

MANAGING SHORT-RUN CRISIS IN AN OPEN ECONOMY

EE 462 Development Macroeconomics

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Topics

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

price takers
(small size)
trade

Most developing countries

interventions by monetary & fiscal policies.

EQUILIBRIUM IN A SMALL, OPEN ECONOMY

Introduction

- So far, we have seen some evidence of ‘unbalanced’ economies due to unstable world market conditions (especially in the 1970s and 1980s).

“Pandemic Shocks”

- 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. **SAP**
- 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**.

Small and Open Economy

- Two features of developing countries: Ex. Closed economy → N. Korea.
 - **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**:
 - Exports and imports are **tradables**; all other goods and services are **nontradables**. (construction, transportation, domestic services)

P_t (exogenous - determined by world mkt.)

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.

$$P_t = e P_t^*$$

Baht Baht × \$
\$

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

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

$e \uparrow \rightarrow P_t \uparrow$
 $e \downarrow \rightarrow P_t \downarrow$

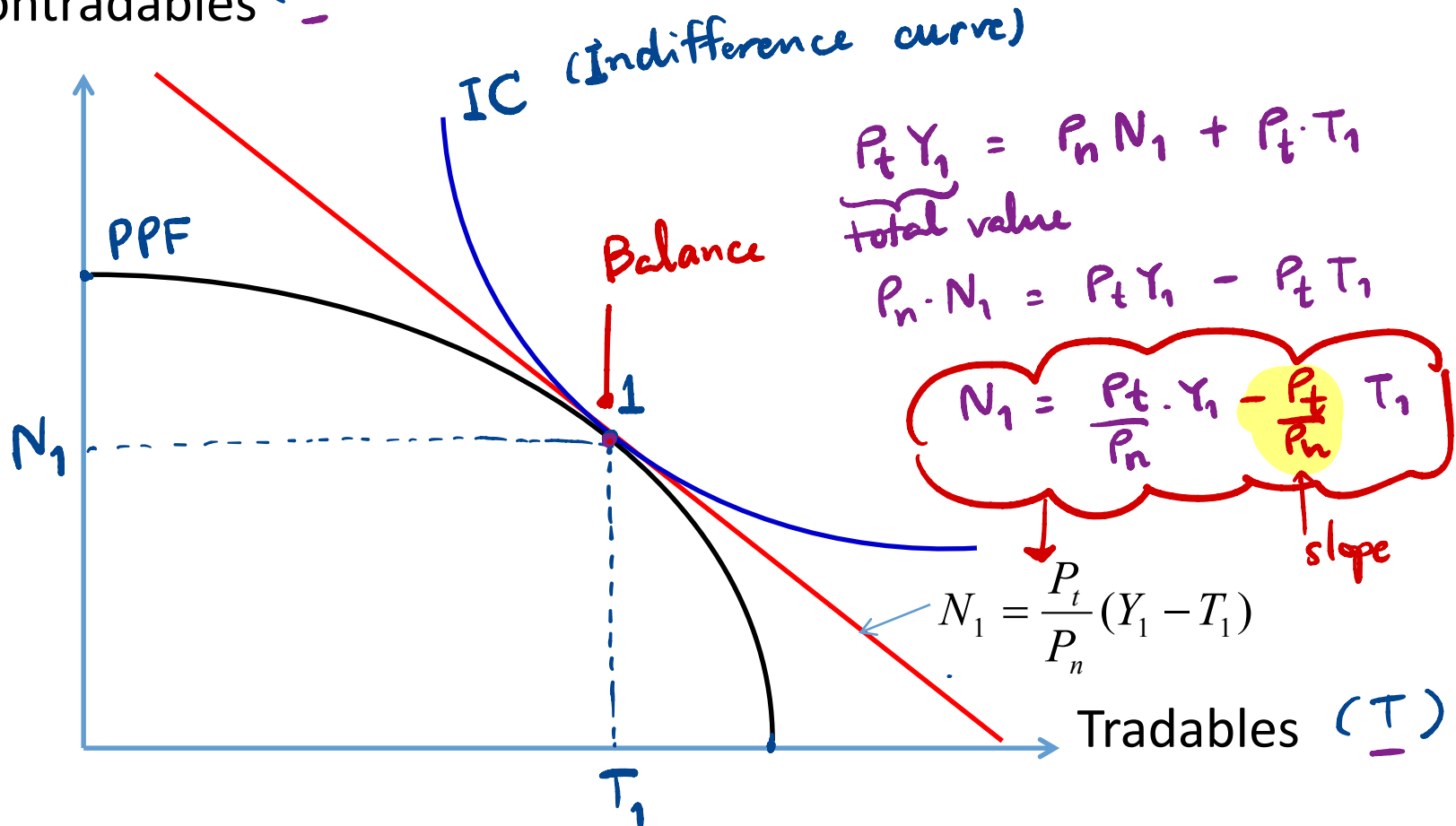
- Nontradables:

- 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)

GDP = $Y \Leftarrow Q = f(T, N)$: Total output
 measured in P_t



Internal and External Balance

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

$$P = P_t / P_n$$

where $P_t = e P_t^*$

↑ nominal exchange rate

$$RER = P = \frac{e P_t^*}{P_n}$$

If $P_n \uparrow$, RER \downarrow .

- **Trade balance:**

B_t = value of tradable supply – value of tradable demand

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



$$A = C + I + G$$

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

→ $A - GDP = M - X$ (equilibrium in Australian model).

$$\hookrightarrow GDP - A = X - M$$

Australian Model (small, open economy).

- 2 types of commodities
 - nontradables : P_n
 - tradables : P_t

- $RER = \frac{e \cdot P_t^{\leftarrow \text{exogenous}}}{P_n} = \frac{P_t}{P_n}$, $e = \text{nominal exchange rate}$

- Absorption : $A = C + I + G$

- Trade balance : $CA = X - M$

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.

