

29 OCTOBER 2024

# Institutional insights to modern real estate forecasting & investments decisions





1. Introduction
2. Forecast process
3. Strategies & implementation

1

Introduction

# CBRE Investment Management

## Global scale and resources

30+  
OFFICES

1,100+  
EMPLOYEES<sup>1</sup>

\$142.5B  
USD AUM<sup>2</sup>

830  
INSTITUTIONAL  
CLIENTS

### Platforms

Real Estate

Infrastructure

### Strategies

Direct Private  
Real Estate

Indirect Private  
Real Estate

Private  
Infrastructure

Listed  
Real Assets

Real Estate  
Credit

### Sectors

Logistics

Residential

Office

Retail

Other

### Risk Profiles

Core

Core+

Value Add

Opportunistic

### Implementation

Separate Accounts

Commingled Funds

As of June 30, 2024.

1. As of December 31, 2023. CBRE Group, Inc. and CBRE Investment Management provide personnel counts on an annual basis. Employee numbers exclude interns.
2. Assets under management (“AUM”) refers to the fair market value of real assets-related investments with respect to which CBRE Investment Management provides, on a global basis, oversight, investment management services and other advice and which generally consist of investments in real assets; equity in funds and joint ventures; securities portfolios; operating companies and real assets-related loans. This AUM is intended principally to reflect the extent of CBRE Investment Management’s presence in the global real assets market, and its calculation of AUM may differ from the calculations of other asset managers and from its calculation of regulatory assets under management for purposes of certain regulatory filings.

# CBRE IM Real Asset Outlook Process

56  
PEOPLE

13  
GLOBAL CITIES

\$3M  
DATA BUDGET

## Macroeconomic and Real Asset Outlook

Our team creates a bespoke macroeconomic scenario that gives a consistent set of forecasts from national to city level across all of our markets

## Real Assets Macro Outlook

<b>Round 0</b>	CIOs meet to discuss high level market trends and provide guidance that frames the regional discussions
<b>Round 1</b>	Regional research and real assets teams discuss the most recently published data and the latest capital and leasing market trends
<b>Round 2</b>	Regional research presents their real assets forecasts to the real assets teams and incorporate feedback
<b>Round 3</b>	Regional research presents their first draft risk-adjusted returns (RARE) with the real assets team and incorporate feedback. Together the teams formulate the new model portfolios and preferred strategies by region
<b>Round 4</b>	The CIOs, global investment teams and global research team check the global roll up of the forecasts and create the global model portfolios and preferred strategies

## European real estate forecast coverage as of October 2024

A comprehensive market coverage

Total: 165 (20 countries)



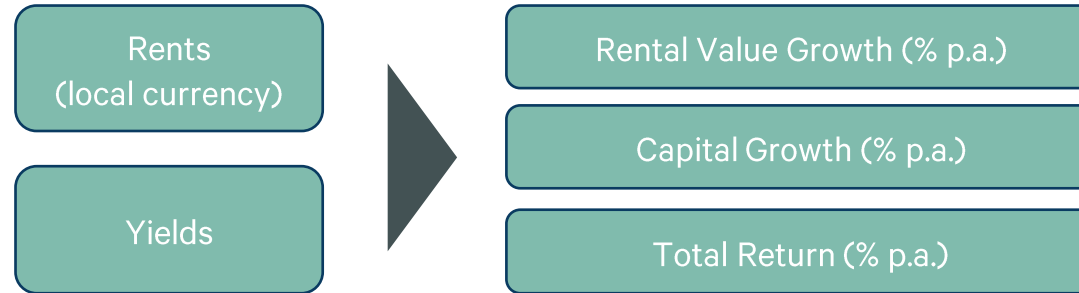
2

Forecast  
process

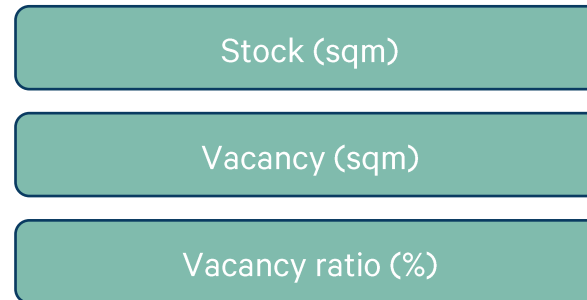
We forecast 'prime' and/or 'average' data series depending on availability

### Market indicators that we forecast

For all markets we produce...



