IPF Investment Property Forum

Investment Property Forum Educational Trust

Disagreement and Uncertainty in UK Property Market Forecasts

Research Findings

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The IPF Educational Trust and IPF Joint Research Programme

This research was commissioned and funded under the auspices of the IPF Educational Trust and IPF Joint Research Programme.

The three-year 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 the other financial markets, wider business community and government on a range of complementary issues.

The programme is funded by a cross-section of 16 businesses, representing key market participants. The IPF Educational Trust and the IPF gratefully acknowledge the contributing organisations:

Capital & Regional, Donaldsons, Grosvenor, GVA Grimley, Investment Property Databank, KPMG, LaSalle Investment Management, Land Securities, Lovells, Morley Fund Management, Nabarro Nathanson, Prudential Property Investment Managers, Quintain Estates & Development, Scottish Widows Investment Partnership, SJ Berwin and Strutt & Parker.

Disagreement and Uncertainty in UK Prperty Market Forecasts research team

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The Project Steering Group

The IPF, appointed a project steering group to guide and assist the Research team. They gratefully acknowledge the contribution from: Matthew Ryall (LaSalle Investment Management) - Chairman, Russell Chaplin (UBS Global Asset Management), Andy Schofield (IPD), Morgan Angus (Arlington Property Investors) and Charles Follows (IPF).

Preface

Introduction

The IPF Consensus forecasts further the objective of the Investment Property Forum to improve the efficiency and transparency of the investment property market. The IPF is extremely grateful for the continuing support of the contributors as noted on the quarterly publications, as the publication of Consensus Forecasts is only possible thanks to the provision of the individual forecasts. The IPF has published consensus forecasts since 1999.

Property market forecasting is an important component within the property investment decision-making process for institutional investors, supporting asset allocation, property fund strategy and stock selection in a mixed-asset portfolio. This has taken on increased importance in recent years with the closer alignment of property and the capital markets and increased application of modern financial techniques to property investment decision-making. Property forecasts are of increasing interest within the burgeoning property derivatives market. However, uncertainty is inherent in any forecast model or process, the input variables and the output forecasts.

Research that contributes to understanding the reliability of property forecasts will enhance the knowledge and understanding of property as an investment asset class, both to property professionals, and to those outside property and contribute to improvement in the functioning and efficiency of the property market.

Objectives

The project investigates the extent of disagreement among individual organisations' forecasts of UK commercial property markets and analyses whether disagreement provides market signals. This project involves investigation of the IPF's data set of forecasts to examine variations in forecasts (performance) between individual organisations. The research proposes to analyse patterns in and the information content of the distribution of the individual forecasts and to assess variations in the performance of the forecasting organisations contributing to the IPF's quarterly survey. However, no individual forecaster will be identifiable from the findings

The IPF congratulates the Research Team on an excellent project will help inform users of the IPF Consensus Forecasts and property forecasts more generally.

The IPF invite comments on the findings and the recommendations for future research. Please address comments or suggestions to Charles Follows, Research Director, IPF 3 Cadogan Gate, London SWIX 0AS. cfollows@ipf.org.uk 020 7695 1649

From 24 February 2006 the Investment Property Forum will be moving to New Broad Street House, 35 New Broad Street, London EC2M 1NH.
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Contents

Executive Summary

Background and Objective

Property forecasts are an integral part of the property investment process at the strategic, tactical and stock selection levels. This study investigates the nature, extent and patterns of disagreement and uncertainty in the forecasts of UK property investors and their advisors. From the outset, it is important to be clear that uncertainty is inevitably associated with all forecasts and that a set of forecasts will contain some degree of disagreement. Market structures and relationships are never completely stable and even a perfect model could not account for (by definition) unforeseeable 'shocks'. Property market forecasts also rely upon forecasts of the market drivers which are typically obtained from macro-economic forecasting organisations. Different forecasting organisations then apply different model specifications to these inputs, interpret the information in different ways and, inevitably, produce different forecasts.

Data and Approach

In order to examine uncertainty and disagreement in property market forecasts, we analyse the Investment Property Forum's consensus forecasts from 1999-2004. The forecasts of individual property forecasting organisations were made available to the researchers on an anonymous basis. In addition, we compare the results from the property forecasters with non-property forecasters predicting an array of macro-economic and capital market variables. We then apply a range of standard measures of accuracy to the forecasts. An interesting feature of the IPF forecasts is that, although the target remains fixed (IPD All Property Rental Growth, Capital Growth and Total Return for end of calendar year), each forecaster makes a number of forecasts at different times in the preceding 24 months.

Main Findings

- An interesting finding of the analysis is the extent to which property forecasting organisations agree with each other. This may be caused by a combination of the use of common forecasting methods, obtaining 'driver' forecasts from similar sources and an element of herding among forecasting organisations.
- Although most property forecasting organisations tend to have similar expectations, the consensus forecast often contains significant forecasting uncertainty. This suggests that forecasting organisations should not draw too much comfort about being close to the consensus.
- Given high levels of agreement and high levels of uncertainty in the consensus forecast, uncertainty in the property forecasts of the individual organisations seem to be primarily generated by common factors rather than by the individual forecasting organisation itself. This is not a unique feature of property market forecasters and non-property forecasters display similar patterns.
- A key source of uncertainty in the property market forecasts of capital and total returns may have been due to problems of forecasting yield shifts. The fact that capital growth tended to 'mirror' rental growth indicated that forecasters' expectations of capital returns were generally a product of rental return expectations. This may reflect the generally acknowledged increased difficulties of modelling yield shifts relative to rental growth. Alternatively, it may result from the aggregation of individual sector and regional forecasts into a forecast of the index.

Executive Summary

- The analysis suggests that there are inefficiencies in property market forecasts. When market performance was improving, total returns tended to be systematically underestimated. Conversely, when performance was deteriorating, total returns tended to be systematically overestimated.
- We find little evidence of consistent superior or inferior performance among individual forecasting organisations. When comparing the performance of individual forecasting organisations, very few individual forecasting organisations stand out. Again, this is true of both property and non-property forecasting organisations.
- At a group level, property advisors and fund managers tended to be marginally more accurate (in terms of absolute error) in their property forecasts than equity brokers.
- In specific years, across the three performance measures, the "best" individual forecasters were property advisors (45% of years), fund managers (20% of years) and equity brokers (35% of years). However, most individual forecasters were generally unable to repeat the performance in other years. Most evidence of forecasters being able to repeat strong performance was for rental growth.

1. Introduction

For institutional property investors, expectations of future investment performance at the levels of individual property asset, sector, region, country and across other asset classes (e.g. bonds and shares) are crucial to property selection and tactical and strategic asset allocation decisions. Forecasts are an important driver of expectations formation. A high degree of technical sophistication in forecasting has been developed over recent years, with a range of advanced quantitative and qualitative procedures now used by institutional investors, including judgemental procedures, causal/econometric procedures and time series/trend analysis procedures (Higgins, 2000). Numerous property forecasting studies have been conducted in recent years; these have been concerned with forecasting property rents, stock levels, returns, yields and cash flows; econometric and structural modelling, and comparisons of property forecasting procedures (see Newell, McAllister and Brown, 2003).

Given the centrality of forecasting to property investment decisions and performance, the focus in this report is on uncertainty in forecasts of property rents and returns, and disagreement in expectations. Uncertainty is an integral element of forecasts, and commercial property investors are constantly in the position of decision-making under uncertainty. "Forecasting competitions" suggest that the use of econometric modelling that dominates professional property forecasting can sometimes be of limited value. Confirming many studies outside the property sector, property researchers have found, in many instances, simple forecasts (e.g. via naïve predictors[1]) to be more accurate than using complex econometric models (Chaplin, 1999, 2000; Higgins, 2001; Wilson et al, 2000). Further, in macro-economic forecasts, non-causal models[2] often tend to dominate causal models (Hendry and Clements, 1999).

There has been growing interest in the fact that market participants often disagree. In most standard micro-economic models, market participants are assumed to share a common information set and to form similar expectations conditional upon that information. The topic of forecast disagreement (outside property) has generated a substantial body of research focussing on sources and causes of forecast disagreement and, interestingly, on signals and information contained in forecast disagreement.

This report focuses on two dimensions of forecast uncertainty namely; accuracy and disagreement. Drawing upon a dataset of professional forecasts of UK property market performance over 1999-2004, we investigate these property forecasts in terms of forecast error, bias and efficiency at both the consensus and individual forecaster level. We examine the extent and nature of disagreement among professional property forecasters. In order to investigate the comparative performance of UK property forecasters and to provide a benchmark against which this performance can be evaluated, we also examine the forecasting performance of major UK-based investment banks and fund managers. We compare the reliability of real estate forecasts with non-real estate analysts' forecasts of a range of variables such as GDP growth, earnings growth and stock market performance. Before examining the forecasts, we provide a brief review of some previous work on this topic and discuss the criteria for forecast evaluation.

[1] A 'naïve' prediction is usually derived from a simple rule e.g. the return will be the same as last year.

[2] Non-causal models typically exploit statistical patterns in the data to predict future movements and do not rely on any theory of how the market operates to produce forecasts.

1. Introduction

1.1 Forecast Uncertainty and Accuracy

There are many dimensions to evaluating forecasts and in particular to estimating accuracy. The topic of the *measurement* of forecast accuracy has itself generated substantial debate (see Fildes and Stekler (1999) for a detailed review). This means that there are a number of different quantitative measures of accuracy which capture different aspects of accuracy. The discussion about forecast uncertainty echoes much of the debate on valuation uncertainty and smoothing (e.g: Webb, 1994; Clayton, Geltner and Hamilton, 2001). The same distinctions are drawn between random variations between actual outcomes and predicted outcomes (error), and systematic tendencies towards optimism or pessimism (bias).

Similarly, the large body of research on forecast bias reproduces similar concepts found in research on valuation smoothing. As in property, the term 'forecast smoothing' is used in the forecast literature to describe the tendency of forecasts to be less volatile than the outcomes and to be display serial correlation. Clements (1995) identifies a tendency towards excessive smoothness in forecasts. Nordhaus (1987) speculates that the lack of volatility in forecasts, relative to actual outcomes, is due to factors such as the need to reach a consensus and to maintain forecast credibility by avoiding major "jumps". In research that assessed the accuracy of consensus property market forecasts in the UK over 1999-2002, Newell *et al* (2003) found empirical evidence of forecast inertia. Newell *et al* (2003) concluded that persistent over-estimation and under-estimation, manifested in serial correlation in forecast errors, suggested a smoothing effect in which significant new information is needed before major revisions to prior property forecasts are carried out.

Outside property, there is an extensive literature on the interlinked definition and causes of forecast uncertainty. If we define forecast uncertainty in terms of simple *ex post* differences between forecasts and actual outcomes[3], Hendry and Clements (2003) argue that it is rarely forecasting models that are the most important cause of forecast uncertainty. Although it may in some circumstances be attributable to factors such as inadequate theory and inaccurate observations, it mainly arises due to structural breaks in the patterns under study. As Hendry and Clements (2003, 303) state; "all econometric models are mis-specified, and all economies have been subject to unanticipated shifts". This produces a situation where model specification can be irrelevant to performance, in that correctly specified models can be outperformed by poorly specified models. Consequently, from an *ex ante* perspective, Hendry and Clements (2003) make a distinction between measurable and un-measurable uncertainty. The former is linked to the intrinsic error term inherent in econometric modelling[4] and is a standard output of the regression estimation. However, the error term can provide a misleading indicator of actual forecast uncertainty, given the largely unknowable (and therefore un-measurable) uncertainty caused by unanticipated shifts and shocks.

Capstaff, Paudyal and Rees (2001) provide a comprehensive review of the empirical evidence on forecast accuracy among financial analysts' forecasts of earnings per share. They identify a number of findings consistent with other studies. Analysts tend to outperform time series models; be optimistic and can be

[3] Evidence from UK property forecasters suggests that they would regard such a measure as a crude indicator of forecast success. Gallimore and McAllister (2005) find that most property forecasters regarded identifying the relative rather than absolute performance as the best indicator of success. Reflecting the preferences of many UK property forecasters, Granger and Pesaran (1999, 538) advocate a decision theoretical approach to forecast evaluation where there is a "consideration of the linkage between the modeler who produces forecasts and the decision maker who consumes them" in order to compare the relative usefulness of forecasts.

[4] As a result there is growing interest in communicating results in terms of probability density functions.

1. Introduction

reluctant to provide unfavourable forecasts; to over-react to positive information and under-react to negative information. They propose incentive structures and behavioural biases as potential explanations of systematic optimism. As noted, Capstaff *et al* (2001) is just one example of the much cited bias of equity analysts in optimistic forecasting of the performance of companies which are clients. Among macro-economic forecasters, Laster *et al* (1999) found that in selecting forecast outcomes, forecasters are motivated not merely by forecast accuracy, but also by potential publicity for their firm. Accordingly, where the rewards from the publicity attached to being accurate are relatively higher, forecasters are more likely to differentiate their views from the consensus, deliberately biasing their forecasts; a form of "rational" bias. The balance between the attractions of publicity and a requirement for accuracy provides conflicting pressures for divergence and convergence (herding) forecasts. In a discussion of how forecasters may be biased, Croushore (1997, 6) mentions "publicity effects" and suggests that:

> *"….some (survey) respondents might shade their forecasts more toward the consensus (to avoid unfavourable publicity when wrong), whilst others might make unusually bold forecasts to stand out from the crowd."*

Although there has been little published work on the accuracy of property forecasts, for the US, Ling (2004) provides an interesting analysis of the forecasting ability of the sector and Metropolitan Statistical Area rankings in the Real Estate Research Corporation (RERC) survey. Ling (2004) assesses whether the consensus opinions on market conditions contained in RERC's survey results are useful in forecasting subsequent return performance. He finds no evidence to support the view that analysts' forecasts can improve performance and identifies no positive correlation between the prediction of the RERC survey respondents and actual return performance. Intriguingly, he also finds that consensus predictions are correlated with NCREIF returns in the two years *prior to* the survey. He therefore concludes that RERC's investment conditions survey is clearly backward looking and not forward-looking implying that expectations are influenced by recent past performance. Using a vivid metaphor, he describes using consensus opinions to make property investment decisions as akin to driving a car by looking in the rear view mirror.

