in the UK since the global financial crisis and least in Australia, which has suffered least from the event. Yields on US index-linked bonds show very little variation. Apart from a jump in the index-linked bond yield gap in 2009, it has also been very stable in the USA since 2005. In all three countries there is a higher correlation between equivalent yields/ capitalisation rates and the yield on index-linked government bonds than the yield on 10-year bonds.

5. STRUCTURAL CHANGES

In the previous sections a number of reasons were identified to explain potential changes in the risk premium and the yield gap over time. Some of these influences are incremental over time but others are more transient, such as investment sentiment, and it was earlier acknowledged that there is a cyclical element to risk premiums. This section revisits the time series of yield gaps presented previously for the UK, to test for the existence of structural breaks based on the monthly time series.

Visual inspection of these time series reveals that significant changes in yield gaps are associated with booms followed by recessions in all three countries. This is confirmed by a statistical test known as an ARCH model[1] that tests for clusters of volatility. A graphical illustration of this is through the 'volatility cluster' graphs shown in Figures 5.1 and 5.2, which suggest that there are strong structural breaks in both series in the early 1990s and late 2000s.

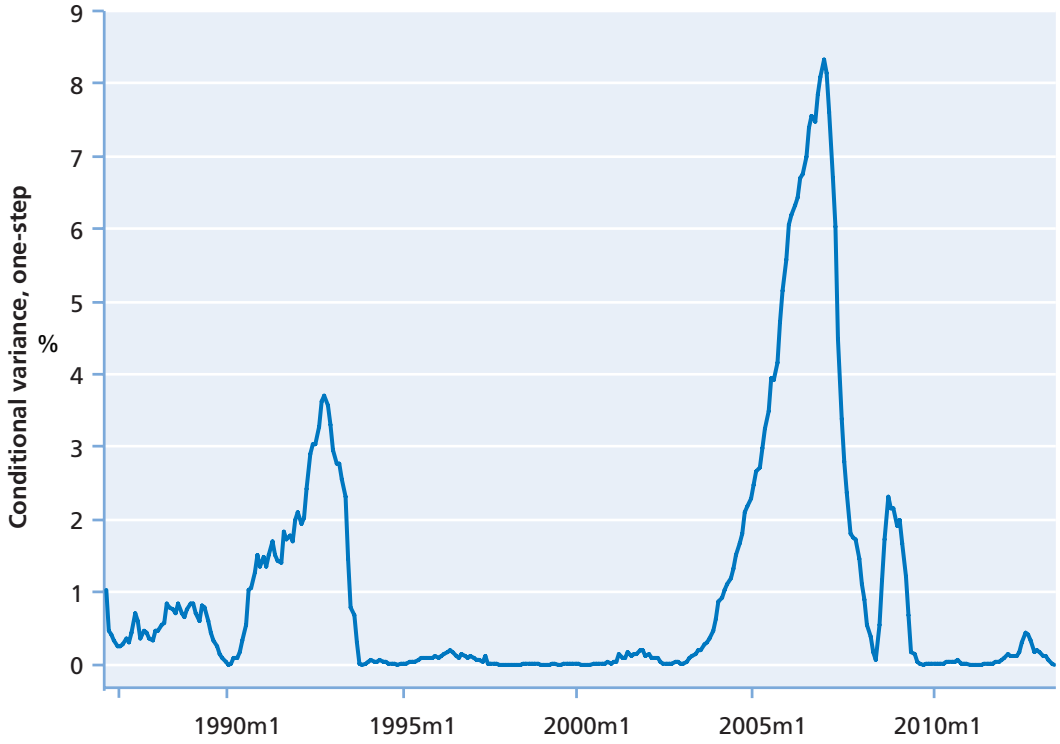
Figure 5.1: Volatility Cluster Graph for the UK 10-Year Gilt Yield Gap, 1987-2013



[1] AutoRegressive Conditional Heteroscedasticity models are used to characterise and model observable time series.

5. STRUCTURAL CHANGES

Figure 5.2: Volatility Cluster Graph for the UK Index-linked Gilt Yield Gap, 1987-2013



One explanation of the incidence and timing of the statistical structural breaks is the sudden unexpected rises in bond yields in early 1994 and 2008, although this is likely to be only part of the story. A further possible explanation for the apparent structural break in the early 1990s could be a real crisis of confidence in the UK amongst institutional investors, following the large losses they had suffered on development projects, and widespread questioning as to whether commercial property was a suitable asset for pension and insurance funds. Likewise, the apparent structural break that began in 2005 was probably, at least in part, due to the boom and subsequent bust in property lending. These results can best be viewed as cyclical outcomes when there are severe rapid adjustments in the property market. From this perspective, these structural breaks are about substantial changes in sentiment through a cycle.

From the fundamental equation (in Section 3), changes in yield gaps occur either as a consequence of a re-evaluation of the risk premium or of expected rental growth or both. In other words, it could be investors responding particularly to property upturns and downturns differently, for example being (overly) optimistic about rental growth expectations in a 'boom' and (overly) pessimistic about forecasts in the 'bust'. The flip from one to the other could cause a statistical structural break. This certainly occurred during the credit crunch. As the global financial crisis began to unfold, investors were still projecting substantial rental growth, only for these expectations to be dramatically and swiftly downgraded. In the aftermath, pricing at best assumed no growth. In the summer of 2009, applying zero expected rental growth in the fundamental pricing equation implies a risk premium of 5.4% at that time.

