

# MANAGING SHORT-RUN CRISIS IN AN OPEN ECONOMY

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EE 462 Development Macroeconomics

Semester 1/2020

# Topics

- Equilibrium in A Small, Open Economy
- Australian Model
- Zones of Imbalance
- Applications of the Australian Model

# EQUILIBRIUM IN A SMALL, OPEN ECONOMY

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# Introduction

- So far, we have seen some evidence of 'unbalanced' economies due to unstable world market conditions (especially in the 1970s and 1980s).
  - Oil price shocks and rising inflation in the 1970s
  - Overvalued exchange rates prior to the Asian financial crisis
  - IMF's stabilization programs intended to correct these macroeconomic imbalances.
- This lecture is to explain a mechanism for analyzing the macroeconomic policies for LDCs to stabilize its economy and create a climate for faster economic growth.
- Two main policies for correcting macroeconomic imbalances: *reductions in expenditures* and adjustments in *relative prices*.

*Pandemic Shocks.*

# Small and Open Economy

- Two features of developing countries:
  - **Open economy**: Trade and capital flows across borders in sufficient volume to influence the domestic economy, particularly prices and money supply.
  - **Small economy**: Price takers in world markets. Their exports and imports cannot influence world market prices.

- **Australian model:**  $P_t$  (exogenous)

- Exports and imports are **tradables**; all other goods and services are **nontradables**.

construction  
transportation  
wh services

↳  $P_n$  (endogenous)

# Australian Model

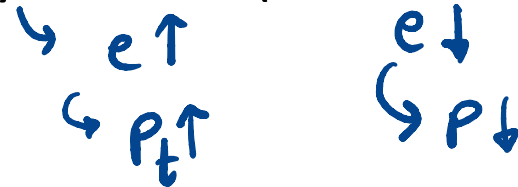
- Tradable goods and services:

- Prices within the country are determined by supply and demand on world markets, and therefore are exogenous to the model.

$$P_t (\text{฿}) = e \frac{\$}{\$} P_t^* (\text{\$})$$

where  $e$  = nominal exchange rate (baht/\$),  $P_t^*$  = world market price

- How does  $e$  change as a country *devalue* (or *revalue*) its currency?

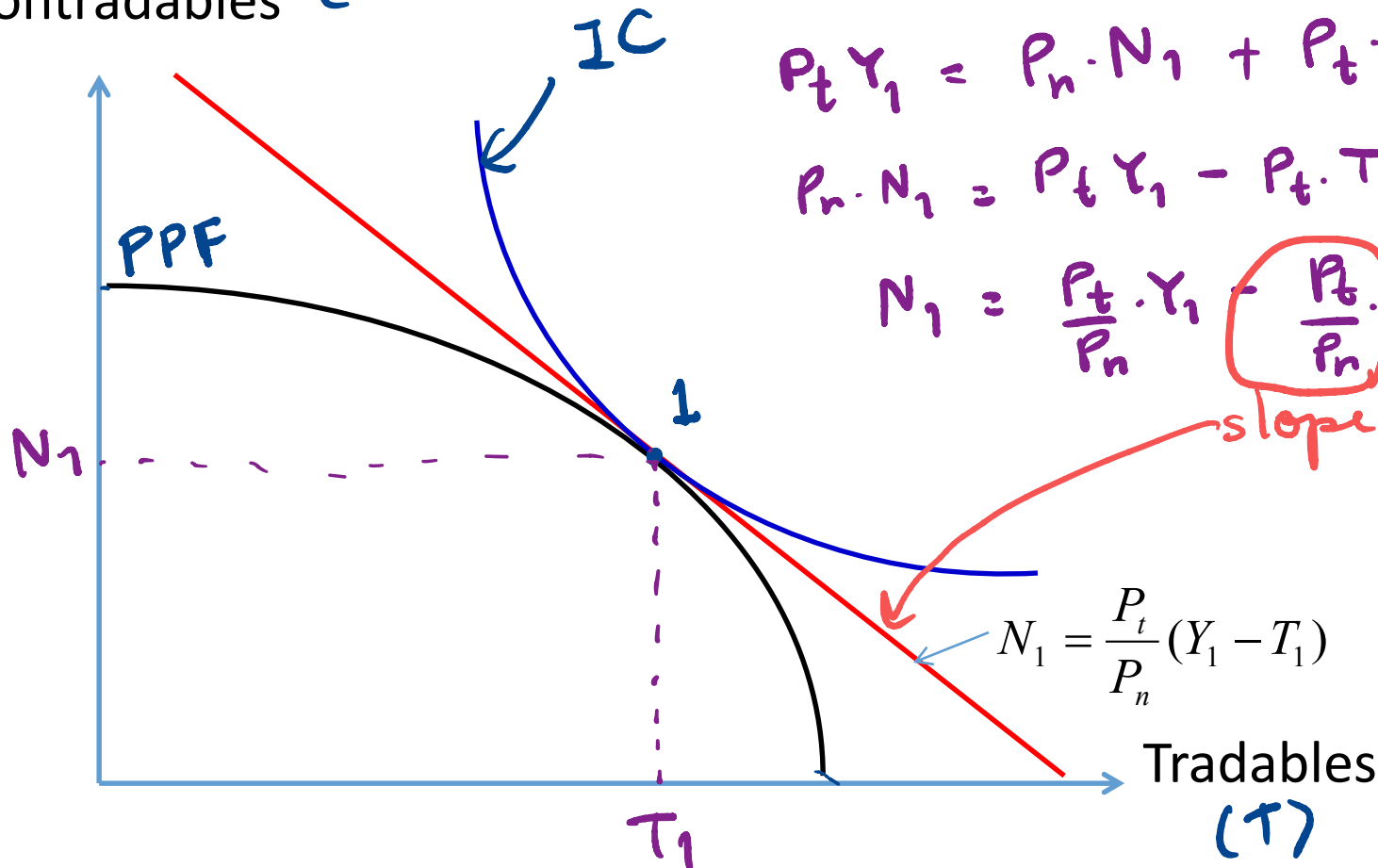


- Nontradables:

- Prices ( $P_n$ ) are determined by market forces within the country and therefore are endogenous to the model.

