

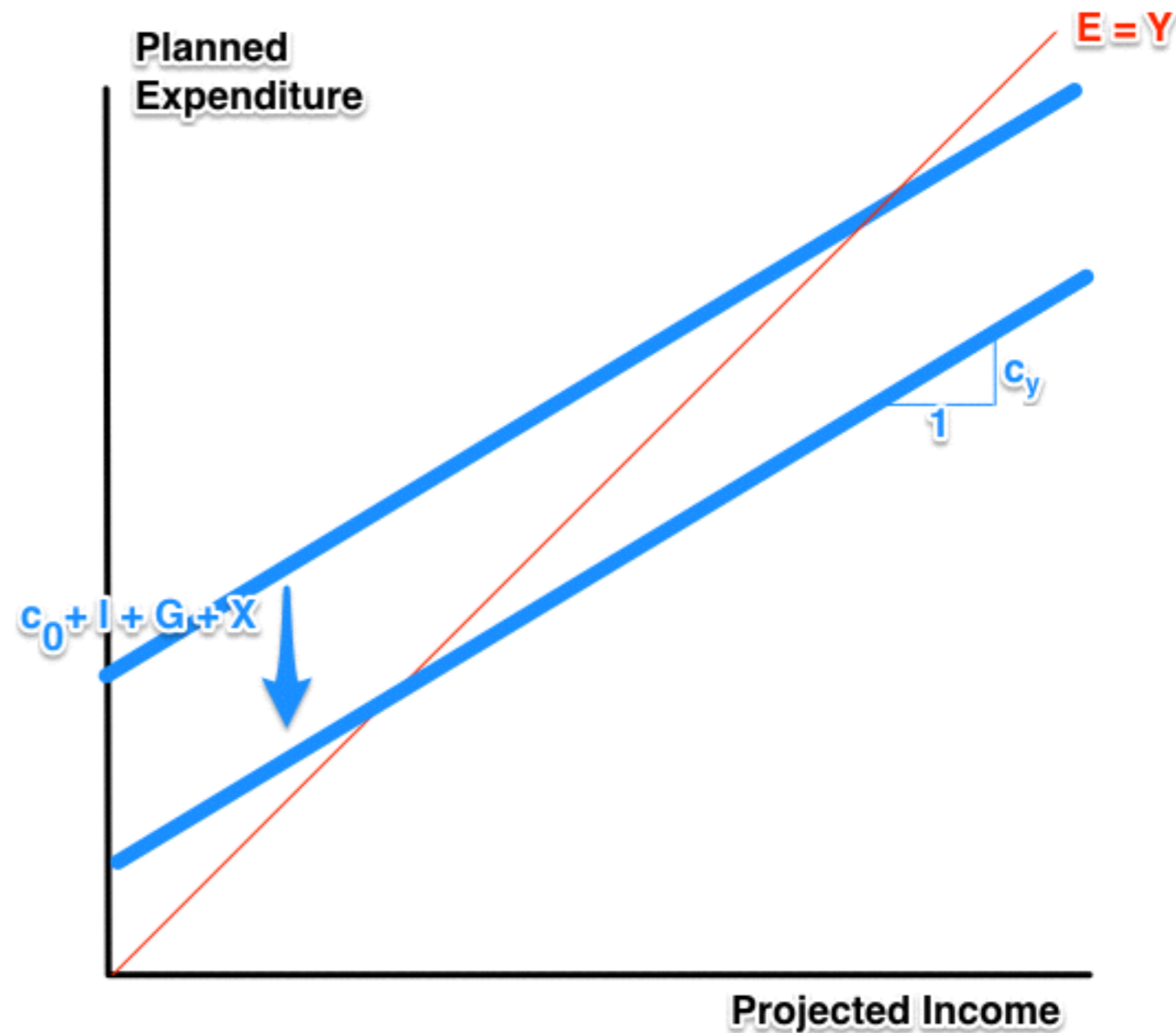
Principles of Economics
Macroeconomics

Aggregate Demand and Aggregate Supply

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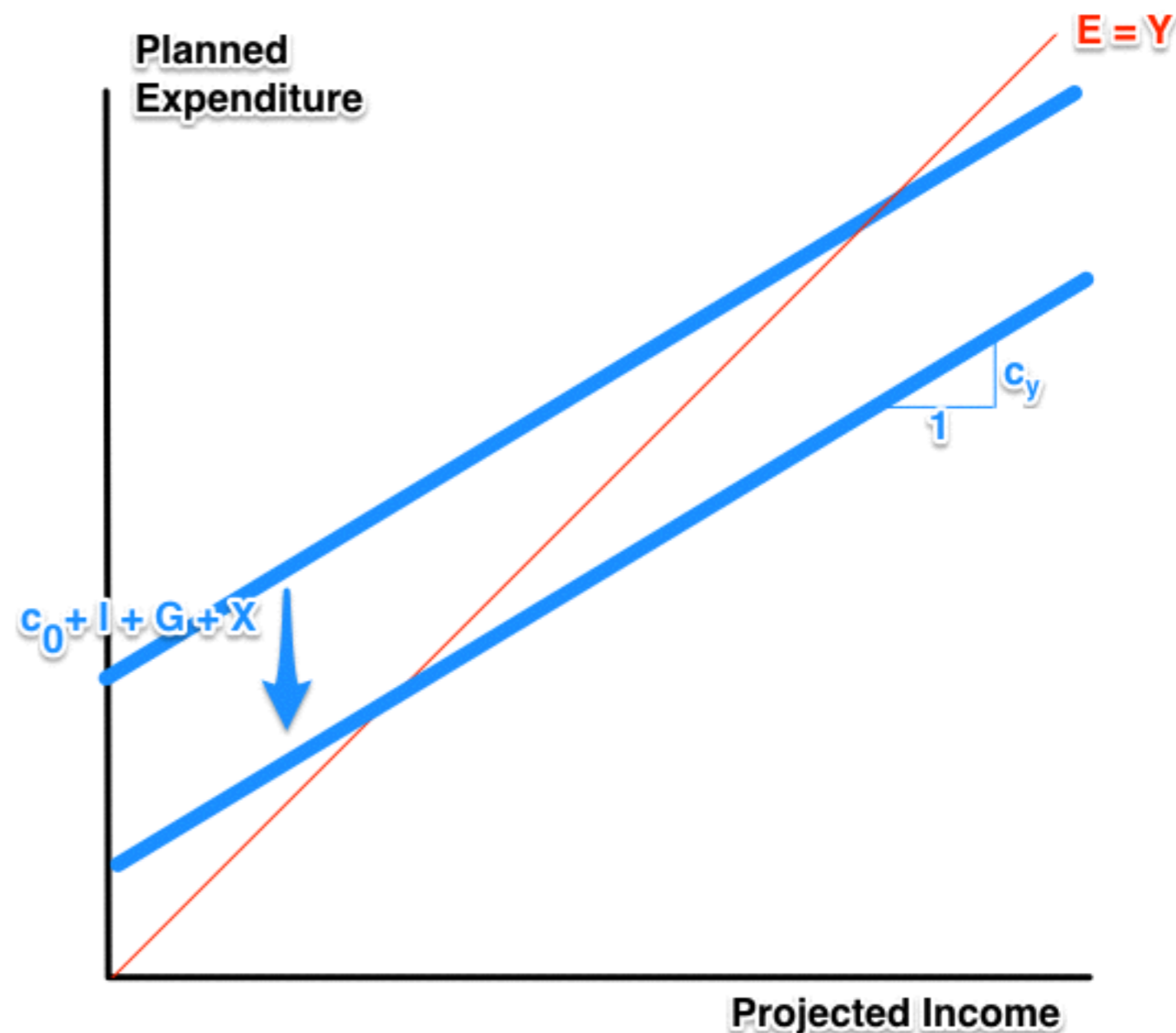
Gentlebeings, to Your iClickers...

