Aggregate Expenditure

$$AE = C + I + G + X - M$$

C = ***C***onsumption expenditures

- Durable goods:
- Non-durable goods:
- Services:

I = ***I***nvestment expenditures

- Business fixed investment on structures and equipment
- Residential investment on the construction of

G = ***G***overnment expenditures on goods and services

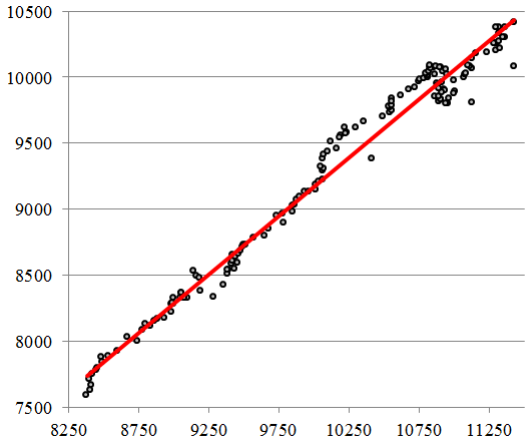
- New aircraft carriers,
- Does the government buy US products only?

X – M = e***X***ports – i***M***ports (net exports)

- *X* is the amount spent by
- *M* is the amount spent by

*C*onsumption expenditures

Consumption function



*C*onsumption expenditures

Simulated consumption function

$$A = W + Y_e - PL - r$$

$$C = A + mpc \cdot DI$$

$$C = [\, W + Y_e - PL - r \,] + mpc \cdot DI$$

- **Example:** Suppose consumer wealth is \$5 trillion ($W = 5$), expected future income is \$7 trillion ($Y_e = 7$), the price level is \$8 thousand ($PL = 8$), the real rate of interest is 2 percent ($r = 2$), and the marginal propensity to consume is 0.75 ($mpc = 0.75$). Derive the consumption function.

$$C = [\, W + Y_e - PL - r \,] + mpc \cdot DI$$

*C*onsumption expenditures

Consumption function

- **Example (*continued*):**

$$C = 2 + 0.75\,DI$$

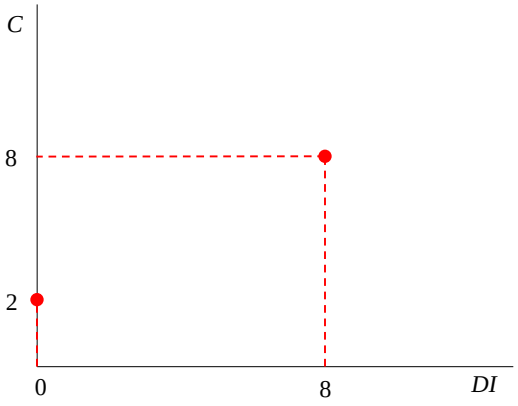
When $DI = 0$

$$C = 2 + 0.75(0)$$

When $DI = 8$

$$C = 2 + 0.75(8)$$

$$C = 2 + 6$$



*C*onsumption expenditures

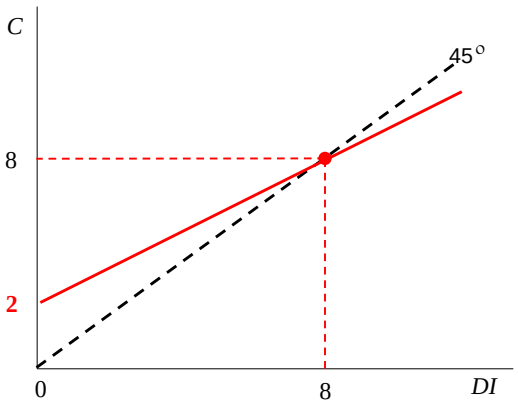
Consumption function

- **Example (*continued*):**

  $C = 2 + 0.75\,DI$

  When consumption lies on the 45° line, all disposable income is consumed and saving is zero.

  Saving = $DI - C$



*C*onsumption expenditures

Consumption function

- **Example (*continued*):**

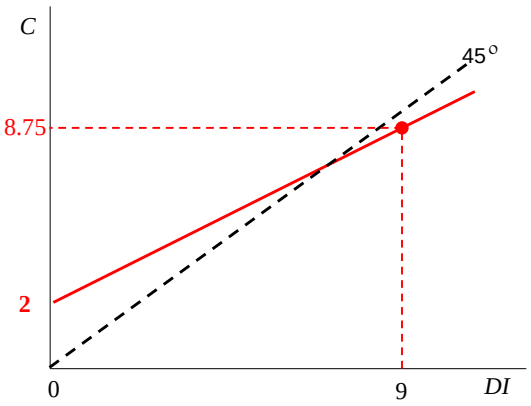
  $C = 2 + 0.75\,DI$

  When consumption lies below the 45° line, saving occurs.