# Equilibrium in the Australian Model

Nontradables (N)



$$Y_1 = \text{GDP (measured in } P_t)$$

$$P_t Y_1 = P_n \cdot N_1 + P_t \cdot T_1$$

$$P_n \cdot N_1 = P_t Y_1 - P_t \cdot T_1$$

$$N_1 = \frac{P_t \cdot Y_1}{P_n} - \frac{P_t \cdot T_1}{P_n}$$

$$N_1 = \frac{P_t}{P_n} (Y_1 - T_1)$$

# Internal and External Balance

- **Internal balance (IB):** equilibrium in the nontradeables markets
- **External balance (EB):** equilibrium in the tradeables markets
- **Real exchange rate (RER):**

$$P = P_t / P_n \quad \text{where } P_t = eP_t^* \quad \text{ic. } P = \frac{eP_t^*}{P_n} = \text{RER}$$

- **Trade balance:**

$B_t$  = value of tradable supply – value of tradable demand

$$B_t = P_t(S_t - D_t)$$

$$A = C + I$$

- Recall:  $\text{GDP} = Y = C + I + X - M = A + X - M$  (A= Absorption).

$$\rightarrow A - \text{GDP} = M - X \quad (\text{equilibrium in Australian model}).$$

$$\rightarrow \text{GDP} - A = X - M$$

Balance of trade

$$B_t = P_t(S_t - D_t)$$

$$= P_t S_t - P_t D_t$$

$$= (X_s + M_s) - (X_D + M_D)$$

$$B_t = \underbrace{(X_s - X_D)}_{\text{Excess supply of exports}} - \underbrace{(M_D - M_s)}_{\text{Excess Demand for import}}$$

$$P_t \uparrow \rightarrow B_t > 0$$

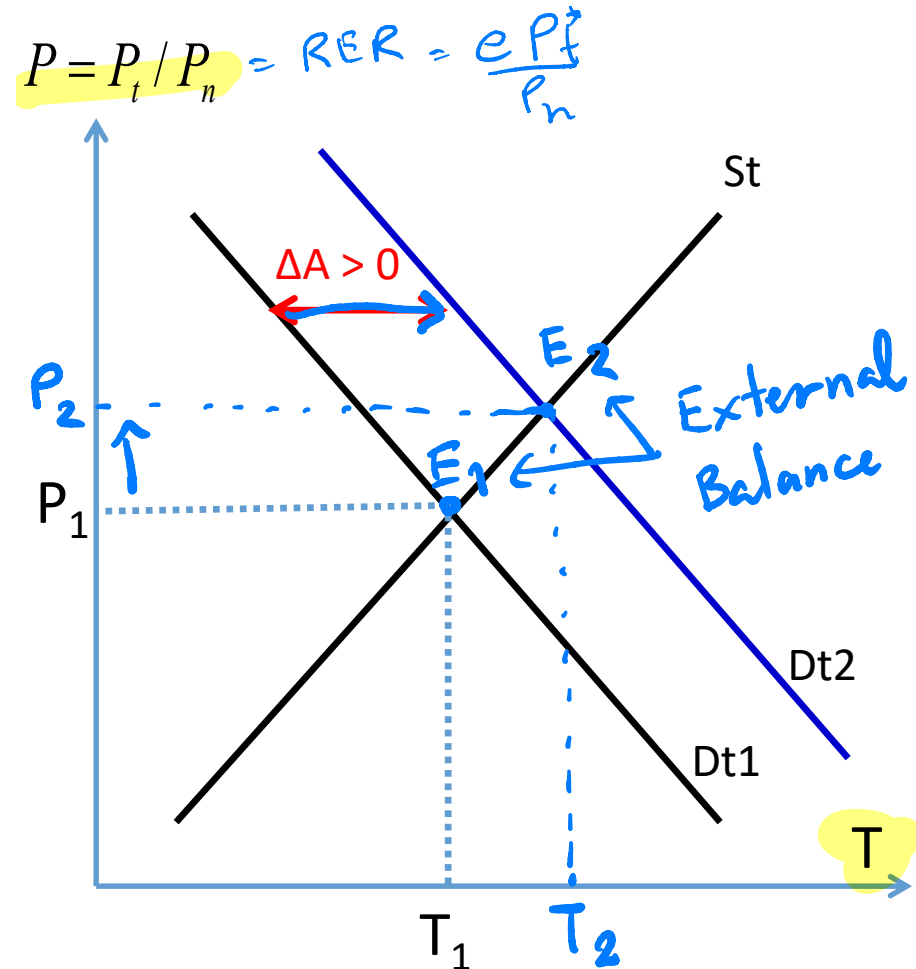
# Results from Australian Model

- *Macroeconomic equilibrium* is defined as a balance between supply and demand in two markets, tradables (**external balance**) and nontradables (**internal balance**).
- To achieve equilibrium in both markets, two conditions must be satisfied:
  - ✓ Expenditure (absorption) = income
  - ✓ The relative price of tradables (real exchange rate) must be at a level that equates demand and supply in both markets.
- Two remedies for an economy that is out of balance: **adjusting absorption**, the **nominal exchange rate**, or both.

