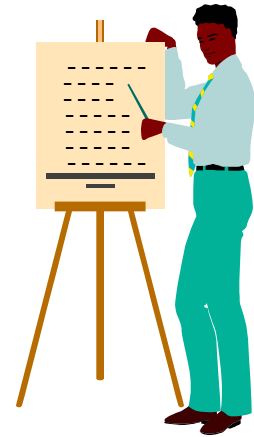


Exchange Rate Forecasting

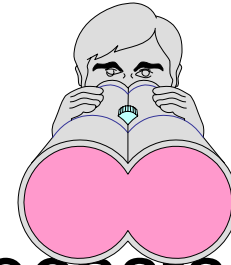


Chapter Objectives

- To explain how firms can benefit from forecasting exchange rates;
- To describe the common techniques used for forecasting; and
- To explain how forecasting performance can be evaluated.



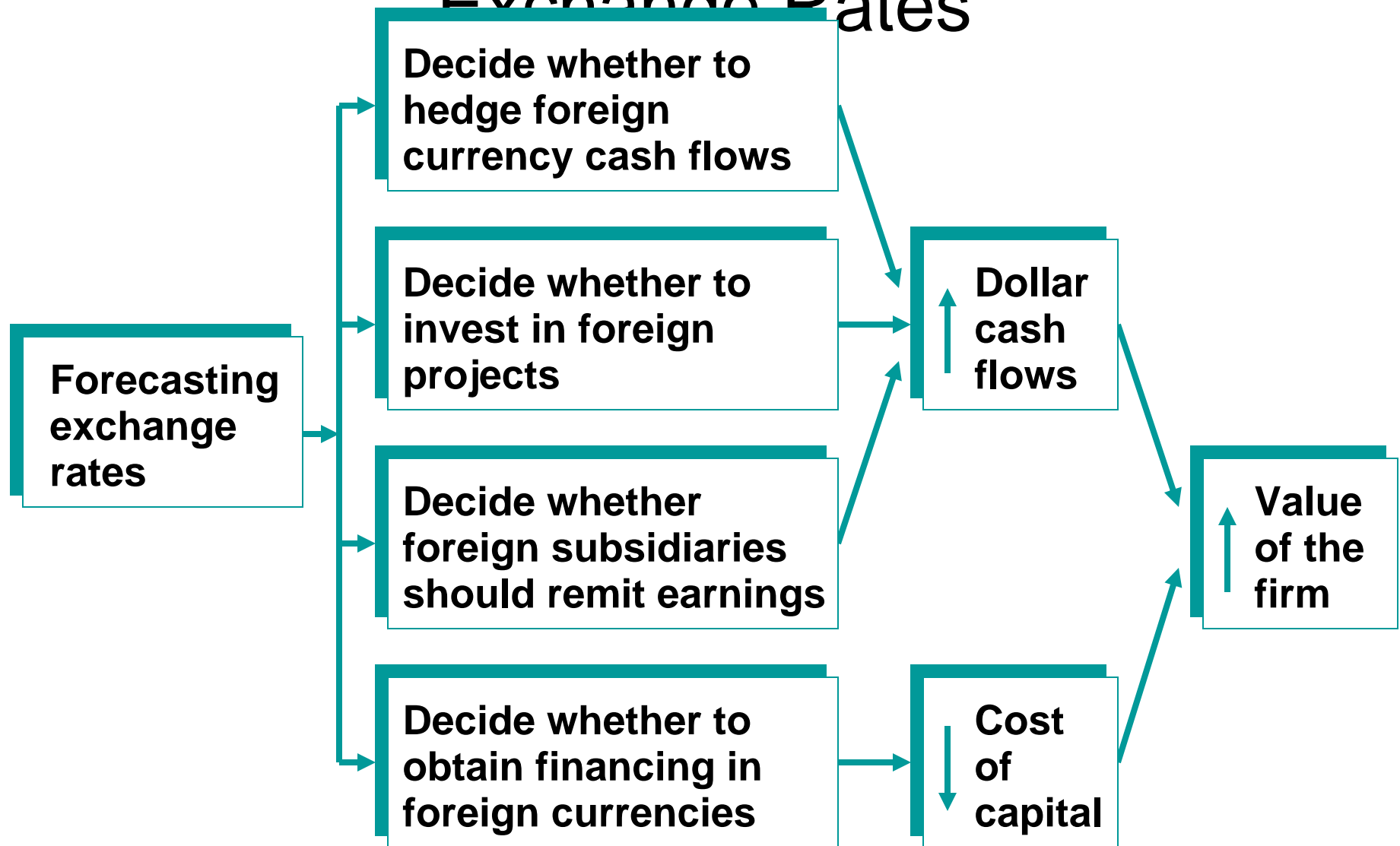
Why Firms Forecast Exchange Rates



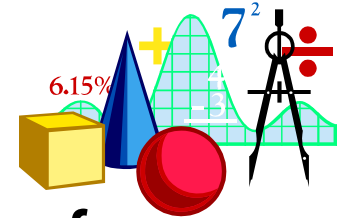
- MNCs need exchange rate forecasts for their:
 - hedging decisions,
 - short-term financing decisions,
 - short-term investment decisions,
 - capital budgeting decisions,
 - earnings assessments, and
 - long-term financing decisions.

Corporate Motives for Forecasting

Exchange Rates

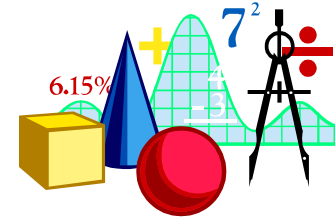


Forecasting Techniques



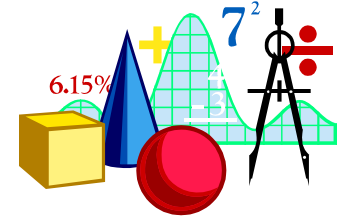
- The numerous methods available for forecasting exchange rates can be categorized into four general groups:
 - ① technical,
 - ② fundamental,
 - ③ market-based, and
 - ④ mixed.

Technical Forecasting



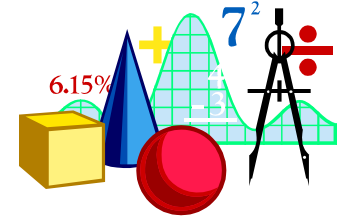
- **Technical forecasting** involves the use of historical data to predict future values.
 - E.g. time series models.
- Speculators may find the models useful for predicting day-to-day movements.
- However, since the models typically focus on the near future and rarely provide point or range estimates, they are of limited use to MNCs.

