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ANALYSING UK REAL ESTATE MARKET FORECAST DISAGREEMENT

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Abstract

Given the significance of forecasting in real estate investment decisions, this paper investigates forecast uncertainty and disagreement in real estate market forecasts. Using the Investment Property Forum (IPF) quarterly survey amongst UK independent real estate forecasters, these real estate forecasts are compared with actual real estate performance to assess a number of real estate forecasting issues in the UK over 1999-2004, including real estate forecast error, bias and consensus. The results suggest that real estate forecasts are biased, less volatile compared to market returns and inefficient in that forecast errors tend to persist. The strongest finding is that real estate forecasters display the characteristics associated with a consensus indicating herding.

Keywords: Real estate forecasting, forecast accuracy, forecast disagreement, consensus.

INTRODUCTION

For institutional real estate investors, expectations of future investment performance at the levels of individual real estate asset, sector, region, country and asset class are crucial to stock selection, and tactical and strategic asset allocation decisions. While all real estate forecasting is subject to some degree of uncertainty, a high degree of sophistication has been developed over recent years, with a range of advanced quantitative and qualitative procedures now used by institutional investors in real estate forecasting, including judgemental procedures, causal/econometric procedures and time series/trend analysis procedures (Higgins, 2000). This has seen numerous real estate forecasting studies in recent years concerning forecasting real estate rents, stock levels, returns, yields and cash flows; econometric and structural modelling, and comparisons of real estate forecasting procedures (see Newell *et al*, 2003).

Given the centrality of forecasting to real estate investment decisions and performance, the focus in this paper is on uncertainty in forecasts of real estate rents and returns, and disagreement in expectations. Uncertainty is an integral element of forecasts, and commercial real estate investors are constantly in the position of decision-making under uncertainty. "Forecasting competitions" suggest that the use of econometric modelling that dominates professional real estate forecasting can sometimes be of limited value. Confirming many studies outside the real estate sector, real estate researchers have found, in many instances, simple forecasts (e.g. via naïve predictors) 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 often tend to dominate causal models (Hendry and Clements, 1999).

This paper focuses on two dimensions of forecast uncertainty; namely, accuracy and disagreement. Drawing upon a data set of professional forecasts of UK real estate market performance over 1999-2004, we investigate these real estate forecasts in terms of forecast error, bias and efficiency. We also examine the extent and nature of disagreement among professional real estate forecasters. 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. However, there has been growing interest in the fact that market participants often disagree. The topic of forecast disagreement (outside real estate) has generated a substantial body of research (see below) focussing on sources and causes of forecast disagreement and, interestingly, signals and information contained in forecast disagreement.

FORECAST FAILURE: UNCERTAINTY, ACCURACY AND RATIONALITY IN FORECASTS

The discussion about the different dimensions of forecast uncertainty echoes much of the debate on appraisal 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 appraisal-smoothing. As in real estate, the term 'forecast smoothing' is used in the forecast literature to describe the tendency of forecasts to be less volatile than reality 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 real estate 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 real estate forecasts are carried out.

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).

Outside real estate, there is an extensive literature on the interlinked definition and causes of forecast failure. If we define forecast failure in terms of simple *ex post* differences between forecasts and actual outcomes[i], Hendry and Clements (2003) argue that it is rarely forecasting models that are the most important cause of forecast failure. 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 Clement (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[ii]. However, the error can provide a misleading indicator of actual forecast uncertainty, given the largely unknowable 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 reluctant to provide unfavourable forecasts; to over-react to positive information and under-react to negative information. They propose incentive structures and behaviourial 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."

FORECAST DISAGREEMENT

Bomberger (1996) examines disagreement and uncertainty in forecasts. Disagreement is defined in terms of a measure of the *ex ante* dispersion of individual forecasts around the

mean forecast, whereas uncertainty is defined in terms of the *ex post* 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 errors in the consensus forecasts rather than disagreement that are the dominant component of individual forecast uncertainty. 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 real estate forecasters in the UK often engage in "self-censorship" or are "censored" when 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.

In explaining forecast disagreement, 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. Linden (2003, 5) expresses the point, arguing that "forecasters have both different types and different amounts of information to form their beliefs".

