

Lecture 6: Intermediate macroeconomics, autumn 2008

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Fixed exchange rates

- **Gold standard: 1871-1915**
- **Failed attempts to restore the gold standard: 1920s**
- **Bretton Woods system: 1945 – 1973**

Current situation

- **From 1973 floating exchange rates between most OECD currencies.**
- **But many small countries have chosen to peg their currencies to large currencies (dollar, the British pound, euro – earlier the D-mark or the French franc) or a currency basket (a weighted average of currencies).**
- **Some countries have a "crawling peg" (depreciation against another currency at a given rate) or a "managed float" (the central bank tries to influence a floating exchange rate but does not change it according to a predetermined plan).**
- **China has had a fixed exchange rate to the dollar. Official change to a "managed float" against a currency basket 2005. Some appreciation against the dollar.**

Sweden

- **1945 – 73: Fixed exchange rate within the Bretton Woods system (devaluation 1949)**
- **1973 –77: Fixed exchange rate to the D-mark within the European "snake" (devaluation 1976)**
- **1977 – 91: Fixed exchange rate to a trade-weighted basket with extra weight for the dollar (repeated devaluations: 1977, 1981 and 1982)**
- **1991 – 92: Fixed exchange rate to the ecu (weighted average of the currencies within the EU). Abandoned after exchange rate crisis.**
- **1992 - ?: Freely floating exchange rate with inflation target for the central bank**
- **? - ?: EMU membership with the euro as the common currency?????**

ERM (European Exchange Rate Mechanism) established 1979. Exchange rate band +/- 2.25% around central parity. Widened band after exchange rate crises 1992/93 to +/- 15 %, but Belgium, Denmark, France, Germany and the Netherlands maintained the earlier narrow bands.

ERM 2: 1999 – 2000 Denmark + Greece + euro area. Today Denmark, Estonia, Latvia, Lithuania, Slovak Republic + euro area. Condition for EMU entry: ERM membership for two years. Slovenia, Cyprus and Malta have been ERM members but have now entered the euro area.

A fixed exchange rate and interest rate parity

$$R = R^* + (E^e - E)/E$$

Credible fixed exchange rate $\Rightarrow E^e = E$.

This implies: $R = R^*$

Monetary policy must be pursued such that:

$$M/P = L(R^*, Y)$$

$Y \uparrow \Rightarrow L \uparrow$. This must be matched by $M \uparrow$

- The monetary base = the liabilities of the central bank form the "base" for money supply
- The money supply can be thought of as a multiple of the monetary base (banks create "money" through the credit multiplier)
- Monetary base = Foreign assets + Domestic assets

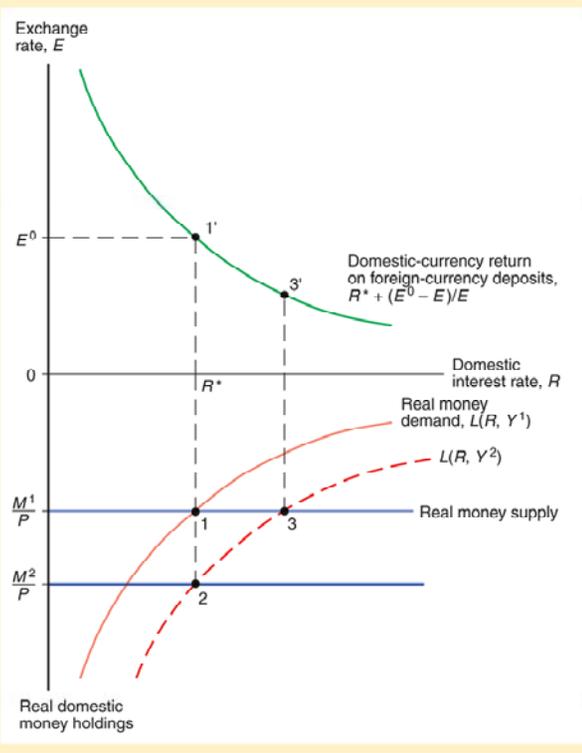
The central bank can increase the money supply (M) in two ways

- 1. Purchases of foreign assets (larger foreign exchange reserves)**
- 2. Purchases of domestic assets (the stock of domestic assets held by the central bank increases and the stock held by the private sector falls).**

Central bank transactions usually take the form of (repurchase agreements): if the central bank purchases government bills, it enters into an agreement at the same time to sell the bills a few weeks later. Repo transactions affect the *repo rate* (the short-term interest rate).

Figure 17-1**Asset Market Equilibrium with a Fixed Exchange Rate, E^0**

To hold the exchange rate fixed at E^0 when output rises from Y^1 to Y^2 , the central bank must purchase foreign assets and thereby raise the money supply from M^1 to M^2 .