1.2 Forecast Disagreement

Bomberger (1996) examines disagreement and uncertainty in forecasts. Disagreement is defined in terms of a measure of the dispersion of individual forecasts around the mean forecast, whereas uncertainty is defined in terms of the dispersion of individual forecasts around the actual. Whilst the two concepts are integrally related, a distinction is also drawn between individual and consensus uncertainty. The uncertainty of an individual forecast is greater than the uncertainty of the mean forecast. In an analysis of long-term inflation expectations, Bomberger (1996) finds that it is uncertainty in the consensus forecasts rather than disagreement that are the dominant component of individual forecast uncertainty. In other words, the uncertainty in individual forecasts is due to common factors rather than individual features of the forecaster.

However, it should also be noted that observed disagreement among forecasters may underestimate actual disagreement. Supporting the forecast smoothing hypothesis, Gallimore and McAllister (2005) found that professional property forecasters in the UK often engage in "self-censorship" or are "censored" when forecasting models generate contentious or conspicuous forecasts. This distrust of "big numbers" may be a rational bias, given the range of uncertainties about the inputs and the models; in addition to the reputational risks.

1. Introduction

In explaining forecast disagreement, commentators tend to focus on differences in information availability and processing. Linden (2003, 5) expresses the point succinctly, arguing that "forecasters have both different types and different amounts of information to form their beliefs". Williams (2003) draws upon theories of rational heterogeneity of beliefs which assume that agents have at their disposal a range of forecasting models, but are uncertain as to which model or models to use. Consequently, they adaptively update their model choice or priors over the various models based on forecasting performance. In essence, it is argued that idiosyncratic differences in agents' characteristics (e.g. different initial conditions in model priors and costs to learning new models) implies that a range of models will be in use at any point in time.

Subjectivity is intrinsic to property forecast formation and is likely to generate disagreement among property forecasters. It has been recognised that differences in property forecasts occur due to differences in the structure of the econometric models, statistical procedures and data used (Mitchell and McNamara, 1997). In the UK, Gallimore and McAllister (2005) argue that judgement is pervasive in the forecast formation process occurring in (econometric) model formation, due to variations in choice of causal variables, data selection and treatment, and constant and parameter specification. Additionally, in a survey of professional forecasters, they found that the output of mechanical models is rarely the final forecast.

Pure model output is usually amended, as it is mediated and contested within organisations and forecasters themselves (who, as noted above, often have incentives to avoid conspicuous forecasts). Similarly, in the US, Guilkey (1999) investigated the practice of US property market forecasters in terms of their parameters, methodology and output, and identified significant differences in the variables used, model specifications and the exogenous variables which are obtained from macro-economic forecast providers. He found disagreement amongst forecasters, concluding that property forecasters "get to their conclusions using very different methodologies and obtain very different MSA rankings" (Guilkey, 1999, 40).

There is also a body of work that tests for consensus in forecasts. The standard definition of 'consensus' is "an agreement of opinion". Where a statistical measure of consensus is being sought, measures of central tendency are typical. However, a more sophisticated deconstruction of consensus can be identified in the literature. Byrne and Lee (1999) argue that central tendency statistics do not robustly reflect the presence or absence of agreement. This is measured more formally by analysing the distributional properties of forecasts to assess whether a consensus exists. Byrne and Lee (1999) adapt a sequential test from Schnader and Stekler (1991) which puts a check for normality as the key test for consensus. Following Schnader and Stekler (1979), they suggest that a consensus is present when forecasts are relatively close to each other and that no consensus exists if there is wide disagreement among the forecasts in a given cross-section. However, even if normality is not present, it is argued that the lack of a consensus requires skewness (indicating a significant minority dissenting opinion). If skewness is not present, then significant platykurtosis[5] must be present (if a distribution is leptokurtic, then there is even more clustering around the mean than when the distribution is normal).

Previous analyses suggest that forecast disagreement may contain useful signals and information about future market performance. Examining hypotheses generated by price-optimism models, Diether *et al* (2002) find that the bigger the disagreement in analysts' forecasts of a stock's returns, the lower its

[5] Kurtosis describes the extent to which a distribution follows the normal bell-shaped distribution. If a distribution is even more 'peaked' than the normal distribution, the distribution is described as leptokurtic. If, on the other hand, the distribution is 'flatter' than the normal distribution, it is describe as platykurtic.

1. Introduction

future returns. Their central hypothesis is that optimistic buyers bias prices positively and cause future underperformance. Focussing on inflation forecasts, Mankiw *et al* (2003) identified under-reaction to information when forming expectations about inflation. They find that forecast disagreement rises with inflation and when inflation changes sharply. They suggest that disagreement about future inflation moves together with other macro-economic variables, raising "the possibility that disagreement may be a key to macro-economic dynamics". Bomberger (1996) finds that forecast disagreement can act as a proxy for forecast uncertainty, so that there is a positive relationship between the forecast errors and forecast disagreement at the time of the forecasts. Looking at individual forecasters, Cooper *et al* (1999) distinguished between lead or dominant forecasters and follower forecasters. They argued that it was rational for less informed forecasters to delay publication of forecasts. Linden (2003) investigates patterns of asymmetries in forecast disagreement and their relationship with future performance. In essence, it is argued that significant skewness in distributions of forecasts can signal upside and downside risk, depending on market conditions.

1.3 Forecast Evaluation

Since the contribution of forecasts to organisational decision-making will depend on the specific use of forecasts in the organisation, evaluation is to some extent an inherently subjective process. For instance, Granger and Pesaran (1999, 538) advocate a decision theoretical approach where there is a "consideration of the linkage between the modeler who produces forecasts and the decision maker who consumes them". Whilst it is possible to focus on loss functions, these also are user specific. The most appropriate measure of accuracy is therefore dependent upon the utility of the forecast to the forecast user. Whilst we apply a number of objective measures of accuracy below, we need to acknowledge that each provides different insights into the usefulness of the forecasts.

Below, a number of simple error measures are applied to the data. However, the debate on forecast evaluation has highlighted that, when comparing forecasts of variables with very different time series characteristics, error metric measures do not control for a number of issues to ensure that 'fair' comparisons are being made. Scale may be significant. Variables measured in large units (e.g. capital growth) will almost inevitably have large differences in terms of simple error metrics compared to more stable variables (e.g. GDP change). The volatility of the variable will affect the 'degree of difficulty' of predicting it. Variables which tend to display high levels of serial correlation (e.g. CPI change, rental growth) will tend to be easier to forecast than variables that move in a random pattern (e.g. stock prices and bond yields). Typically, differences in variability are controlled for by incorporating information on the observed change in the predicted variable.

Partially to overcome scaling problems, we also compare the performance of forecasters against a naïve time series model (same change as last year). Theil's U2-statistic is used. The main rationale is based upon an expectation that forecasters should be able to outperform very simple models. The naïve forecasting methods used in calculating Theil's U2-statistic in this study were the **"same return"** forecasting strategy, in which the previous actual annual return is used as the property forecast for the subsequent annual period. In particular, in interpreting Theil's U2-statistic:

- U=1 indicates the naïve forecasting method is **as good as** the forecasting technique being evaluated
- U<1 indicates the forecasting technique being evaluated is **better** than the naïve forecasting method
- U>1 indicates the forecasting technique being evaluated is **worse** than the naïve forecasting method.

1. Introduction

Forecast bias is closely linked to tests of efficiency and rationality in forecasts. Rational expectations would imply forecasts are efficient in that they do not display predictable errors. Essentially, tests for forecast efficiency look for correlations between forecast errors and observable variables, the existence of which implies that forecast errors are predictable and therefore not rational. Tests applied include identifying:

- non-zero mean in forecast errors;
- serial correlation in forecast errors;
- significant correlation between forecast errors and a constant and the forecast itself; and
- tests of correlation between forecast errors and a set of variables (assumed to be the information set).

A simple linear regression often used to test for bias in the forecast series is estimated for each category of forecaster. The regression equation takes the form:

$$A_t = \beta_o + \beta_1 F_t + e_t$$

where A_t is actual value and F_t is the forecast value in some previous period. Unless $\__0 = 0$ and $\__1 = 1$, the value of A_t predicted by the equation will differ from the forecast value F_t.

In summary, this report is concerned with assessing the nature and extent of the phenomenon of disagreement in property forecasts and assessing the accuracy of consensus forecasts and the individual forecasts that comprise the consensus. There is ample evidence from the capital markets and macro-economic forecasts to argue that disagreement and uncertainty are intrinsic to forecasting. Overall, the more interesting questions relate to the quantity and pattern of disagreement and uncertainty in property forecasts and the signals in and consequences of these aspects of property forecast uncertainty.

2 Data and Methodology

Property forecasts for the UK over 1999-2004 were obtained from the Investment Property Forum (IPF) *Survey of Independent Forecasts: UK Property Investment* (IPF, 2004), as well as individual forecasters' values provided by the IPF. The IPF property forecast surveys have been conducted since November 1998 and have been conducted quarterly (February, May, August and November) since November 1998[6]. These IPF expert opinion forecasting surveys collect information on future rental growth, capital growth and total returns from a range of UK property forecasters, including property advisors, fund managers and equity brokers. The target is the IPD All Property Rental Growth, Capital Growth and Total Return for end of calendar year. A problem facing the forecasters is that the constituents of the IPD All Property Index change over the forecast period as properties enter and exit the index. The extent of this problem will depend on the extent to which new properties differ in the performance characteristics from the existing properties.

Exhibit 1: IPF Survey Of Independant Forecast: Respondent Profile: November 2004

Period of surveys: 1998-2004

Frequency of survey : quarterly (typically February, May, August, November)

Property parameters surveyed: rental growth, capital growth, total returns

Number of participants[7]**:** 27

- property advisors: 12
- fund managers: 11
- equity brokers: 4

Participants:

Property advisors: ATIS REAL Weatheralls, CB Richard Ellis, Cluttons, Colliers CRE, GVA Grimley, Cushman & Wakefield Healey & Baker, Knight Frank, Real Estate Forecasting, PMA, Experian Business Strategies, IPD, King Sturge

Fund managers: Arlington Property Investors, Deutsche Asset Management, Henderson Global Investors, LaSalle Investment Management, Legal and General Investment Management, Prudential Property Investment Managers, Standard Life Investments, Cordea Savills, ING Real Estate Investment Management, Invesco, Scottish Widows Investment

Equity brokers: Merrill Lynch, UBS, Morgan Stanley, Un-named

[6] No survey was conducted in February 1999.

[7] Some survey respondents are unnamed for confidentiality reasons.

2 Data and Methodology

The research team was given access the data from individual forecasters on an anonymous basis. The forecasts used in each edition of Consensus Forecast were coded and made completely anonymous before being passed to the research team. The IPF Research Director assigned each individual forecaster a code number. The individual forecasters were listed in random order before assigning the code. The Research Director tracked organisations through names changes and mergers. The changes in personnel at the organizations were not tracked. Forecasts from Fund Managers have a code FMxx, Equity Brokers have a code EBxx and Property Advisors & Research Consultancies have a code PAxx. The research team are not aware of the identity of contributors beyond the information published in each edition of Consensus Forecasts. Some contributions are supplied on an anonymous basis.

18-31 property forecasters have participated in this quarterly survey, with an average of 24 participants per IPF property forecasting survey over 1998-2004. Details of the November 2004 IPF property forecasts survey, including participants, are shown in Exhibit 1. Inevitably, the analysis of individual forecaster consistency is hindered by organisational and personnel changes over the study period. Over 1998-2004, the IPF survey has seen new contributing organisations emerge, previous contributors leave (and sometimes re-emerge) and existing contributors merge with other existing contributors. This means that for a total of 46 contributors, there are only 10 who contributed for the full six years. There have also been changes in personnel within the various forecasting teams over this time period.

In each IPF survey, participants are asked to forecast property performance (rental growth, capital growth and total returns) to the end of the current calendar year, as well as forecast these property performance measures to the end of the year for the next two years. The 'target' is the IPD All Property Index. This sees property forecasts presented for up to 35 months ahead. With these IPF surveys conducted quarterly, this sees subsequent property forecasts presented for forecast a whole range of lead times. This allows the assessment of the accuracy of property forecasting as the time difference between the property forecast and the actual property performance data reduces on a quarterly basis from thirty five months to two months. The IPF UK property forecasts were then compared with the respective Investment Property Databank (IPD) actual UK annual property returns.

