

Aggregate Demand & Aggregate Supply Analysis

Required Readings

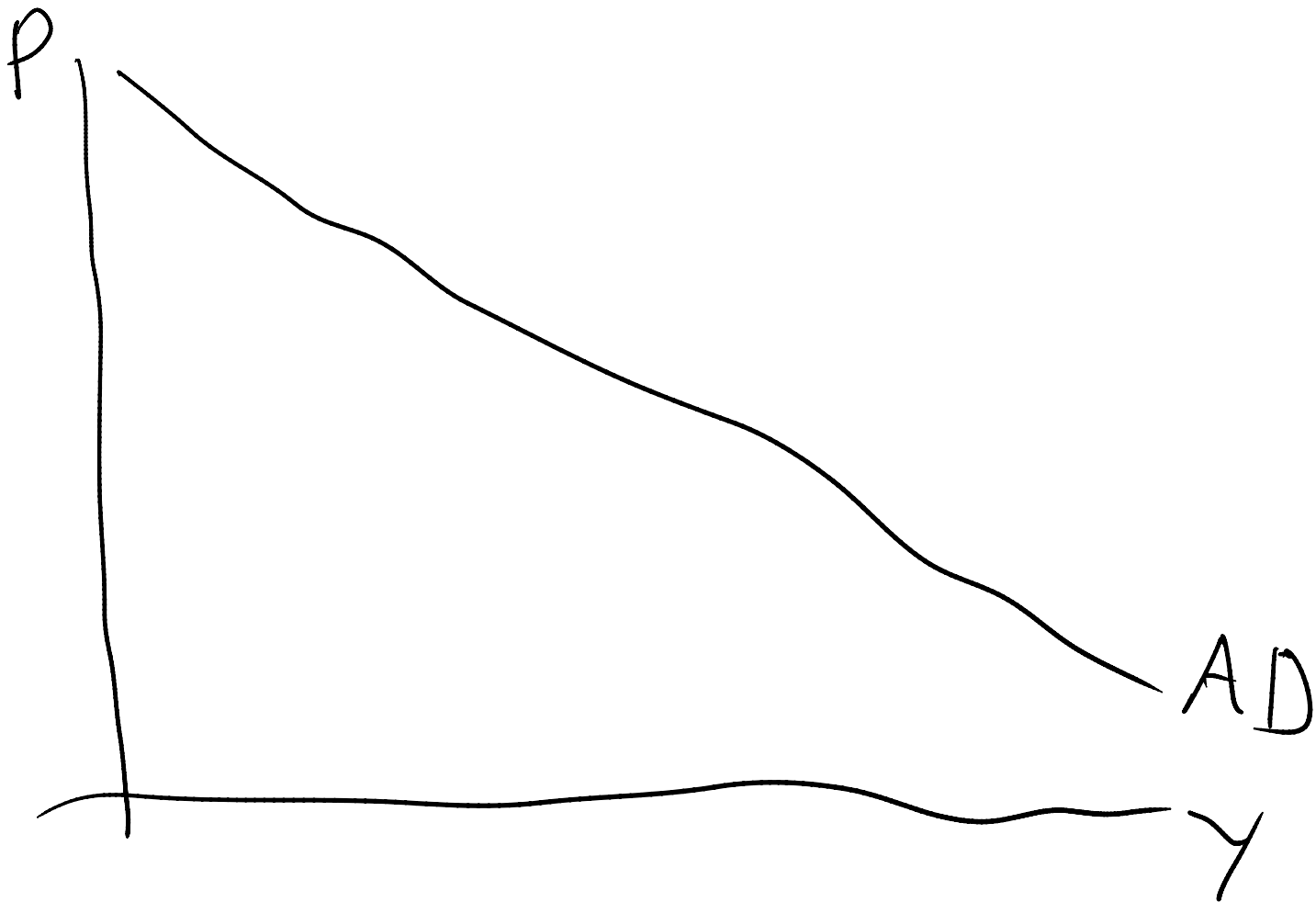
- Chapter 8, pp. 155-159
- Chapter 9, pp. 174-176 & 185
- Chapter 10, pp. 193-199

Motivation

- Previous Model: Unable to analyze the effects on C+I of the Decline in Housing prices and the Financial Crisis
- Relax the assumption of “**Completely Slack Conditions**”
- Expand the analytical framework to allow **both P and Y** to vary

Objective

Derive the Aggregate Demand Curve



AD = Aggregate Demand Curve

Consumption Function

Real Consumption Expenditure depends on:

- Real (Disposable) Income

OTE: \uparrow Real Income \Rightarrow \uparrow Consumption Expenditure

- Real Wealth

OTE: \uparrow Real Wealth \Rightarrow \uparrow Consumption Expenditure

- OTE means "Other Things Equal"

Wealth

Assets (Items People Own):

- **Financial Assets:**

- Money
- Stocks
- Bonds
- CDs
- Saving Deposits
- Mutual Funds
- Money Market Funds
- Etc

- **Durable Goods Assets:**

- Current Value of House
- Current Value of Cars
- Current Value of Furniture
- Current Value of Art Work
- Current Value of Vacation Home
- Etc

Liabilities (Items People Owe):

- **Financial Liabilities:**

- Mortgage
- College Loan
- Auto Loan
- Credit Card Debt
- Etc

- **Nominal Wealth**

= Assets – Liabilities

= Financial Assets

+ Durable Goods Assets

- Liabilities

Nominal and Real Wealth

- Nominal Wealth = A = Assets - Liabilities
- Real Wealth = $\frac{A}{P}$
- P = Prices of Goods & Services
(Not Prices of Financial Assets)

