

Keynesian Supermultiplier

National income accounting equation:

$$Y = C + I + G + X - M \quad (1)$$

Consumption function includes autonomous consumption, a , plus the marginal propensity to consume, b , times disposable income:

$$C = a + bY_d \quad (2)$$

Disposable income is aggregate national income less the tax bill, T :

$$Y_d = Y - T \quad (3)$$

Assuming a flat rate income tax, t , the tax bill is equal to the tax rate times aggregate national income:

$$T = tY \quad (4)$$

Substituting equation 4 into equation 3 gives:

$$Y_d = Y - tY \quad (5)$$

Investment may be thought of as having an autonomous component, d , but also a component that is a function of income (not disposable income). So we can introduce the marginal propensity to invest, e :

$$I = d + eY \quad (6)$$

Government spending remains autonomous:

$$G = G \quad (7)$$

Aggregate exports are also exogenous, since it is determined by other nations' demand:

$$X = X \quad (8)$$

Imports, however, may be thought of as having an autonomous component, f , and a component that depends on disposable income (marginal propensity to import, m):

$$M = f + mY_d \quad (9)$$

Substituting equations 2, 6, and 9 into equation 1 gives:

$$Y = a + bY_d + d + eY + G + X - (f + mY_d) \quad (10)$$

Substituting equation 5 into equation 10 gives:

$$Y = a + b(Y - tY) + d + eY + G + X - f - m(Y - tY) \quad (11)$$

Multiplying through (watch those signs!):

$$Y = a + bY - btY + d + eY + G + X - f - mY + mtY \quad (12)$$