

Tools: Macroeconomics for Beginners

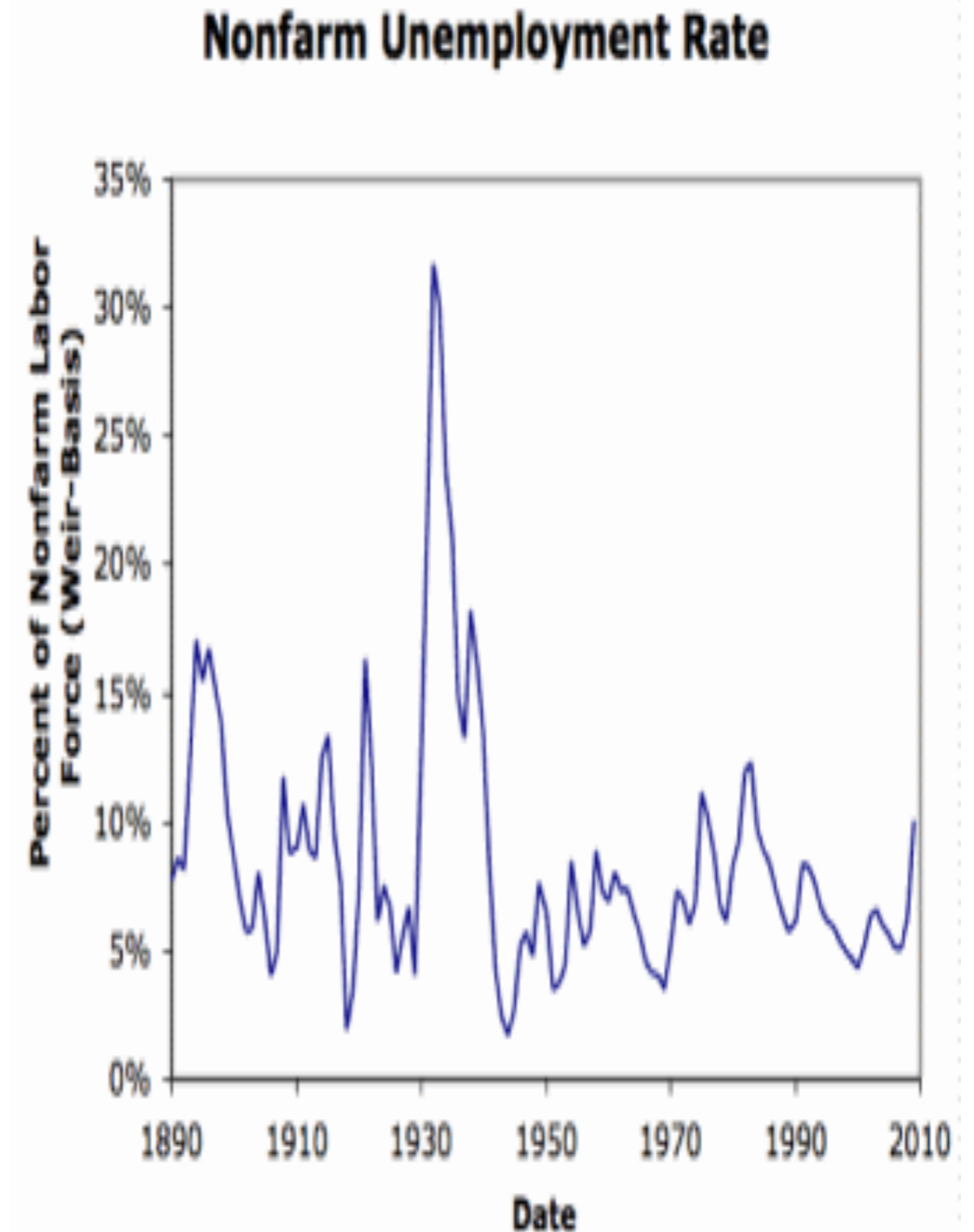
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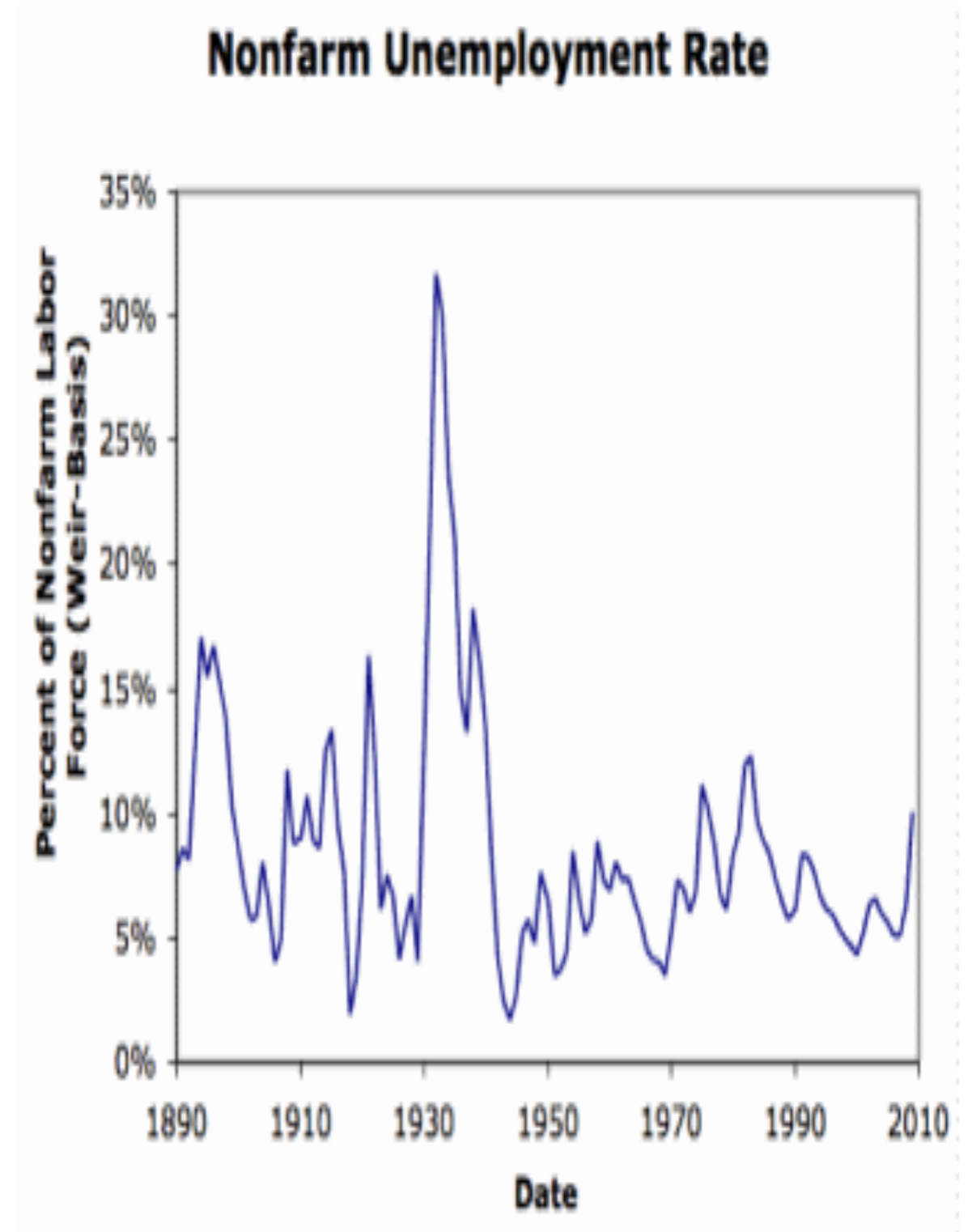
“General Glut” = “Excess Demand for Cash”

