EC652 International Monetary Economcis

5. Macroeconomy, Internal Balance and External Balance under Fixed Exchange Regime (Part 2)

Euamporn Phijaisanit

Thammasat University

Semester 2/2018

Outline

- Balance of payments and money supply
- Sterilization
- Monetary policy with fixed exchange rate
- Fiscal policy with fixed exchange rate
- Perfect capital mobility
- Shocks to the economy
- Imbalances and policy responses

Objectives

- The connection between official intervention in the foreign exchange market and the domestic money supply.
- How official intervention affects a country's BOPs and macroeconomic performance goals.
- The reasons for, and methods of, sterilized intervention by monetary authorities.
- How monetary and fiscal policies affect internal and external balance under fixed exchange rates.
- The effectiveness of monetary policy and fiscal policy under perfect capital mobility.
- When aggregate demand policies can and cannot achieve both internal and external balance.
- How, under imperfect capital mobility, an appropriate mix of monetary and fiscal policies can achieve internal and external balance in the short-run.
- When a country might want to abandon its defense a fixed exchange rate
- How much the grade balance will respond to a change in the exchange rate.

BALANCE OF PAYMENTS AND MONEY SUPPLY

Under fixed exchange rate…

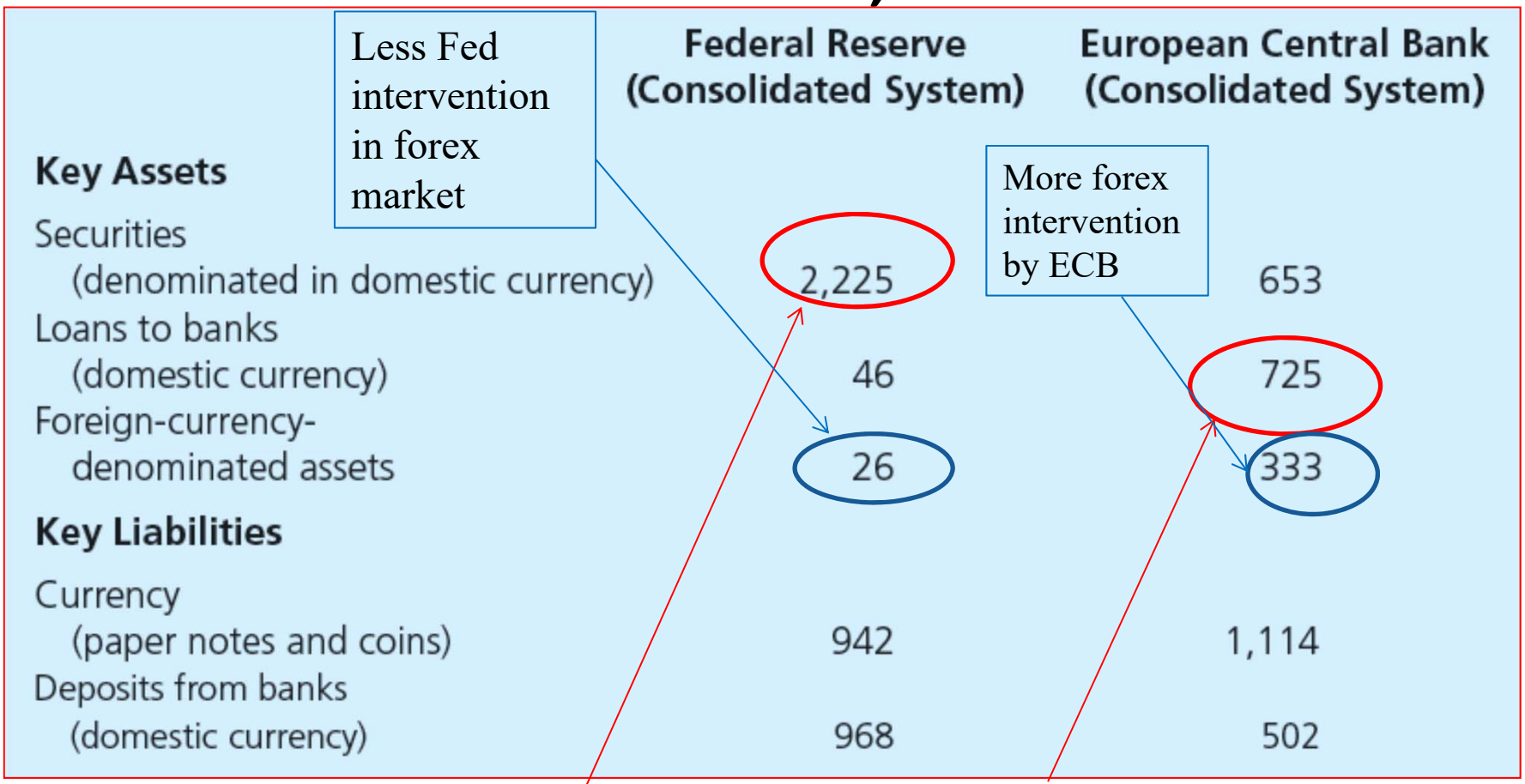
- Official intervention causes:
  - change in holdings of official reserves as central bank buys or sells foreign currency
  - money supply *may* change if central bank buys or sells domestic currency

Assets and Liabilities of Central Bank

Central Bank	
Selected Assets	**Selected Liabilities**
Domestic assets (D)	*Monetary base (MB)*
Debt securities	Currency
Loans to banks	Deposits from banks
International reserve assets (R)	
Foreign-currency assets	

Source: Pugel (2012), p. 577

Key Balance-Sheet Items, the Fed and the ECB, December 31, 2010



Source: Pugel (2012), p. 577

Fed buys and sells govt securities using (domestic monetary policy through OMO)

ECB mostly makes loans (in euros) to banks and financial institutions

BOT Assets and Liabilities (Million Baht)

		DEC 2012	JAN 2013	FEB 2013	MAR 2013	APR 2013	MAY 2013	JUN 2013 p
1	**Assets**							
2	Monetary Gold and SDRs	299,489	289,793	276,765	274,420	257,367	251,034	235,635
5	Currency and Deposits	892,269	721,570	647,879	514,432	692,654	743,957	847,220
15	Securities Other Than Shares	4,654,944	4,659,798	4,724,438	4,716,563	4,562,570	4,588,687	4,549,281
26	Loans	204,955	204,287	204,851	204,691	204,312	203,688	204,656
42	Other Loans to Nonresidents	0	0	0	0	0	0	0
43	Shares and Other Equity	19,018	18,504	18,381	18,181	18,222	18,933	19,167
51	Other Accounts Receivable	90,284	92,570	73,296	72,319	78,603	86,830	96,869
54	Nonfinancial Assets	10,789	10,823	10,825	10,854	10,890	10,924	10,952
57	Total Assets	6,171,748	5,997,345	5,956,434	5,811,460	5,824,618	5,904,052	5,963,779
58	**Liabilities**							
59	Banknotes in Circulation	1,350,932	1,260,118	1,271,379	1,267,943	1,261,521	1,248,795	1,239,108
60	Deposits Incl. in Broad Money (BM)	4,554	3,901	3,508	3,601	4,205	4,181	4,367
74	Deposits Excl. from Broad Money (BM)	422,275	412,280	422,905	380,435	396,552	398,945	590,163
97	Securities Other Than Shares, excl. from BM&MB	3,083,038	3,043,253	3,075,902	2,967,731	3,058,870	2,983,735	3,024,704
106	Loans	942,150	1,097,037	1,078,275	1,216,417	1,145,947	1,250,081	954,609
123	Other Accounts Payable	24,111	42,799	60,432	66,338	29,044	26,823	20,157
133	SDR Allocations	45,677	44,563	43,798	42,630	42,959	43,893	45,441
134	Shares and Other Equity	299,011	93,394	236	-133,635	-114,480	-52,400	85,231
135	Total Liabilities	6,171,748	5,997,345	5,956,434	5,811,460	5,824,618	5,904,052	5,963,779

Source: www.bot.or.th

Key Assets

- Domestic Assets (D) are domestic-currency denominated assets which include:
  1. Bonds and similar debt securities
  2. Loans that the central bank has made to (regular) domestic banks or other domestic financial institutions
- International Reserves (R) are foreign currency assets held by the central bank

Key Liabilities

1. Domestic currency (paper money and coins) issued by the central bank
2. The deposits that the country's (regular) domestic banks (or other domestic financial institutions) have placed with the central bank.

