International Finance
FINA 342

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Class Notes 7

EXCHANGE RATE FORECASTING

I. MARKET-BASED FORECASTS

- Market-based exchange rate forecasts combine the international parity conditions with market prices.

- Forward Parity or Unbiased Expectations Hypothesis

  ◊ Use the unbiased nature of forward rates.

  $$E[S_t^{d/f}] = F_t^{d/f}$$

  Expected future spot rate at time t = Forward rate that matures at time t, which the price is known today.

  ◊ However, forecasting horizon is limited for about 1 year with forward rates, because forward rates that have horizons longer than 1 year are not always obtainable.

  ◊ Let $s_t^{\$/FC}$ be the percentage change in the spot exchange rate and $FP_t^{\$/FC}$ be the forward premium. Then the forward parity requires

  $$s_t^{\$/FC} = \alpha + \beta\, FP_t^{\$/FC} + e_t$$

  Forward parity predicts that $\alpha = 0$ and $\beta = 1$.

- Interest Rate Parity and Exchange Rate Determination

  ◊ Recall: IRP relationship is given by

$$F_{t+1}^{\$/FC} = S_t^{\$/FC} \frac{1+i_t^{\$}}{1+i_t^{FC}}$$

  or

$$F_t^{\$/FC} = S_0^{\$/FC} \left(\frac{1+i^{\$}}{1+i^{FC}} \right)^t$$

  ◊ Combining with the forward parity gives

$$E\left[S_t^{\$/FC}\right] = S_0^{\$/FC} \left(\frac{1+i^{\$}}{1+i^{FC}} \right)^t$$

  or

$$S_0^{\$/FC} = E\left[S_t^{\$/FC}\right] \left(\frac{1+i^{FC}}{1+i^{\$}} \right)^t$$

  – Expectation plays a key role in exchange rate determination.
  – Exchange rate behavior is driven by news events.

- PPP and Exchange Rate Determination

  ◊ From the relative PPP relationship, we obtain

$$E\left[S_{t+1}^{\$/FC}\right] = S_t^{\$/FC} \frac{1+p_t^{\$}}{1+p_t^{FC}}$$

  or

$$E\left[S_{t+1}^{\$/FC}\right] = S_0^{\$/FC} \left(\frac{1+p^{\$}}{1+p^{FC}} \right)^t$$

◊ Absolute PPP and Quantity Theory of Money

– Absolute PPP: $S^{\$/FC} = P^{\$} / P^{FC}$

– Quantity theory of money: $P^{\$} = M^{\$} V^{\$} / y^{\$}$

$P^{FC} = M^{FC} V^{FC} / y^{FC}$

– The *monetary approach* is based on PPP and the quantity theory of money, i.e.,

$$S^{\$/FC} = \left(\frac{M^{\$}}{M^{FC}} \times \frac{V^{\$}}{V^{FC}} \right) \Big/ \frac{y^{\$}}{y^{FC}}$$

– The monetary approach can be viewed as a long-run theory, not a short-run theory, of exchange rate determination.

II. MODEL-BASED FORECASTS

- Fundamental Analysis

◊ Use macroeconomic data to predict future exchange rate changes.

◊ Example: Monetary approach

$$s_t^{\$/FC} = \alpha + \beta_1 (m_t - m_t^*) + \beta_2 (v_t - v_t^*) + \beta_3 (y_t^* - y_t)$$

◊ Difficulties

– One has to forecast a set of independent variables to forecast the exchange rates.

– The parameter values that are estimated using historical data may change over time.

- Technical Analysis

  ◊ Use past information of prices or exchange rates and trading volume. This technique is also called *charting*. It relies on various patterns of price movements, including trend and moving averages.

  ◊ Some forecasting services use technical analysis to predict exchange rate movements. They graphically record the actual trading history of the currency and try to infer possible future trends based on that information alone.

  ◊ The analysis is technical in the sense that it does not rely on any fundamental analysis of the underlying economic determinants of exchange rates, but only on the extrapolations of past price trends.

