

Open Economy Macroeconomics, Aalto University SB

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Exchange Rates and International Finance: Exchange Rate
Determination

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Simple Monetary Model of Floating Exchange Rate

- We will set up the scene by analysing a simple model generating conclusions often associated with international monetarism
- **Assume 1:** *Aggregate Supply curve is vertical*
- Note that this does not imply that output is constant, only that it varies as a result of changes in productivity; also note that perfect price flexibility is implicitly assumed
- **Assume 2:** *Money demand is given by the Cambridge quantity equation*

$$M^d = kPy$$

- This assumption matters a lot: think of what implies for the Aggregate Demand for a given money stock (supply) M_0^s

$$M_0^s = kPy = kY$$

Simple Model

- Hence, nominal income $Py = Y$ must be constant along the Aggregate Demand curve, since it is drawn for a given value of the money stock!
- Graphically nominal income is simply the area of the rectangle between the curve and the axes (see graph)
- More importantly, consider the effect of increasing the nominal money stock
 - we know the AD shifts up and to the right, but by how much?
 - at any given level of real income y , the change in the price level must be proportional to the change in the nominal money stock
 - so, if the nominal money stock doubles, then nominal demand doubles and at a given level of real income, the price level doubles
- **Assume 3:** *Purchasing Power Parity (PPP) obtains at all times*

$$SP^f = P$$

Simple Model

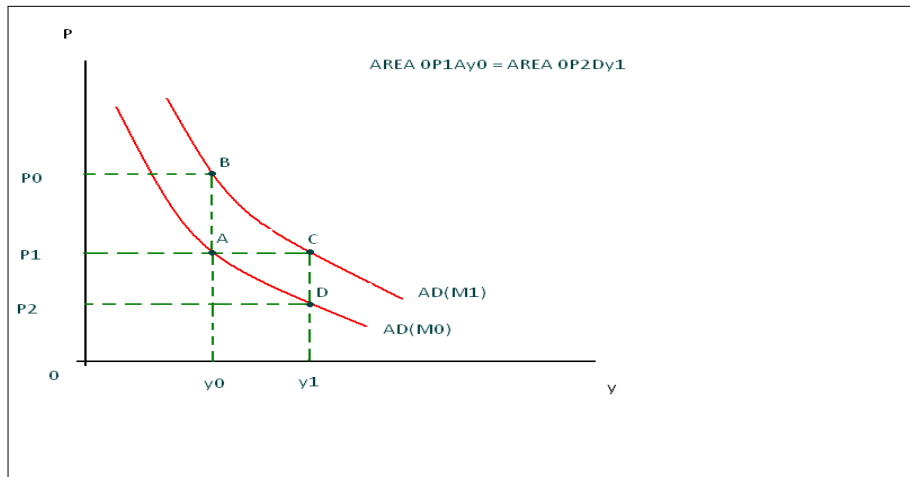


Figure: Aggregate Demand $AD(M)$ and Money Stock.

Simple Model: PPP

- We can represent the PPP graphically as follows
 - put the domestic price level P on the vertical axis
 - put the nominal exchange rate S on the horizontal axis
 - the line drawn from the origin is the **PPP line**: points on the line are consistent with the PPP
 - points above and to the left of the PPP line indicate that the domestic economy is uncompetitive
 - points below and to the right of the PPP line indicate that the domestic economy is competitive
- In real terms: points above and to the left of the PPP line suggest that a real *depreciation* of the domestic currency is needed to restore equilibrium (PPP)

PPP Line

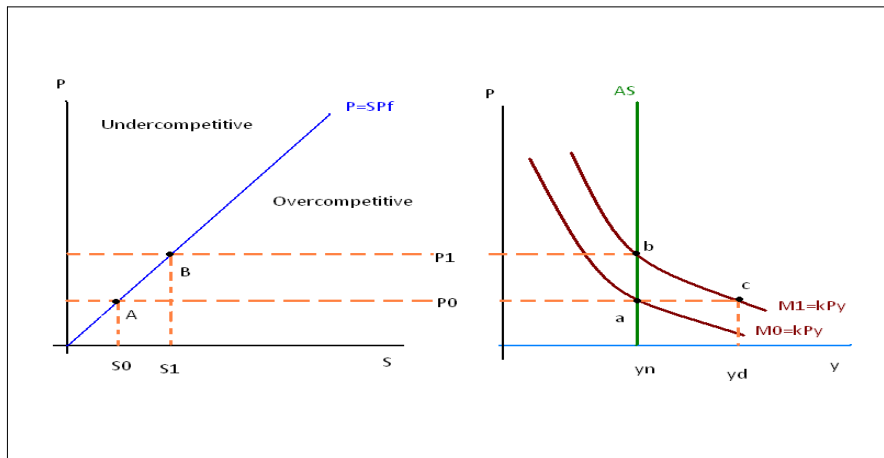


Figure: Money supply increase under flex exchange rates: Monetary Model.

