

The Quantity Theory of Money

The relationship among money, price, and real output can be represented by the *equation of exchange*, which typically takes the following form:

$$MV = PQ$$

where

- M = the money supply
- V = the velocity of money (the number of times an average dollar bill is spent)
- P = the average price level
- Q = real value of all final goods and services (real gross domestic product [GDP])

This equation shows the balance between “money,” represented on the left side of the equation, and goods and services, represented on the right side of the equation. The equation shows that, for a given level of V, if M increases more than Q there must be an increase in P (inflation) to keep the two sides of the equation equal. This means that an increase in the money supply not offset by an increase in real output will lead to inflation. Classical economists assumed that the velocity of money was stable (constant) over time because institutional factors—such as how frequently people are paid—largely determine velocity. Therefore, changes in the money supply will lead to inflation if the economy is at full employment.

1. Define (in your own words and in one or two sentences each) the four variables in the equation of exchange.
2. The product of V and M equals PQ. What is PQ?
3. Suppose velocity remains constant, while the money supply increases. Explain how this would affect nominal GDP.
4. Changes in technology have led to increases in electronic transactions. Explain how these changes affect velocity.