

Answers to Study Problem Keynesian Macroeconomics I

The Simple Keynesian Model and Its Application

1. What is the MPC? The Marginal Propensity to Consume is the slope of the consumption function. It's the coefficient of Y , or 0.8. We call it "b." What is the MPS? The Marginal Propensity to Save is the slope of the saving function. It's always equal to $1-b$. Here, it's 0.2. The 0.8 and the 0.2 add to 1.0. When we earn an extra (i.e., marginal) dollar, we spend an extra \$0.80 and save the \$0.20. What is the significance of the "100"? It's the level of consumption spending that corresponds to an income of zero. With no income, this spending would also represent "dissaving." (The fact that $a > 0$ reminds us that the Keynesian consumption equation applies to the short run.)
2. What are the spending multipliers? The investment-spending multiplier is $1/(1-b) = 1/(1-0.8) = 1/0.2 = 5$. The government-spending multiplier is also 5. The leverage that an increase in spending entails is independent of who (the investment community or the government) is actually doing the spending.
3. Write the specific savings equation that corresponds to the consumption equation. $S = -100 + 0.2Y$
4. At what level of income does savings equal zero? Write: $0 = -100 + 0.2Y$; and solve: $Y = 500$. You can confirm this answer by plugging $Y = 500$ into the consumption equation: $C = 100 + 0.8Y = 100 + 0.8(500) = 100 + 400 = 500$. If you earn 500 and spend 500, you save nothing.
5. How much is aggregate demand, or total spending, when income (Y) is 1100? Aggregate demand, or total spending, is simply $C + I + G$. Evaluate C by plugging $Y = 1100$ into the consumption equation: $C = 100 + 0.8Y = 100 + 0.8(1100) = 100 + 880 = 980$. Then add I and G to get $C + I + G = 980 + 50 + 60 = 1090$. Is the economy in equilibrium at this level of income? No. Y doesn't equal $C + I + G$. Rather, $1090 = C + I + G < Y = 1100$.
6. Graph $C + I + G$ and the 45° line and locate the different income magnitudes relative to one another. The key here is recognizing that $C + I + G < Y$. Thus, starting from $Y = 1100$ on the horizontal axis, the distance up to the $C + I + G$ curve (1090) is less than the distance up to the 45-degree line (1100). So, an income of 1100 is located beyond the income where aggregate demand drops below the 45-degree line. What you notice, here, is that the (given) full-employment income ($Y_{fe} = 1300$) lies above the current income of 1100, while the equilibrium level of income (Y_{eq}) lies below it. The income level needs to rise if prosperity is to be achieved, but the market process (as envisioned by Keynes) will instead cause income to fall—until the level of savings is just enough to finance the current level of investment and government spending. This sort of perversity is characteristic of the market system according to John Maynard Keynes's 1936 book, *The General Theory of Employment, Interest, and Money*.
7. What is the equilibrium level of income? $Y_{eq} = 1050$. You get this value by setting income equal to expenditures ($Y = C + I + G$), substituting $100 + 0.8Y$ for C , plugging in the given values for I and G , and solving for Y . Describe the economic process that brings about this Keynesian equilibrium. The shortfall of expenditures below income (i.e., $1090 < 1100$) means that inventories are accumulating. The excess inventories, which amount to $1100 - 1090 = 10$, cause businesses to cut back on production—and to lay off workers. The workers' loss of income means reduced spending, but spending isn't reduced as much as

the reduction in income (This is the key implication of Keynes's consumer-spending theory: $b < 1$.) Income and expenditures spiral downwards until the excess inventories are dissipated—at which point income equals expenditures, and the economy is in macroeconomic equilibrium with $Y = E = C + I + G = 1050$.

8. Suppose that the government raises the level of government spending by 30. What does this do to the equilibrium level of income? We've already calculated the government-spending multiplier: $1/(1-b) = 5$. The increase in the equilibrium level of income, then, is 5 times 30, or 150. That is $\Delta Y = 1/(1-b)\Delta G$. The government's extra spending of 30 raises equilibrium income from 1050 to 1200.

9. How much more government spending is required to achieve full employment? With income now at 1200, the economy is still 100 short of the (given) full-employment income (of 1300). Using, once again, the multiplier of 5, we see that the government can raise income by 100 by spending an additional 20. That is, write $\Delta Y = 1/(1-b)\Delta G$, plug in $\Delta Y = 100$ and $b = 5$, and solve for ΔG .

10. What assumptions about wage rates and prices do your calculations presuppose. Wage rates and prices are "sticky downwards"—and for simplicity, we assume that they do not change at all. If they did actually change quickly enough to clear the markets for goods and for labor, then there would be no lapses from full employment to theorize about. (We do assume that prices and wages adjust upward when aggregate demand is greater than full-employment income. Trying to push the economy beyond its full-employment level causes inflation and results in no sustainable increases in real output and real income.)