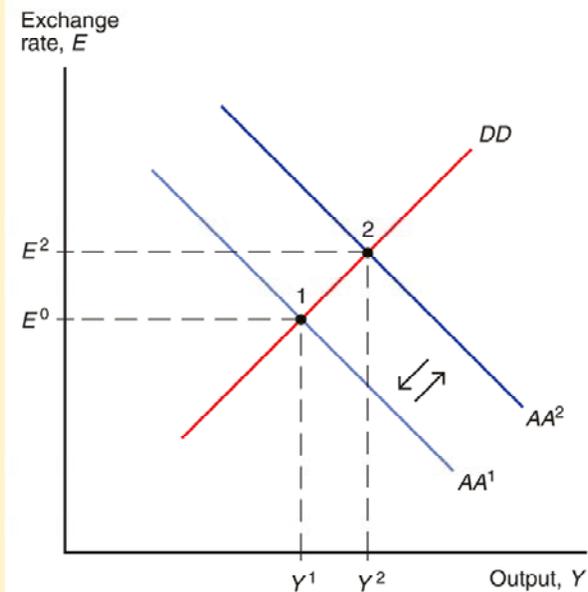
Fixed Exchange Rates

Monetary Policy and Fixed Exchange Rates (cont.)

Figure 17-2

Monetary Expansion Is Ineffective Under a Fixed Exchange Rate

Initial equilibrium is shown at point 1, where the output and asset markets simultaneously clear at a fixed exchange rate of E^0 and an output level of Y^1 . Hoping to increase output to Y^2 , the central bank decides to increase the money supply by buying domestic assets and shifting AA^1 to AA^2 . Because the central bank must maintain E^0 , however, it has to sell foreign assets for domestic currency, an action that decreases the money supply immediately and returns AA^2 back to AA^1 . The economy's equilibrium therefore remains at point 1, with output unchanged at Y^1 .

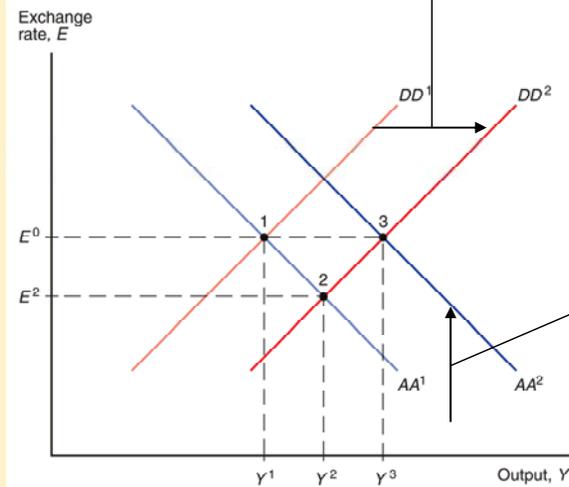


Fiscal Policy and Fixed Exchange Rates in the Short Run (cont.)

Figure 17-3

Fiscal Expansion Under a Fixed Exchange Rate

Fiscal expansion (shown by the shift from DD^1 to DD^2) and the intervention that accompanies it (the shift from AA^1 to AA^2) move the economy from point 1 to point 3.



Conclusions on stabilisation policy

- **Flexible exchange rate**
 - **Monetary policy is the primary stabilisation tool**
 - **Fiscal policy is not so effective (exchange rate offset)**

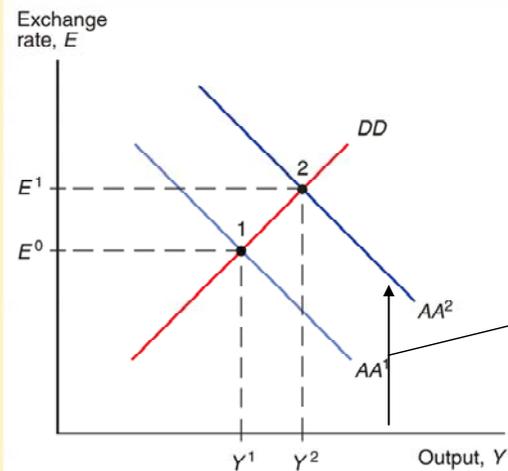
- **Fixed exchange rate**
 - **Monetary policy is ineffective**
 - **Fiscal policy is the only effective stabilisation tool**

Devaluation (cont.)

Figure 17-4

Effect of a Currency Devaluation

When a currency is devalued from E^0 to E^1 , the economy's equilibrium moves from point 1 to point 2 as both output and the money supply expand.



