

Economics 1: The Income-Expenditure Model

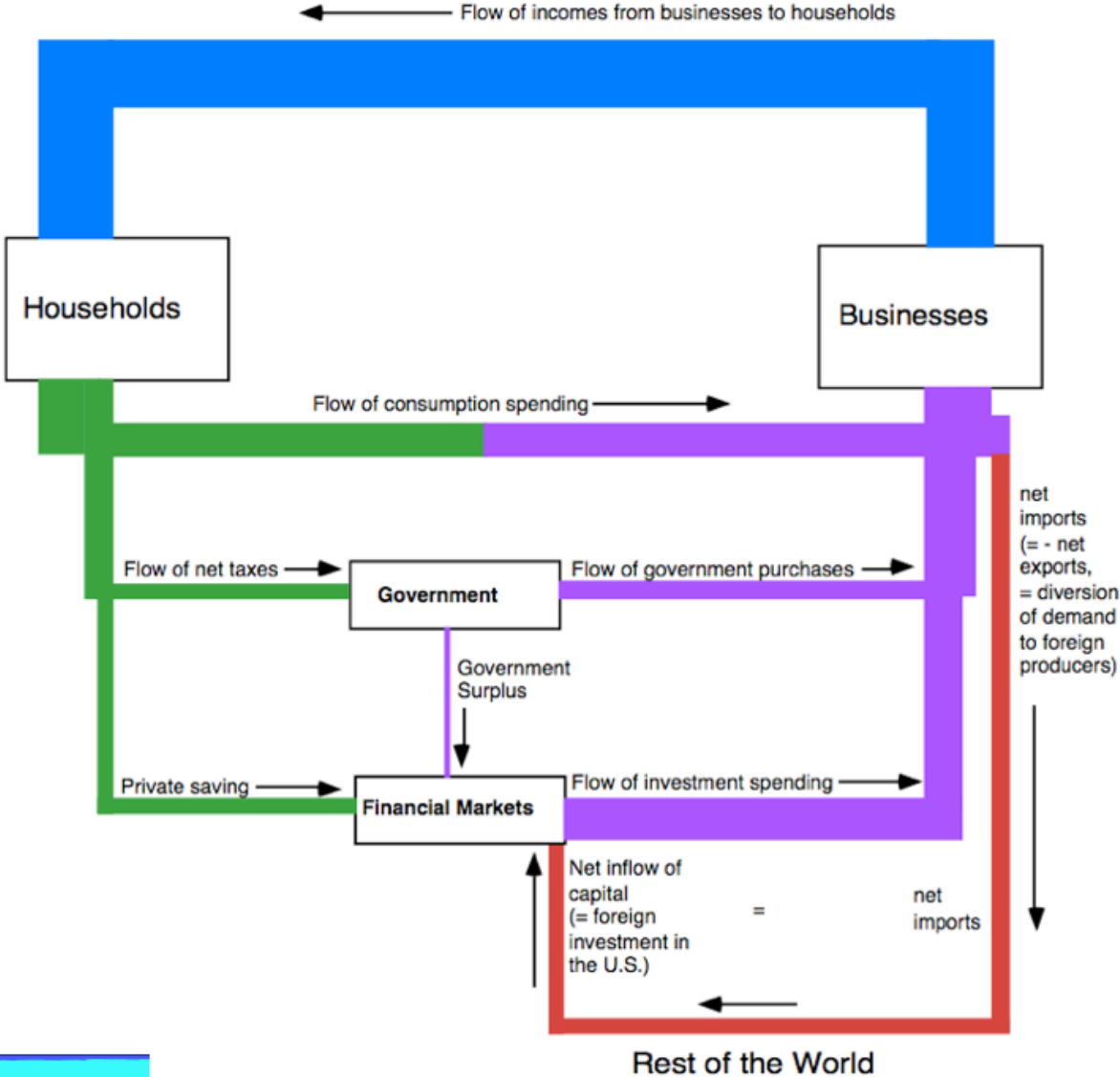
J. Bradford DeLong, Lanwei Wang, etc...