Equilibrium

- Previous graph: P_0 is the price level consistent with domestic equilibrium ($AS=AD$); it is also the equilibrium price level in this open economy model
 - the value of the price level is determined without any reference to the conditions in the external sector of the economy
- In the external sector, PPP requires a nominal exchange rate of S_0 (lower value leads to competitive problems and higher values to overcompetitiveness)
- Equilibrium can now be stated formally as

$$M_0^s = kPy = kSP^f y$$

or

$$S = \frac{M_0^s}{kP^f y}$$

- Hence, in equilibrium the international value of the domestic currency is essentially pinned down by the ratio of the domestic nominal money stock to the demand, measured at the foreign price level

- It is now easy to prove the follow important proposition:

Proposition 1 *In the monetary model, a given percentage increase in the domestic money supply leads, other things being equal (cet. par.), to a depreciation of the same proportion in the value of the domestic currency*

- **Income increase under floating rates:** think now of the effects on the exchange rate of an increase in real income y
- The following graph provides a graphical proof of the following propositions:

Proposition 2 *In the monetary model, a rise in domestic real income leads, cet. par., to an appreciation of the domestic currency*

Proposition 3 *In the monetary model, rise in the foreign price level, cet. par., is associated with an appreciation of the domestic currency and no other change in the domestic economy*

An Increase in Real Income and Foreign Price Level

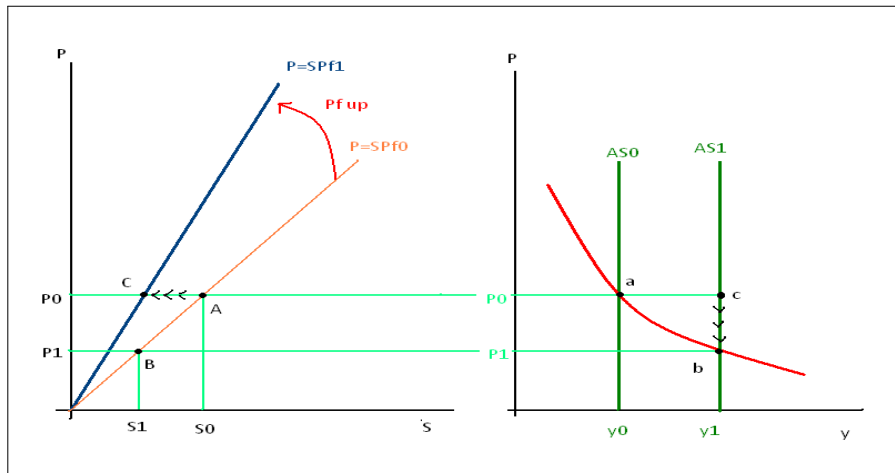


Figure: The effects of a rise a) in real income and b) foreign price level in the Monetary Model

Two-country Model of a Floating Exchange Rate

- Now, bring the foreign country or rest-of-the-world (ROW) into the simple model
- Assume a symmetric structure in the sense that

$$M^{f,d} = k^f P^f y^f$$

so that

$$M_0^{f,s} = k^f P^f y^f$$

- Take the ratio of domestic to foreign money supply and demand

$$\frac{M_0^s}{M_0^{f,s}} = \frac{kPy}{k^f P^f y^f}$$

and use the PPP $P = SP^f$ or $P/P^f = S$

$$\frac{M_0^s}{M_0^{f,s}} = \frac{kSy}{k^f y^f}$$

Two-country Model of a Floating Exchange Rate

- Solve for the nominal exchange rate

$$S = \frac{M_0^s / M_0^{f,s}}{k_y / k^f y^f} = \frac{\tilde{M}}{\tilde{k}\tilde{y}}$$

where the \tilde{x} above the variable x signifies 'relative domestic variable X ', ie. the ratio of the domestic variable X to its foreign counterpart X^f

- Consequently, propositions 1 and 2 above can be generalized by substituting for the domestic variables their relative values
- **What about fixed exchange rates?** We can fine-tune the model to analyze also open economy adjustment under fixed rates
- Recall money supply

$$M^s = FX + DC$$

an think about the effects of an expansionary monetary policy, represented as an increase in domestic credit DC

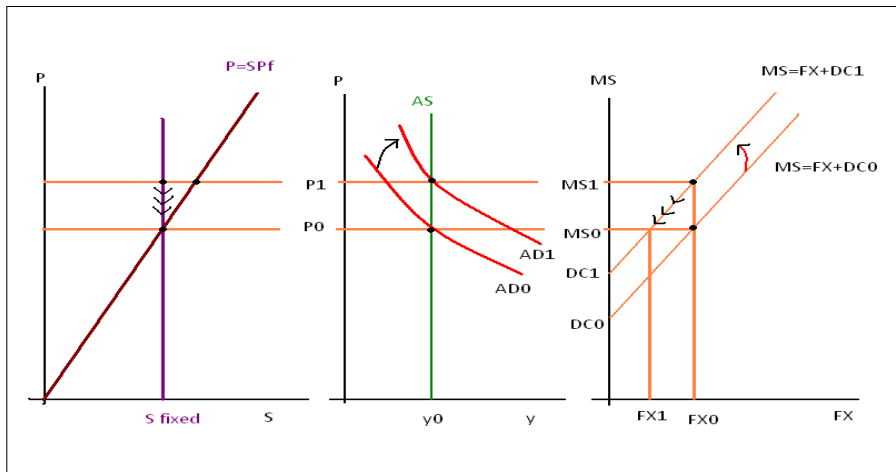


Figure: Increase in domestic credit under fixed exchange rates.