- What determines if there is “too little” cash in an economy?
- The economy as a whole is trying to accumulate cash—and so cutting (planned) spending back below (projected) income—whenever...?
- Four sets of actors:
 - Households
 - Business investment committees
 - Foreigners
 - The government



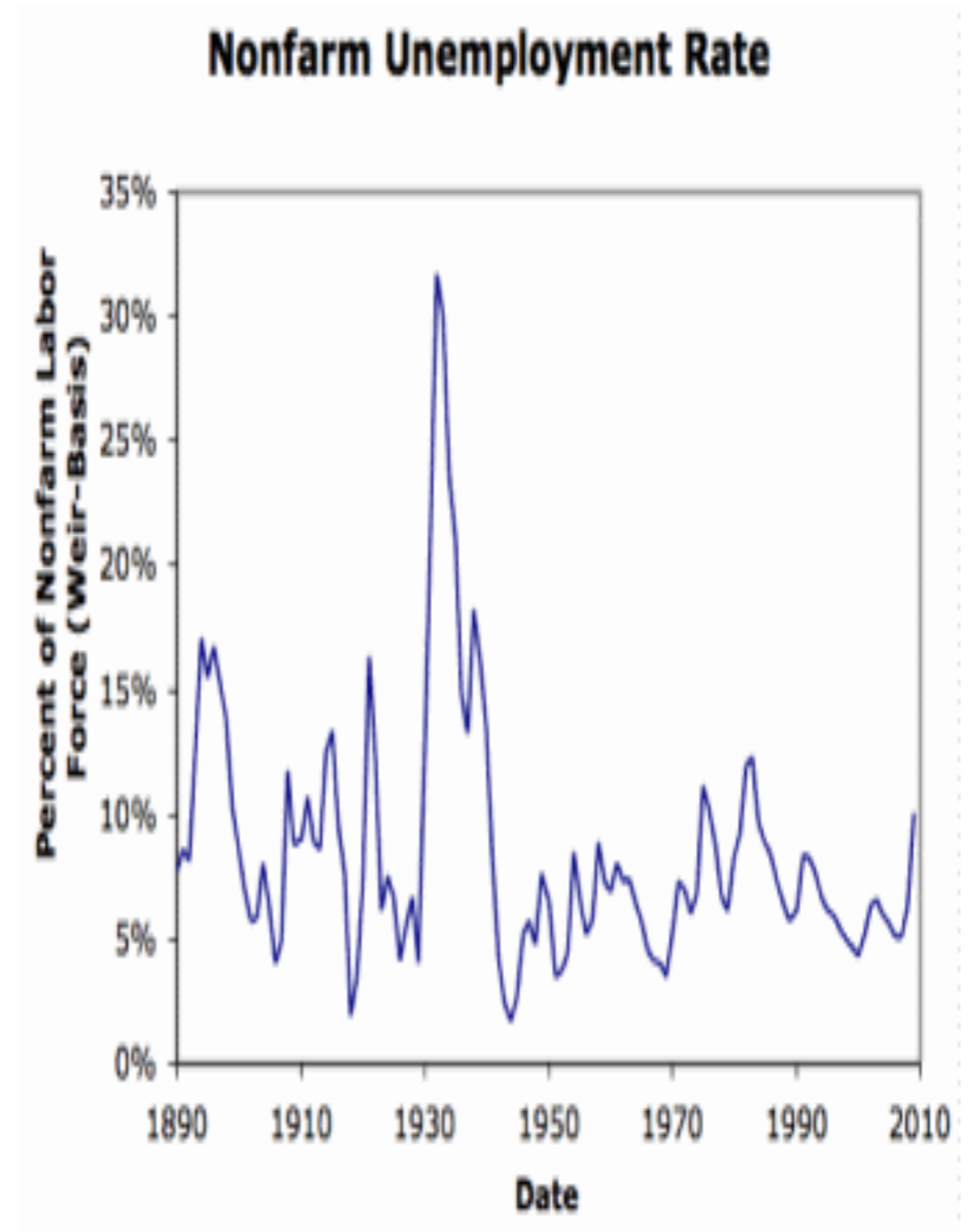
Four Sets of Actors

- Households
 - Have a view of their *permanent income*
 - Spend a fraction c_y of the gap between their current income Y and their permanent income
 - $C = c_0 + c_y \times Y$
 - Hoard in cash or save by lending to businesses the rest
- Foreigners: sell us our imports and then decide:
 - to spend some on our exports, net amount NX
 - to hoard in cash or save by lending to businesses the rest
- The government: spends G
- Business investment committees: decide to borrow and invest I , depending on:
 - Spending E —less spending, why invest?
 - Their “animal spirits”
 - The real interest rate r they must pay to borrow