  ◊ This forecasting method is typically used for very short-term analysis such as intraday or weekly forecasts.

  ◊ Technical trading rules based on past exchange rates:
  (i) Filter rule
  (ii) Moving average rule

  ◊ Filter Methods

  – Filter rules are trading strategies based on the past history of an asset price that provides signals to an investor indicating when to buy and sell.

  – Filter rules generate buy signals when an exchange rate rises N% (the filter) above its most recent trough, and sell signals when it falls N% below the previous peak.

  See Exhibit 7.1

– Numerical example:

Month	Spot ($/£)	$ interest rate	£ interest rate
0	1.5000	5% p.a.	8% p.a.
1	1.5150	5	8.5
2	1.5250	5	8.5
3	1.6500	5.5	8.5
4	1.6335	6	8
5	1.6005	6	8
6	1.5500	6	8
7	1.4500	6	8
8	1.4645	6	8.5

◊ Moving Average Rule

– An (Y,Z) moving average crossover rule goes long (short) in the foreign currency when the short-term moving average of past prices (based on the most recent Y days) crosses the long-term moving average (based on Z pervious days) from below (above). Common moving average rules are (1,5), (1,20), (5,20).

See Exhibit 7.2

– When the short-term moving average exceeds the long-term moving average, the currency's value in the recent past exceeds its value in the more distant past, indicating that an upward trend is developing.

– The signals from a moving average rule could entail frequent trading, when the long-term moving average crosses the spot exchange rate at several points.

Exhibit 7.1

Filter Rule

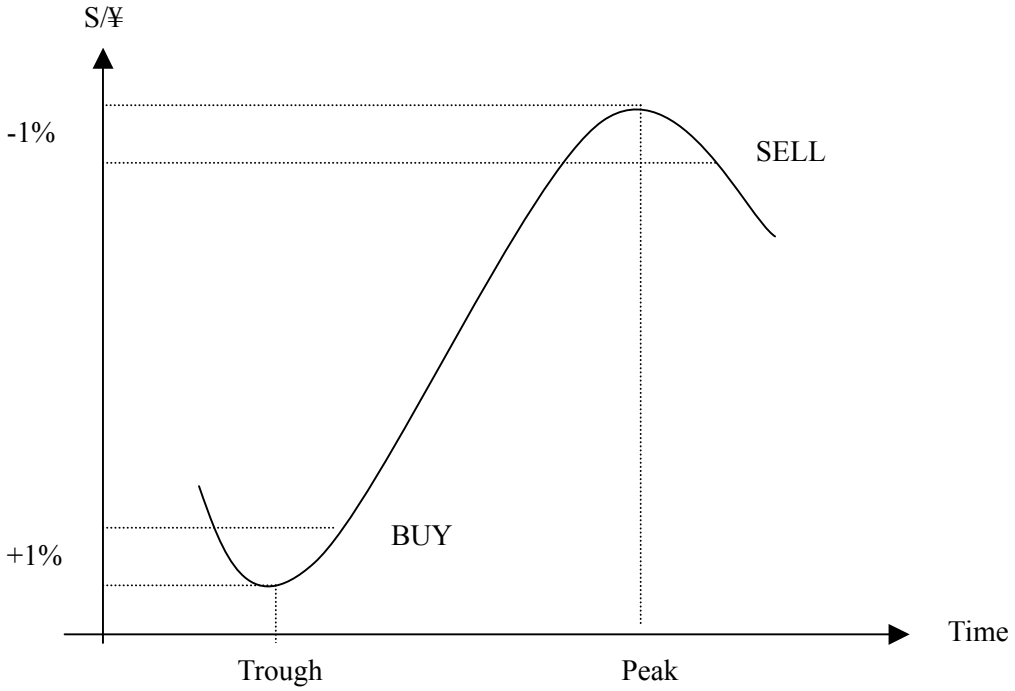

Exhibit 7.2

Moving Average Rule