

## 固定匯率與外匯干預 (part 2)

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[取材自Krugman, et al. (2018)  
chap. 7]

### 1 管理浮動與沖銷干預

- Under **managed floating**, ...the central bank faces a trade-off between domestic objectives such as employment or the inflation rate and exchange rate stability
- ...assume that foreign exchange intervention is being **sterilized**, so that opposite domestic asset transactions prevent it from affecting the money supply
- Empirical studies of central bank behavior confirm this assumption and consistently show central banks to have practiced sterilized intervention under flexible and fixed exchange rate regimes alike
  - (but) ...there is considerable disagreement among economists about its effects

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### 1-1 完全的資產替代與沖銷干預的無效性

- Our model ... predicts that sterilization will be fruitless **under a fixed exchange rate**
  - 無論是財政(擴張)或貨幣(寬鬆)政策
  - The key feature of our model that leads to these results is the assumption that the foreign exchange market is in equilibrium only when the expected returns on domestic and foreign currency bonds are the same
  - This assumption is often called **perfect asset substitutability** (⇒均衡匯率由利率平價條件決定)

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### 1-1

- In contrast ..., **imperfect asset substitutability** exists when it is possible for **assets' expected returns to differ in equilibrium**
- If bonds denominated in different currencies have different degrees of risk, investors may be willing to earn lower expected returns on bonds that are less risky
- Correspondingly, they will hold a very risky asset only if its expected return is relatively high
- Under imperfect asset substitutability, however, both risk *and* return matter, so central bank actions that alter the riskiness of domestic currency assets can move the exchange rate even when the money supply does not change

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### 1-2 資產不完全替代下的外匯市場均衡

- **(let)...** risk premium,  $\rho$ , reflect the difference between the riskiness of domestic and foreign bonds
- 利率平價條件成為：

$$R = R^* + (E^e - E)/E + \rho. \quad (7-2)$$

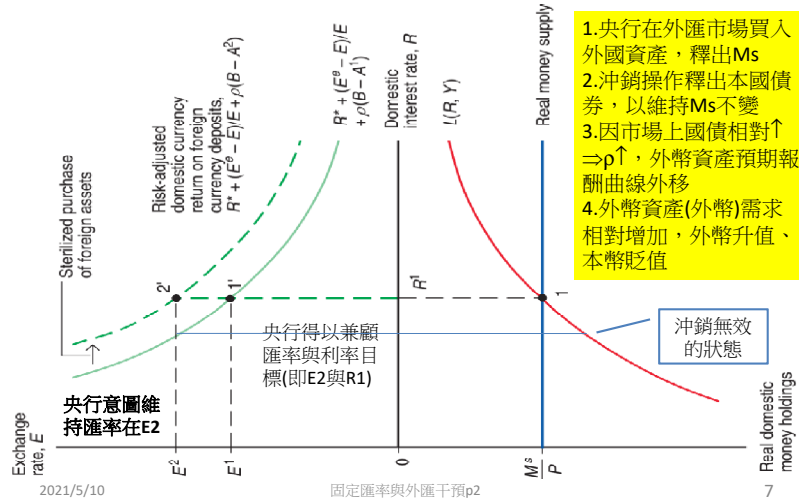
- 風險貼水(溢酬) $\rho > 0$ 表示本國債券的風險相對較高
- 反之若 $\rho < 0$ 表示本國債券的風險相對較低
- Investors will be unwilling to assume the increased risk of holding more domestic government debt, however, unless they are compensated by a higher expected rate of return on domestic currency assets (何時風險會有高低?)