If the central bank devalues the domestic currency so that the new fixed exchange rate is E_1 , it buys foreign assets, increasing the money supply, decreasing the interest rate and increasing output

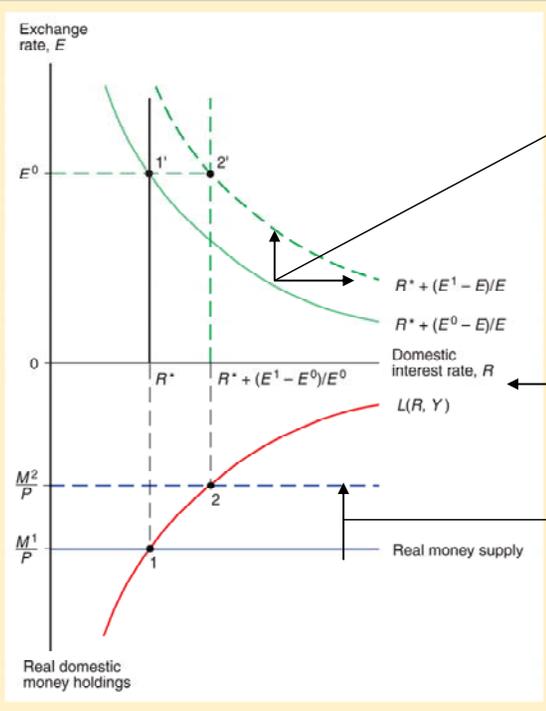
Why does a country devalue?

- 1. Expansionary fiscal policy may be impossible because of large budget deficits and large government debt: Sweden 1992 or Argentina 2001.**
- 2. Under a fixed exchange rate and free capital movements an exchange rate devaluation is the only way of using monetary policy.**
- 3. Foreign exchange reserves may be depleted and the central bank may not dare to take the exchange rate risk that is implied by further borrowing (and other central banks and the IMF may not dare to lend because of the risk that the borrowing central bank may not be able to service the debt).**

Financial Crises and Capital Flight (cont.)

Figure 17-5
Capital Flight, the Money Supply, and the Interest Rate

To hold the exchange rate fixed at E^0 after the market decides it will be devalued to E^1 , the central bank must use its reserves to finance a private financial outflow that shrinks the money supply and raises the home interest rate.



Expected devaluation makes the expected return on foreign assets higher

To attract investors to hold domestic assets (currency) at the original exchange rate, the interest rate must rise through a sale of foreign assets.

Speculative attacks

- 1. Response to future unavoidable development**
- 2. Self-fulfilling expectations (multiple equilibria)**

It is always “**technically possible**” to defend a fixed exchange rate through selling foreign currency from foreign exchange reserves or currency obtained from borrowing: the problem is the **goal conflicts caused by high interest rates**

- **Lower employment**
- **Higher interest rates on government debt and thus larger government budget deficits**
- **Private sector bankruptcies (banks and financial firms)**

Examples: Sweden 1992, Mexico 1994, Brazil 1998-99, Argentina 2001

- **Dramatic increases in unemployment**
- **Huge government budget deficits**
- **Bankruptcies of banks, financial firms and real estate firms**

Argentina 2001

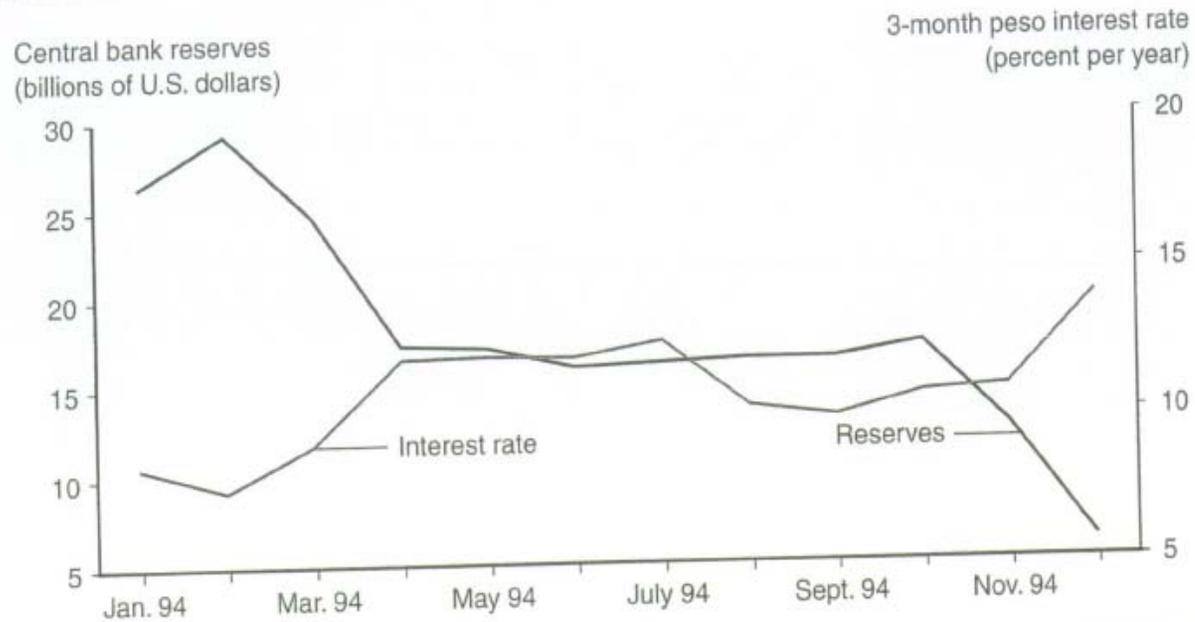
- **The peso was pegged to the dollar through a currency board arrangement**
- **All central bank debt is backed by forex reserves. Forex reserves are depleted first if all domestic currency disappears. The idea is that this should make the fixed exchange rate credible.**
- **No active monetary policy to influence the business cycle: foreign exchange reserves were only used to stabilise the exchange rate.**
- **The idea of the fixed exchange rate was to break the earlier cycle of devaluations-inflation-devaluations and thus to impose a nominal anchor on the economy holding down inflation.**