An interesting feature of the forecasting problem is that the forecasters are forecasting rental and capital growth and total return at a given number of points during that year. As the year progresses, it would be expected that forecasting accuracy increases as the target end-of-year date becomes closer. Additionally, property forecasters for the IPD Annual Index are informed by the IPD Monthly Index[8]. Although the sample of properties in the monthly index is different from the annual index[9], it provides a monthly update on performance as the year progresses. Timing is quite complex. The IPF August survey reflects forecasts that may have been estimated in July. It is extremely unlikely that the forecaster was aware of the performance to the end of July and may not be aware of the performance to the end of June. However, in effect, the forecasters are receiving regular signals about market returns in a similar sub-market that should help them to update their property forecasts. These implied forecasts also provide us with some insights about the efficiency of property forecasters in reacting to new information. However, it is not necessarily clear precisely when forecasters will be able to incorporate information from the monthly index.

[8] There are typically minor differences in performance between the two indices. The monthly index consists of funds appraised on a monthly basis which are typically unitised funds. The lot size tends to be smaller in such funds so that certain sectors do not have as large weights e.g. shopping centres, London offices.

[9] A key difference is that the average lot size is smaller in the Monthly Index.

2 Data and Methodology

It is not necessarily the case that at a quarterly forecast, the forecaster will be aware of the IPD Monthly Index performance in the previous month. For instance, the IPD Monthly Index for August is not produced until ten working days after the end of the calendar month. The level of information available to the forecaster depends on the timing of forecast production and the release of performance measures by IPD.

Legal and General Investment Management have also kindly provided us with forecasts for a range of capital market and macro-economic variables for a range of investment organisations. Full details of the organisations and the variables are provided below.

- ABN Amro
- Barclays
- Chase
- Citigroup Smith Barney
- CSFB
- Deutsche Bank
- Dresdner Kleinwort Wasserstein
- Goldman Sachs
- HSBC Securities
- JP Morgan
- L&G Inv Mgt
- Merrill Lynch
- Morgan Stanley
- Schroder SSB
- UBS

Similar to the IPF survey, these data typically consist of forecasts (which are usually updated quarterly) for a range of variables at calendar year end. The variables discussed here are GDP growth and CPI growth in calendar year; dividend and earnings growth in calendar year and the percentage change in the FTSE index. In terms of timing, the key difference from the property forecasts is that the projections are produced on a more typical quarterly basis and only to end of current year. However, a crucial issue to bear in mind when considering the observed patterns is that the macro-economic forecasts may form inputs in both the property and capital market forecasting models. For instance, common macro-economic assumptions may be independent variables in both the dividend/earnings growth forecasting models and the rental growth forecasting models.

3 Results

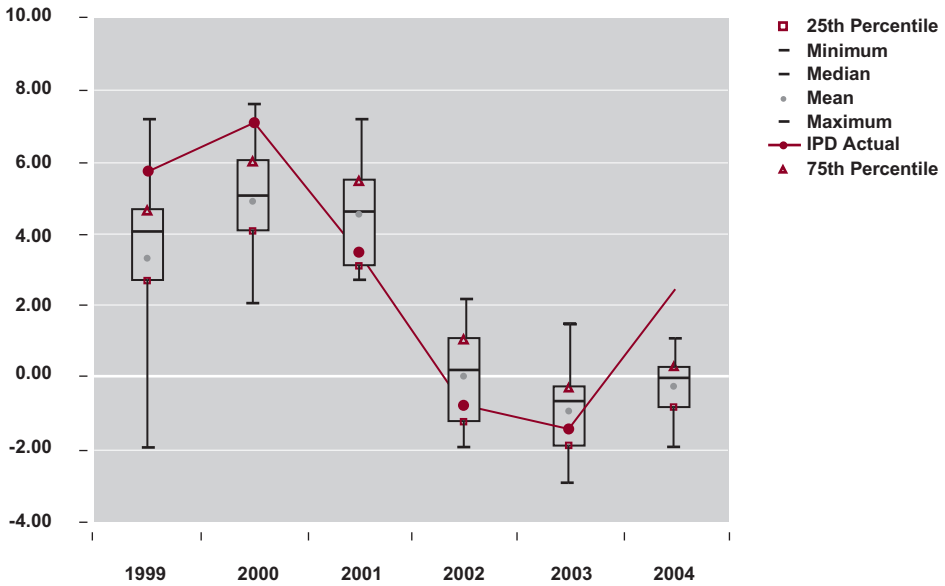
3.1 Forecast Disagreement

In Appendices 1 and 2, we present descriptive statistics of the one-year ahead forecasts for change (%) in property rental and capital growth and total returns and non-property variables[10]. In each case, it is based on the February forecast of the end-of-year returns; consideration of subsequent quarterly updated forecasts (at May, August and November) are not assessed in this section. Forecast disagreement is indicated by the range between the maximum and minimum forecasts and the standard deviation of forecasts. Exhibits 2-4 illustrate how the actual outcomes compare with the maximum and minimum, the interquartile range, the mean and median.

Similarities are a prevailing theme. The median and the mean forecast tend to be similar, providing a preliminary indication of normality in the distribution of forecasts. The range between maximum and minimum for forecasts tend to remain relatively constant over the period. Additionally, the standard deviation of forecasts remains relatively stable from year to year. This suggests that the level of disagreement among forecasters is relatively stable for one year-ahead forecasts. Although the ranges appear large, it is apparent that around three quarters of the forecasts for total return are typically within 1.5% of the mean.

Further, the evidence of a consensus among property forecasters is strong. In all but one case, the annual distribution of the forecasts is normal for all forecasts. The only clear-cut exception is the rental growth forecast for 2002, when the distribution is significantly non-normal and there is significant negative skewness in the forecast for rental growth. This may reflect negative sentiment following the perceived increase in downside risk following 9/11 in 2001. Likewise, the forecasts for 1999 display similar characteristics. The rejection of non-normality is marginal and there is significant negative skewness. Again, this may reflect increased negative sentiment following the perceived growth in downside risk following the financial market turmoil in the second half of 1998 associated with the Russian debt crisis and the collapse of Long Term Capital Management. However, these factors only feature in rental growth forecasts and strong evidence of consensus remains about total returns and capital growth in both 1999 and 2002.

Exhibit 2: All Forecasters Rental growth



[10] The 1999 forecast is based upon the November 1998 survey. The greater disagreement in this year may reflect the fact that the forecast is earlier.

3 Results

Exhibit 3: All Forecasters: Capital Growth

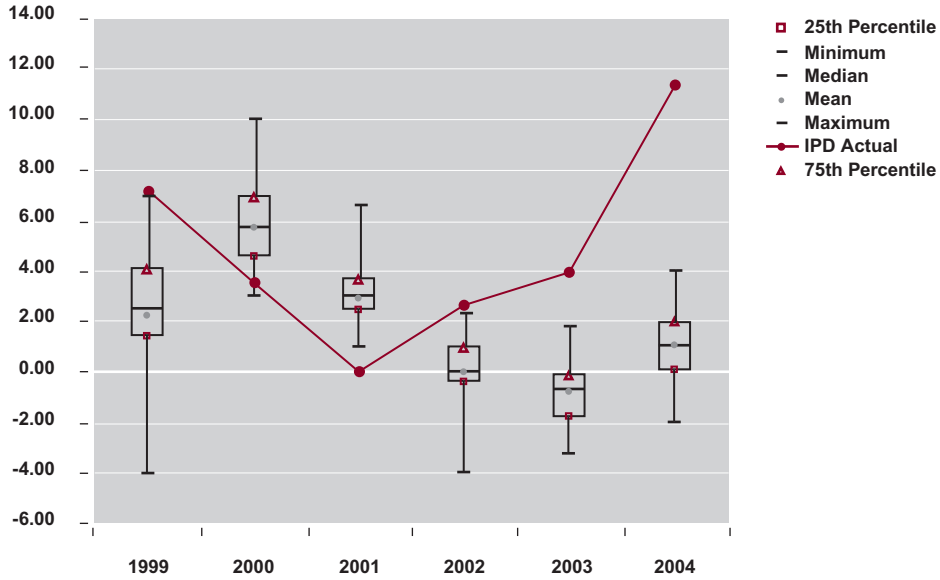
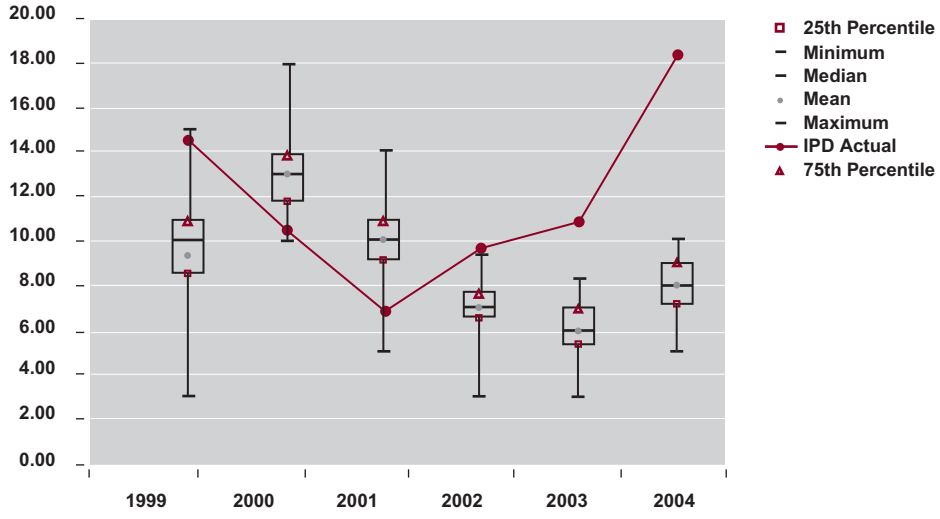


Exhibit 4: All Forecasters: Total Return



We find remarkably similar patterns for non-property forecasters. In Appendix 2, we present the descriptive statistics for projections of dividend and earnings annual growth and FTSE annual change. Whilst the sample size may indicate small sample problems, at first sight it is clear that there is strong evidence of consensus amongst non-property forecasters. For both earnings growth (2003) and dividend growth (2000), there is only one year when the distribution of forecasts is non-normal. These similarities generate two possibilities. Firstly, it may suggest that the tendency of forecasters to herd is not purely a property phenomenon, but is typical of the wider economic forecasting sector. Alternatively, since property forecasters typically use macro-economic forecasts, they may be maintaining their consensus attributes in property forecasts.

3 Results

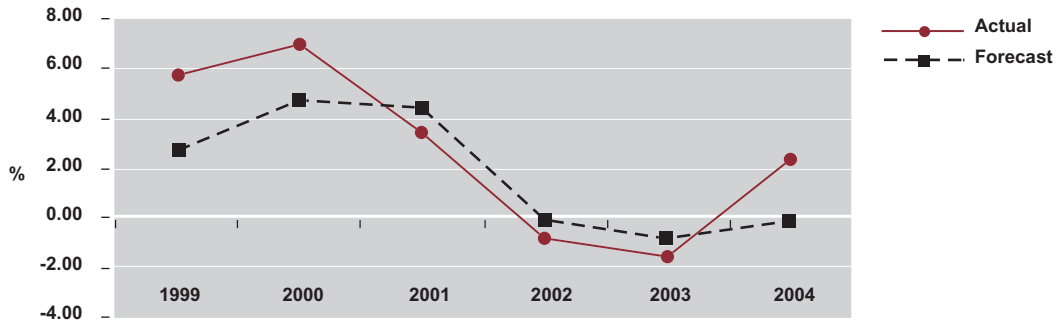
The Box-Plots also provide us with a useful visual indication of the accuracy of the property forecasting organisations. Clearly, for capital growth and total returns, the outcome is often outside the range of the forecasts. For capital growth, in no year is the outcome with the interquartile range of the forecasts. Forecasts of rental growth seem to have less uncertainty. In three of the six years, actual rental growth is close to the consensus forecasts. Below, we measure more formally the uncertainty in the consensus forecasts.

3.2 The Accuracy of Consensus Property Forecasts

As discussed above, there are many dimensions to forecast accuracy. In this report, we initially apply a range of common error metric measures – mean error and mean absolute error - to the data. We also provide some qualitative analysis of the timing ability of forecasters. Firstly, we focus on the simple absolute differences between forecasts and actual outcomes. Exhibits 5-7 illustrate the accuracy of the one year-ahead forecasts for rental and capital growth and total returns.

At this level of analysis, it seems that it is uncertainty in capital growth that are driving the uncertainty in total return. Indeed, at the consensus level, capital growth forecasts tend to mirror rental growth forecasts. This generates a hypothesis that *forecast* rental growth is the key determinant of *forecast* capital growth and that forecasters are assuming stable capitalization rates in their forecasts of capital growth. This is consistent with research on the property forecasting process, which suggests that forecasters have limited confidence in their ability to forecast capitalization rates (see Gallimore and McAllister, 2005). Below, we investigate this issue in more depth.