- Suppose we have:
 - $E = C + I + G + X$
 - $C = c_0 + c_y(Y - T)$
 - $c_y = 0.5$
 - c_0 falls by $\$1T$ while I, G, X, T remain unchanged
- What happens to the equilibrium level of Y at which $Y = E$ (substitute any numbers in for I, G, X, T , and initial c_0 . It doesn't matter)?
 - A. It falls by $\$2T$. B. It falls by $\$1T$. C. It falls by $0.5T$. D. You cannot tell from the information given. E. None of the above



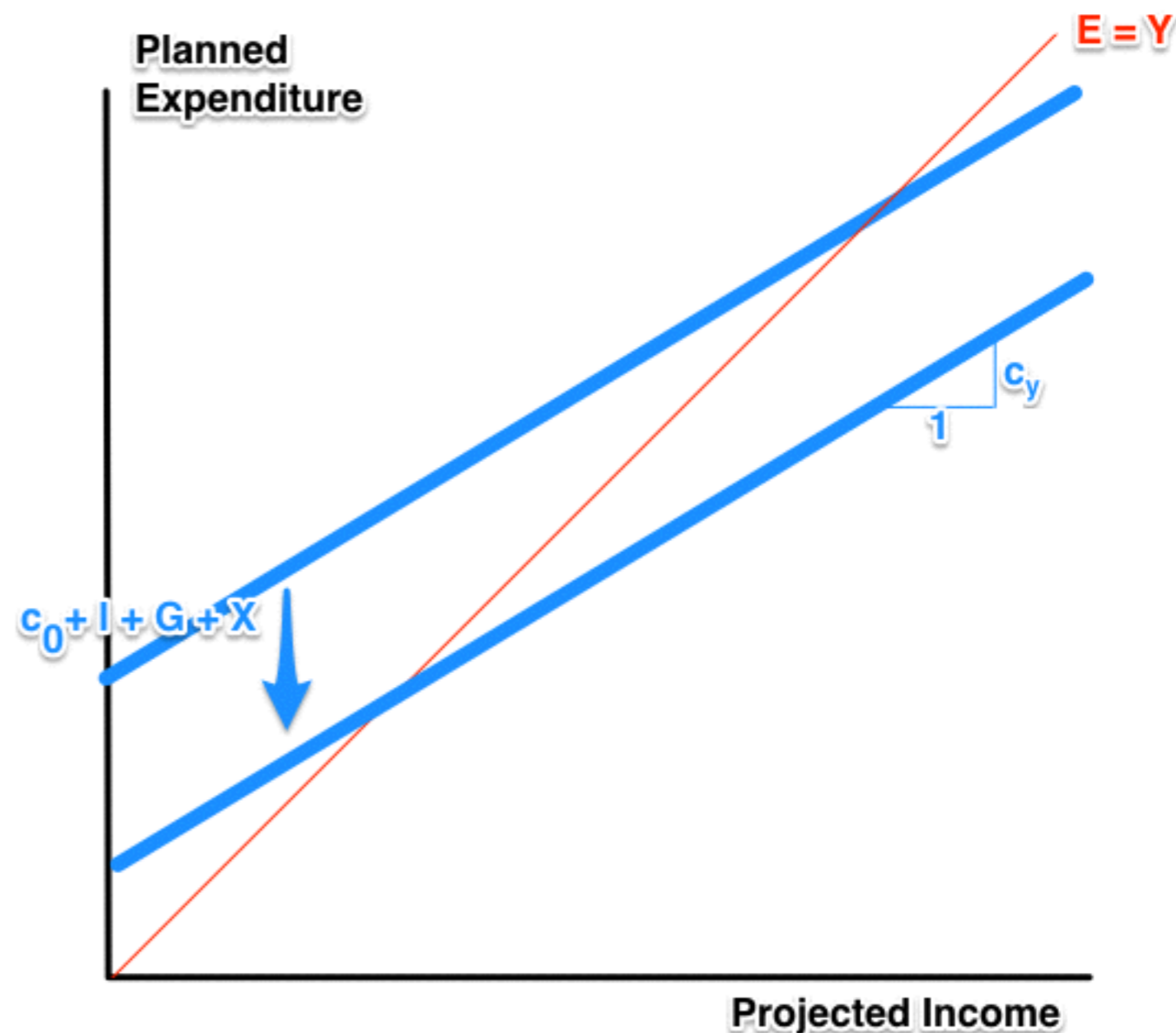
Gentlebeings, to Your iClickers...: Answer

- Suppose we have: $E = C + I + G + X$; $C = c_0 + c_y(Y - T)$; $c_y = 0.5$; c_0 falls by $\$1T$ while I, G, X, T remain unchanged
- What happens to the equilibrium level of Y at which $Y = E$ (substitute any numbers in for I, G, X, T , and initial c_0 . It doesn't matter)? A. It falls by $\$2T$. B. It falls by $\$1T$. C. It falls by $\$0.5T$. D. You cannot tell from the information given. E. None of the above
- **The answer I am looking for is A: falls by $\$2T$**