Consumption Function

$$C = C\left(Y, \frac{A}{P}\right)$$

$$C = \bar{C} + bY + \gamma \frac{A}{P}$$

$$0 < b < 1 \quad \gamma > 0$$

Marginal Propensities to Consume

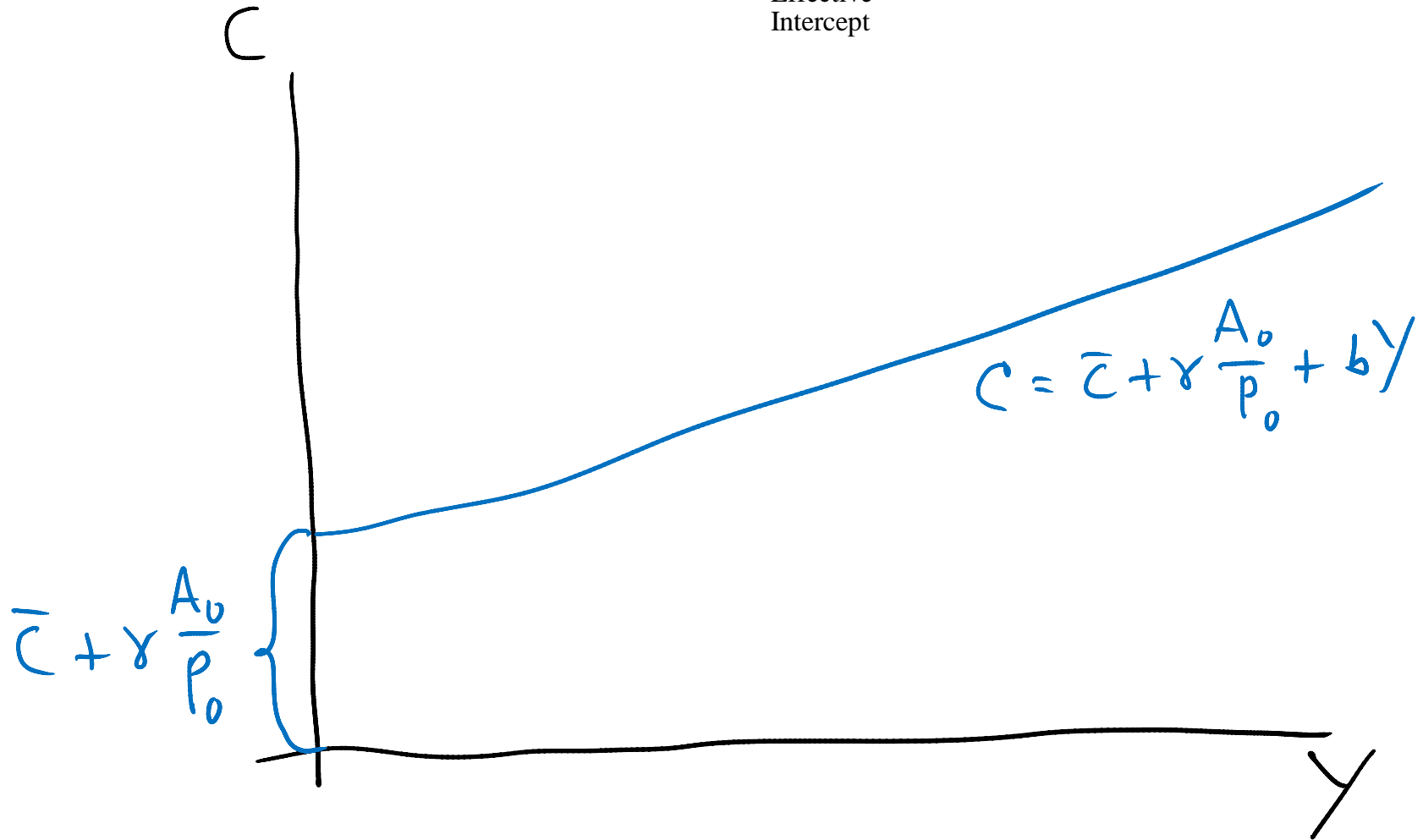
- $b = MPC_Y = \frac{\Delta C}{\Delta Y}$: Measures Sensitivity of C to Y
- $\gamma = MPC_{\frac{A}{P}} = \frac{\Delta C}{\Delta \frac{A}{P}}$: Measures Sensitivity of C to $\frac{A}{P}$

To Plot the Consumption Function

Define:

- $A_o =$ Specific Level of Nominal Wealth
- $P_o =$ Specific Price Level
- $\frac{A_o}{P_o} =$ Specific Level of Real Wealth