Fundamental Forecasting



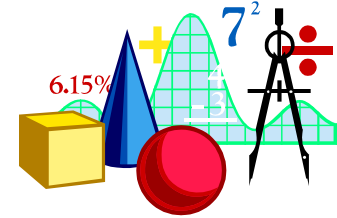
- **Fundamental forecasting** is based on the fundamental relationships between economic variables and exchange rates.
 - E.g. subjective assessments, quantitative measurements based on regression models and sensitivity analyses.
- Note that the use of PPP to forecast future exchange rates is inadequate since PPP may not hold and future inflation rates are also uncertain

Fundamental Forecasting



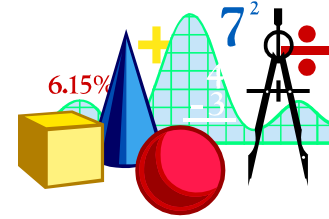
- In general, fundamental forecasting is limited by:
 - the uncertain timing of the impact of the factors,
 - the need to forecast factors that have an immediate impact on exchange rates,
 - the omission of factors that are not easily quantifiable, and
 - changes in the sensitivity of currency movements to each factor over time.

Market-Based Forecasting



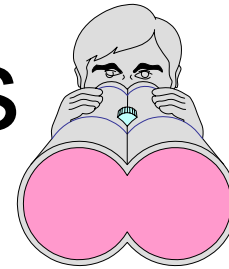
- **Market-based forecasting** uses market indicators to develop forecasts.
- The current spot/forward rates are often used, since speculators will ensure that the current rates reflect the market expectation of the future exchange rate.
- For long-term forecasting, the interest rates on risk-free instruments can be used under conditions of IRP.

Mixed Forecasting



- **Mixed forecasting** refers to the use of a combination of forecasting techniques.
- The actual forecast is a weighted average of the various forecasts developed.

