国际财务管理

第四讲 国际金融的平价条件

对外经济贸易大学国际商学院会计学系制作

International Parity Conditions

- Some fundamental questions managers of MNEs, international portfolio investors, importers, exporters and government officials must deal with every day are:
  - What are the determinants of exchange rates?
  - Are changes in exchange rates predictable?
- The economic theories that link exchange rates, price levels, and interest rates together are called international parity conditions.
- These international parity conditions form the core of the financial theory that is unique to international finance.

Prices and Exchange Rates

- If the identical product or service can be sold in two different markets, and no restrictions exist on the sale or transportation costs of moving the product between markets, the products price should be the same in both markets.
- This is called the *law of one price*.

The Law of One Price

一价定律可用下式表示：

$$P(i, t) = P^*(i, t)\, S(t) \qquad (1)$$

其中， $P(i, t)$表示i商品的一种货币价格

$P^*(i, t)$ 表示i商品的另一种货币价格

$S(t)$是两种货币之间的现行汇率。

例：黄金在纽约 1盎司＝400美元

在伦敦 1盎司＝250英镑

$\$400 = £250 \times S(t)$　　$S(t) = \$1.6/£$

Purchasing Power Parity—PPP

购买力平价定理的含义是：一国货币按其所能购买的商品和服务而确定其价值，因此，两国货币之间的汇率应同这两个国家物价水平的比率相一致。

用商品的价格水平代替(1)式中的商品价格，得到购买力平价的绝对式：

一个国家（本国）的价格水平：$P(t)=\sum W(t)\,P(i,t)$

另一个国家(外国)的价格水平：$P^*(t)=\sum W^*(t)\,P^*(i,t)$

其中$W(t)$和$W^*(t)$分别表示i商品在两国经济中的权数。两国之间的价格水平的关系为：

$$P(t)=P^*(t)\,S(t) \qquad (2)$$

This is the *absolute version* of the PPP theory.

Absolute form of PPP

一组商品	价格 德国：DM	英国：£	美国：$
2升啤酒	4	1.75	3
1磅羊毛	2	0.25	1
1磅牛肉	10	2.00	4
合计	16	4.00	8

上表说明：$P = \sum W(t)\, P(i, t) = DM16$

$P = £4$　　$P = \$8$

Relative form of PPP

考虑价格指数：

例：Pt=∑Q it Pit　　Po=∑Q io P io

其中Qi表示i种商品价值占样本价值中的权数

$$\text{价格指数}=\text{PI}=\frac{P_t}{P_0}=\frac{\sum Q_{it}P_{it}}{\sum Q_{i0}P_{i0}}$$

在计算物价指数时，通常基础年份为100，如果样本商品在基础年份价格是10.43美元，而到第2年变为11.06美元，则第2年的物价指数为：

$$PI=\frac{P_t}{P_0}=\frac{11.06}{10.43}\times 100=106.04\%=1+\dot{P}$$ =1+6.04%

$\dot{P}$ 表示通货膨胀率

Relative form of PPP

购买力平价的相对形式认为：汇率的变动与相应时期内有关国家用物价指数表示的物价水平相对变动成比例，其表达如下：

在 t 时期　　P (t)＝P *(t) S (t)

在 t +T 时期　P (t＋T)＝P*(t＋T) S (t＋T)

$$\frac{S(t+T)}{S(t)} = \frac{P(t+T)}{P(t)} \Big/ \frac{P^*(t+T)}{P^*(t)} \qquad (3)$$