- Monetary base (MB) is the total of these two central-bank liabilities, currency and deposits from banks.

Money Supply

- The country's money supply consists (mainly) of currency held by the public and various types of deposits (like checking accounts) that the public has at regular banks.

Fractional reserve banking

- The amount of reserves that a bank is required to hold (ie., bank's holding of currency in its vault and the bank's holdings of deposits at the central bank) is typically some fraction of deposits that the bank owes to its customers. This system is called fractional reserve banking.

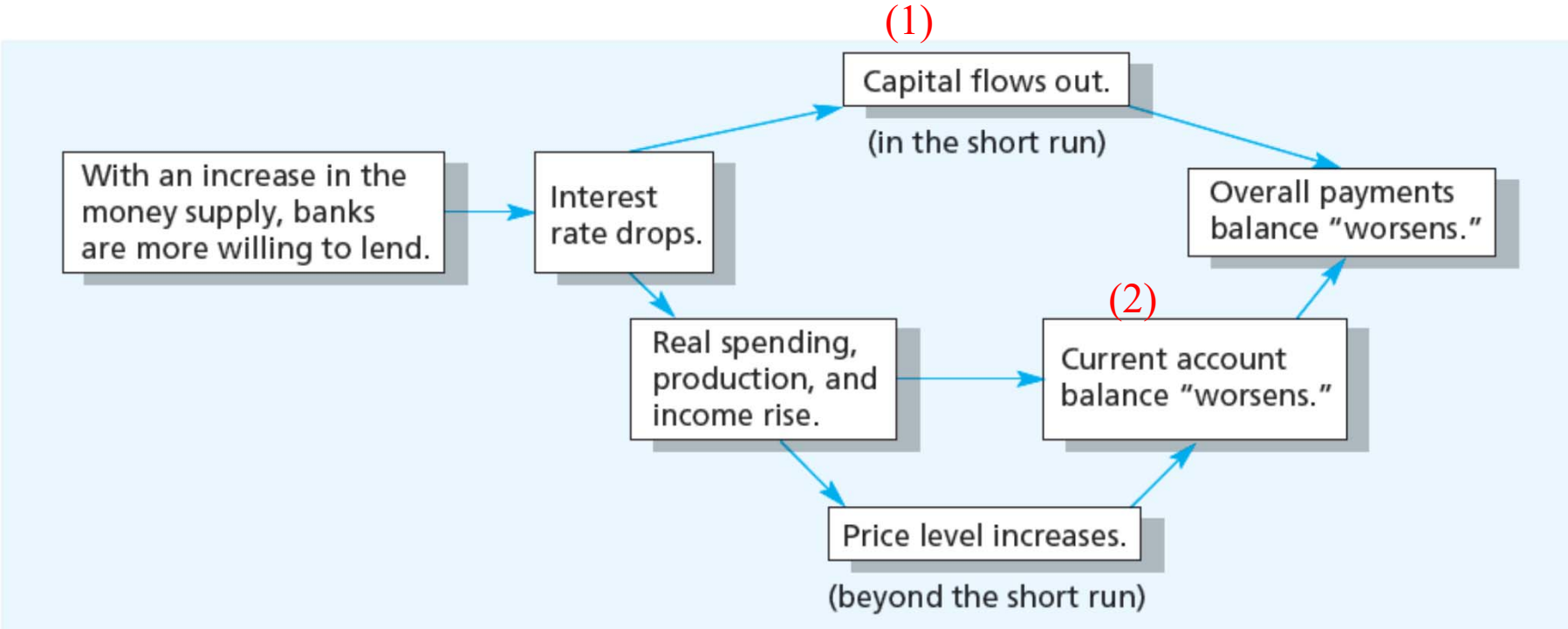
Suppose there is official settlements balance deficit…

- The exchange-rate value of the country's currency depreciates.
- The central bank intervenes by selling foreign currency and buying domestic currency.
  - Official Reserve holdings (R)↓,
  - Liabilities (MB) ↓ as the domestic money is removed from the economy.
  - Money Supply (MS) ↓

Suppose there is official settlements balance surplus…

- The exchange-rate value of the country's currency appreciates.
- The central bank intervenes by buying foreign currency and selling domestic currency.
  - Official Reserve holdings (R)↑,
  - Liabilities (MB) ↑ as the domestic money is added to the economy.
  - Money Supply (MS) ↑

Expanding the Money Supply Worsens the Balance of Payments with Fixed Rates

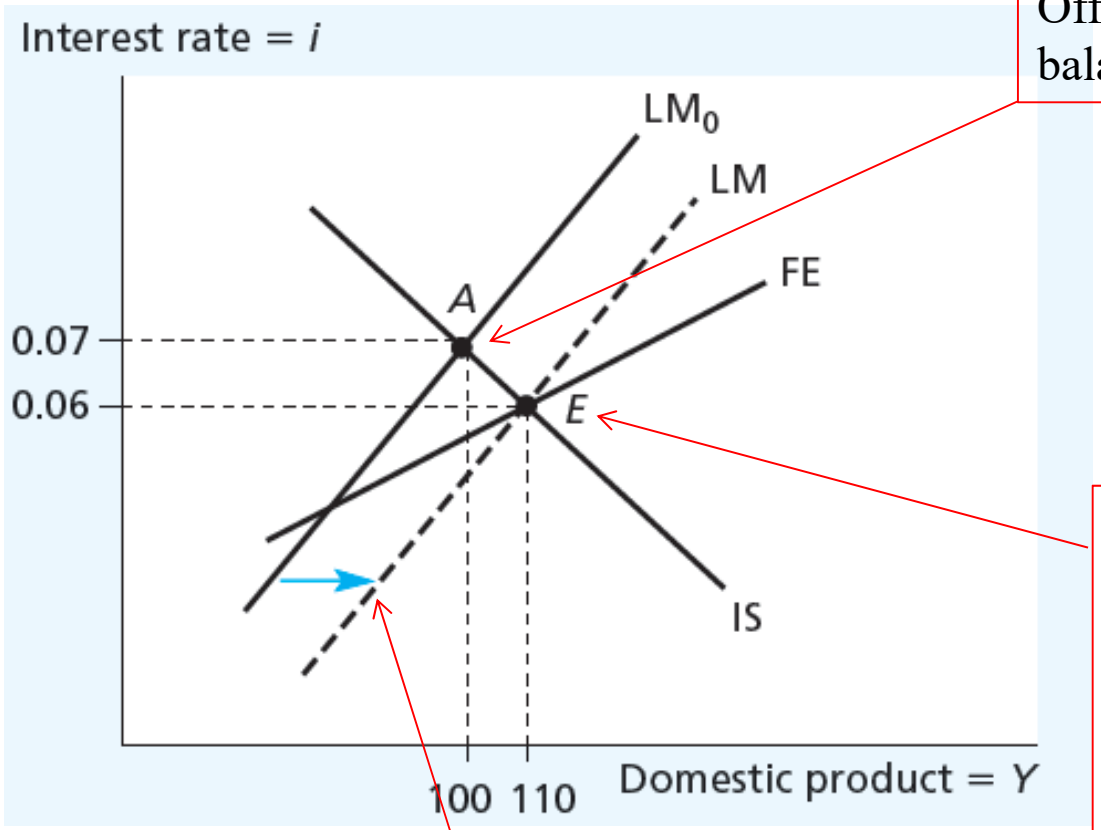


Source: Pugel (2012), p. 580

Effects of Official Intervention on Money Supply

- Official intervention by a country that initially has BOPs surplus can increase the money supply, and this increase in the money supply sets off adjustments in the economy that tend to reduce the size of the surplus.

Payments Adjustments for a Surplus Country with Fixed Rates



Official settlements balance surplus at A.