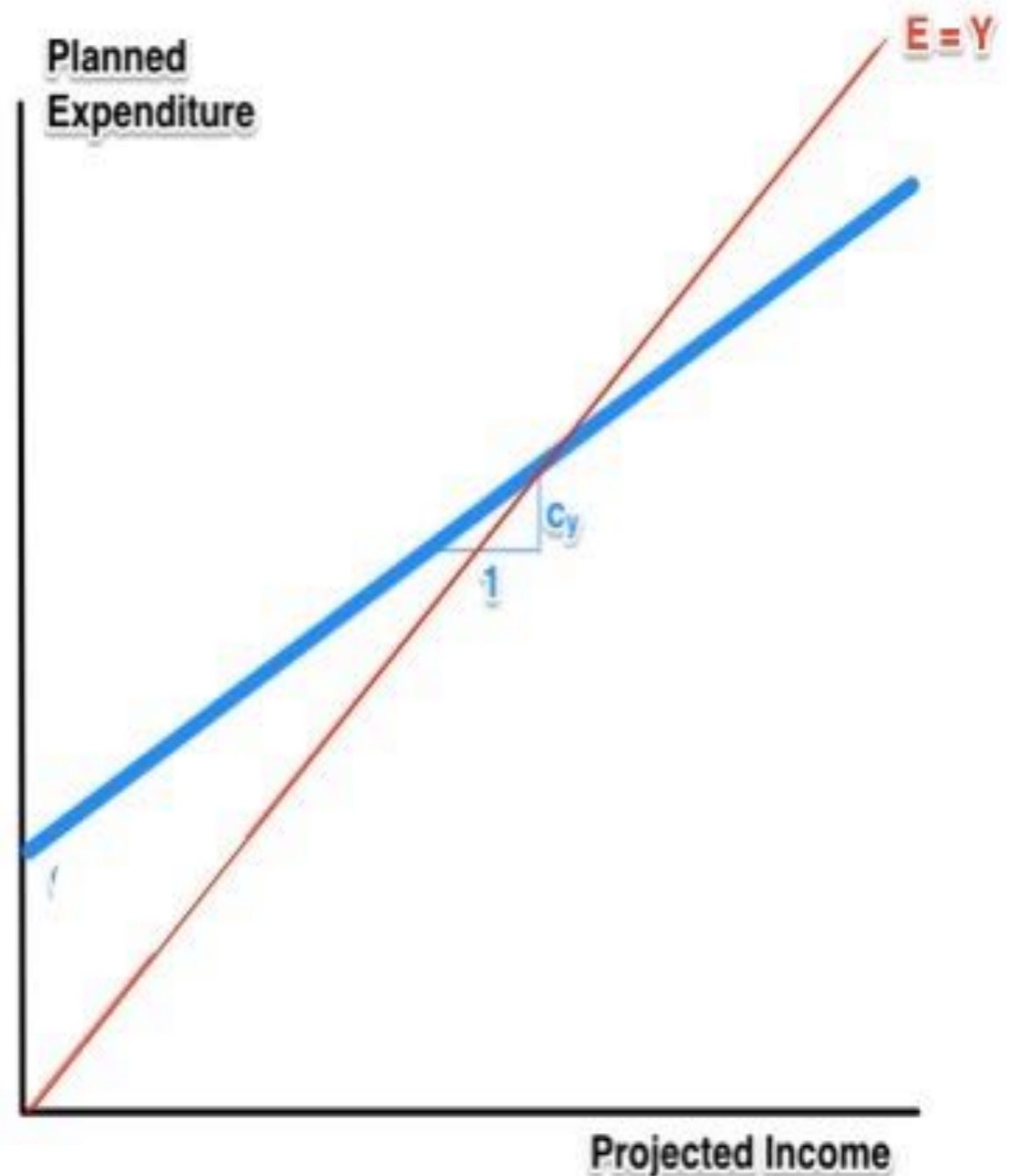
The Whole Model

- Y —income
- E —spending
- $E = C + I + NX + G$
 - $C = c_0 + c_y \times Y$
(households)
 - NX (foreigners)
 - G (government)
 - $I = I_0 - I_r \times r$ (businesses)
- Central bank (Federal Reserve) *influences* (does not control) r ...