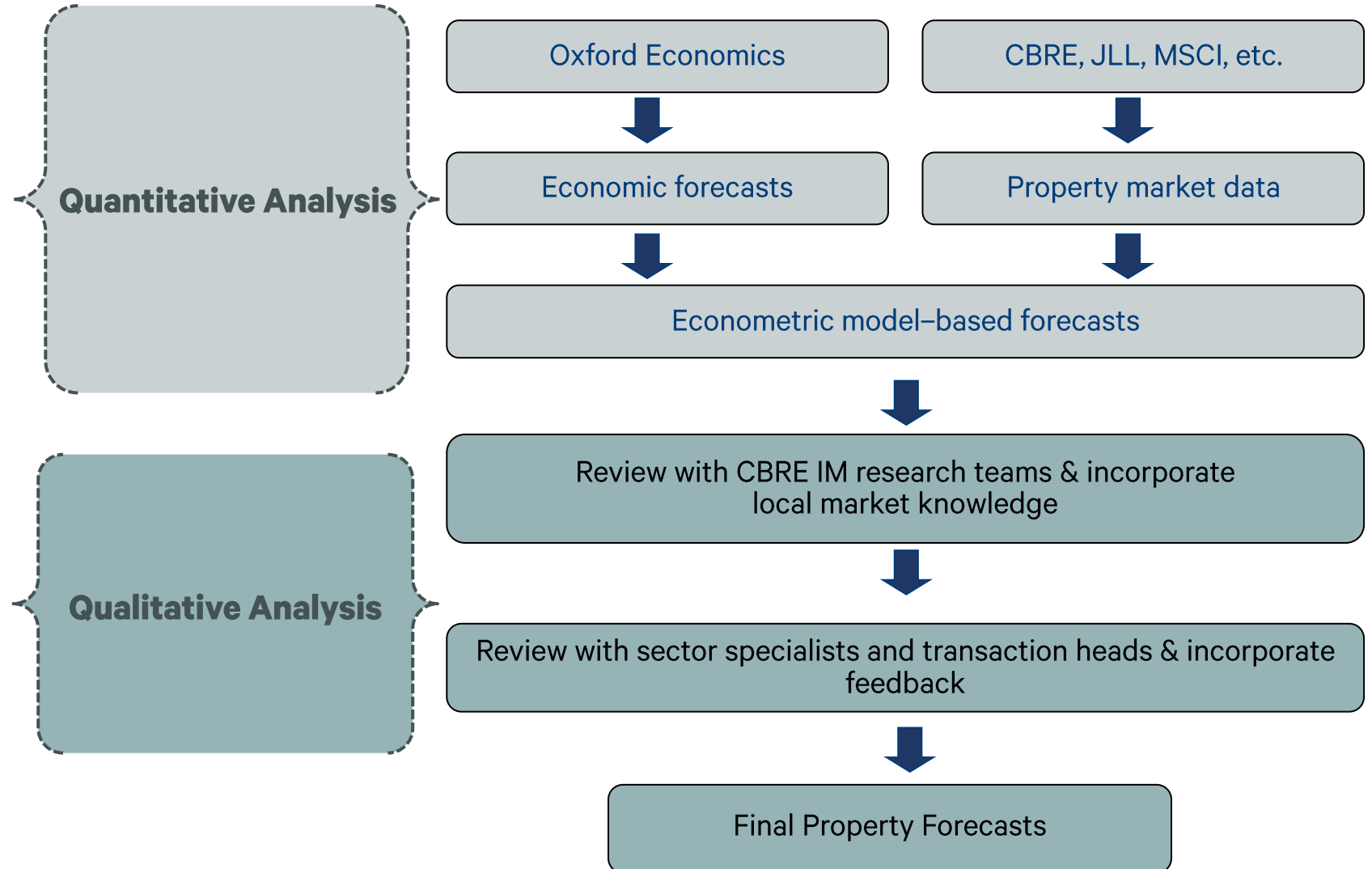
For many office/ industrial markets we produce...





A truly rigorous process combining both quantitative and qualitative analyses

Graphic view of the process



# Structure of the yield model

## Fundamentals of property pricing

### Theory:

$$Y_t + g_t = RF_t + RP_t$$

$Y_t$  = initial yield (cap rate)

$g_t$  = expected net rental income growth

$RF_t$  = risk free rate of return

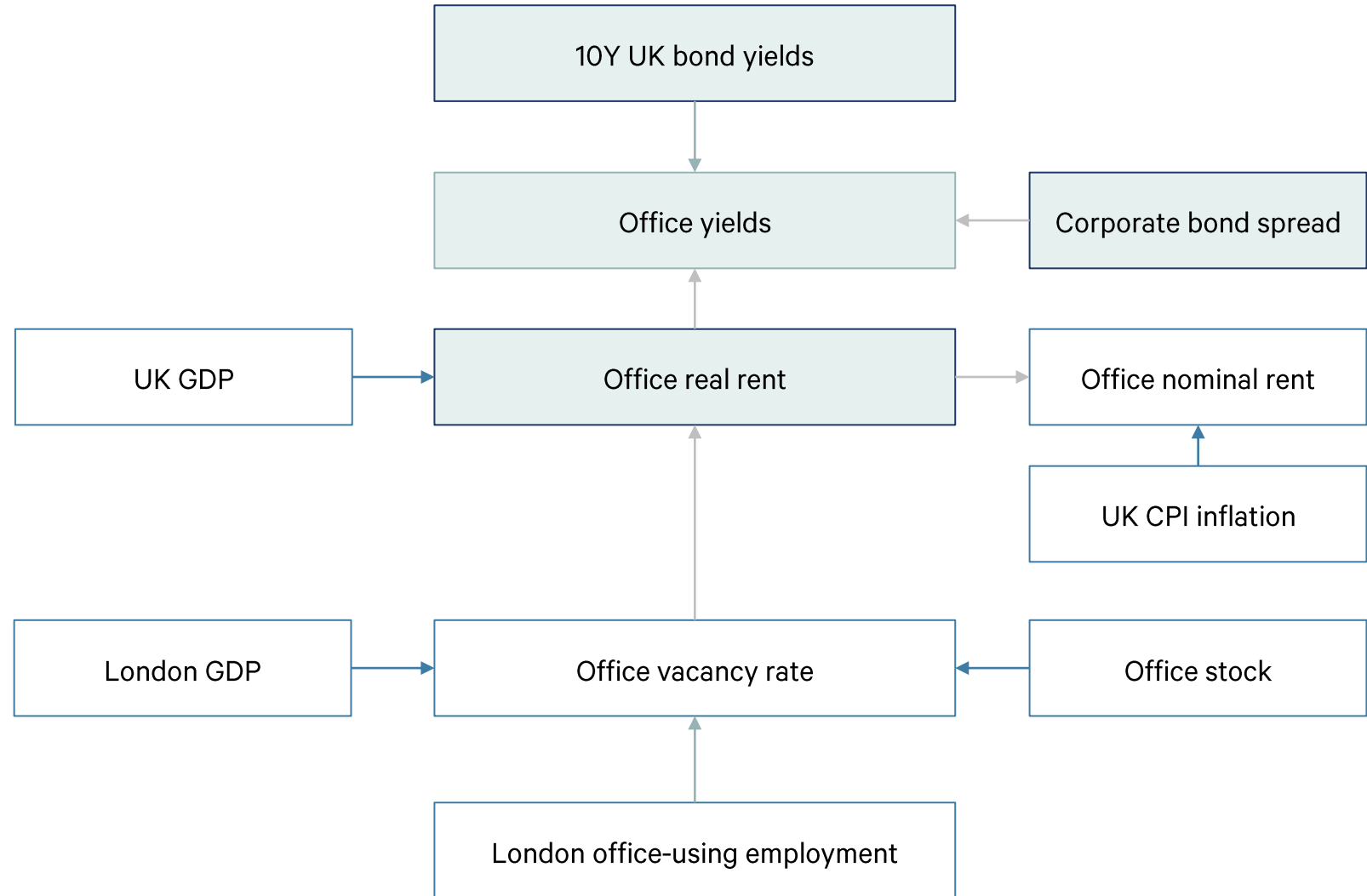
$RP_t$  = risk premium

### Models explored:

- ARIMA
- OLS
- ARDL
- Markov Switching
- OLS-based Lasso variable selection
- Random Forest
- MIDAS

