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Economic Analysis

CFA二级培训项目

讲师：何　旋

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Reading 13

CURRENCY EXCHANGE RATE: DETERMINATION AND FORECASTING

Bid-Ask Spread

影响因素★	
quoted by the dealer	1. interbank spread (+) 2. size of the transaction (+) 3. relationship between the dealer and client: give favorable rates to preferred clients
interbank spread	1. Currencies involved: high-volume currency pairs (e.g., USD/EUR, USD/JPY, and USD/GBP) command lower spreads 2. Time of day: New York→8:00 a.m.~11:00 a.m.; London→13:00~16:00 3. Market volatility (+) 4. Spreads in forward exchange rate: increase with maturity

Triangular Arbitrage ★★

计算

1.计算cross rate：将两个汇率算出交叉汇率，再和第三个汇率对比，哪一种货币便宜就买哪一种

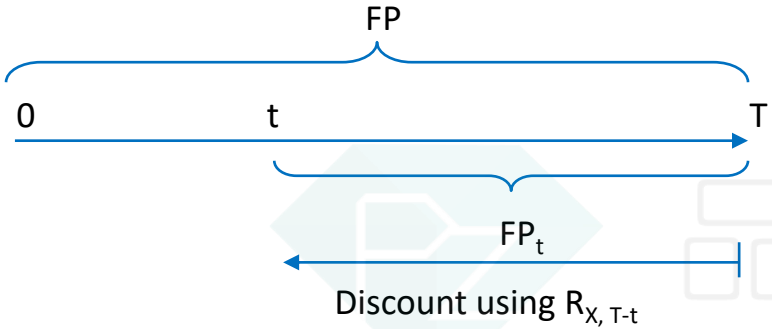
2.A→B→C→A，可以计算出arbitrage profit (Compare bid-ask rate quoted by ***dealer*** with exchange rate in current ***interbank*** market.)

注意：相乘同边，相除对角；乘小除大

Mark-to-market value★

计算

1. Forward discount or premium = $F - S_0$
2. Mark-to-market value: 思路→签反向对冲合约，计算净收益，就是value



$$V_t = \frac{(FP_t - FP)(\text{contract size})}{\left(1 + R\left(\frac{days}{360}\right)\right)}$$

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International Parity Conditions★★

Interest Rate Parity

Covered IRP 计算

公式: $$\frac{F_{X/Y}}{S_{X/Y}}=\frac{\left(1+r_X\right)^{\left[\frac{Actual}{360}\right]}}{\left(1+r_Y\right)^{\left[\frac{Actual}{360}\right]}}$$

考法:

1、计算F，或forward premium (=F – S)

2、arbitrage：

$If\ \frac{F}{S}>\frac{1+r_X}{1+r_Y},\frac{F}{S}\times(1+r_Y)>1+r_X$

→ borrow X currency, the profit will be $\frac{F}{S}\times(1+r_Y)-(1+r_X)$

$If\ \frac{F}{S}<\frac{1+r_X}{1+r_Y},\frac{S}{F}\times(1+r_X)>1+r_Y$

→ borrow Y currency, the profit will be $\frac{S}{F}\times(1+r_X)-(1+r_Y)$

Uncovered IRP 性质

公式: $$S_0\times\left(\frac{1+r_X}{1+r_Y}\right)^t=E\left[S_t\right]$$

性质:

- Uncovered in this context means not bound by arbitrage.
- The base currency is expected to appreciate (depreciate) by approximately r_x - r_Y when the difference is positive (negative), r_x - r_Y >0.
- Uncovered interest rate parity assumes that investors are risk-neutral.

区别联系:

- Covered → no-arbitrage forward rate, uncovered →expected future spot rate.
- If uncovered interest rate parity holds, the forward rate is an unbiased predictor of expected future spot rates.
- Uncovered does not hold in the short run, and it does hold in the long run.

International Fisher Relation

公式	$\frac{1+r_X^{Nom}}{1+r_Y^{Nom}}=\frac{1+\pi_X^{e}}{1+\pi_Y^{e}} \Rightarrow r_X^{Nom}-r_Y^{Nom} \approx \pi_X^{e}-\pi_Y^{e}$
假设	Real interest rates are stable over time and equal across international boundaries. (***real interest rate parity***)
结论★	Interest rate differential between two countries should be equal to the expected inflation differential.