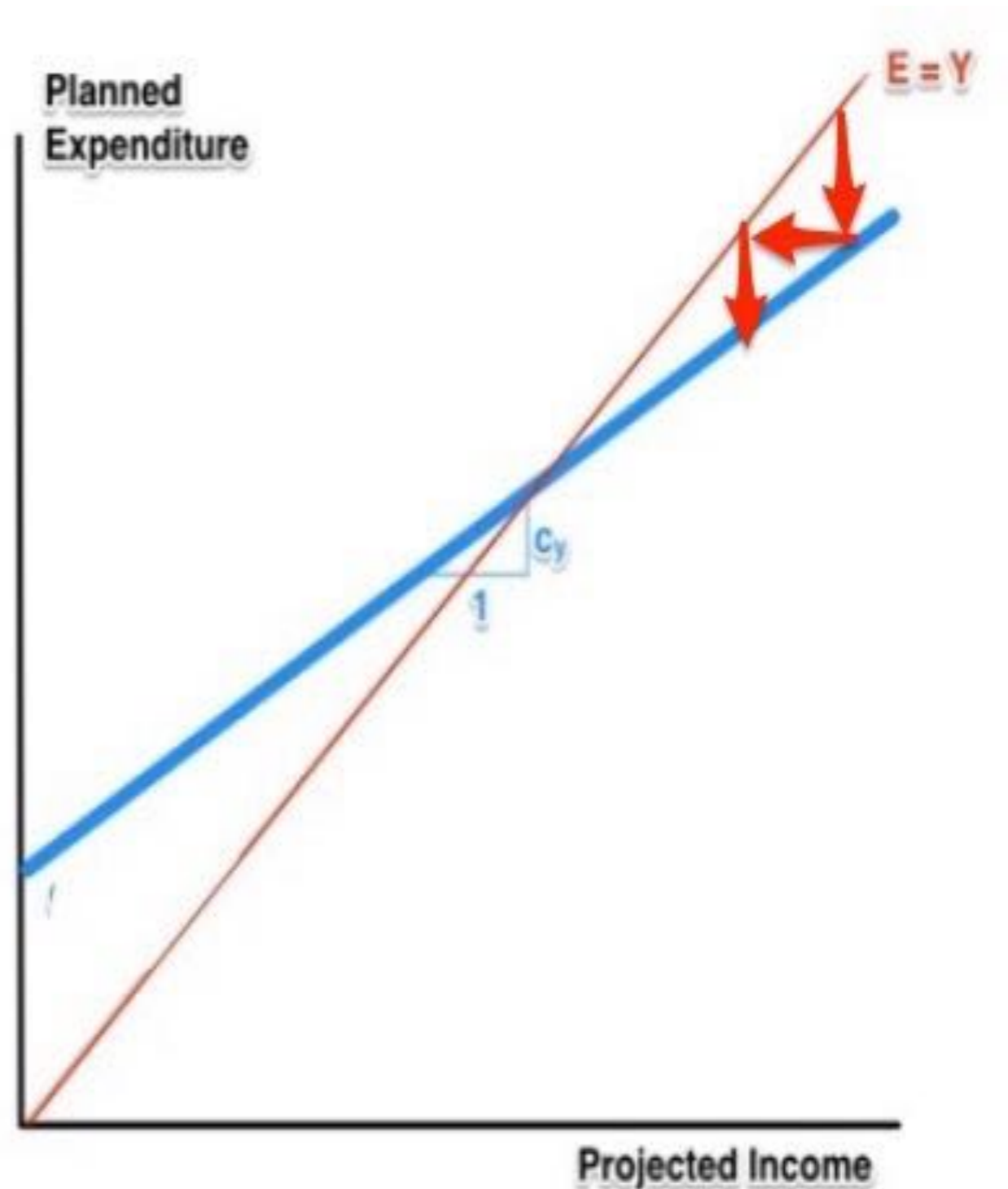
Expenditure and Income

- Expenditure
- $E = C + I + NX + G$
- $E = (C_0 + I_0 + NX + G) + c_y Y - I_r r$
- Equilibrium: $E = Y$
- What happens if planned expenditure E is less than expected income Y ?
 - People make stuff, expecting to sell it
 - It doesn't sell
 - So income comes in lower than people and expected
 - What happens next?