April 9, 2012

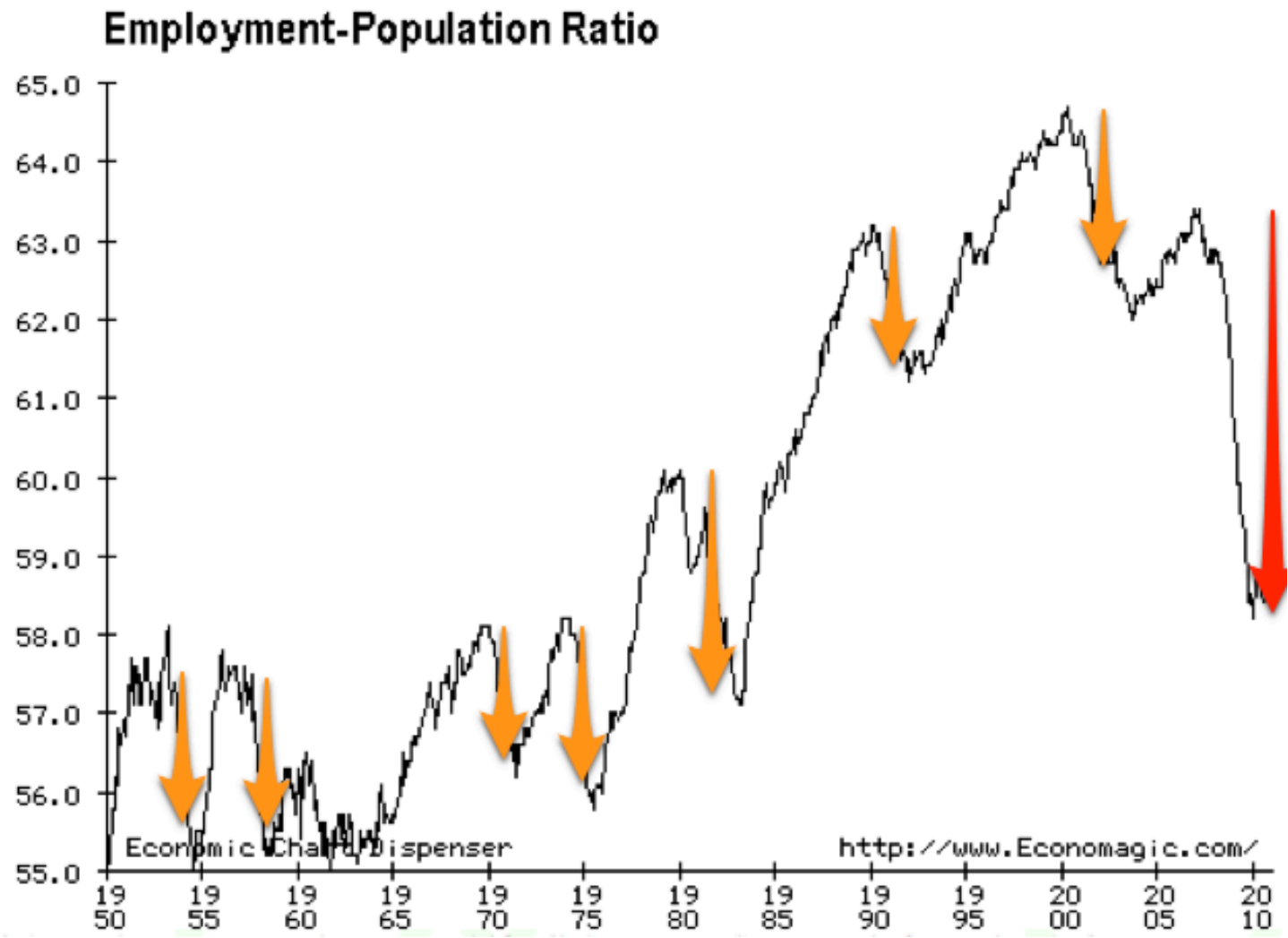
Logistics

- Problem set 7 out...
- No Friday 11 AM Wheeler Auditorium “Office Hour” this week
- Milton Friedman and Rose Director Friedman, *Free to Choose*, essays due this week
- Draft *Principles of Macroeconomics* textbook at Copy Central (southside on Bancroft)