PPP

Absolute PPP	Absolute PPP might not hold because the weights (consumption patterns) of the various goods in the two economies may not be the same.
Relative PPP (事后形式)	公式：$\frac{S_t}{S_0}=\frac{\text{é}1+\mathrm{I}_X\text{ù}}{\text{ê}1+\mathrm{I}_\mathrm{Y}\text{ú}}$, if t=1, $\frac{S_t - S_0}{S_0}=\%\mathrm{D}S_{X/Y} \approx \mathrm{I}_X - \mathrm{I}_\mathrm{Y}$
	结论：★ ✓ Relative PPP focuses on actual changes in exchange rates being driven by actual differences in national inflation rates. ✓ Because there is no true arbitrage available to force the PPP relation to hold, violations of the relative PPP relation in the short run are common.
Ex-Ante PPP (relative PPP)	$S_0\left[\frac{1+\mathrm{I}_X^{e}}{1+\mathrm{I}_Y^{e}}\right]^t=E(S_t)$

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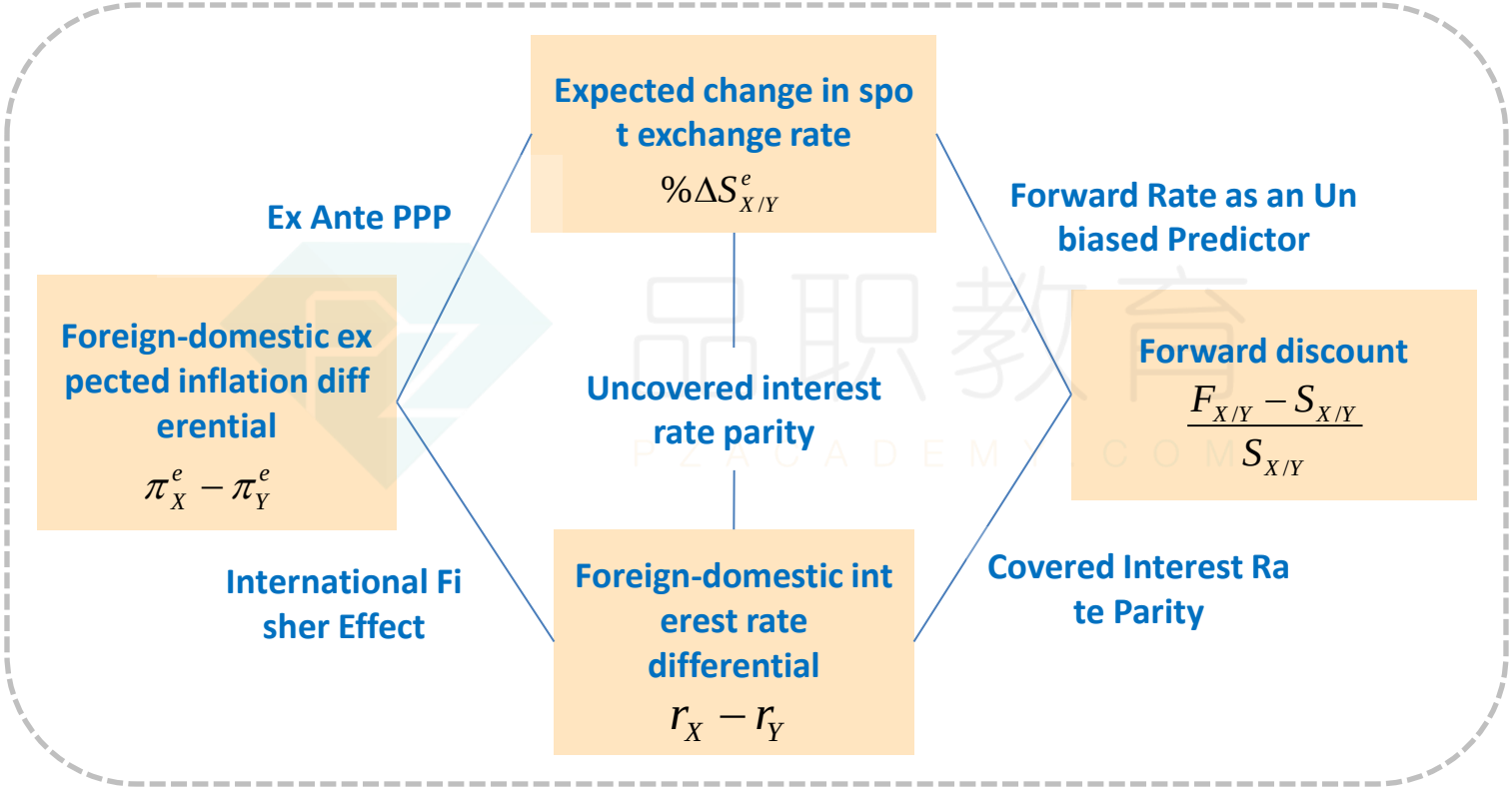
Relationships Among International Parity Conditions