### 1-2

- the risk premium on domestic assets rises when the stock of domestic government bonds available to be held by the public rises and falls when the central bank's domestic assets rise
  - 若市場充斥相對多的本國債券，本國債券的風險 $\uparrow$
  - 反之若央行買進本國債券，本國債券的風險 $\downarrow$
- the risk premium depends positively on the stock of domestic government debt, 用  $B$  表示, less the domestic assets of the central bank, 用  $A$  表示

$$\rho = \rho(B - A). \quad (7-3)$$

### 1-3 沖銷干預效果與資產不完全替代



### 1-3

- With imperfect asset substitutability, even sterilized purchases of foreign exchange cause the home currency to depreciate
  - Similarly, sterilized sales of foreign exchange...
- ... the central bank can also use sterilized intervention to hold the exchange rate fixed as it varies the money supply to achieve domestic objectives such as full employment
- In effect, the exchange rate and monetary policy can be managed independently of each other in the short run **when sterilized intervention is effective**

### 1-4 沖銷干預效果的實證(證據)

- Little evidence has been found...
  - **Little evidence** has been found to support the idea that sterilized intervention exerts a major influence over exchange rates independent of the stances of monetary and fiscal policies
  - there is also considerable **evidence against** the view that bonds denominated in different currencies are perfect substitutes
  - these conflicting results that while risk premiums are important, they **do not** depend on central bank asset transactions in the simple way
  - 或是the tests that have been used to detect the effects of sterilized intervention are flawed
- ... market's exchange rate expectations?

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1-4

- ...sterilized intervention may give an indication of where the central bank expects (or desires) the exchange rate to move
- This **signaling effect** (信號效應、宣示效果) **of foreign exchange intervention**, in turn, can alter the market's view of future monetary or fiscal policies and cause an immediate exchange rate change even when bonds denominated in different currencies are perfect substitutes
  - A sterilized purchase of foreign assets, for example, may convince the market that the central bank intends to bring about a home currency depreciation  
(該操作須具可信度，且效果如預期，否則央行可能虧錢(若本幣未隨央行的意圖而貶值))

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1-4

- If governments do not follow up on their exchange market signals with concrete policy moves, the signals soon become ineffective (央行宜口惠而實至)
- Thus, **intervention signaling cannot be** viewed as a policy weapon to be wielded independently of monetary and fiscal policy

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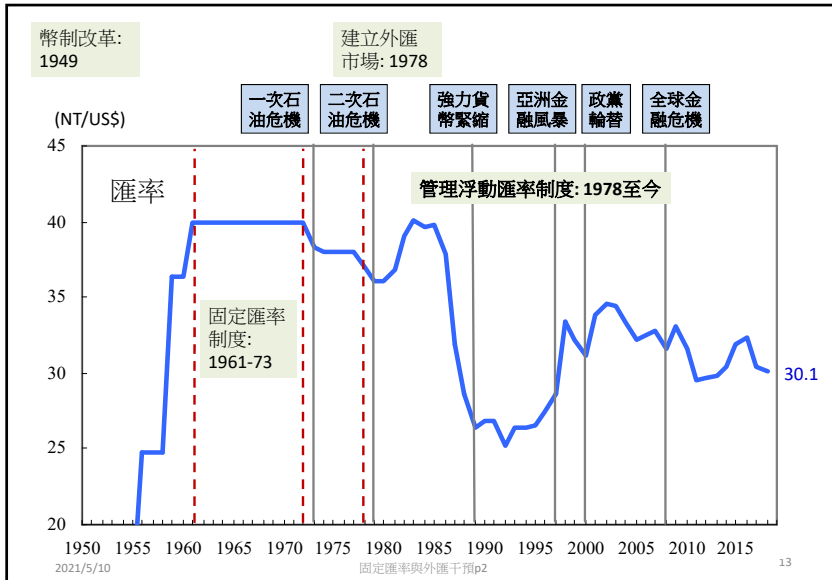
### 2 國際貨幣體系中的準備貨幣

- ... adopt a global perspective and study the macroeconomic behavior of the world economy under **two possible systems for fixing the exchange rates** of *all* currencies against each other
  - a **reserve currency**, the currency central banks hold in their international reserves, and each nation's central bank fixes its currency's exchange rate against the reserve currency by standing ready to trade domestic money for reserve assets at that rate (如台灣1973以前，見次圖)
    - Between the end of World War II and 1973, the U.S. dollar was the main reserve currency and almost every country pegged the dollar exchange rate of its money

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- The second fixed-rate system is a **gold standard** (金本位)
  - Under a gold standard, central banks peg the prices of their currencies in terms of gold and hold gold as official international reserves
  - The heyday of the international gold standard was between 1870 and 1914
- **Both reserve currency standards** and the **gold standard** result in fixed exchange rates between **all pairs** of currencies in the world
- But the two systems have very different implications about how countries share **the burden of balance of payments financing and about the growth and control of national money supplies**