5. STRUCTURAL CHANGES

An alternative explanation could be that significant property market downturns act as a catalyst for structural change to investment strategies and the property market. The mid-noughties saw the increasing adoption of shorter leases. The retail sector was profoundly affected by the recession and shopping on the web, whilst the office sector was beginning to adopt the green agenda as a marketing tool to let properties. Only industrial sheds were arguably left unscathed from structural change that accelerated obsolescence after the global financial crisis. Further research at the sector level is required. All these changes would have increased the overall risk premium and contributed to the statistical structural break.

6. THE FUTURE

In this section the analysis draws on two types of forecasts of yield gap trends derived from the 10-year and index-linked gilt yield gaps respectively. They are therefore based on models that focus solely on the relationship between gilt yields and rental growth, with the yield gap as the dependent variable. The gilt yield is then added to the yield gap to provide a forecast of property equivalent yields. This innovative approach is applied to highlight the importance of changes in the yield gap. The forecasts are designed not to give precise figures but to offer indications of the potential future travel of property equivalent yields, as gilt yields and rental values change.

Most forecasters are expecting a recovery in the economy over the medium term, which has been described as "rapid normalisation" by Fathom Consulting (2013). This is the basis of the primary or central scenario applied here. Ten-year gilt yields are assumed to follow the forecasts of Consensus Economics (2013) that see a gradual rise from approximately 3% to 4.1% through to 2018, followed by a marginal fall to 3.9% at the beginning of 2019. This central scenario forecast for index-linked gilts is taken as a gradual rise in yields over the next three years until they reach the anticipated level of real GDP growth by Consensus Economics (2013) of 2.1% in 2017 and 2% in 2018. Rental growth is assumed to be 2.1% this year followed by 2.5% in the following two years, 2.4% in 2017 and dropping slightly to 2.1% in 2018, as set out in IPF UK Consensus Forecasts (February 2014).

Fathom Consulting (2013) argue that there are other scenarios that are possible, for which it coins the terms "supply pessimism" and "financial repression". Both could arise from a combination of weak productivity and growth in demand leading to increasing inflation. The latter is based on the further assumption that interest rates will be repressed to protect households, banks and government finances.

Based on these three scenarios for gilt yields and rental growth over time, property yields are forecast and then used as a framework for a discussion of the issues and to draw some conclusions for the future. The forecasting approach is explained in detail in the Appendix, which also provides more detail of the results. The statistical model uses monthly data and assumes that long-term relationships between property equivalent yields and gilt yields/rental growth continue into the future. As noted, all these models take the form of a yield gap, based either on the 10-year gilt yield or on the index-linked gilt yield, as the dependent variable, and the requisite gilt yield and rental growth as the independent variables. Annual forecasts of the independent variables are interpolated to monthly statistics.

In all cases, the coefficients of the independent variables are statistically significant (see Appendix). Both coefficients of the independent variables are negative. The negative coefficient on each gilt yield means that there is an inverse relationship between it and the respective yield gap. In other words, as gilt yields rise the yield gap falls, so that the yield is signalling inflationary expectations.

Central Scenario 10-Year Gilt Yield Gap Model

Figure 6.1 shows how the model tracks the yield gap and its future forecast, based on 10-year gilt yields rising to 4%. The projected trend is for the yield gap to fall consistently through to 2018 by just over 100 basis points before rising again, but for yields to still marginally rise in absolute terms (Figure 6.2).

6. THE FUTURE

Figure 6.1: Actual and Central Scenario Forecast 10-Year Gilt Yield Gaps, 1987-2019