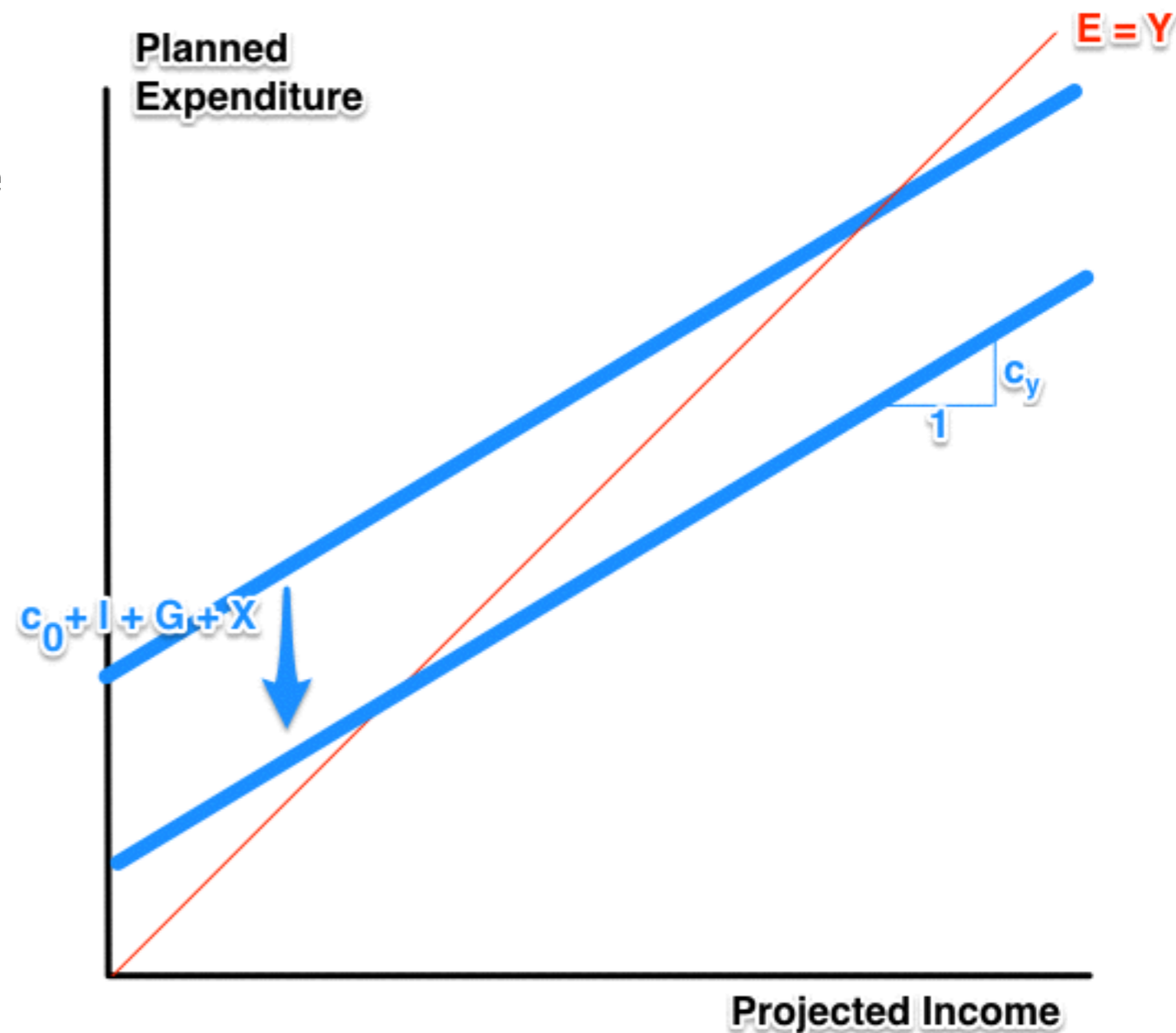
Gentlebeings, to Your iClickers...: Answer II

- Suppose we have: $E = C + I + G + X$; $C = c_0 + c_y(Y - T)$; $c_y = 0.0$; c_0 falls by $\$1T$ while I, G, X, T remain unchanged
- What happens to the equilibrium level of Y at which $Y = E$ (substitute any numbers in for I, G, X, T , and initial c_0 . It doesn't matter)? A. It falls by $\$2T$. B. It falls by $\$1T$. C. It falls by $\$0.5T$. D. It falls by $\$1.5T$. E. None of the above
- **The answer I am looking for is B: falls by $\$2T$**
- **The fall in c_0 opens up a $\$1T$ gap between planned expenditure and projected income.**
- **Each $\$1T$ reduction in income reduces income by $\$1T$, and reduces planned expenditure by $\$0.5T$**
- **So each $\$1T$ reduction in income reduces desired money hoarding by $\$0.5T$**



What Is the Pattern Here?: The Multiplier μ

- Suppose we have:
 - $E = C + I + G + X$; $C = c_0 + c_y(Y - T)$; c_0 falls by \$1T while I, G, X, T remain unchanged
 - $c_y = 0.75$; $\mu = 4$
 - $c_y = 0.5$; $\mu = 2$
 - $c_y = 0.3333$; $\mu = 1.5$
 - $c_y = 0$; $\mu = 1$
 - **$\mu = 1/(1 - c_y)$**