$$A - GDP = M - X$$

$$RER = \frac{e P_t^*}{P_n}$$

Note $A = C + I$ (Absorption). | $A - GDP = M - X$

Tradables and Nontradables Markets

↪ EB

↪ IB

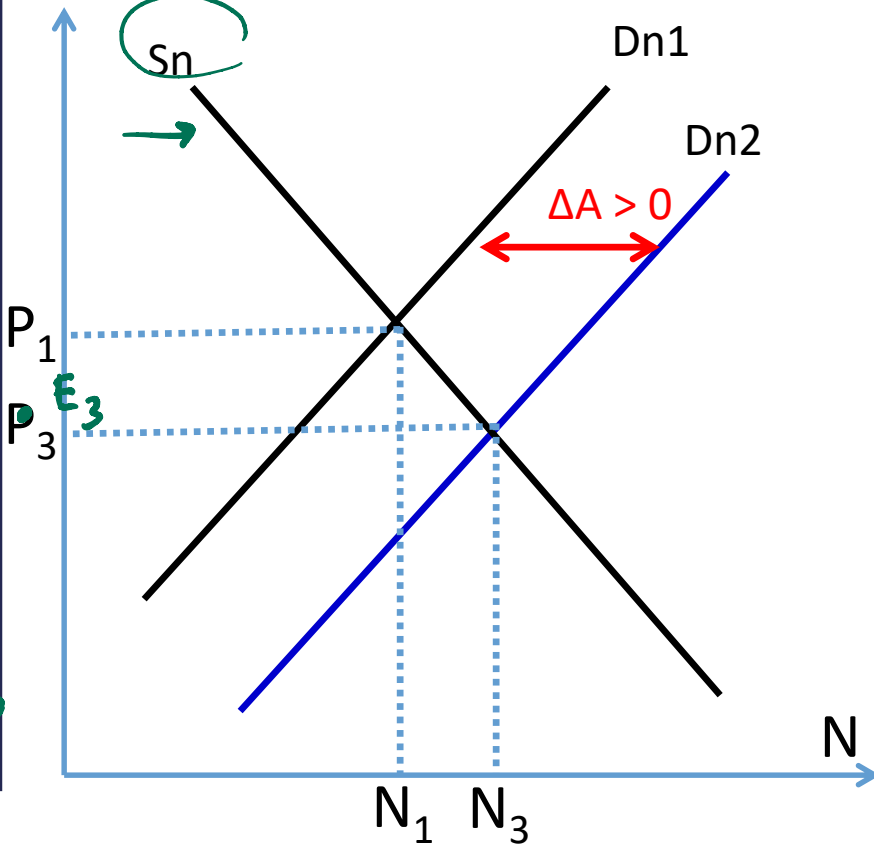
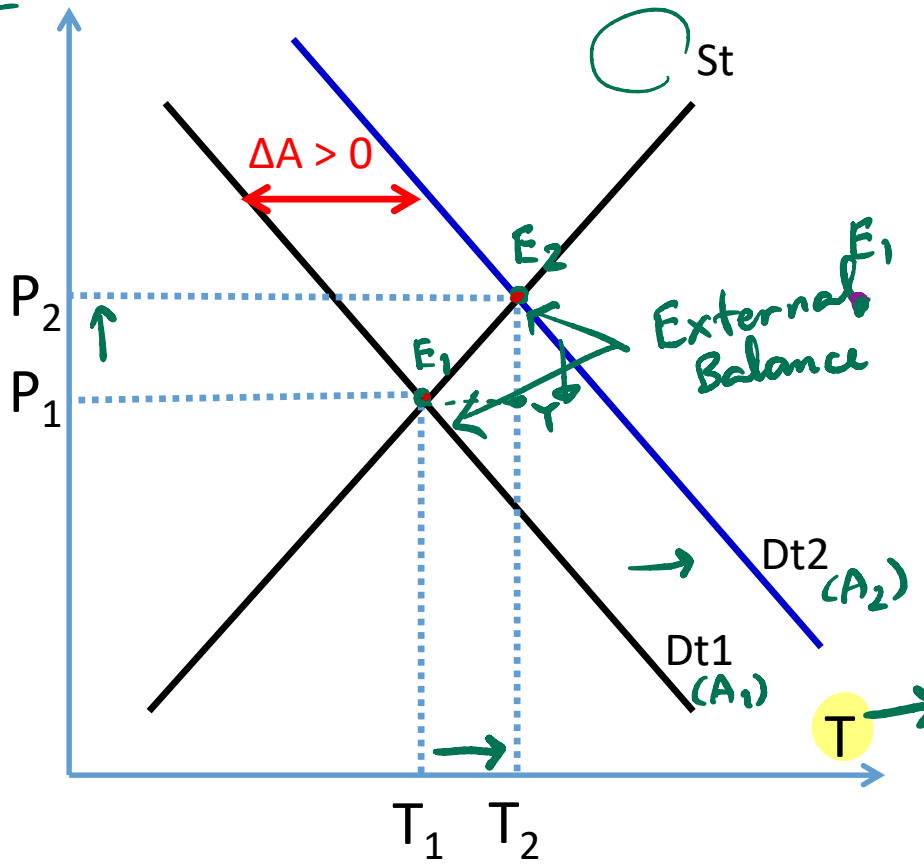
Tradables Market

Nontradables Market

REER

$P = P_t / P_n$

$P_n \uparrow \rightarrow \frac{P_t}{P_n} \downarrow \rightarrow \frac{D_n}{S_n} \downarrow$