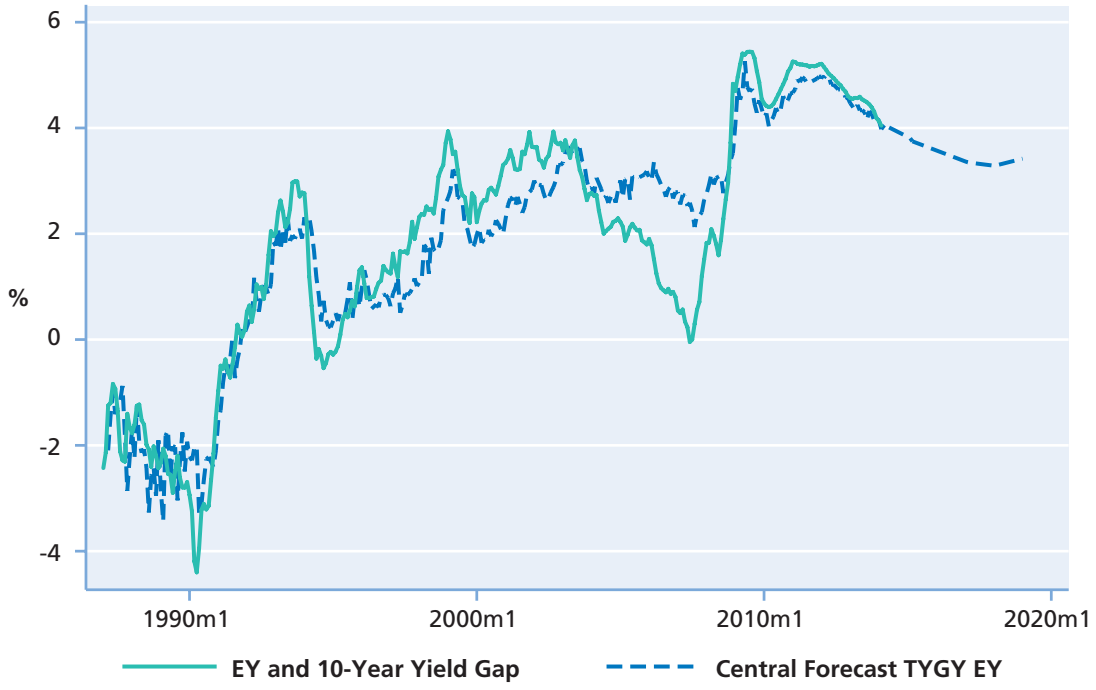
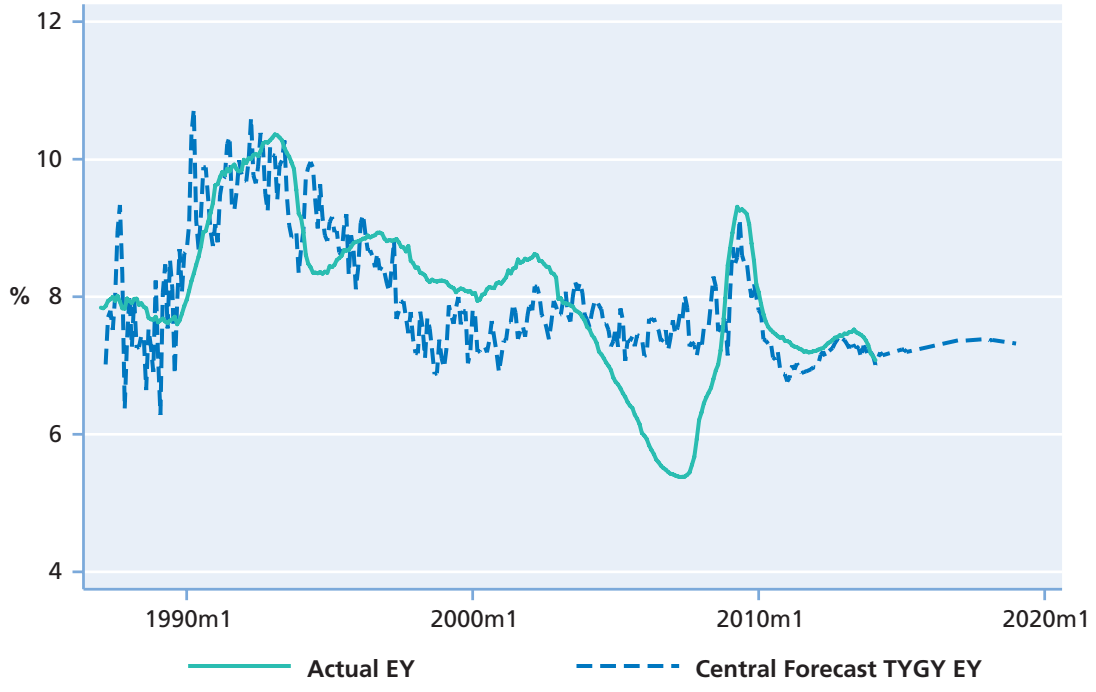


Figure 6.2: Actual and Central Scenario Forecast Property Equivalent Yields, 1987-2019, based on 10-year Gilt Yield Changes