IS-LM intersection now moves closer to FE curve.
If price level does not change, full adjustment has occurred (after several years) when the LM has shifted down to the triple intersection at point E.

Intervention to defend fixed rate increases MS, shifting LM curve.

Source: Pugel (2012), p. 581

Main Ideas

- If an external imbalance exists, intervention to defend the fixed rate changes the domestic money supply.
- The money supply change causes adjustments that move the country back toward external balance.
- So what is the problem?

Two Possible Problems

- The increase or decrease in international reserve assets may be viewed as undesirable. For example, officials may not want LM to be affected.
- Adjustment toward external balance may not be consistent with internal balance.
  - Example: In surplus situation, increase in MS can put upward pressure on price.
  - In deficit situation, the decrease in money supply can result in recession (declining real production) and rising unemployment.

STERILIZATION

Sterilization

- The central bank can keep the external surplus or deficit from having an impact on the domestic money supply by taking an offsetting domestic action.
- Sterilization is taking an action to reverse the effect of official intervention on the domestic money supply.

Example of Sterilization

- Suppose there is BOPs surplus.
- Central bank initially intervenes to defend the fixed exchange rate.
- MS ↑ (since R↑ and MB↑)
- Sterilization is when central bank sells domestic government bonds in the open market operation (OMO).
  - This will reduce MS by reducing both the domestic assets held by the central bank and the central bank liabilities that serve as the base for the domestic money supply (D↓ and MB↓).
  - The effects on the monetary base and the money supply of the combination of intervention and sterilization tend to cancel out (MB↑ = MB↓).
  - The net effects of the sterilized intervention are to alter the composition of the central bank's assets (in this case, R↑ and D↓)
  - Since sterilization does NOT change the MS, the LM curve does NOT change.

Wait-and-see strategy

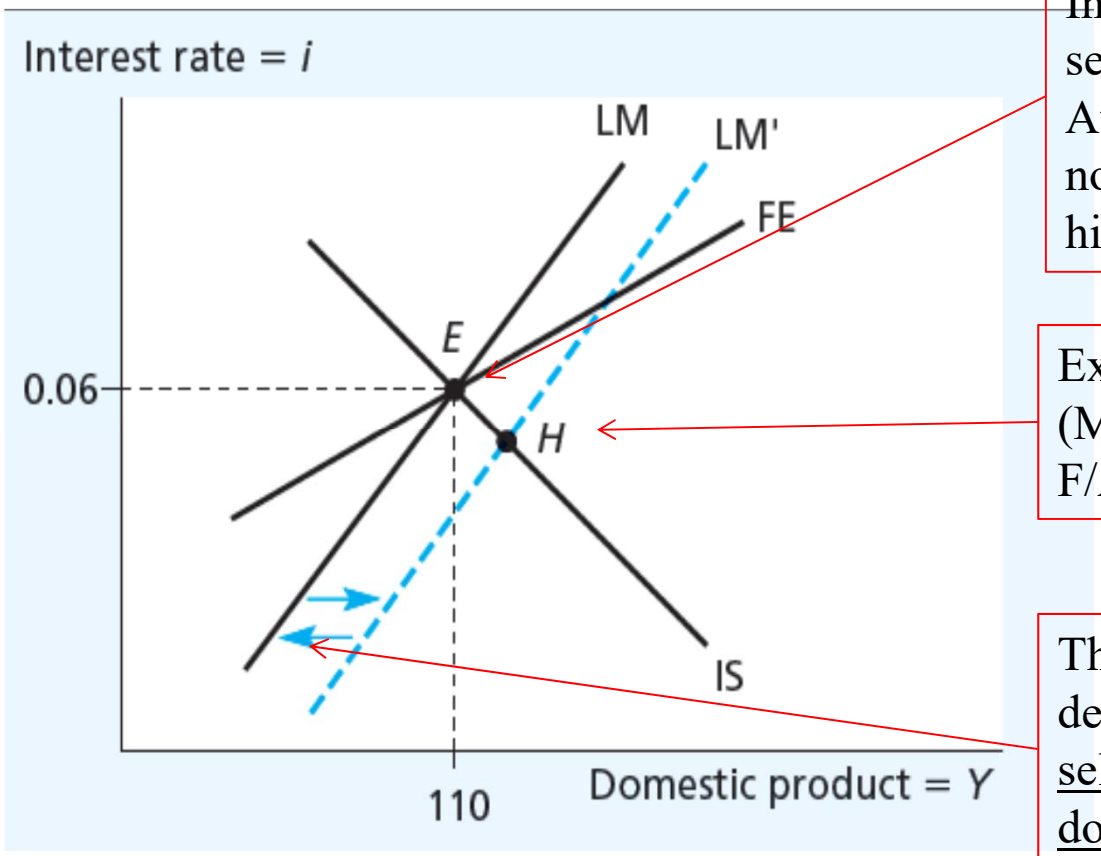
- If central bank conducts sterilization intervention, the economy's equilibrium remain at point A.
- There is no adjustment toward external balance.
- Often this is a wait-and-see or a wait-and-hope strategy that something else will shift the FE curve toward point A, or some other source of change will shift IS-LM intersection toward the FE curve.
- If nothing happens, there will be limits to central bank to continue using sterilized intervention.
  1. Unwillingness of the central bank to continue increasing official reserve assets
  2. Complaints by other countries about the country's on-going surplus.

Major Implication

- Fixed exchange rate regime greatly constrains a country's ability to pursue an independent monetary policy.

MONETARY POLICY WITH FIXED EXCHANGE RATES

Expansionary Monetary Policy with Fixed Rates



Initially begins with official settlements balance (B) = 0.
At E, country may believe that it has not achieved internal balance due to high employment rate.

Expansionary monetary policy (MS↑). Y↑ but B < 0 and C/A and F/A will deteriorate at point H.

The country must intervene to defend its fixed exchange rate, selling foreign currency and buying domestic currency. This reduces MS, forcing the country to abandon its expansionary policy. Sterilization can be conducted for a while but not forever.

Source: Pugel (2012), p. 584

Monetary Policy under Fixed Exchange

- The ability to change the money supply is limited, and eventually stops, because of the feedback from the BOPs and the need to defend the fixed rate.