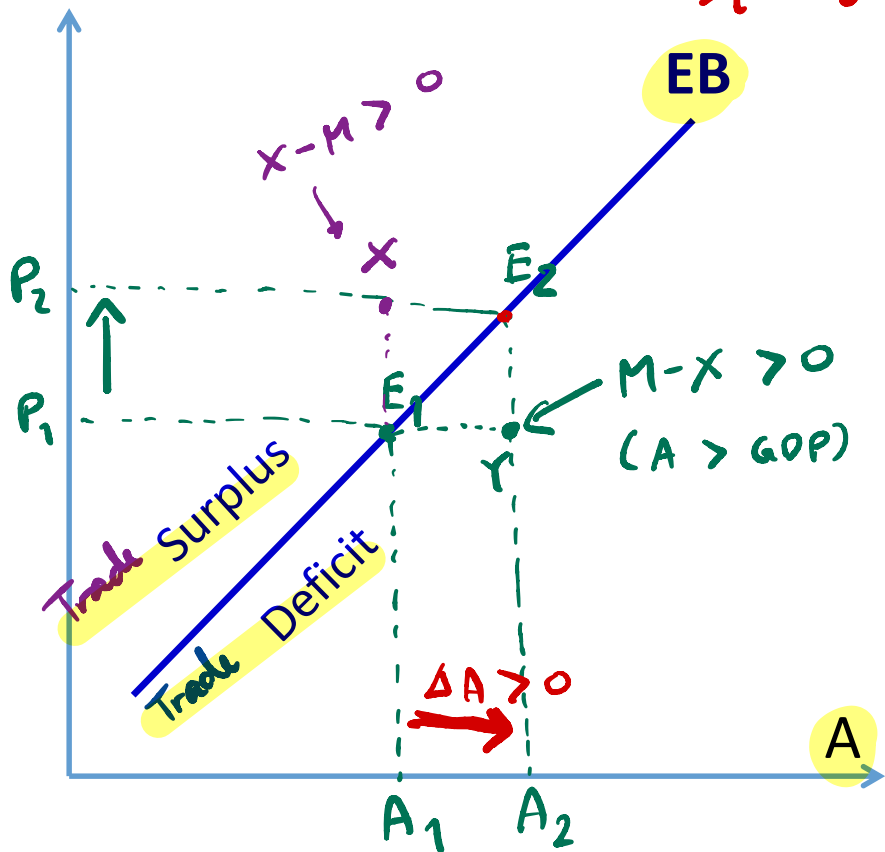
The Phase Diagram

External Balance

$$(P \propto A)$$

RER

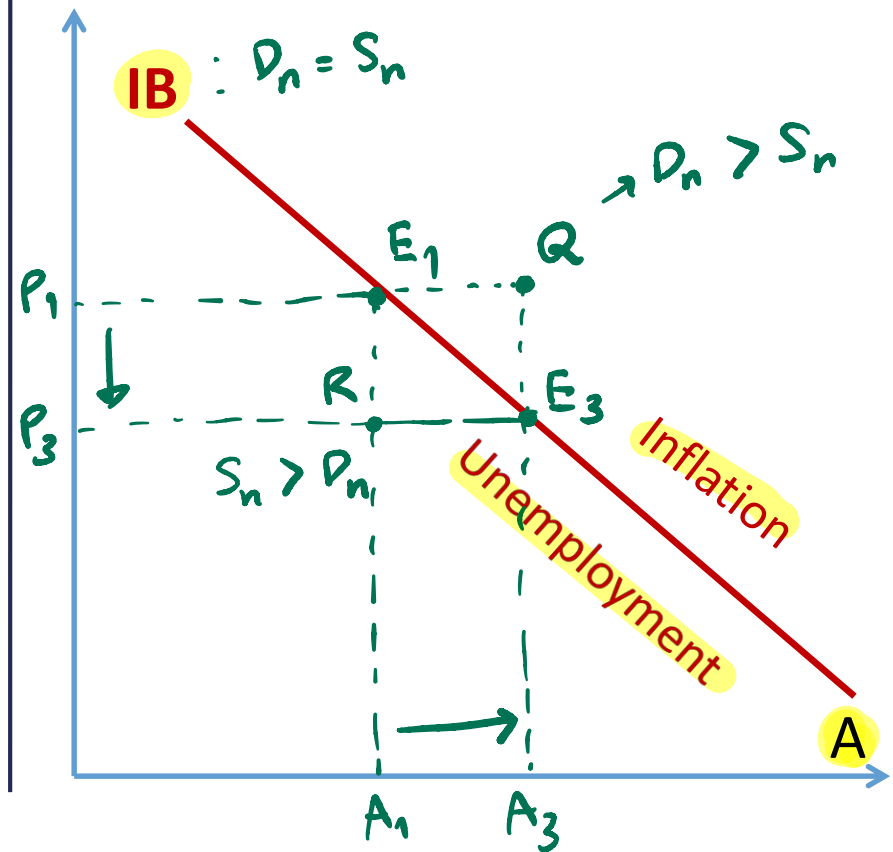
$$P = P_t / P_n$$



Internal Balance

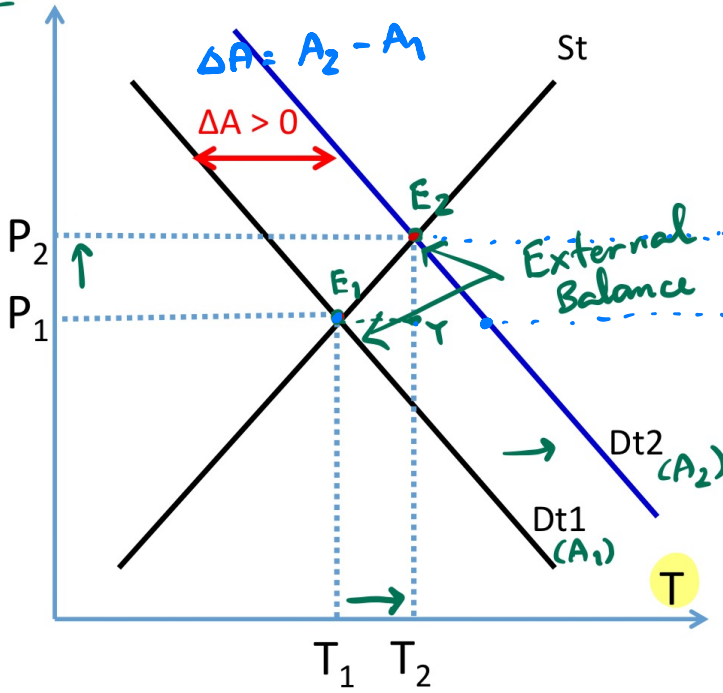
$$(P \propto \frac{1}{A})$$

$$P = P_t / P_n$$



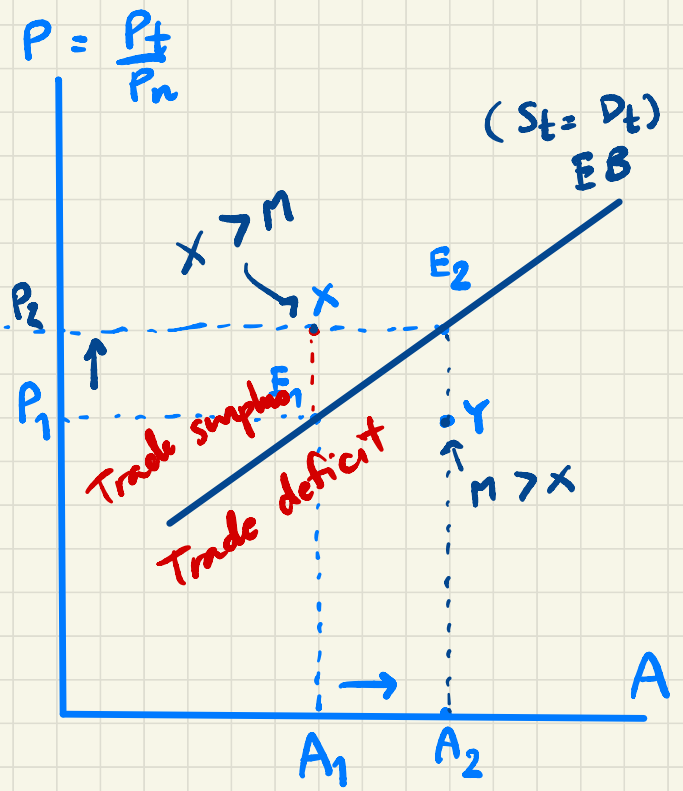
Tradables Market

$P = P_t / P_n = RER$



$P_t \uparrow \Rightarrow P \uparrow \Rightarrow S_t \uparrow$
 \Downarrow
 $D_t \downarrow$

External Balance

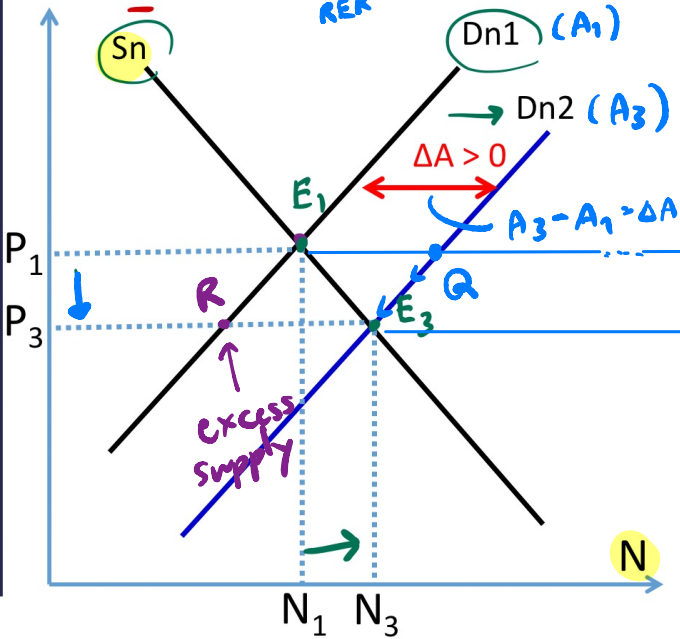


Nontradables Market

$$P = P_t / P_n$$

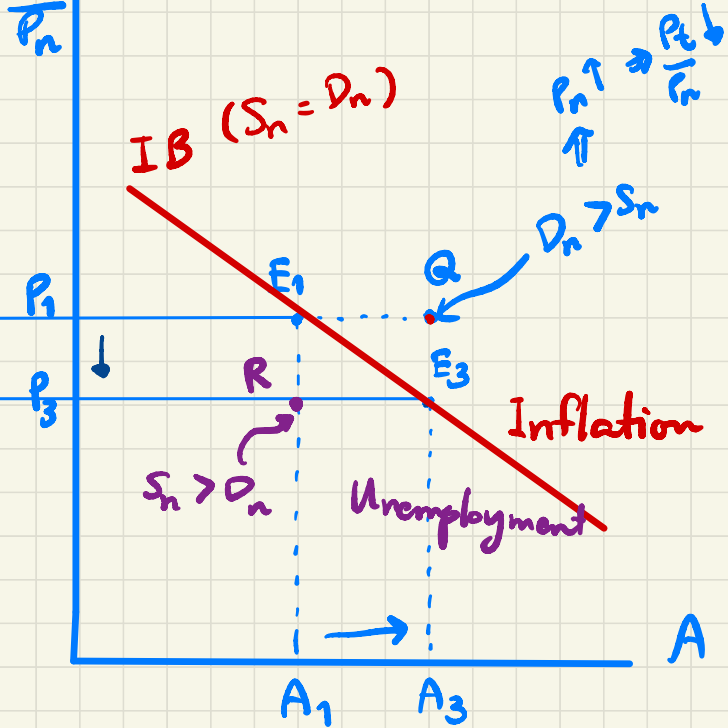
$$P_n \uparrow \rightarrow \frac{P_t}{P_n} \downarrow \rightarrow \frac{D_n}{S_n} \downarrow$$

REER



Internal Balance (IB)