Exhibit 5: Forecast Accuracy - Rental growth one year-ahead



3 Results

Exhibit 6: Forecast Accuracy - Capital growth one year-ahead

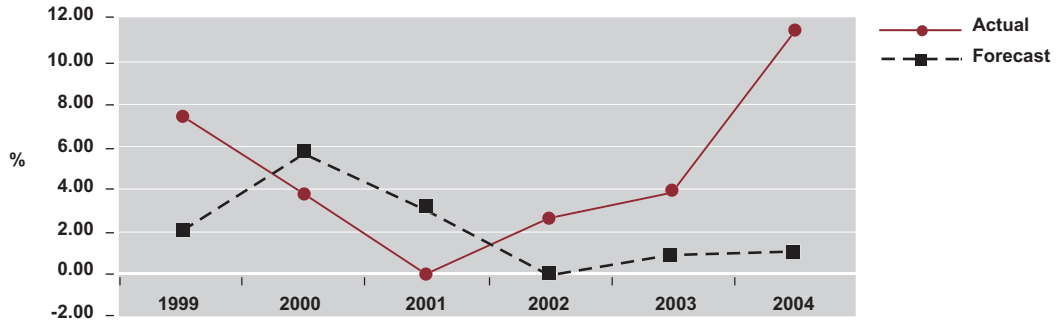
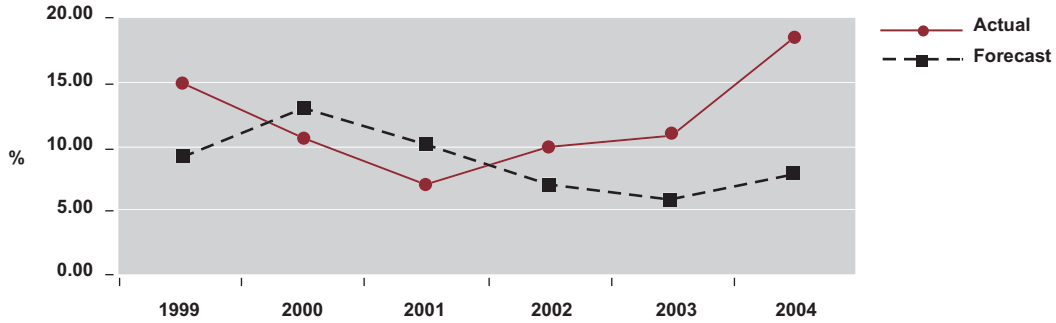


Exhibit 7: Forecast Accuracy - Total return one year-ahead



The largest consensus forecasting deviation from the actual was in 2004. All forecasting organisations failed to anticipate the fall in capitalization rates that produced high levels of capital growth in that year. The mean forecast for capital growth in 2004 was 1.03%, with a standard deviation of 1.37% and a maximum of 4%. This compares to recorded capital growth of 11.04%. The mean absolute error in one-year ahead total return forecasts for the six years between January 1999 and December 2004 was 4.87%. Given the existence of consensus and the relatively low dispersion about the mean, for total returns, this suggests that the largest contributor to individual forecast uncertainty was consensus uncertainty.

Not surprisingly, forecasts became more accurate the closer the forecast was to the end of the year. As noted above, the information provided by the monthly index provides forecasters with valuable information about the likely out-turn at the end of the calendar year. It is clear from Exhibit 8, that typically the February forecasts display the highest level of absolute error, whilst the November forecasts display the lowest. Almost invariably, there is an increase in accuracy as the year progresses.

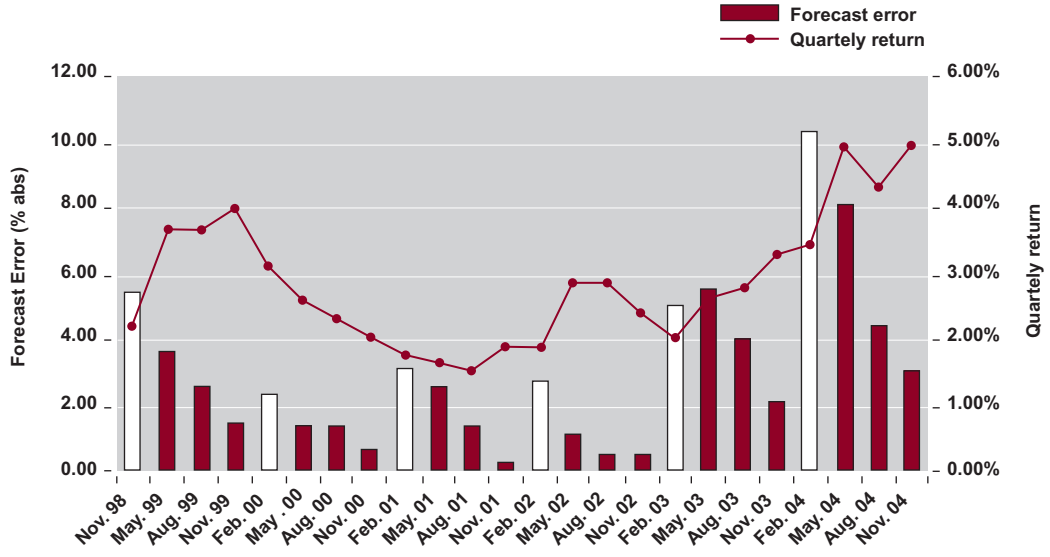
3 Results

3.3 Bias in Property Forecasts

Exhibit 9 shows the average percentage errors for the IPF forecasting data over 1999-2004. This graph provides preliminary support for a number of conclusions about the related concepts of bias and efficiency in property forecasts; namely:

- Forecasts display evidence of systematic bias. When performance was improving, total returns tended to be systematically underestimated. Conversely, when performance was deteriorating, total returns tended to be systematically overestimated.
- Indicating inefficiency, there is clear serial correlation in the forecast errors. For instance, the mean (raw) errors in the consensus forecasts for total returns have a serial correlation of 0.71 (significant at 5% level).
- Despite the information in the IPD monthly index, the bias in the forecast errors tends to continue. Initial over-estimations or under-estimations at the beginning of the calendar year invariably persist, providing evidence of inefficiency amongst property forecasters.

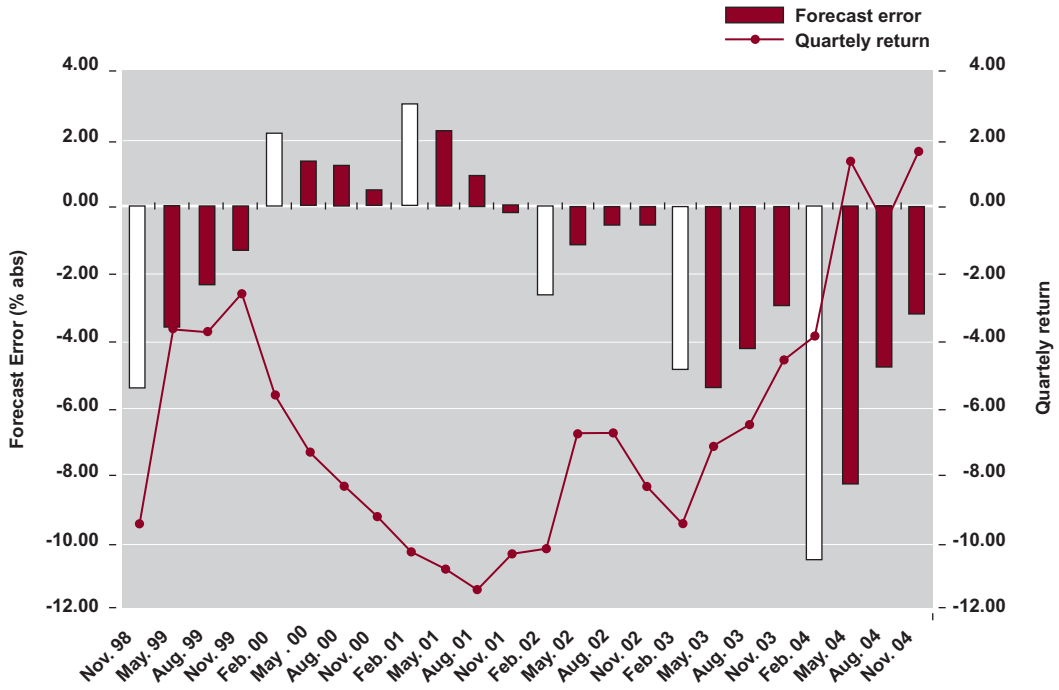
Exhibit 8: Consensus Forecast: Absolute Perecentage Error: 1999 – 2004[11]



11 One year ahead forecasts are shaded grey

3 Results

Exhibit 9: Consensus Forecast: Average Percentage Error: 1999 - 2004



As noted earlier, as the calendar year progresses, forecasters have periodic monthly updates on achieved performance. As such, it is also possible to estimate the implied forecasts by extracting recorded performance to the date of the forecasts and comparing it to the actual performance over the remaining period. For instance, in August 2004, the consensus forecast for total returns was 13.89%. Given that recorded performance until July 2004 was 9.24%, this can be interpreted as an implied forecast of approximately 4.5% for the period of August to December 2004. Drawing again on the monthly index, the actual recorded performance for August to December 2004 was 9.5%.

Exhibit 10 provides summary data on the accuracy and characteristics of the implied forecasts over 1999-2004. They also display characteristics associated with forecast inefficiency. The mean of the forecast errors is negative. Given typically rising markets, this implies an element of lagging or inertia. Further, there is strong evidence of forecast smoothing. Forecast errors are positively serially correlated and the standard deviation of actual returns is higher than forecast returns.

3 Results

Exhibit 10: Implied Consensus Forecasts: 1999 – 2004

	Implied consensus forecasts (quarterly) 1999-2004		
	Rental growth	Capital growth	Total return
Mean error	-0.59%	-1.89%	-2.16%
Volatility (actual)	2.12	3.05	4.16
Volatility (forecast)	1.72	1.84	3.26
Auto-correlation in errors	0.68	0.81	0.80

For the three different sub-groups, econometric tests for unbiasedness were undertaken for three periods; namely, the current year, the following year and two years out. Exhibit 11 summarises the results for the three groups and for the combined group. Under the null hypothesis of unbiasedness, the regression parameters, the intercept and slope would be zero and one, with significant deviations of *either* parameter signifying biased forecasts. A 'Yes' indicates that the forecasts were not biased and 'No' that they were biased.

The first observation is that, on balance, forecasts for two years ahead are unbiased and current year forecasts are biased. As a group, property advisors and fund managers provide unbiased short-term, current year forecasts. For one and two year periods out, property advisors provide unbiased forecasts for capital growth and total return. Combining all forecasts leads to an averaging-out of biases resulting in , apart from capital growth, unbiased forecasts over one and two years out. The nature of the biases varies. For example, on average, rental values tend to be under-estimates, whereas capital values are over-estimated. Total returns are usually under-estimated.

Exhibit 11: Bias in Property Forecasts

Property Advisors

Forecast Period	Rental Growth	Capital Growth	Total Return
Current Year	Biased	Unbiased	Unbiased
One Year Ahead	Unbiased	Biased	Biased
Two Years Ahead	Unbiased	Biased	Biased

Fund Managers

Forecast Period	Rental Growth	Capital Growth	Total Return
Current Year	Biased	Unbiased	Unbiased
One Year Ahead	Unbiased	Unbiased	Unbiased
Two Years Ahead	Biased	Biased	Biased

3 Results

Equity Brokers

Forecast Period	Rental Growth	Capital Growth	Total Return
Current Year	Unbiased	Unbiased	Unbiased
One Year Ahead	Unbiased	Biased	Biased
Two Years Ahead	Biased	Unbiased	Unbiased

All (combined)

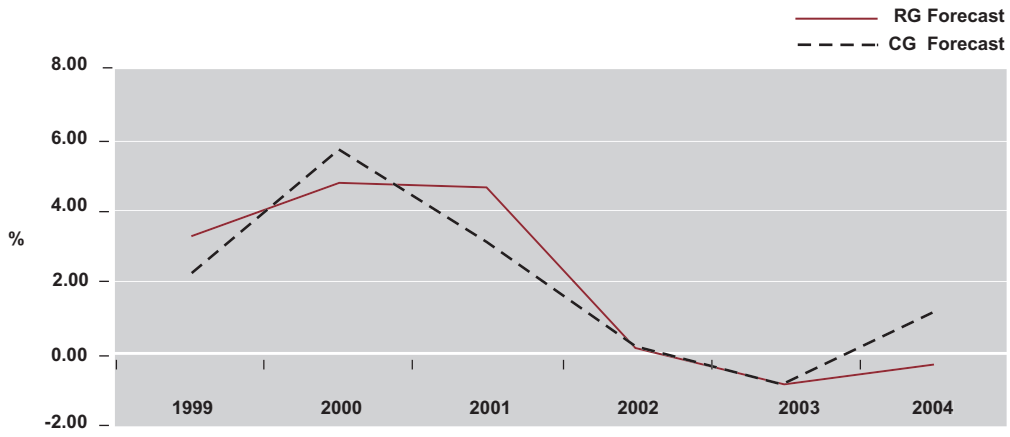
Forecast Period	Rental Growth	Capital Growth	Total Return
Current Year	Unbiased	Unbiased	Unbiased
One Year Ahead	Biased	Unbiased	Biased
Two Years Ahead	Biased	Biased	Biased

Note: Conclusion based on Wald test for F and Chi-square test statistics

3.4 The Relationship between Rental Growth and Capital Growth Forecasts

It was hypothesised above that forecasts of rental growth were the main driver of forecasts of capital growth and that property forecasters did not incorporate yield shifts into their forecasts of capital growth. This is certainly apparent at the aggregate level when we see how capital growth closely tracks rental growth (see Exhibit 12). Whilst the correlation co-efficient between *actual* rental and capital growth is 0.12 for the period 1999-2004, the correlation co-efficient between *forecasted* rental and capital growth at the consensus level is 0.91.

Exhibit 12: Forecasts of Rental and Capital Growth



3 Results

However, in order to state definitively whether rental forecasts are the main driver of capital growth forecasts, it is necessary to establish whether this correlation is a consequence of the aggregation of forecasts rather than a pattern of behaviour common to *individual* forecasters. In other words, do individual forecasters simply base their capital growth forecast on rental growth and fail to incorporate potential yield shifts?

