

# Fiscal and Monetary Policy in the Growth Model

## Introduction

- A. Our focus will be on fiscal and monetary policies over a long-time horizon. (ex. 10 years)
- B. Ex. The federal budget deficit was much higher since 1980 (except for the late 1990s) than it was in the 1960s and 1970s.
- C. Ex. Money growth was much higher in the 1970s than it has been since the early 1980s.

# Fiscal and Monetary Policy

## A. Fiscal policy

1. It involves changes in government spending (G), taxes (T), transfer payments (F) and interest on the government debt ( $R \times D$ ).
2. Budget surplus (deficit) =  $T - G - F - R \times D$ .
3. Fiscal policy is determined by the President and Congress.
4. Fiscal policy primarily affects output in long-run by adjusting the supply of
  - a. technology by changing R&D spending.
  - b. labor by altering marginal income tax rates.
  - c. capital by changing government spending's share of GDP.

5. The supply effects of fiscal policy are usually small in the short run but build over time.

## B. Monetary policy

1. It involves changes in the money supply.
2. The Federal Reserve conducts monetary policy in the U.S.
3. In the long run, monetary policy affects the inflation rate but NOT output.

# How Fiscal Policy Affects the Shares of Output

## A. Identifying the problem

1. Recall, the spending approach to GDP

$$Y = C + I + G + (X - IM)$$

2. Divide the components of GDP by  $Y$

$$1 = C/Y + I/Y + G/Y + (X - IM)/Y$$

3. Government spending's share of GDP is  $G/Y$ .
4. Non-government spending's share of GDP is  $C/Y + I/Y + (X - IM)/Y$ .
5. Any change in  $G/Y$  must bring about an equal change in  $C/Y + I/Y + (X - IM)/Y$  but in the opposite direction.
6. How much  $C/Y$ ,  $I/Y$ , and  $(X - IM)/Y$  change depends on how sensitive each component is to the interest rate.

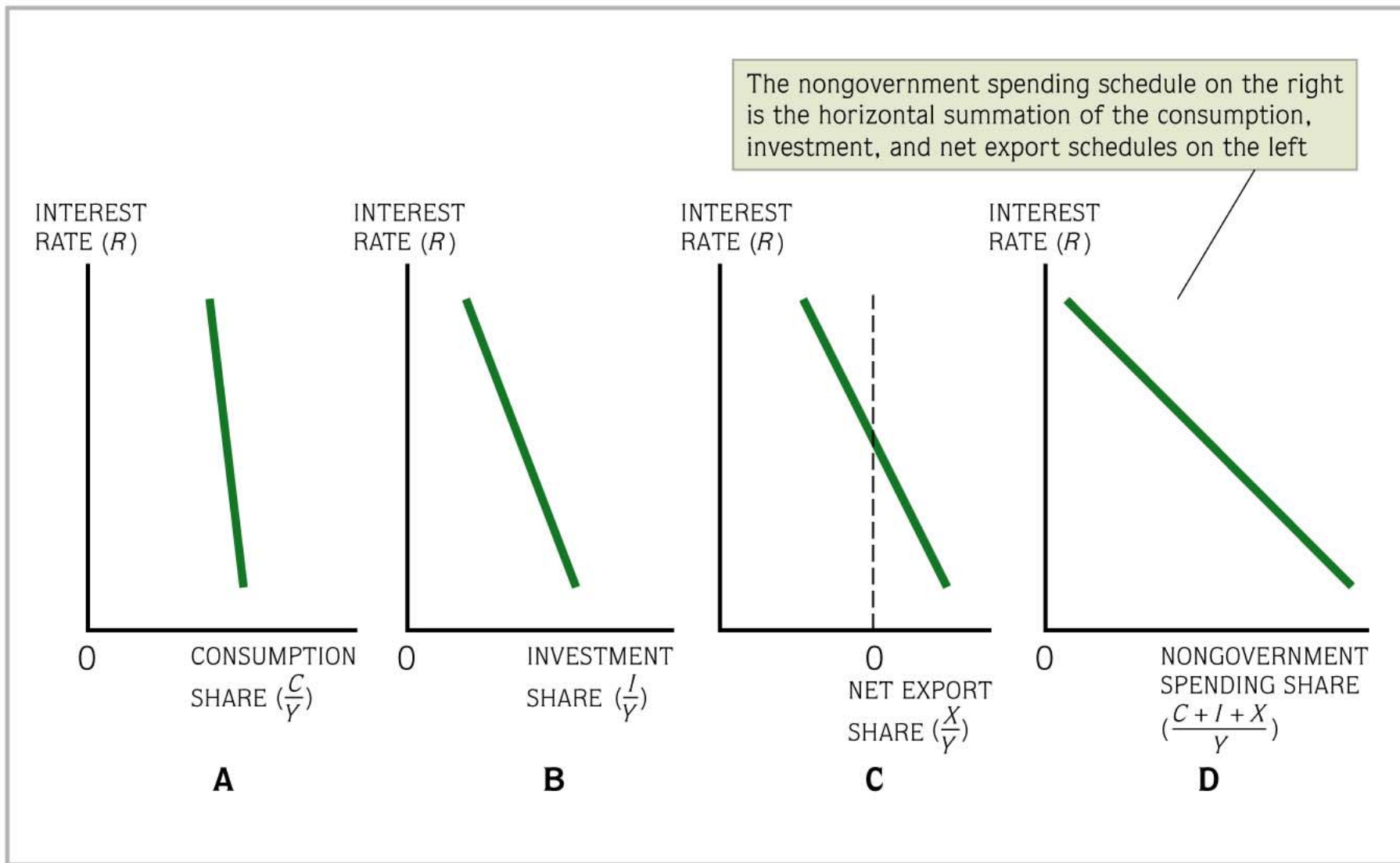
B. The interest rate ( $R$ ) sensitivity of  $C/Y$ ,  $I/Y$ , and  $(X - IM)/Y$ . (see Figure 9.11)