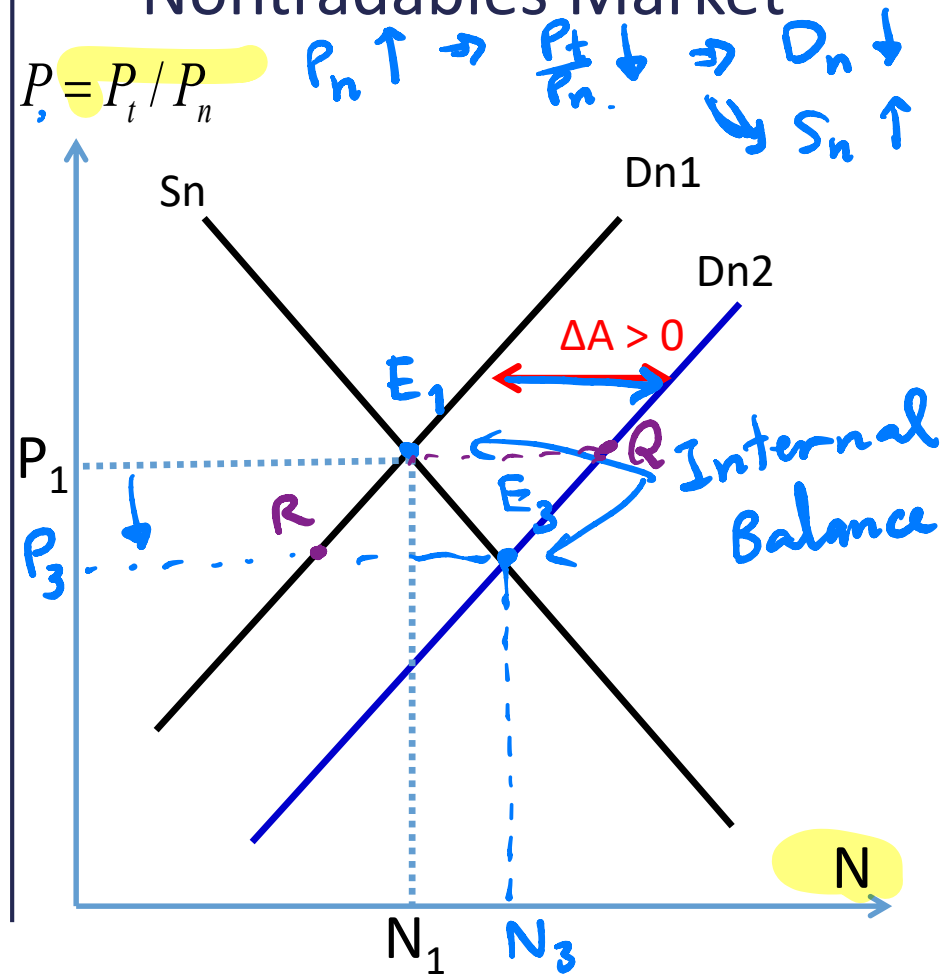
$$A = C + I$$

# Tradables and Nontradables Markets

## Tradables Market



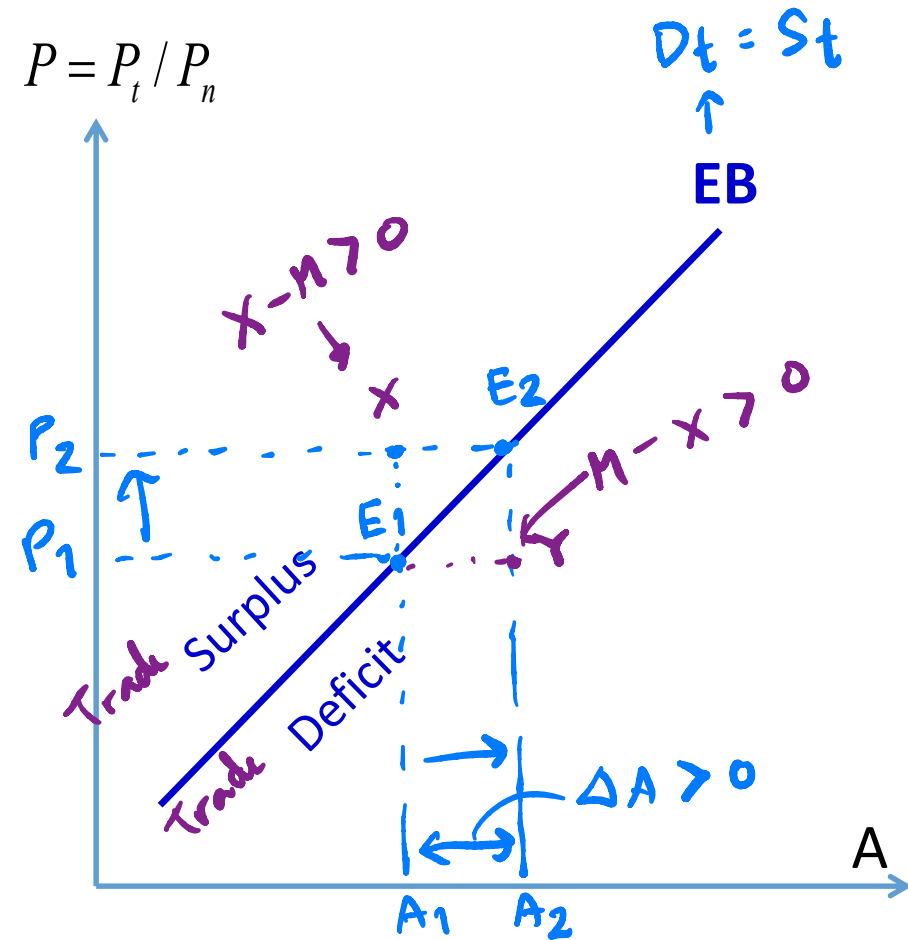
## Nontradables Market



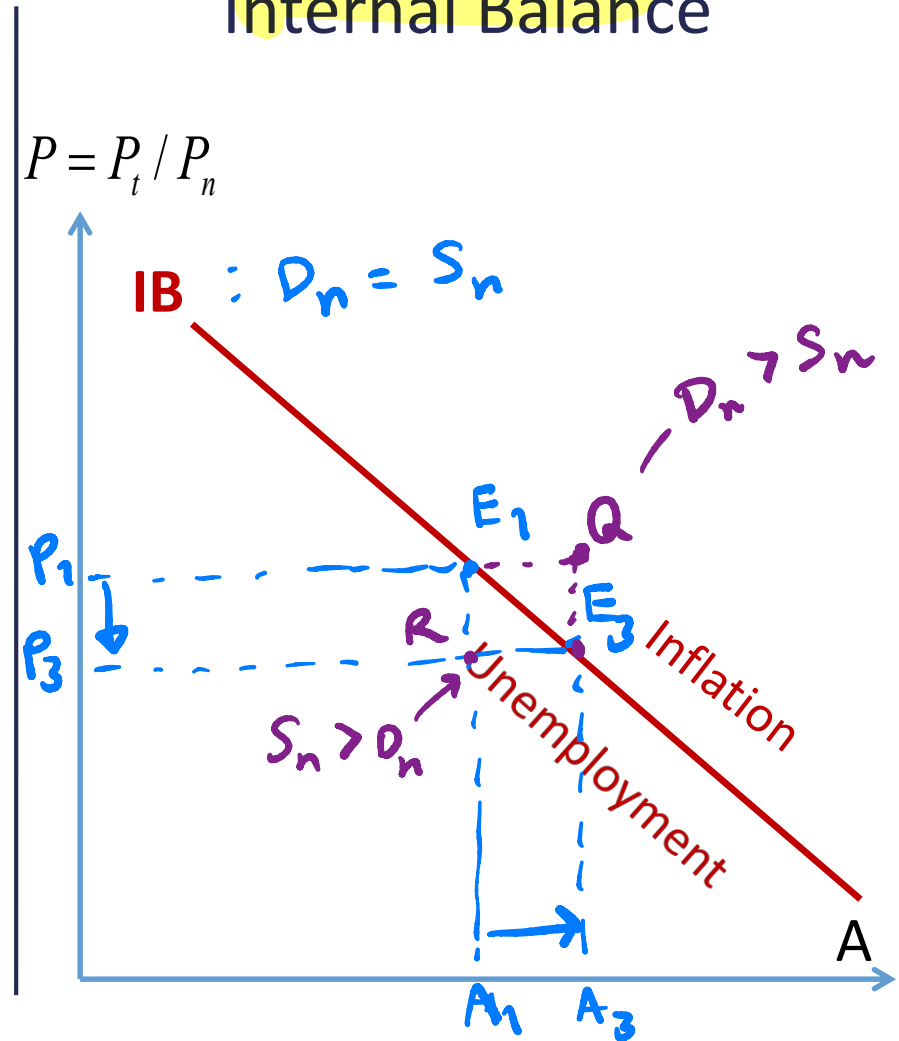
$$A = C + I$$

# The Phase Diagram

## External Balance



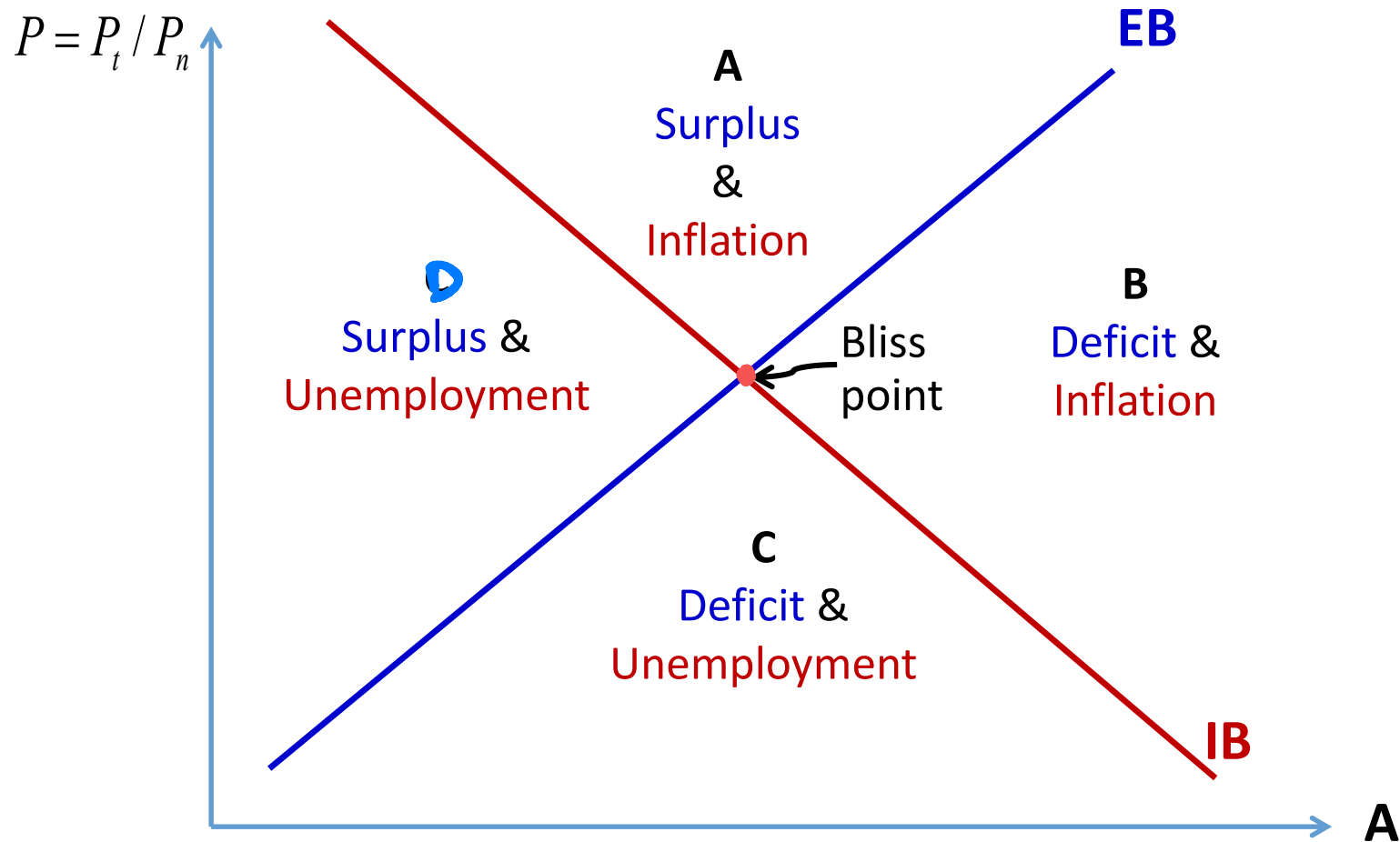
## Internal Balance



# Zones of Imbalance

- External imbalance:
  - **External surplus**:  $X > M$ , real exchange rate  $P >$  equilibrium  $P$ , production of tradables exceeds demand →  $P$  is more depreciated than required
  - **External deficit**:  $X < M$ , demand  $>$  supply of tradables →  $P$  is more appreciated
- Internal imbalance:
  - **Internal deficit**: excess demand for nontradables, absorption is too high → *Inflation*
  - **Internal surplus**: excess supply of nontradables, absorption is too low → *Unemployment*

# Figure: Zones of Imbalance



# Equilibrium vs. Disequilibrium

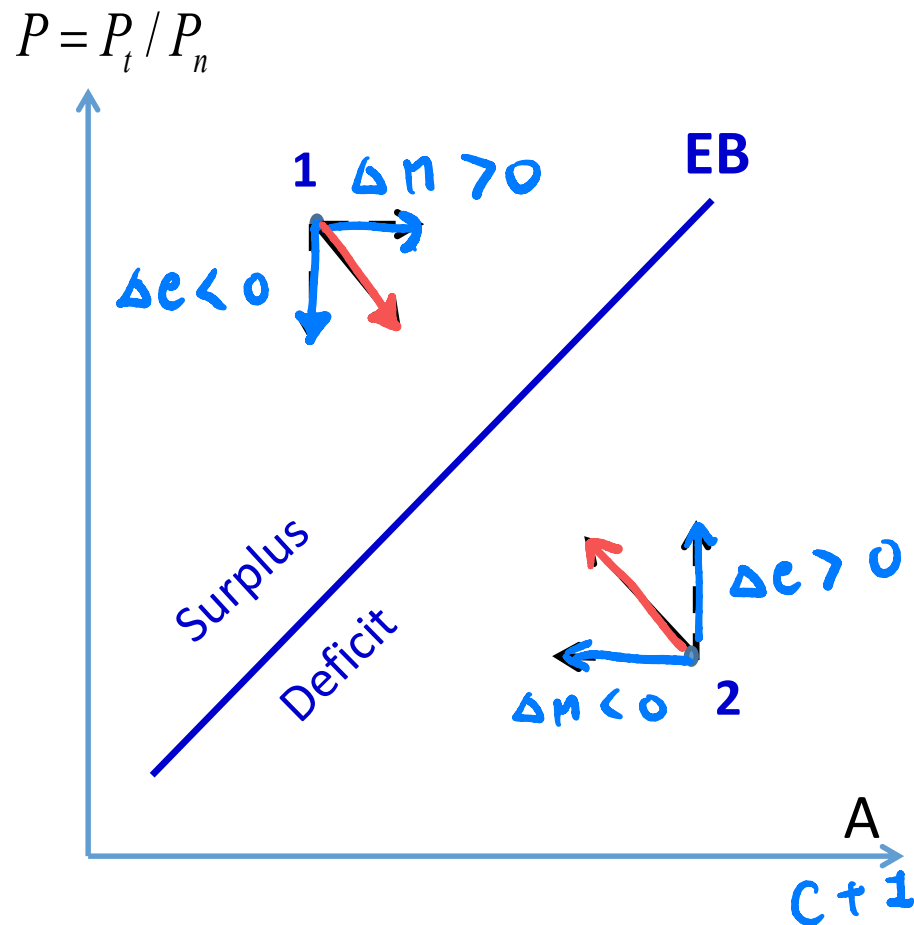
- Disequilibrium in the tradable markets
  - ➔ Either a balance of payments deficits (case of excess demand) or a balance of payments surplus (case of excess supply)
- Disequilibrium in the nontradable markets
  - ➔ Either a higher rate of inflation (case of excess demand) or higher unemployment (case of excess supply)
- Four combinations of disequilibrium:

	Nontradables	
Tradables	A: BOP surplus + inflation	D: BOP surplus + unemployment
	B: BOP deficit + inflation	C: BOP deficit + unemployment

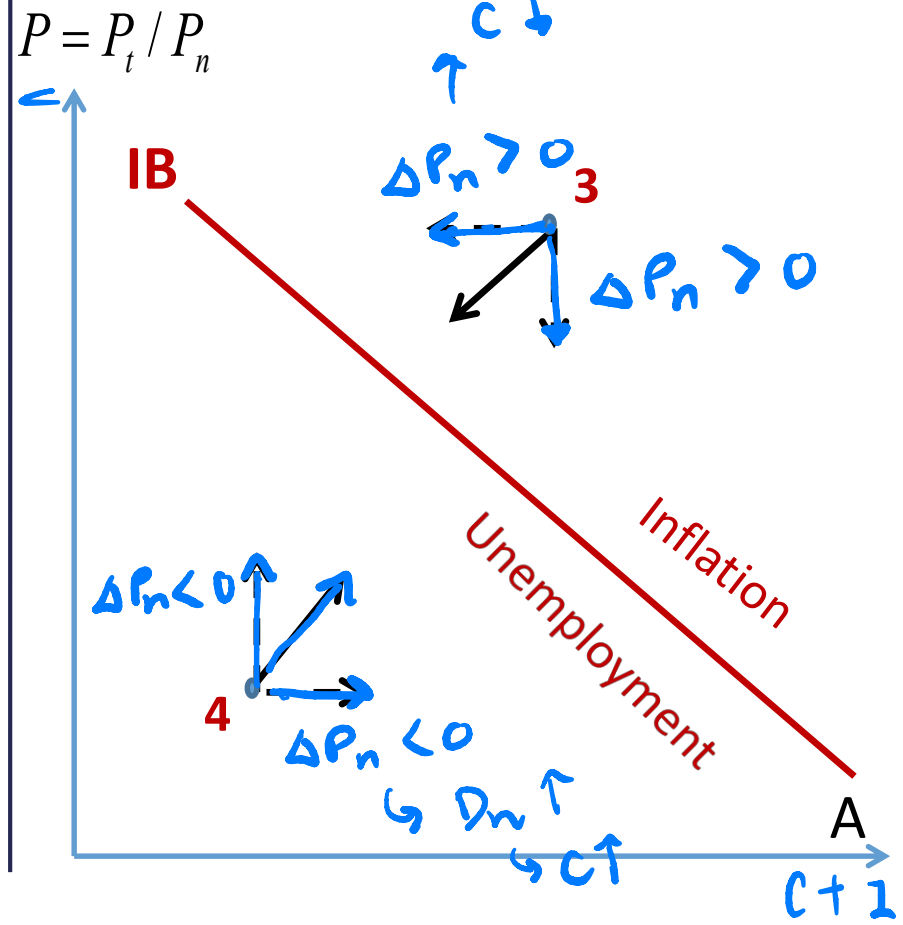
# Tendencies toward Equilibrium

## External Balance

$M^s \uparrow \Rightarrow r \downarrow \Rightarrow I \uparrow \Rightarrow A \uparrow$



## Internal Balance



# Tendencies toward Equilibrium: Self-Correcting Tendencies

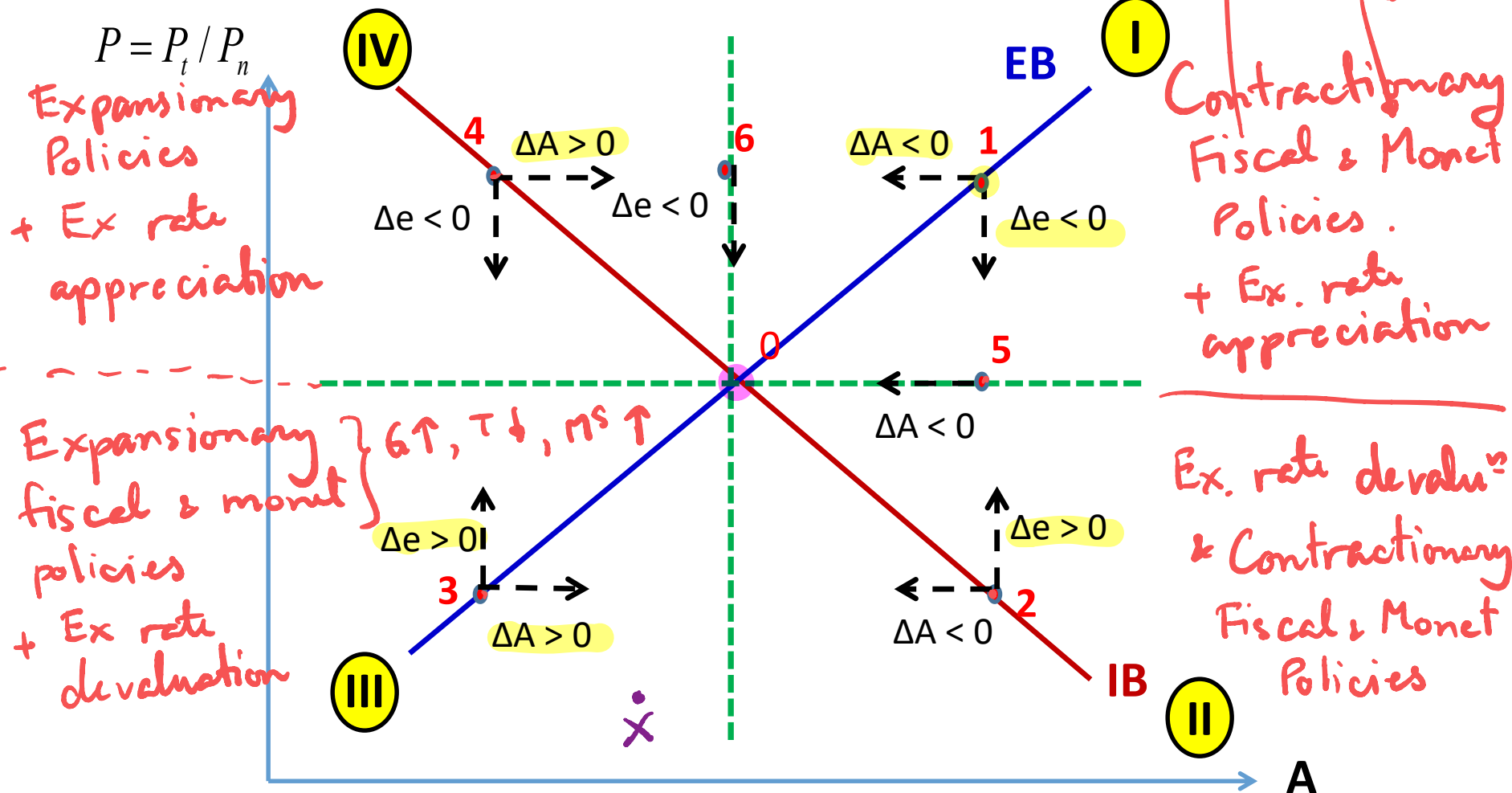
- External surplus (1)
  - International reserves increase  $\rightarrow M_s \uparrow \rightarrow r \downarrow \rightarrow A \uparrow$
  - Inflow of foreign exchange  $\rightarrow M_d \uparrow \rightarrow e \downarrow$  (appreciation)
- External deficit (2)
  - International reserves decrease  $\rightarrow M_s \downarrow \rightarrow r \uparrow \rightarrow A \downarrow$
  - Inflow of foreign exchange  $\rightarrow M_d \downarrow \rightarrow e \uparrow$  (depreciation)
- Internal deficit (3)
  - Inflation (rise in NT prices)  $\rightarrow \rightarrow e \downarrow$  (appreciation) &  $A \uparrow$
- Internal surplus (4)
  - Unemployment would be self-correcting if prices are able to fall as easily as they rise, but this is seldom the case.