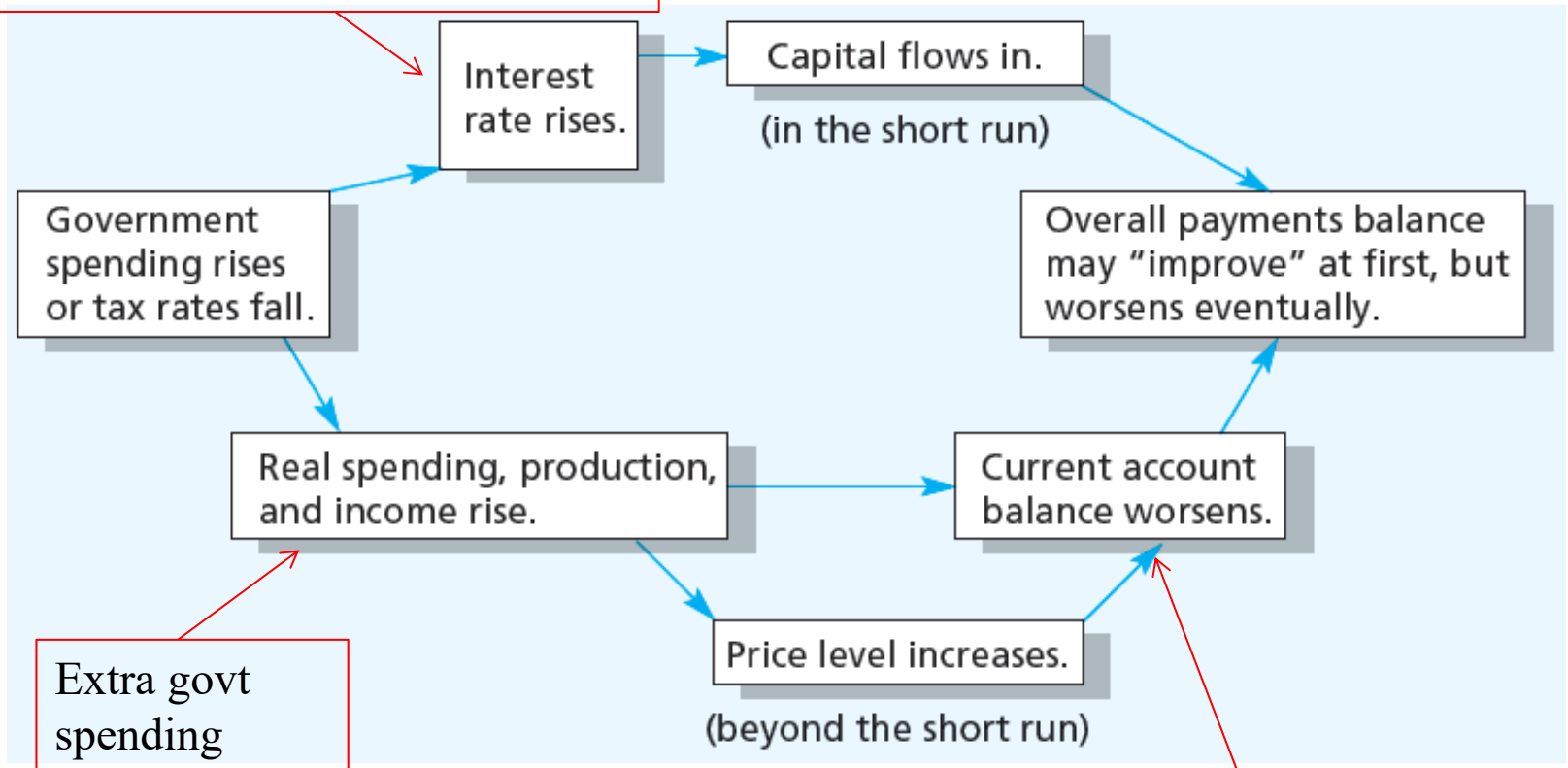
FISCAL POLICY WITH FIXED EXCHANGE RATES

Fiscal Policy

- Fiscal policy is implemented by changing government spending (G)and taxes (T).
- A change in fiscal policy affects the balance of payments through both the current account and the financial account.

How Expansionary Fiscal Policy Affects the Balance of Payments with Fixed Rates

To finance budget deficit, government is borrowing more and driving up interest rates.



Extra govt spending increase AD

May export less or import more

Source: Pugel (2012), p. 585

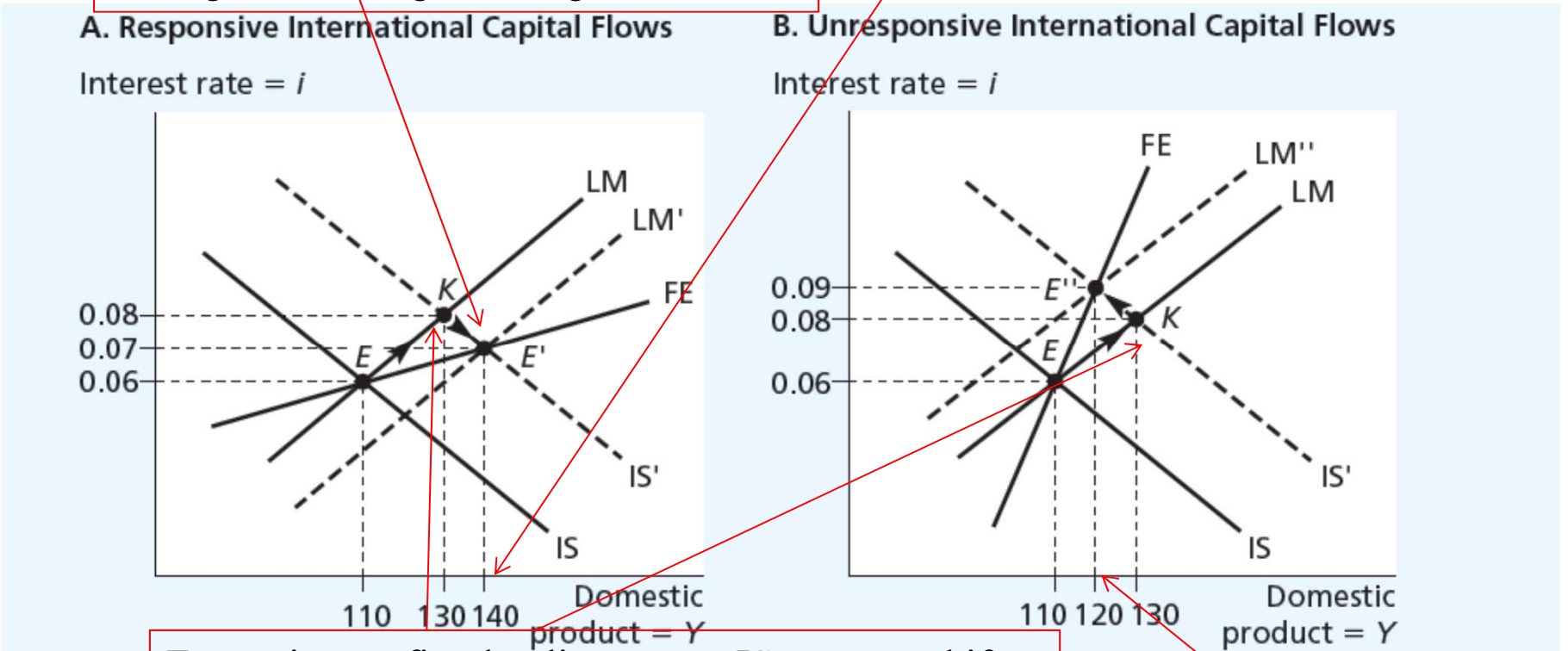
Overall Balance will depend on how responsive international financial capital flows responsive are to interest rate changes and the timing

- If international capital flows are very responsive to interest rate changes (high capital mobility), then capital inflows will be large, and the official settlements balance will go into surplus.
- If the capital flows are unresponsive (low capital mobility), then the financial account will improve only a little, and the overall balance will go into deficit.
- The capital inflows may be large at first, but they probably will dwindle as international portfolios are adjusted to the new economic conditions.

Expansionary Fiscal Policy with Fixed Exchange Rates

To defend its exchange rate, central bank must intervene by buying foreign currency and selling its domestic currency, increasing MS, shifting LM to the right, leading to E'.

In this case, fiscal policy is more powerful in increasing real GDP as central bank must intervene to defend fixed exchange rate.



Expansionary fiscal policy causes IS curve to shift and obtain new IS-LM intersection at point K with higher interest rate and real domestic product. This causes BOP surplus in A and BOP deficit in B.

In this case, due to BOPs deficit, central bank buys domestic currency and reduce MS, LM shifts left. Fiscal policy is less powerful.