Fixed Exchange Rates

- In the following graph the rightmost part represents the relationship between FX and M^s ; when $FX = 0$ domestic money supply equals domestic credit; increasing FX increases domestic money supply one-for-one
- The middle graph describe AD-AS equilibrium, while the leftmost graph depicts the PPP line
- An increase in domestic credit shifts the money supply curve up in the utmost right figure, generating an increase in Aggregate Demand (middle graph)
- The increase in AD puts pressure on the domestic price level to increase, which, in turn, threatens to make the domestic economy internationally less competitive
- The incipient loss in international price competitiveness puts pressure on the exchange rate: demand for foreign currency increases which tends to weaken the domestic currency

- S is (credibly) fixed, cannot depreciate; CB has to satisfy the increased demand for foreign currency by running down FX reserves ($FX_0 \Rightarrow FX_1$)
- Hence domestic money supply starts to shrink; this continues as long as FX falls, ie. PPP is not restored
- We can now state

Proposition 4 *Under fixed exchange rates in the monetary model, starting from a position in equilibrium, domestic credit creation will be neutralized, cet. par., by a fall in the reserves as a result of a temporary BoP deficit. Conversely, domestic credit contraction will cause a temporary BoP surplus and a consequent offsetting rise in the reserves*

I

- Instead of talking about neutralizing the effects of a change in domestic credit under fixed exchange rates, economists talk about *sterilization*

Definition

Sterilization is the process of neutralizing the effect of a BoP deficit (surplus) by creating (retiring) enough domestic credit to offset the fall (rise) in foreign exchange reserves

- Is sterilization effective? Still debated, but for sure there is a limit to (effective) sterilization: the amount of forex reserves backing domestic money stock is limited
- As long as the domestic money stock is above the equilibrium level under fixed rates, forex reserves will be diluted
 - hence, in order to avoid reducing forex reserves, reasons underlying the need for sterilization (money supply too high) have to be addressed

Effects of Increases in Income

- Think of an increase in real income; how does the economy adjust to these according to our simple model?
- We can prove the following two propositions

Proposition 5 *Under fixed exchange rates in the monetary model, starting from a position of an equilibrium, the result of an increase in domestic real income will be, cet. par., to cause an increase in reserves as a result of a temporary BoP surplus. In the new equilibrium, the domestic money supply will have increased and the home price level will have returned to the PPP level*

Effects of Increases in the Foreign Price Level

- Similarly

Proposition 6 *Under fixed exchange rates in the monetary model, starting from a position of an equilibrium, the result of an increase in the foreign price level will be to cause, cet. par., an increase in the reserves as the result of a temporary BoP surplus. In the new equilibrium, the domestic money stock will be greater and home price level will have risen to its PPP level*

- Note the implication here: if a country adopts a fixed exchange rate system, it has ultimately to accept the world price level
 - it is thus forced to import inflation from the rest of the world
 - the fact that it cannot control its money supply means it cannot choose its price level or inflation rate independently of developments beyond its borders
- Hence: a country cannot follow an independent monetary policy under fixed exchange rates

- There is a qualification: world money supply determines world price level (to the extent world money supply exceeds demand)
- Hence, for a single country not to be able to conduct independent monetary policy under fixed exchange rates, it has to take world money supply as outside its control, ie. as exogenous
 - this assumption makes sense if, in particular, the country is small relative to the ROW so that changes in its money supply does not affect world money supply
- But there is an instrument of monetary policy a country can use also under fixed exchange rates: devaluation/revaluation of the domestic currency
- Devaluation is an isolated discrete change in the international value of the domestic currency
- To analyze the effects of a devaluation, it must be emphasized that it must be (perceived as) an isolated event, one that does not **generate expectations of further devaluations to come**

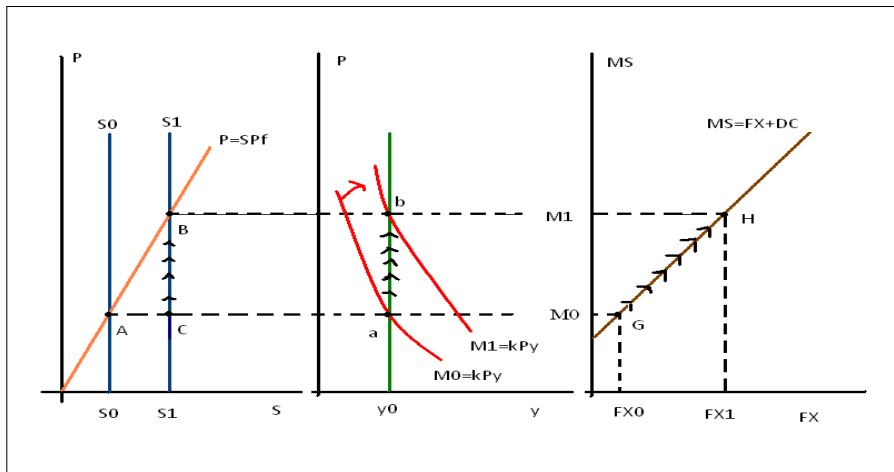


Figure: Devaluation under fixed exchange rates ($M_0 = P_0 = 1$).