# Stabilization Policies

- Because of *structural rigidities*, the economy often fails to work smoothly.
  - ✓ Exchange rate changes may take time to affect actual imports and exports.
  - ✓ Nontradables prices may rise quickly if there is excess demand, but the inflation may persist once it starts.
  - ✓ When there is unemployment, unions strike may prevent prices from falling.
- Governments need to take an active role to stabilize their economies. Three instruments: *exchange rate management*, *fiscal policy*, and *monetary policy*.
  - *Exchange rate management*. From fixed to floating rates.
  - *Fiscal policy and monetary policy* are two instruments to influence absorption level.

# Policy Zones

$$A = C + I + G$$



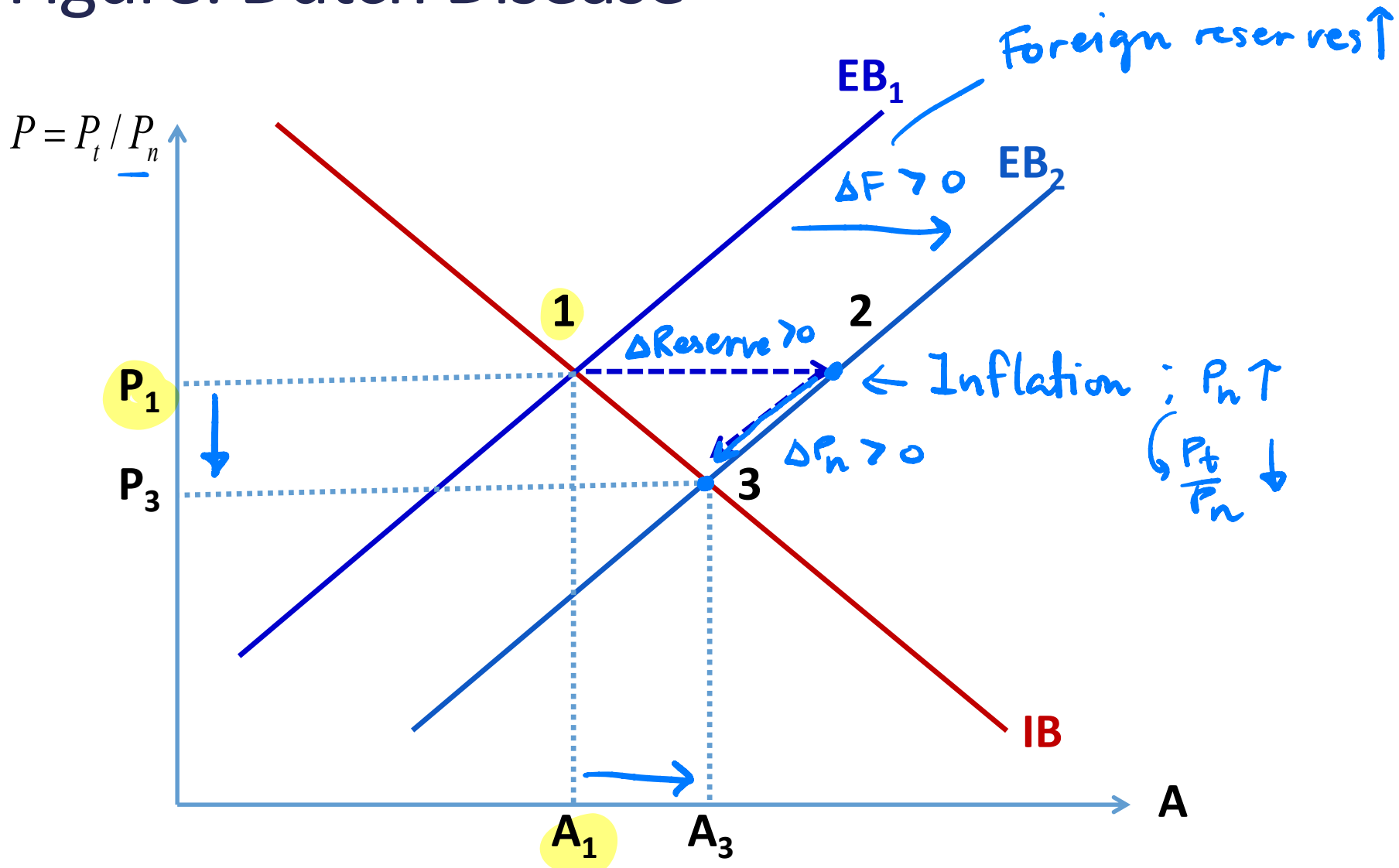
# APPLICATIONS OF THE AUSTRALIAN MODEL

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# Dutch Disease

- A country receives higher export prices or a larger inflow of foreign capital may end up worse off than without the windfall.
- Windfall in foreign reserves occurs:
  - EB shifts rightward, the economy is in surplus, leads to more expenditure.
  - Absorption rises.
  - The economy moves off its internal balance into inflation.
- Effects of a rise in  $P_N$ :
  - *Reduction in real absorption* (partially corrects the initial rise in A)
  - *Real appreciation of exchange rate* (assuming official rate is fixed)