Forecasting Services



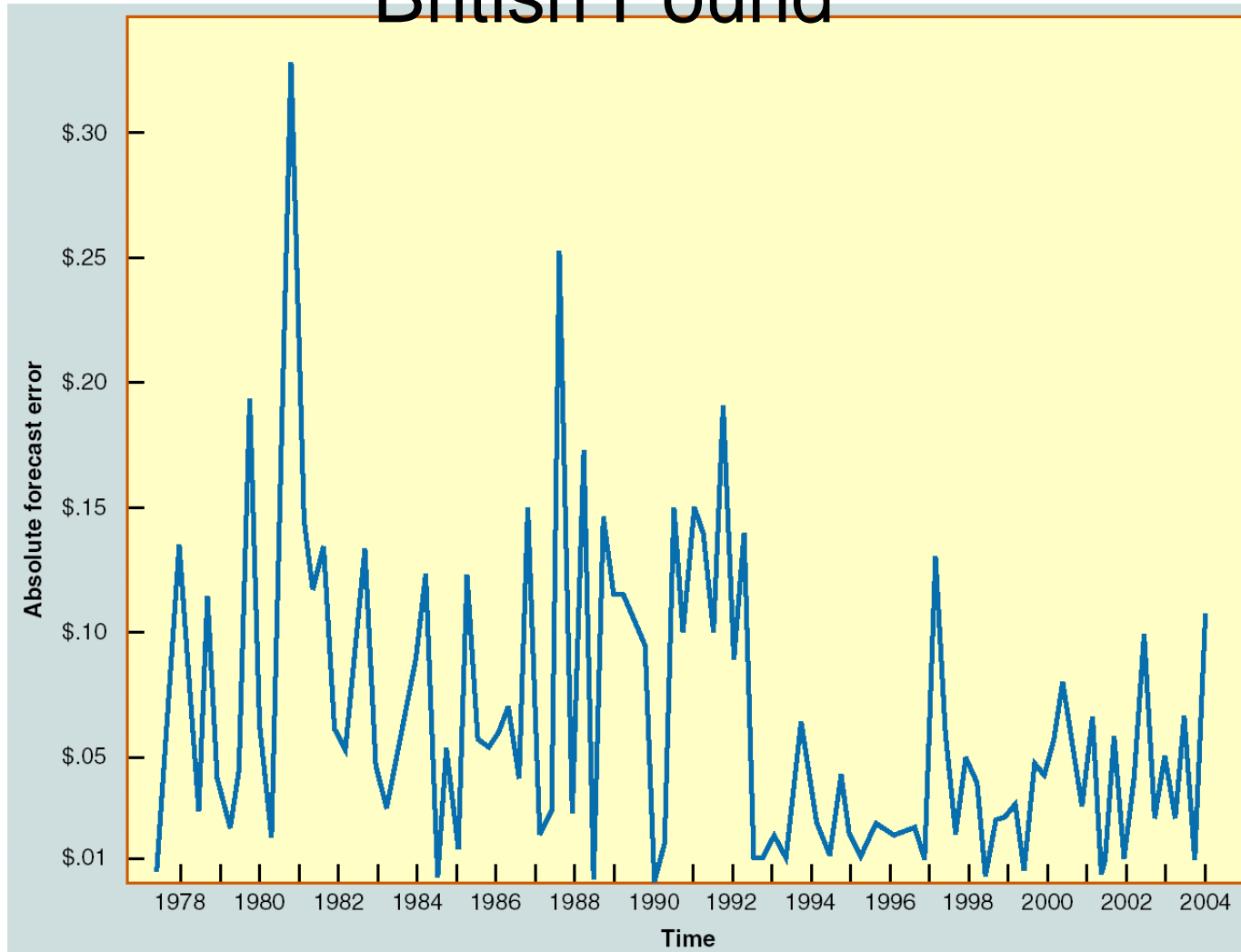
- The corporate need to forecast currency values has prompted some consulting firms and investment/commercial banks to offer forecasting services.
- One way to determine the value of a forecasting service is to compare the accuracy of its forecasts to that of publicly available and free forecasts.

Forecast Performance Evaluation

- An MNC that forecasts exchange rates should monitor its performance over time to determine whether its forecasting procedure is satisfactory.
- One popular measure, the **absolute forecast error** as a percentage of the realized value, is defined as:

$$\frac{|\text{forecasted value} - \text{realized value}|}{\text{realized value}}$$