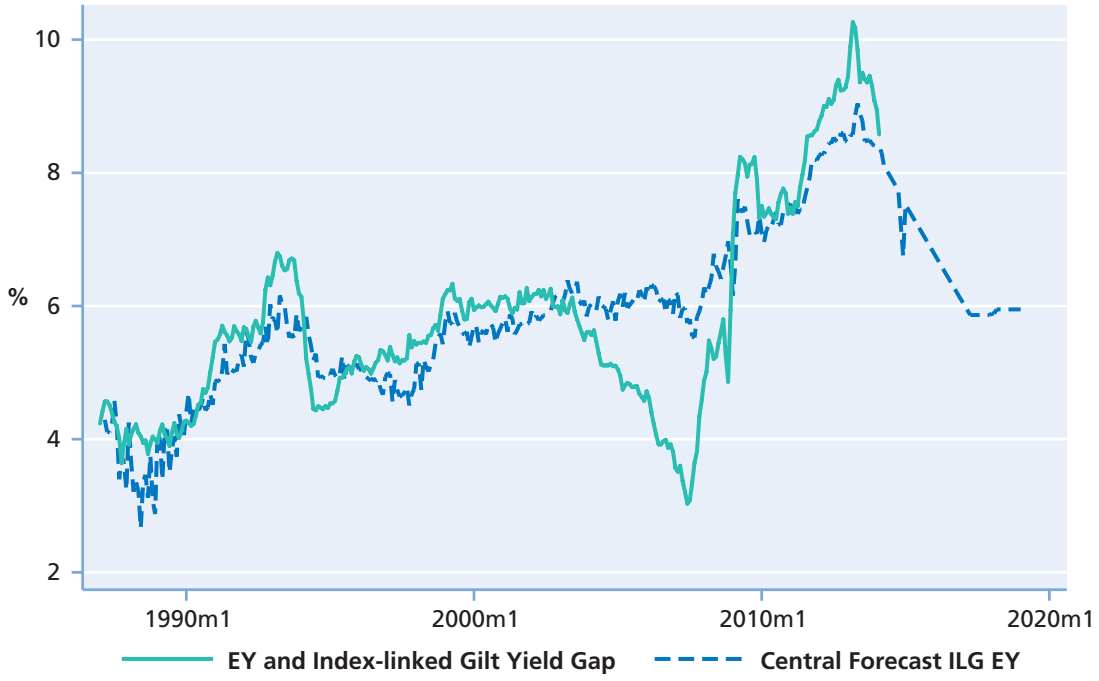


6. THE FUTURE

Central Scenario Index-linked Gilt Yield Gap Model

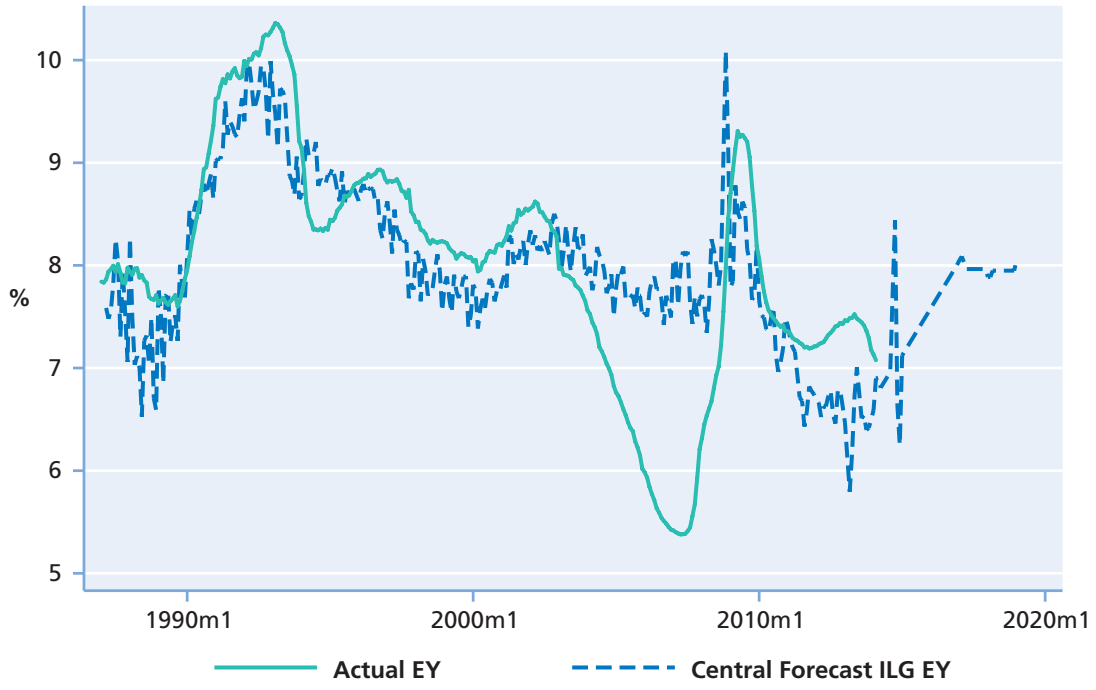
The application of the model to forecasting the index-linked gilt yield gap is presented in Figures 6.3 and 6.4. The yield gap to projected to fall substantially, to around 5.5% in the latter half of 2016, before reaching a plateau. Based on the index-linked gilt yield gap model, yields are estimated to peak at just over 8%.

Figure 6.3: Actual and Central Scenario Forecast Index-linked Gilt Yield Gaps, 1987-2019



6. THE FUTURE

Figure 6.4: Actual and Central Scenario Forecast Property Equivalent Yields, 1987-2019, based on the Index-linked Gilt Yield Gap



Other Scenarios

Property equivalent yield forecasts are presented for two alternative scenarios, which, though possible, are considered to be less likely than the Central Scenario. In the two alternative scenarios, economic growth and, hence, nominal rental growth are assumed to run at only half the rate of that in the Central Scenario. The details of the Scenarios are defined as:

- "Supply Pessimism" sees no rebound in productivity and inflation averages 5% over a five-year period. Ten-year gilt yields are presumed to rise to 1% above the Central Scenario, i.e. to 5%. At the same time, there is a slow rise in index-linked gilt yields to 1% at the beginning of 2017, followed by a slower rate of growth so that yields reach 1.5% by January 2019.
- "Financial Repression" occurs because the Bank of England responds to persistent weakness in the economy by re-starting quantitative easing. As a result, while index-linked gilt yields rise to 0% in the middle of 2015, yields fall away to -1.8% at the end of 2018, to the level where they are at the beginning of 2014. Similarly,10-year gilt yields, after an initial rise, return to today's levels.