Devaluations

- Start from a position of equilibrium (A, a, G)
- S devalued: $S_0 \Rightarrow S_1$; prior to price level adjustment, a jump from $A \Rightarrow C$
- Competitiveness advantage to domestic goods as they become cheaper internationally
- Results in a BoP surplus \Rightarrow FX start to increase \Rightarrow domestic M^s starts to increase
- The increase in the domestic money supply supports an increase in Aggregate Demand: AD shifts as indicated from $M_0 \Rightarrow M_1$
- The resulting excess demand in the domestic goods market implies that the domestic price level increases: this increase continues as long as there is excess demand, ie. as long as PPP is not restored
- Hence, domestic price level moves from $C \Rightarrow B$; domestic economy has accumulated reserves as indicated by the arrows from $G \Rightarrow H$ (money supply up)

- Note: the assumption above that the economy is initially in equilibrium may sound silly as more often than not authorities resort to devaluations to (try to) correct for an underlying disequilibrium!
- Anyway, we have yet another proposition

Proposition 7 *Under fixed exchange rates in the monetary model, a once and for all devaluation will result in a temporary improvement in the competitiveness of the home country and, hence, BoP surplus, leading to a rise in FX reserves. However, the ensuing inflation will erode the country's price advantage as time passes until the economy finds itself back where it started, with a higher price level, greater reserves and a larger nominal money stock, but the same real money stock*

- Sometimes it is argued that the BoP improvement may come with a delay; actually, the initial response of the BoP may be the opposite

Devaluations

- Reason? Often trade flows are priced in the currency of the exporter and after a devaluation there is a fall in the average foreign currency price of exports while the foreign currency price of imports does not change at all
- Furthermore, price elasticity of exports and imports are, in the very short-run, negligible, so the initial impact of a devaluation is to leave volumes unchanged with less favourable prices for the home country
- If this analysis is correct (and there is some evidence it is), then a devaluation will be followed by an initial increase in the current account deficit, reversing itself gradually, until it surpasses its former position and carries on improving: this is the so called **J-curve effect**
- J-curve is often regarded as a problem; however, it relates exclusively to the current account
- So, if the objective of devaluations is to improve the current account, the possibility of a J-curve effect may be a worry
- Cannot rule out cost pressures in the domestic economy emerging before current account starts to improve

Interest Rates in the Monetary Model

- The previous analysis rests on the simple Cambridge Quantity Equation
- What if money demand depends also on interest rates?
- For the moment, abstract from UIP/CIP conditions analyzed previously and assume myopic exchange rate expectations (zero exp.)
- Refer to the next graph, which follows through the effects of an increase in the domestic interest rates on the macroeconomic equilibrium in the simple model
- An increase in the domestic interest rate will create an excess supply of money in the domestic money market and an excess demand in the goods market
- Hence, the Aggregate Demand schedule shifts to the right creating, at the initial price level, an excess demand for goods equal to $y^d - y$ ($a \implies c$)
- The domestic price level starts to move up along the rightmost Aggregate Demand schedule (towards b)

Interest Rates in the Monetary Model

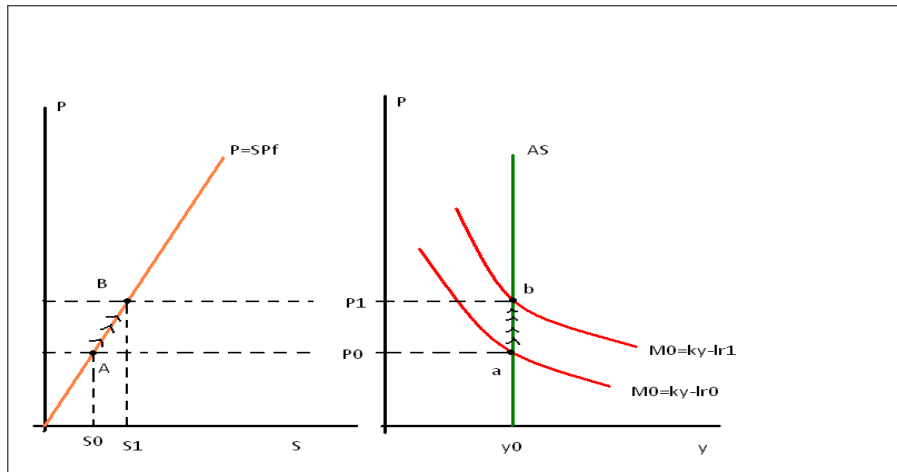


Figure: Interest rate increase under floating exchange rates.

Interest Rates in the Monetary Model

- Thus, at the higher domestic interest rates, agents are economizing on real balances (by spending more)
- In the process, they drive up the domestic price level until the real money stock has been reduced to a level consistent with the money market equilibrium at high interest rates
- What happens in the external sector, ie. the leftmost graph
- The exchange rate is floating; so the increase in the domestic price level induced by the higher domestic interest rate has made the domestic economy less competitive, implying, in turn, a depreciation of (ie. an increase in) S ($S_0 \implies S_1$)

Proposition 8 *According to the monetary model, an increase in the domestic interest rate relative to the ROW gives rise to a depreciation of the domestic currency (for a given money supply and real income)*

Handbook of intl economics: Levich (1985, vol. I), Rose-Frankel (1995, vol. II) and Engel (2014, vol. III)

