Velocity of Money

From its name, the *velocity of money* must refer somehow to the speed of money.

Transactions Velocity of Money

The *transactions velocity* is the economy-wide dollar value of all transactions during a year, divided by the average money supply during the period:

$$\text{Transactions Velocity} = \frac{\text{Transactions}}{\text{Money}}.$$

The transactions velocity is the number of times on average that a dollar is used for a transaction. If the velocity were fifty-two, for example, then on average a dollar changes hands once each week.

Company Town

Consider a company town, in which weekly town product is \$100.

The money supply is \$100.

The workers are paid \$100 in wages each Friday, and on Saturday they spend the entire \$100 in the company store. Total transactions per year are

$$52 \times \$200 = \$10,400.$$

The transactions velocity of money is therefore

$$\frac{\text{Transactions}}{\text{Money}} = \frac{\$10,400}{\$100} = 104.$$

Each dollar changes hands twice per week and 104 times per year.

Income Velocity of Money

Let Y denote the nominal national income and product per year, and let M denote the average nominal money supply.

The income velocity v of money is nominal income divided by nominal money,

$$v = \frac{Y}{M}.$$

In the company town,

$$Y = 52 \times \$100 = \$5,200,$$

so the income velocity is

$$v = \frac{Y}{M} = \frac{\$5,200}{\$100} = 52.$$

Equivalently, the income velocity v is also real income y divided by the real money supply m, since

$$v = \frac{y}{m} = \frac{\frac{Y}{P}}{\frac{M}{P}} = \frac{Y}{M}.$$

Velocity is a Real Economic Variable

Since either the transactions velocity or the income velocity is a dollar value divided by another dollar value, velocity is a *real* economic variable.

Payday Every Two Weeks

Modify the company town example so the workers are paid only every two weeks. At payday they receive \$200 of wages, and the next day they spend the entire \$200 in the company store.

Consequently the economy now requires \$200 of money, twice as much as the original value.

Total transactions per year are unchanged, and total income per year is unchanged. Money does not circulate as quickly—both the transactions velocity and the income velocity are only half their original values.

Transactions Velocity Versus Income Velocity

At a minimum, each dollar of national income and product requires two dollars of transactions—one dollar when the workers and other producers are paid their incomes, and one dollar when the consumers buy the product. Consequently the transactions velocity must be at least twice the income velocity.

In practice the transactions velocity is more than double:

- intermediate goods transactions;
- financial transactions (very large).

Historical Trend in the Velocity of Money

As the economy develops, the transactions and income velocity both increase. The substitution of check and credit card for transactions reduces the need for cash. The volume of financial transactions relative to the national income and product rises.

Demand for Money

A simple model of the demand for money is that the system of banking and payments (real economic factors—frequency of paydays, use of checks and credit cards versus cash, etc.) determine the income velocity of money.

The real demand for money is then

$$m = \frac{y}{v},$$

proportional to the real income and product and inversely proportional to the income velocity.