It did not work

- **Strong domestic recession at the same time as the dollar appreciated strongly which led then to an appreciation of the peso against other currencies as well (at the same time as the currency of the main competitor Brazil depreciated strongly): lost international competitiveness because of strong real appreciation. Obviously Argentina and the US did not form an *optimal currency area* together.**
- **Insufficient fiscal discipline**

- **But Hong Kong managed to ride out the storm during the Asian crisis 1998 with its currency board and peg to the dollar**
- **Other examples of currency boards: Estonia, Bulgaria and Lithuania.**
 - **unclear whether or not Estonia and Lithuania will manage**
 - **boom led to high inflation and large real exchange rate appreciations**
 - **strong credit expansions (Swedish banks)**
 - **now strong downturns and falls in house prices**
 - **domestic-currency value of debt in euro would rise if devaluations**

Mexican Foreign Reserves and Interest Rates, January–December 1994



As devaluation fears intensified during 1994, Mexico's reserves fell and its interest rates rose. The interest rate shown is that on a three-month *cetes*, the Mexican government's peso-denominated debt.

Source: Jeffrey Sachs, Aaron Tornell, and Andrés Velasco, "The Collapse of the Mexican Peso: What Have We Learned!" *Economic Policy* 22 (April 1996), pp. 13–63.