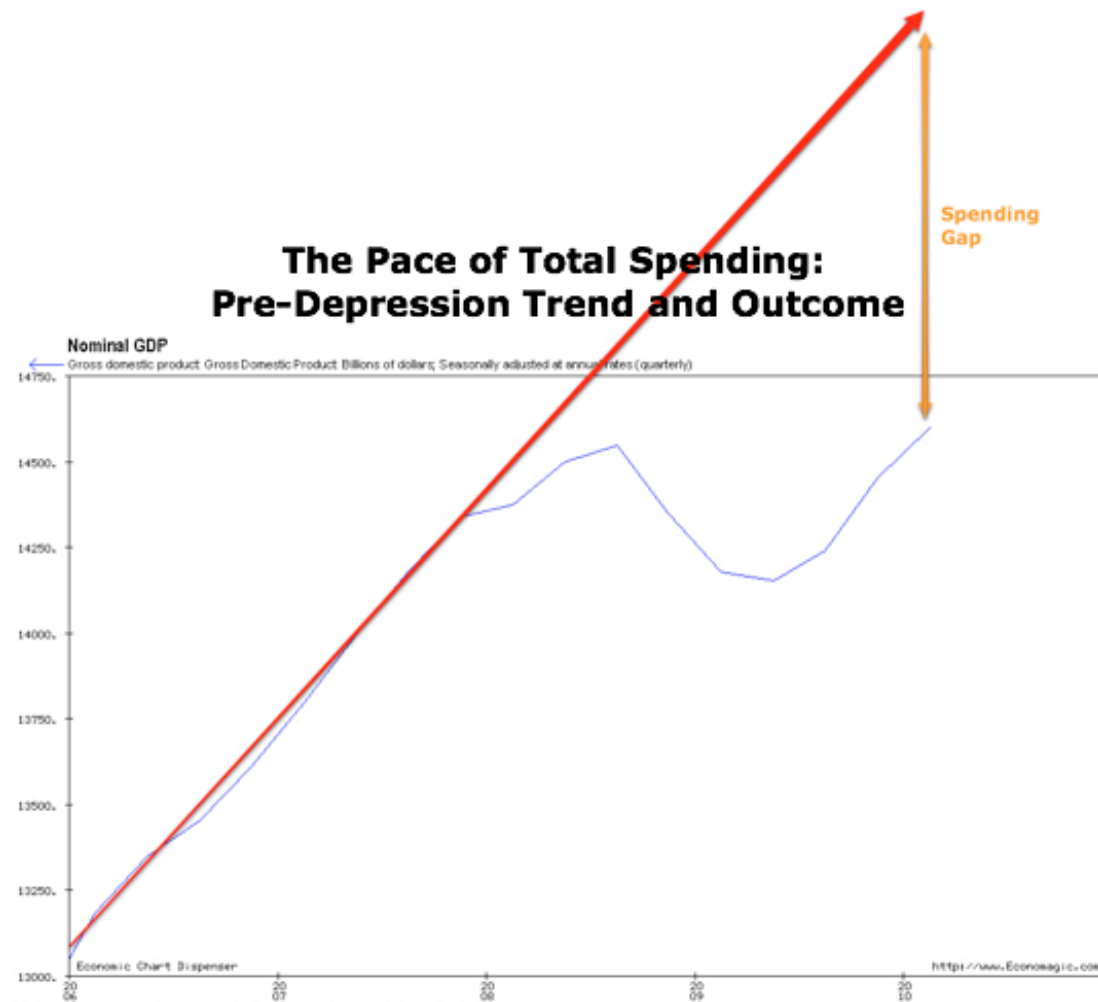
The Circular Flow of Economic Activity



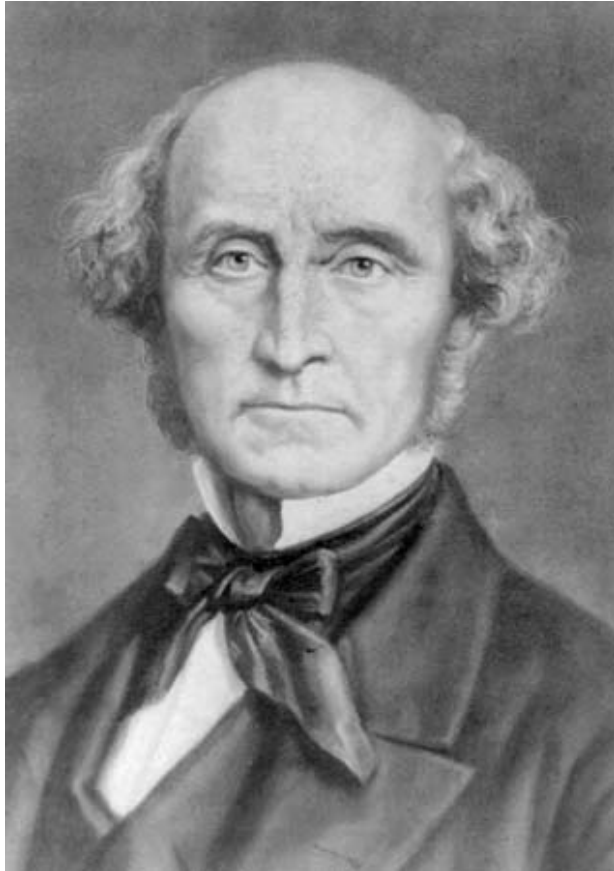
Interruptions in the Circular Flow



Caused by Fall-Offs in the Pace of Spending



John Stuart Mill : Excess Supply of Goods Is Excess Demand for Money



- What they called a general superabundance was... of all commodities relatively to money... Persons... from a general expectation of being called upon to meet sudden demands, liked better to possess money.... Money... was in request... other commodities... in... disrepute. In extreme cases, money is collected in masses, and hoarded... the result is, that all commodities fall in price, or become unsaleable... No... impropriety in saying that there is a superabundance of all or most commodities...

Excess Demands for Financial Assets That Disrupt Circular Flow

- Three kinds:
 - Demand for liquid cash money
 - Demand for bonds—i.e., for places to store your wealth because you don't want to spend it now, you want to save it and spend it in the future
 - Demand for high-quality assets: places where you can be sure that your money won't melt away
- We had the first in 1982, the second in 2001, and we have the third type today

How Low Will the Economy Go?

- We need a model
- The income-expenditure framework
- Assume: downward-sticky wages and prices
- $E = C + I + G$
 - E: total expenditure, total economy-wide spending
 - C: consumption spending by households
 - I: investment spending, spending by businesses to add to their productive capacity
 - G: government purchases

Building Our Model

- $E = C + I + G$, more complicated than we need
- Consumption function:
 - Remember, one important thing we need to model is that when people get fired and lose their incomes they stop (or they at least slow down) their spending
 - $C = c_0 + c_y \times Y$; Y – income, production
 - Today: $c_0 = \$3.5$ trillion/year
 - Today: $c_y = 0.5$
 - Money households don't spend on consumption they save or pay in taxes

Behind the Model

- What happens if $Y < E$? Then people in general are trying to spend down their holdings of financial assets—they are trying to run into debt, to leverage up
- What happens if $Y < E$? Then people in general are trying to spend up their holdings of financial assets—they are trying to run down debt, to deleverage
- But the economy as a whole cannot do this...
- Attempted deleveraging is excess demand for financial assets—and deficient demand for currently-produced goods and services