For the Supply Pessimistic Scenario, the forecast from the 10-year yield gap is shown in Figure 6.5 and predicts that property equivalent yields will rise sharply before levelling off just below 8%. The index-linked gilt yield-based forecast, shown in Figure 6.6, suggests a less immediate rise in yields but a consistent growth to almost 8%.

6. THE FUTURE

Figure 6.5: Actual and Supply Pessimistic Scenario Forecast Property Equivalent Yields, 1987-2019, based on 10-Year Gilt Yield Gap

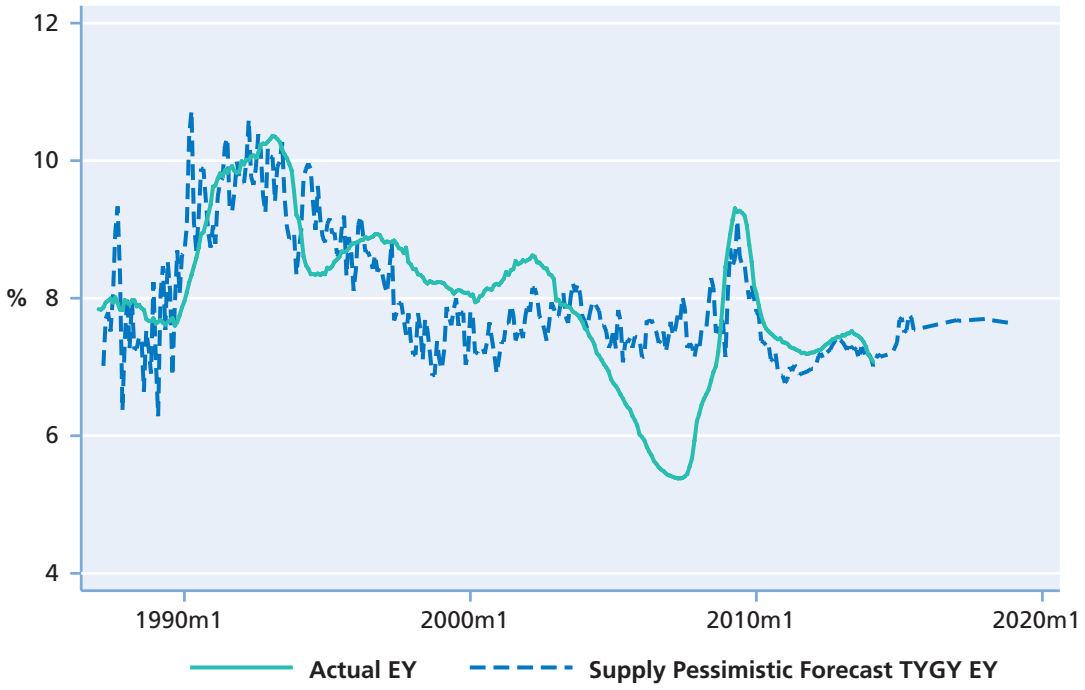
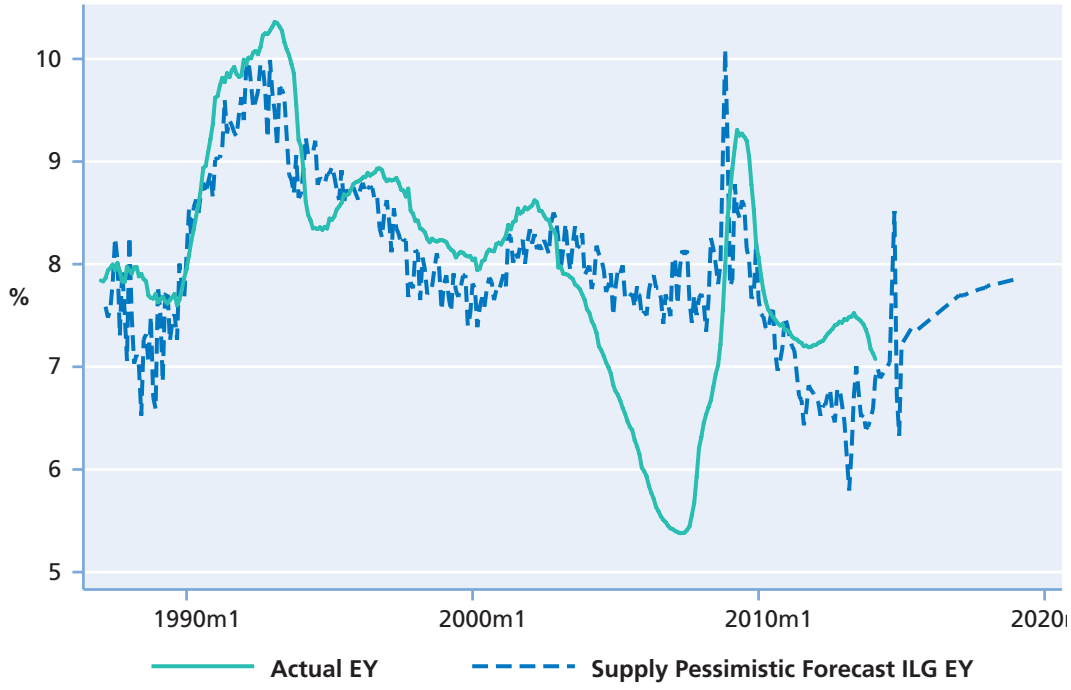