# Structure of the econometric model used for London City's office prime yield

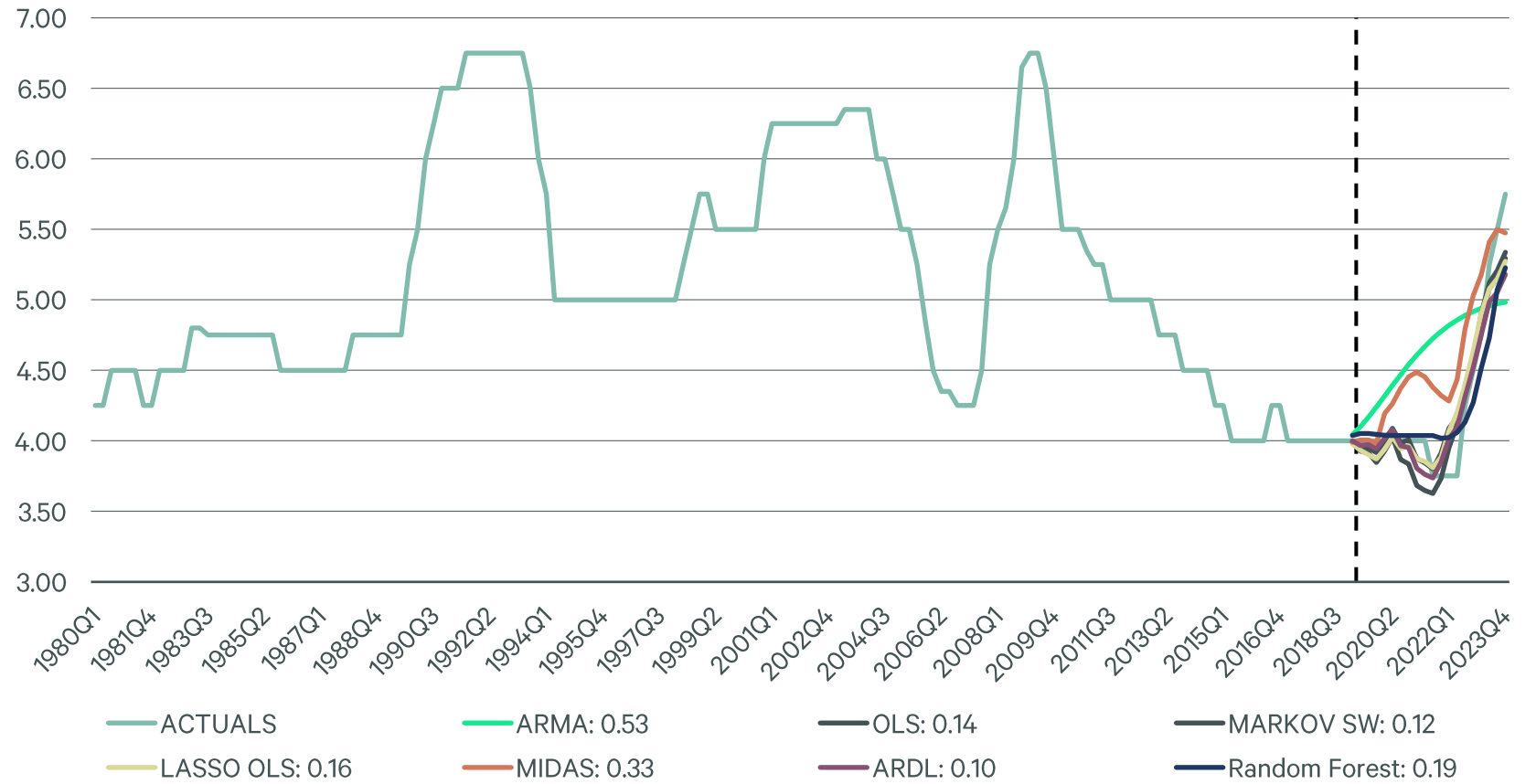
London Office Yield Model's Dependency Graph



- Lags only
- Lags & contemporaneous
- Contemporaneous only

Based on MAE, the best model is the ARDL

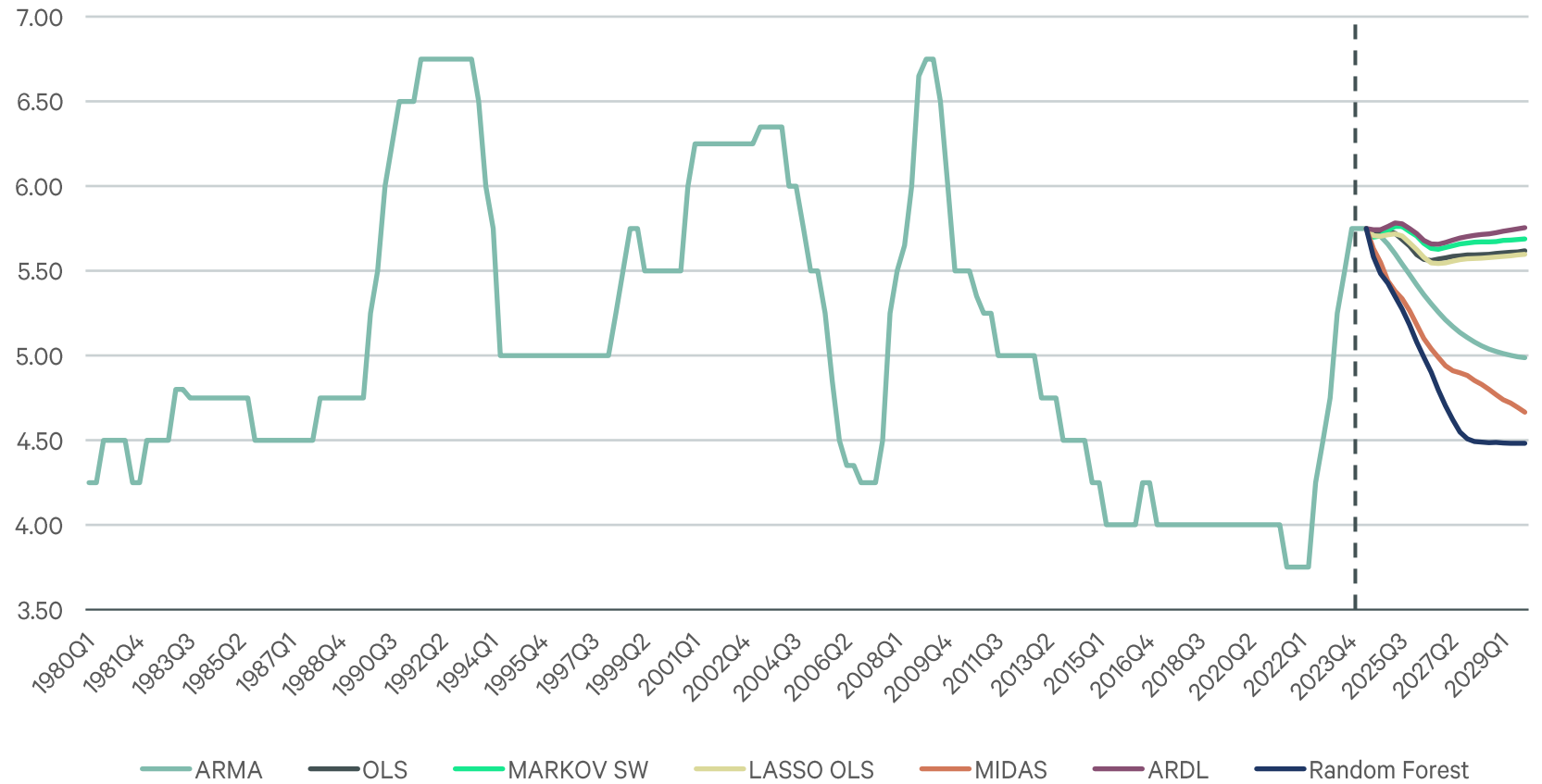
London City office yield in-sample forecasts by model (MAE indicated legend), yield in %