区别联系：Uncovered IRP、international Fisher relation、Ex-Ante PPP，三者当中其中两个成立，另外一个也成立

评估long-run fair value of an exchange rate★

Relative PPP成立	Real exchange rate is constant →equilibrium real exchange rate
Macroeconomic balance approach	Current account balance时的汇率才是均衡汇率
External sustainability approach	external debt (asset) relative to GDP towards its sustainable level才是均衡汇率
Reduced-form econometric model	Estimates the equilibrium path of exchange rate movements based on patterns in several key macroeconomic variables

BOP对汇率的影响★

Current Account	1. Initial deficit→本币贬值； 2. →domestic import price上升，export price下降→出口数量不会立刻上升，因为有***time lag***； 3. →***Price elasticity***比较大时，才增加出口revenue，降低进口revenue
Financial Account	1. capital flows into a country →currency appreciation 2. Excessive capital inflows into emerging markets create problems 3. X/Y：r_Y上升→Y升值；risk premium of Y上升→Y贬值 4. Countries that run relatively tight monetary policies, introduce structural economic reforms, and lower outsized budget deficits will often see their currencies strengthen over time. **5. Equity market trends and exchange rate** • ***Instability in correlation*** • ***Correlation tends to converge toward zero in the long run***
Capital flows tend to be the dominant factor influencing exchange rates in the short term	

Taylor Rule★★

公式	中央银行目标名义利率→$R = r_n + \pi + \alpha(\pi - \pi^*) + \beta(y - y^*)$
结论	1. policy rate(市场上观察到的政策利率) > R →扩张的政策，使得利率下降，达到目标 2. policy rate(市场上观察到的政策利率) < R →紧缩的政策，使得利率上升，达到目标

FX Carry Trade★★

计算profit	If $r_X > r_Y$, borrow Y and invest in X $all\ in\ return = \frac{S_0}{S_1}(1+r_X) - (1+r_Y) \approx r_X - r_Y - \%DS$
前提	Uncovered IRP不成立。 If uncovered IRP held at all times, investors couldn't profit
Risk	✓ Funding currency may appreciate significantly against the currency of the investment. ✓ Crash risk: return distribution of the carry trade is not normal; it is characterized by negative skewness and excess kurtosis
风险管理	Volatility管理：Carry trade typically performs well during low-volatility periods Valuation管理：如果X本来价值就被高估，尽量不要做X的carry trade

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Exchange Rate Determination Models

宏观经济政策对汇率的影响：三个model

1. Mundell-Fleming model★★

Flexible Exchange Rate Regimes	
High capital mobility	Monetary policy (financial account的影响)： 1. 扩张→r下降→资本流出→本币贬值； 2. 紧缩→r上升→资本流入→本币升值。
	Fiscal policy (financial account & current都有影响)： 1. 扩张→ ✓ Current account：经济增长，国民收入增加，inflation上升→出口下降，进口增加，current account赤字→本币贬值 ✓ Financial account：r上升→资本流入→本币升值 2. 紧缩→ ✓ Current account：国民收入下降→进口下降，current account盈余→本币升值 ✓ Financial account：r下降→资本流出→本币贬值
Low capital mobility (以扩张政策为代表)	Monetary policy： 扩张→r下降→资本流出，但资本无法大幅自由流动→本币很小幅贬值
	Fiscal policy (资本账户管制，current account起主要影响作用)：扩张→ ✓ Current account：经济增长，国民收入增加，inflation上升→出口下降，进口增加，current account赤字→本币贬值 ✓ Financial account：r上升→资本流入，但是资本无法大幅流入→**本币小幅升值**