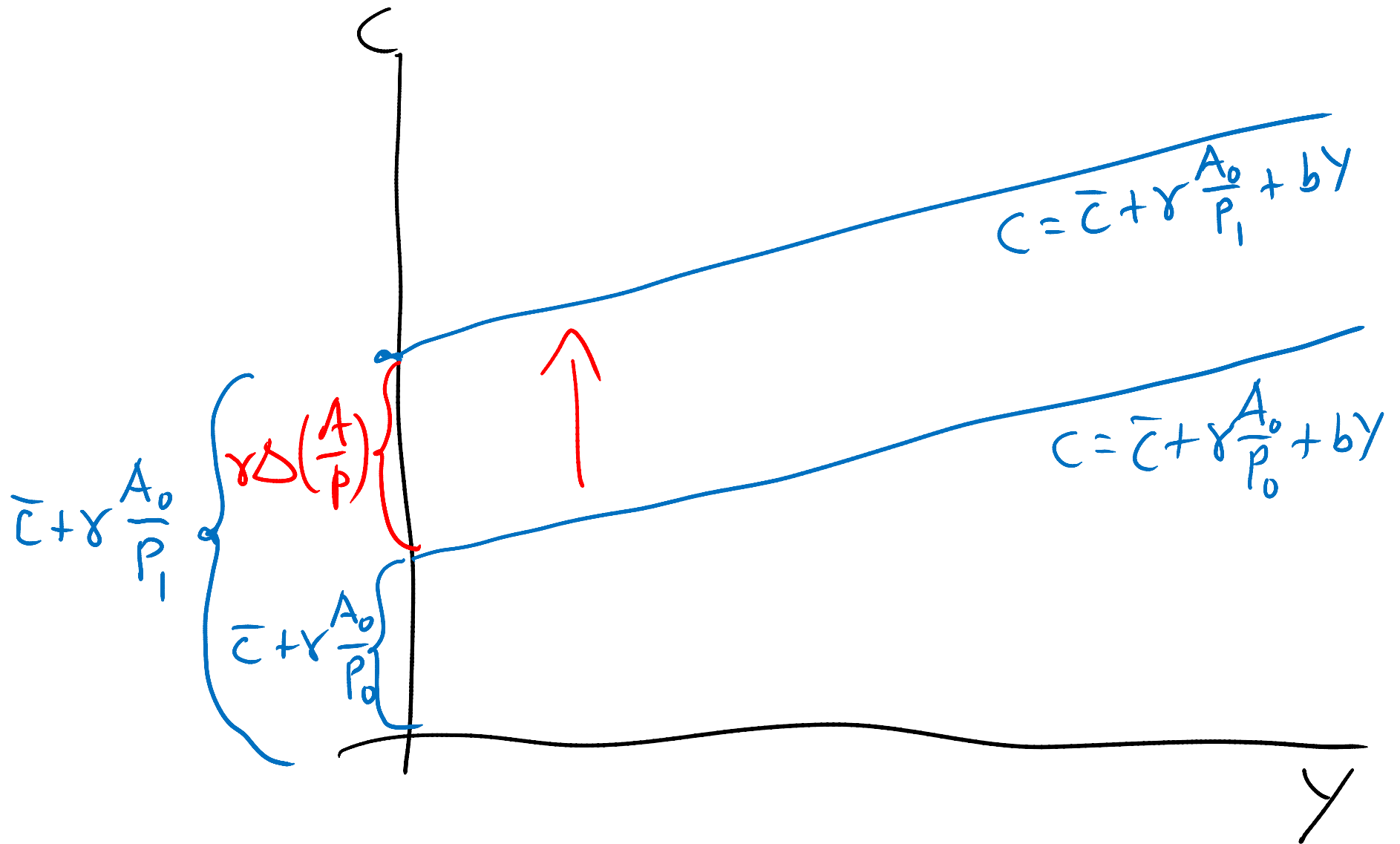
$$C = \bar{C} + bY + \gamma \frac{A_0}{P_0} = \underbrace{\bar{C} + \gamma \frac{A_0}{P_0}}_{\text{Effective Intercept}} + \underbrace{bY}_{\text{Slope}}$$



Distinguish between Changes in A and P

- An increase in Real Wealth, $\frac{A_o}{P_o}$, can be due to
 - An increase in Nominal Wealth, A_oor
 - A decrease in the Price Level, P_o
- And vice-versa

A Decrease in P_0



Interpretation

- $\downarrow P_o \Rightarrow \uparrow \frac{A_o}{P_o} \Rightarrow \uparrow$ Intercept of Con. Fn.
 $\Rightarrow \uparrow C$ for a given Y

- $$\Delta \left(\frac{A}{P} \right) = \frac{A_o}{P_1} - \frac{A_o}{P_o} = \left(\frac{A_o}{P_1} \right) \left(\frac{P_o}{P_o} \right) - \frac{A_o}{P_o} = \frac{A_o}{P_o} \left(\frac{P_o}{P_1} - 1 \right)$$
$$= \frac{A_o}{P_o} \left(-\frac{P_1 - P_o}{P_1} \right)$$