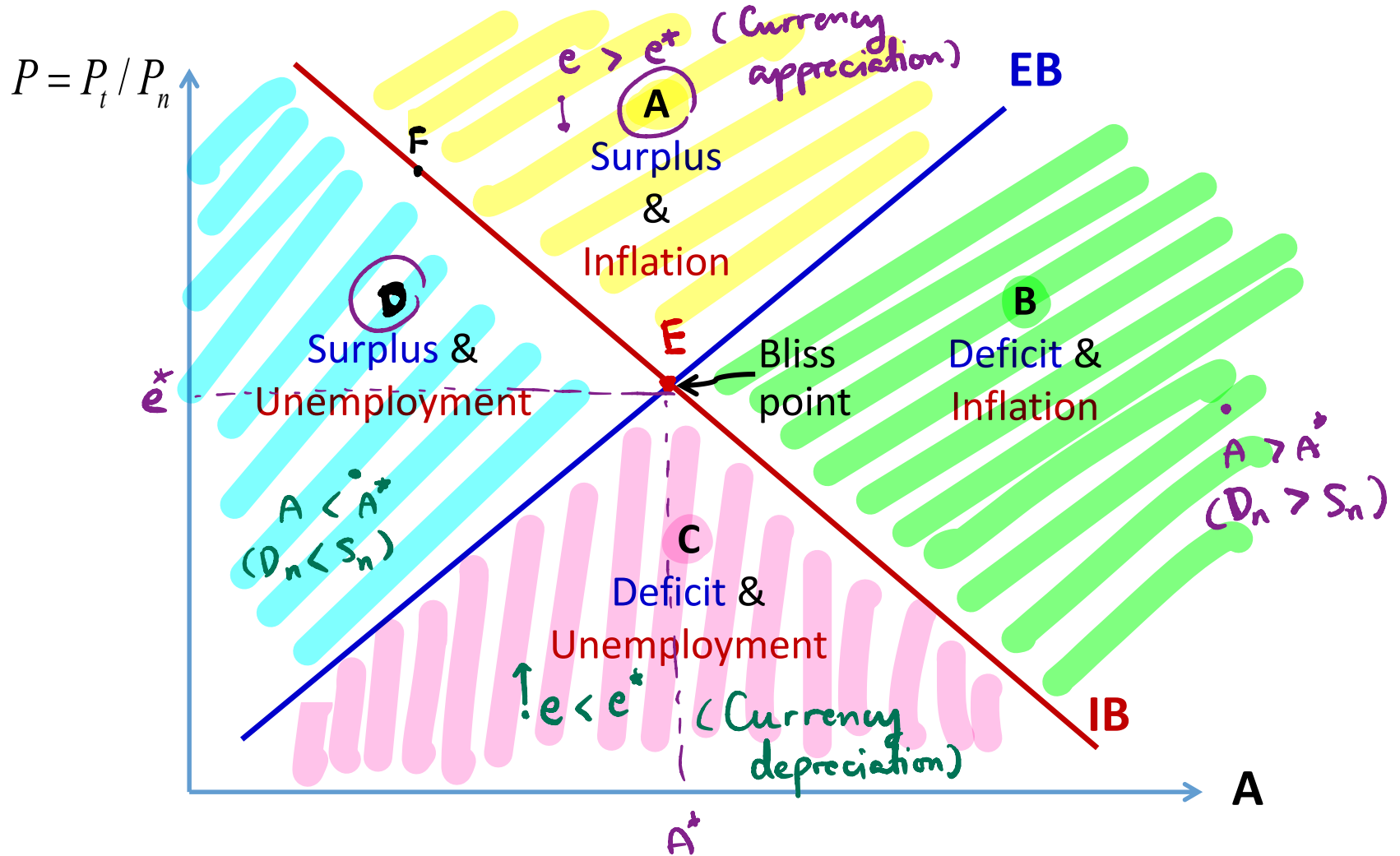
$$\frac{P_t}{P_n} = \text{REER}$$



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 ($P_n \uparrow$)
 - Internal surplus: excess supply of nontradables, absorption is too low → unemployment

Figure: Zones of Imbalance (both tradeables and nontradeable market).



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

(Tradeable Market).

External Balance

$x - m > 0 \Rightarrow M^s \uparrow \Rightarrow r \downarrow \Rightarrow I \uparrow \Rightarrow A \uparrow$

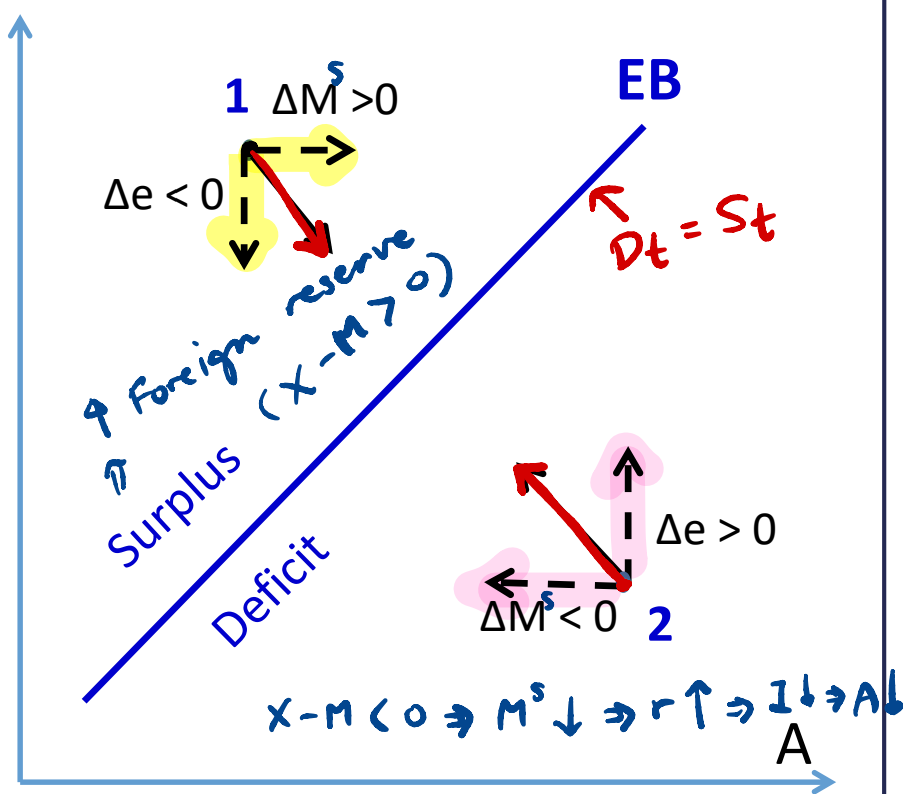
(Nontradeable Market)

Internal Balance

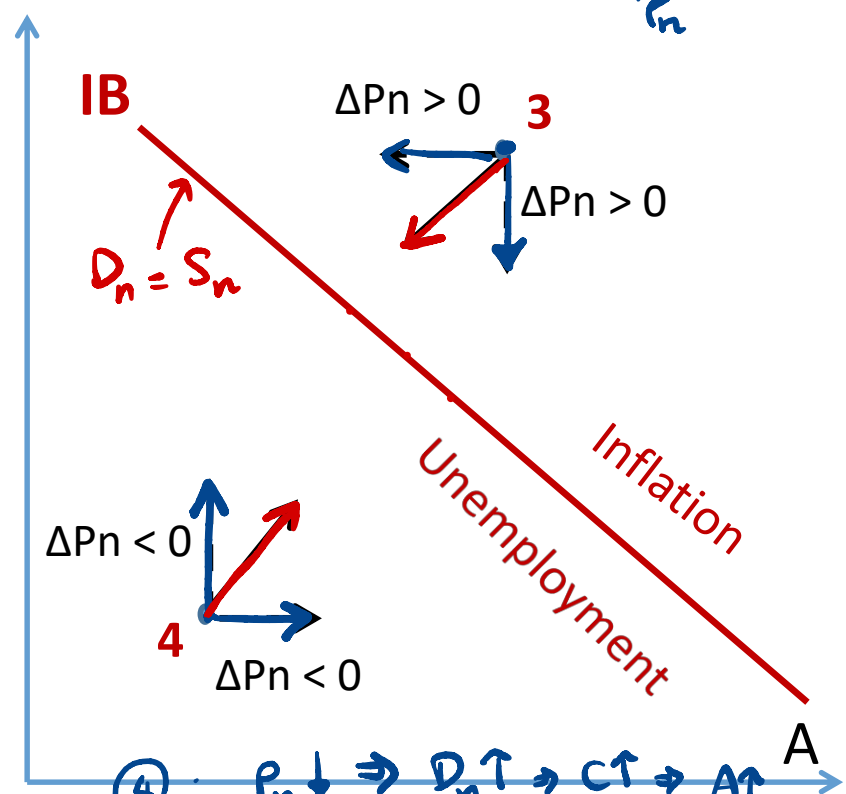
($\Delta A < 0$)

③: $P_n \uparrow \Rightarrow C \downarrow \Rightarrow A \downarrow$
 $\frac{P_t}{P_n} = RER \downarrow$

$P = P_t / P_n$



$P = P_t / P_n$



④: $P_n \downarrow \Rightarrow D_n \uparrow \Rightarrow C \uparrow \Rightarrow A \uparrow$
 $\frac{P_t}{P_n} = RER \uparrow$

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

price rigidity (wage rigidity).