At a basic single property level, a 5% growth in rental value will produce approximately a 5% growth in capital value. Typically, the other significant possible driver of capital growth is change in the yield (capitalisation rate). In Exhibits 13-15, the actual forecasts of rental and capital growth for the individual forecasters in 1999, 2002 and 2004 are displayed. They

Exhibit 13: Individual Forecasts - Rental and Capital Growth 1999

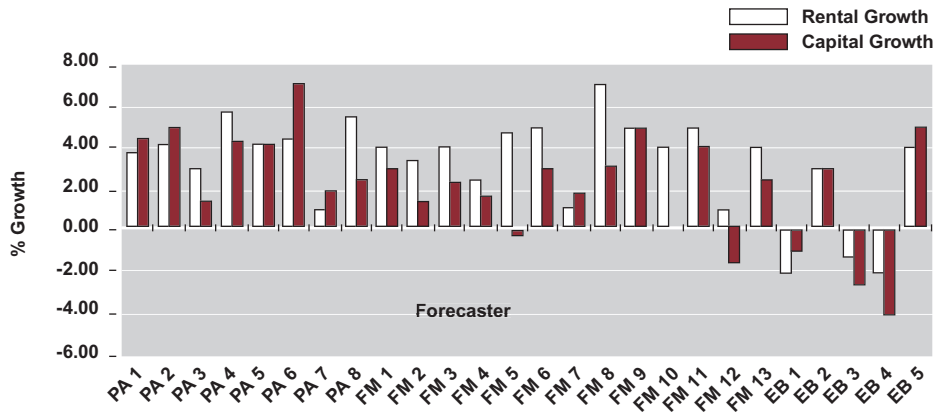
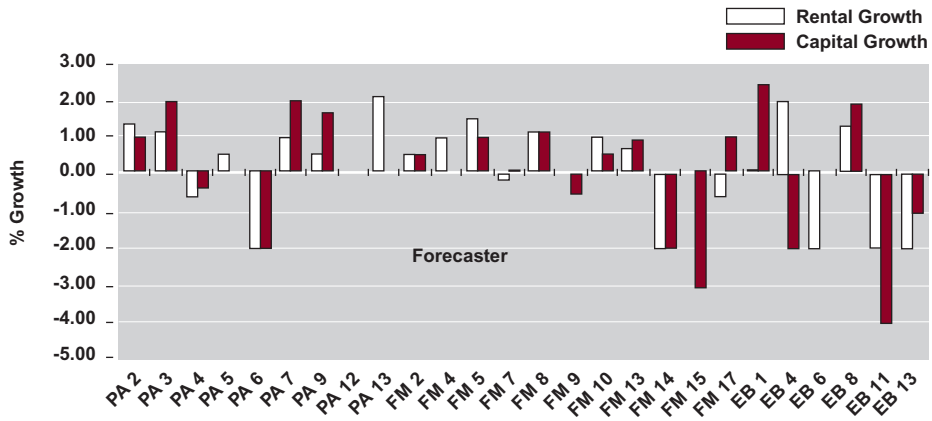
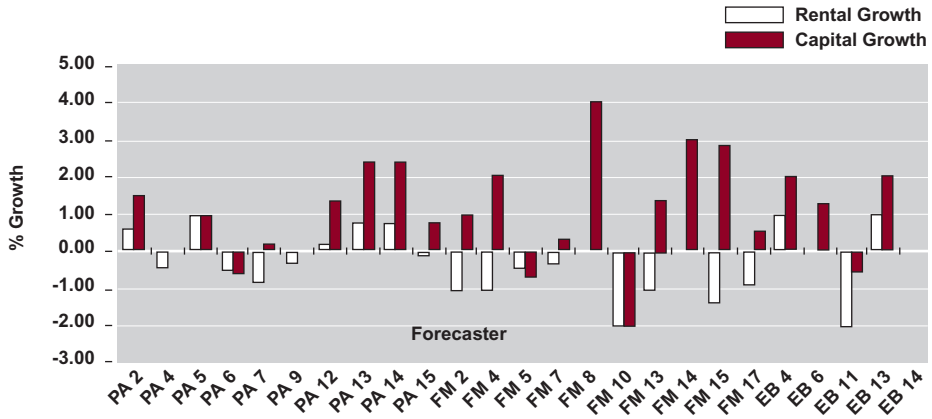


Exhibit 14: Individual Forecasts - Rental and Capital Growth 2002



3 Results

Exhibit 15: Individual Forecasts - Rental and Capital Growth 2004



show that individual forecasts of rental growth are generally similar to the forecasts of capital growth in terms of direction and quantity. This suggests that the majority of individual forecasters are assuming no or minor changes in yields. This lends support to the hypothesis that forecasters are cautious in forecasting yield movements. This, in turn, produces a close linkage between forecasts of capital and rental growth.

3.5 Property Compared with Non-Property Forecasters

Firstly, we focus on the simple differences between forecasts and actual outcomes. Focusing initially at a basic level, Exhibit 16 presents the results of the actual change in FTSE with the consensus predicted change in FTSE for the period 2001-2004. At first sight, the results (from only four observations) suggest that the performance of equity market forecasters is poor. In 2001 and 2002, the consensus forecasts had large absolute errors and failed to forecast the correct direction of the market. Indeed, it reinforces the apparent herding effect. No individual forecaster predicted a fall in the index in 2001 and 2002. Alternatively, equity markets may be extremely difficult to forecast and we need to control for both the variability and randomness of the return patterns. Property performance tends to be 'smoother' and more sluggish. This point is clear when we look at Exhibit 17. Without allowing for differences in scale in the Y axis, we see that the forecasting record for CPI is much better. Perhaps a fairer comparison is between the consensus predictions for the income components of total return.

Exhibit 18 displays the simple mean error for quarterly[12] forecasts for end-of-calendar year growth in rental values and dividends. Although 2001 stands out as a period when equity market analysts persistently overestimated dividend growth, the similarities in both series are striking. If we exclude this year, the mean quarterly error is for dividend growth is 0.4% and for rental growth, it is 0.2%. Much more striking are the similarities in serial correlation in the errors (dividend growth: 0.73, rental growth: 0.62). This suggests that both groups of forecasters display notable sluggishness in adjusting their forecasts.

[12] N.B Dates of the quarterly property and non-property forecasts are different.

3 Results

Exhibit 16: Consensus Forecast Error FTSE - Actual and Predicted

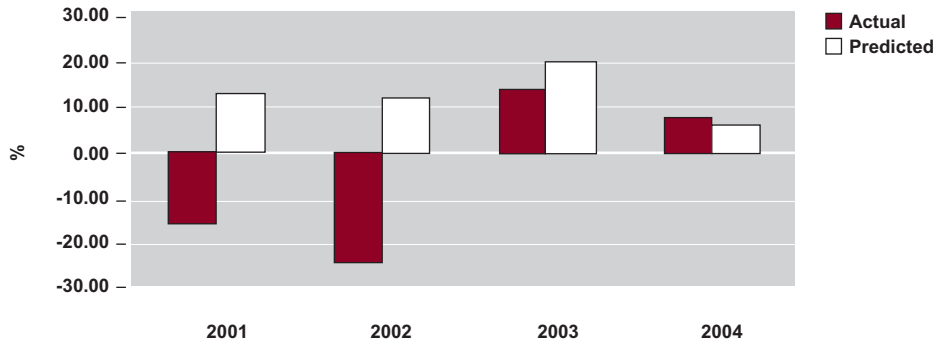


Exhibit 17: Consensus Forecast Error CPI Change- Actual and Predicted

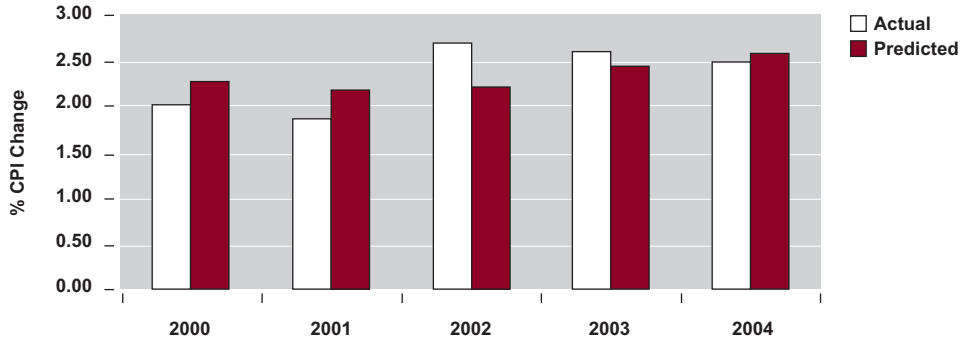
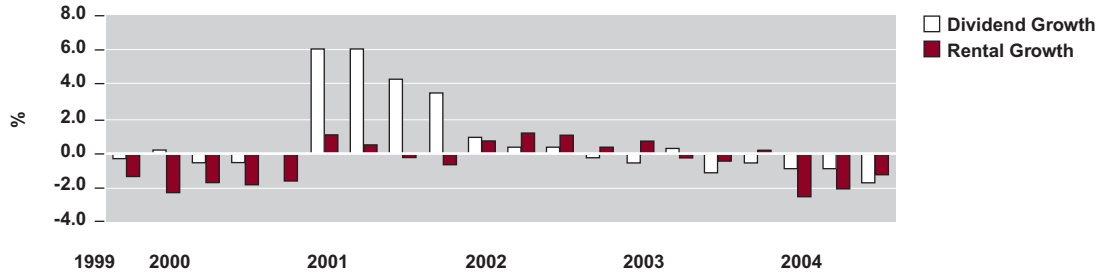


Exhibit 18: Comparative Forecast Errors Consensus Dividend and Rental Growth Forecasts



3 Results

Our final comparative analysis is using Theil U2-statistic. As noted above, this is a common approach to standardise different types of forecasts for evaluation. The results are displayed in Exhibit 19. We calculate the Theil U2- statistic for each individual forecaster and then provide the average for each individual year.

Exhibit 19

	Mean Theil U2-statistic				
	2000	2001	2002	2003	2004
Rental Growth	1.68	**0.40**	**0.35**	1.64	**0.66**
Capital Growth	**0.58**	**0.89**	**0.84**	3.61	1.38
Total Return	**0.56**	**0.99**	**0.79**	3.86	1.40
CPI Change	1.09	1.08	1.45	**0.93**	**0.59**
GDP Growth	**0.21**	**0.43**	**0.37**	**0.50**	**0.25**
Dividend growth	1.20	4.30	1.47	**0.84**	1.20
Earnings Growth	1.19	1.63	2.28	**0.46**	3.00
Base rates	**0.68**	3.46	1.30	**0.50**	**0.67**
FTSE growth		4.84	6.18	1.76	**0.65**

Bearing in mind that a U2-statistic below one indicates superior performance relative to the naïve strategy, figures below one are highlighted in bold. It is apparent that not only are there large differences between the variables, but there are also large differences among the annual figures. It is significant that it is only for GDP that there is clear-cut evidence that forecasters consistently outperform the naïve forecast. We now go on to examine whether any individual property forecasters stand out from the group.

3.6 Individual Property Forecasters Compared with Individual Property Forecasters

To assess the performance of individual forecasters, individual absolute differences for capital growth, rental growth and total returns were assessed for one year ahead forecasts (over 1999-2004) and two years ahead forecasts (over 2001-2004).

Forecaster performance accuracy - one year ahead forecasts

It is important to assess whether some forecasters are consistently amongst the top performers each year. As such, within each year, the property forecasters were ranked and then assigned to quartiles. Exhibits 20-22 give the details for capital growth, rental growth and total returns respectively for those forecasters who participated in at least four of the six years.