1. Consumption

- a. Higher  $R$  increases the financing costs for household durable goods, such as cars, which causes  $C$  to fall.
- b.  $C/Y$  is the least sensitive to  $R$  of the three components.

2. Investment

- a. A higher  $R$  raises the financing cost of capital investment, which causes  $I$  to fall.
- b.  $I/Y$  is more sensitive to  $R$  than  $C/Y$ .



**FIGURE 9.11** Interest-Rate Sensitivity of Consumption, Investment, and Net Exports

### 3. Net exports

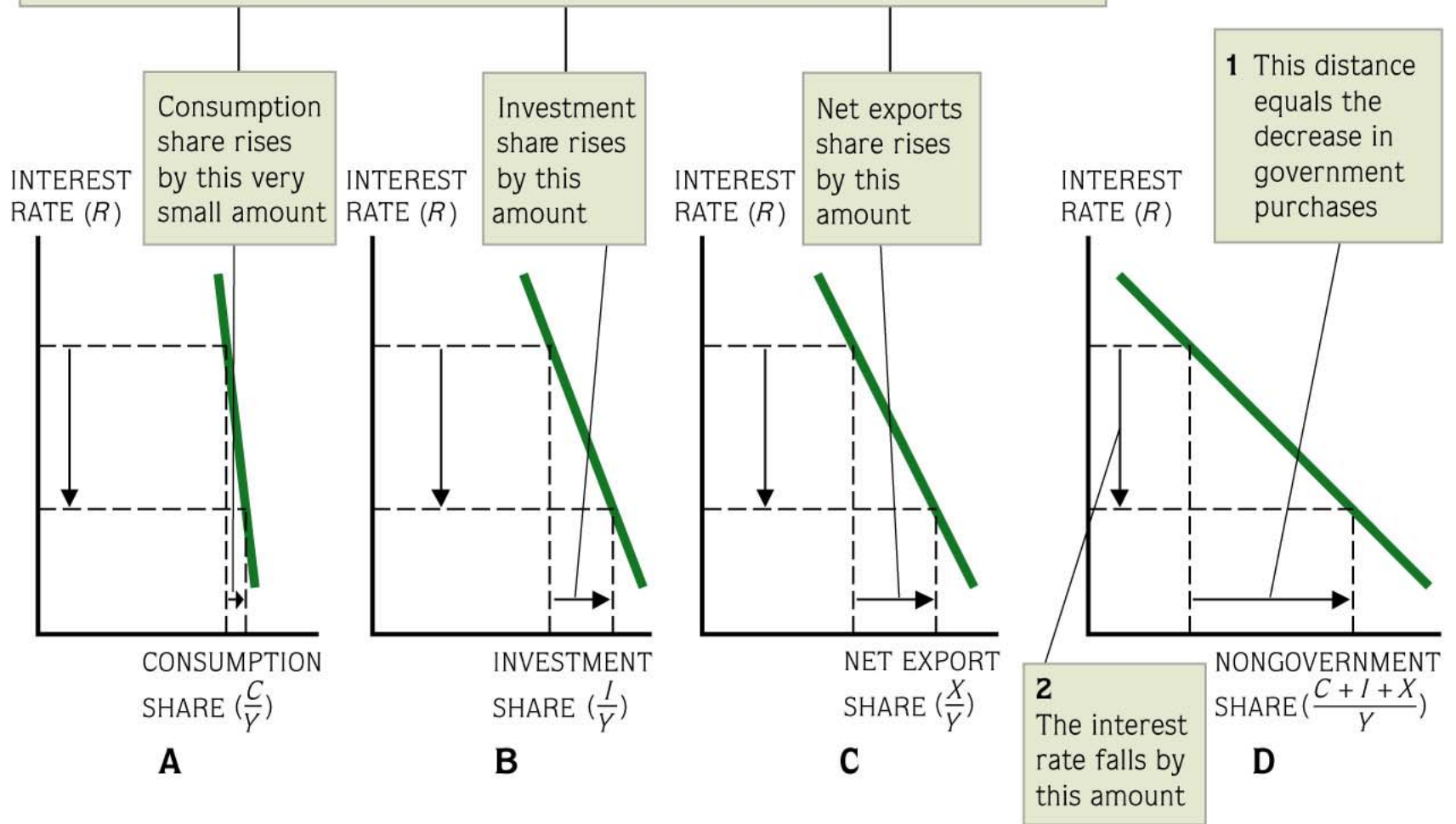
- a. A higher  $R$  increases foreigners' demand for U.S. assets, which raises the value of the dollar. A strong dollar decreases exports ( $X$ ) and increases ( $IM$ ), which leads to a fall in  $(X - IM)$ .
- b.  $(X - IM)/Y$  is the most sensitive to  $R$  of the three components.

C. Suppose  $G/Y$  declines, ceteris paribus

1. A fall in  $G/Y$  pushes up government savings ( $S_G$ ). That rise in  $S_G$  pushes down  $R$ , which causes  $C/Y$ ,  $I/Y$ , and  $(X - IM)/Y$  to increase. [ $G/Y \downarrow \rightarrow S_G \uparrow \rightarrow R \downarrow \rightarrow (C/Y \uparrow, I/Y \uparrow, \& (X - IM)/Y \uparrow)$ ]
3. Ex. see Figure 9.12.
4. A rise in  $(X - IM)$  causes the trade surplus (deficit) to rise (fall).