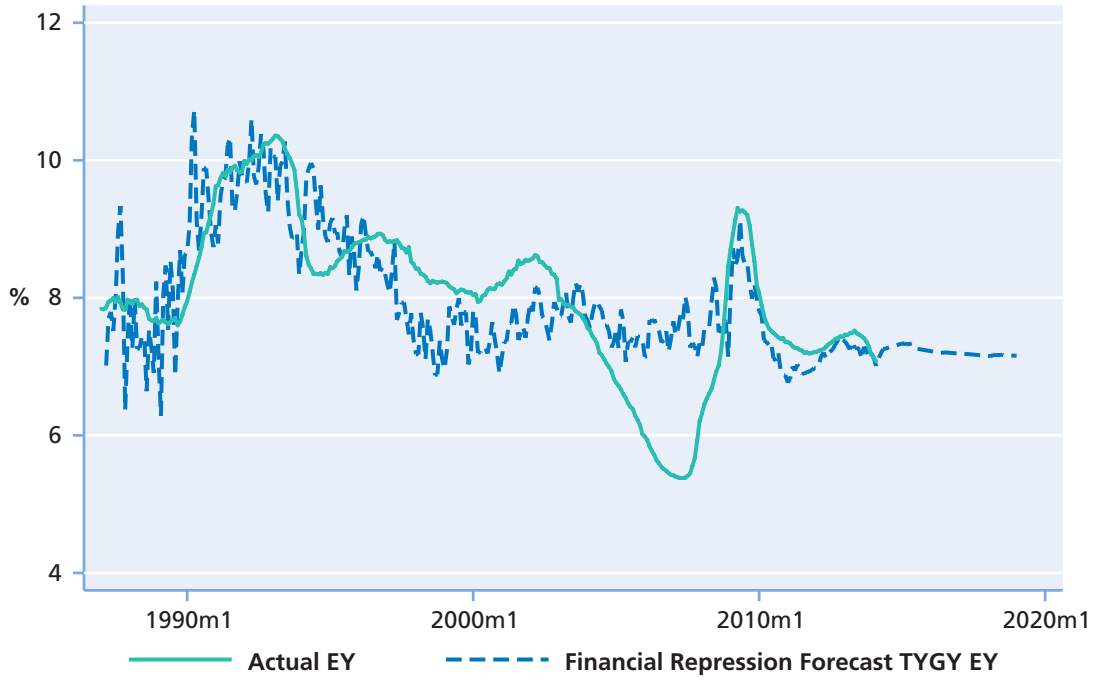
Figure 6.6: Actual and Supply Pessimistic Scenario Forecast Property Equivalent Yields, 1987-2019, based on the Index-linked Gilt Yield Gap



6. THE FUTURE

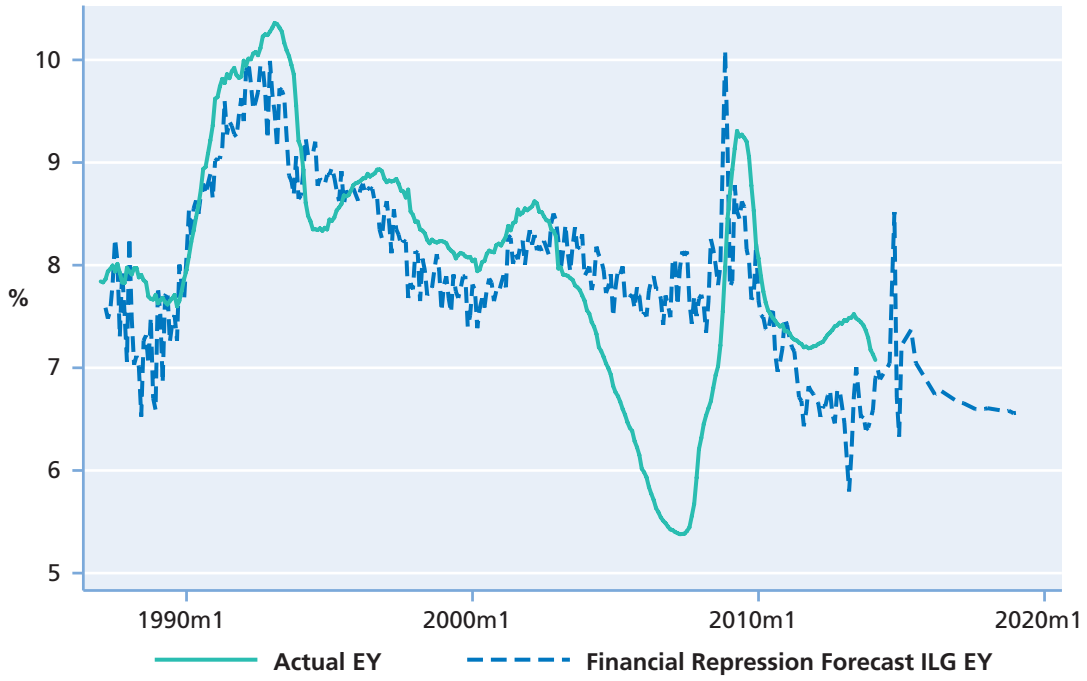
The Financial Repressive Scenario sees monetary policy dampen gilt yields and the forecast for property equivalent yields from the 10-year yield gap regression is broadly stationary through to 2019, at around 7%, as Figure 6.7 demonstrates. The index-linked gilt yield gap-based forecast sees equivalent yields falling to 6.5% over this period (Figure 6.8).