Building Our Model II

- $E = C + I + G$
- $C = c_0 + c_y \times Y$
- $E = I + G + c_0 + c_y \times Y$
- What if $E < Y$? Then Y will be shrinking...
- What if $E > Y$? Then Y will be growing...
- Only if $E = Y$ will Y be stable...
- So if we are looking for points of stability—for situations in which Y is not changing rapidly...
- We can assert $Y=E$ and substitute it in
- $Y = I + G + c_0 + c_y \times Y$

Solving Our Model II

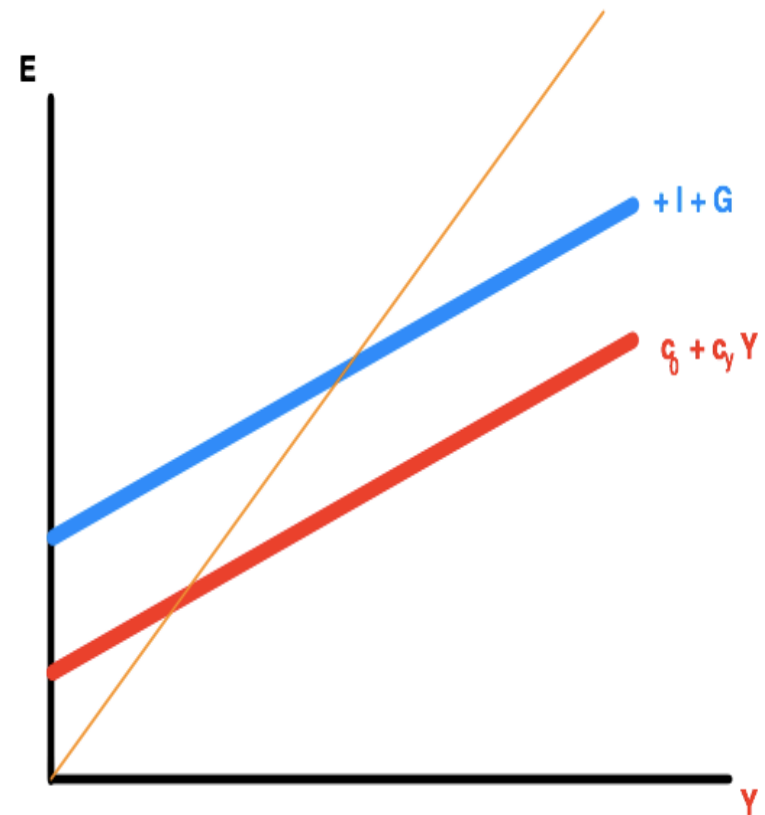
- $Y = I + G + c_0 + c_y \times Y$
- $Y - c_y \times Y = I + G + c_0 + c_y \times Y - c_y \times Y$
- $Y - c_y \times Y = I + G + c_0 + \cancel{c_y \times Y} - \cancel{c_y \times Y}$
- $Y \times (1 - c_y) = I + G + c_0$
- $Y \times (1 - c_y) / (1 - c_y) = (I + G + c_0) / (1 - c_y)$
- $Y \times \cancel{(1 - c_y)} / \cancel{(1 - c_y)} = (I + G + c_0) / (1 - c_y)$
- $Y = (I + G + c_0) / (1 - c_y)$
- And we are done: that is all that we need!