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## 2-1 準備貨幣本位的運作機制

- 以二戰後，美元作為主要國際準備貨幣為例
  - every central bank fixed the dollar exchange rate of its currency through foreign exchange market trades of domestic currency for dollar assets
  - The frequent need to intervene meant that each central bank had **to have on hand sufficient dollar reserves**
  - Because each currency's dollar price was fixed by its central bank, the exchange rate between **any two currencies** was automatically fixed as well through **arbitrage** in the foreign exchange market (How?)

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2-1

- **...arbitrage** in the foreign exchange market
  - Let's suppose the French franc price of dollars was fixed at FFr 5 per dollar while the deutsche mark price of dollars was fixed at DM 4 per dollar
  - $\Rightarrow$  the DM had to remain constant at DM 0.80 per franc
  - even though no central bank was directly trading francs for DM to hold the relative price ... fixed
  - At a DM/FFr rate of DM 0.85 per franc, for example, you could have made a sure profit of \$6.25 by selling \$100 to the Bank of France, for  $(\$100) * (\text{FFr } 5 \text{ per dollar}) = \text{FFr } 500$ , selling your FFr 500 in the foreign exchange market for  $(\text{FFr } 500) * (\text{DM } 0.85 \text{ per franc}) = \text{DM } 425$ , and then selling the DM to the German Bundesbank (for \$) (反之，同理(p.241))

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## 2-1

- Even though each central bank tied its currency's exchange rate only to the dollar, market forces automatically held all other exchange rates—called **cross rates (交叉匯率)**—constant at the values implied by the dollar rates

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## 2-2 國際儲備中心的地位不對稱

- In a reserve currency system, the country whose currency is held as reserves occupies a special position because it never has to intervene in the foreign exchange market (類似作為計價單位的貨幣)
  - 假設N國N個貨幣，其一為國際準幣貨幣
  - there are only  $N - 1$  exchange rates against the reserve currency
  - ...there is no exchange rate left for the reserve center to fix (其實，作為國際準幣貨幣的「匯率」無論如何皆=1)
  - This set of arrangements puts the reserve-issuing country in a privileged position because **it can use its monetary policy for macroeconomic stabilization** even though it has fixed exchange rates (因完全無需仰仗外匯干預即可獲致固定匯率結果)

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## 2-2

- What would be the effect of **a purchase** of domestic assets **by the central bank of the reserve currency country**?
  - 其 $M_s \uparrow$ 、 $R \downarrow$ ，外匯市場上(各種)外幣資產出現超額需求，外幣皆呈升值
  - 各國為阻止其貨幣對美元升值... all other central banks in the system would be forced to buy reserve assets with their own currencies, expanding their money supplies and pushing their interest rates down to the level established by the reserve center
  - Output throughout the world, as well as at home, would expand after a purchase of domestic assets by the reserve country
- Our account of monetary policy under a reserve currency system points to **a basic asymmetry (貨幣政策自主性的不對稱)**  
The reserve country has the power to affect its own economy, as well as foreign economies, by using monetary policy

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## 2-2

- Other central banks are forced to relinquish monetary policy as a stabilization tool and instead must passively “import” the monetary policy of the reserve center because of their commitment to peg their currencies to the reserve currency
- This inherent asymmetry of a reserve system places immense economic power in the hands of the reserve country and is therefore likely to lead eventually to policy disputes within the system
- Such problems helped cause the breakdown of the postwar “dollar standard” in 1973

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### 3 金本位制

- An international gold standard avoids the symmetry inherent in a reserve currency standard by avoiding the “Nth currency” problem
  - Under a gold standard, each country fixes the price of its currency in terms of gold by standing ready to trade domestic currency for gold
  - Because there are  $N$  currencies and  $N$  prices of gold in terms of those currencies, no single country occupies a privileged position within the system:
    - Each is responsible for pegging its currency’s price in terms of the official international reserve asset, gold

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### 3-1 金本位的運作機制

- ...under a gold standard, official international reserves take the form of gold (用以隨時準備交易)
- Gold standard rules also require each country to allow **unhindered imports and exports of gold** across its borders
- a gold standard ...results in fixed exchange rates between all currencies
  - The same arbitrage process that holds cross exchange rates fixed under a reserve currency system keeps exchange rates fixed under a gold standard as well
  - 如何套利?