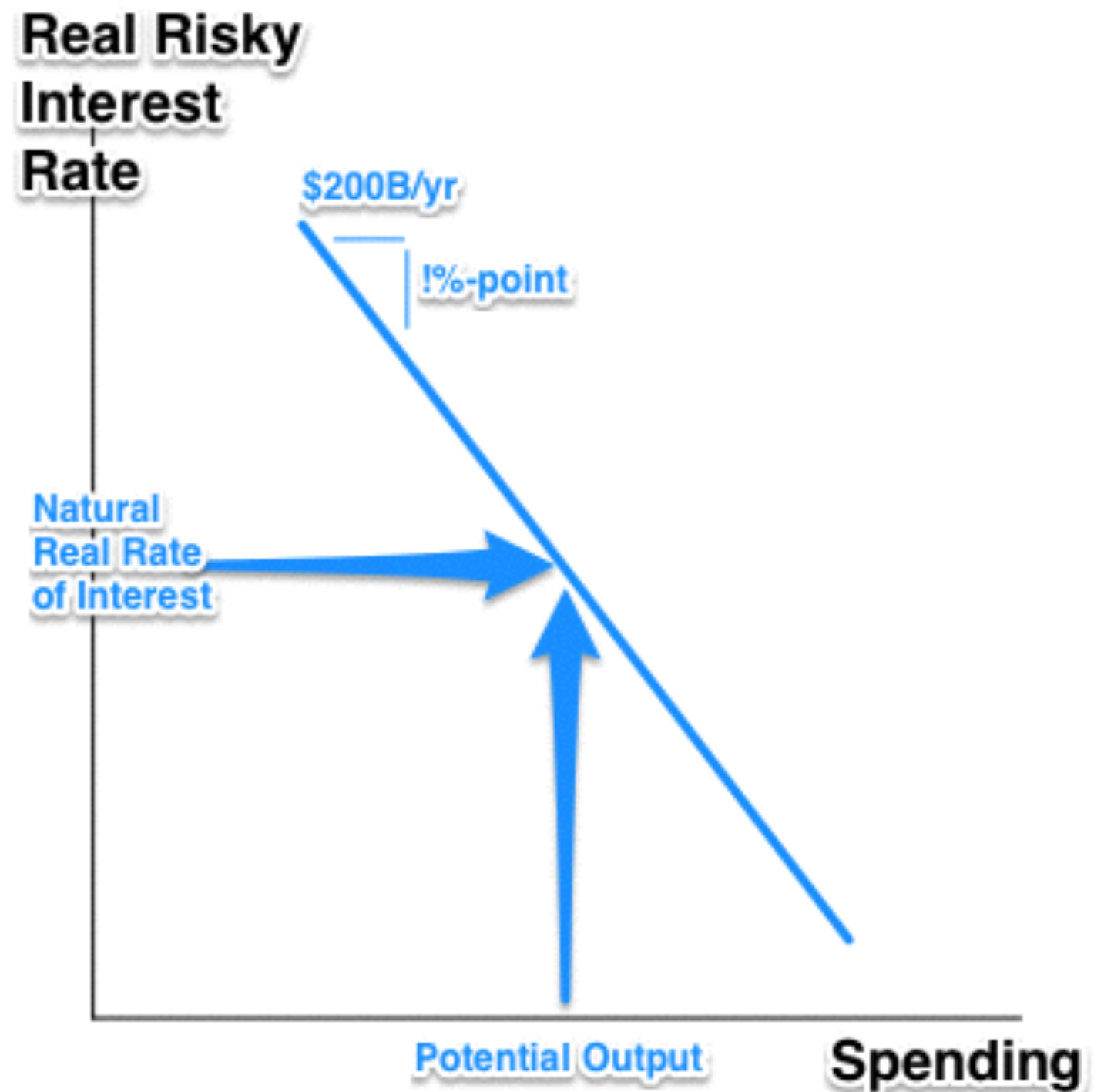


Interest Rates and Spending I

- $Y = \mu[c_0 + (G - c_y T) + (c_w W + I + X)(r)]$; r : the real interest rate:
 - $r = i$ (the current interest rate) + $E(\Delta i)$ (expected change in interest rates) + ρ (the risk premium) - $E(\pi)$ (expected inflation)
 - Federal Reserve & financial markets determine r
- Rule of thumb: in the U.S. today, boost the (risky) real interest rate r by 1%-point...
 - And reduce exports by \$50 billion/year
 - And reduce household consumption spending by \$50 billion/year
 - And reduce business investment spending by \$200 billion/year

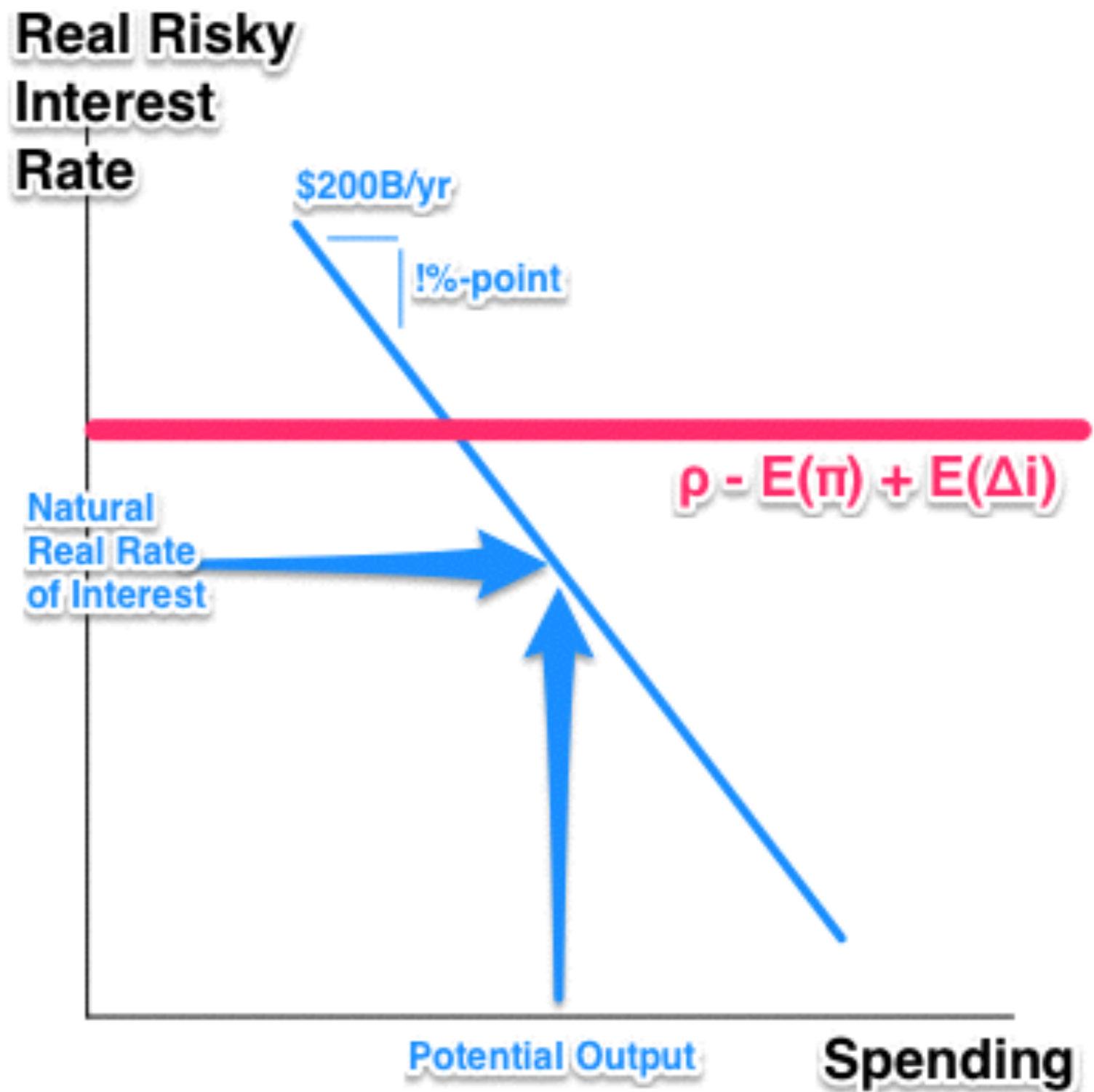
Interest Rates, Wealth, Exchange Rates, Exports, Business Investment and Spending

- The “Investment-Savings” Curve
 - Slope = $-\$200\text{B}/\text{yr}/\%-\text{pt}$
 - The “natural real” risky rate of interest
 - Full employment/potential output
 - Quantity of money at which people are happy holding the cash there is at full employment
 - Spending = Income at full employment