- How does our simple model fair with facts
- Unfortunately not at all well, particularly over the short-run
- Over the long-run, the facts do not seem to contradict the basic implications of the simple monetary model
- Surprising? Not necessarily so, once it is remembered that PPP is such a central element of the monetary model
- Also, the assumption of perfectly flexible prices may be more plausible over the long-run, while it may be more reasonable to assume fairly constant prices as a good approximation to reality over the short-run

Estimate: $s = a + b(m - m^*) + c(y - y^*) + u$

Mundell-Fleming Model: set-up

- M-F model is a prototype Keynesian model analyzed earlier, with the assumption of sticky prices at the core of the analysis

Assumption 4 *The Aggregate Supply curve (AS) is flat*

- Hence, the burden of adjustment to Aggregate Demand fluctuations falls on the level of economic activity (y) rather than on the price level (P)
- We can consequently concentrate on the demand side of the economy: or, we can concentrate on the IS-LM framework within which AD is determined
- The distinguishing feature of the M-F model is the specification of the external sector
 - current account balance is determined independently of the capital account, so that the achievement of the overall balance requires adjustment in the domestic economy

- **Current Account (CA):** starting point is the following assumption

Assumption 5 *PPP does not hold, even in the long-run. Instead the size of the CA surplus depends positively on the real exchange rate and negatively on real income*

- In formal terms: CA surplus B

$$B = B(y, Q), \quad B_y < 0, \quad B_Q > 0$$

- There are a number of **exogenous shift factors** that could be incorporated in B : shocks to intl tastes, shocks to export demand etc. etc.
- For the **Capital Account (CaPA):**

Assumption 6 *Exchange rate expectations are static*

Assumption 7 *Capital mobility is less than perfect*

Mundell-Fleming Model: Capital Mobility

- The absence of perfect capital mobility: international interest rate differential are assumed to provoke *finite capital flows* into and out of the economy
- Previously we argued for reason of imperfect capital mobility: eg. limited supply of arbitrage funds, risk aversion etc
- We can formalize these ideas as suggesting that capital flows respond to international interest rate differential via the function K

$$K = K(r - r^f) = k(r), \quad k' > 0$$

where the exogenously given foreign interest rate r^f is defined so as to include any expected rate of depreciation of the domestic currency

- Hence, Finland's net capital inflows, K , will be an increasing function of the extent to which the domestic interest rate is greater than the one ruling in the USA (inclusive of any expected depreciation in the value of the euro)

Mundell-Fleming Model: BoP Locus

- BoP equilibrium obtains when the flow of capital across the exchanges is just sufficient to finance the CA deficit or absorb the surplus
- Under float the overall BoP must be in equilibrium at all times, implying the the sum of the surplus in CaPA and CA must be zero

$$B(y, Q) + k(r) = 0$$

or more compactly

$$F(y, Q, r) = 0, \quad F_y < 0, \quad F_Q > 0, \quad F_r > 0$$

- This relationship is depicted in the next figure

Mundell-Fleming Model: BoP Locus

- Note that for given Q (fixed at \bar{Q}), we have

$$B_y dy + k' dr = 0 \iff \left. \frac{dr}{dy} \right|_{Q=\bar{Q}} = -\frac{B_y}{k'} > 0$$

ie. the locus consisting of the set of interest rate - real income points that maintain BoP equilibrium at fixed real exchange rate can be represented as an upward sloping curve in the (y, r) -space

- Under and to the right of this BoP locus, the economy suffers from a CA (BoP) deficit so that for a given interest rate, real income has to fall to bring the CA into equilibrium; similarly above and to the left of the BoP locus, the economy runs a CA surplus implying that for a given interest rate real income has to increase to equilibrate the CA
- Note also that under perfect capital mobility, $k' \nearrow \infty$ so $\left. \frac{dr}{dy} \right|_{Q=\bar{Q}} \nearrow 0$; hence, the BoP locus is flat

Mundell-Fleming Model: BoP Locus

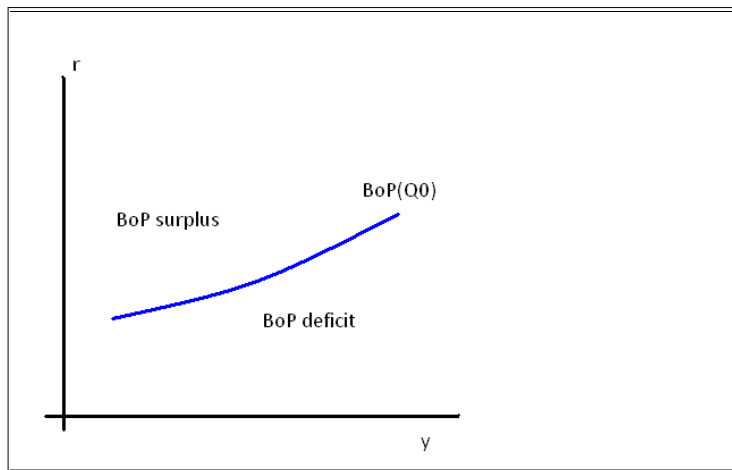


Figure: Balance of Payment equilibrium locus in M-F model (BoP).