- 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. *managed-float*
 - **Fiscal policy and monetary policy** are two instruments to influence absorption level. *⇒ change A* *⇒ change RER.*
 - ↳ contractionary
 - ↳ expansionary

Policy Zones

$$P = P_t / P_n$$

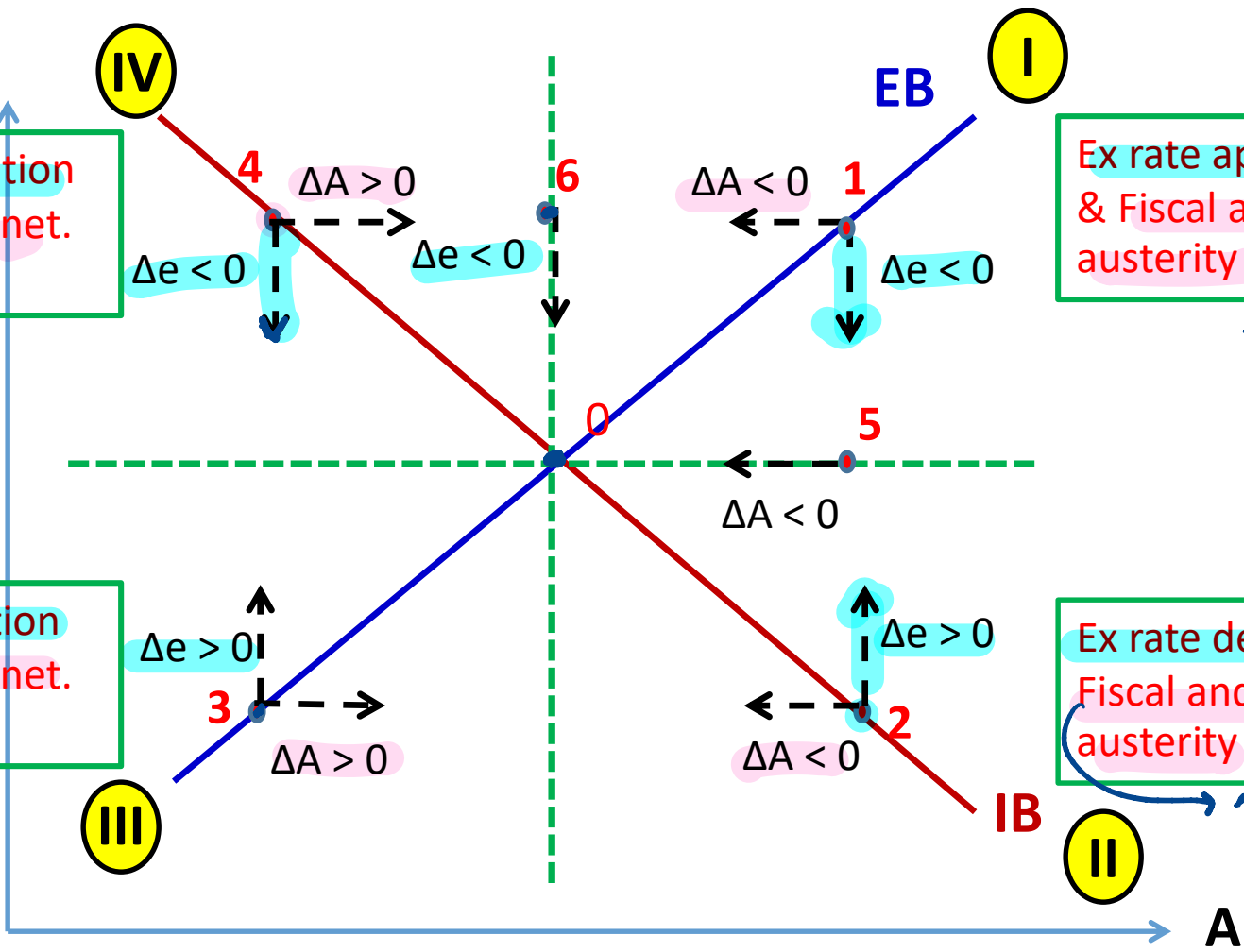
Ex rate appreciation & Fiscal and monet. expansionary

Ex rate appreciation & Fiscal and monet. austerity $\rightarrow \uparrow T = \downarrow G$
 $\rightarrow \downarrow M^s \rightarrow \uparrow r$

Ex rate devaluation & Fiscal and monet. expansionary

Ex rate devaluation & Fiscal and monet. austerity $\downarrow M^s$
 $\rightarrow \uparrow T = \downarrow G$

$\uparrow G = \downarrow T \rightarrow A$
 $M^s \uparrow$



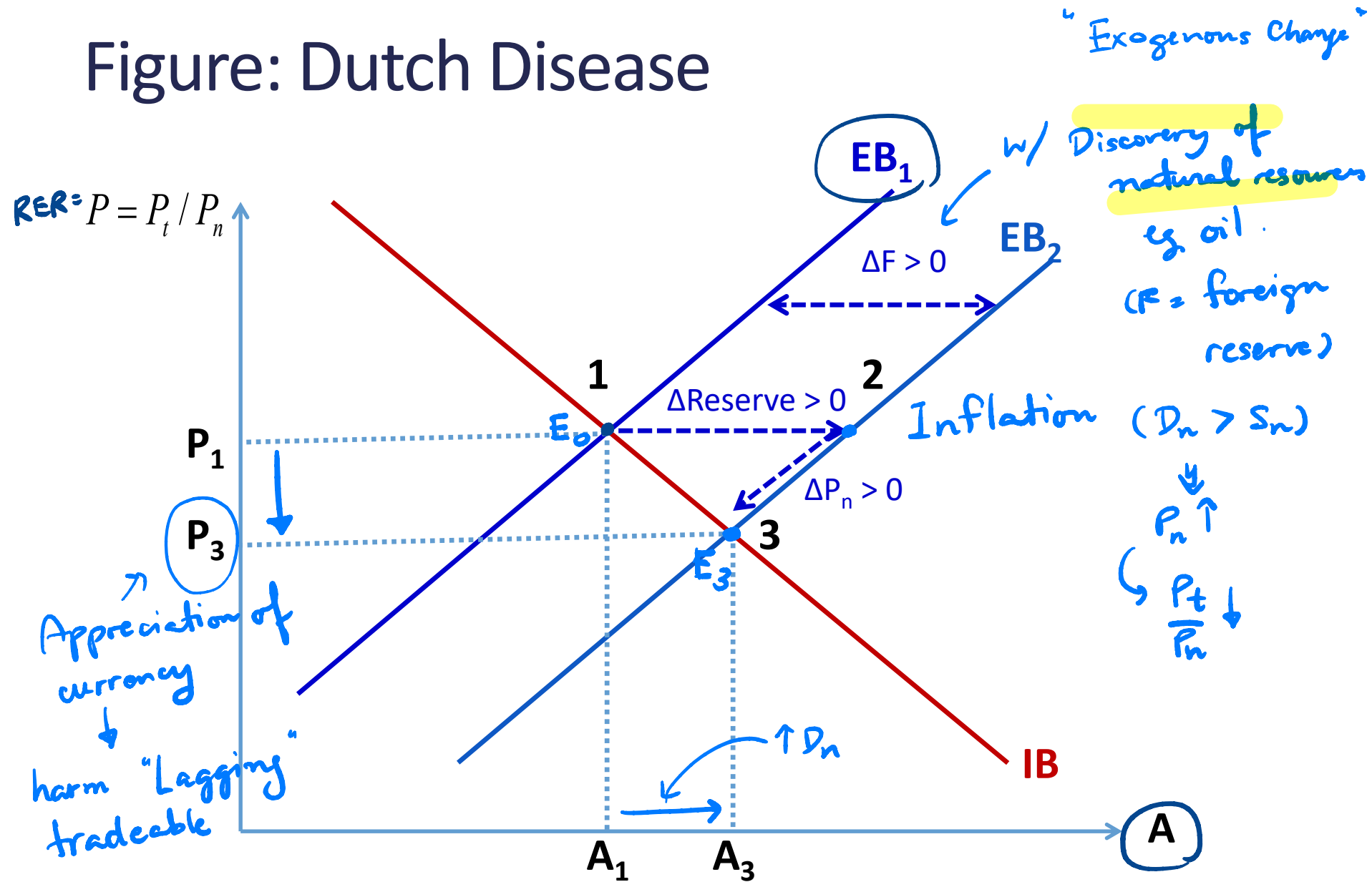
APPLICATIONS OF THE AUSTRALIAN MODEL

Dutch Disease

→ Booming industry → Primary goods
↳ ↑ tradeables.