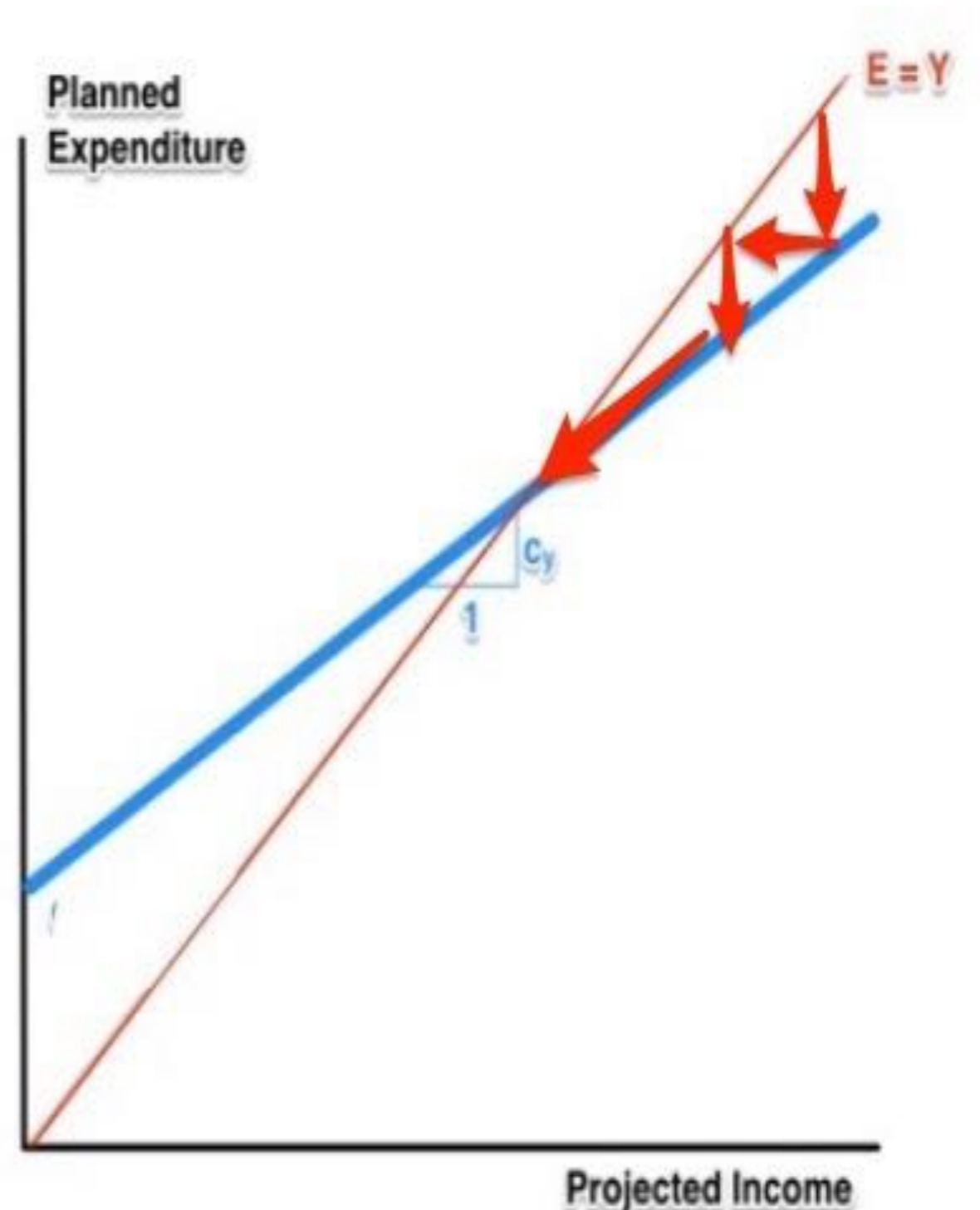
Expenditure and Income II

- $E = C + I + NX + G$ — behavioral rules
- $E = Y$ — equilibrium condition
- What happens if planned expenditure E is less than expected income Y ?
 - People make stuff, expecting to sell it
 - It doesn't sell
 - So income comes in lower than people and expected
- What happens next?
 - Businesses go bankrupt, people get fired, and income falls...
 - And as income falls, planned expenditure falls further...
- Where does the process stop?