The Solution to Our Model

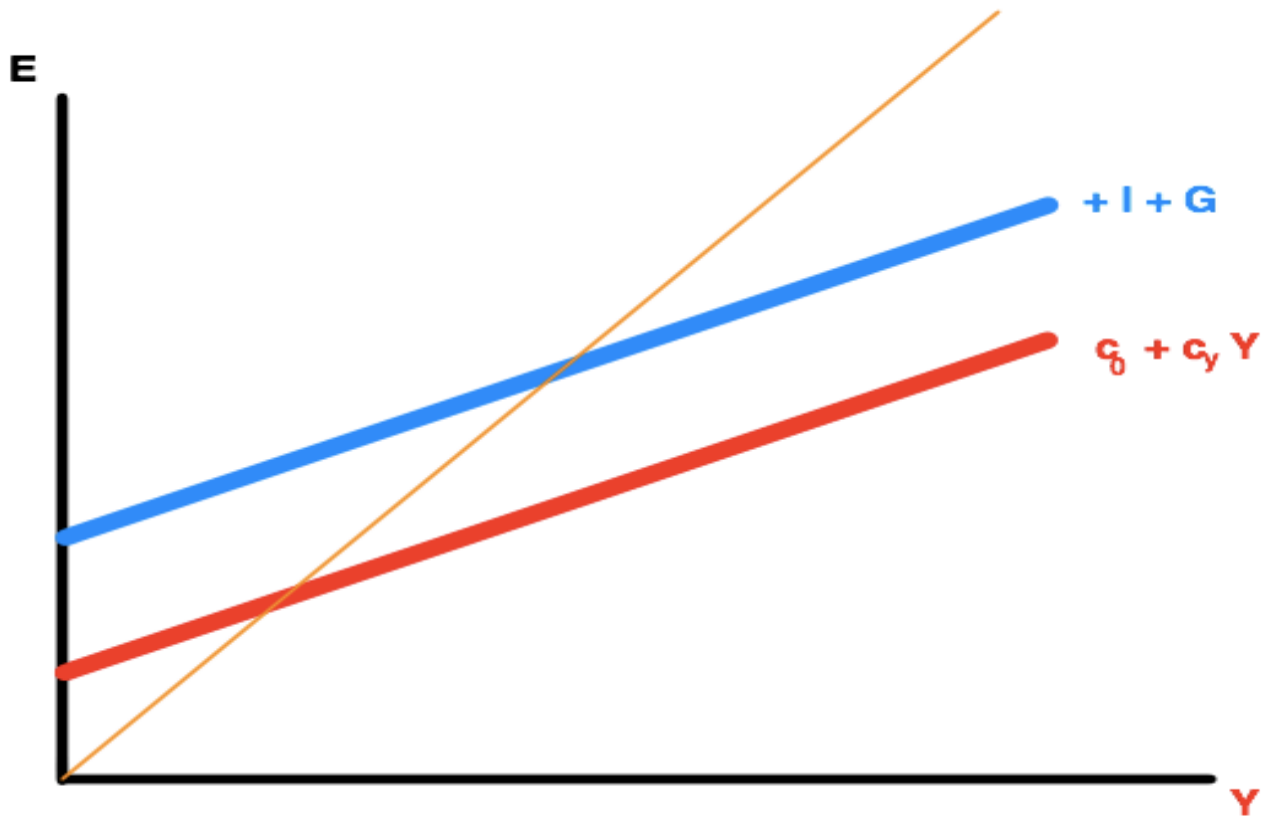
- $Y = (I + G + c_0)/(1 - c_y)$
 - Take the flow of “other spending”: business investment I plus government purchases G
 - Add to that the amount of consumption spending that depends on “confidence” and like factors c_0
 - Divide by $1 - c_y$
 - You are done. That’s the level of spending—and incomes, and production—at which the economy is going to settle.

The “Keynesian Cross” Diagram

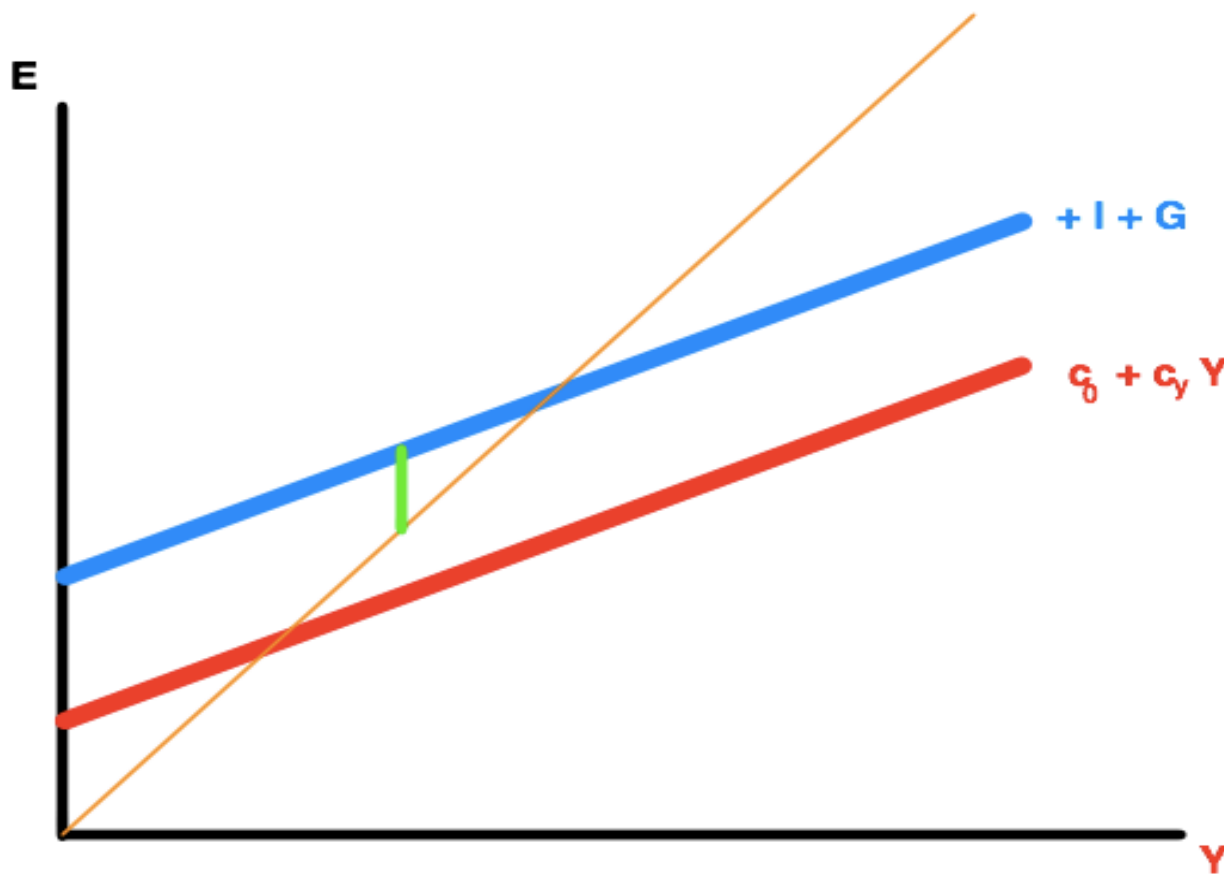
- Plot expected household income on the horizontal axis
- Plot planned spending on the vertical axis
- Households: plan to spend buying goods and services
- Businesses: buy things that they then sell—no net addition to demand
- Businesses: buy things to add to capacity
- Government: purchases goods and services
 - Effect of taxes and transfers shows up in consumption