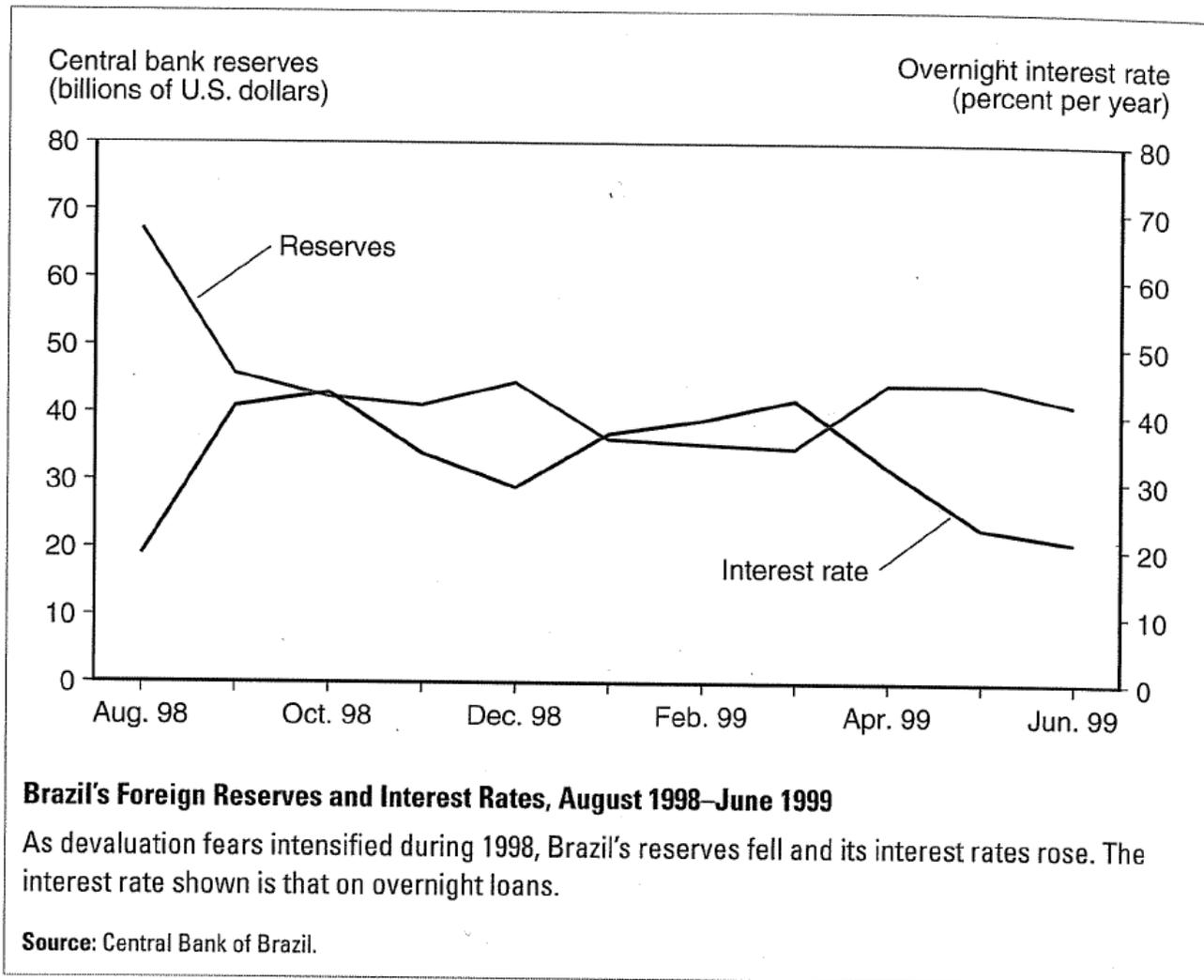


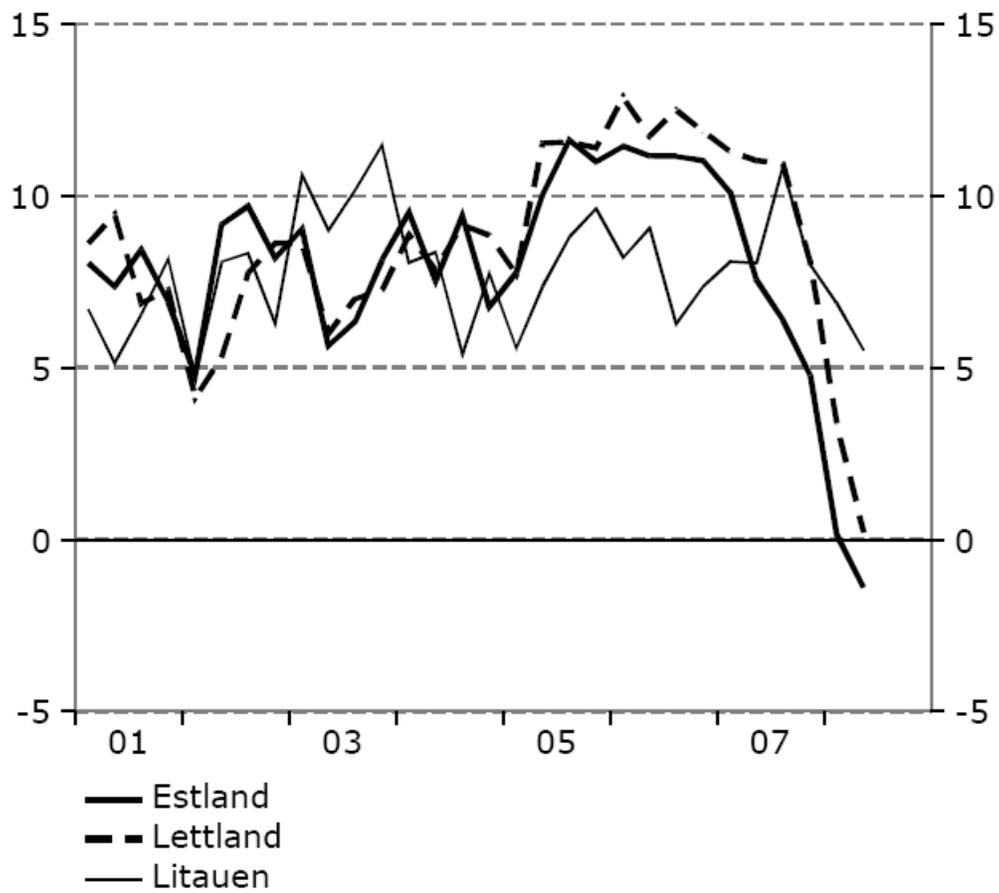
Diagram 49 Harmoniserat index för konsumentpriser i Baltikum

Årlig procentuell förändring



Källa: Reuters EcoWin.