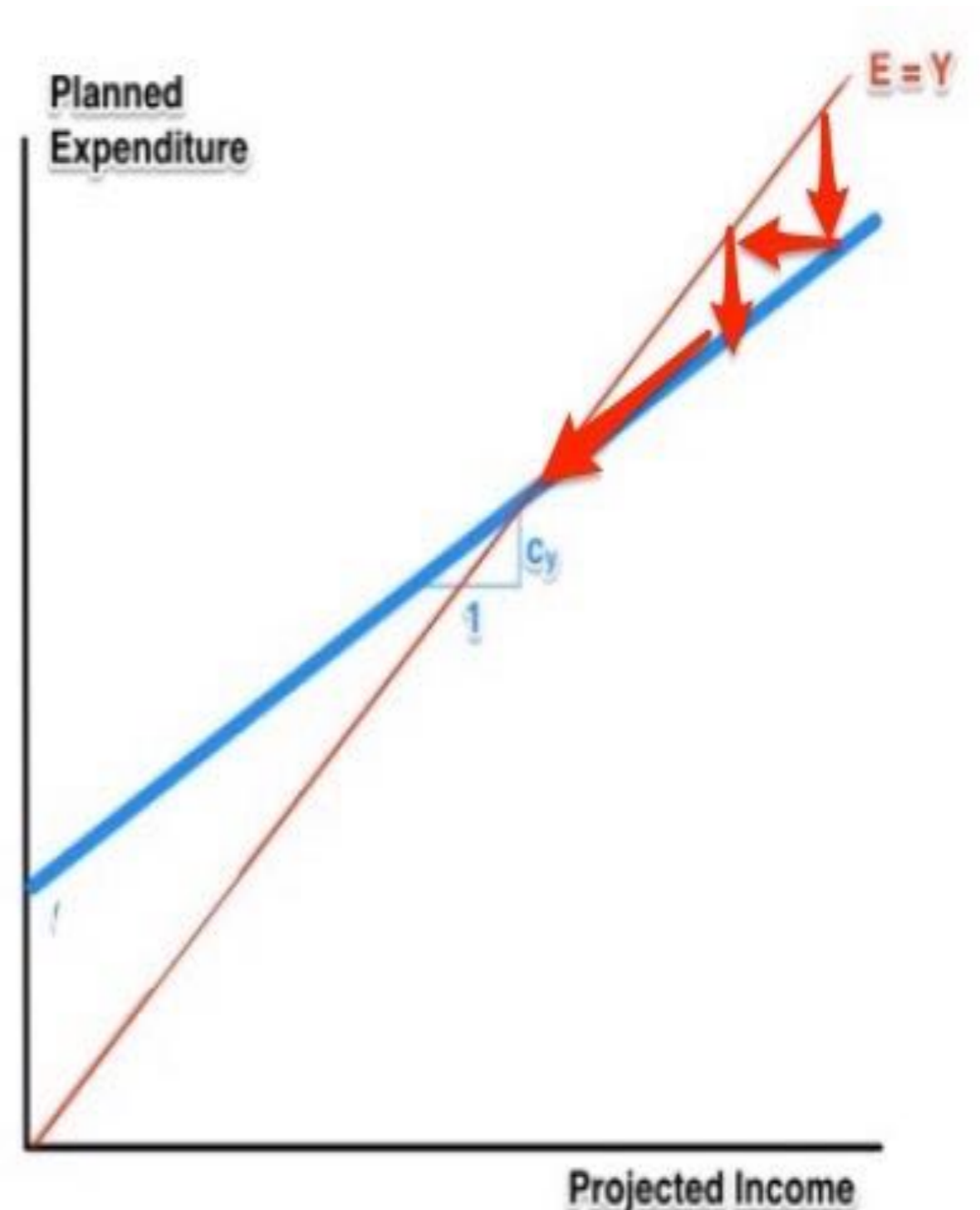
Expenditure and Income III

- The process stops when
 - people, at their new lower income level,
 - are happy holding the money they have
 - i.e., it stops when income has fallen to the income level at which there is no longer an excess demand for money
- The math:
 - $E = (c_0 + I_0 + NX + G) + c_y Y - I_r r$
 - $E = Y$
 - $Y = (c_0 + I_0 + NX + G) + c_y Y - I_r r$
 - $(1 - c_y)Y = (c_0 + I_0 + NX + G) - I_r r$
 - $Y = (c_0 + I_0 + NX) / (1 - c_y) - [I_r / (1 - c_y)]r + G / (1 - c_y)$



Expenditure and Income IV

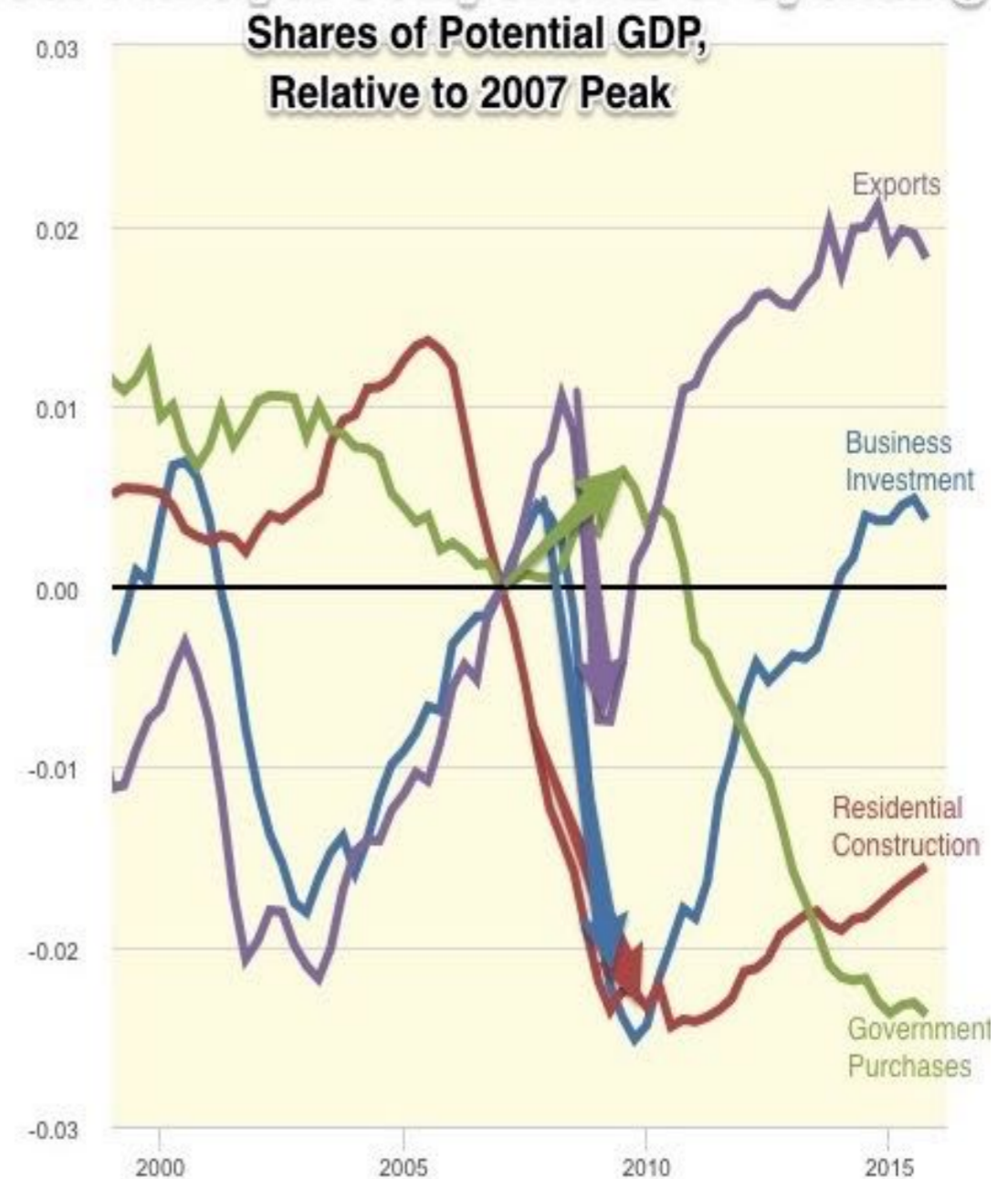
- $Y = (c_0 + I_0 + NX)/(1 - c_y) - [I_r/(1 - c_y)]r + G/(1 - c_y)$
 - $\mu = 1/(1 - c_y)$
- Changes in anything have a *multiplied* effect on Y
- $Y = \mu(c_0 + I + NX) + \mu I_r r + \mu G$
- That includes government spending G
- Changes in the interest rate r are a powerful way of changing Y
- Note that there are all kinds of other, weaker linkages here
 - We have ignored for the moment...
 - But they can become important in particular circumstances...
 - Would Greece's deciding to increase spending by its government in 2010 have boosted income and production in Greece? Almost surely not. Why not? Because of linkages that are not in this simple model.