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### 3-1

- 金本位下的套利行為
  - For example, if the dollar price of gold is pegged at \$35 per ounce by the Fed. while the pound price of gold is pegged at £14.58 per ounce by BOE, the dollar/pound exchange rate must be constant at  $(\$35 \text{ per ounce}) \div (£14.58 \text{ per ounce}) = \$2.40 \text{ per pound}$
  - 假使雙邊匯率為\$2.50 per pound，套利者可用\$3,500跟Fed換100 ounce黃金，再將黃金送至英國，跟BOE換1458 pound，然後到外匯市場拋售這些英鎊，得\$3,645 ( $=\$2.5 \times 1458$ )即賺\$145；因此英鎊匯價↓

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### 3-2 金本位之下對稱的貨幣調整

- no country in the system occupies a privileged position by being relieved of the commitment to intervene
- 以BOE採貨幣寬鬆(BOE進行OMO買進本國債券)為例
  - 其 $M_s \uparrow$ 、 $R \downarrow$ ，外匯市場上(各種)外幣資產變得較具吸引力，致投資人都想拋售本幣(pounds)資產來買外幣資產，結果發現市場上沒人要接手本幣資產(因為採金本位，預期匯率不會變動(不像在浮動匯率制度之下))
  - ...This depreciation cannot occur when all currencies are tied to gold
  - 怎辦? unhappy holders of pounds can sell these to the Bank of England for gold, sell the gold to other central banks for their currencies, and use these currencies to purchase deposits that offer interest rates higher than the interest rate on pounds

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## 3-2

- 結果：Britain (本國) therefore experiences a **private financial outflow** (cf. capital ...) and foreign countries experience an inflow
- This process reestablishes equilibrium in the foreign exchange market
  - The BOE loses foreign reserves since it is forced to buy pounds and sell gold to keep the pound price of gold fixed
  - Foreign central banks gain reserves as they *buy* gold with their currencies
  - Countries share equally in the burden of **balance of payments adjustment**
- Because official foreign reserves are declining in Britain and increasing abroad, the British money supply is falling, pushing the British interest rate back up, and foreign money supplies are rising, pushing foreign interest rates down

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## 3-2

- 最後各國利率恢復呈相同水準，資產市場維持均衡
  - The total world money supply (not the British money supply) ends up being higher by the amount of the Bank of England's domestic asset purchase
  - Interest rates are lower throughout the world
- 對稱性：Whenever a country is losing reserves and seeing its money supply shrink as a consequence, foreign countries are gaining reserves and seeing their money supplies expand
- In contrast, monetary adjustment under a reserve currency standard is highly asymmetric
  - Countries can gain or lose reserves without inducing any change in the money supply of the reserve currency country,
  - and only the latter country has the ability to influence domestic and world monetary conditions

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## 3-3 金本位的優缺點

- 優點
  - 對稱性
  - A gold standard ... places automatic limits on the extent to which central banks can cause increases in national price levels through expansionary monetary policies
    - These limits can make the real values of national monies more stable and predictable, thereby enhancing the transaction economies arising from the use of money
    - No such limits to money creation exist under a reserve currency system; the reserve currency country faces no automatic barrier to unlimited money creation

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## 3-3

- 金本位的缺點
  - (1) The gold standard places undesirable constraints on the use of monetary policy to fight unemployment (In a worldwide recession...)
  - (2) Tying currency values to gold ensures a stable overall price level only if the relative price of gold and other goods and services is stable (suppose that there is a major gold discovery...)
    - Note: 貨幣跟黃金為固定關係，但其他商品則不是；若黃金跟其他商品相對價格下降代表貨幣價值也跟這下降，故物價上揚
  - (3) An international payments system based on gold is problematic because central banks cannot increase their holdings of international reserves as their economies grow unless there are continual new gold discoveries (流動性不足以支應經濟發展)