Subjectivity is intrinsic to real estate forecast formation and will generate disagreement among real estate forecasters. It has been recognised that differences in real estate 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 real estate 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 real estate 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. 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. Analysis of the distributional properties of forecasts is necessary to enable an assessment as to 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. 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 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 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 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.

In summary, this paper is concerned with assessing the nature and extent of the *ex ante* phenomenon of disagreement in real estate forecasts and assessing *ex post* the accuracy of consensus forecasts and the individual forecasts that comprise the consensus (if it is formally present). There is ample evidence from the capital markets and macro-economic forecasts to argue that disagreement and error are intrinsic to forecasting. Overall, the more interesting questions relate to the quantity and pattern of disagreement and error in real estate forecasts and the signals in and consequences of these aspects of forecast uncertainty.

DATA AND METHODOLOGY

Real estate 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 confidentially provided by the IPF. The IPF is a major real estate industry group in the UK and represents the interests of those involved in commercial real estate investment. With over 1400 members, including investment surveyors, fund managers, academics, bankers, lawyers, actuaries and related professionals, the IPF's objective is to enhance the knowledge, understanding and efficiency of real estate as an investment by undertaking research and special projects, providing education for members, and encouraging discussion and debate amongst those concerned with real estate investment in the UK (see www.ipf.org.uk).

The IPF real estate forecast surveys have been conducted since November 1998 and have been conducted quarterly (February, May, August and November) since 1999[iii]. These IPF expert-opinion forecasting surveys collect information on future rental growth, capital growth and total returns from a range of UK real estate forecasters, including real estate advisors, fund managers and equity brokers. These rental growth, capital growth and total return forecasts are presented at the "total" UK property level, with office, retail and industrial property sub-sector forecast results not available.

Typically, 18-31 real estate forecasters participate in this quarterly survey, with an average of 24 participants per IPF real estate forecasting survey over 1998-2004. Details of the November 2004 IPF real estate forecasts survey, including participants, are shown in Exhibit 1. The participants involved further reinforces the breadth of the UK real estate forecasting community that respond to this IPF survey. Building upon Newell *et al* (2003), this study analyses the individual forecasts that create the consensus forecasts.

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.

EXHIBIT 1: IPF SURVEY OF INDEPENDENT FORECASTS : 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[iv]: 27

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

Participants:

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

Previous US real estate forecasting studies (e.g. Guilkey, 1999) have indicated that this type of real estate forecasting data is not readily available for the US. Similarly, some US survey-based real estate forecasts (eg: IRRs, cap rates, yields) are available from the Korpacz Real Estate Investment Survey (see www.pwcreval.com) and the Real Estate Research Corporation (see www.rerc.com). Grissom and DeLisle (1998) provide details of the Korpacz and Real Estate Corporation forecasting surveys. However, neither of these US forecasting surveys provide the necessary depth nor time series structure of forecasts comparable to the UK IPF real estate forecasting surveys. As such, no equivalent consensus expert-opinion real estate forecast surveys are available in the other mature real estate

markets, such as the US or Australia. Hence this IPF survey represents a unique real estate forecasting service and expert-opinion real estate forecasting database.

In each IPF survey, participants are asked to forecast real estate performance (rental growth, capital growth and total returns) to the end of the current year, as well as forecast these real estate performance measures to the end of the year for the next two years. The 'target' is the IPD All Property Index. This sees real estate forecasts presented for up to thirty months ahead. With these IPF surveys conducted quarterly, this sees subsequent real estate forecasts presented for forecast lead times of 30M, 27M, 24M, …, 6M, 3M, 0M; thus allowing the assessment of the accuracy of real estate forecasting as the time difference between the real estate forecast and the actual real estate performance reduces on a quarterly basis from thirty months to zero months.

The IPF UK real estate forecasts were then compared with the respective Investment Property Databank (IPD) actual UK annual real estate returns (IPD, 2005a). The IPD real estate indices represent the commercial real estate performance benchmarks for the UK. The IPD annual database is the most reliable benchmark of direct real estate performance in the UK. It comprises approximately 11,000 properties with a total value of over £121 billion at December 2004 (see Exhibit 2: Panel A), equivalent to 45% of the total real estate assets of UK investing institutions and listed real estate companies. Full details of the IPD UK real estate indices are available from www.ipdindex.co.uk.