Model

$$Y = E$$

$$E = C + I$$

$$C = \bar{C} + bY + \gamma \frac{A_0}{P_0}$$

$$I = \bar{I}$$

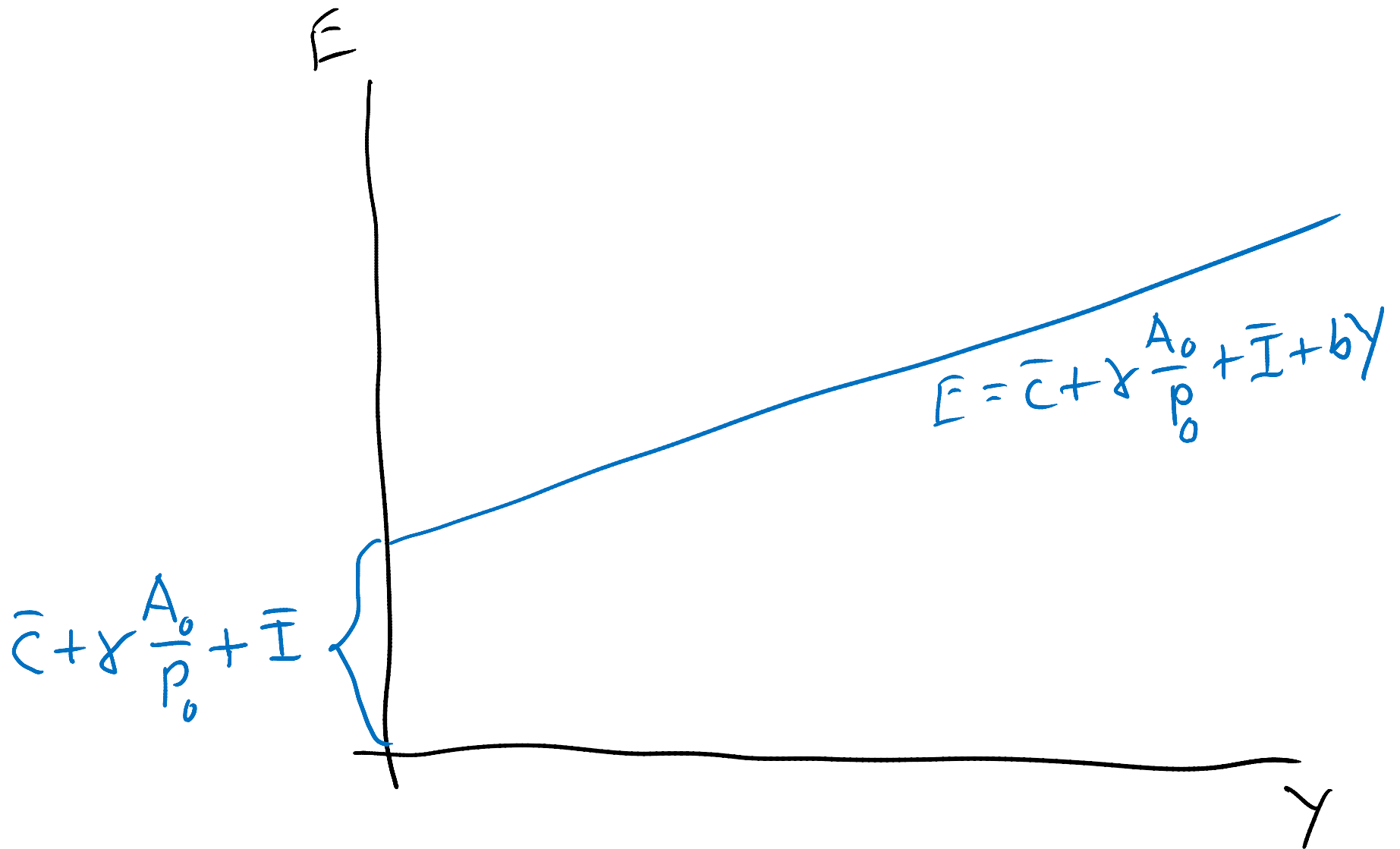
Aggregate Expenditure

$$E = C + I$$

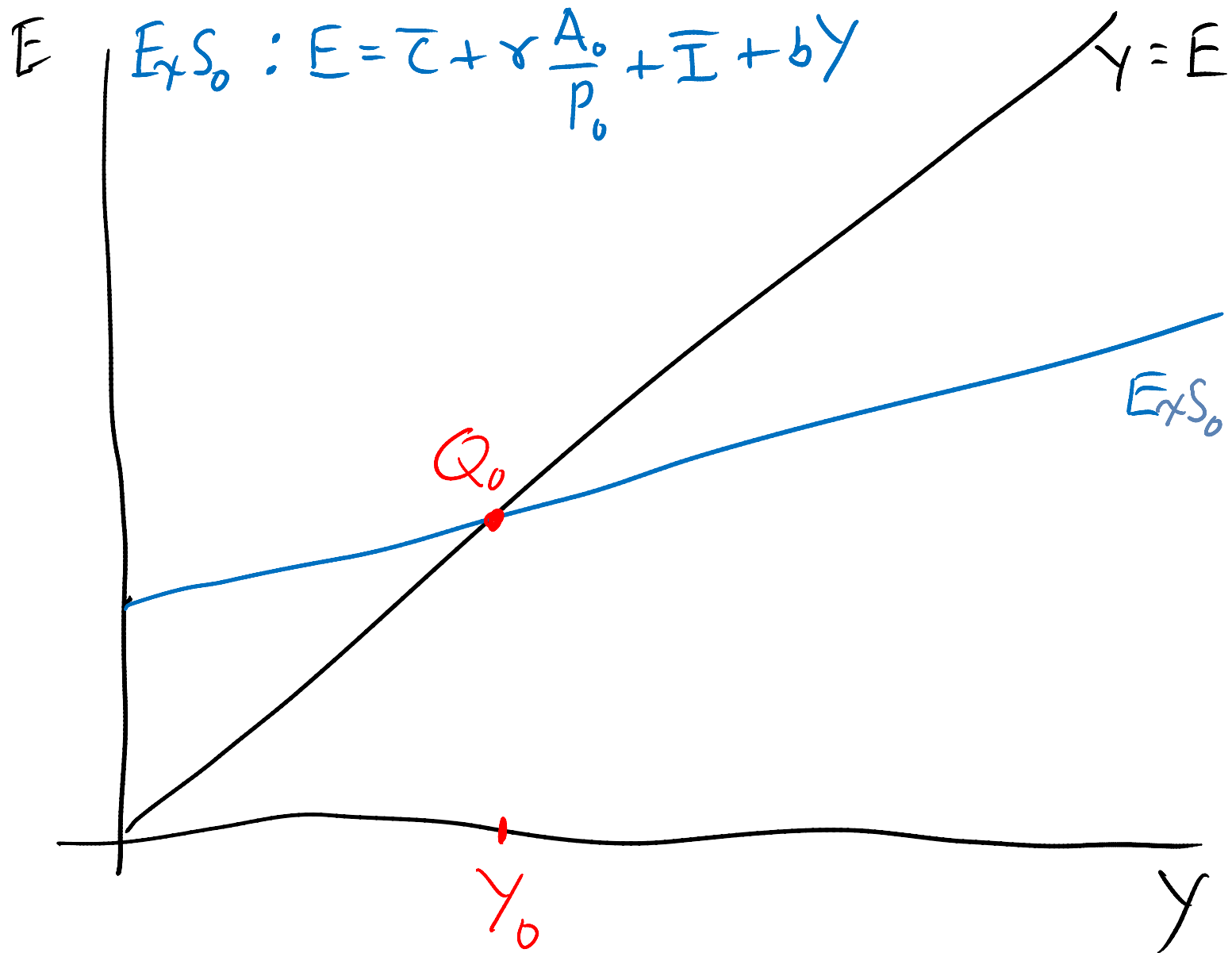
$$= \bar{C} + bY + \gamma \frac{A_0}{P_0} + \bar{I}$$

$$= \underbrace{\bar{C} + \gamma \frac{A_0}{P_0} + \bar{I}}_{\text{Effective Intercept}} + \underbrace{b}_{\text{Slope}} Y$$