5. When an increase in  $G$  causes  $I$  to fall, economists say higher  $G$  crowds out  $I$ .
6. Thus, a long-run decline in  $G/Y$  causes
  - a.  $R$  to fall.
  - b.  $C/Y$ ,  $I/Y$ , and  $(X - IM)/Y$  to rise.



3 Once the interest-rate decline is determined in the far right panel, the effects on the composition of spending can simply be read off the other three panels



**FIGURE 9.12** Effects of a Decrease in Government Purchases

- D. Suppose taxes' share of GDP ( $T/Y$ ) increases, ceteris paribus
1. Higher  $T/Y$  reduces household disposable income ( $Y^D$ ), so  $C/Y$  falls. [ $T/Y \uparrow \rightarrow Y^D \downarrow \rightarrow C/Y \downarrow$ ]
  2. An increase in  $T/Y$  increases the government savings ( $S_G$ ), so  $R$  falls. That lower  $R$  raises  $C/Y$ ,  $I/Y$ , and  $(X - IM)/Y$ .  
[ $T/Y \uparrow \rightarrow S_G \uparrow \rightarrow R \downarrow \rightarrow (C/Y \uparrow, I/Y \uparrow, \& (X - IM)/Y \uparrow)$ ]
  3. Overall, the decline  $C/Y$  from the lower  $Y^D$  dominates the rise in  $C/Y$  from the lower  $R$ , so higher  $T/Y$  leads to a decline in  $C/Y$ .
  4. Thus, a long-run rise in  $T/Y$  causes
    - a.  $C/Y$  and  $R$  to fall.
    - b.  $I/Y$  and  $(X - IM)/Y$  to rise.