  When $DI = 9$

  $C = 2 + 0.75(9)$

  Saving = $DI - C$



*C*onsumption expenditures

Consumption function

- **Example (*continued*):**

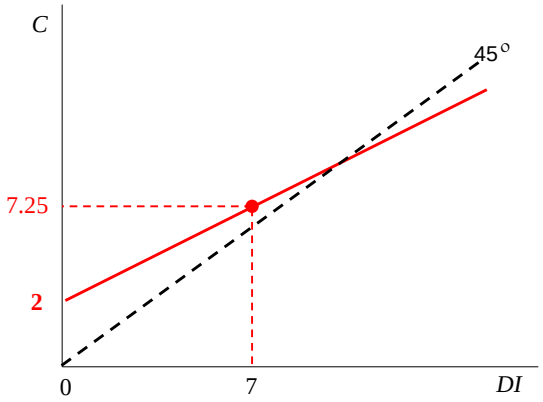
  $C = 2 + 0.75\,DI$

  When consumption lies above the 45° line, dissaving occurs.

  When $DI = 7$

  $C = 2 + 0.75(7)$

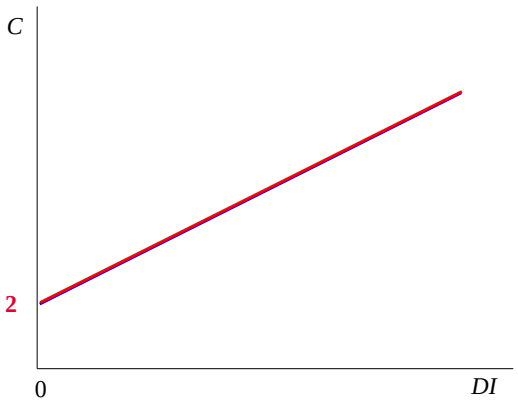
  Saving = $DI - C$



*C*onsumption expenditures

Consumption function

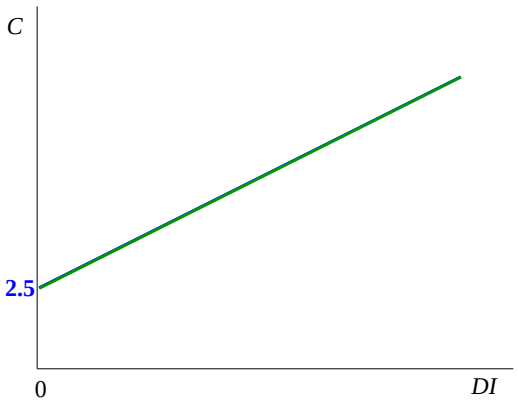
- **Example (*continued*):** Show what happens if consumer wealth rises to \$5.5 trillion (***W* = 5.5**).



*C*onsumption expenditures

Consumption function

- **Example (*continued*):** Show what happens if the price level increases to \$9 thousand (***PL* = 9**).



*C*onsumption expenditures

Consumption function

$$C = [\ W + Y_e - PL - r\ ] + mpc \cdot DI$$

- Because AE, AD, SRAS, and LRAS are graphed with Y on the horizontal axis, C should be too:

$$DI = Y - T$$

$$C = [\ W + Y_e - PL - r\ ] + mpc \cdot (DI)$$

$$C = [\ W + Y_e - PL - r\ ] + mpc \cdot (Y - T)$$

$$C = [\ W + Y_e - PL - r\ ] + mpc \cdot Y - mpc \cdot T$$

$$C = [\ W + Y_e - PL - r\ - mpc \cdot T\ ] + mpc \cdot Y$$

*C*onsumption expenditures

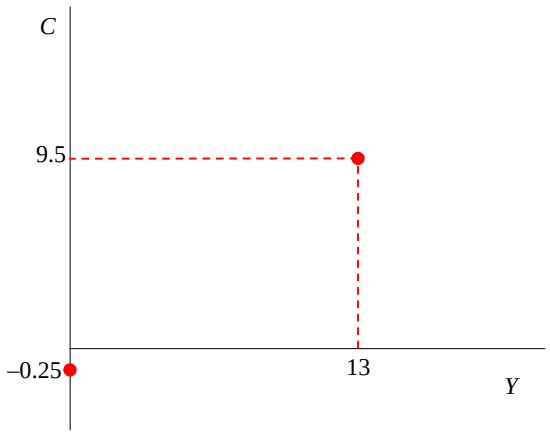
Snarrian Consumption

- **Example:** In addition to $W = 5$, $Y_e = 7$, $PL = 8$, $r = 2$, and $mpc = 0.75$, assume taxes net of transfers is \$3 trillion ($T = 3$).