Source: CBRE IM Research

Based on feedback after internal consultation, ARMA wins on forecast expectations

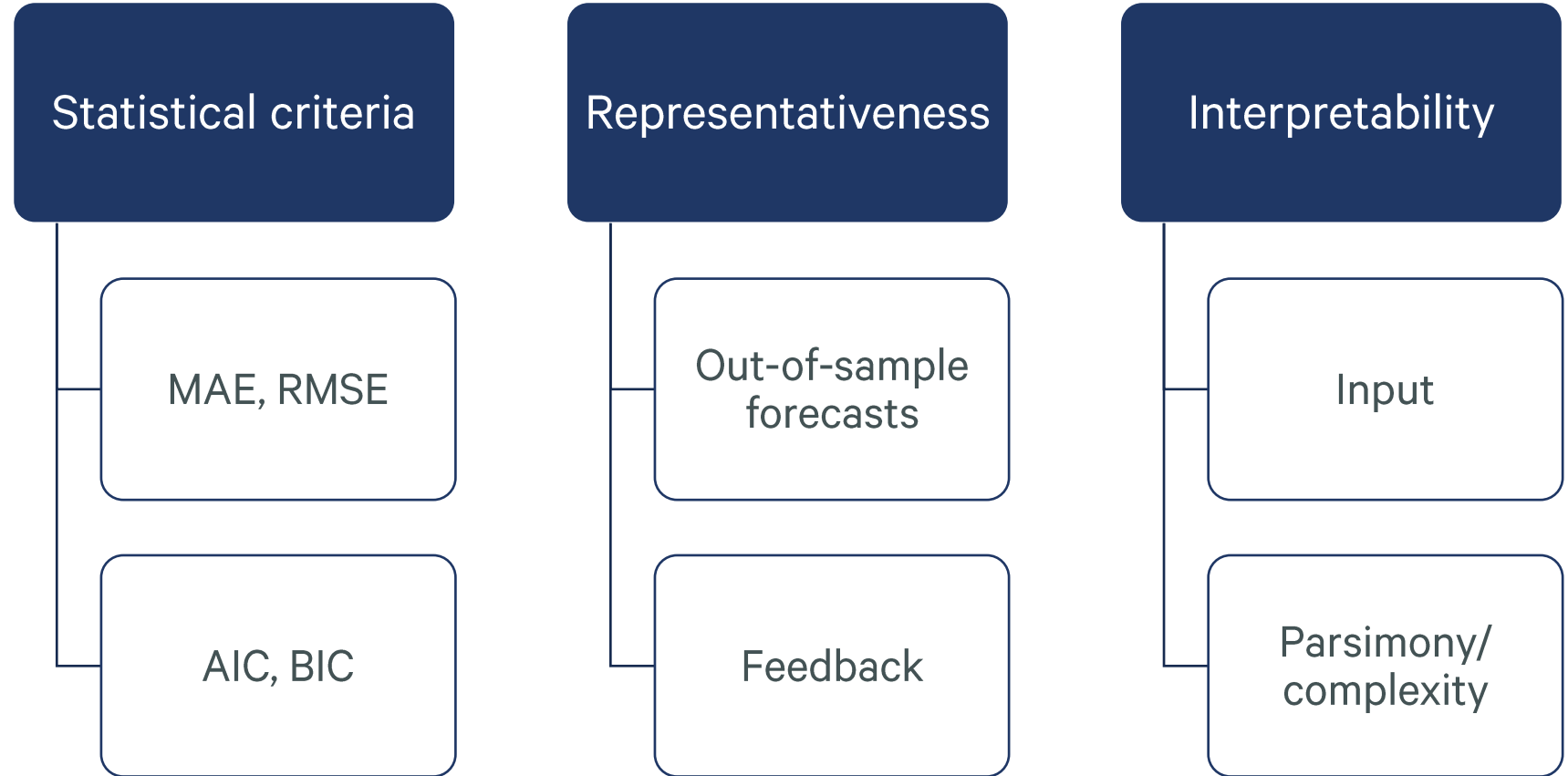
London City office yield out-of-sample forecasts by model, yield in %