EXHIBIT 2: IPD UK PROPERTY INDEX PORTFOLIOS: DECEMBER 2004

Panel A: Annual index

Property portfolio component	Number of properties	Value of portfolio	Percentage of portfolio value
Office	2,947	£33.3 billion	27.6%
Retail	4,359	£64.4 billion	53.3%
Industrial	2,966	£19.3 billion	16.0%
Other	714	£3.8 billion	3.1%
Total	10,986	£120.8 billion	100.0%

Panel B: Monthly index

Property portfolio component	Number of properties	Value of portfolio	Percentage of portfolio value
Office	736	£6.3 billion	23.6%
Retail	1,465	£15.5 billion	58.1%
Industrial	756	£4.4 billion	16.5%
Other	143	£0.5 billion	1.8%
Total	3,100	£26.7 billion	100.0%

Source: IPD (2005a,b)

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, real estate forecasters for the IPD Annual Index are informed by the IPD Monthly Index[v] (IPD,2005b). Although drawing from a different sample of properties (see Exhibit 2: panel B), this monthly index provides a monthly update on performance as the year progresses. For example, the IPF August survey forecast is a forecast for the next five months, with the forecaster able to draw upon the recorded IPD monthly returns to June/July. In effect, the forecasters are receiving regular signals about actual market returns that should enable them to update their real estate forecasts. These implied forecasts also provide us with some insights about the efficiency of real estate forecasters in reacting to new information.

RESULTS

The analysis of these forecasting results over 1999-2004 is performed at a macro level in this paper, with fuller analysis on individual forecaster performance to be carried out at a later stage in this research project.

Forecast Disagreement

In Exhibit 3, we present a summary of the one-year ahead forecasts for change (%) in rental and capital growth and total returns[vi]. In each case, it is only based on the real estate forecast in February for 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. 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 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 risks 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 risks 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 3: DESCRIPTIVE STATISTICS FOR IPF FORECASTS: 1999 - 2004

RENTAL GROWTH FORECAST (% p.a.)

	1999	2000	2001	2002	2003	2004
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
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

TOTAL RETURN FORECAST (% p.a.)

	1999	2000	2001	2002	2003	2004
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

Forecast Accuracy

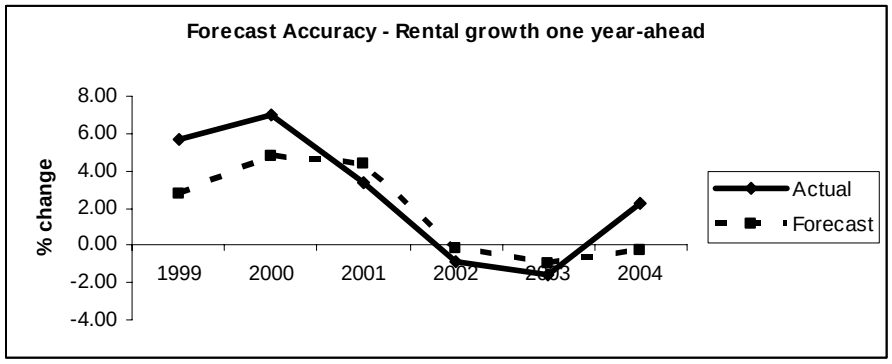
As discussed above, there are many dimensions to forecast accuracy. Firstly, we focus on the simple differences between forecasts and actual outcomes. Exhibit 4 illustrates the accuracy of the one year-ahead forecasts for rental and capital growth and total returns. At this level of analysis, it is clear that it is errors in capital growth that are driving the errors in total return. This suggests that *forecasted* rental growth is the key determinant of *forecasted* capital growth.