Diagram 48 BNP-tillväxt i Baltikum
Årlig procentuell förändring

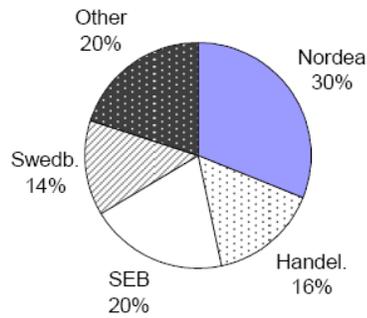


Källor: Reuters EcoWin och ländernas centralbanker.

Figure 9. Sweden: Key Financial System Indicators

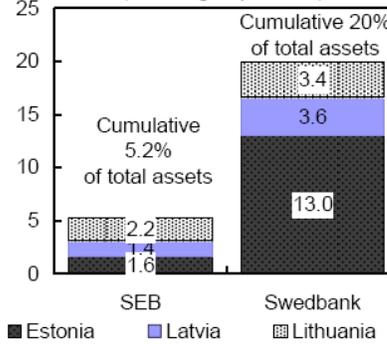
Four banks dominate the system...

In percent of total assets, end-2007



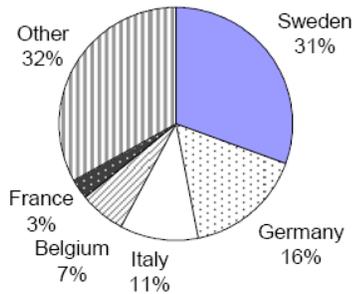
... two of which have significant exposure to the Baltic countries.

Direct exposure to Baltics (in % of group assets)

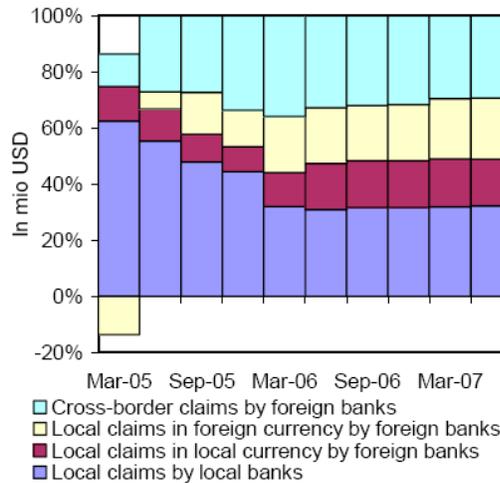


This exposure represents almost one third of total foreign bank funding

Key Home Countries for Baltics, end-Sept 2007 (in % of total foreign bank funding to the Baltics)



...and over 20 percent of total private sector credit in the Baltic countries.



Exchange rate crises and "emerging markets"

- **Large capital inflows in good times to "emerging economies" with fixed exchange rates**
 - **borrowing in both domestic and foreign currency**
 - **High returns**
- "convergence game": capital gains if interest rates fall**
- **But capital flows are very volatile**
 - **Sudden capital flow reversals: large and fast capital outflows in macroeconomic crises**
 - **Exchange rate crises**
 - **Depreciation of domestic currency increases the value of debt in foreign currency: bankruptcies of banks and other borrowers**
- **Examples: Asian crisis 1998 (Thailand, Malaysia, Indonesia), Russia**
- **Potential risk for new EU member states: especially the Baltic countries**