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## 3-3

- 金本位的缺點(*cont.*)
  - (4) The gold standard could give countries with potentially large gold production, such as Russia and South Africa, considerable ability to influence macroeconomic conditions throughout the world through market sales of gold
- Because of these drawbacks, few (只有少數) economists favor a return to the gold standard today
- While most central banks continue to hold some gold as part of their international reserves\*, the price of gold now plays no special role in influencing countries' monetary policies

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## 3-4 金屬複本位制度

- ... a **bimetallic standard** (或稱金屬雙重本位) in which the currency was based on both silver and gold
  - Up until the early 1870s, many countries...
  - 美國 from 1837 until the Civil War
  - ...France, which abandoned bimetalism for gold in 1873
  - 中國古代(金與銅(秦、漢)、金與銀(西漢)、銀與銅(明清))
- In a bimetallic system, a country's mint will coin specified amounts of gold *or* silver into the national currency unit (typically for a fee)

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## 3-4

- The mint parity could differ from the market relative price of the two metals, however, and when it did, one or the other might go out of circulation (Gresham's法則：劣幣驅逐良幣)
  - 例如在金銀複本位制度下，若官方兌換比例低估黃金市價時，大眾將珍藏金幣(良幣)而導致流通在外的貨幣多是銀幣(劣幣)
- 複本位的優點
  - it might reduce the price level instability resulting from use of one of the metals alone
 

Were gold to become scarce and expensive, cheaper and relatively abundant silver would become the predominant form of money, thereby mitigating the **deflation** that a pure gold standard would imply (但複本位最後在19世紀末仍被金本位取代)

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## 補充說明－ Gresham's法則：劣幣驅逐良幣

- 發生於兩種鑄幣之間的官定兌換比例，跟市場或大眾給與的評價不相稱的時候
  - 例如在金銀複式本位制度下，若官方兌換比例低估黃金市價時，大眾將珍藏金幣(良幣)而導致流通在外的貨幣多是銀幣(劣幣)
- 發生劣幣驅逐良幣的前提在於「劣幣依然是法定貨幣」
  - 或依然為大眾普遍接受的交易支付工具
- 但市場若能自由選擇並決定做為交易支付工具的其他商品時，該法則就會出現例外情形...

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### Gresham's法則(cont.)

- 若交易支付工具的接受度係由市場偏好來決定(而非(依法)被迫接受)，則通常會出現「**強勢貨幣取代弱勢貨幣**」(Robert Mundell, 1998)的結果
  - 此時，**葛萊欣法則**不成立
  - 例如在國際貿易中，經常被作為計價單位與支付工具的美元與歐元，皆屬相對強勢的國際「良幣」
  - 違背市場偏好的後果：例如 ...
    - 捨棄金銀幣改採鐵幣的斯巴達(Sparta)國王立柯革斯(Lykurgos, 776BC)
    - 結果「使得外國商人不喜歡與斯巴達通商...」(鹽野七升(1992):「羅馬不是一天造成的」, 徐幸娟(譯), 三民書局, 頁92)

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貨銀2020\_貨幣與支付系統的演進  
(Part 1)

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### 3-5 金匯兌本位(Gold exchange standard)

- Under a gold exchange standard, central banks' reserves consist of gold *and* currencies whose prices in terms of gold are fixed, and each central bank fixes its exchange rate to a currency with a fixed gold price
- A gold exchange standard can operate like a gold standard in restraining excessive monetary growth throughout the world, but it allows more flexibility in the growth of international reserves, which can consist of assets besides gold
- The post-WW II reserve currency system centered on the dollar was, in fact, originally set up as a gold exchange standard
  - While foreign central banks did the job of pegging exchange rates, the U.S. Federal Reserve was responsible for holding the dollar price of gold at \$35 an ounce

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### 3-5

- 金本位 – WW II – 金匯兌本位 – 國際儲備貨幣本位
  - By the mid-1960s, the system operated in practice more like a pure reserve currency system than a gold standard (or金匯兌本位)
  - President Richard M. Nixon unilaterally severed the dollar's link to gold in August 1971, shortly before the system of fixed dollar exchange rates was abandoned

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