$$C = [W + Y_e - PL - r - mpc \cdot T] + mpc \cdot Y$$

When $Y = 13$

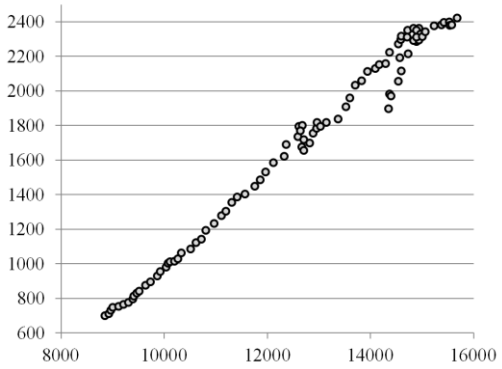
$$C = -0.25 + 0.75(13)$$



i*M*port expenditures

Import function

- Money is spent on domestic products (C) & imported products (M).
- M is the amount spent by Americans on goods from outside of the USA.
- In the short run, the factor influencing imports is U.S. real GDP.
  - If $Y = 0$, products cannot be imported:
  - As Y rises,
- ***M***arginal ***P***ropensity to i***M***port is the fraction of a rise in Y spent on imports.



http://research.stlouisfed.org/fred2/graph/?g=o4M

Aggregate Expenditure

Simulated aggregate expenditure

$$AE = [C] + I + G + X - \{M\}$$

$$AE = [W + Y_e - PL - r - mpc \cdot T + mpc \cdot Y] + I + G + X - \{mpm \cdot Y\}$$

$$AE = [W + Y_e - PL - r - mpc \cdot T + I + G + X] + mpc \cdot Y - mpm \cdot Y$$

$$AE = [W + Y_e - PL - r - mpc \cdot T + I + G + X] + \{mpc - mpm\} \cdot Y$$

Aggregate Expenditure

Simulated aggregate expenditure

- **Example:** In addition to $W = 5$, $Y_e = 7$, $PL = 8$, $r = 2$, $mpc = 0.75$, and $T = 3$, assume, investment expenditures total \$1 trillion ($I = 1$), government expenditures total \$3.5 trillion ($G = 3.5$), exports total \$0.5 trillion ($X = 0.5$) with $mpm = 0.25$. Derive the AE equation.

$$AE = [W + Y_e - PL - r - mpc \cdot T + I + G + X] + \{mpc - mpm\} \cdot Y$$

Aggregate Expenditure

Simulated aggregate expenditure

- **Example:**

  Point 1

  $Y = 0$

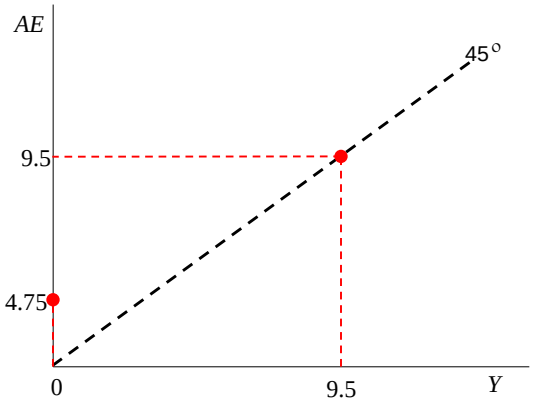
  $AE =$

  Point 2

  $Y = 9.5$

  $AE =$

- Since aggregate planned expenditure equals GDP, the change in firms'
- The AE model has reached an **equilibrium**



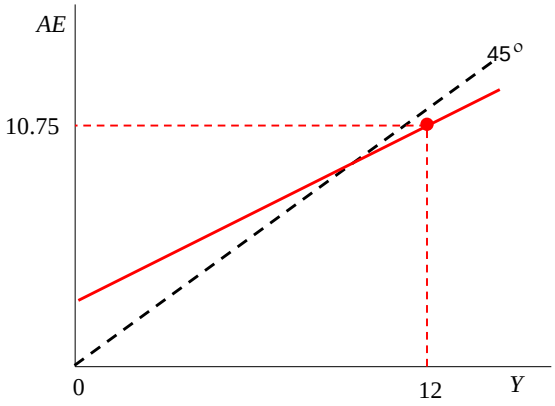
Aggregate Expenditure

Simulated aggregate expenditure

- **Example:** Suppose real GDP is $12 trillion.