# Money and Inflation

## A. The demand for money ( $M^D$ )

1. People want to hold more (less) money when the interest rate (R) falls (rises). [ $R \downarrow \rightarrow M^D \uparrow$ ]
2. People want to hold more (less) money when their income (Y) rises (falls). [ $Y \uparrow \rightarrow M^D \uparrow$ ]
3. People want to hold more (less) money when the price level (P) rises (falls). [ $P \uparrow \rightarrow M^D \uparrow$ ]
4. The money demand function is

$$M^D = (k \times Y - h \times R) \times P$$

- a. k is a constant coefficient which measures the sensitivity of  $M^D$  to changes in Y.
- b. h is a constant coefficient which measures the sensitivity of  $M^D$  to changes in R.

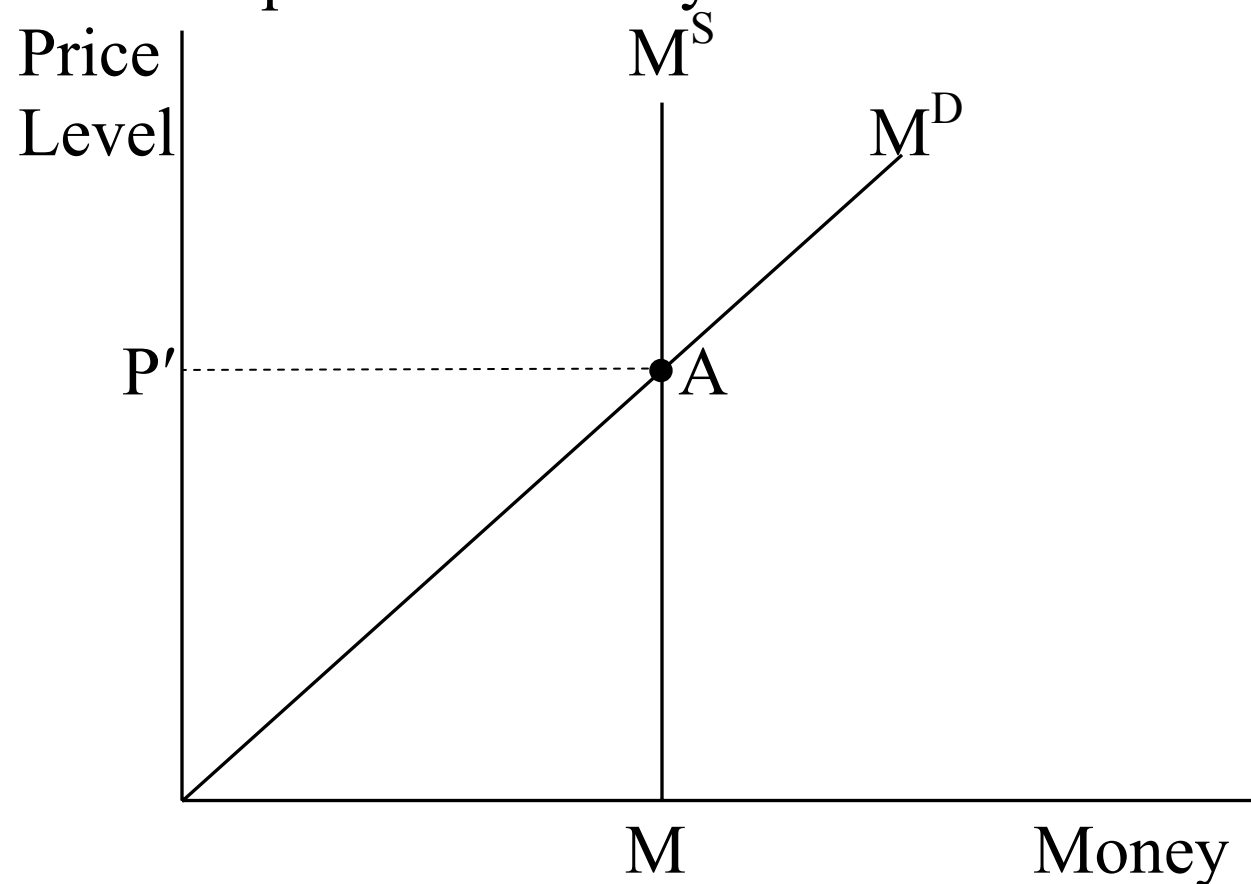
B. The supply of money ( $M^S$ ) is set by the Federal Reserve