Expenditure and Income V

- $Y = \mu(c_0 + I + NX) + \mu_l r + \mu G$
- Know the multiplier
- Track what happens to consumers' expectations, business animal spirits, net exports, government purchases, and the interest rate r
- And you can track the economy

Four Principal Components of Spending



To Your i>Clickers...

- Intel spends \$6B to build a 14nm Fab 42 Manufacturing Facility
 - A. Definitely in GDP
 - B. Definitely not in GDP
 - C. It could go either way—there is a hole in the classification system here
 - D. Not sure

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To Your i>Clickers...

- We have our very simple toy model of the macroeconomy
 - $Y = E$ (equilibrium condition); c_0 , I , G , NX determined by consumer confidence, by business investment committees and bank loan officers, and by foreigners; $C = c_0 + c_y \times Y$, $E = C + I + NX + G$...
- $Y = \mu[(c_0 + I + NX) + G]$
- Suppose $c_0 + I + NX = \$4T$, suppose the multiplier μ is 3. Suppose $G = \$2T$, what is GDP Y ?
 - A. \$18T
 - B. \$12T
 - C. \$6T
 - D. \$9T
 - E. None of the Above

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- $Y = \mu[(c_0 + I + NX) + G]$
- Suppose $c_0 + I + NX = \$4T$, suppose the mpc $c_y = 2/3$. Suppose $G = \$2T$, what is GDP Y ?
 - A. $\$18T$
 - B. $\$12T$
 - C. $\$6T$
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 - B. \$12T
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 - E. None of the Above
- $\mu = 1/(1 - c_y)$ — inverse of one minus the mpc

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- $Y = \mu[(c_0 + I + NX) + G]$
- Suppose $c_0 + I + NX = \$4T$, suppose the mpc $c_y = 2/3$. Suppose that $G = \$2T$. If we increase G from $\$2T$ to $\$2.5T$, what will happen to GDP Y ?
 - A. Y will go from $\$18T \rightarrow \$19.5T$
 - B. Y will go from $\$12T \rightarrow \$13T$
 - C. Y will go from $\$6T \rightarrow \$7.5T$
 - D. Y will go from $\$9T \rightarrow \$10.5T$
 - E. None of the Above

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- $Y = \mu[(c_0 + I + NX) + G]$
- Suppose $c_0 + I + NX = \$4T$, suppose the multiplier is 3. Suppose that we want output to be at full employment, which is $\$21T$. At what level should we set government purchases G ?
 - A. $\$17T$
 - B. $\$9T$
 - C. $\$3T \ll$**
 - D. $\$6T$
 - E. None of the Above

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- $Y = \mu[(c_0 + I + NX) + G]$
- Suppose that it is mid-2008, that $Y = \$15T$ and that the multiplier is 3. Suppose that we learn that $I + NX$ for the next year—2009 is going to fall by $\$1.5T$ as a result of the financial crisis. What should the government do to G in 2009 in order to maintain full employment?
 - A. boost G by $\$0.5T$
 - B. boost G by $\$1.5T$
 - C. shrink G by $\$1.5T$
 - D. boost G by $\$4.5T$
 - E. None of the Above

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Catch Our Breath...

- Comments?
- Questions?