- 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 : → ↓ P_N (↓ C → ↓ A)
 - Reduction in real absorption (partially corrects the initial rise in A)
 - Real appreciation of exchange rate (assuming official rate is fixed)
 - ↳ undermine the country's competitiveness in the world market.

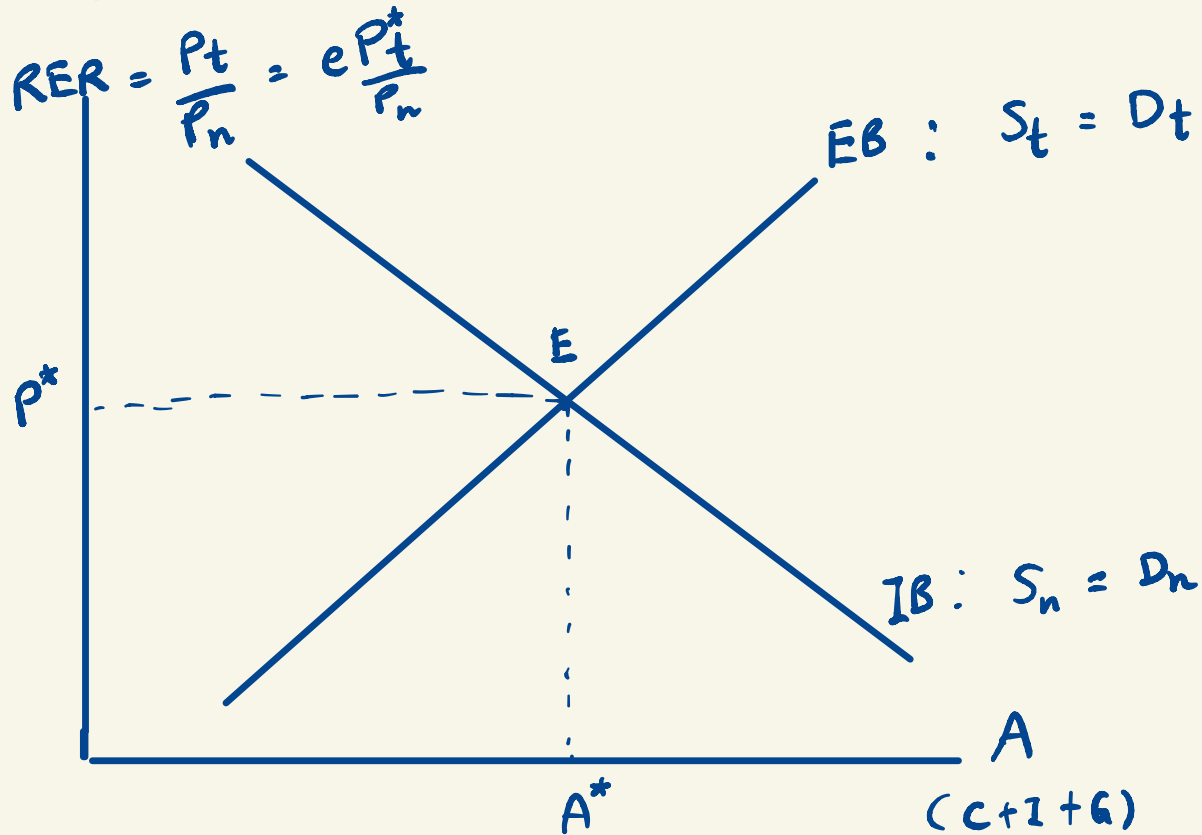
Figure: Dutch Disease



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”
 - ↳ for lagging tradeable sector.

Australian Model



Policies :

- Monetary policy
- Fiscal policy
 - Austerity $\Rightarrow \downarrow A$
 - Expansionary $\Rightarrow \uparrow A$
- Exchange rate management

• Expansionary fiscal policy : $\uparrow G \ \& \ \downarrow T$ / $C = mpc \cdot (Y - T)$
 $\hookrightarrow G \uparrow, C \uparrow \Rightarrow A \uparrow$

• Expansionary Monetary policy : $\uparrow M^S \Rightarrow r \downarrow \Rightarrow I \uparrow \Rightarrow A \uparrow$

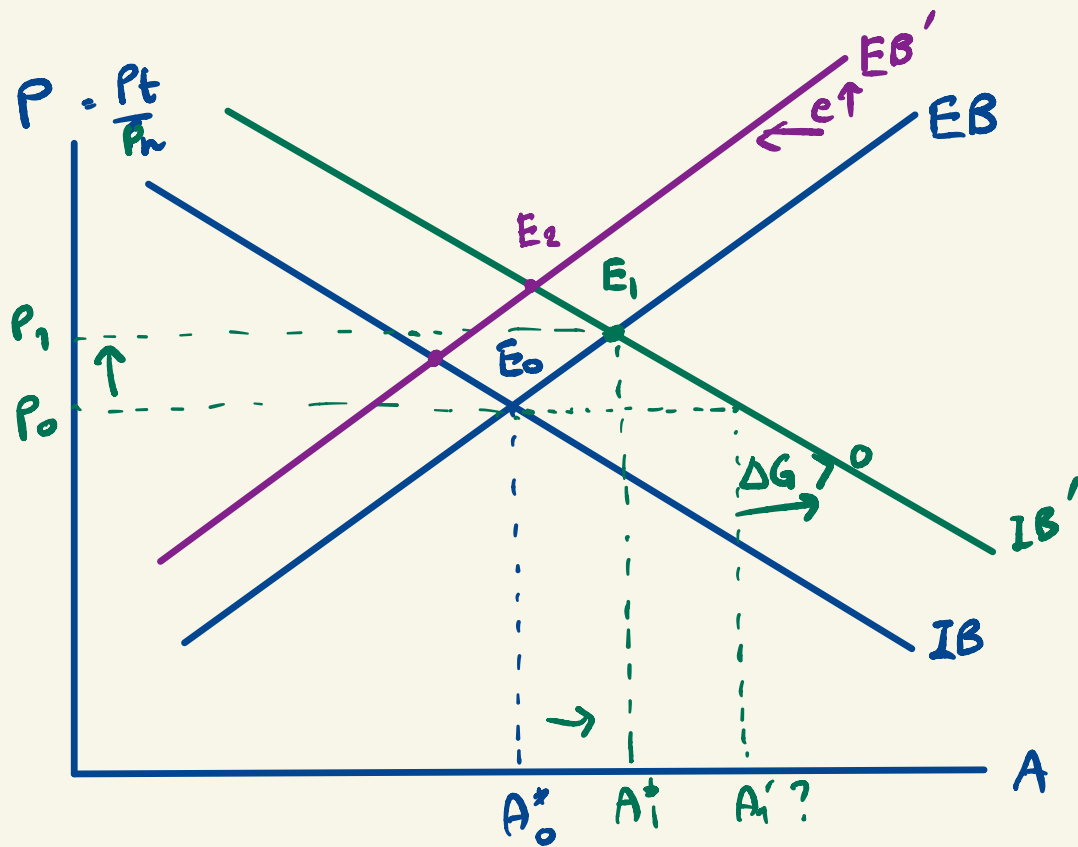
• Austerity fiscal policy : $\downarrow G \ \& \ \uparrow T \Rightarrow A \downarrow$ (and $P \downarrow$)

• Austerity monetary policy : $\downarrow M^S \Rightarrow r \uparrow \Rightarrow I \downarrow \Rightarrow A \downarrow$

• Exchange rate management

\hookrightarrow currency devaluation ($e \uparrow$) $\Rightarrow X \uparrow \ \& \ M \downarrow \Rightarrow P \uparrow$
 $A \downarrow$

\hookrightarrow currency appreciation ($e \downarrow$) $\Rightarrow X \downarrow \ \& \ M \uparrow \Rightarrow P \downarrow \ \& \ A \uparrow$
eg. IS1