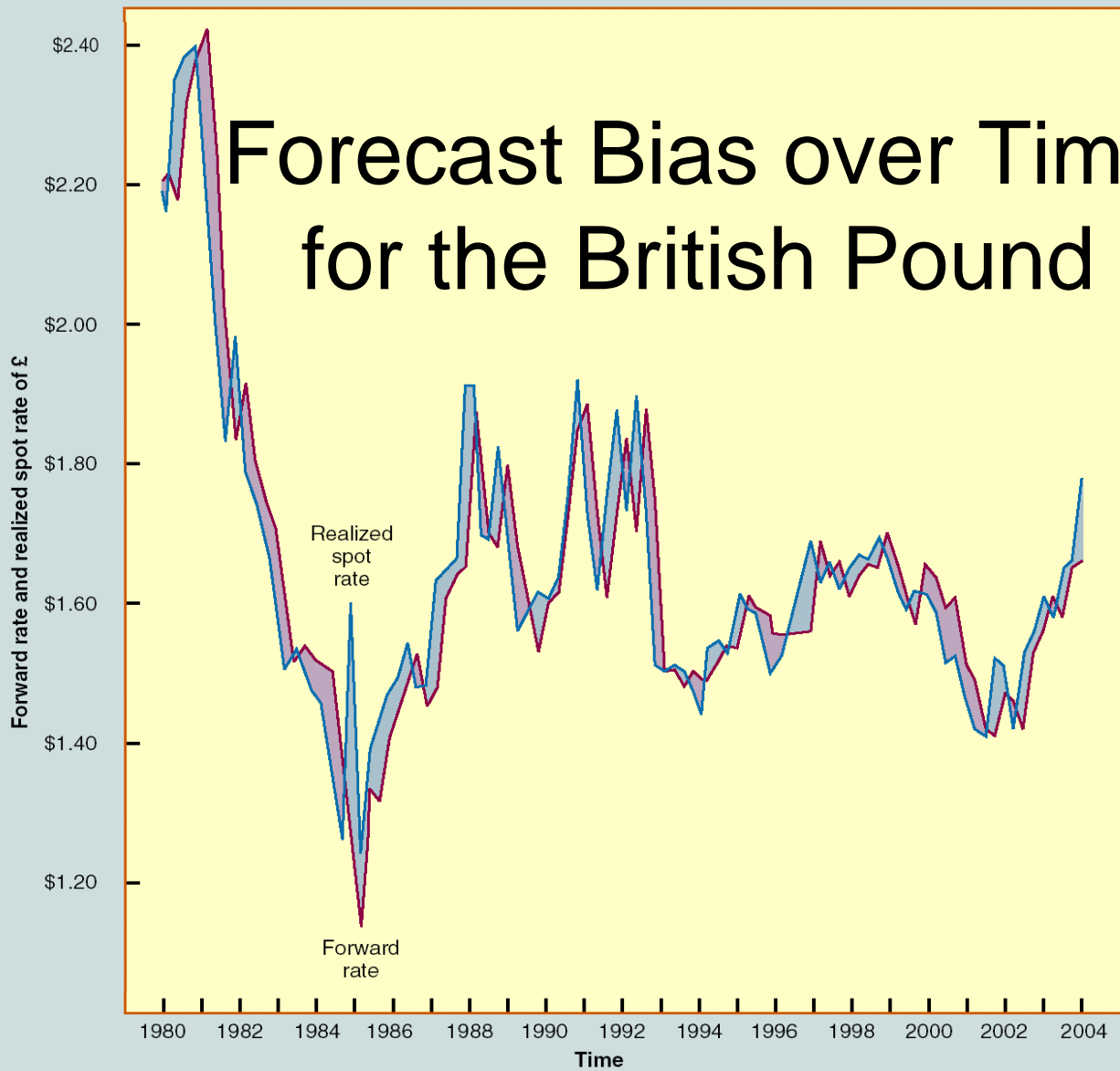
Absolute Forecast Errors over Time Using the Forward Rate as a Forecast for the British Pound



Forecast Performance Evaluation

- MNCs are likely to have more confidence in their forecasts as they measure their forecast error over time.
- Forecast accuracy varies among currencies. A more stable currency can usually be more accurately predicted.
- If the forecast errors are consistently positive or negative over time, then there is a **bias** in the forecasting procedure.