3 Results

Exhibit 20: Quartile performance by individual forecasters: capital growth: one year ahead

Property forecaster	1999	2000	2001	2002	2003	2004
Property advisors						
PA2	1	2	*	2	1	2
PA3	3	2	3	1	*	*
PA4	1	2	1	4	3	3
PA5	1	4	4	3	1	2
PA6	1	3	1	4	2	4
PA7	3	2	2	1	*	3
PA9	*	1	4	1	3	3
PA12	*	3	2	3	2	2
PA13	*	*	2	3	1	1
Fund managers						
FM2	3	3	4	2	2	2
FM4	3	3	4	3	*	1
FM5	4	2	3	2	1	4
FM7	3	4	3	3	1	3
FM8	2	1	2	3	2	1
FM9	1	3	4	4	*	*
FM10	4	1	1	2	3	4
FM13	2	3	1	2	3	2
FM14	*	1	1	4	4	1
FM15	*	1	3	4	*	1
Equity brokers						
EB4	4	3	2	1	4	1
EB6	*	1	2	3	3	2
EB11	*	2	4	*	*	4

Note:
(1): 1=1st quartile, 2=2nd quartile, 3=3rd quartile, 4=4th quartile
(2): *=did not participate in specific year

3 Results

Exhibit 21: Quartile performance by individual forecasters: rental growth: one year ahead

Property forecaster	1999	2000	2001	2002	2003	2004
Property advisors						
PA2	2	3	*	4	2	1
PA3	3	2	4	3	*	*
PA4	1	1	3	1	1	3
PA5	2	1	3	2	*	1
PA6	1	3	2	2	1	3
PA7	4	4	1	3	*	3
PA9	*	4	4	2	3	3
PA12	*	1	2	*	*	1
PA13	*	*	3	4	4	1
Fund managers						
FM2	3	1	4	2	1	4
FM4	4	2	2	3	*	4
FM5	1	1	3	4	4	3
FM7	4	1	2	1	2	2
FM8	2	2	4	4	4	2
FM9	1	2	1	1	*	*
FM10	2	3	2	3	2	4
FM13	2	3	1	3	2	4
FM14	*	4	1	2	3	2
FM15	*	3	1	1	*	4
Equity brokers						
EB4	4	3	1	1	4	1
EB6	*	4	1	4	1	2
EB11	*	3	4	1	*	4

Note:
(1): 1=1st quartile, 2=2nd quartile, 3=3rd quartile, 4=4th quartile
(2): *=did not participate in specific year

3 Results

Exhibit 22: Quartile performance by individual forecasters: total returns: one year ahead

Property forecaster	1999	2000	2001	2002	2003	2004
Property advisors						
PA2	1	2	*	1	1	2
PA3	3	2	3	1	*	*
PA4	1	3	1	2	3	3
PA5	1	4	3	3	1	2
PA6	1	2	2	4	2	4
PA7	3	2	2	1	*	4
PA9	*	1	4	1	2	3
PA12	*	4	1	3	1	2
PA13	*	*	1	2	1	1
Fund managers						
FM2	3	2	3	3	1	2
FM4	3	3	4	3	*	1
FM5	4	2	3	2	1	4
FM7	3	4	3	2	1	3
FM8	2	2	4	3	2	1
FM9	1	3	2	3	*	*
FM10	4	1	1	2	2	4
FM13	3	2	1	2	3	2
FM14	*	1	1	4	4	1
FM15	*	3	4	4	*	1
Equity brokers						
EB4	4	4	2	1	4	1
EB6	*	1	2	4	3	2
EB11	*	2	4	3	*	4

Note:
(1): 1=1st quartile, 2=2nd quartile, 3=3rd quartile, 4=4th quartile
(2): *=did not participate in specific year

3 Results

Of the ten forecasters who participated each year, no forecaster was in the top quartile in all six years. More forecasters were consistently in the top quartile for rental growth; see PA4 (4/6 years) and EB4 (3/6 years). The best that could be achieved for capital growth and total returns were being in the top quartile in two out of the six years. Several forecasters were consistently in the top quartile for all three performance measures; see PA4 and EB4. This may be explained by the strong linkages between the three forecasts. To compare the consistency of property forecasters with non-property forecasters, Exhibit 23 presents the equivalent forecaster profile for stock market dividend growth over 2000-2004. Thirteen forecasters participated overall, with 9-12 forecasters participating each year. One forecaster was in the top quartile in 80% of years (see LGIM), but other forecasters were in the top quartile at best in 40% of years. Whilst based on a smaller pool of non-property forecasters, there was no evidence of more consistent top performers amongst non-property forecasters than for property forecasters.

Exhibit 23: Quartile performance: stock market dividend growth: one year ahead

Stock market forecaster	2000	2001	2002	2003	2004
ABN Amro	*	3	1	1	*
CSFB	1	4	2	1	4
Deutsche Bank	1	2	4	2	2
Dresdner KW	4	1	1	3	*
Goldman Sachs	3	4	4	3	1
HSBC	4	3	2	4	3
LGIM	1	3	1	1	1
Merrill Lynch	3	2	1	4	4
Morgan Stanley	1	3	2	*	*
Schroder	2	3	3	3	*
UBS	2	1	3	2	2

Note:
(1): 1=1st quartile, 2=2nd quartile, 3=3rd quartile, 4=4th quartile
(2): *=did not participate in specific year

Importantly, for these property forecasters who were consistently in the top quartile, they were often amongst the worst performers in some other years; being in the bottom quartile on at least one occasion for each of the performance measures; eg: see EB4. This further highlights the difficulty of property forecasters being consistently accurate over time.

For the 22 forecasters who participated in at least four of the six years, similar trends were evident regarding consistency of being in the top quartile. The best forecaster performance achieved was 75% of years in the top quartile; namely FM9 (rental growth) and PA13 (total return). Only three out of the twenty two forecasters were in the top quartile in at least 50% of years, with these generally being different forecasters for each of the three performance measures.

3 Results

Some forecasters were in the bottom quartile in 50% of years. This occurred for each of the three performance measures; namely capital growth (FM9), rental growth (PA13, FM8, EB11) and total returns (FM15, EB4, EB11), although it was for different forecasters in each case.

Forecaster performance: best in specific years

In specific years, across the three performance measures, the "best" individual forecasters were property advisors (45% of years), fund managers (20% of years) and equity brokers (35% of years). However, most individual forecasters were generally unable to repeat the performance in other years. Most evidence of forecasters being able to repeat strong performance was for rental growth; eg: PA4 (two 1sts, one 2nd and one 3rd in six years) and EB4 (two 1sts and one 3rd in six years).

Forecaster performance: banding

Another element of forecaster behaviour is "banding", in which some forecasters may be consistently optimistic or pessimistic relative to the consensus forecasts. Banding was assessed by assigning forecasters to quartiles based on their forecasts each year and seeing if they were consistently in the top quartile (optimistic) or bottom quartile (pessimistic). While there was considerable variation amongst individual property forecasters, there was some evidence of banding, with property advisors tending to be optimistic concerning capital growth, rental growth and total returns; fund managers being optimistic about rental growth, and equity brokers being pessimistic about rental growth.

Forecaster performance accuracy: two years ahead forecasts

Within each year, the property forecasters were ranked and assigned to quartiles. Exhibits 24-26 give the details for capital growth, rental growth and total returns respectively for those forecasters who participated in at least three of the four years for the two years ahead forecasts.

Of the 14 forecasters who participated each year, no forecaster was in the top quartile in all four years. More forecasters were consistently in the top quartile for rental growth; see EB1 (3/4 years) and EB 4 (3/4 years). No forecasters were consistently in the top quartile for all three performance measures; whereas two forecasters achieved this for the one year ahead forecasts. For those property forecasters who were consistently in the top quartile, they were also in the bottom quartile on other occasions; see EB4.

Some forecasters were in the bottom quartile in at least 50% of years. This was more evident for capital growth (PA5, FM8, EB4, EB11) and total returns (PA5, FM8, EB1, EB4, EB11), with four forecasters (PA5, FM8, EB4, EB11) being in this bottom group for both capital growth and total returns. The incidence of forecasters consistently being in the bottom quartile was more evident for the two years ahead forecasts than for the one year ahead forecasts.

3 Results

Exhibit 24: Quartile performance by individual forecasters: capital growth: two years ahead

Property forecaster	2001	2002	2003	2004
Property advisors				
PA2	3	*	3	1
PA3	2	2	2	*
PA4	2	1	3	3
PA5	4	4	4	2
PA6	1	1	4	1
PA7	3	2	2	*
PA9	2	4	1	*
PA12	4	2	3	1
PA13	*	3	2	3
Fund managers				
FM2	1	2	3	2
FM4	2	3	1	*
FM5	4	1	1	3
FM7	2	1	1	4
FM8	4	2	4	4
FM9	3	3	2	*
FM10	1	4	3	2
FM13	1	2	2	1
FM14	1	3	3	2
FM15	2	1	3	*
Equity brokers				
EB1	1	3	1	3
EB4	1	2	4	4
EB6	1	3	2	1
EB8	1	1	2	*
EB11	4	3	4	*

Note:
(1): 1=1st quartile, 2=2nd quartile, 3=3rd quartile, 4=4th quartile
(2): *=did not participate in specific year

3 Results

Exhibit 25: Quartile performance by individual forecasters: rental growth: two years ahead

Property forecaster	2001	2002	2003	2004
Property advisors				
PA2	3	*	4	1
PA3	4	3	3	*
PA4	4	3	1	3
PA5	1	4	2	3
PA6	1	2	1	4
PA7	1	2	2	*
PA9	2	4	4	*
PA12	4	2	1	2
PA13	*	3	3	1
Fund managers				
FM2	4	3	2	2
FM4	2	2	2	*
FM5	4	3	4	1
FM7	3	1	1	3
FM8	2	4	1	3
FM9	1	4	2	*
FM10	2	2	2	2
FM13	1	3	2	2
FM14	3	1	4	2
FM15	2	1	2	*
Equity brokers				
EB1	1	1	4	1
EB4	1	1	1	4
EB6	1	2	2	4
EB8	3	1	3	*
EB11	3	2	2	*

Note:
(1): 1=1st quartile, 2=2nd quartile, 3=3rd quartile, 4=4th quartile
(2): *=did not participate in specific year

3 Results

Exhibit 26: Quartile performance by individual forecasters: total returns: two years ahead

Property forecaster	2001	2002	2003	2004
Property advisors				
PA2	3	*	3	1
PA3	1	2	2	*
PA4	3	1	3	2
PA5	3	4	4	2
PA6	2	1	4	1
PA7	3	1	1	*
PA9	3	4	2	*
PA12	3	1	3	1
PA13	*	3	2	4
Fund managers				
FM2	1	1	3	3
FM4	2	2	1	*
FM5	4	1	1	3
FM7	2	2	1	3
FM8	4	4	4	4
FM9	4	3	2	*
FM10	1	3	4	3
FM13	1	2	2	1
FM14	1	2	3	2
FM15	4	2	1	*
Equity brokers				
EB1	4	3	1	4
EB4	1	1	4	4
EB6	1	3	3	1
EB8	1	2	2	*
EB11	4	4	4	*

Note:
(1): 1=1st quartile, 2=2nd quartile, 3=3rd quartile, 4=4th quartile
(2): *=did not participate in specific year

3 Results

Forecaster performance: best in specific years

In the specific years, across the three performance measures, the "best" individual forecasters were property advisors (33% of years), fund managers (27% of years) and equity brokers (40% of years). However, these best individual forecasters were generally unable to repeat the performance in other years. Most evidence of forecasters being able to repeat strong performance was for rental growth; eg EB1 (two 1sts and one 2nd in four years) and EB4 (two 1sts in four years). This stronger repeat performance for rental growth was also evident in the one year ahead forecasts.

Forecaster performance: banding

There was some evidence of banding, with property advisors tending to be optimistic concerning capital growth, rental growth and total returns, and equity brokers tending to be pessimistic concerning rental growth. These overall trends for the two years ahead forecasts are similar to the one year ahead forecasts, but not as strongly evident.

3.7 Property Forecaster Sub-group Compared with Property Forecaster Sub-group

Exhibit 27 presents the ranking of forecaster accuracy for the three groups of forecasters over 1999-2004. For capital growth (panel A), rental growth (panel B) and total returns (panel C), there were instances over this six year period where each of these three groups of forecasters were the best performing group, but also the worst performing group. This further reinforces the issue of no one group of property forecasters outperforming the other two groups on a consistent basis. Overall, at a group level, property advisors and fund managers tended to be marginally more accurate (in terms of absolute error) in their property forecasts than equity brokers.

3 Results

Exhibit 27: Forecasting performance: one year ahead

Panel A: Capital growth						
	1999	2000	2001	2002	2003	2004
Property advisors	1st	3rd	3rd	2nd	1st	2nd
Fund managers	2nd	1st	2nd	3rd	2nd	1st
Equity brokers	3rd	2nd	1st	1st	3rd	3rd
Panel B: Rental growth						
	1999	2000	2001	2002	2003	2004
Property advisors	1st	2nd	3rd	3rd	2nd	1st
Fund managers	2nd	1st	2nd	1st	3rd	3rd
Equity brokers	3rd	3rd	1st	2nd	1st	2nd
Panel C: Total returns						
	1999	2000	2001	2002	2003	2004
Property advisors	1st	3rd	3rd	2nd	1st	3rd
Fund managers	2nd	1st	1st	3rd	2nd	1st
Equity brokers	3rd	2nd	2nd	1st	3rd	2nd

Forecaster performance: persistence

Exhibit 28 shows how the forecaster groups compared to the consensus forecasts each year. This is informative to assess whether particular groups tend to be optimistic (above consensus) or pessimistic (below consensus) in their forecasts, compared to the overall group of forecasters. Property advisors tended to be optimistic for all three performance measures, while fund managers tended to be pessimistic. Equity brokers tended to be pessimistic regarding rental growth.

3 Results

Exhibit 28: Forecasting performance: one year ahead: benchmark = consensus

Panel A: Capital growth						
	1999	2000	2001	2002	2003	2004
Property advisors	+	+	+	+	+	+
Fund managers	-	-	-	-	-	-
Equity brokers	-	+	-	+	-	-
Panel B: Rental growth						
	1999	2000	2001	2002	2003	2004
Property advisors	+	+	+	+	+	+
Fund managers	+	+	-	-	+	-
Equity brokers	-	-	-	-	-	+
Panel C: Total returns						
	1999	2000	2001	2002	2003	2004
Property advisors	+	+	+	+	+	-
Fund managers	-	-	-	-	+	+
Equity brokers	-	+	-	+	-	-

Note: + = above consensus, - = below consensus

Similarly, Exhibit 29 shows how the forecaster groups compared to the actual outcomes each year. This is informative to assess whether particular groups tend to be optimistic (above actual) or pessimistic (below actual) in their forecasts. For each of the three performance measures, the three groups were consistent within each year, and this tended to be for both optimistic and pessimistic forecasts. More recent years (2002-04) have seen forecasters be pessimistic compared to actual performance. The notable similarity in the direction of the errors reinforces that consensus uncertainty, rather than disagreement, as being the dominant source of uncertainty in individual property forecasts.