C. Equilibrium in the money market

1.  $M^D = M^S$

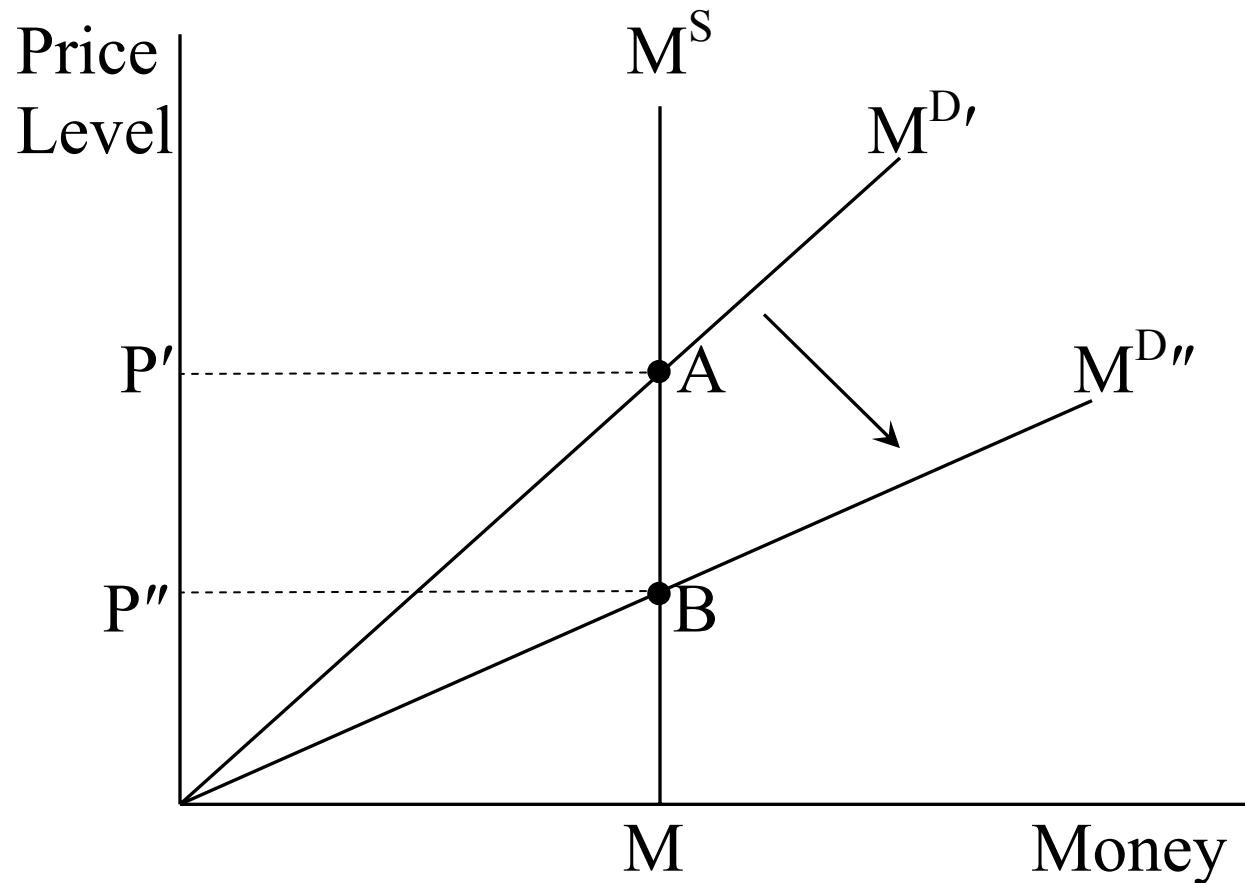
2. Thus,  $M^S = (k \times Y - h \times R) \times P$