# Figure: Dutch Disease



# Problems from Dutch Disease

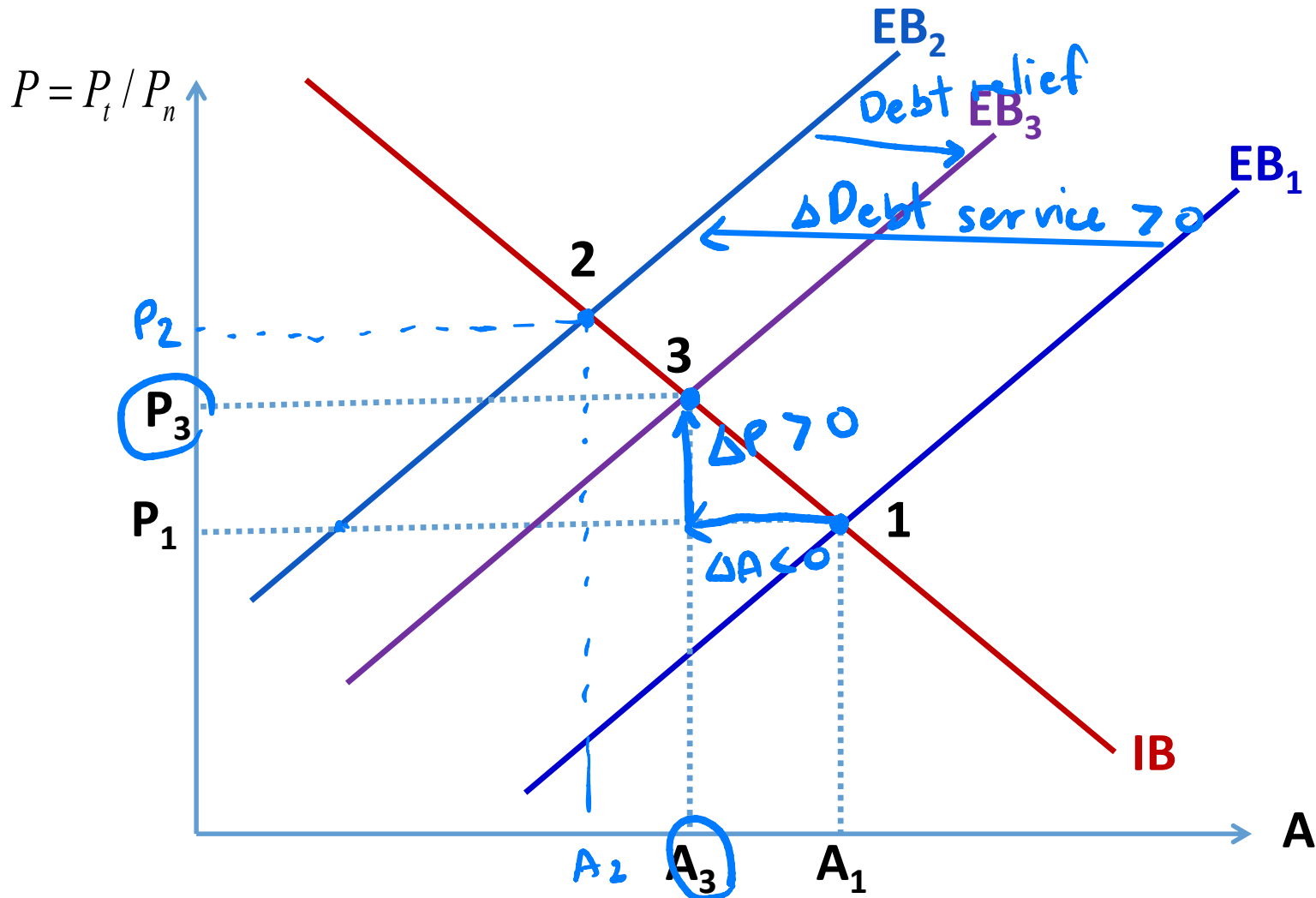
- Such windfalls generally are temporary.
  - When export prices fall or the capital inflow dries up, the EB curve will shift back and a costly adjustment will be necessary.
- In shifting from the old to the new equilibrium, there have to be adjustments in the economy.
  - The *real exchange rate  $P$  is lower* ( $P_n$  rises), so  $S_t$  (tradables supply) has fallen and  $S_n$  (nontradables supply) risen.
  - *Unemployment* occurs when workers switch from tradables to nontradables production.
  - *Decline in tradables sector* → “disease”  
*esp. lagging tradables*

# Debt Repayment Crisis

$$\frac{P_x}{P_m} \downarrow$$

- It's a reverse of the Dutch Disease, a decline of terms of trade.
- Initially, the economy needs to find additional resources to repay its foreign debt or needs to adjust to falling terms of trade.
- EB curve shifts leftward ( $EB_1 \rightarrow EB_2$ ).
- If there is debt relief, then the curve shift rightward EB3.
  - Absorption is reduced due to falling foreign reserves and reduced expenditure.
  - To gain the new equilibrium at point 3, it is also necessary to devalue the currency.

# Figure: Debt Repayment Crisis



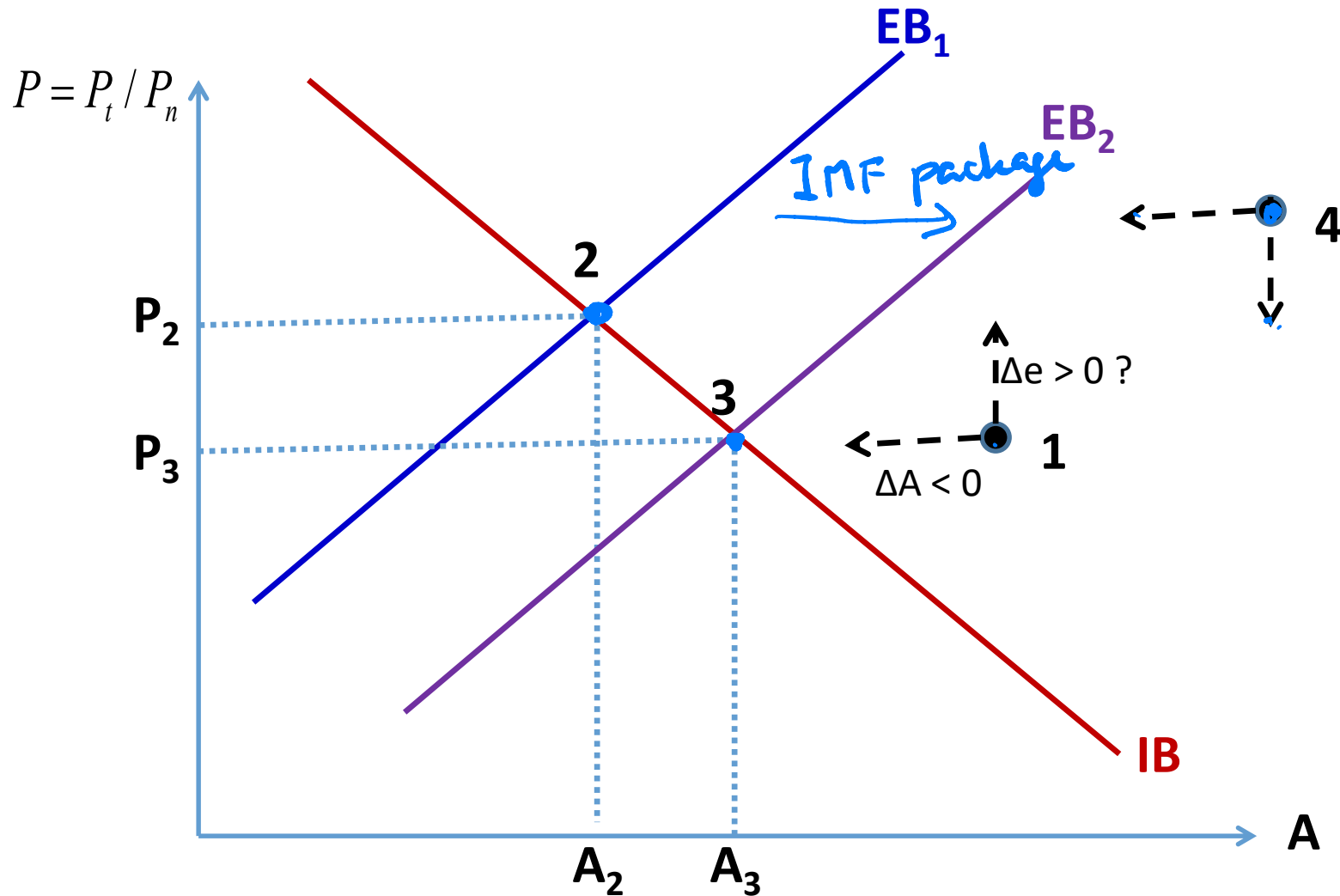
# Stabilization Package: Inflation and a Deficit (1)