其中P (t)和P*(t)既表示价格水平又表示价格指数，t表示基期，t＋T表示下一时期。

Relative form of PPP

在实际应用中，相对购买力平价可以转换成通货膨胀率的形式来表示，由前面所述

$$\frac{P(t+T)}{P(t)} = 1+\dot{P} \qquad \frac{P^*(t+T)}{P^*(t)} = 1+\dot{P}^*$$

由(3)式，可得：$$\frac{S(t+T)}{S(t)} = \frac{1+\dot{P}}{1+\dot{P}^*}$$

又可表示为：（针对基础货币）

$$\frac{S(t+T)-S(t)}{S(t)} = \frac{\dot{P}-\dot{P}^*}{1+\dot{P}^*} \qquad (4)$$

其中$\dot{P}$表示本国通货膨胀率，表示$\dot{P}^*$外国通货膨胀率

此式所明汇价变动的程度取决于二国的通货膨胀率。

Relative form of PPP

设德国的年通货膨胀率是6%，而法国的年通货膨胀率是13%，S (t)＝DM/FF, 则根据(4)式有：

$$\frac{S(t+T)-S(t)}{S(t)}=\frac{\dot{P}-\dot{P}^*}{1+\dot{P}^*}=\frac{0.06-0.13}{1+0.13}=-0.0619$$

这说明法郎相对于马克的年汇率要下降6.19%。

Relative form of PPP

- Empirical testing of PPP and the law of one price has been done, but has not proved PPP to be accurate in predicting future exchange rates.
- Two general conclusions can be made from these tests:
  - PPP holds up well over the very long run but poorly for shorter time periods
  - The theory holds better for countries with relatively high rates of inflation and underdeveloped capital markets

Interest Rate and Exchange Rate

- The Fisher Effect states that nominal interest rates in each country are equal to the required real rate of return plus compensation for expected inflation.
- This equation reduces to (in approximate form):

$$i = r + \dot{P}$$

Where i = nominal interest rate, r = real interest rate and $\dot{P}$ = expected inflation.

- The Fisher Effect (FE）：$i - i^* = \dot{P} - \dot{P}^*$

Interest Rate and Exchange Rate

- The relationship between the percentage change in the spot exchange rate over time and the differential between comparable interest rates in different national capital markets is known as the *international Fisher effect*.

$$\dot{S}(t) = \frac{S(t+T) - S(t)}{S(t)} = \frac{i - i^*}{1 + i^*}$$

国际费雪效应表明：在无限制的国际资本流动的条件下，套利活动使得两国的利率之差可作为预期即期汇率变动的无偏估计。

International Fisher Effect

Pus＝4％ P＝0.97% i us＝8％ i＝4.85%
So＝DM1.840/$ F1＝DM1.7864/$
S1＝？（一年后二国的汇率应等于多少？）
应用**PPP,($/DM)**

S (t)=($\dot{P} - \dot{P}^*$**)/(1＋**$\dot{P}^*$**)＝(4%-0.97%)/(1+0.97%)＝3％**
说明**DM**相对于美元一年后将升值**3％**。
So＝$0.5435/DM,
S1＝0.5435(1+3%)=$0.5598/DM (或**DM1.7864/$**)

应用**IFE**，（**DM/$**）
S (t)= (i－i*)/(1＋i*)＝(I - ius)/(1+ius)=-2.917％
S1＝1.840(1-2.917%)=DM1.786327/$