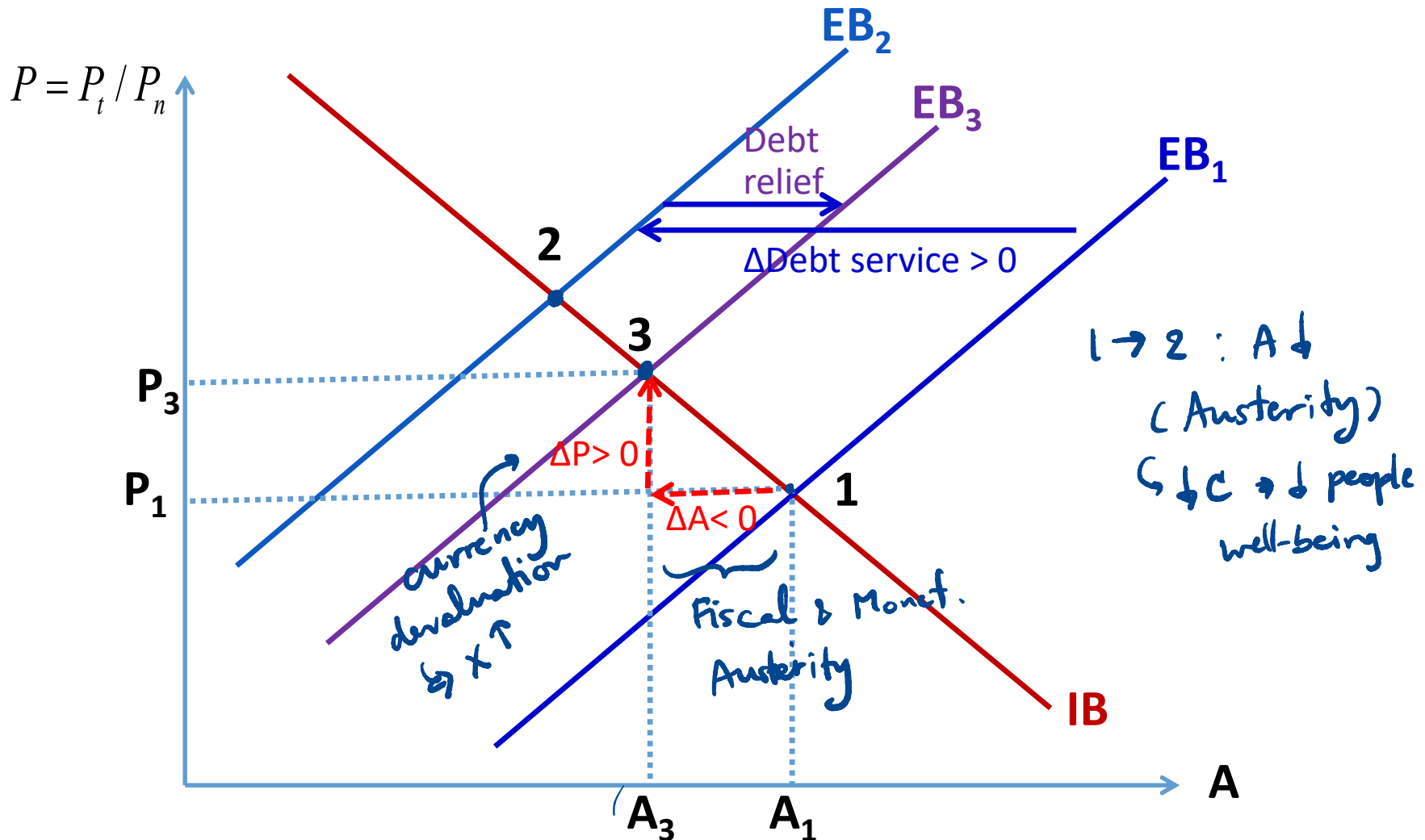
① Gov't uses expansionary fiscal policy \Rightarrow IB shifts right.

② Use currency devaluation \Rightarrow trade surplus

Debt Repayment Crisis \sim declining TOT $\rightarrow \frac{P_x}{P_m} \downarrow$

- 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
- IMF is called to make stabilization program loans. ↗ SAP
- IMF stabilization programs:
 - **Reduction in government's budget deficit** → ↓G & ↑T
 - Programmed targets for domestic credit to **cap the growth of money supply** in order to **reduce absorption** ↓M^s → r↑ → I↓ → A↓
 - The package may require **devaluation** of exchange rate, to reach a new equilibrium and avoid unemployment. → ↑X