3. Graph of the money market



D. Suppose potential GDP ( $Y$ ) rises but  $M^S$  remains constant.

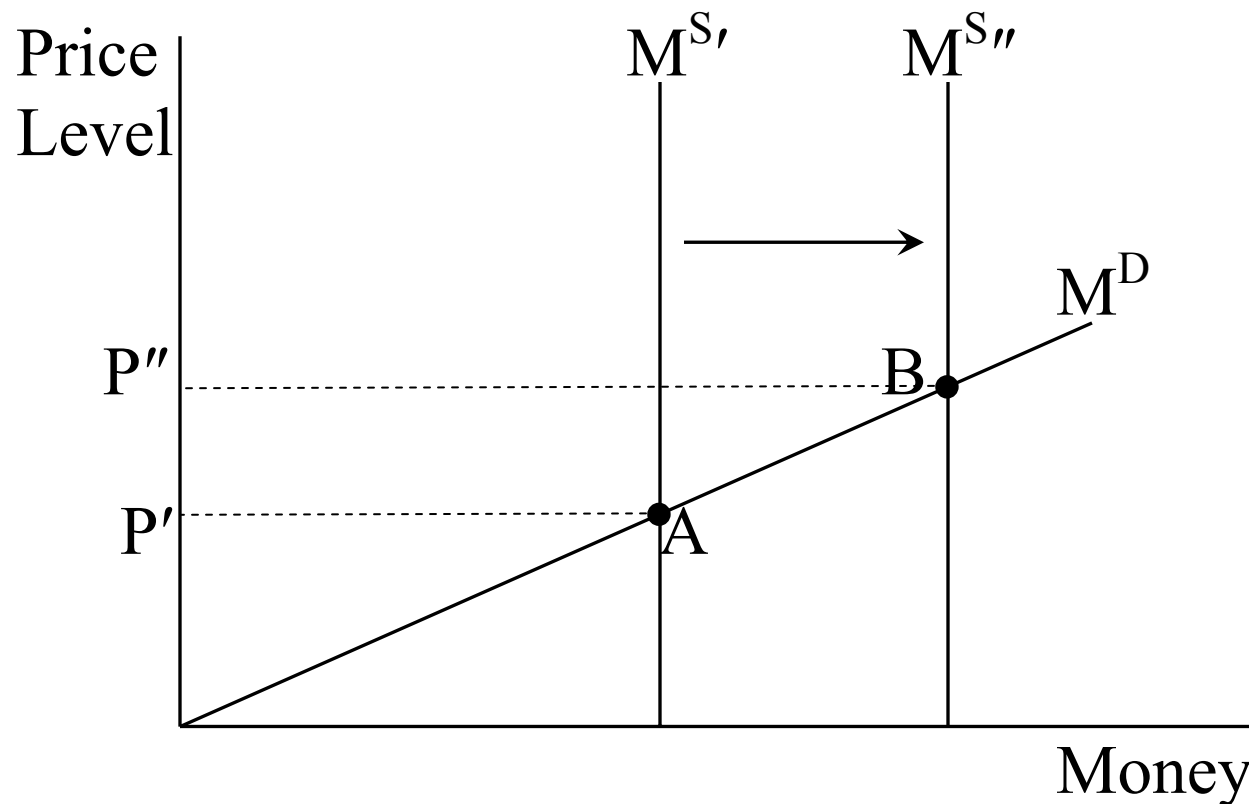
1. The rise in  $Y$  increases  $M^D$  (the  $M^D$  curve rotates downward to  $M^{D''}$ ), which causes  $P$  to fall. [ $Y \uparrow \rightarrow M^D \uparrow \rightarrow P \downarrow$ ]