Source: Pugel (2012), p. 587

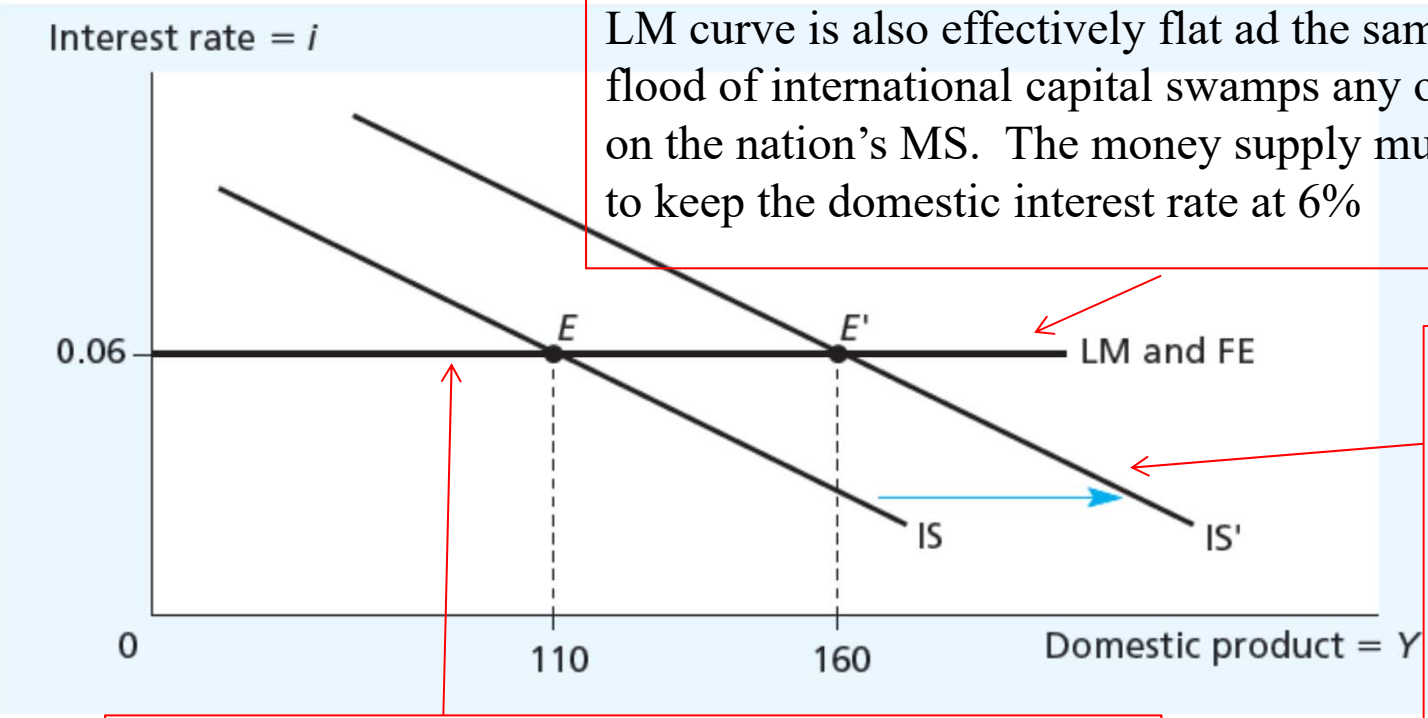
Perfect Capital Mobility

- The case of perfect capital mobility is an extreme case of how international financial flows can alter the effectiveness of monetary and fiscal policies under fixed rates.
- Perfect capital mobility means that a practically unlimited amount of international capital flows in response to the slightest change in one country's interest rates.
- In other words, the balance of payments rules the money supply.
- *Perfect capital mobility with fixed exchange rates robs monetary policy of its ability to influence interest rates or the domestic economy.*

Perfect Capital Mobility and Fiscal Policy

- For fiscal policy, perfect capital mobility actually means enhanced impacts on the domestic economy in the short run.
- Expansionary fiscal policies do not raise interest rates because the extra government borrowing is met by an influx of lending from abroad. Thus, the government borrowing does not crowd out private domestic borrowers with higher interest rates, allowing fiscal policy its full spending multiplier effects on the economy.
- However, government spending and taxes may often be crude and subject to political preferences.

With Perfect Capital Mobility, Monetary Policy Is Impotent but Fiscal Policy is Strong



LM curve is also effectively flat ad the same as FE. Any flood of international capital swamps any other influence on the nation's MS. The money supply must be whatever to keep the domestic interest rate at 6%

By contrast, fiscal policy takes on great power. As govt expenditure increases, IS shifts upward. As interest rate increases slightly, there is massive capital inflow. This will bid back interest rate back to 6%.

The FE curve is flat because the tiniest change in interest rates would trigger a potentially infinite international flow of capital. Point above 6% causes massive inflows and point below 6% causes massive outflows.

Source: Pugel (2012), p. 589

Monetary Policy vs Fiscal Policy

- The case of perfect capital mobility shows clearly that monetary policy is subordinated to the defense of the fixed exchange rate, and that fiscal policy can be powerful with fixed exchange rates.

SHOCKS TO THE ECONOMY

Internal Shocks

- Domestic monetary shock
  - alters the equilibrium relationship between money supply and money demand because
    - Money supply changes
    - The way people hold money changes (eg., caused by an increase in ATMs, or the spread in credit cards)
- Domestic spending shock
  - alters domestic real expenditure (E) through an exogenous force that alters one of its components (C, Id, G).
    - Example, a change in fiscal policy, a change in business mood or consumer sentiment, etc.

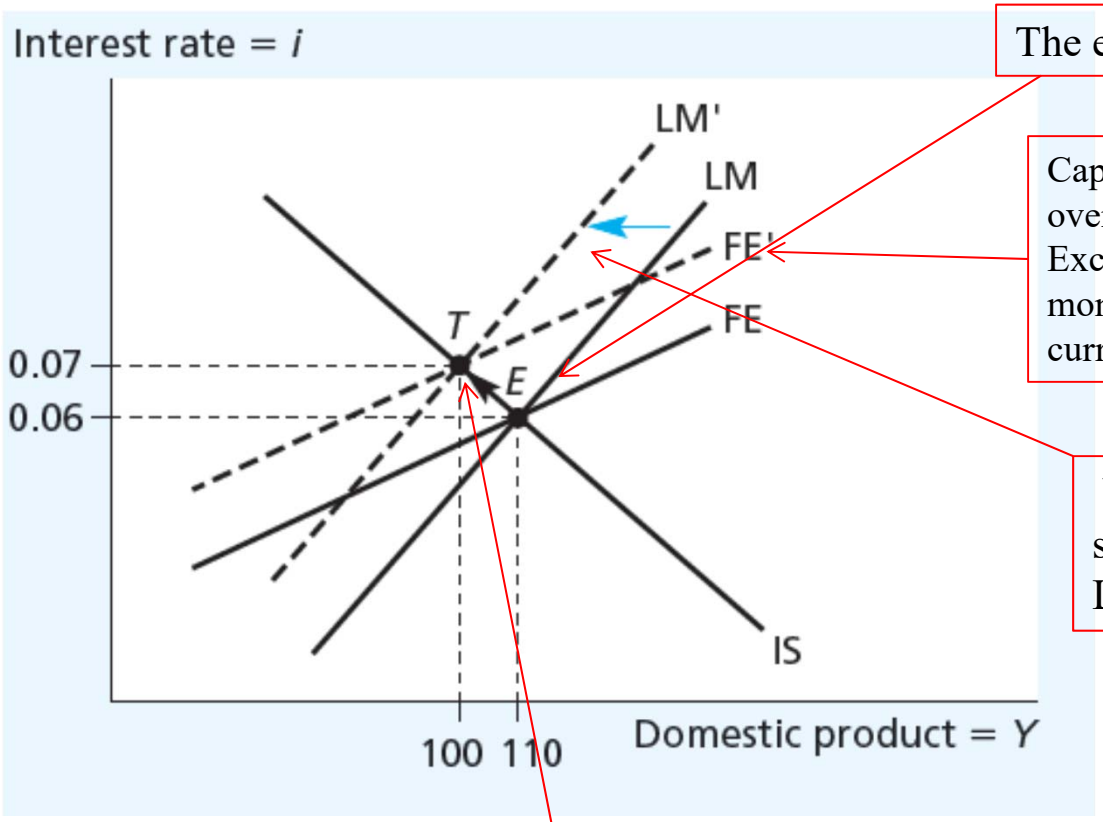
International Capital-Flow Shocks

- International capital-flow shock is the unpredictable shifting of internationally mobile funds in response to such events as change in the foreign interest rate, rumors about political changes, or new restrictions (capital controls) on international asset holdings.

Example of International Capital-Flow Shocks

- Suppose investors believe that the country's government is considering devaluing its currency in the near future.
- This leads to a capital outflow as international investors attempt to reposition their portfolios away from assets denominated in this country's currency before the devaluation.
- This is called "capital flight". Financial account deteriorates.
- This leads to downward pressure on exchange-rate value.
- The central bank buys domestic currency and sells foreign currency.
- If intervention is not sterilized, then the domestic money supply shrinks.
- Interest rates increase and real domestic product decreases.