Mundell-Fleming Model: TT- and FF-locus

- Now, fix the domestic interest rate at \bar{r} ; it then follows from the BoP equilibrium condition that

$$B_y dy + B_Q dQ = 0 \iff \left. \frac{dQ}{dy} \right|_{r=\bar{r}} = -\frac{B_y}{B_Q} > 0$$

- The set of real exchange rate - real income points in the (y, Q) -space that maintain BoP equilibrium at constant interest rates is called the TT -locus; it is thus an upward sloping curve in the (y, Q) -space
 - TT locus basically describes CA equilibria at given interest rates
- Points under and to the right (above and to the left) of this curve represent BoP deficits (surpluses): for a given Q real income needs to fall (increase) to equilibrate the BoP
- In the same vein, we can derive for a fixed real income \bar{y} (FF-locus)

$$B_Q dQ + k' dr = 0 \iff \left. \frac{dr}{dQ} \right|_{y=\bar{y}} = -\frac{B_Q}{k'} < 0$$

Mundell-Fleming Model: TT-and FF -locus

- Hence, at a given level of the domestic real income, domestic interest rates and the exchange rate are negatively correlated along the equilibrium BoP
- Note that these last two relationships should not suggest to you that the CA deficit of the BoP should always be zero, ie. that the triple (y, r, Q) should find values that push the CA deficit to zero
 - we only require that the BoP be in balance, ie. there can be non-zero balance in the component accounts of the BoP even under flexible exchange rates
- For example, in the next graph, the BoP equilibrium corresponding to the level of the domestic income at y_0 , ie. (y_0, r_0, Q_0) implies also a zero balance on the CA and CaPA of the BoP; at y_1 however, the BoP equilibrium requires a weaker domestic currency (in real terms) a slightly lower domestic interest rate, ie. (r_2, Q_1) at the point b on the $FF(y_1)$ curve

Mundell-Fleming Model: TT- and FF -locus

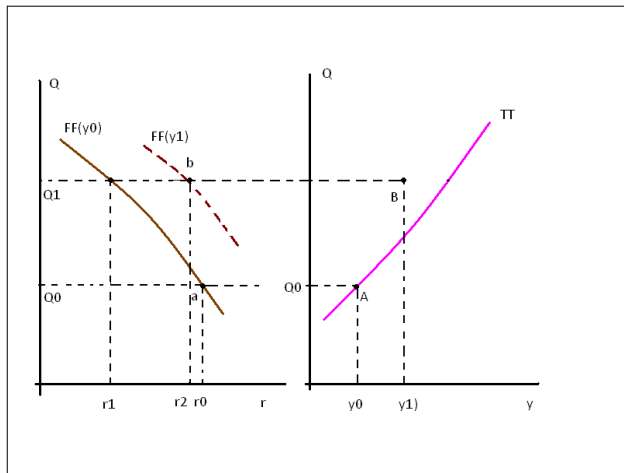


Figure: Representing BoP equilibria: FF and TT locus.

Policy Experiments

- We can now do a set of policy experiments, starting from domestic monetary expansion
 - the M-F model was thought, back in time, to be at its best in these (conceptual) policy experiments and much of the academic as well as practical policy reasoning actually relied on the lessons drawn from these experiments
- Before going to these policy experiment, I feel the need to emphasize that the tools we currently use to analyze these policy questions are different from the ones presented here; in particular, current macromodels emphasize expectations as part of the policy **transmission mechanism**, ie. mechanism through which exogenous shocks and policy moves spread out in the economy resulting in changes in the macroeconomic equilibrium
- Anyway, I do think the M-F model provides us with a good starting point to discuss and debate over the effects of various policy measures and shocks to the economy (ie. macroeconomic equilibrium)

Expansionary Monetary Policy Under Floating Exchange Rates

- Now, think of what happens when the domestic monetary authority (ie. CB) expands the domestic money supply under floating exchange rates
- Note that changes in nominal exchange rates correspond changes in real exchange rates; hence, we can use S instead of Q in our graphical analysis
- Initial equilibrium at point A , ie. (y_0, r_0, S_0) ; the domestic money supply then increases M_0 to M_1
- This policy measure shifts the domestic money market equilibrium locus, LM -curve, down and to the right ($LM(M_0) \Rightarrow LM(M_1)$)
- In a closed economy domestic goods and money markets would settle to an equilibrium C
- In an open economy point C would not represent the full equilibrium point, since the BoP is in deficit (we are below and to the right of the original BP curve)

Expansionary Monetary Policy Under Floating Exchange Rates

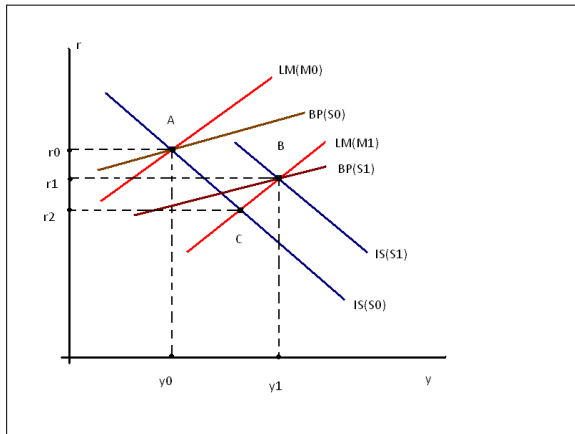


Figure: Expansionary monetary policy in the MF model under flex exchange rates.