Liquidity Trap

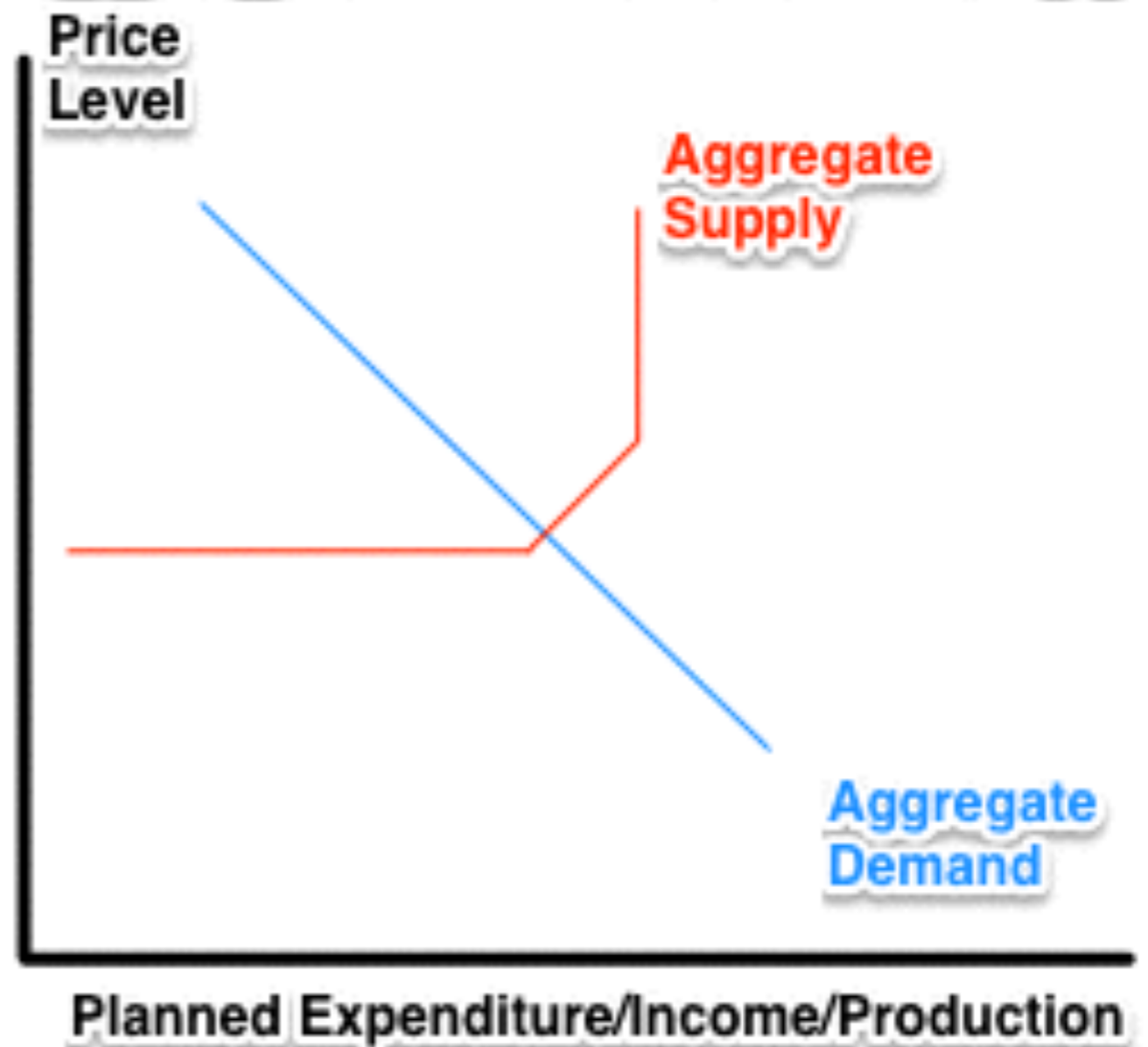
- The “Investment-Savings” Curve gone wrong:
- The Federal Reserve finds that it cannot push the real risky interest rate r low enough to generate full employment



Our Aggregate Supply Curve

- Three regions:
 - A long, flat region—people really do not like their wages cut
 - An upward-sloping region
 - And a region in which the economy is already working flat-out