2. Thus, a rise in  $Y$  leads to a) a decline in  $P$  to  $P''$ ; and b) no change in  $R$ .

E. Suppose the Money Supply ( $M^S$ ) increases by 10%.

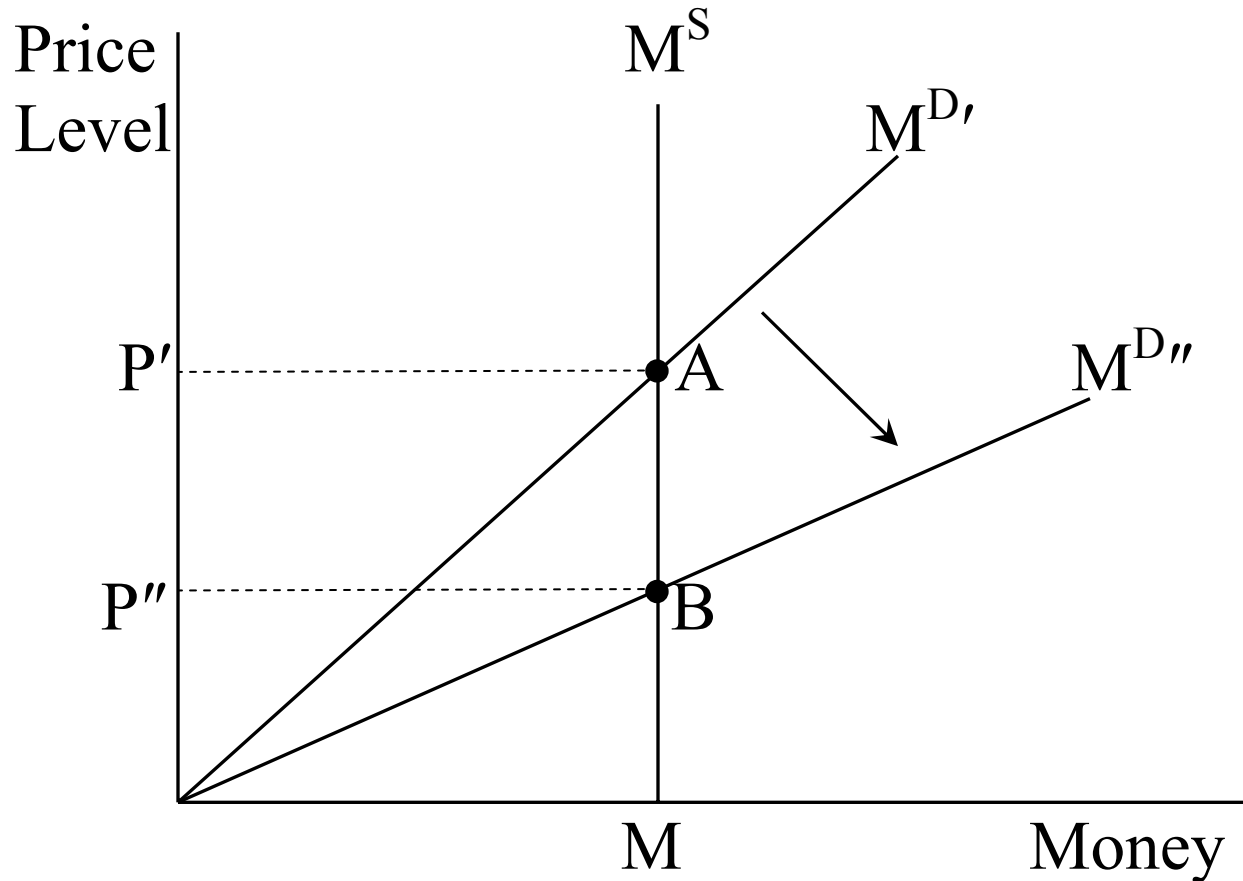
1. A rise in  $M^S$  (the  $M^S$  curve shifts right to  $M^{S''}$ ) causes  $P$  to fall. [ $M^S \uparrow \rightarrow P \downarrow$ ]



2. Thus, a 10% rise in  $M^S$  leads to a) a 10% increase in  $P$  to  $P''$ ; and b) no change in  $Y$  and  $R$ . This property is called the neutrality of money.

F. Suppose the Interest Rate ( $R$ ) decreases.

1. A decline in  $R$  raises  $M^D$  ( $M^D$  curve rotates downward to  $M^{D''}$ ), which causes  $P$  to fall [ $R \downarrow \rightarrow M^D \uparrow \rightarrow P \downarrow$ ]