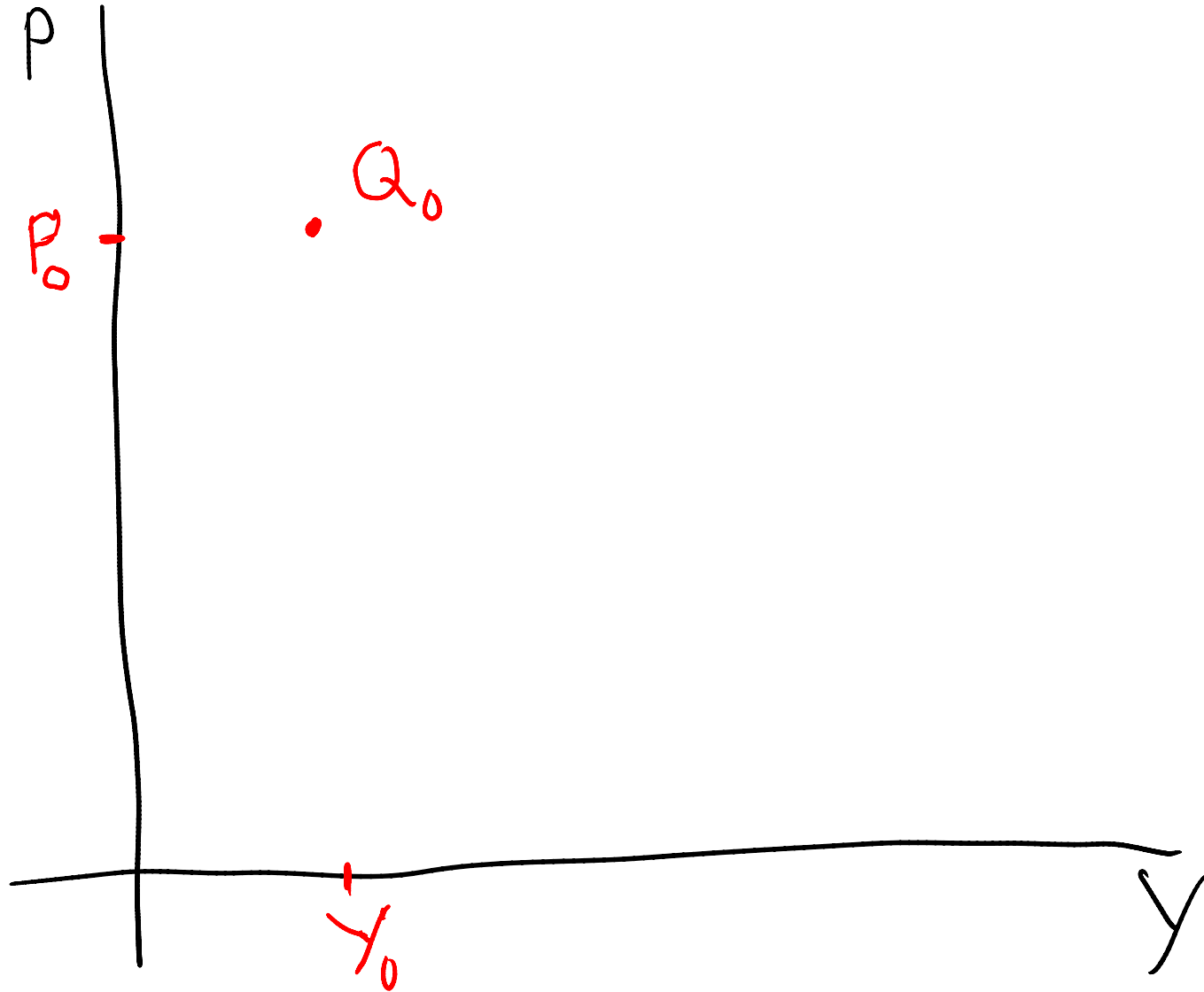
Expenditure Schedule



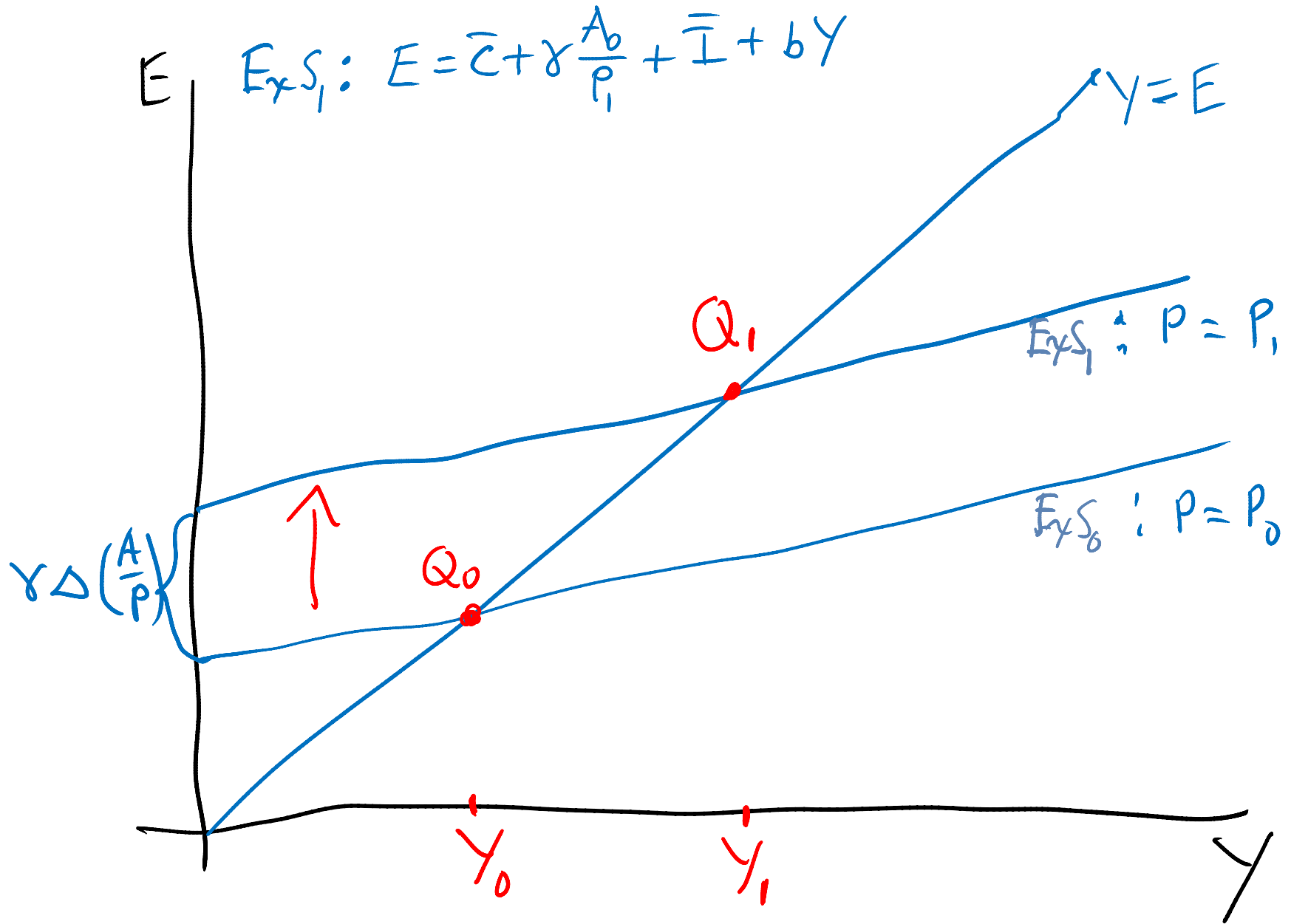
Demand-Side Equilibrium: E-Y Plane



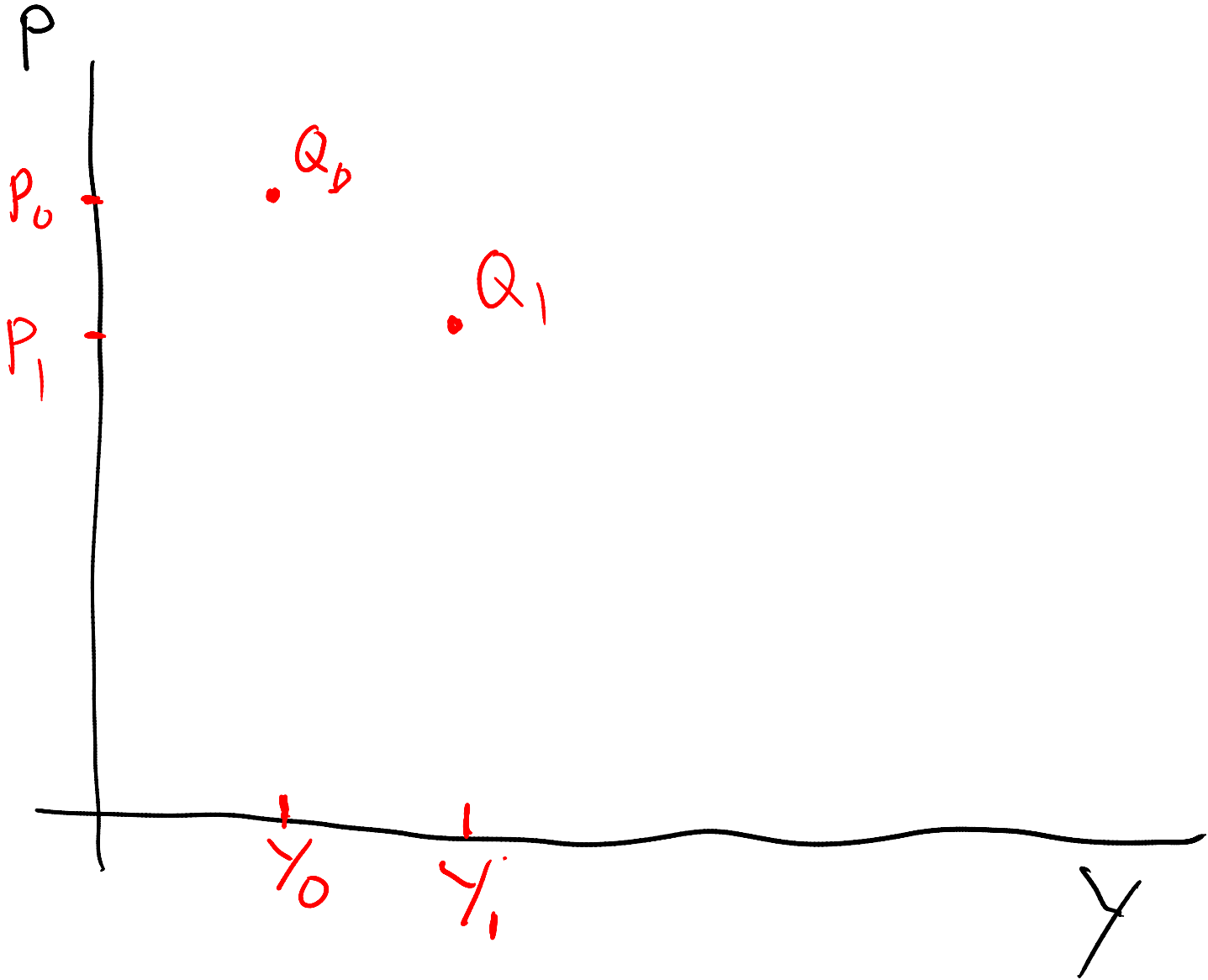
Demand-Side Equilibrium: P-Y Plane



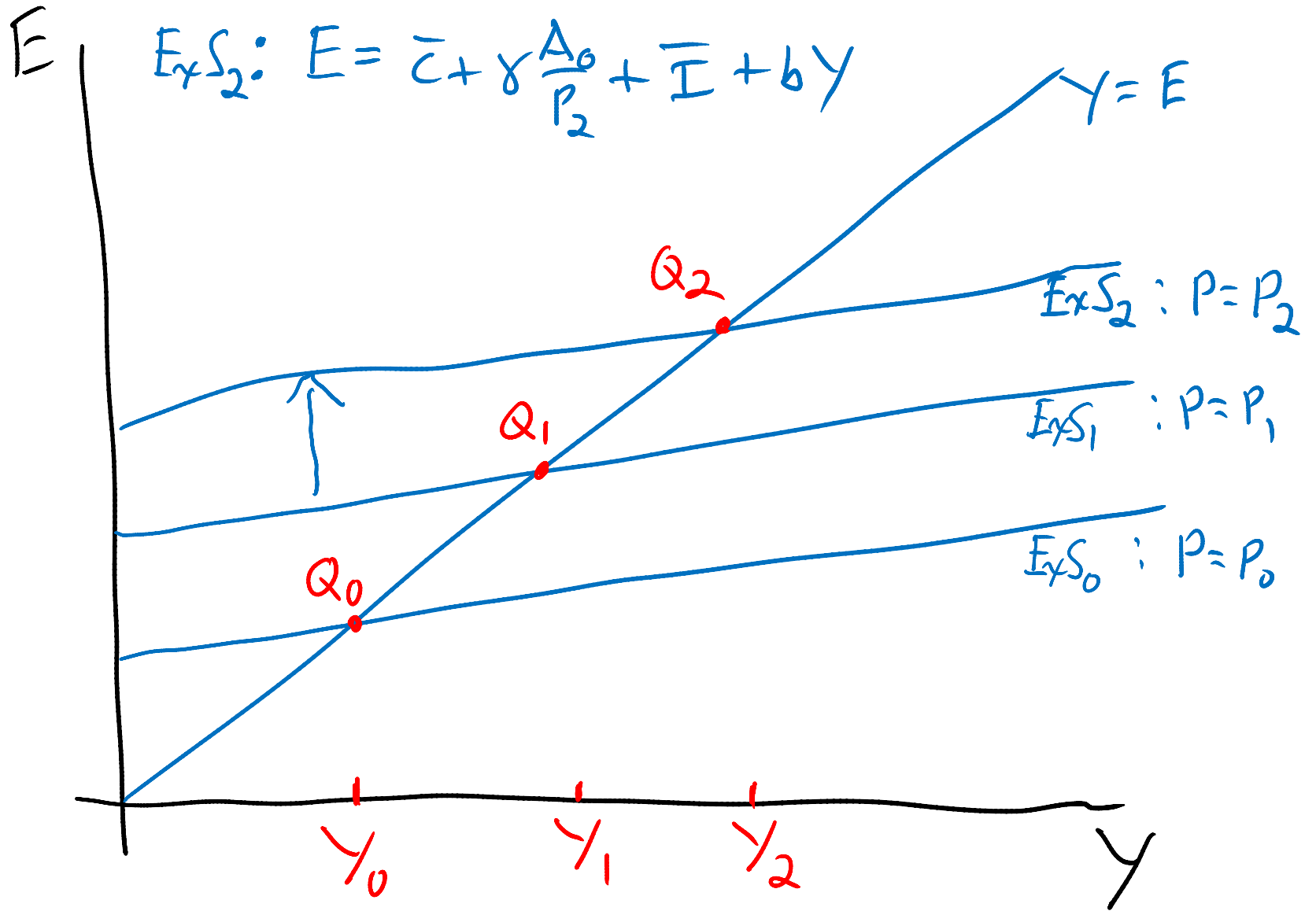
Decline in P: E-Y Plane



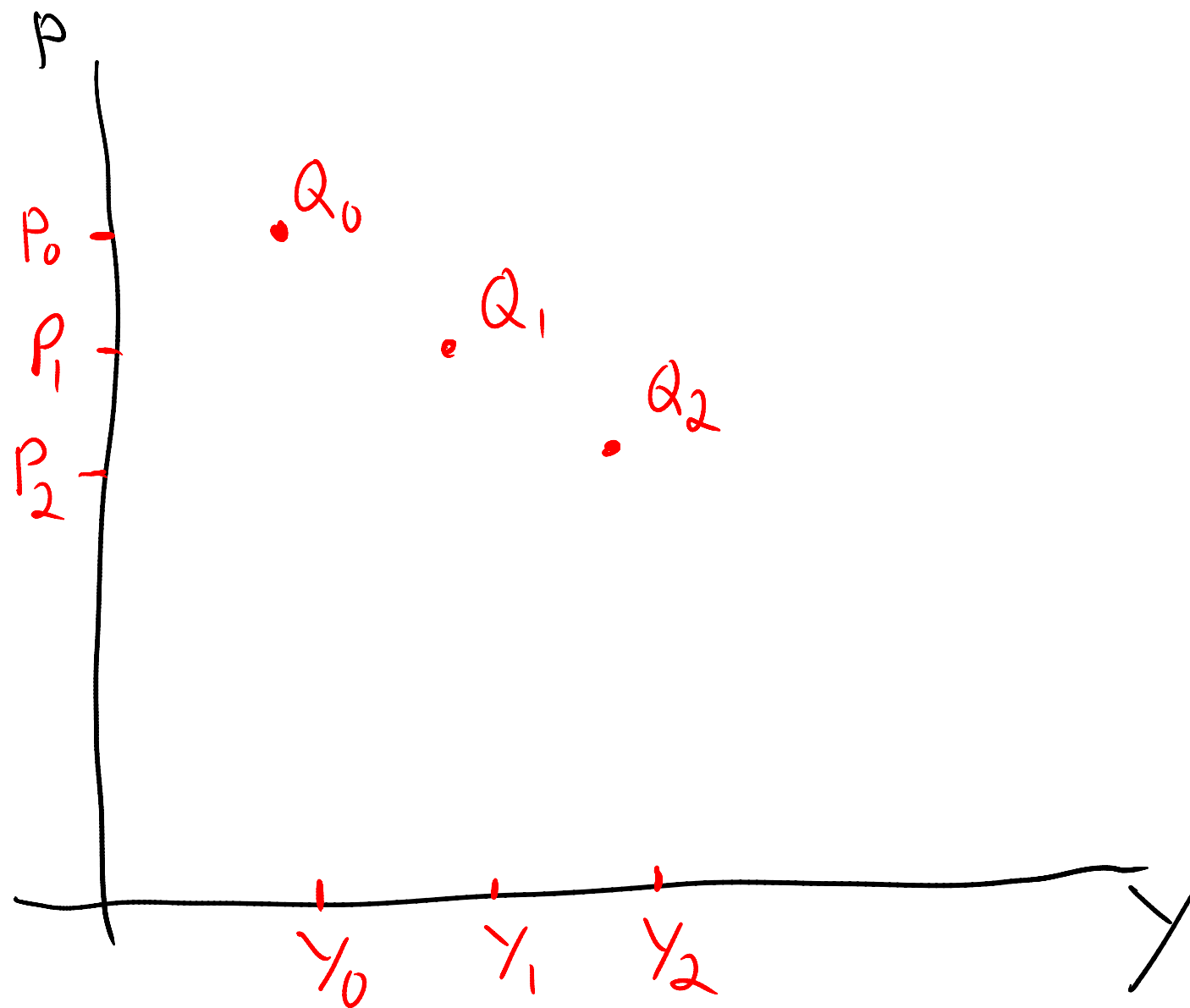
Decline in P: P-Y Plane



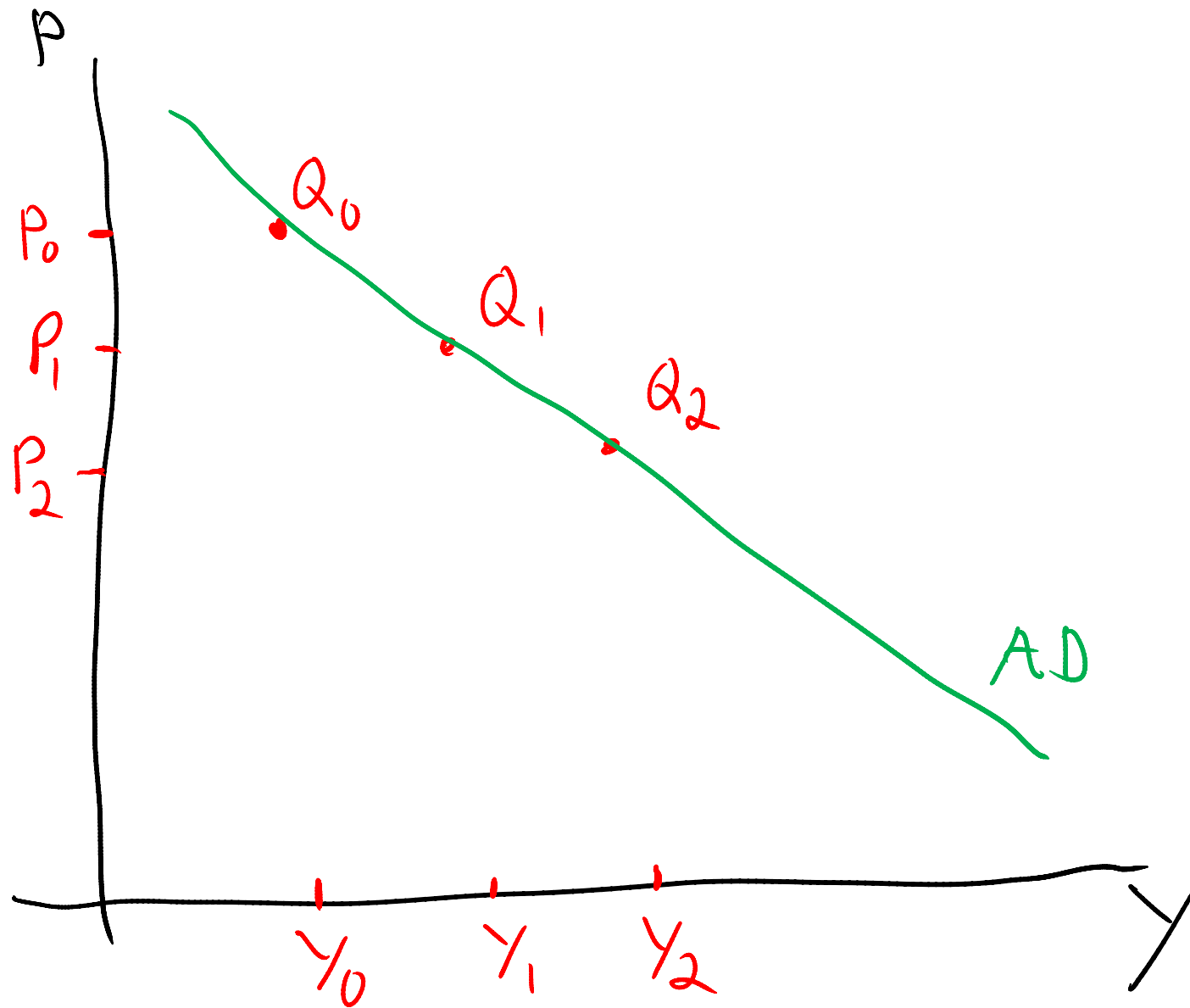