Expansionary Monetary Policy Under Floating Exchange Rates

- Because of the BoP deficit the nominal exchange rate will have to weaken, ie. S has to rise
- A depreciation of the domestic currency will have two effects: it will shift the BoP locus down and to the right ($BP(S_0) \Rightarrow BP(S_1)$) and goods market equilibrium locus, the IS-curve up and to the right ($IS(S_0) \Rightarrow IS(S_1)$)
 - intuition? at a given domestic interest rate, a weaker domestic currency (higher S) allows for a higher domestic real income to be consistent with a BoP equilibrium (eg. TT curve!); a weaker domestic currency makes, cet. par., domestic economy more competitive and induces an improvement in the trade balance and, hence, an increase in AD, which implies a rightward shift in the IS -curve in the (y, r) -plane
- Adjustment continues as long as there is a discrepancy between the **internal (IS-LM)** and **external (BP)** equilibrium

Expansionary Monetary Policy Under Floating Exchange Rates

- Hence, the economy finds the full macroeconomic equilibrium in point B where the activity has risen to y_1 , domestic interest rate has fallen to r_1 and the domestic currency has weakened to S_1
- In conclusion: *expansionary domestic monetary policy will boost domestic output, lower domestic interest rates and make the domestic currency weaker in a small open economy under flexible exchange rates*
- Note that this conclusion is conditional on assuming less than perfect capital mobility; in particular, domestic interest rates cannot fall, if capital is internationally perfectly mobile
- Note also that the CA of the BoP improves after an expansionary MoPo move
- Compare this result to the corresponding one in the simple monetary model
- Beggar-thy-neighbour!

Expansionary Fiscal Policy Under Floating Exchange Rates

- Let us turn to the effects of expansionary fiscal policy on the macroeconomic equilibrium under flexible exchange rates
 - here the assumption of less than perfectly mobile capital is critical
- So, at the initial equilibrium (y_0, r_0, S_0) , the government decides to increase public expenditure from G_0 to G_1 ; goods market equilibrium will shift from $IS(S_0, G_0)$ to $IS(S_0, G_1)$
- Domestic goods and money market would find the equilibrium at point C , but this is not consistent with the external (BoP) balance; at the initial exchange rate S there will be a BoP surplus
- Hence, the domestic currency will start to strengthen, ie. S will fall
- The economy settles to the full macroeconomic equilibrium at B
 - higher output (activity) y , higher domestic interest rate r , stronger domestic currency S and a CA deficit

Expansionary Fiscal Policy Under Floating Exchange Rates

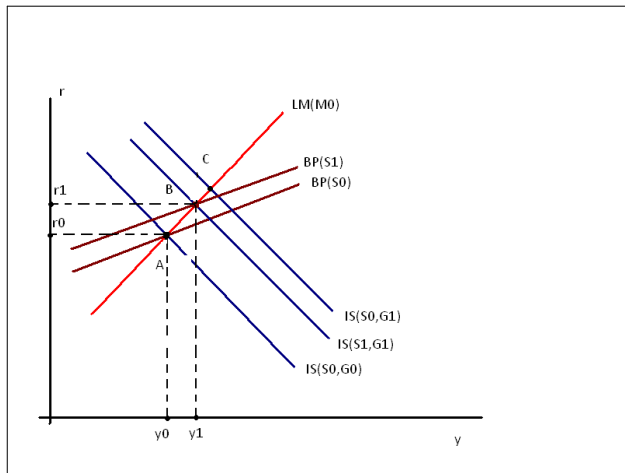


Figure: Expansionary fiscal policy in the MF model under flex exchange rates.

Expansionary Fiscal Policy Under Floating Exchange Rates

- The fact that domestic interest rates increase relies heavily on imperfect capital mobility and results from the underlying logic that to finance the increase in public expenditure, the government issues bonds whereby it thus increases the supply of bonds, i.e. lowers their price or increases the interest rate
- Due to imperfect capital mobility, the supply of capital is effectively less than perfectly elastic implying price (yield) movements once demand for capital shifts
- Under perfect capital mobility, we have the following drastic conclusion:
 - *under perfect capital mobility, government expenditure cannot affect aggregate activity in the small open economy under flexible exchange rates*
- The underlying reason is that the exchange rate keeps appreciating as long as CA surplus looms after the expansionary FiPo move by the government; hence the IS -curve shifts back to its original position

Expansionary Monetary Policy under Fixed Exchange rates

- Policy conclusion need to be qualified once we relax the assumption of a floating exchange rate system
- Actually the relative efficiency of monetary and fiscal policy reverses from what we know about them under flexible exchange rates
- Anyway, to continue, assume fixed exchange rates and the decision by the domestic CB of expand domestic money supply (through domestic credit)
- Assume also an initial equilibrium (y_0, r_0, DC_0) ; foreign exchange reserves are initially at FX_0
- Domestic CB expands domestic credit to DC_1 with the effect of shifting the domestic money market equilibrium locus - LM -curve - down and to the right
- It looks that the domestic economy finds an equilibrium at point B , but this cannot be the overall macroeconomic equilibrium with the new DC at DC_1 , since at the fixed exchange rate \bar{S} the BoP is not in equilibrium