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

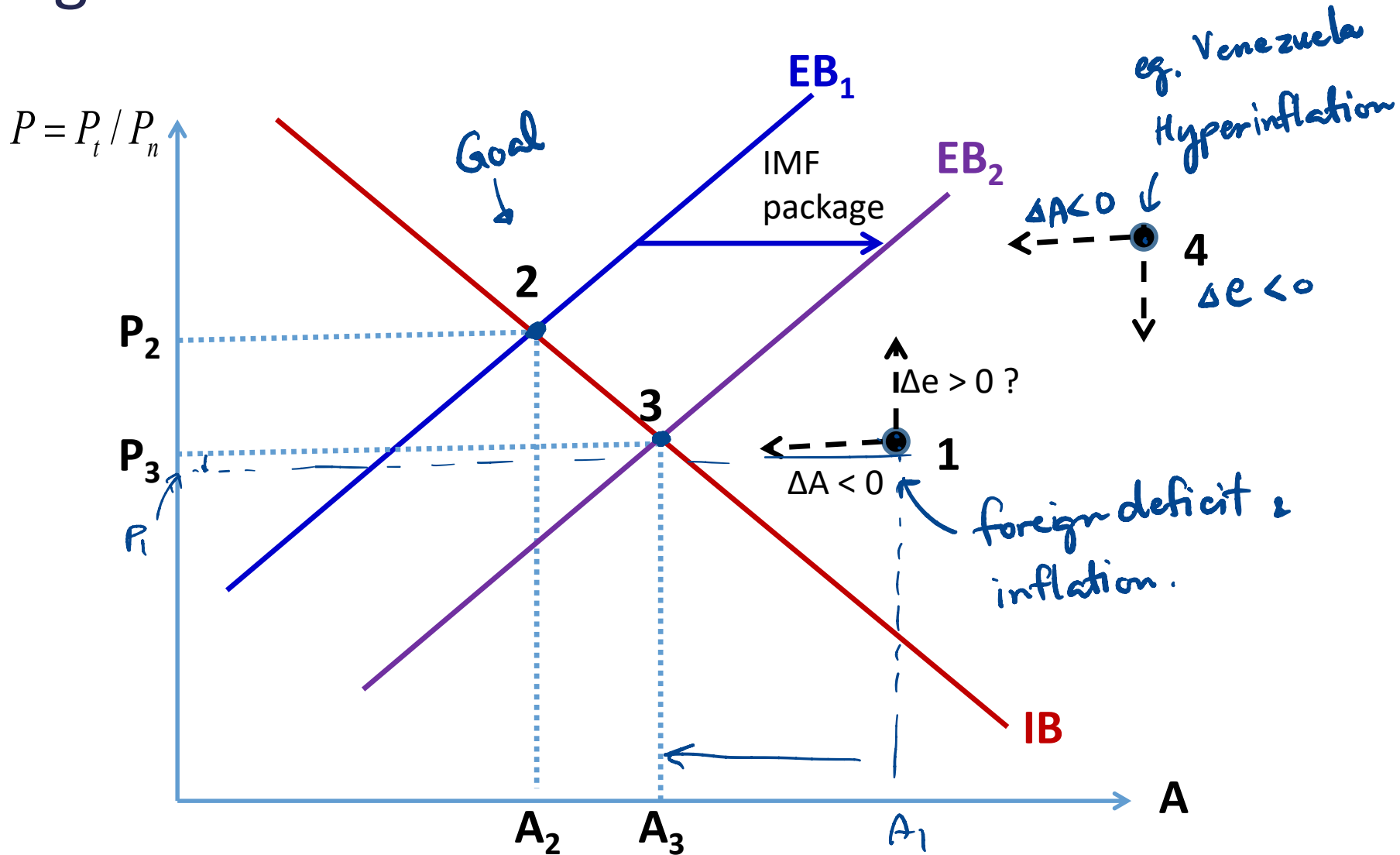
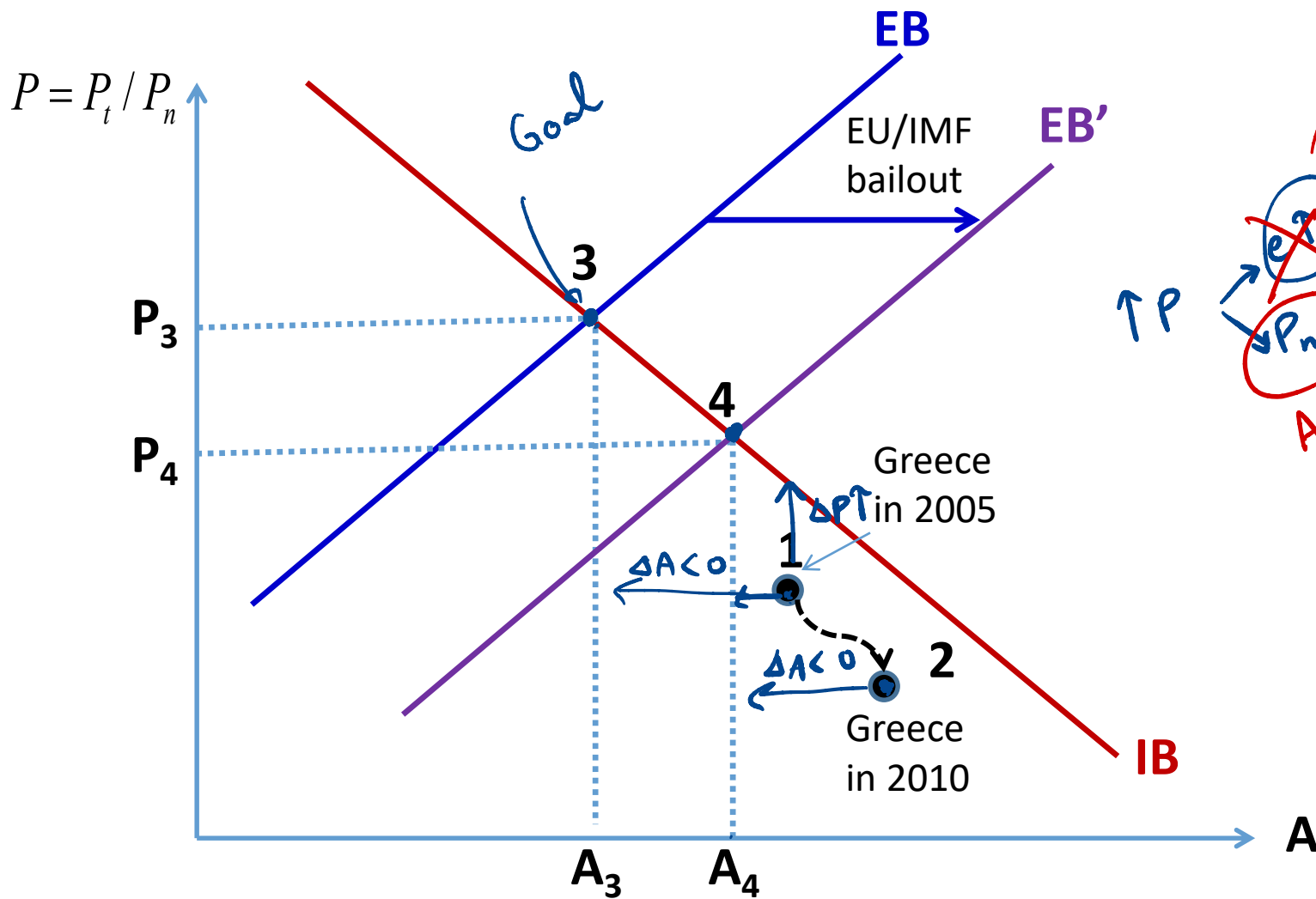


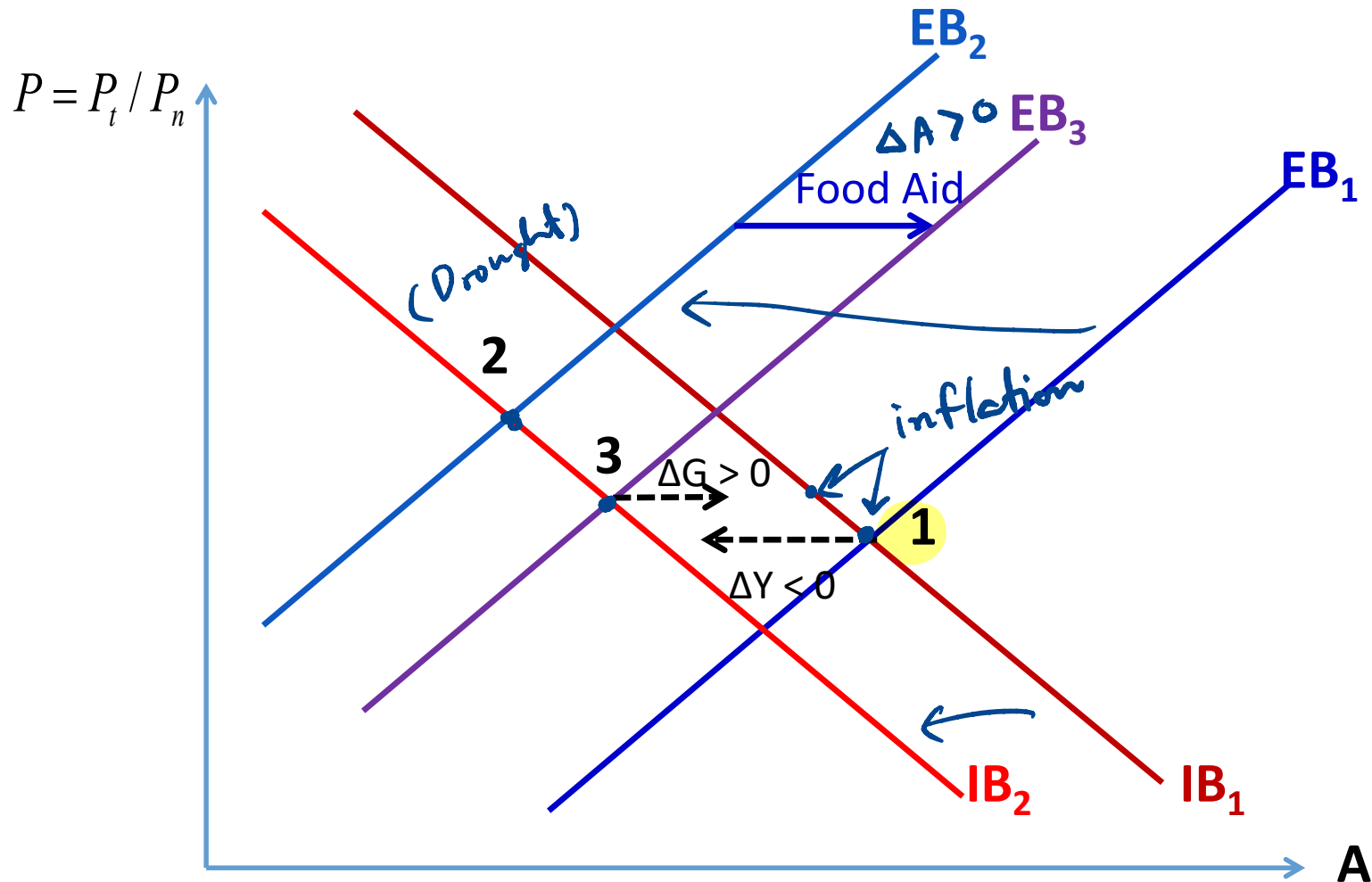
Figure: The Greek Debt Crisis, 2010-2012



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).
(right side of IB).

Figure: Drought , Flood



Question ① How does Covid-19 affect the equilibrium, ^{in a small, open economy} based on the Australian model framework?

② = Impact of Covax program?

- Impact of gov't relief programs?

Submission Date for Research. Project: December 13
@ 11:59 pm.

For now - 1-page write-up of your current research project