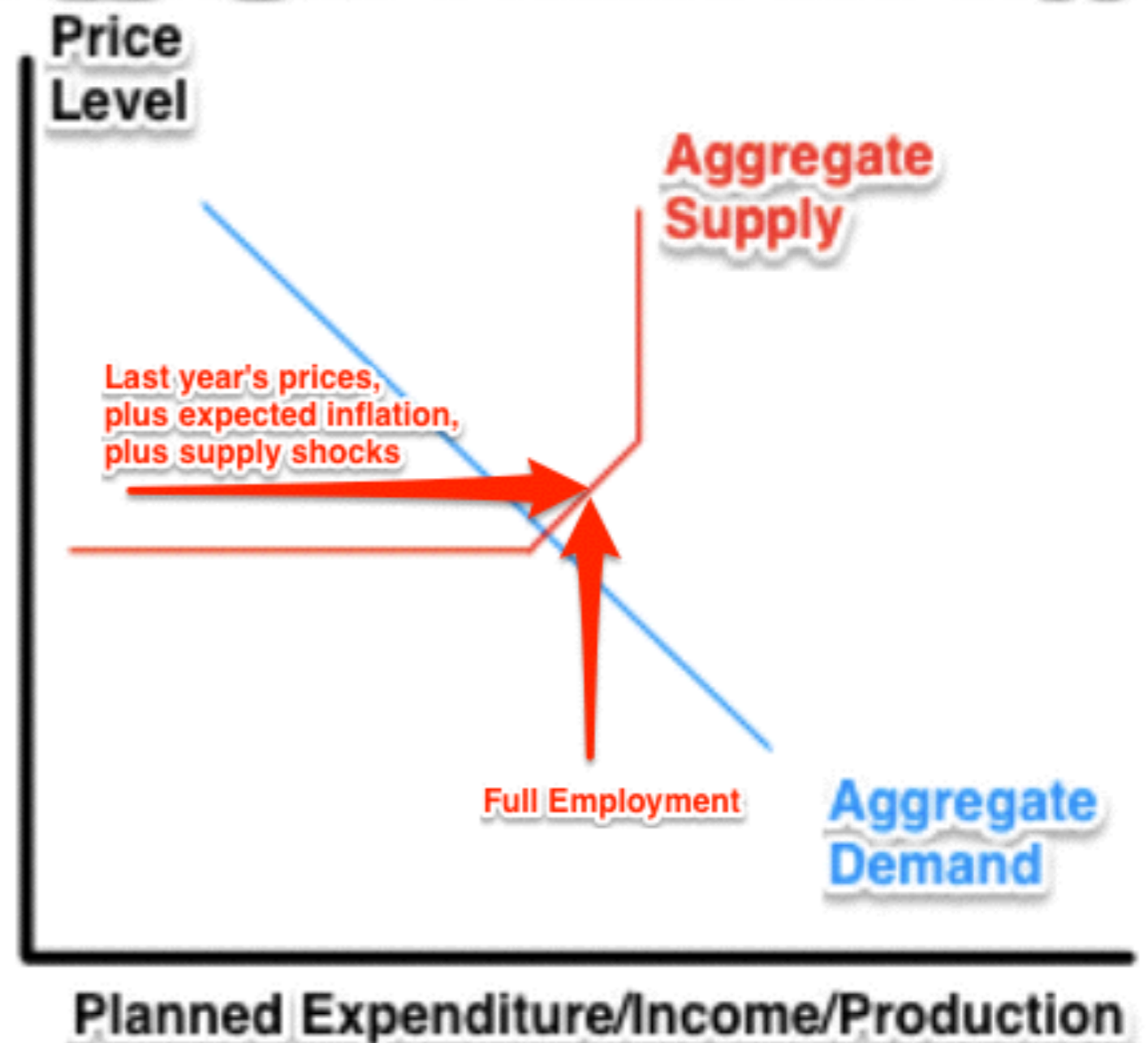
Aggregate Demand and Supply



Our Aggregate Supply Curve II

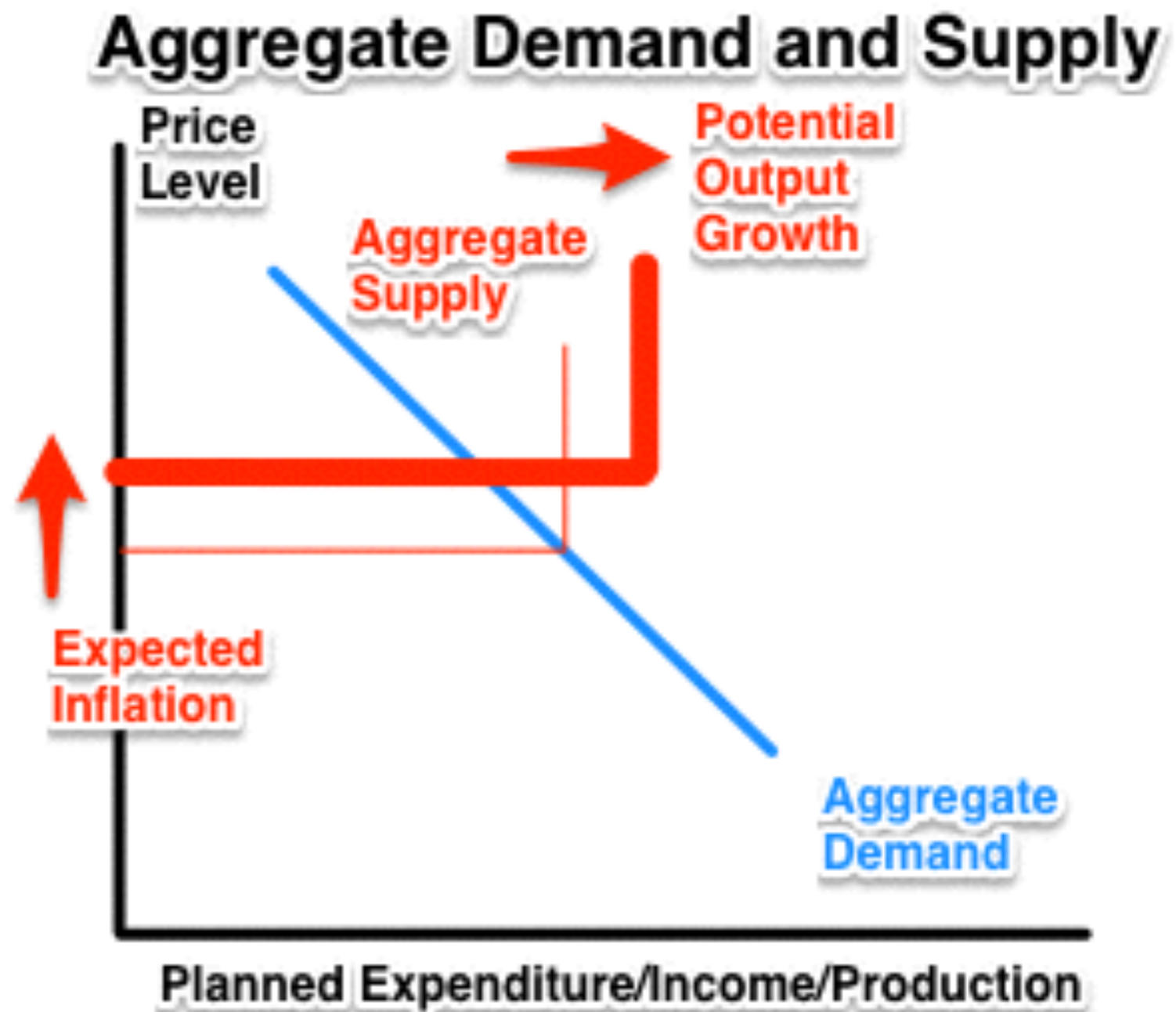
- Where is the aggregate supply curve?
- Full employment
- Last year's prices
- Expected inflation