Expansionary Monetary Policy under Fixed Exchange rates

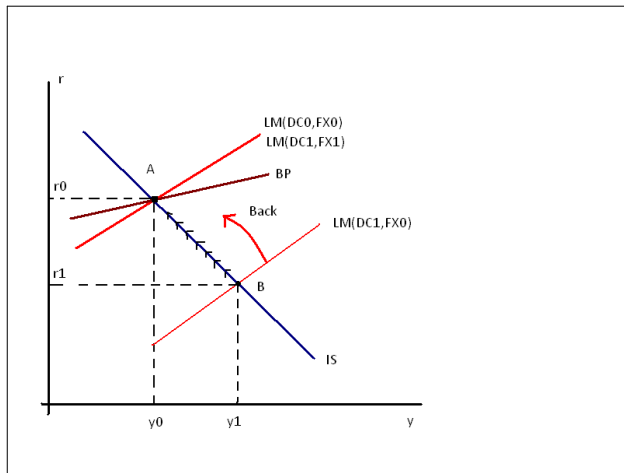


Figure: Expansionary monetary policy in the MF models under fixed exchange rates

Expansionary Monetary Policy under Fixed Exchange rates

- Due to the implied BoP deficit, capital starts to flow out of the domestic economy, thus reducing FX reserves
- As the FX reserves continue shrinking, domestic money supply also shrinks and so does aggregate activity (AD)
- The process continues as long as there is a BoP deficit, ie. as long as domestic money supply is excessively large relative to its equilibrium value
- Since the economy is in full macroeconomic equilibrium at A , domestic money supply and, hence, activity returns back to the original level
- Drastic conclusion: *under fixed exchange rates, monetary policy is completely ineffective, ie. cannot affect domestic activity; only the composition of the domestic money supply changes*

Expansionary Fiscal Policy under Fixed Exchange rates

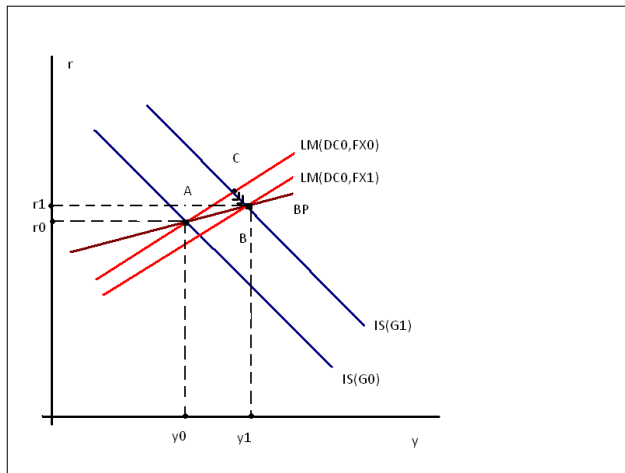


Figure: Expansionary fiscal policy in the MF model under fixed exchange rates.

Expansionary Fiscal Policy under Fixed Exchange rates

- Assume government expenditure increases $G_0 \rightarrow G_1$; goods market equilibrium locus (IS) shifts up and to the right
- Internal equilibrium at C : BoP surplus, which implies that forex reserves start to increase ($FX_0 \rightarrow FX_1$); money market equilibrium (LM) shifts down and to the right
- New macroeconomic equilibrium at B : (y_1, r_1)
- Note that the effects of fiscal expansion on activity are greater under higher capital mobility

Models are different

- The Monetary and Mundell-Fleming model differs in terms of the price level, income, expectations and interest rates
- The domestic price level is fully flexible in the Monetary Model, which fixed in the M-F Model: the AS curve is vertical in the former and horizontal in the latter
- In the Monetary Model changes in income can only occur due to exogenous events; consumption implicitly depends on the real interest rate rather than income
 - the only role for income is to determine the demand for real balances and since exogenous changes in real income swell demand for money, it leads to the appreciation of the domestic currency
- In the M-F Model income is one of the endogenous variables; an (endogenous) increase in income leads to an increase in the domestic interest rate in so far it leads to an increase in the demand for money; by feedback it also leads to an increase in private consumption and, via marginal propensity to import, worsening of the current account

Models are different

- This latter effect, in turn, leads either to reserves losses (fixed e-rates) or depreciation of the domestic currency (flex e-rate)
- As for expectations and interest rates, neither model provides an explicit role for expectations
- In the Monetary Model, however:
 - expectations are exogenously given **OR**
 - expectations depend in some more complicated fashion on other variables
- The Monetary Model belongs to the classical tradition, so that it assumes the real interest rate is determined purely in the savings market
- When combined with the interest parity, these two facts imply that nominal interest rates cannot fluctuate freely to clear the money market; that job is left to the price level; the domestic interest rate is thus effectively tied to the foreign interest rate

Models are different

- The Keynesian approach takes the goods market equilibrium as dependent at least as much on income as on interest rates
- Hence, the interest rate is free to help clear both money and goods markets
- Viewed from the international perspective, the link with foreign interest rates is almost completely broken; in place of UIP, we have

$$r = r^f + \Delta s^e + \rho$$

- If the required risk premium - the last term on the r.h.s. - rises with the amount of domestic-currency assets held, it follows that the scale of capital inflows at any point will be an increasing function of the domestic interest rate, *for a given value of the expected rate of depreciation*
- This is ok, if we can take the expected rate of depreciation as given and if the required risk premium is independently determined