The “Keynesian Cross” Diagram

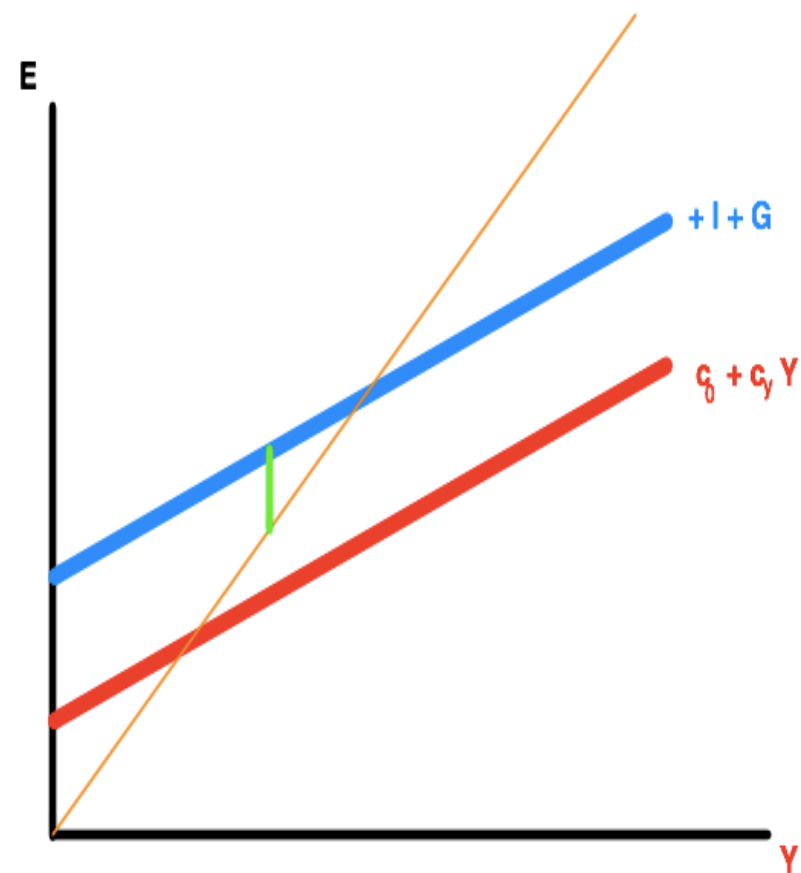


The “Keynesian Cross”: Excess Demand for Financial Assets—Excess Supply for Currently-Produced Commodities