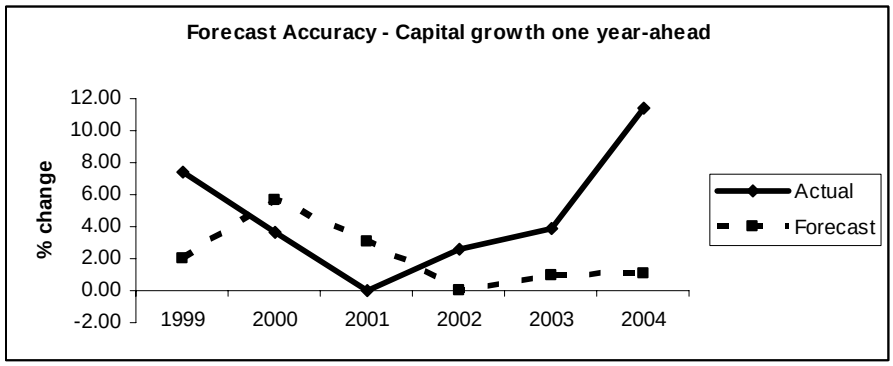
Essentially, forecasters are assuming stable capitalization rates in their forecasts of capital growth. The correlation coefficient between rental growth and capital growth is 0.88 (significant at 5% level). This is consistent with research on the real estate forecasting process, which suggests that forecasters have limited confidence in their ability to forecast capitalization rates (see Gallimore and McAllister, 2005).

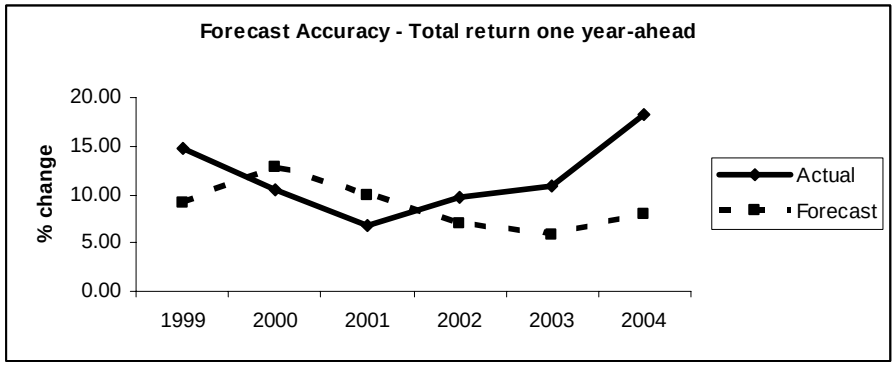
The largest consensus forecasting failure was in 2004. All forecasting organisations failed to anticipate the fall in capitalization rates that produced high levels of capital growth in that year. The mean forecast for capital growth in 2004 was 1.03%, with a standard deviation of 1.37% and a maximum 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, the largest contributor to individual forecast error was consensus uncertainty rather than individual forecast 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 5, that 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.

EXHIBIT 4 : FORECAST ACCURACY : 1999 - 2004







Forecast bias

Exhibit 6 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 real estate 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 real estate forecasters.

As noted earlier, as the calendar year progresses, forecasters have periodic monthly updates from IPD 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 7 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.