2. Thus, a decline in  $G/Y$  leads to a) a fall in  $R$ ; b) a drop in  $P$  to  $P''$ ; and c) no change in  $Y$ .

## Money and Inflation in the Long Run.

A. Recall, the money demand equation

$$M^S = (k \times Y - h \times R) \times P$$

B. Since  $Y$  grows in the long run,  $M^S$  must grow at the same rate to keep  $P$  constant.

C. If  $M^S$  grows faster in the long run than  $Y$ ,  $P$  will rise in the long run.

D. Recall, a rising  $P$  is called inflation.

E. Thus, the long-run inflation rate is directly related to the long-run money growth rate.

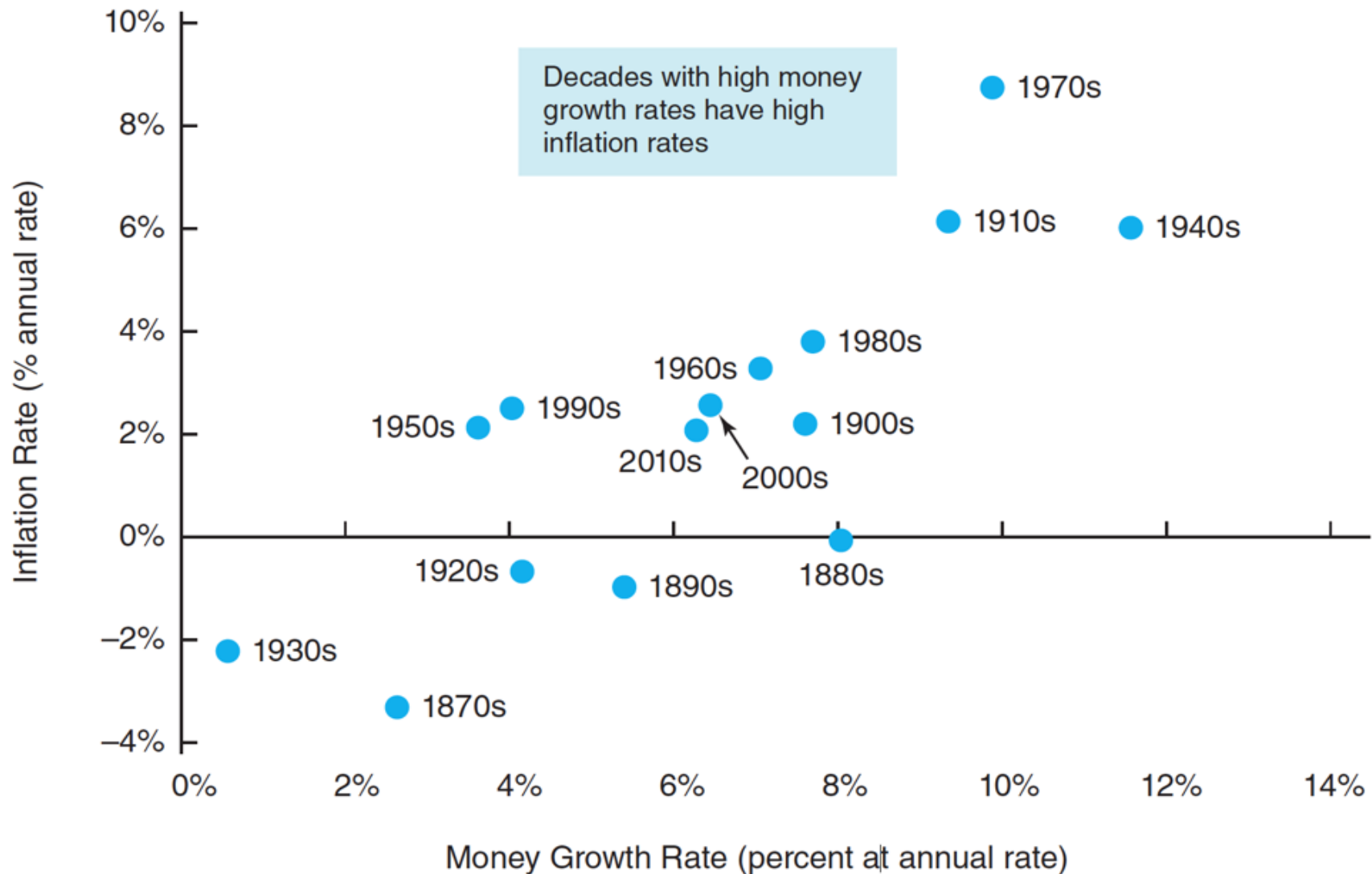
F. That is, a high long-run money growth rate causes a high long-run inflation rate.



# G. The Data: Long-Run Money Growth and Long-Run Inflation

## 1. In the United States by decade

(a) U.S. Inflation and Money Growth Rates by Decade, 1870s–2000s



## 2. Across countries from 2003 – 2013

(b) International Comparison of Average Inflation and Money Growth (2003–2013)