Forecast Bias over Time for the British Pound

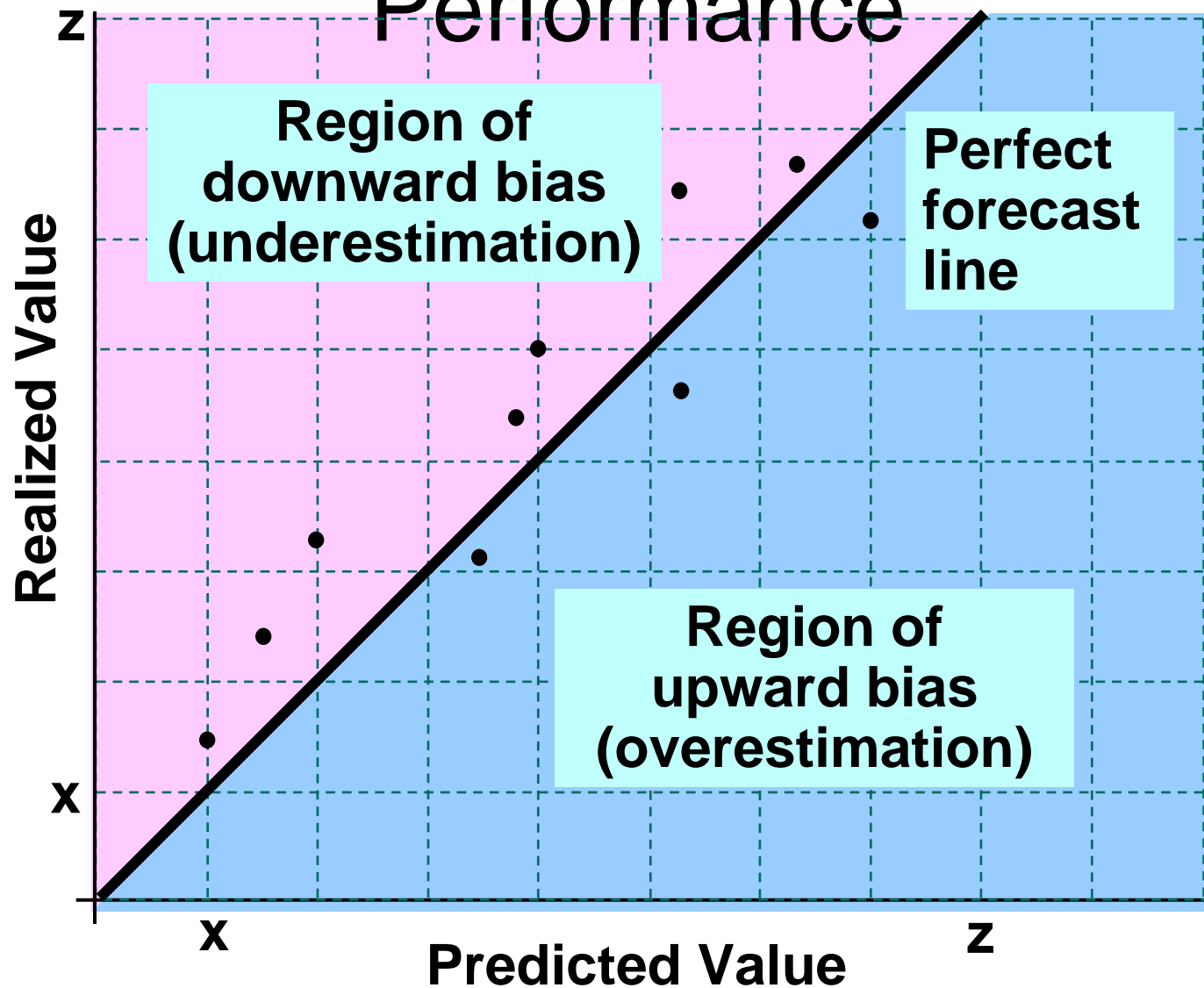


Forecast Bias

- The following regression model can be used to test for forecast bias:

