

Managing a Money Machine

How often should a manager of a bank send someone to refill the money machine? To answer this question, the manager must know, on average, how many money machine transactions individuals make in a given day. The number of money machine transactions will depend on the level of purchases by consumers and on the interest rate. As the interest rate rises, the opportunity cost of spending money increases, since more interest is forgone when money is taken out of the bank. As the interest rate and the desired level of individuals' consumption change, the amount of money people will get from money machines changes. Managers of banks find regression analysis useful to aid in predicting how changes in consumption and interest rates will affect the use of money machines.

Table 3-8 presents the results of a study estimating the impact of changes in consumption and interest rates on the demand for money. Since the regression is in log-linear form, the coefficients of the variables are elasticities. For example, a 10 percent increase in consumption (C) will increase the use of money by 3.44 percent. During the Christmas season, when purchases are up, the money machine must be filled more frequently. Notice that the t -statistic for this parameter estimate is greater than 2, so consumption is a statistically significant determinant of the use of money.

The coefficient of the logarithm of the interest rate is $-.0545$ and represents the elasticity of the use of money with respect to the interest rate.

A 10 percent rise in the interest rate will reduce the use of money by roughly one-half of 1 percent. The t -statistic for this parameter estimate is slightly less than 2, so the interest rate is close to being a statistically significant determinant of the use of money, but less than our rule-of-thumb value of 2. Furthermore, the interest rate is not an economically important determinant of money use, because a large rise in the interest rate leads to a relatively small reduction in money use. The interest elasticity of money based on this study suggests that the demand for money is very inelastic with respect to the interest rate.

TABLE 3-8 The Demand for Money

$$\log M = 6.229 + .344 \log C - .0545 \log r$$

(6.25) (3.34) (1.89)

M = real currency balances

C = value of transactions (consumption)

r = interest rate on ordinary deposits

NOTE: The absolute values of the t -statistics are given in parentheses.

Source: Nils Gottfries, Torsten Persson, and Edward Palmer, "Regulation, Financial Buffer Stocks, and Short-Run Adjustment: An Econometric Case-Study of Sweden, 1970-1982," *European Economic Review* 33 (1989), pp. 1545-65.