Source: CBRE IM Research

### Econometric model selection process

A combination of criteria in selecting models that is robust and inclusive



Source: CBRE IM Research

# Feedback matters: Adjusted predictions broadly outperform modelled predictions of 1-year forecasts

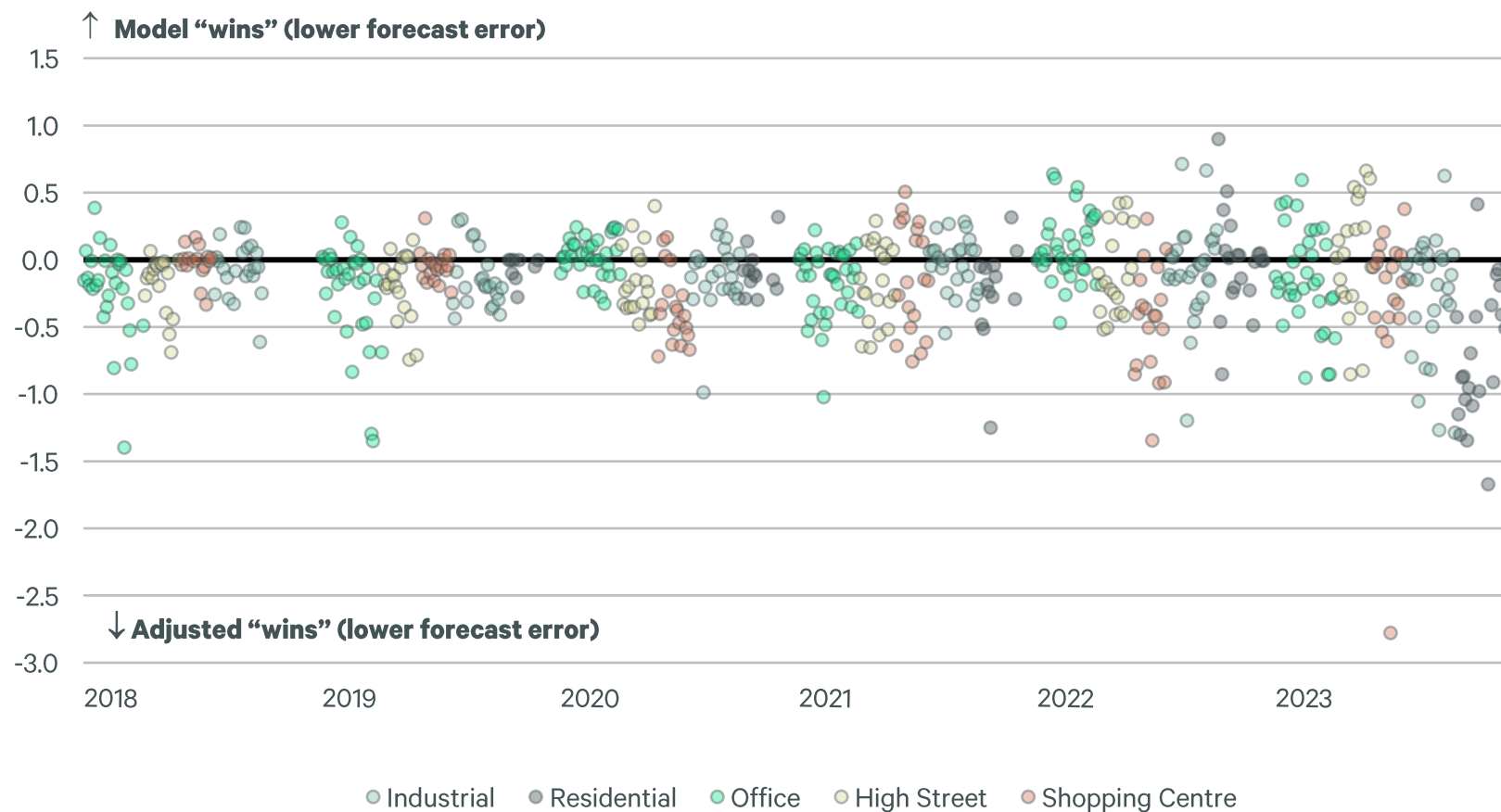
Methodology note: Model forecast “wins” if the forecast error of the model’s prediction (forecast value minus actual value) is smaller than the forecast error of the adjusted forecast. Each dot represents the difference between the absolute value of the adjusted forecast error and the model’s forecast error.

Dot =  $ABS(Adjusted - Actual) - ABS(Model - Actual)$   
 If  $ABS(Adjusted - Actual) > ABS(Model - Actual)$ , then the Adjusted forecast is NOT better than the Model’s forecast, hence the ‘Model wins’.  
 If  $ABS(Adjusted - Actual) < ABS(Model - Actual)$ , then the Adjusted forecast is better than the Model’s forecast, hence the ‘Adjusted wins’.  
 If  $ABS(Adjusted - Actual) = ABS(Model - Actual)$ , Model and Adjusted perform the same.

Source: CBRE IM Research

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## Model v. adjusted YIELD forecasts, one-year forecast horizon, split by sector