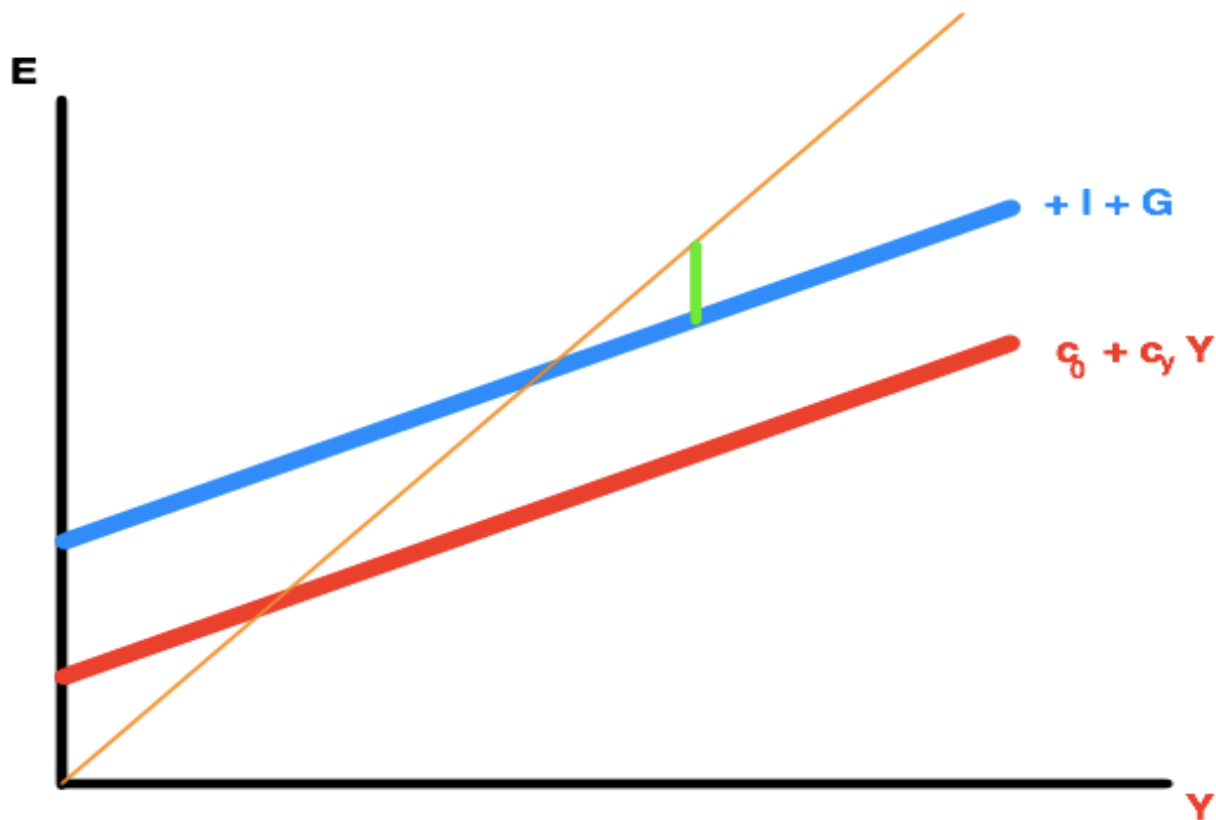


The “Keynesian Cross”: Excess Demand for Financial Assets—Excess Supply for Currently-Produced Commodities

- Suppose planned spending is greater than expected income...
- People think they are holding too many financial assets
- They try to spend them
 - And income grows
 - And planned spending grows too
 - Multiplier effect

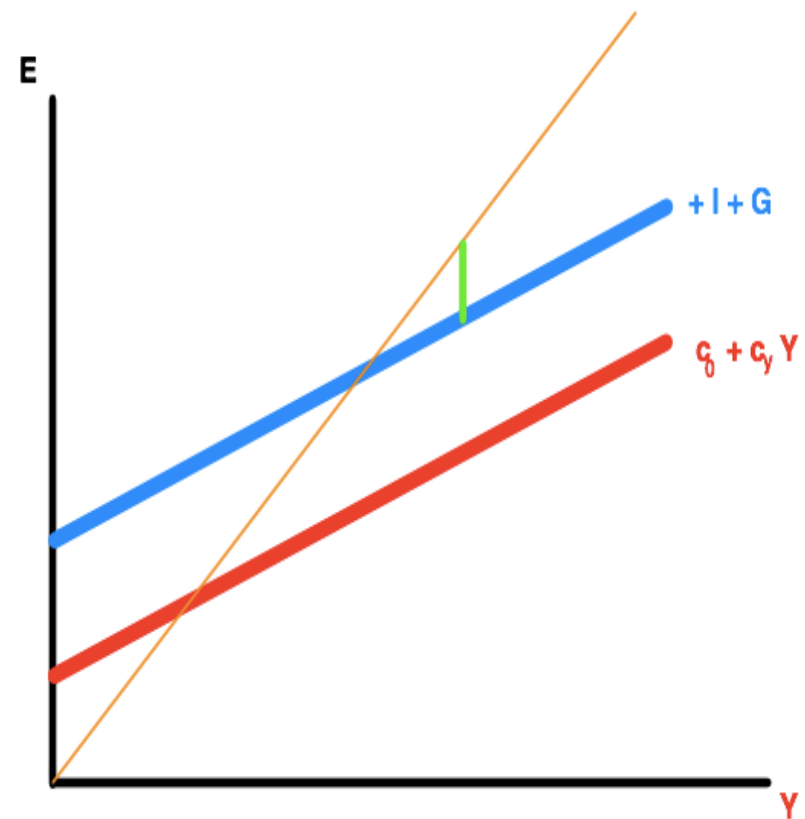


The “Keynesian Cross”: Excess Supply of Financial Assets—Excess Demand for Currently-Produced Commodities



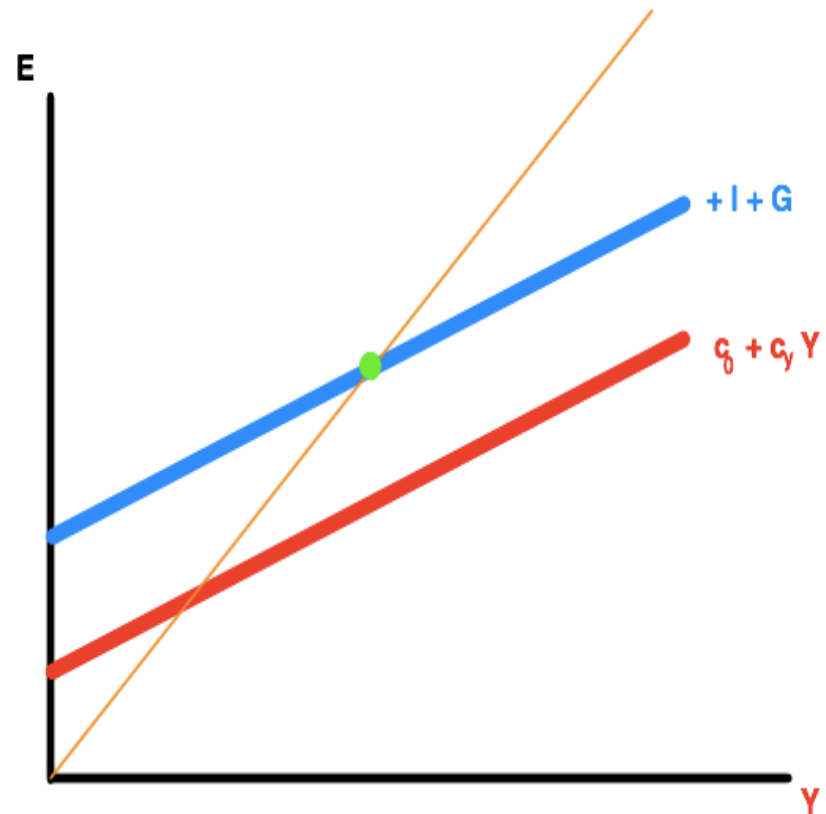
The “Keynesian Cross”: Excess Supply of Financial Assets—Excess Demand for Currently-Produced Commodities