An Adverse International Capital-Flow Shock



The economy begins at point E

Capital flight causes FE curve to shift up. The overall balance is in deficit at point E. Exchange rate value will be devaluated, and monetary authority needs to buy domestic currency and sell foreign currency.

Without sterilization, the MS will shrink, causing LM to shift left to LM'.

Source: Pugel (2012), p. 592

The new triple intersection will be at point T. Real domestic product has declined. The country now has an internal balance, in the form of low aggregate demand, higher unemployment, assuming that the country did not begin with the opposite imbalance of excessively strong aggregate demand.

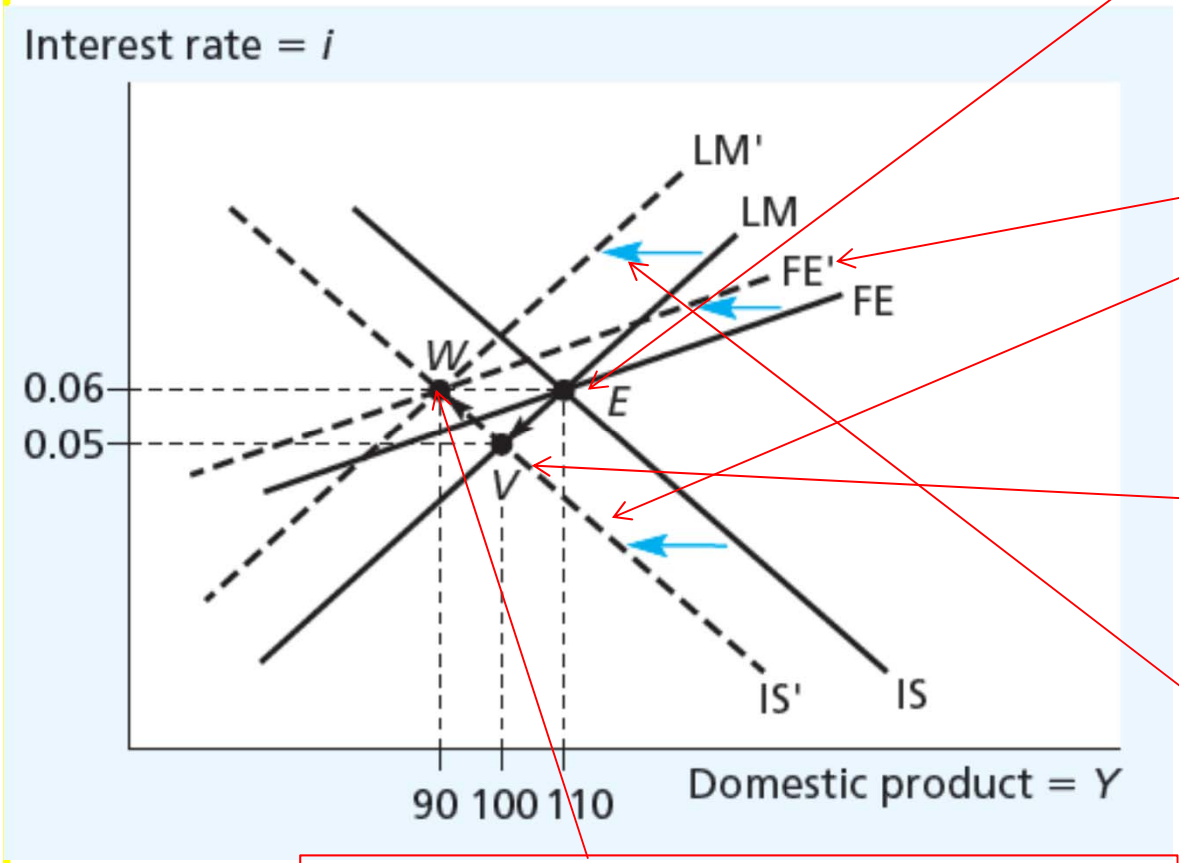
International Capital-Flow Shocks

- *Under fixed exchange rates, external capital-flow shocks can have powerful impacts on internal balance through the changes in the money supply driven by official intervention to defend the fixed rate.*

International Trade Shocks

- An international trade shock is a shift in a country's exports or imports that arises from causes other than changes in the real income of the country.
  - Example, demand for a country's exports can change for many reasons, eg., changing perceptions of the products, domestic substitutes, etc.

An Adverse International Trade Shock



The economy begins at point E

Trade shock changes the current account (FE shifts to the left). Thus it directly affects both the country's overall BOPs and AD for domestic production (IS curve shifts to the left as well).

The new IS-LM intersects at point V, which is to the right of FE curve, meaning overall payments are in deficit.

Intervention to defend fixed exchange rate reduces domestic money supply (LM shifts to LM'), assuming no sterilization.

External balance is reestablished at point W when LM shifts to LM'. However, real domestic porduct has declined even more!

Source: Pugel (2012), p. 593

International Trade Shocks

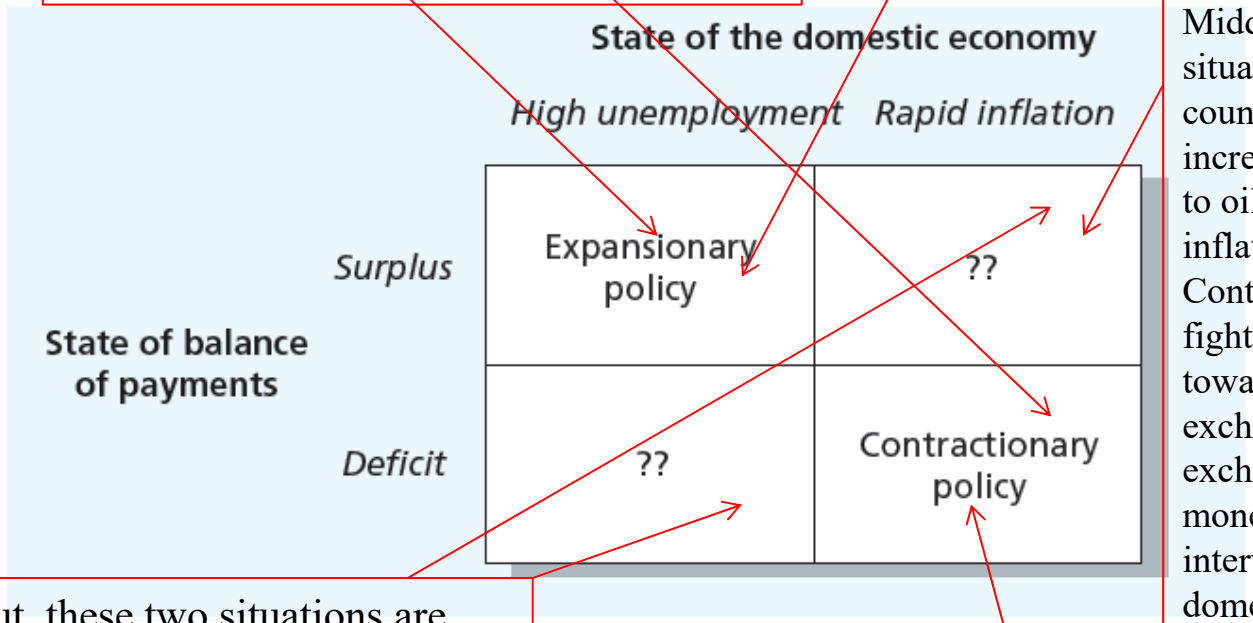
- As with international capital-flow shock, international trade shocks can have a powerful effect on the internal balance of a country with a fixed exchange rate.

IMBALANCES AND POLICY RESPONSES

Policies for Internal and External Balance

With fixed exchange rates, a country's policymakers could get lucky and face the straight-forward problems represented by Expansionary or Contractionary policy. For example, high unemployment and surplus BOP can exert expansionary policy.

For example, expansionary monetary policy will increase AD and lower unemployment while also reducing the payment surplus.



