Some Answers

1) Suppose that real money demand is represented by the equation $(M/P)^d = 0.25*Y$. Use the quantity equation to calculate the income velocity of money.

$$V = 4.$$  

2) Assume that the demand for real money is $(M/P)^d = 0.6*Y - 100i$, where $Y$ is national income and $i$ is the nominal interest rate. The real interest rate $r$ is fixed at 3 percent by the investment and saving functions. The expected inflation rate equals the rate of nominal money growth.

   a) If $Y$ is 1000, $M$ is 100, and the growth rate of nominal money is 1%, what must $i$ and $P$ be?

   Given the quantity theory of money, we know that inflation will simply equal the growth rate of money (provided that output is constant). Given the Fisher equation, this means that $i = 4$ percent. Thus, plugging into our money demand equation above, we get $P = 0.5$.

   b) If $Y$ is 1000, $M$ is 100, and the growth rate of nominal money is 2%, what must $i$ and $P$ be?

   Here $i$ would be 5%, and $P$ would be 1.

3) Econoland finances government expenditures with an inflation tax.

   a) Explain who pays the tax and how it is paid.

   Everyone in the economy ends up paying in some way, but the costs come in the more subtle forms of social costs.

   b) What are the costs from this tax?

   Just be able to tick off the costs described in the text, both anticipated and unanticipated.
4) A macroeconomist threatens to call the Secret Service to have Mr. Biggy Rich arrested for counterfeiting because Mr. Rich claims he “makes a lot of money.”

   a) Explain why the macroeconomist is making this threat based on the macroeconomic definition of money. Be sure to explain the macroeconomic functions of money.

   Money consists of the assets used to make transactions. Money serves as a store of value, unit of account, and medium of exchange. In most fiat money economies, the government maintains a monopoly over the supply of money. If Mr. Rich is “making money,” i.e., increasing the supply of money, this counterfeiting, which is totally illegal.

   b) Suggest an alternative phrase that Mr. Rich can use that will not result in a charge of counterfeiting.

   Mr. Rich could say he “earns a lot of income,” “has a lot of wealth/money,” “makes big profits,” etc.

5) Explain how each of the following events affects the monetary base, the money multiplier, and the money supply.

   a) The Federal Reserve buys bonds in an open-market operation.
   b) The Fed increases the interest rate it pays banks for holding reserves.
   c) The Fed reduces its lending to banks through its Term Auction facility.
   d) Rumors about a computer virus attack on ATMs increase the amount of money people hold as currency rather than demand deposits.
   e) The Fed flies a helicopter over 5th Avenue in New York City and drops newly printed $100 bills.

   a) When the Fed buys bonds, the dollars that it pays to the public for the bonds increase the monetary base, and this in turn increases the money supply. The money multiplier is not affected, assuming no change in the reserve-deposit ratio or the currency-deposit ratio.

   b) When the Fed increases the interest rate it pays banks for holding reserves, this gives banks an incentive to hold more reserves relative to deposits. The increase in the reserve deposit ratio will decrease the money multiplier. The decline in the money multiplier will lead to a decrease in the money supply. Since banks are
holding more reserves (because they are making fewer loans), the monetary base will increase.

c) If the Fed reduces its lending to banks through the Term Auction Facility, then the monetary base will decrease, and this in turn will decrease the money supply. The money multiplier is not affected, assuming no change in the reserve–deposit ratio or the currency–deposit ratio.

d) If consumers lose confidence in ATMs and prefer to hold more cash, then the currency–deposit ratio will increase, and this will reduce the money multiplier. The money supply will fall because banks have fewer reserves to lend. The monetary base will increase because people are holding more currency, but will decrease because banks are holding fewer reserves. The net effect on the monetary base is zero.

e) If the Fed drops newly minted $100 bills from a helicopter, then this will increase the monetary base and the money supply. If any of the currency ends up in the bank, then there will be a further increase in the money supply. If people end up holding more currency relative to deposits, then the money multiplier would fall.

6) An economy has a monetary base of 1000 $1 bills. Calculate the money supply in scenarios (a)-(d) and then answer part (e).

   a) All money is held as currency. The money supply will be $1,000.
   b) All money is held as demand deposits. Banks hold 100 percent of deposits as reserves. The money supply will be $1,000.
   c) All money is held as demand deposits. Banks hold 20 percent of deposits as reserves. The currency–deposit ratio is 0, and the money multiplier will be 1/0.2, or 5. The money supply will be $5,000.
   d) People hold equal amounts of currency and demand deposits. Banks hold 20 percent of deposits as reserves. The money supply will be $1,000.
   e) The central bank decides to increase the money supply by 10 percent. In each of the above four scenarios, how much should it increase the monetary base?

   a) If all money is held as currency, then the money supply is equal to the monetary base. The money supply will be $1,000.
   b) If all money is held as deposits, but banks hold 100 percent of deposits on reserve, then there are no loans. The money supply will be $1,000.
   c) If all money is held as deposits and banks hold 20 percent of deposits on reserve, then the reserve–deposit ratio is 0.20. The currency–deposit ratio is 0, and the money multiplier will be 1/0.2, or 5. The money supply will be $5,000.
   d) If people hold an equal amount of currency and deposits, then the currency–
deposit ratio is 1. The reserve–deposit ratio is 0.2 and the money multiplier is 
\((1 + 1)/(1 + 0.2) = 1.67\). The money supply will be $1,666.67.

e) The money supply is proportional to the monetary base and is given by 
\(M = m \times B\), where \(M\) is the money supply, \(m\) is the money multiplier, and \(B\) is the monetary base. Since \(m\) is a constant number defined by the currency–deposit ratio and the reserve–deposit ratio, a 10-percent increase in the monetary base \(B\) will lead to a 10-percent increase in the money supply \(M\).

7) Imagine that you are the chairman of the Federal Reserve. Assume, further, that the money supply has been growing at 3 % per year. You have been called before Congress to testify about the long-run effects of increasing the growth of the money supply to 10 % per year. State and then explain the long-run effects of this change on each of the following (give numerical estimates when possible):

a) the annual rate of inflation

\[\text{According to the quantity equation: } MV = PY\]
\[\text{Taking percentage changes of both sides yield:}\]
\[\%ΔM + \%ΔV = \%ΔP + %ΔY\]
\[3\% + 0\% = 3\%\]
\[\text{IF WE ASSUME that in the long run, } \%ΔY = 3\%, \pi = 0\%\]
\[\text{If } M^S \text{ grows at 10\%, } π = 10\% - 3\% = 7\%. \text{ Inflation rises by 7\%.}\]

b) the real interest rate

\[\text{Real interest rate remains unchanged.}\]

c) the nominal interest rate

\[i = r + \pi. \text{ Nominal rates rise by 7\%.}\]

d) the real exchange rate

\[\text{By classical dichotomy or PPP, real exchange rate remains unchanged.}\]

e) the nominal exchange rate

\[\%Δe = \%Δe + \%ΔP - %ΔP^*\]
\[\text{Since foreign inflation remains unchanged, U.S. nominal exchange rate drops}\]
\[\text{by 7\%.}\]
f) investment (ignore both taxes and uncertainty)

Investment is a function of r, so investment is unchanged.

g) real GDP

\[ Y = C + I + G. \] Output will not be affected.