- An economy has **foreign deficit** and **inflation**. Private investors try to invest in nonproductive assets like land or to invest abroad, which deepens the external deficit.
  - IMF is called to make **stabilization program loans**.
- IMF stabilization programs:
  - **Reduction in government's budget deficit**
  - Programmed targets for domestic credit to **cap the growth of money supply** in order to **reduce absorption**
  - The package may require **devaluation** of exchange rate, to reach a new equilibrium and avoid unemployment.

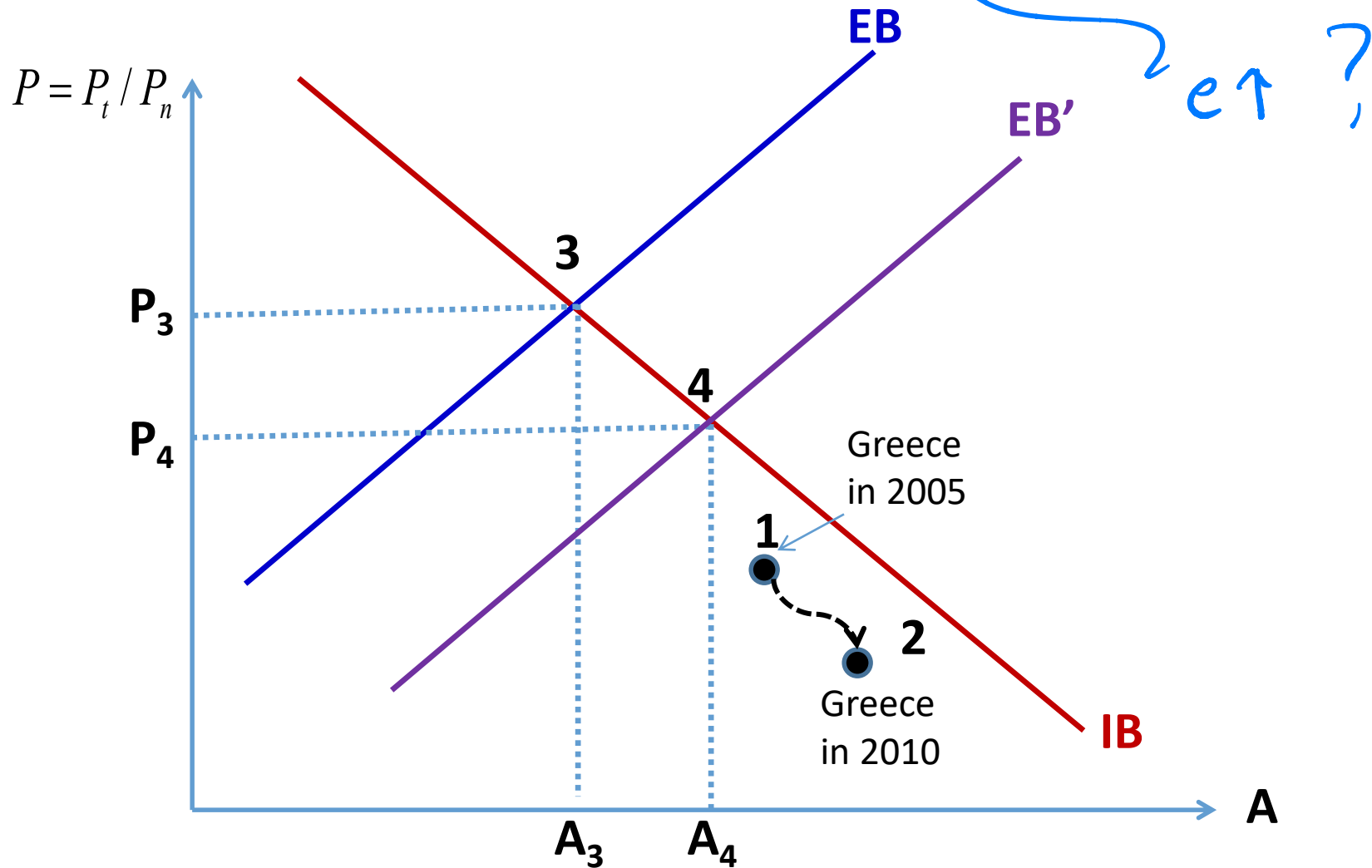
## Stabilization Package: Inflation and a Deficit (2)

- However, IMF programs usually come with substantial aid attached from IMF, World Bank and bilateral donors.
- The **aid package** would enable the country to have more foreign reserves to buy tradables.
  - EB shifts to the right → new equilibrium
- Two things happen for the package:
  - It reduces the need for austerity.
  - It reduces the need for devaluation of the exchange rate. But IMF and donors often insist on devaluation.

# Figure: Stabilization from Inflation and Deficit



# Figure: The Greek Debt Crisis, 2010-2012



# Drought, Hurricanes, and Earthquakes

- Starting from point 1, drought or another natural disaster reduces the capacity to produce both N and T, so both IB and EB curves shift to the left.
- Disaster relief from abroad helps by shifting EB to the right → new equilibrium (point 3).
- If the economy remains temporarily at point 1, it is inflationary.
  - The *absorption declines* due to a fall in incomes
  - At the same time government tries to spend more to relieve hunger, disease and other problems.
  - The outcome could be *continued inflation* (somewhere between points 1 and 3).

# Figure: Drought