Middle-east countries face this situation in 2007-2008. These countries fix currency to USD. By increase revenue from oil export due to oil price rise, country faced high inflation. Two options: (1) Contractioary monetary policy to fight rising inflation and moves towards BOPs deficit or let go the exchange rate or (2) continue to fix exchange rate and allow domestic monetary expansion as government intervene to buy dollar and sell domestic currency.

But, these two situations are unclear. The dilemma is to choose which goal is the priority.

A country with high inflation and BOP deficit can use contractionary policies.

Source: Pugel (2012), p. 594

The country in one of the two dilemma cells has 3 basic choices (Pugel, p. 595)

1. It can abandon the goal of external balance, which eventually means that the country will abandon its fixed exchange rate.
2. It can abandon the goal of internal balance, at least in the short-run, and set its policies (esp. money supply) to achieve external balance. This is sometimes called the "rules of the game" in a fixed-exchange rate system such as the gold standard. Defending the fixed rate is the highest goal.
3. The government can try to find more policy tools or more creative ways to use the tools that it already has.

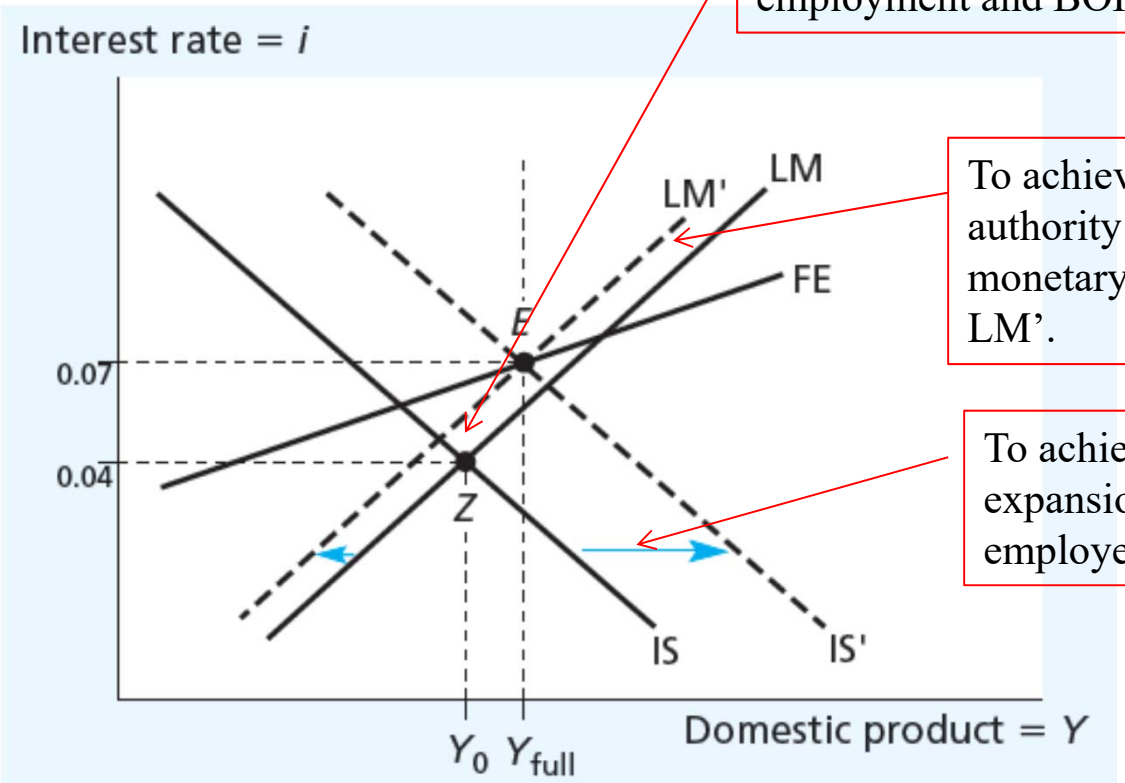
Other tools

- With high unemployment and BOPs deficit, one tool is to increase the economy's supply capabilities.
  - Improvement in productivity, human skills, technology.
  - Sounds too good to be true? - Policymakers usually have no fast, low-cost way of improving the economy's supply capabilities. Hence, this option would be too slow in politics!

A SHORT-RUN SOLUTION: MONETARY-FISCAL MIX

How Monetary and Fiscal Policy Could Combine to Cure Both Unemployment and a Balance-of-Payments Deficit

The economy begins at point Z, where this is under-employment and BOP deficit.



To achieve external balance, the authority pursues tighter monetary policy. LM shifts to LM'.

To achieve full employment, expansionary fiscal policy is employed, IS shifts to IS'.

Mundell's assignment rule: Assign to fiscal policy the task of stabilizing the domestic economy only, and assign to monetary policy the task of stabilizing the balance of payments only.

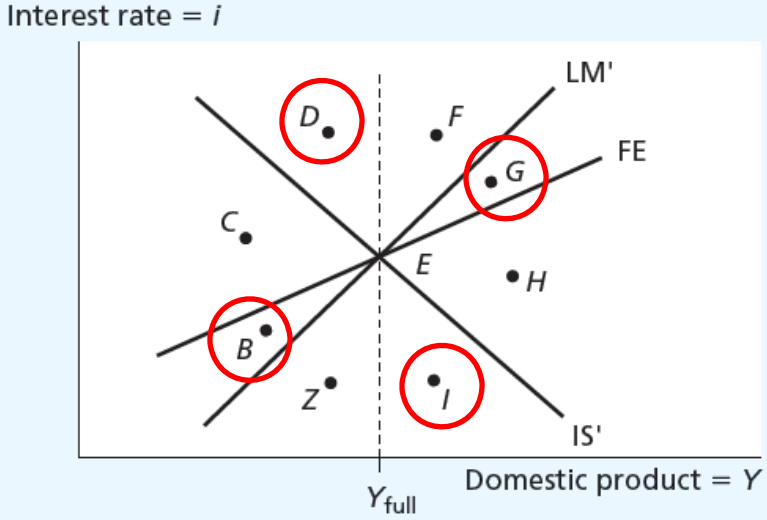
Source: Pugel (2012), p. 600

Short-run Solution: Monetary-Fiscal Mix

- *Monetary and fiscal policies can be mixed so as to achieve any combination of domestic product and overall payments balance in the short-run.*

Monetary-Fiscal Recipes for Internal and External Balance

State of the Balance of Payments	State of the Domestic Economy: *High unemployment*	State of the Domestic Economy: *Rapid inflation*
Surplus	Easier monetary policy, easier fiscal policy	Easier monetary policy, tighter fiscal policy
Deficit	Tighter monetary policy, easier fiscal policy	Tighter monetary policy, tighter fiscal policy



Points B and G are where monetary policy in the assignment rule may go wrong.

Points D and I are where fiscal policy in the assignment rule may go wrong.