Figure 6.7: Actual and Financial Repression Scenario Forecast Property Equivalent Yields, 1987-2019, based on 10-Year Gilt Yield Gap



6. THE FUTURE

Figure 6.8: Actual and Financial Repression Scenario Forecast Property Equivalent Yields, 1987-2019, based on the Index-linked Gilt Gap



Summary

These results suggest that the variation in yield gaps relates closely to market conditions. The Central Scenario forecasts all project a rise in gilt yields that will lead to a narrowing in yield gaps so that property equivalent yields will not rise proportionally.

The rise in gilt yields is linked with an expected improvement in the economy and associated rental growth. The yield gaps narrow with more positive rental projections feeding into investors' calculations of yields. This is based on the February 2014 IPF UK Consensus Forecasts that see rental growth as 2.3% per annum to 2018, significantly more than projected in the previous report (1.8% per annum, IPF November 2013). On the other hand, this forecast is still below the medium-term forecast for inflation of 3.5%.

Any change in the risk premium is more difficult to quantify. The obsolescence issues that emerged in the last decade have probably been magnified with continuing demands to reconfigure property, but this effect would not be included in the forecasts above.

The issue may be characterised as follows: As the index-linked gilt yield gap demonstrates the steadiest pattern, with a long-term average gap of 5%, on that basis property yields should be currently at around 3.2% instead of above 7%. However, the economy and property market have been subject to an unprecedented severe downturn and low interest rates that have almost certainly created structural change. As the economy/property market emerges from this period, there are likely to be upward pressures on property yields, as gilt yields rise, and downward pressures as the economy/(expected) rental growth recovers. Overall, it is expected that the yield gaps will fall but that yields will still rise.

7. CONCLUSIONS

This research has sought to re-evaluate the concept of the yield gap in order to look forward to changing yields in the future. The analysis has considered both the traditional yield gap with 10-year gilts and that with index-linked gilts. It has looked at the fundamentals of these yield gaps and their statistical trends over time. Previous research has been limited but has suggested the gap is falling and has a cyclical component. The time series presented by the research team confirms the latter but they find that the yield gap(s) have risen since the 1980s, probably reflecting the lower inflationary environment. Despite the usual focus on the 10-year gilt yield gap, the analysis of statistical trends in the UK and Australia finds that index-linked gilts have a closer relationship with property yields than conventional gilts.

The relationships between bond and property yields go through a traumatic time around the period of the global financial crisis. This is true not only for the UK but also the USA and Australia – and probably most western economies. There is evidence that these changes are sufficiently strong to be statistically defined as 'structural breaks' in the time series. However, it is possible to see the sudden switch in the yield gaps as a consequence of an extreme change in sentiment towards expected rental growth. The severe downturn may have also stimulated a greater appreciation of structural change in the property market and, hence, the risk premium, through the realisation of increased probability of obsolescence. Together these could amount to a change in general investment sentiment toward property.

Since the global financial crisis, property investment has almost certainly become focused on current income. Investors have not necessarily been factoring in rental growth and, undoubtedly, many properties will see rent fall at the end of leases. These arguments support the current yield gaps. While gilt yields seem set to rise, so too are the economy, inflation and rental growth. This implies, as the forecasts suggest, that yields will rise but that the gaps will narrow, ameliorating the increase. However, the index-linked gilt yield gap will only close back to, say, the 5% norm when investment sentiment turns and believes substantial rental growth will return. The consensus rental forecasts incorporated in this analysis are not projecting a real rise in rents. The current conservative consensus may take some time to be convinced.

APPENDIX: STATISTICAL DETAILS OF FORECASTING MODELS

The forecasting models are based on the fundamental investment pricing equation, set out in Section 3, and estimate the yield gap based on monthly data from 1987-2013. Rental growth is taken as a proxy for expected net rental growth. This is a limitation as expectations of rental growth are formed in a more complex way and are not simply extrapolations of current rental growth. Part of these expectations is based on inflationary expectations, which are, to a degree, captured in the gilt yield variables.