# Feedback matters: Adjusted predictions broadly outperform modelled predictions of 1-year forecasts

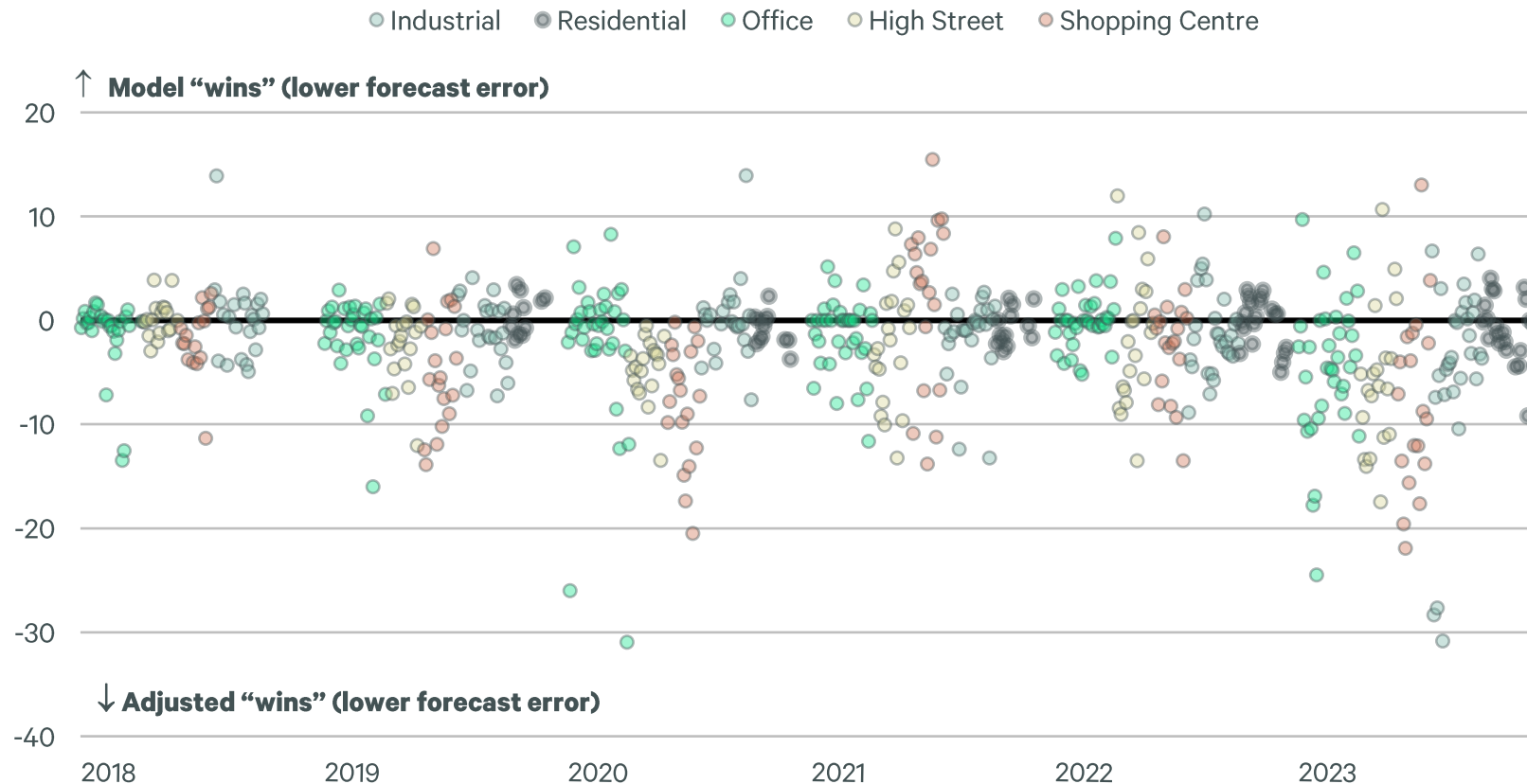
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Source: CBRE IM Research

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Model v. adjusted RENT GROWTH forecasts, one-year forecast horizon, split by sector



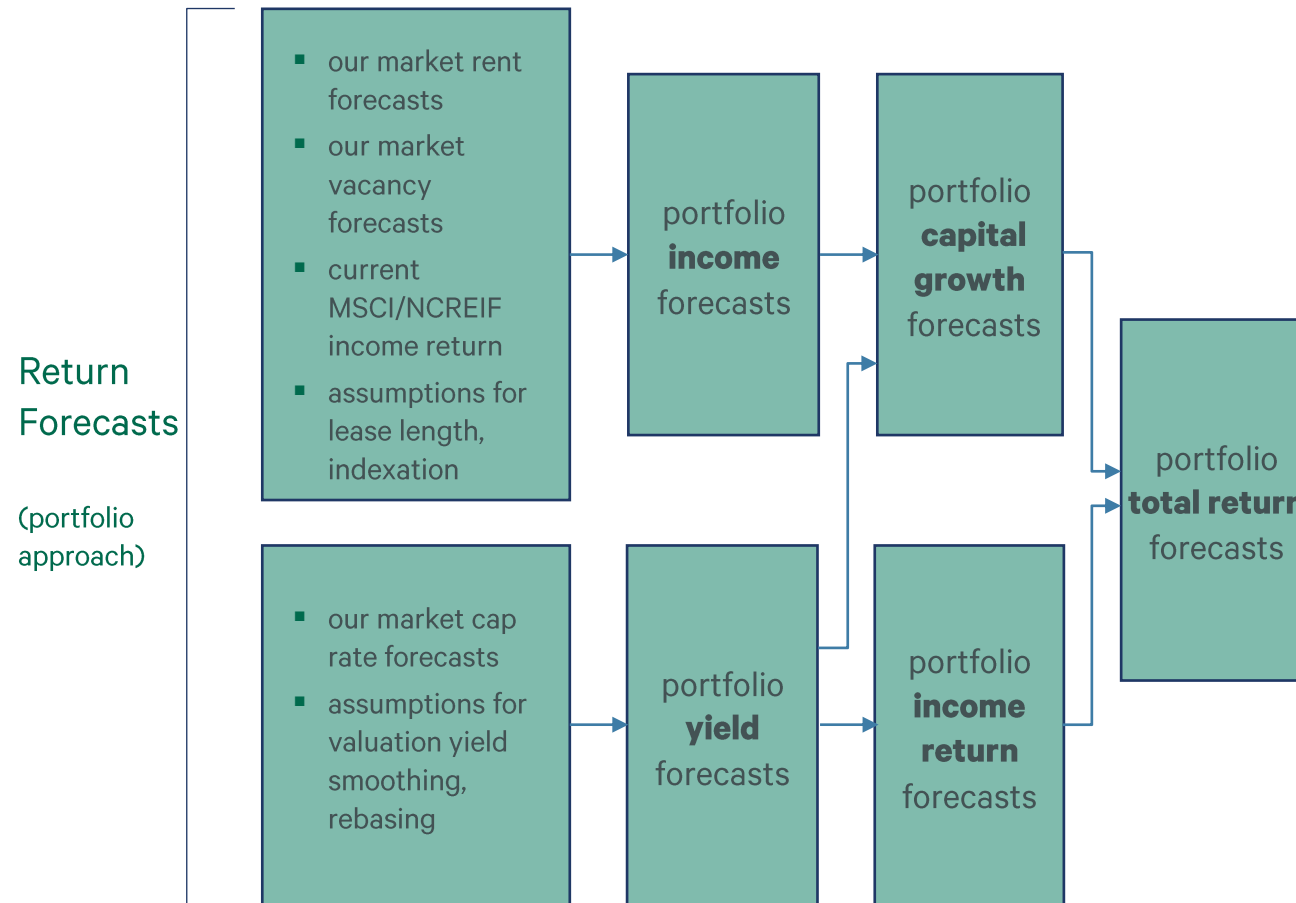


# 3

Strategies &  
implementation

**Global consistent index calculation makes our market forecast comparable across sectors and markets and enables us to rank markets**