Forward Rate as an Unbiased Predictor of the Future Spot Rate

$$\frac{F(t+T)-S(t)}{S(t)} \approx i - i^*$$

$$\dot{S}(t) = \frac{S(t+T)-S(t)}{S(t)} \approx i - i^*$$

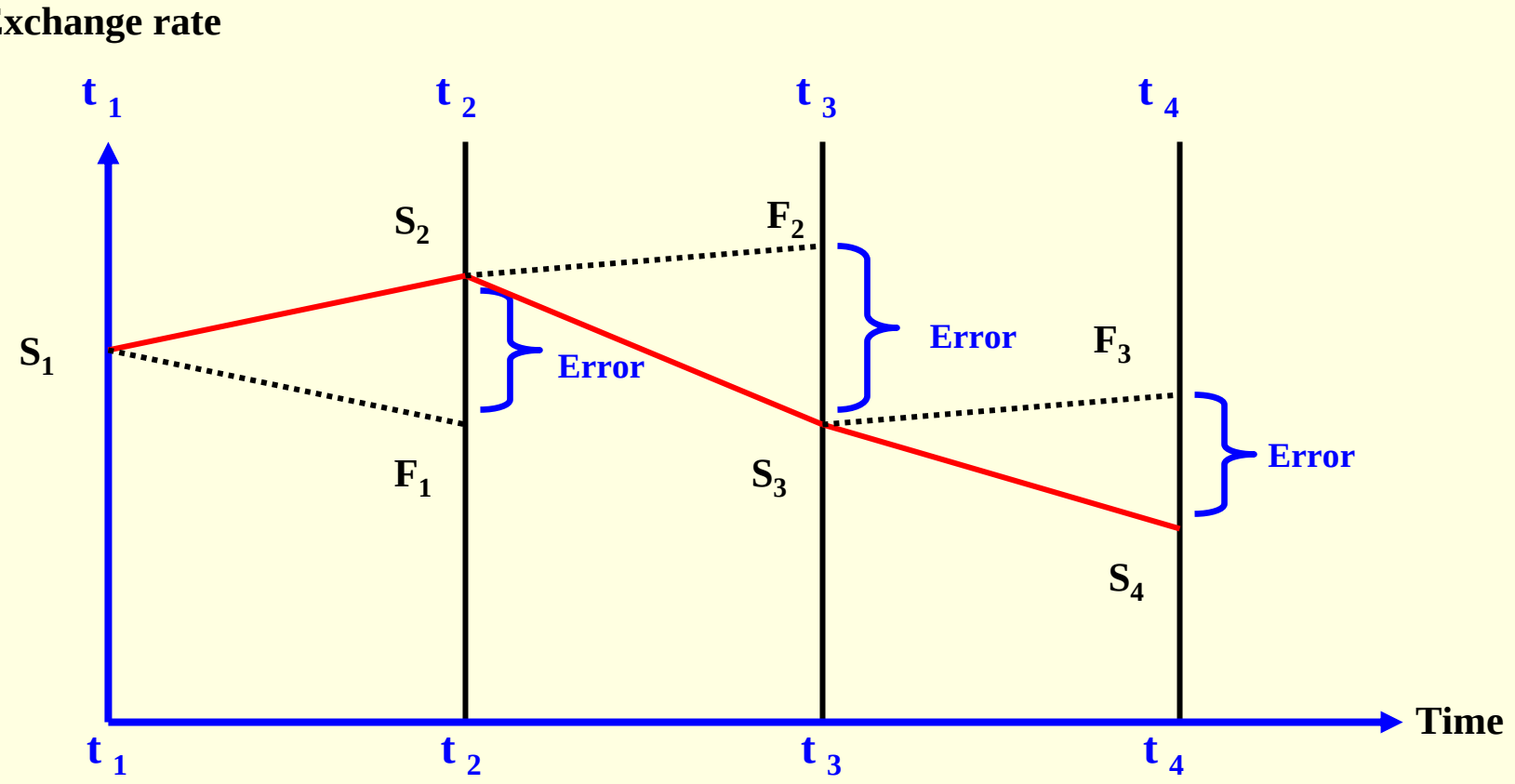
$$\frac{F(t+T)-S(t)}{S(t)} = \frac{S(t+T)-S(t)}{S(t)}$$

$$F(t+T) = S(t+T)$$

Forward Rate as an Unbiased Predictor of the Future Spot Rate

- Some forecasters believe that forward exchange rates are unbiased predictors of future spot exchange rates.
- Intuitively this means that the distribution of possible actual spot rates in the future is centered on the forward rate.
- Unbiased prediction simply means that the forward rate will, on average, overestimate and underestimate the actual future spot rate in equal frequency and degree.

Exhibit 1 Forward Rate as an Unbiased Predictor for Future Spot Rate



The forward rate available today ($F_{t,t+}1$), time t, for delivery at future time t+1, is used as a "predictor" of the spot rate that will exist at that day in the future. Therefore, the forecast spot rate for time S_{t2} is F_1; the actual spot rate turns out to be S_2. The vertical distance between the prediction and the actual spot rate is the forecast error. When the forward rate is termed an "unbiased predictor of the future spot rate," it means that the forward rate over or underestimates the future spot rate with relatively equal frequency and amount. It therefore "misses the mark" in a regular and orderly manner. The sum of the errors equals zero.