Fixed Exchange Rate Regimes	
High capital mobility (low不讨论)	Monetary policy (financial account的影响)： 扩张→r下降→资本流出→本币有贬值倾向→央行为了稳定币值，要大量买入本币，相当于又回收流动性→紧缩的货币政策→货币政策无效
	Fiscal policy (financial account 起主要影响)： 扩张→r上升→资本流入→本币有升值倾向→央行为了稳定币值，要大量抛本币，相当于扩张的货币政策→双扩张政策，效果加倍
结论	**三元悖论**：mobility of capital、independent monetary policy、Fixed Exchange Rate Regimes三者不可兼得，只能取其中两个

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2. Monetary Approach 了解结论

对比Mundell-Fleming	1. Mundell-Fleming model：inflation play no role、short term view 2. monetary models：monetary policy →影响**inflation** (假设output is fixed)→exchange rates.
Pure monetary	Long term view, PPP成立 扩张→inflation→本币贬值(名义贬值；因为PPP成立，所以实际汇率不变)
Dornbusch overshooting model	Short term view, PPP不成立 扩张货币政策→短期会影响实体经济，r下降→资本流出→本币贬值 (实际汇率的贬值)
	Long term view, PPP成立 扩张→inflation→本币贬值(名义贬值；因为PPP成立，所以实际汇率不变)
	结论：In the short term, exchange rates overshoot the long-run PPP implied values. In the long term, exchange rates gradually increase toward their PPP implied values.

3. Portfolio Balance (Asset Market) Models 了解结论

对比Mundell-Fleming	✓ The Mundell-Fleming approach focuses on the short-term implications of fiscal policy. ✓ The portfolio balance model focuses on the long-term implications of sustained fiscal policy (deficit or surplus) on currency values.
主要观点	扩张财政政策→fiscal deficit→长期赤字不可持续→investors may refuse to fund the deficits→投资者撤资，本币贬值
	Mundell-Fleming model：扩张财政政策→本币最终升值

Central Bank Intervention

了解结论

Effectiveness：

- For developed markets, central banks are relatively ineffective.
- Central banks of emerging market countries may have accumulated sufficient foreign exchange reserves (relative to trading volume).

Sterilized Intervention Operation

- If ***inflation is a concern***, then this intervention would need to be sterilized.
  - In a sterilized intervention operation, EM authorities would ***sell domestic securities*** to the private sector to mop up any excess liquidity created by its FX intervention activities.

Capital Control

- ***The more persistent*** those flows are, and ***the larger their magnitude***, the ***less likely it is that capital controls will be effective.***

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Signs of Currency Crisis

了解

Terms of trade deteriorate.
Official foreign exchange reserves dramatically decline.
Real exchange rate is higher than the mean-reverting level.
Inflation increases.
Equity markets experience a boom-bust cycle.
Money supply relative to bank reserves increases.
Nominal private credit grows.

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ECONOMIC GROWTH AND INVESTMENT DECISION

Preconditions for Growth

对经济增长有利的方面：★★
Savings and investment： high saving
Financial markets and intermediaries：完善的金融市场体系
The political stability, rule of law, and property rights：政治稳定，有专利权
Investment in human capital：对教育的投资
Tax and regulatory systems：完善、透明
Free trade and unrestricted capital flows：没有贸易和资本管制是好的

股票市场和经济增长的关系★

%△P = %△GDP + %△(E/GDP) + %△(P/E)， Over the long term→

- growth in earnings relative to GDP is zero
- Growth in the P/E ratio will also be zero
- ***the potential GDP growth rate equals the growth rate of aggregate equity valuation.***

Importance of Potential GDP

- Growth in potential GDP →consumers expect their incomes to rise →consumption增加，saving下降→为了鼓励储蓄，会提供给投资者更高return →higher real interest rates &higher real asset returns
- The relationship between actual GDP and potential GDP: the gap between the two can be used as a ***forecast of inflationary pressures***, which is the most important factor for ***fixed income investor***.