3 Results

Exhibit 29: Forecasting performance: one year ahead: benchmark = actual

Panel A: Capital growth						
	1999	2000	2001	2002	2003	2004
Property advisors	-	+	+	-	-	-
Fund managers	-	+	+	-	-	-
Equity brokers	-	+	+	-	-	-
Total	-	+	+	-	-	-
Panel B: Rental growth						
	1999	2000	2001	2002	2003	2004
Property advisors	-	-	+	+	+	-
Fund managers	-	-	+	+	+	-
Equity brokers	-	-	+	+	-	-
Total	-	-	+	+	+	-
Panel C: Total returns						
	1999	2000	2001	2002	2003	2004
Property advisors	-	+	+	-	-	-
Fund managers	-	+	+	-	-	-
Equity brokers	-	+	+	-	-	-
Total	-	+	+	-	-	-

Note: + = above actual, - = below actual

Summary of one year ahead forecasting results

Key findings are:

- Property advisors and fund managers tended to be marginally more accurate than equity brokers
- Property advisors tended to be more optimistic in their forecasts than fund managers and equity brokers
- All three groups of forecasters were consistent each year in being optimistic/pessimistic compared to actual performance

3 Results

3.8 The Information Content of Disagreement

One of the initial objectives of the research was to assess whether changes in the level and pattern of disagreement among forecasting organisations provided any information about future market performance and/or the level of uncertainty in current forecasts. In particular, previous research was discussed which suggested that increases in disagreement about expected financial performance or macro-economic outcomes tended to be associated with weaker future performance and an increase in forecast uncertainty.

It has been difficult to carry out similar analyses in this case. The data-set is for a relatively short time period. For instance, studies of signals in disagreement in inflation expectations have 45-50 years of data. The small (time series) sample makes it difficult to carry out a modelling exercise from which we could draw any robust statistical inferences. Additionally, there have not been large changes in the level of disagreement over time. In Exhibits 30-32, we plot the standard deviation of the one year ahead forecasts (right hand axis) against the actual outcome (left hand axis).

In contrast to the large changes that we see in returns over the period, there is relative stability in the dispersion of the individual forecasts across the sample period. We could see this visually in the Box-Plots (see earlier Exhibits 2-4) and it is clear from the standard deviation of forecasts for individual years that there are minor changes in the extent of disagreement. As a result, it is difficult to identify any relationship between forecast uncertainty and/or future performance from changes in disagreement. We do not pursue this question further in this study

3 Results

Exhibit 30: Disagreement and Performance

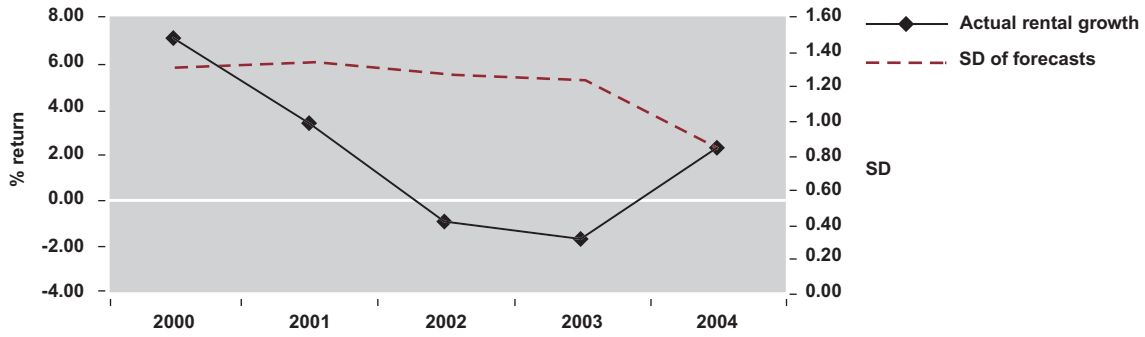


Exhibit 31: Disagreement and Performance

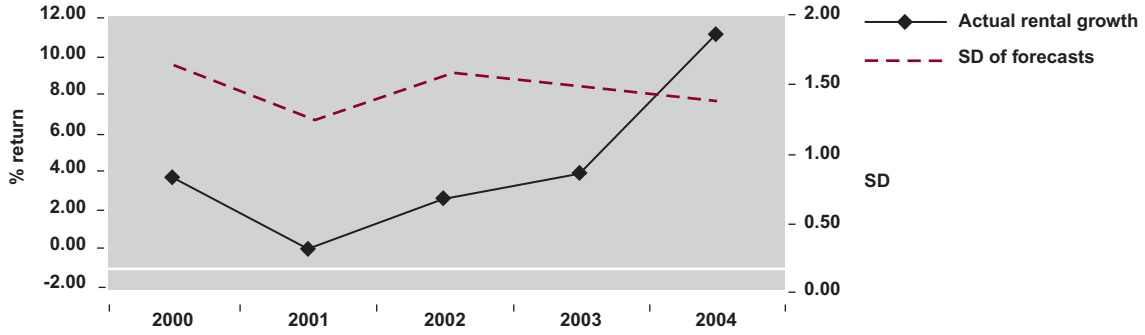
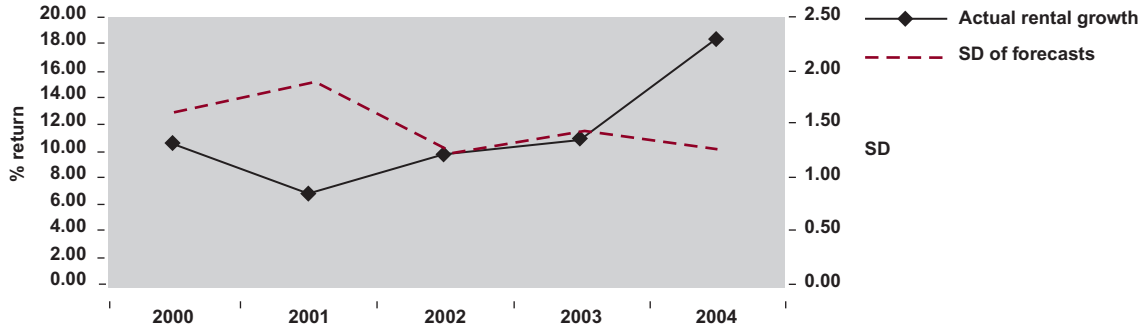


Exhibit 32: Disagreement and Performance



4 Conclusion

The IPF's *Survey of Independent Forecasts* has provided a rich source of data on market expectations of property investment performance at the index level. The ability to analyse the forecasts of individual organisations and groups enables analysis of variation in expectations and in the performance of property forecasting organisations. Additionally, the property forecasting organisations predict rental, capital and total returns for a given year over a wide range of time horizons and, interestingly, from one year out obtain monthly updates of market performance. In order to provide some context to measurements of disagreement and accuracy, the study also compared the performance of property forecasting organisations with non-property forecasting organisations' predictions for a number of capital market and macro-economic variables. However, the data set is relatively short, especially when compared with the long histories of forecasts in macro–economic variables. The number of contributors to the IPF survey is a small unbalanced panel. However, not-with-standing the relative limitations of the data set, it was possible to obtain valuable insights into the track record of the forecasts.

Uncertainty and disagreement are inherent in the forecasting process. Error (in the statistical sense) is intrinsic to econometric forecasting techniques since estimates are essentially a point drawn from a probability distribution. The inherent limitations of econometric methods due, in particular, to the effects of structural shifts and unanticipated events are exacerbated by problems of data availability and reliability in property markets. Additionally, property forecasts are normally dependent upon 'driver' forecasts of the independent (typically macro-economic) variables which themselves will be subject to forecast uncertainty and, where two or more are procured, will display disagreement. Given this inevitability of uncertainty and disagreement in property forecasts, the most interesting questions relate to the quantity, patterns, causes and information content in forecast disagreement and uncertainty rather than their existence.

The evaluation of forecasts has itself generated a significant debate amongst researchers. Some variables are much easier to forecast than others because they are more stable and/or tend to display strong cyclical patterns. Further, as we implied above, a forecasting model may provide an incorrect forecast because of a 'shock' that could not have been anticipated. Whilst we focus on measurement of uncertainty and disagreement in this study, it could be argued that measures of uncertainty relative to actual outcomes provide a limited indication of forecast success and that there should be a greater emphasis on the contribution to forecasts to decision-making. Implicitly, the criteria should be the 'usefulness' of the forecast. Forecasts could be evaluated on the basis of whether they generated 'good' investment decisions rather than generating the correct numbers i.e. whether investors were directed towards 'winners' rather than 'losers'.

A robust finding of the analysis is that property forecasting organisations display the characteristics associated with a consensus. This seems to indicate herding among forecasters. Alternatively they may be using common methods, sources of 'driver forecasts' and other data sets. Disagreement amongst forecasters is limited. This suggests that large errors in the property forecasts of the individual organisations are generated by 'group' rather than by idiosyncratic effects. For instance, in one year-ahead forecasts of property total returns, the actual outcome was always outside one standard deviation of the average of the forecasts. However, this is not a unique property trait and non-property forecasts display similar patterns of (dis)agreement. Cause and effect are difficult to disentangle in this case. There may be common behavioural traits (such as herding) amongst forecasting organisations that produce consensus or the use of non-property forecasts as an input into property forecasts may persist in the property forecasts to produce a similar pattern of consensus. It may even be a combination of the two effects.

4 Conclusion

At the aggregate level, a key source of uncertainty in the forecasts of total returns seems to have been due to problems of forecasting yield shifts. The fact that capital growth tended to 'mirror' rental growth at the aggregate level indicated that forecasters' expectations of capital returns were generally a product of rental return expectations. When we 'drilled down' to the individual level, it was clear that many forecasters had similar forecasts of rental and capital growth. Forecasters seemed to assume 'no or little change' in yields. This probably reflects the generally acknowledged increased difficulties of modelling yield shift relative to rental growth.

When comparing the performance of individual forecasting organisations, very few individual forecasting organisations stand out. Again, this is true of property and non-property forecasting organisations. Further, it is important to remember the small sample size. We need to be careful about drawing forceful conclusions about the performance of a single organisation over such a short time period. Even if we had observed a consistent 'winner', one or more individual organisations may appear to be superior or inferior for purely random reasons.

The analysis of the UK property forecasters suggests that there is bias in property forecasts. The mean of the forecast errors is non-zero. When performance was improving, total returns tended to be systematically underestimated. Conversely, when performance was deteriorating, total returns tended to be systematically overestimated. There is evidence of forecast smoothing. The volatility of forecasted returns was invariably lower than the volatility of actual returns. Inefficiency is apparent in that forecast errors are positively serially correlated. Despite having periodic updates with which to update forecasts, where the first annual consensus forecast was initially too pessimistic (optimistic), the final annual consensus forecast was also too pessimistic (optimistic). This would suggest a degree of inertia in the forecasting process.

Whilst every investment decision reflects a view about future performance and contains either implicit and/or explicit forecasts, it is clear that the evaluation of explicit economic and asset market forecasts is not a simple process. It is important to bear in mind that uncertainty is intrinsic to the forecasting process and varies according to what is being forecast. Crucially, 'the numbers' may be secondary in that the forecasting process is often a means of facilitating an analysis for the investment decision-making process. Given the implications for market efficiency, it is not surprising that we find little evidence of consistent superior or inferior performance among individual forecasting organisations. However, a clear-cut finding is that most property forecasting organisations tend to be close to the consensus but that the consensus is often prone to substantial uncertainty. This suggests that forecasting organisations should not draw too much comfort about being close to the consensus. However, property forecasting organisations are not unique in displaying this apparent herding and we find similar patterns in non-property forecasts.

References

Bomberger, W., **Disagreement as a Measure of Uncertainty, Journal of Money,** *Credit and Banking,* 1996, 28, 381-392.

Byrne, P. and Lee, S., **Some Implications of the Lack of a Consensus View of UK Property's Future Risk and Return,** *Journal of Property Research,* 1999, 16, 257-270.

Capstaff, Paudyal, K. and Rees, W., **The Relative Forecast Accuracy of UK Brokers,** *Accounting and Business Research,* 1999, 30, 3-16.

Chaplin, R., **An Ex-Post Comparative Evaluation of Office Rent Prediction Models,** *Journal of Property Valuation and Investment,* 1998, 16, 21-37.

Chaplin, R., **The Predictability of Real Office Rents,** *Journal of Property Research,* 1999, 16, 21-49.

Chaplin, R., **Predicting Real Estate Rents: Walking Backwards into the Future,** *Journal of Property Investment and Finance,* 2000, 18, 352-370.

Clayton, J., Geltner, D. and Hamilton, S., **Smoothing in Commercial Property Valuations: Evidence From Individual Appraisals,** *Real Estate Economics,* 2001, 29, 337-360.

Clements, M., **Rationality and the Role of Judgment in Macroeconomic Forecasting,** *The Economic Journal,* 1995, 105, 410-420.

Clements, M. and Hendry, D., **Forecasting Non-stationary Economic Time Series,** 1999, MIT Press.

Cooper, R., Day, T. and Lewis, C., **Following the Leader: A Study of Individual Analysts Earnings Forecasts,** Working Paper, Financial Management Research Center, Vanderbilt University, 1999.

Croushore, D., **The Livingston Survey; Still Useful After All These Years,** *Federal Reserve Bank of Philadelphia Business Review,* 1997, March/April, 15-26.

Diether, K., Malloy, T. and Scherbina, A., **Differences of Opinion and the Cross-section of Stock Returns,** *Journal of Finance,* 2002, 57, 2113-2141.

Fildes R and Stekler H, **The State of Macro-economic Forecasting,** Working Paper 1999/002, Lancaster University Management School.

Gallimore, P. and McAllister, P., **Judgment and Quantitative Forecasts in Commercial Property Investment,** *RICS Research Series,* forthcoming.