- Suppose planned spending is lower than expected income...
- People think they are holding too few financial assets
- They try to accumulate them
 - And income falls
 - And planned spending falls too
 - Multiplier effect



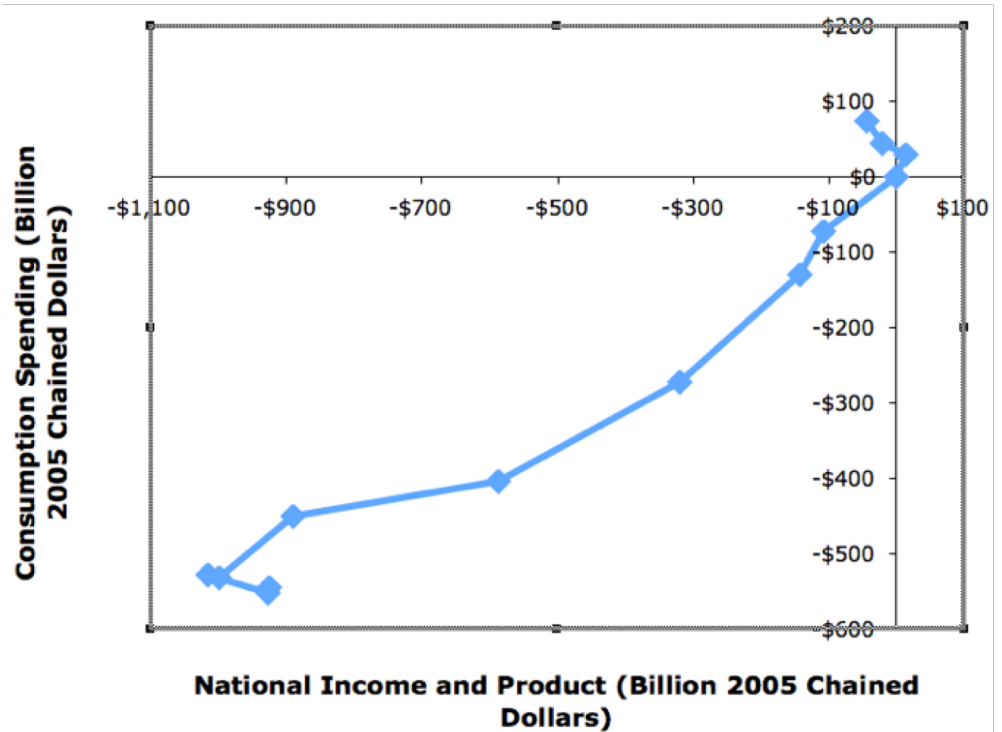
The “Keynesian Cross”: Equilibrium

- Planned spending is equal to planned income
- People are neither trying to hold more or hold less in the way of financial assets
- The circular flow is stable
- The economy is in equilibrium



How Well Does This Work?

- Quite well
- Trained high-paid professionals do this...
- In the current recession
 - $Y = (I + G + c_0)/(1 - c_y)$
 - $c_y = 0.5, \Delta I = -\$500\text{B/yr}$
 - $\Delta Y = \Delta I/(1 - c_y)$
 - $\Delta Y = -\$1\text{T/yr}$



An Example

- Start with:

- $C = \$3.5 + 0.5 \times Y$

- $I = \$2$

- $G = \$2$

- $Y = (I + G + c_0)/(1-c_y)$

- $Y = (3.5+2+2)/(1-0.5)$

- $Y = 15$

- Start with:

- $C = \$1 + 0.6666 \times Y$

- $I = \$2.5$

- $G = \$2$

- $Y = (I + G + c_0)/(1-c_y)$

- $Y = (1+2.5+2)/(1-0.6666)$

- $Y = 16.5$

Test Your Knowledge

- Which early nineteenth-century classical economist—Malthus, Mill, or Say—changed his position on the possibility of “general gluts” over his life, and how did he change it?
- Why did that classical economist change his mind?
- What does break Say’s Law of the circular flow—why isn’t it the case that excess supply of some currently-produced goods and services always is offset by excess demand for some others?
- What kinds of financial excess demand produce “general gluts”—produce economic downturns and high unemployment rates?
- Why is it allowable for us to conclude that E , total expenditure, total economy-wide spending, is equal to Y , income and output?
- What is our equation for figuring out how much production and incomes Y will fall if there is a fall in either I , G , or the “confidence” component of consumption spending c_0 ?