The first step was to test for cointegration amongst the independent variables. Based on appropriate critical values for the Johanson test for cointegration, three potential time lags where derived for each yield gap model. Vector error correction models were then applied with the respective equivalent yield gap as the dependent variable. On the basis of these results, the 10-year gilt yield gap regression model was then estimated, incorporating two-month lags for the independent variables – gilt yield and rental growth. On the same basis, the index-linked gilt yield gap model was estimated with only a lag of two months for the gilt yield.

Table A1: Regression Equation for 10-Year Gilt Yield Gap

Independent Variables	Coefficient	Standard Error	T statistic
Constant	6.33	0.12	51.9
Rental growth (-2)	-0.20	0.08	-14.2
10-year gilt yield (-2)	-0.69	0.02	-36.6

Number of observations 324
R square 0.86
Adjusted R square 0.86

Table A2: Regression Equation for Index-linked Gilt Yield Gap

Independent Variables	Coefficient	Standard Error	T statistic
Constant	7.34	0.08	94.2
Rental growth	-0.93	0.08	-11.3
Index-linked gilt yield (-2)	-0.62	0.03	-22.2

Number of observations 324
R square 0.69
Adjusted R square 0.69

The r squares relate to the efficiency of these monthly models rather than the overall relationship between the respective yield gap and gilt yields. These equations are then applied to the annual forecasts for yields and rental growth set out in the text. To produce smooth curves, these forecasts are based on the annual forecasts interpolated to a monthly basis.

The regression equations mean that the following relationships hold:

- 1% annual rental growth equates to a 20 basis points fall in the 10-year gilt yield gap;
- 1% annual change in 10-year gilt yield equates to a 69 basis points fall in the 10-year gilt yield gap;
- 1% annual rental growth equates to a 93 basis points fall in the index-linked gilt yield gap;
- 1% annual change in the index-linked gilt yield equates to a 62 basis points fall in the index-linked gilt yield gap.

APPENDIX: STATISTICAL DETAILS OF FORECASTING MODELS

The forecasts from these equations for the different Scenarios are summarised in the tables below. The figures relate to the January of each year, with 2013 and 2014 as actual statistics, while the subsequent years show the predictions and underlying assumptions for rental growth and gilt yields.

Table A3: Central Scenario 10-Year Gilt-based Forecast

	2013	2014	2015	2016	2017	2018	2019
Gilt Yield	2.9	3.0	3.2	3.4	3.7	4.1	3.9
Annual Rental Growth	-0.2	0.8	2.1	2.5	2.5	2.4	2.1
Yield	7.46	7.13	7.23	7.28	7.37	7.39	7.32

Table A4: Central Scenario Index-linked Gilt-based Forecast

	2013	2014	2015	2016	2017	2018	2019
Gilt Yield	-1.98	-1.82	-0.4	0.8	2.0	2.0	2.1
Annual Rental Growth	-0.2	0.8	2.1	2.5	2.5	2.4	2.1
Yield	7.46	7.13	7.12	7.58	8.05	7.89	8.05

Table A5: Supply Pessimistic Scenario 10-Year Gilt-based Forecast

	2013	2014	2015	2016	2017	2018	2019
Gilt Yield	2.9	3.0	3.2	3.9	4.7	5.1	4.9
Annual Rental Growth	-0.2	0.8	1.05	1.25	1.25	1.2	1.05
Yield	7.46	7.13	7.69	7.59	7.68	7.70	7.63

Table A6: Supply Pessimistic Scenario Index-linked Gilt-based Forecast

	2013	2014	2015	2016	2017	2018	2019
Gilt Yield	-1.98	-1.82	-0.4	0.4	1.0	1.3	1.5
Annual Rental Growth	-0.2	0.8	1.05	1.25	1.25	1.2	1.05
Yield	7.46	7.13	7.22	7.46	7.70	7.78	7.86

APPENDIX: STATISTICAL DETAILS OF FORECASTING MODELS

Table A7: Financial Repressive Scenario 10-Year Gilt-based Forecast

	2013	2014	2015	2016	2017	2018	2019
Gilt Yield	2.9	3.0	3.4	3.3	3.2	3.1	3.0
Annual Rental Growth	-0.2	0.8	1.05	1.25	1.25	1.2	1.05
Yield	7.46	7.13	7.34	7.22	7.19	7.16	7.16

Table A8: Financial Repressive Scenario Index-linked Gilt-based Forecast

	2013	2014	2015	2016	2017	2018	2019
Gilt Yield	-1.98	-1.82	-0.4	-0.8	-1.4	-1.7	-1.8
Annual Rental Growth	-0.2	0.8	1.05	1.25	1.25	1.2	1.05
Yield	7.46	7.13	7.22	6.82	6.67	6.61	6.56

Table A9: Comparative Forecasts

Year	Central ILG	Central TYGY	Repression ILG	Repression TYGY	Pessimistic ILG	Pessimistic TYGY
01/2015	7.12	7.23	7.22	7.34	7.22	7.69
01/2016	7.58	7.28	6.82	7.22	7.46	7.59
01/2017	8.05	7.37	6.67	7.19	7.70	7.68
01/2018	7.89	7.39	6.61	7.16	7.78	7.70
01/2019	8.05	7.32	6.56	7.16	7.86	7.63

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