Granger, C. and Pesaran, M., **Economic and Statistical Measures of Forecast Accuracy,** *Journal of Forecasting,* 2000, 19, 537-560.

Guilkey, D., **How Good are MSA Forecasts? A Review of Major Supply- and Demand-Side Information Providers,** *Real Estate Finance,* 1999, 15, 27-41.

Hendry, D. and Clements, M., **Economic Forecasting: Some Lessons From Recent Research,** *Economic Modelling,* 2003, 20, 301-329.

Higgins, D., **Current Status of Forecasting the Performance of Australian Commercial Property Markets,** *Australian Property Journal,* 2000, 36, 43-49.

References

Holden, K. and D.A. Peel (1985), **An Evaluation of Quarterly National Institute,** *Forecasts Journal of Forecasting,* Vol. 4, pp. 227-34.

Investment Property Databank, *IPD UK Annual Index : 2004,* IPD, 2005a.

Investment Property Databank, *IPD UK Monthly Index : Dec 2004,* IPD, 2005b.

Investment Property Forum, *Survey of Independent Forecast: UK Property Investment: November 2004,* IPF, 2004 (and miscellaneous previous copies).

Laster, D., Bennett, P. and Geoum, I., **Rational Bias in Macroeconomic Forecasts,** *The Quarterly Journal of Economics,* 1999, 114, 293-318.

Ling, D. A, **Random Walk Down Main Street: Can Experts Predict Returns on Commercial Real Estate,** *Journal of Real Estate Research,* 2005, 27, 2, 137-154.

Mankiw, G. and Reis, R., **Sticky Information versus Sticky Prices: a Proposal to Replace the New Keynesian Phillips Curve,** *Quarterly Journal of Economics,* 2002, 117, 1295-1328.

Mankiw, N., Reis, R. and Wolfers, J., **Disagreement about Inflation Expectations, Discussion Paper Number 2011,** *Harvard Institute of Economic Research,* 2003.

Mincer, J. and V. Zarnowitz (1969), **The Evaluation of Economic Forecasts, in Economic Forecasts and Expectations: Analyses of Forecasting Behaviour,** *National Bureau of Economic Research Studies in Business Cycles No. 19, ed. by Jacob Mincer, National Bureau of Economic Research,* New York.

Mitchell, P. and McNamara, P., **Issues in the Development and Application of Property Market Forecasting: the Investor's Perspective,** *Journal of Property Finance,* 1997, 8, 363-376.

Newell, G., McAllister, P. and Brown, S., **The Accuracy of Real Estate Forecasting,** Paper presented at 2003 ERES conference, Helsinki.

Nordhaus, W., **Forecasting Efficiency: Concepts and Applications,** *Review of Economics and Statistics,* 1987, 69, 667-74.

Schnader, M. and Stekler, H., **Do Consensus Forecasts Exist?,** *International Journal of Forecasting,* 1991, 7, 165-170.

Webb, B., **On the Reliability of Commercial Appraisals,** *Real Estate Finance,* 1994, 11, 62-66.

Williams, J., **"Discussion of 'Disagreement about Inflation Expectations' by N. Gregory Mankiw, Ricardo Reis, and Justin Wolfers."** *NBER Macroeconomic Annual 2003,* ed. by Mark Gertler and Kenneth Rogoff. Cambridge, Mass.: MIT Press.

Wilson, P., Okunev, J., Ellis, C. and Higgins, D., **Comparing Univariate Forecasting Techniques in Property Markets,** *Journal of Real Estate Portfolio Management,* 2000, 6, 283-306.

Wilson, P. and Okunev, J., **Enhancing Information Use To Improve Predictive Performance In Property Markets,** *Journal of Property Investment and Finance,* 2001, 19, 472-497.

Appendix 1

Descriptive Statistics For IPF Forecasts: 1999 - 2004

Rental Growth Forecast (% p.a.)

	1999	2000	2001	2002	2003	2004
Actual	5.72	7.02	3.4	-0.86	-1.59	2.3
Mean	3.26	4.86	4.65	0.18	-0.88	-0.27
Median	4.00	5.00	4.65	0.55	-0.70	-0.10
Maximum	7.10	7.50	7.10	2.10	1.40	1.00
Minimum	-2.00	2.00	2.70	-4.00	-3.00	-2.00
Range	9.10	4.50	4.40	6.10	4.40	3.00
Std. Dev.	2.32	1.31	1.34	1.36	1.25	0.86
Skewness	-0.99	-0.18	0.12	-1.40	-0.10	-0.31
Kurtosis	3.35	2.44	1.83	4.94	2.49	2.47
Jarque-Bera	4.39	0.58	1.48	11.59	0.21	0.70
Probability	0.11	0.75	0.48	0.00	0.90	0.70
Observations	26	31	25	24	17	25

Capital Growth Forecast (% p.a.)

	1999	2000	2001	2002	2003	2004
Actual	7.36	3.59	-0.03	2.61	3.91	11.4
Mean	2.21	5.68	3.19	0.40	-0.78	1.04
Median	2.50	5.70	3.00	0.30	0.00	1.00
Maximum	7.00	10.00	6.60	2.70	1.80	4.00
Minimum	-4.00	3.00	1.00	-3.00	-3.20	-2.00
Range	11.00	7.00	5.60	5.70	5.00	6.00
Std. Dev.	2.56	1.62	1.22	1.38	1.46	1.37
Skewness	-0.59	0.35	0.55	-0.63	-0.44	0.01
Kurtosis	3.04	3.06	3.92	3.22	2.13	2.73
Jarque-Bera	1.53	0.65	2.16	1.63	1.20	0.07
Probability	0.47	0.72	0.34	0.44	0.55	0.96
Observations	26	31	25	24	19	25

Appendix 1

Total Return Forecast (% p.a.)

	1999	2000	2001	2002	2003	2004
Actual	14.67	10.49	6.71	9.66	10.91	18.3
Mean	9.40	12.78	10.38	7.31	6.07	7.97
Median	10.00	13.00	10.00	7.40	6.25	8.00
Maximum	15.00	17.00	14.90	9.20	8.30	10.10
Minimum	3.00	10.00	6.00	5.00	3.00	5.00
Range	12.00	7.00	8.90	4.20	5.30	5.10
Std. Dev.	2.62	1.61	1.91	1.22	1.45	1.26
Skewness	-0.46	0.45	0.32	-0.14	-0.54	-0.43
Kurtosis	3.29	3.30	3.65	2.33	2.42	2.67
Jarque-Bera	1.00	1.14	0.87	0.55	1.12	0.89
Probability	0.61	0.57	0.65	0.76	0.57	0.64
Observations	26	31	25	25	18	25

Appendix 2

Descriptive Statistics For Non-Property Forecasts: 1999 - 2004

Dividend Growth Forecats (% p.a.)

	1999	2000	2001	2002	2003	2004
Actual	5.6	7.0	0.4	3.5	3.2	7.0
Mean	5.33	7.05	6.42	4.36	2.64	6.12
Median	5.00	7.00	7.00	4.00	2.65	6.00
Maximum	8.00	14.00	8.00	8.00	6.00	10.00
Minimum	4.00	4.00	4.00	-2.00	0.00	4.00
Std. Dev.	1.50	2.71	1.24	2.73	1.54	1.92
Skewness	0.93	1.52	-0.55	-0.86	0.59	0.76
Kurtosis	2.40	5.09	2.32	3.92	3.89	2.86
Jarque-Bera	1.91	6.22	0.83	1.75	0.92	0.88
Probability	0.38	0.04	0.66	0.42	0.63	0.64
Observations	12	11	12	11	10	9

FTSE Change Forecasts (% p.a.)

	1999	2000	2001	2002	2003	2004
Actual	n/a	n/a	-13.17	-24.48	13.60	7.55
Mean	n/a	n/a	12.95	11.56	19.67	5.63
Median	n/a	n/a	13.29	11.18	15.48	5.00
Maximum	n/a	n/a	22.13	18.84	39.59	11.71
Minimum	n/a	n/a	6.06	3.51	6.60	0.54
Std. Dev.	n/a	n/a	5.04	5.15	12.38	4.58
Skewness	n/a	n/a	0.04	-0.01	0.70	0.15
Kurtosis	n/a	n/a	2.12	1.90	2.04	1.59
Jarque-Bera	n/a	n/a	0.39	0.56	1.21	0.78
Probability	n/a	n/a	0.82	0.76	0.55	0.68
Observations	n/a	n/a	12	11	10	9

Appendix 2

Earnings Growth (% p.a.)

	1999	2000	2001	2002	2003	2004
Actual	11.00	18.00	-3.67	-13.57	10.14	29.40
Mean	5.18	9.64	7.73	2.39	10.79	8.39
Median	5.00	9.00	8.16	3.00	9.50	8.00
Maximum	8.50	15.00	12.00	8.40	23.00	13.00
Minimum	1.70	5.00	1.20	-7.00	6.00	5.00
Std. Dev.	2.15	2.84	3.03	4.75	4.93	2.69
Skewness	-0.18	0.36	-0.60	-0.56	1.60	0.76
Kurtosis	1.96	2.56	2.81	2.44	4.83	2.43
Jarque-Bera	0.61	0.32	0.73	0.71	5.68	0.99
Probability	0.74	0.85	0.69	0.70	0.06	0.61
Observations	12	11	12	11	10	9

Glossary

Autocorrelation

This refers to the dependence/association between values of the same time series. It measures the correlation at different time lags. In the present context it refers to possible autocorrelation amongst the residuals resulting from a regression of actual values on forecast values. A positive autocorrelation patter would indicate that the forecasts do not take all information into account are inefficient (see efficient forecasts).

Biased estimates

An estimate of a parameter, such as a Beta values shown in this report, which is not equal to the 'true' (population) value. This can arise from a mis-specification of the relationship being estimated

Econometric model

A set of behaviour equations/relationships between the variables of interest. The equations may be used to, for example, make forecasts or undertake simulations based on different input values of the variables driving those variables that have be modelled. Often the accuracy of the forecasts is as good as the assumptions made about the value of the variables driving the equations.

Efficient forecasts

Forecasts are obtained from models that use all relevant information. These forecasts cannot be improved on by using other models or information.

Ex ante forecast

This is a forecast that only uses the available information at the time the forecast is made.

Forecast accuracy

A number of criteria exist for assessing the accuracy of forecasts. Examples include mean absolute percentage error (MAPE), mean squared error (MSE) and mean percentage error (MPE), which can also be regarded as a measure of bias. All assess the outcome against the forecast. No one method is preferred/superior to any other.

Forecast horizon

This is the length of time into the future for which forecasts are made. The forecasts looked at in this report are for one, two and three years ahead.

Forecast update

These are revised forecasts based on new information.

Mean

Also known as the average.

Mean absolute percentage error (MAPE)

This is the mean of the sum of all the percentage errors, without taking account of the sign of the error, but only its magnitude.

Mean squared error (MSE)

The average of the individual errors (actual minus outcome) squared.

Naïve forecast

This is a forecast which relies on a minimum amount of information. For example, using last period's outcome as a forecast or the average of several period's outcomes are naïve forecast. A more elaborate, but still naïve forecast, would be a model that assigns weights to previous periods' values.

Glossary

Normal distribution

This provides the basis for classical statistical analyses. Numerous data series follow this distribution. It is a symmetrical bell-shaped distribution.

Outliers

These are values that are either large or small compared with the average or a consensus. Box-plots are used in this report to show the distribution of forecasts.

R-squared

This is a term from regression analysis and shows how much of the variability of the model is explained by the variables in a regression equation. If its value is equal to 1 all of the variability of the variable being investigated is perfectly explained and if the value is equal to 0 then none is explained. In the analyses undertaken for the report, it measures the extent to which an individual forecaster or a group of forecasters were able to forecast actual values.

Residual

In the present context, this broadly refers to the error in making the forecast. That is the mis-match between the forecast and the outcome.

Root Mean Square Error (RMSE)

The square root of the MSE (see above) is known as the root mean square error, or RMSE.

Skewness

This is a measure of the asymmetry of the distribution of forecast values. The skewness of a symmetric distribution, such as a normal distribution, will be equal to 0. A positive value indicates that the distribution is skewed towards the higher values and a negative value that it is skewed towards lower value.

Smoothing

Broadly, this term is used when the volatility of the series is understated. It often it arises when adjacent values are related or there are runs of positive or negative values.

Theil's U- Statistic

This is a statistic that provides a basis for comparing alternative forecasts relative to a *naïve* forecast (see above). If it has a value equal to 1 the forecasts add nothing as the naïve forecasts would have been as just as effective. If it has a value less than 1 the forecasts are better than employing the naïve forecasts. If the value is great than 1 the naïve forecasts would have out-performed the (model) forecasts.

Turning point

This refers to a point in time where the pattern of values changes direction. For example, several years of positive rental growth are seen to come to an end and the outlook is for negative rental growth. The year when this occurs is the turning point.

Unbiased forecasts:

This refers to forecasts that are on average equal to outcomes on average. Forecast errors average out to zero. The standard way of testing for bias involves the estimation of the following regression (introduced by Mincer and Zarnowitz (1969)):

$A_t = \beta_0 + \beta_1 F_t + u_t$,

A_t and F_t denote the actual value and forecast value respectively and u_t is an error term. If the forecast is unbiased, β_0 and β_1 are equal to zero and unity respectively, and the error term is a white noise. Following Holden and Peel (1985), a joint test was applied to examine whether or not these restrictions hold.

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