EXHIBIT 5 : CONSENSUS FORECAST : ABSOLUTE PERCENTAGE ERROR : 1999 - 2004

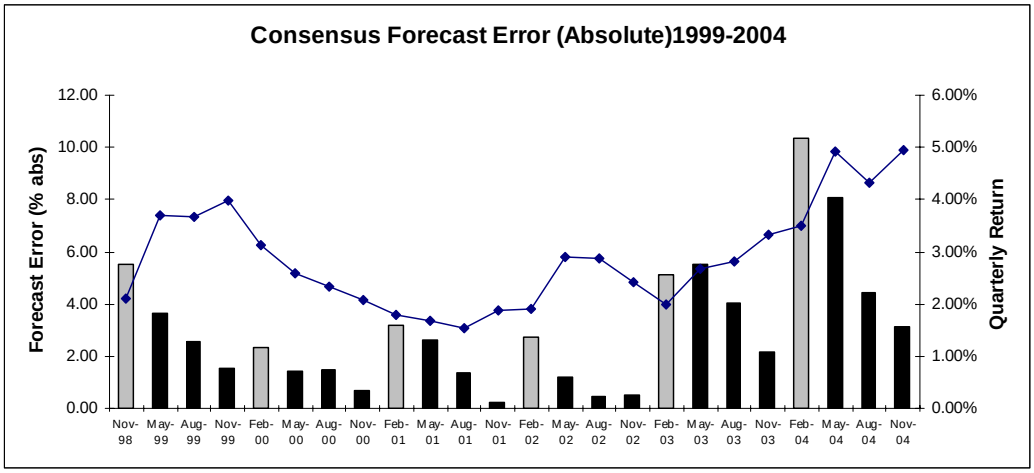


EXHIBIT 6 : CONSENSUS FORECAST : AVERAGE PERCENTAGE ERROR: 1999 - 2004

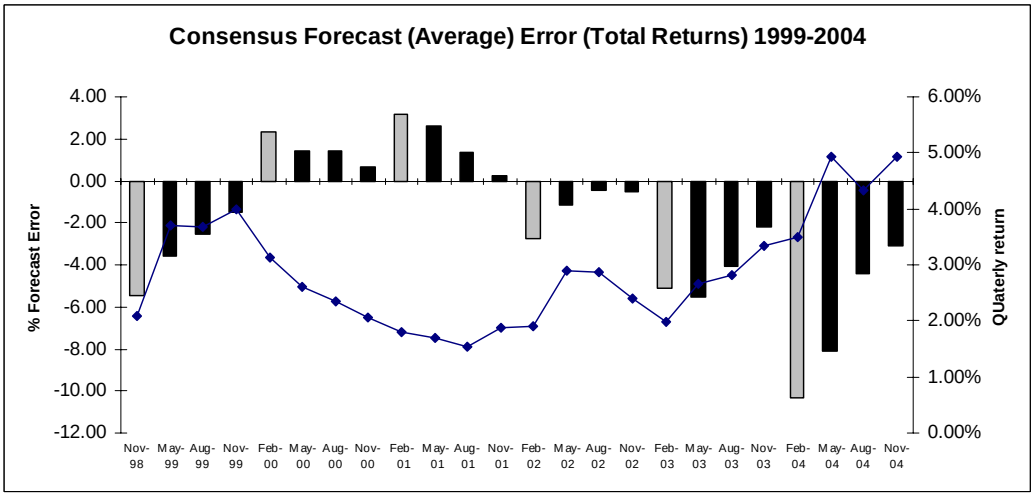


EXHIBIT 7 : IMPLIED CONSENSUS FORECASTS : 1999 – 2004

	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

CONCLUSION

Our review of the literature suggests that uncertainty and disagreement are inherent in the forecasting process. Error is to be expected given the nature of an (econometric) estimate (as a point drawn from a probability distribution); problems of data availability and reliability in real estate markets; and the inherent limitations of econometric methods due, in particular, to the effects of structural shifts and unanticipated events. Additionally, real estate forecasts are normally dependent upon 'subsidiary' forecasts of the independent (typically macro-economic) variables which themselves will be subject to forecast error and, where two or more are procured, will display disagreement. Previous research suggests that forecasts can often display evidence of bias and inefficiency. Average errors may be non-zero, negative and positive errors may display persistence whilst forecasted volatility may lower than actual.

The analysis of the UK real estate forecasters suggests that there is bias in real estate 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).

Probably the most robust finding of the analysis so far is that real estate forecasters display the characteristics associated with a consensus. This seems to indicate herding among forecasters. Disagreement amongst forecasters is limited. For one year-ahead forecasts of total returns, the actual outcome was always outside one standard deviation of the mean forecast. This suggests that consensus uncertainty rather than disagreement has been key driver of individual forecast uncertainty. A key source of error in the forecasts seems to have been the implied use of naïve forecasts of capitalization rates. The fact that capital growth tended to 'mirror' rental growth at the consensus level indicated that forecasters' expectations of capital returns were generally a product of rental return expectations. Basically, forecasters seemed to assume 'no or little change' in capitalization rates. This probably reflects the increased difficulties of modelling capitalization rates relative to rental growth.

The data set offers plenty of scope for further analysis. This paper has not fully explored whether the patterns identified in the consensus forecasts can be confirmed at the level of the individual forecaster. There may also interesting distinctions between categories of forecaster

and time period of forecast. More formal econometric analysis for the existence of bias and inefficiency in the forecasts needs to be carried out if the conclusions are to be robust.

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[i] Evidence from UK real estate forecasters suggests that they would regard such a measure as a crude indicator of forecast success. Gallimore and McAllister (2005) find that most real estate forecasters regarded identifying the relative rather than absolute performance as the best indicator of success. Reflecting the preferences of many UK real estate 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.

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

[iii] No survey was conducted in February 1999.

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

[v] 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.

[vi] 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.