Exhibit 2 International Parity Conditions in Equilibrium (Approximate Form)

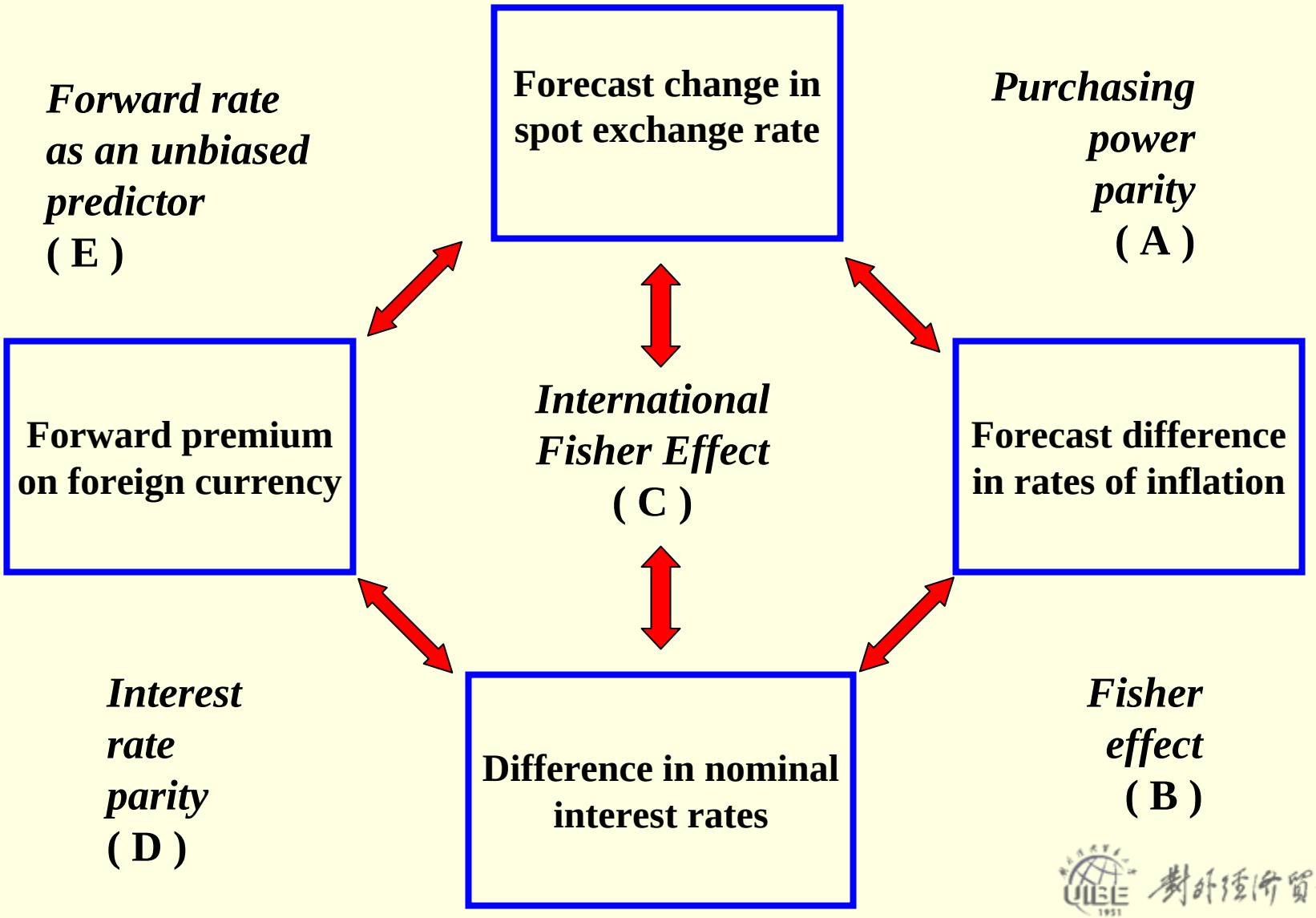
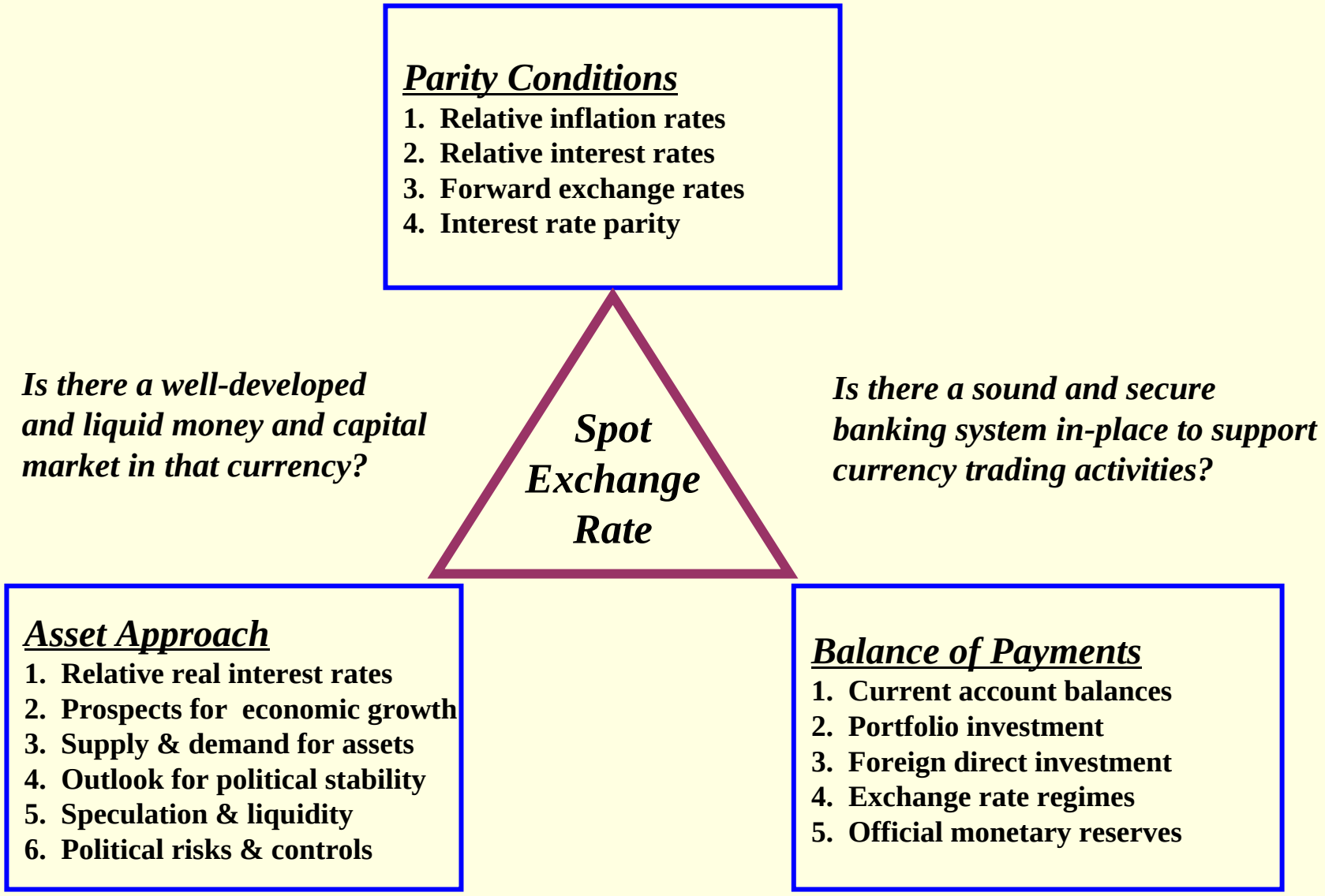


Exhibit 3 The Determinants of Foreign Exchange Rates



Exchange Rate Forecasting

- **Fundamental Analysis**
  - A、经济方面
    - a. 国际收支
    - b. 通货膨胀率
    - c. 利率水平
    - d. 汇率政策
  - B、政治及新闻舆论方面
  - C、心理预期方面
  - D、投机因素
  - E、其它方面
- **Technical Analysis**

Exhibit 3 Differentiating Short-Term Noise from Long-Term Trends