Aggregate Demand and Supply



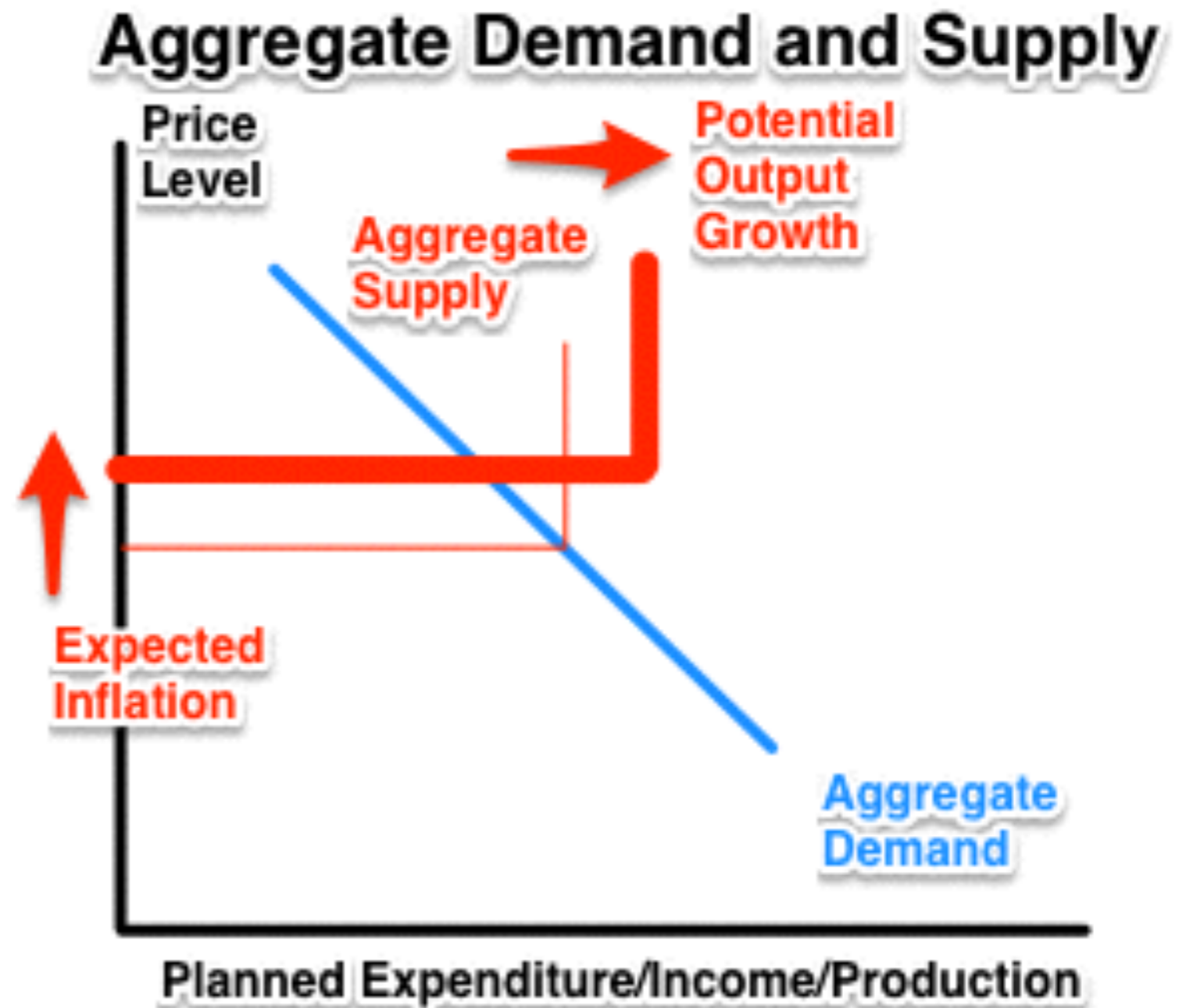
The Evolution of Aggregate Supply

- Start from last year's situation...
- Add on:
 - Expected inflation
 - Supply shocks (if any)
 - Growth in potential output



Ladies and Gentlemen, to Your iClickers...

- Suppose that last year's aggregate supply curve was:
- $P = 1.08$ for $Y < \$18.5T$ (2009)
- $P > 1.08$ for $Y = \$18.5T$ (2009)
- No possibility of $Y > \$18.5T$ (2009)



Ladies and Gentlemen, to Your iClickers... II

- Suppose that last year's aggregate supply curve was: $P=1.08$ for $Y < \$18.5T$ (2009); $P > 1.08$ for $Y = \$18.5T$ (2009); no possibility of $Y > \$18.5T$ (2009). Suppose that there are no supply shocks, that potential output growth is 2.2%/year, and that expected inflation is 1.85%/year.
- What is this year's aggregate supply curve?
 - A. $P=1.08$ for $Y < \$18.5T$ (2009); $P > 1.08$ for $Y = \$18.5T$ (2009); no possibility of $Y > \$18.5T$ (2009)
 - B. $P=1.06$ for $Y < \$18.1T$ (2009); $P > 1.10$ for $Y = \$18.1T$ (2009); no possibility of $Y > \$18.1T$
 - C. $P=1.10$ for $Y < \$18.9T$ (2009); $P > 1.10$ for $Y = \$18.9T$ (2009); no possibility of $Y > \$18.9T$
 - D. $P=1.10$ for $Y < \$18.1T$ (2009); $P > 1.10$ for $Y = \$18.1T$ (2009); no possibility of $Y > \$18.1T$
 - E. None of the above

Ladies and Gentlemen, to Your iClickers... ANSWER

- Suppose that last year's aggregate supply curve was: $P=1.08$ for $Y < \$18.5T$ (2009); $P > 1.08$ for $Y = \$18.5T$ (2009); no possibility of $Y > \$18.5T$ (2009). Suppose that there are no supply shocks, that potential output growth is 2.2%/year, and that expected inflation is 1.85%/year.
 - What is this year's aggregate supply curve? A. $P=1.08$ for $Y < \$18.5T$ (2009); $P > 1.08$ for $Y = \$18.5T$ (2009); no possibility of $Y > \$18.5T$ (2009). B. $P=1.06$ for $Y < \$18.1T$ (2009); $P > 1.10$ for $Y = \$18.1T$ (2009); no possibility of $Y > \$18.1T$. **C. $P=1.10$ for $Y < \$18.9T$ (2009); $P > 1.10$ for $Y = \$18.9T$ (2009); no possibility of $Y > \$18.9T$.** D. $P=1.10$ for $Y < \$18.1T$ (2009); $P > 1.10$ for $Y = \$18.1T$ (2009); no possibility of $Y > \$18.1T$ E. None of the above.
- **Workers take last year's wage and price level and add 1.85% to it, so the flat horizontal arm of the AS curve moves up to $P=1.10$**
- **Investment and technological progress add 2.2% to potential output, so the vertical arm of the AS curve moves out to $Y = \$18.9T$ (2009)**

Ladies and Gentlemen, to Your iClickers...

- Given the aggregate supply curve that you just calculated— $P=1.08$ for $Y<\$18.5T$ (2009); $P>1.08$ for $Y=\$18.5T$ (2009); no possibility of $Y>\$18.5T$ (2009)—what should the Federal Reserve's target for GDP be?
 - A. $\$18.1T$ (2009)
 - B. $\$18.5T$ (2009)
 - C. $\$18.9T$ (2009)
 - D. $\$18.5T$ (2010)
 - E. None of the above

Ladies and Gentlemen, to Your iClickers...: ANSWER

- Given the aggregate supply curve that you just calculated— $P=1.08$ for $Y<\$18.5T$ (2009); $P>1.08$ for $Y=\$18.5T$ (2009); no possibility of $Y>\$18.5T$ (2009)—what should the Federal Reserve's target for GDP be?
 - A. $\$18.1T$ (2009). B. $\$18.5T$ (2009). **C. $\$18.9T$ (2009).** D. $\$18.5T$ (2010). E. None of the above
- **The Federal Reserve aims for the sweet spot where there is neither excess unnecessary slack capacity and high unemployment, nor unwanted inflation. That sweet spot has a real GDP level of $\$18.9T$**

Ladies and Gentlemen, to Your iClickers...