Further Decline in P: E-Y Plane



Further Decline in P: P-Y Plane



Aggregate Demand Curve



Summary: Aggregate Demand Curve

- AD: Combinations of P and Y that are consistent with Demand-Side Equilibrium
- Each point, Q_0 , Q_1 , Q_2 , etc. on AD is a "Demand-Side Equilibrium"
- Aggregate Planned Expenditure equals Output (= Income)
- Observation: Ignores the Supply-Side

Slope of AD Curve

- *AD* is Negatively-sloped

- Intuition: $\downarrow P \Rightarrow \uparrow \frac{A}{P} \Rightarrow \uparrow C \Rightarrow \uparrow E \Rightarrow \uparrow Y$

- And vice-versa

Aggregate Demand Curve Mathematical Statement

- Define: $Y_d =$ Demand for Output
- $AD: Y_d = D(P, \bar{C}, \bar{I}, A_0)$

$$= D(\underbrace{P}_{\substack{\text{Determines} \\ \text{the Slope} \\ \text{of AD}}}, \underbrace{\bar{C}, \bar{I}, A_0}_{\substack{\text{Determines the} \\ \text{Position of AD}}})$$

Shifts in AD Curve

- Diagram: $\uparrow \bar{C}$, $\uparrow \bar{I}$, or $\uparrow A_o$ shifts AD to the right, and vice-versa
- Intuition: $\uparrow \bar{C}$, $\uparrow \bar{I}$, or $\uparrow A_o \Rightarrow \uparrow E \Rightarrow \uparrow Y$

$$AD_0: Y_d = D(P, \bar{C}, \bar{I}, A_0)$$