# Return forecast methodology



# Next steps...

## Global House View

FORECASTS



RARE



MODEL  
PORTFOLIOS



RECOMMENDED  
STRATEGIES

**is firm-wide**

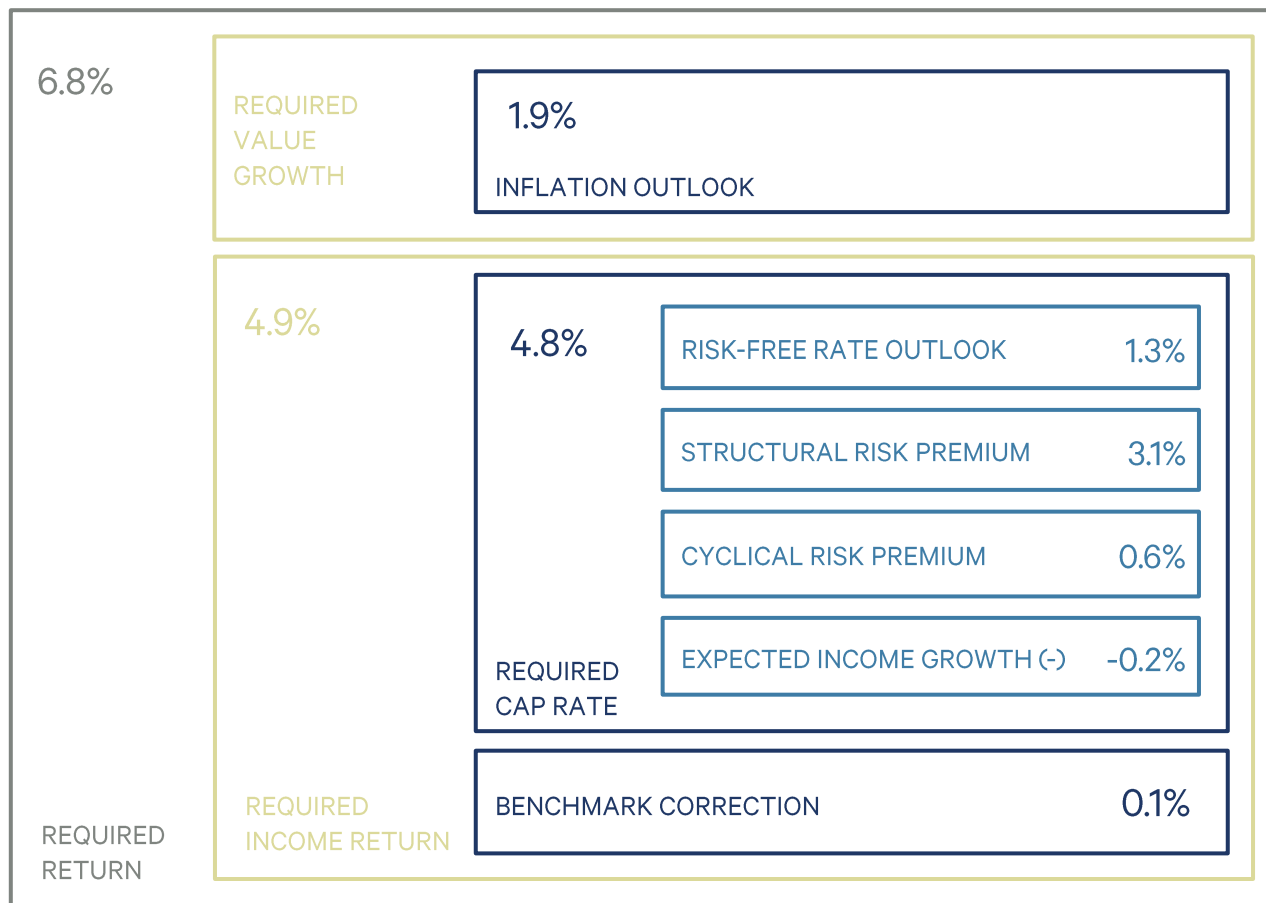
Research

Investment teams

## Required returns sum inflation, bond yields and risk premiums

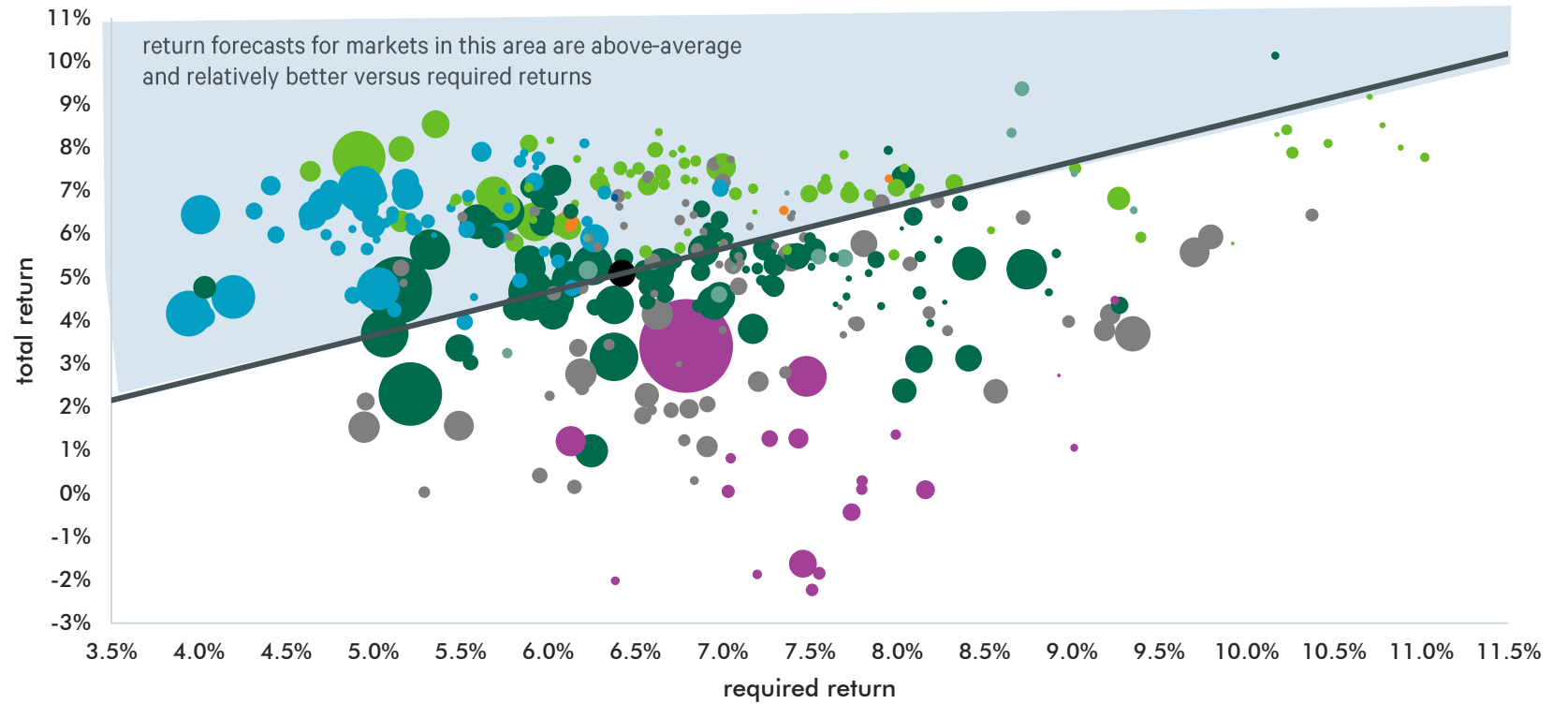
# RARE contrasts forecasted returns with required returns