Source: Pugel (2012), p. 601

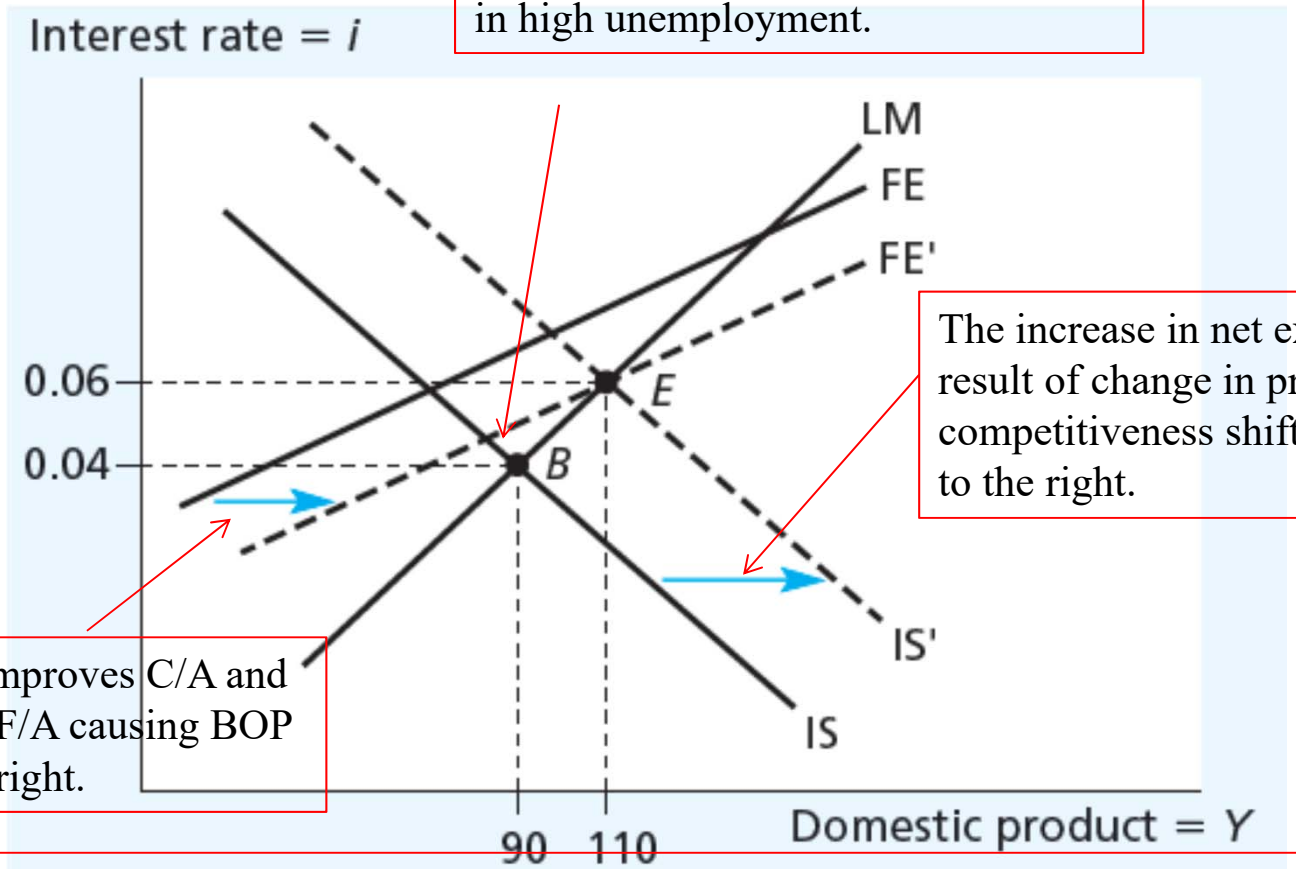
SURRENDER: CHANGING THE EXCHANGE RATE

Changing the Exchange Rate

- If an imbalance in a country's overall BOPs is large enough or lasts for long enough (a "fundamental disequilibrium"), the country's government may be unwilling to change domestic policies by enough to eliminate the imbalance.

Devaluation of the Country's Currency

The economy begins at point B with BOP deficit. Low level of Y results in high unemployment.



The increase in net exports as a result of change in price competitiveness shifts IS curve to the right.

Devaluation improves C/A and may improve F/A causing BOP to shift to the right.

Devaluation of the correct size can shift the economy to the triple intersection (external balance) with a higher domestic product (and lower unemployment). The new equilibrium at point E may not correctly be internal (full employment), but it is a move in the correct direction.

Source: Pugel (2012), p. 603

Devaluation Affects the Trade Balance

A. How Devaluation Could Worsen the Trade Balance

Exchange Rate	$P_x^{£}$	•	X	−	$P_m^{£}$	•	M	=	$CA^{£}$
Before dollar devaluation: \$1.60/£	1.00	•	80	−	1.00	•	120	=	−40
After dollar devaluation: \$2.00/£	0.80	•	80	−	1.00	•	120	=	−56

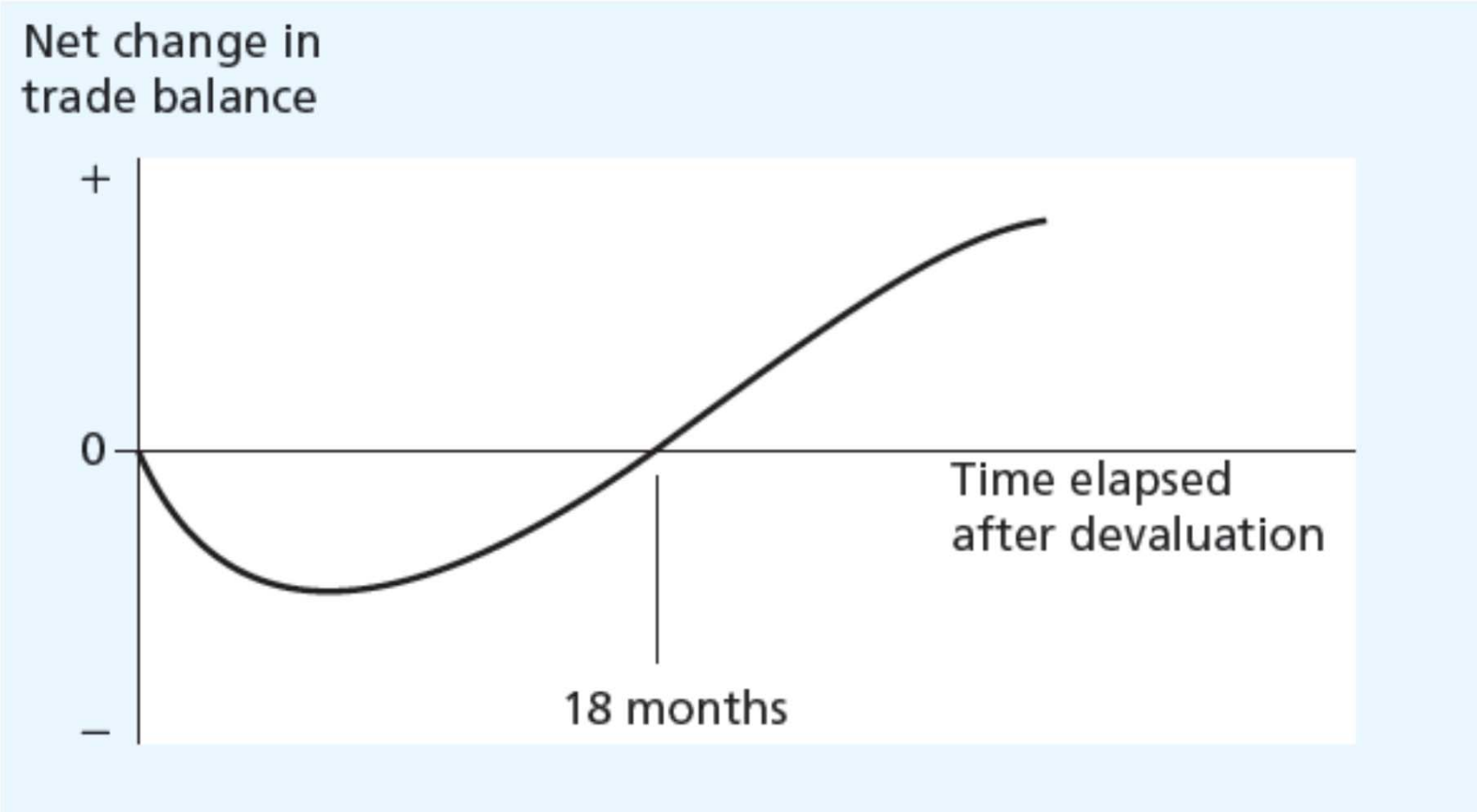
The key to this case: Demand curves are inelastic, so the volumes of exports and imports do not change. Devaluing our currency just lowers the value of foreign exchange we earn on exports, worsening the trade deficit.

B. The Small-Country Case

Exchange Rate	$P_x^{£}$	•	X	−	$P_m^{£}$	•	M	=	$CA_m^{£}$
Before dollar devaluation: \$1.60/£	1.00	•	80	−	1.00	•	120	=	−40
After dollar devaluation: \$2.00/£	1.00	•	105	−	1.00	•	100	=	+5

Source: Pugel (2012), p. 606

The J Curve: How the Trade Balance Probably Responds to a Drop in the Value of a Country's Currency



Source: Pugel (2012), p. 608