Cobb-Douglas production function★★

$$Y = TK^{\alpha}L^{(1-\alpha)}$$

- α and (1 - α)= the share of output allocated to capital (K) and labor (L)
- It exhibits constant returns to scale.

第一个变形：Output per worker=Y/L=T(K/L)$^{\alpha}$

结论：

- increases in output can be gained by increasing capital per worker (capital deepening) or by improving technology (increasing TFP).
- The Cobb-Douglas function exhibits diminishing marginal productivity of capital (but constant marginal product of capital)
- Developed countries：the capital per worker ratio is relatively high →增加资本对经济增长效果很小 →technological progress其主要作用.
- Developing nations：low capital per worker ratios, so capital deepening can lead to at least a short-term increase in productivity.

第二个变形： $\frac{\Delta Y}{Y} \approx \frac{\Delta A}{A} + \alpha\frac{\Delta K}{K} + (1-\alpha)\frac{\Delta L}{L}$ 计算

第三个变形： $\frac{\mathrm{D}Y}{Y} \approx \frac{\mathrm{D}y}{y} + \frac{\mathrm{D}L}{L}$

Growth rate in potential GDP = long-term growth rate in labor productivity ＋long-term growth rate of labor force

各种factor对经济增长的影响

Natural Resources ★★	'Dutch disease': 自然资源丰富的国家→出口自然资源→本币升值→other domestic industries uncompetitive in the global markets.
Labor Supply Factors	1. Demographics: younger populations & 高fertility rates，有利 2. Labor force participation： more women enter the workforce 3. Immigration. 4. Average hours worked
Capital	Human capital： education Physical capital
Technology	Developed countries tend to spend the most on R&D. Less developed countries often copy.

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Economic Growth Theories

理论	主要观点
Classical growth theory	The growth in real GDP is not permanent. Real wages will eventually be driven back to the subsistence level.
Neoclassical growth theory★★	Long-term steady state growth rate: $g^* = \frac{q}{(1-a)}$ $G^* = \frac{\theta}{(1-\alpha)} + \Delta L$ 计算 1. **Capital Accumulation:** affects the ***level of output*** but ***not the growth rate*** in the long run; Regardless of its initial level, a growing economy will ***move to a point of steady state growth***. 2. **Capital Deepening vs. Technology:** ***Long-term sustainable growth cannot rely solely on capital deepening investment***. Because of ***diminishing marginal returns to capital,*** the only way to sustain growth in potential GDP per capita is through ***technological change or growth in total factor productivity.*** 3. **Convergence:** ***convergence of per capita incomes between developed and developing countries*** 4. **Effect of Savings on Growth:** ***Higher savings cannot permanently raise the growth rate of Y.***
Endogenous growth theory★★	1. Investment →technological growth 2. no steady state growth rate 和neoclassical区别： 1. Neoclassical theory assumes that capital investment will expand as technology improves,但技术进步是偶然发生的。 2. capital investment →提高技术进步，技术进步是可持续的

Convergence Hypotheses ★

考法：给出描述，判断是哪一种

和Neoclassical growth theory是一致的	
Absolute	无条件的，Less developed countries will achieve equal living standards
Conditional	Same production functions,saving rate才趋同
Club	自身change→加入club →club里的国家会趋同

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Reading 15

ECONOMICS OF REGULATION

掌握重要名词

Regulations
Statutes：立法机关制定的法律
Administrative regulations：government agencies或其他政府授权机构制定的rules
Judicial law: findings of the court

几个特殊的regulator →

SROs:要有政府授权。比如，PCAOB、FINRA
Outside bodies：制定监管准则的。比如，FASB、IASB

Regulatory Interdependencies★	
Regulatory capture theory	Regulator会受到被监管行业的影响
Regulatory competition	Regulator竞相提供更友好的商业环境
Regulatory arbitrage	被监管人会钻监管漏洞。 要求全球合作统一监管

Cost Benefit Analysis of Regulation →

Regulatory burden
sunset clause


Thank
You!