China's exchange rate policy

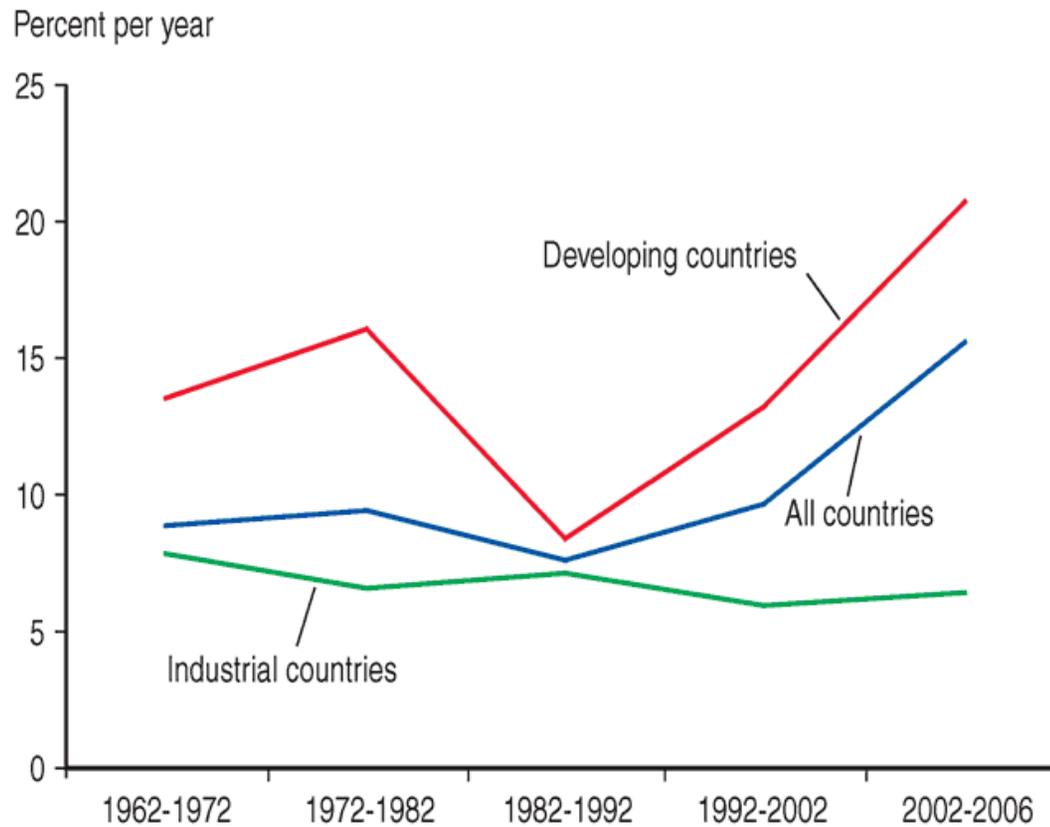
- **Undervalued exchange rate has been maintained through central bank purchases of dollar: accumulation of dollar assets by the central bank**
 - **Current account surplus: 11.6 % of GDP**
 - **The largest foreign currency reserves in the world: 20 % of world reserves**
- **Explanations**
 - **High private savings because of underdeveloped social security and pension system**
 - **Undervalued exchange rate helps industrialisation through strategy of "export-led growth"**
 - **Precautionary motive for accumulating assets: ability to meet capital outflows (cf Asian crisis)**
- **Problems:**
 - **Distorted relative prices: imports are too expensive**
 - **Overinvestment in export sector**
 - **Low purchasing power for domestic consumers**
- **Problems associated with appreciation**
 - **Exchange rate losses on accumulated dollar reserves**
 - **Many export firms that are profitable today would become unprofitable**
 - **Risks of financial crisis**

Exchange rate of the euro and renminbi against the US dollar



Sources: Federal Reserve Bank of St. Louis; calculations by the EEAG.

Fig. 17-7 Growth Rates of International Reserves



Source: Economic Report of the President.

Sterilised interventions in currency markets

- **Attempt to disconnect exchange rate and interest rate developments**
- **When the euro was low, the ECB tried to appreciate the euro by purchasing euros without having to raise the interest rate**
- **Method: ECB sells dollars (buys euros) but at the same time holds the money supply constant by buying domestic assets: foreign exchange transactions reduce the money supply at the same time as the repo transactions increase money supply by as much.**
- **Current situation: ECB could sell euros now at the same time as the money supply effect (interest rate effects) are sterilised through sales of domestic assets.**

**Interest rate parity when domestic and foreign deposits
are imperfect substitutes**

$$R = R^* + (E^e - E)/E + \rho$$

ρ = risk premium

$$\rho = \rho (B - A)$$

B = outstanding stock of government debt

A = the central bank stock of government debt

$B - A$ = den private sector's stock of government debt

(the higher the holdings of the private sector, the larger is the risk premium required)

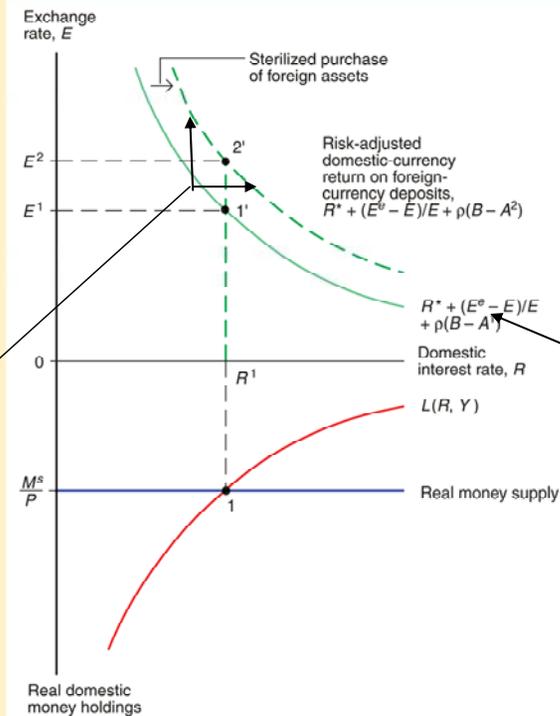
- The central bank purchases domestic currency
(sells foreign exchange reserves)
- The central bank also purchases domestic assets.
- The money supply is held unchanged: then we know from money market equilibrium that the interest rate is unchanged
- $A \uparrow \Rightarrow B - A \downarrow$ (private sector stock of government debt falls)
- $\rho \downarrow \Rightarrow E^e - E \uparrow \Rightarrow E \downarrow$ if E^e , R and R^* do not change.