$$\text{realized value} = a_0 + a_1 \times F_{t-1} + \mu$$

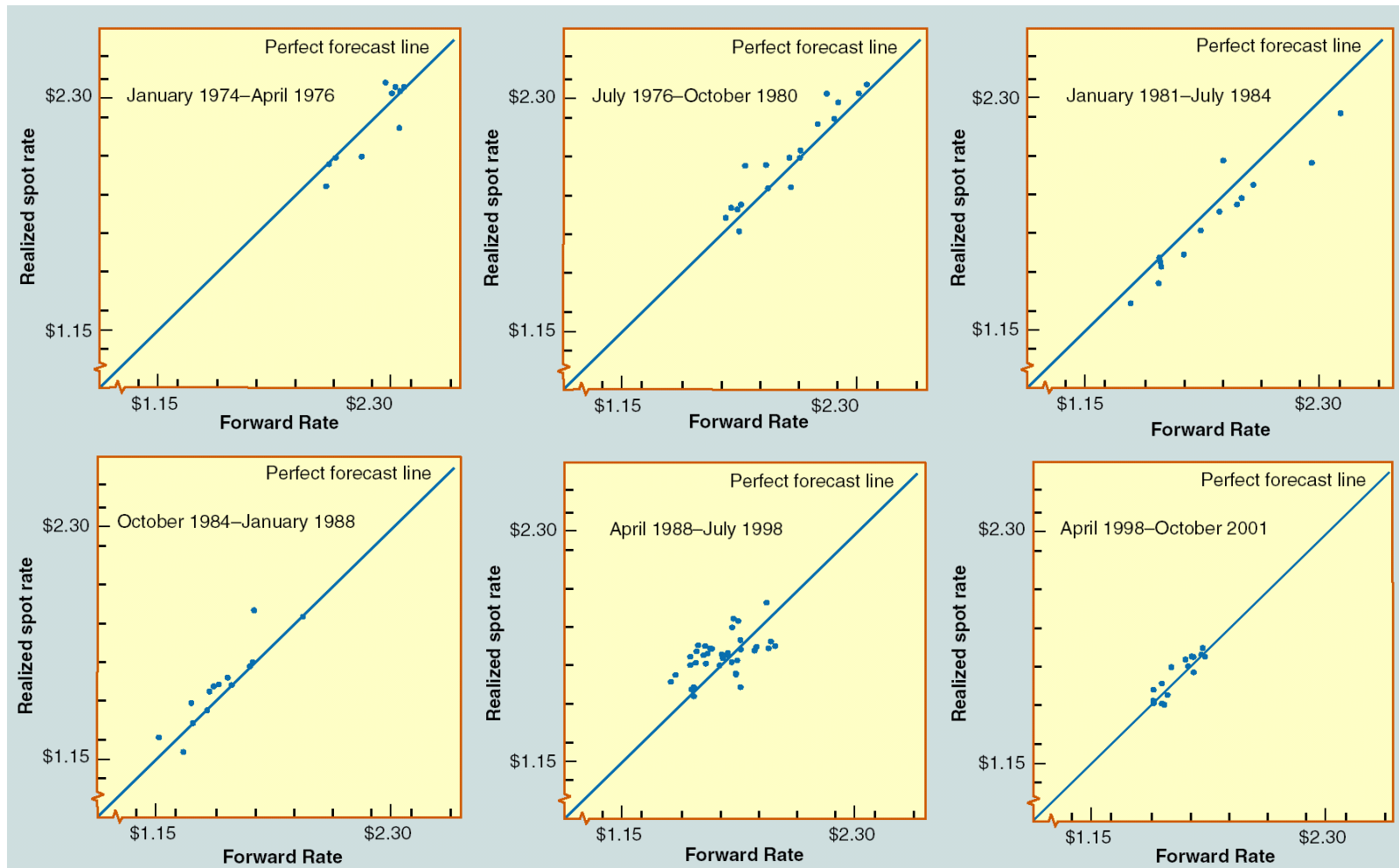
Graphic Evaluation of Forecast Performance



Graphic Evaluation of Forecast Performance

- If the points appear to be scattered evenly on both sides of the perfect forecast line, then the forecasts are said to be **unbiased**.
- Note that a more thorough assessment can be conducted by separating the entire period into subperiods.

Forecast Bias in Different Subperiods for the British Pound



Comparison of Forecasting Methods

- The different forecasting methods can be evaluated
 - graphically – by visually comparing the deviations from the perfect forecast line, or
 - statistically – by computing the forecast errors for all periods.

Forecasting Under Market Efficiency

- If the foreign exchange market is **weak-form efficient**, then the current exchange rates already reflect historical information. So, technical analysis would not be useful.
- If the market is **semistrong-form efficient**, then all the relevant public information is already reflected in the current exchange rates.

Forecasting Under Market Efficiency

- If the market is **strong-form efficient**, then all the relevant public and private information is already reflected in the current exchange rates.
- Foreign exchange markets are generally found to be at least semistrong-form efficient.

Forecasting Under Market Efficiency

- Nevertheless, MNCs may still find forecasting worthwhile, since their goal is not to earn speculative profits but to use exchange rate forecasts to implement policies.
- In particular, MNCs may need to determine the range of possible exchange rates in order to assess the degree to which their operating performance could be affected.

Exchange Rate Volatility

- A more **volatile** currency has a larger expected forecast error.
- MNCs measure and forecast exchange rate volatility so that they can specify a range (confidence interval) around their point estimate forecasts.

Exchange Rate Volatility

- Exchange rate volatility can be forecasted using:
 - ① recent (historical) volatility,
 - ② a historical time series of volatilities (there may be a pattern in how the exchange rate volatility changes over time), and
 - ③ the implied standard deviation derived from currency option prices.