- The losses from having too high and too low a level of aggregate demand are asymmetric: too high a level of aggregate demand gets you inflation; too low gets you excess unemployment. Does this asymmetry mean that you should aim high, aim low, or does it not matter?
 - A. Aim high: run some risk of extra inflation in order to make sure that there is no unnecessary unemployment
 - B. Aim low: run some risk of high unemployment in order to make sure that there is no extra inflation.
 - C. Aim at the target: the asymmetry doesn't matter.
 - D. Aim low: since fiat money systems are inherently unstable, no risk of extra inflation is ever worthwhile...
 - E. None of the above

Ladies and Gentlemen, to Your iClickers...: ANSWER

- The losses from having too high and too low a level of aggregate demand are asymmetric: too high a level of aggregate demand gets you inflation; too low gets you excess unemployment. Does this asymmetry mean that you should aim high, aim low, or does it not matter?
 - A. Aim high: run some risk of extra inflation in order to make sure that there is no unnecessary unemployment. B. Aim low: run some risk of high unemployment in order to make sure that there is no extra inflation. **C. Aim at the target: the asymmetry doesn't matter.** D. Aim low: since fiat money systems are inherently unstable, no risk of extra inflation is ever worthwhile... E. None of the above
- **But that's just what I say. Let's think about this at greater length...**

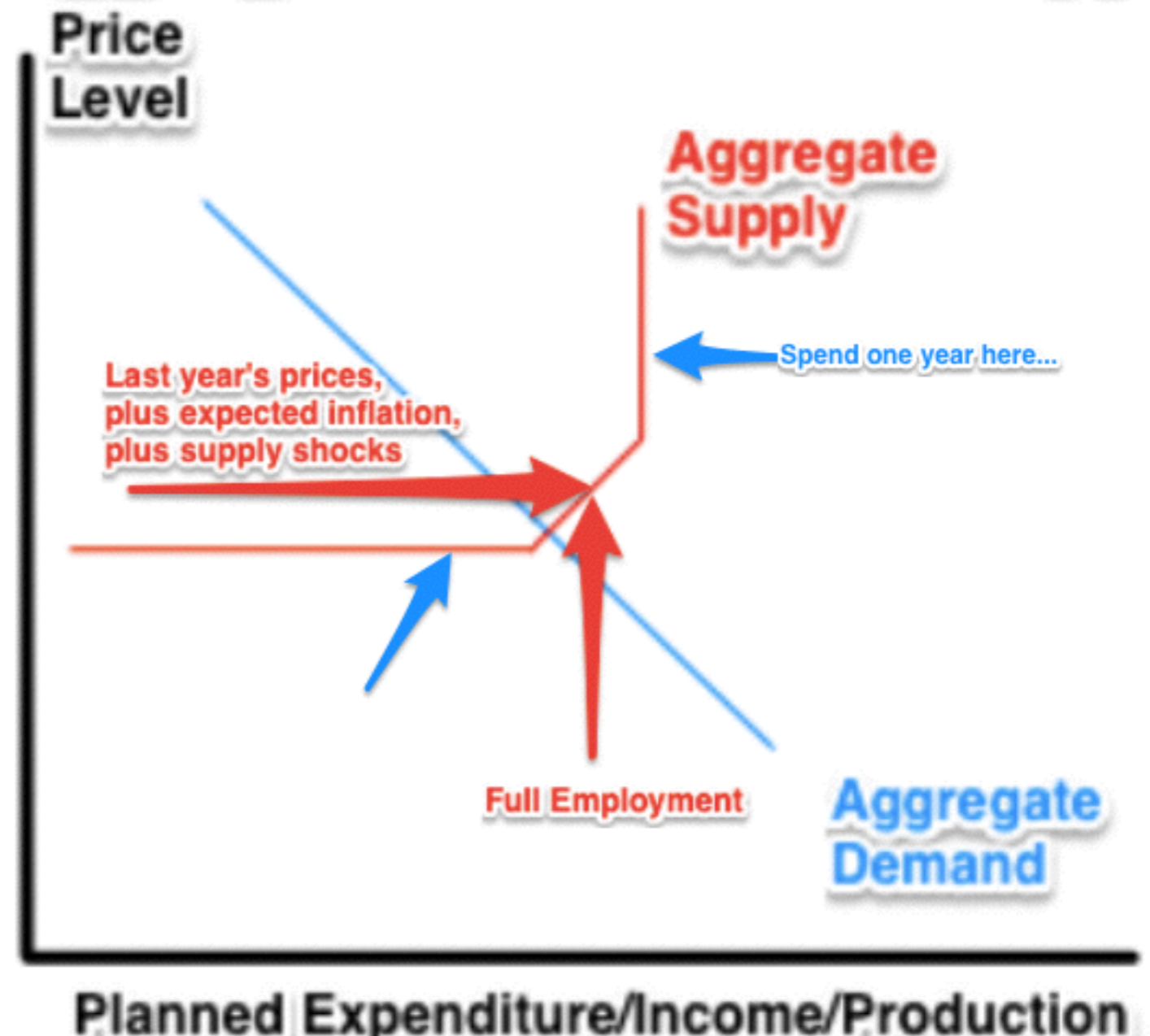
Aim Low Because Fiat Money Systems Are Inherently Unstable?

- The argument is that once you create a belief that inflation is on the way, it is then very, very difficult to purge it from the system...
- You get relatively little extra production by running a high-pressure economy—but you get a bunch of inflation, and that inflation feeds into expected inflation, and you then have to suffer long and large depressions to wring that expected inflation out of the system...

Aim Low Because Fiat Money Systems Are Inherently Unstable? II

- The argument is that once you create a belief that inflation is on the way, it is then very, very difficult to purge it from the system...
- You get relatively little extra production by running a high-pressure economy—but you get a bunch of inflation, and that inflation feeds into expected inflation, and you then have to suffer long and large depressions to wring that expected inflation out of the system...

Aggregate Demand and Supply



Aim High Because Unemployment Is More Costly?

- This is what John Maynard Keynes thought:
 - “In an impoverished world, it is better to disappoint the *rentier* than to create unemployment...”
- The *rentier*: French word for someone who lives well by clipping bond coupons, as opposed to working or “working”
- Implication that if the world were rich—if people had enough stuff, and were working out of habit or for display, the calculation might be different...

Aim at the Target?

- An argument that all of these other considerations are minor ones, and have at most a very small effect on what you should do...
- This is where I think we are:
 - There seems to me to be no great reason to fear that pushing inflation too high for a couple of years will release the anchor from inflation expectations.
 - But there are costs from trying to deliberately aim for a policy result than is different from the policies you communicate.
 - And the Federal Reserve's "dual mandate" seems to have served us reasonably well to date.