  $AE = 4.75 + 0.5(12)$

- When aggregate planned expenditure is less than real GDP, an unplanned



Aggregate Expenditure

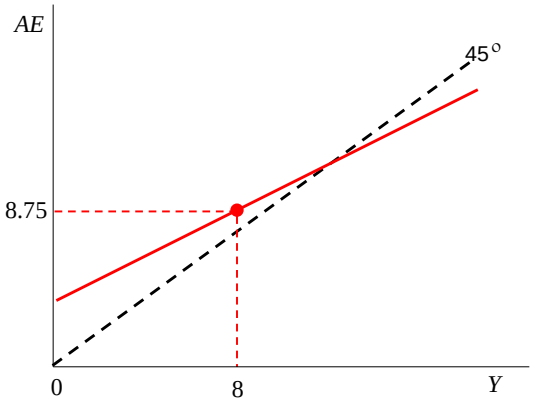
Simulated aggregate expenditure

- **Example:** Suppose real GDP is $8 trillion.

  $AE = 4.75 + 0.5(8)$

  $=$

- When aggregate planned expenditure exceeds real GDP , an unplanned decrease in inventories occurs.

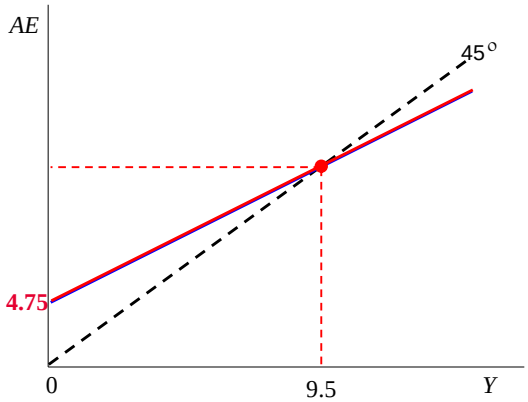


Aggregate Expenditure

Simulated aggregate expenditure

- **Example:** What happens if government spending is increased by $0.5 trillion?

$$AE = [5 + 7 - 8 - 2 \ - 0.75 \cdot 3 + 1 + 3.5 + 0.5] + \{0.75 - 0.25\} \cdot Y$$

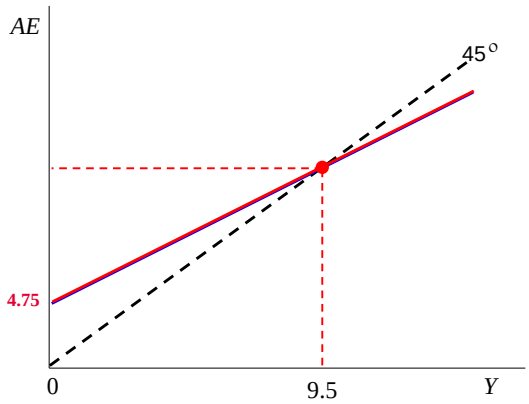


Aggregate Expenditure

Simulated aggregate expenditure

- **Example:** What happens if taxes net of transfers are cut by \$0.5 trillion?

$$AE = [5 + 7 - 8 - 2 \ - 0.75 \cdot 3 + 1 + 3.5 + 0.5] + \{0.75 - 0.25\} \cdot Y$$



Aggregate Expenditure

Simulated aggregate expenditure

$$AE = [W + Y_e - PL - r \ - mpc \cdot T + I + G + X \ ] + \{ \ mpc - mpm \ \} \cdot Y$$

- The Congress and President are in charge of **fiscal policy**.
  - Expansionary fiscal policy involves
  - Restrictive fiscal policy involves
- The Federal Reserve (our central bank) is in charge of **monetary policy.**
  - Expansionary monetary policy involves
  - Restrictive monetary policy involves

Aggregate Demand

Simulated aggregate demand

- **Example:** What happens if the price level falls by \$0.5 thousand?

$$AE = [5 + 7 - 8 - 2 \ - 0.75 \cdot 3 + 1 + 3.5 + 0.5] + \{0.75 - 0.25\} \cdot Y$$