

Fixed versus floating exchange rates with imperfect capital mobility

ECON4330 Lecture 9-2

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- ① Policy regimes
- ② MFT-Model
- ③ Effects of shocks
- ④ Scope for policy

Rødseth 3.1 and 6.1-6.4

Policy regimes: Targets at different levels

- 1 Welfare of population
 - 2 Price stability, low unemployment
 - 3 Inflation rate 2.5, Price of dollar 7.15 kr
 - 4 Interest rate, quantity of money
- Day to day targets: Interest rate, exchange rate, quantity of money, central bank credit
 - Only two can be set independently
 - If UIP, only one can be set independently

Central Bank balance sheet:

$$EF_g - B - M = EF_{g0} - B_0 - M_0$$

- Quantities: M (money), B (NOK bonds), F_g (USD bonds)
- Prices: i (NOK interest rate), E (NOK/USD exchange rate)
- i_* (USD interest rate) given, money no interest
- Assets are bought with assets
- Cannot decide both price and quantity in a market
- Perfect capital mobility means there is only one bond market

- When CB buy foreign currency, it pays with money
- Equilibrium in the money market requires that demand equals supply:

$$\frac{M}{p} = m(i, Y)$$

- A purchase of foreign currency raises M and lowers i
- Sterilization means that CB finances the purchase by selling bonds
- The money paid is withdrawn
- Same result can be achieved by intervening in the forward market

- Standard Keynesian Open Economy model
- Home and foreign goods
- Goods prices change only gradually
- Small economy
- Portfolio approach to financial side
- Mundell - Fleming - Tobin

- Short-run variations in activity
- Importance of capital mobility
- Regimes where CB sets interest rate or exchange rate (or both)
- Foreigners do not hold domestic currency
- Dropped M , interpret B as total kroner assets

$$Y = C(Y_p, W_p, \rho, \rho_*) + I(\rho, \rho_*) + G + X(R, Y, Y_*) \quad (1)$$

$$Y_p = Y - \rho_* \frac{EF_*}{P} - T \quad (2)$$

$$W_p = \frac{B_0 + EF_{p0}}{P} \quad (3)$$

$$\rho = i - \dot{p}_e \quad (4)$$

$$R = \frac{EP_*}{P} \quad (5)$$

Output (Y) Consumption (C), Investment (I), Government purchases (G), net exports (X), Disposable income (Y_p), net Taxes and Transfers T

$$0 < C_Y < 1, C_W > 0, C_\rho < 0, C_{\rho_*} < 0, I_\rho < 0, I_{\rho_*} < 0.$$

Marshall-Lerner Condition

$$X = Z_* - RZ = Z_* - \frac{EP_*}{P}Z$$

Z, Z_* Import volumes. Import demand functions:

$$Z = Z(R, Y) \quad Z_R < 0; \quad Z_Y > 0$$

$$Z_* = Z_*(R, Y_*) \quad Z_{*R} > 0; \quad Z_{*Y} > 0$$

$X_Y < 0$, and $X_{Y_*} > 0$ follows

$X_R > 0$ Positive quantity effects, negative price effects

$X_R > 0, X_Y < 0$ assumed - quantity effects dominates

Marshall-Lerner: Sum of demand elasticities > 1

$$\delta = i - i_* - \dot{e}_e(E) \quad (6)$$

$$\frac{B}{P} = W_p - f(\delta, W_p) \quad (7)$$

$$\frac{EF_p}{P} = f(\delta, W_p) \quad (8)$$

$$F_g + F_p = -F_* \quad (9)$$

δ = risk premium, $\dot{e}_e(E)$ = expected rate of depreciation
 $f_\delta < 0$, $0 < f_W < 1$, $e'_e < 0$.

- Given from abroad: P_*, i_*, Y_*, ρ_*
- Predetermined: $P, \dot{p}_e, F_*, B_0, F_{p0}$
- Policy; Fiscal G, T , Monetary E, F_g, i, B
- Remaining: $Y, Y_p, R, \delta, \rho, W_p, F_p$ (7 in all)

Nine equations, nine endogenous variables \Rightarrow

Two monetary policy variables can be chosen "freely"

Regimes we shall look at

- ① Fixed exchange rate, i and E fixed, interventions used to keep E on target
- ② Floating, i and F_g fixed, E floats
- ③ Fixed by interest rate: F_g and E fixed, i used instead of interventions

Compare first 1 and 2, come to 3 later

Recall chapter 1:

- Equilibrium condition: $F_g + F_p + F_* = 0$
- or after inserting demand function

$$F_g + (P/E)f(i - i_* - \dot{e}_e(E), (B_0 + EF_{p0})/P) + F_* = 0$$

Fixed:

- E, i exogenous, F_g endogenous
- Lower i means loss of reserves, F_g down
- More capital mobility ($|f'_\delta|$ high) means greater loss of reserves

Floating:

- F_g, i exogenous, E endogenous
- Lower i means depreciation (E up)
- More capital mobility means stronger depreciation

In both cases are i and F_g unaffected by the goods market

Fixed rate *IS*-curve:

$$Y = C\left(Y - \rho_* \frac{EF_*}{P} - T, \frac{B_0 + EF_{p0}}{P}, i - \dot{p}_e, \rho_*\right) + I(i - \dot{p}_e, \rho_*) + G + X\left(\frac{EP_*}{P}, Y\right)$$

Note the effects of a devaluation (E up) when $F_* < 0$ and $F_{p0} < 0$:

- Interest payments on the foreign debt increase leading to reduced consumer demand
- Real wealth goes down leading to a further reduction in consumer demand
- Imports become more expensive leaving less to be spent on home goods
- Home goods become relatively cheaper shifting demand towards them

ISFX - IS with $E(i, i_*, F_g)$ inserted

The positive direct effect of a cut in i on Y is often (usually?) reinforced by the accompanying depreciation

- This is more likely
 - the lower the foreign currency debt
 - the higher the trade surplus
 - the closer substitutes home and foreign goods are
- An interest rate cut may fail to raise Y if
 - foreign currency debt is high
 - the trade deficit is large
 - substitution is weak between home and foreign goods
 - direct interest rate effects are weak

Assume 1) i given, 2) An increase in E raises aggregate demand

- Demand shocks (including fiscal policy)
 - have same effect on output
 - have no effect on exchange rate or forex-reserves
- Disturbances in the forex-market
 - fixed exchange rate insulates the goods market
 - floating rate means shocks are transmitted from forex to goods through the E
 - high capital mobility makes E and, hence, Y , more sensitive to shifts in exchange rate expectations.

- Reduced Interest rate
 - stronger output effect when floating
 - necessitates use of forex-reserve when fixed
 - potential revenue loss if i differs too much from i_*
 - high capital mobility means larger interventions
- i can be used to target output or home goods inflation
- More capital mobility means larger interventions needed
- Interventions lose their effect when capital mobility perfect

Fixed versus float: Policy opportunities

- In both cases i can be used to pursue any one of a large number of potential targets, e.g. output, home goods inflation, M_2
- A fixed exchange rate provides a “nominal anchor”
- A clean float by itself does not yield nominal stability. That then require that i is used for this somehow.
- A fixed exchange rate will be undermined over time if interest rate is set without concern for price stability
- More capital mobility means larger interventions needed to get a given output effect

- Fixed exchange rates with occasional devaluations / revaluations
- Floating exchange rates with occasional interventions

In principle one can achieve the same results

Exchange rate fixed by interest rate

F_g and E exogenous, i used to keep E on target

$$F_g + (P/E)f(i - i_* - \dot{e}_e(E), (B_0 + EF_{p0})/P) + F_* = 0$$

- Disturbances in foreign exchange market transmitted to goods market through the interest rate.
- Works also with perfect capital mobility
- Prone to speculative attacks when countries are hit with asymmetric disturbances
- Strength of such attacks can increase tremendously when capital mobility is high

Qualifications

- Trend inflation may have real consequences
 - seignorage, downward nominal rigidity in wages, zero lower bound on interest rates
- Centralized bargaining, strategic interactions with monetary policy
- Credibility issues, speculative attacks on rigid (fixed) rules
- Volatility of shocks may depend on exchange rate system

Perfect capital mobility: The trilemma

UIP and money market equilibrium:

$$i = i_* + e_e(E), \quad \frac{M}{P} = m(i, Y)$$

- the central bank can use only one out of i , E or M as an instrument
- sterilized interventions are without effect on the exchange rate
- fixed rate: i used to keep E fixed, cannot stabilize the domestic economy
- floating rate: fixed money supply: i cannot be used to stabilize the exchange rate

The dilemma of fixed exchange rates

High confidence in fixed rate

- Little exchange rate risk
- $e_e = 0$ and κ large
- Must have $i \approx i_*$
- If not, costs may be enormous

Low confidence in fixed rate

- More exchange rate risk
- Lower capital mobility
- Changing expectations
- High variability in interest rates
- Occasional breakdowns

Responses to dilemma

- Mutual fixing
- Monetary union
- Currency boards
- Wide margins
- Restoration rules
- Exchange controls
- Floating rates with inflation target