Interest Rate Differentials (cont.)

Figure 17-6

Effect of a Sterilized Central Bank Purchase of Foreign Assets Under Imperfect Asset Substitutability

A sterilized purchase of foreign assets leaves the money supply unchanged but raises the risk-adjusted return that domestic currency deposits must offer in equilibrium. As a result, the return curve in the upper panel shifts up and to the right. Other things equal, this depreciates the domestic currency from E^1 to E^2 .



Increase in the perceived risk of investing in domestic assets makes foreign assets more attractive and leads to a depreciation of the domestic currency.

Or at fixed exchange rates, the return on domestic assets needs to be higher in equilibrium

- During the gold standard central banks guaranteed that currencies could be converted into gold at a fixed price
- The gold standard thus implied a fixed price of different currencies in gold: this locked all cross exchange rates between different currencies
- The gold standard tied changes in money supply to changes in the gold stock: this ensured that inflation would not run away
- The gold standard was abandoned only during deep crises (usually wars): implicit commitment to return to earlier parities afterwards
- Long-run price movements tied to changes in the gold stock associated with swings in gold production
- Monetary policy could not be used for stabilisation of the business cycle

Gold-dollar exchange standard in the Bretton Woods system

- The dollar functioned as a reserve currency
- $N - 1$ -problem: With N currencies only $N - 1$ countries need to maintain fixed exchange rates (because there are only $N - 1$ exchange rates)
- The reserve currency country (the US) can choose any rate of change of money supply: the others must adjust their money supply increases and interest rates so that they maintain fixed exchange rates vis-à-vis the dollar.

- **The system worked until the US started printing money and create inflation in the 1960s (financing of the Vietnam war and domestic social reforms)**
- **Other countries (Germany, France, Japan) were not prepared to maintain fixed exchange rates, as this implied that they would import inflation**
- **The Bretton-Woods system broke down after a series of serious exchange rate crises**

ERM-system in the 1980s and 1990s

- **Germany functioned as reserve currency country**
- **Germany determined the inflation rate in the ERM area (other countries could import price stability from Germany)**
- **But German monetary policy aimed at stabilising the German business cycle**
- **In the early 1990s after German unification there was a strong boom in Germany at the same time as Europe went into recession. German high interest rates to keep down domestic inflation aggravated the recession in the rest of Europe.**
- **EMU was seen by many (France in particular) as a way of replacing German control of European monetary policy with common European decision making in a common European Central Bank.**

Convergence of Inflation Rates Among EMS Members, 1978–2000

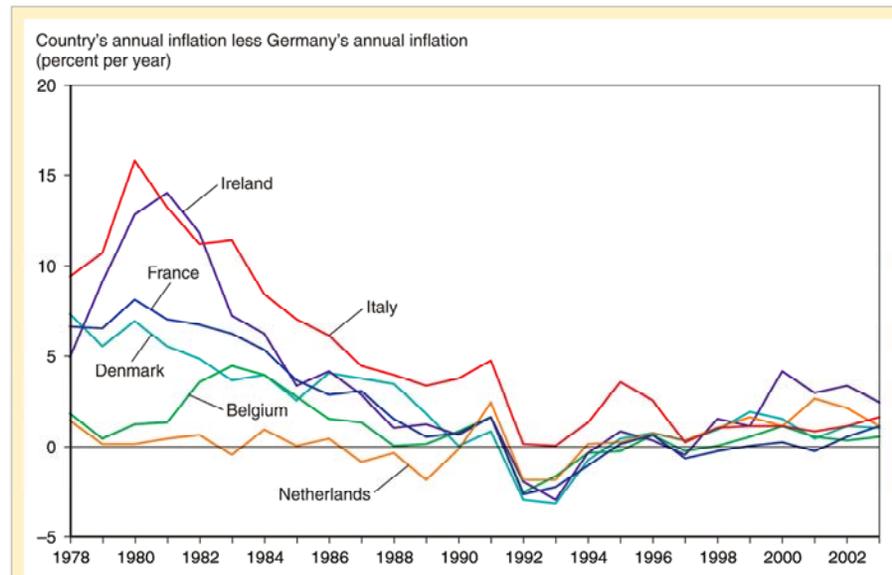


Figure 20-2

Inflation Convergence for Six Original EMS Members, 1978–2003

Shown are the differences between domestic inflation and German inflation for six of the original EMS members, Belgium, Denmark, France, Ireland, Italy, and the Netherlands.

Source: CPI inflation rates from International Monetary Fund, *International Financial Statistics*.