- The required return applies to markets (local currency, unlevered, no fees, core risk), so not to investment strategies
- The required return is risk-based but not a pure risk measure
- Within countries, a city ranking on required returns equals a city ranking on risk premiums (+growth)



Figures reflect global average across markets in H1 2021

# RARE's market calls

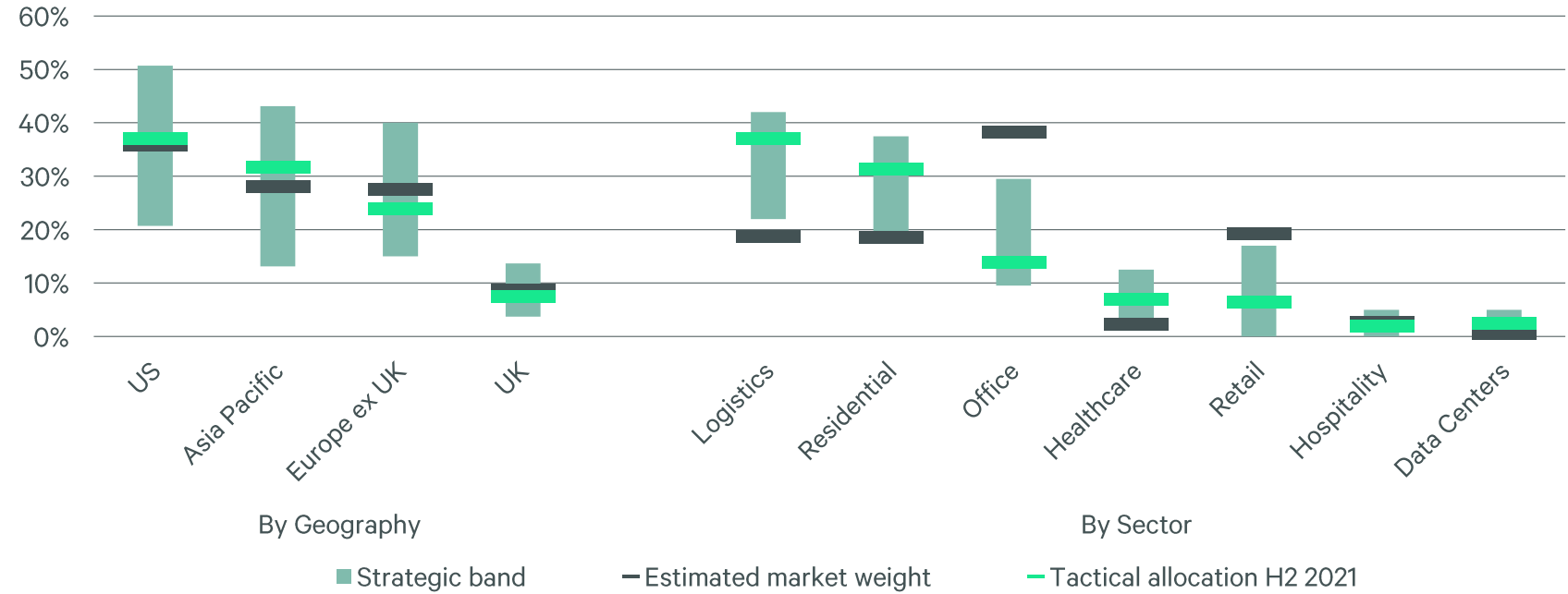


- Data centres
- Healthcare
- High street retail
- Hospitality
- Logistics
- Malls
- NCC
- Office
- Residential
- Retail
- Global / All Property

Source: CBRE Investment Management, forecasts as of H1 2021. Japan and USA hotels are not shown, with return forecasts exceeding 11%. Important note: portfolio figures indicate existing core, unlevered, passive portfolios. Assumptions are generalized to provide a consistent market outlook and asset specific strategies have not been taken into account.

# Components of a standard model portfolio

**A generic model portfolio is based on both research and investment team knowledge and consists of tactical positions within strategic bands**



**Estimated market weights:**

The estimation of the invested universe is based on the size of the national country/sector sizes within the MSCI Global Index corrected for coverage. A few exceptions apply.

**Strategic bands:**

These specify the ranges in which future tactical allocations could move. They reflect our long-term views on the regions and sectors and vary with market size and volatility.

**Tactical allocations:**

These reflect the allocations that are expected to give the best absolute return outlook and relative value versus their required returns for the coming 5 years.

Source: CBRE Investment Management

# Thank you

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