Explain what is meant in macroeconomics by the terms *money* and *bonds*. Explain the elementary theory of *demand for money* and its relationship to *the velocity of money*. Think of three variables other than income, prices and the interest rate, which might affect the demand for money; describe and explain what effect you think each might have on the demand for money and velocity.

In Macroeconomics any financial asset is either a bond or money. A bond is a debt instrument, issued by a borrower and promising a specified stream of payments to the purchaser, usually regular interest payments plus a final repayment of principal. Bonds are exchanged on open markets including, in the absence of capital controls internationally, providing a mechanism for international capital mobility. Bonds cannot be used to pay for goods and services, their nominal value may fluctuate and they pay an explicit rate of interest. There is a relationship between bonds and interest rates, which is: as the price of a bond falls, the interest rate rises. Money is the sum of coin and note and bank deposits (cheques) which people use to buy goods and services. Its nominal value does not fluctuate and money does not typically pay an explicit rate of interest.

The demand for money is the quantity of monetary assets, such as cash and bank and other cheque accounts that people choose to hold in their portfolios. The demand for money will depend on expected return, risk, and liquidity of money and other assets. In practice two features of money are particularly important. First, money is the most liquid asset. This liquidity is the primary benefit of holding money, although alternative assets such as short-term government bonds for instance are no riskier than money and pay a higher return. Secondly, money pays low return. The low return earned by money, relative to other assets, is the major cost of holding money. Public's demand for money is determined by how they trade off their need for liquidity against the cost of a lower return. The macroeconomic variables that have the greatest effect on money demand are the price level, real income, and interest rates. Higher prices or income increases people's need for liquidity and thus raise the demand for money. As income falls however, purchase of bonds increases. Interest rates affect money demand through the expected return channel: the higher the interest rate on money, the more money people will demand; however, the higher the interest rate paid on alternative assets to money, the more people will want to switch from money to those alternative assets.

The velocity of money measures how often the money stock 'turns over' each period. The velocity of money is often described as the inverse of money to nominal income. If the velocity of money is increasing it basically means that money is changing hands faster. Specifically, velocity is nominal GDP divided by the nominal money stock. If velocity rises, each unit of money stock is being used in a greater volume of transactions in each period, assuming that the volume of transactions proportional to GDP. The velocity of money is a concept closely related to demand for money and one could say that they are interdependent. A rise in the interest rate on bonds will make people switch from money to bonds, which means that the demand for money will fall. This means that people will be spending more of their income, which is basically the concept of velocity. Hence a rise in interest rate lowers demand for money, or in other words, a rise in interest rate lowers the proportion of income that people wish to hold as money, which in turn, is the same thing as a rise in the velocity of money.

One of the variables that affect the demand for money is risk. Money usually pays a fixed nominal interest rate (zero in case of cash), so holding money itself is usually not risky. However, if the risk of alternative assets such as stocks and property increases greatly,

people may demand safer assets, including money. Thus increased riskiness of the economy may increase money demand. And as it has been explained above demand for money affects the velocity of money. Hence if the demand for money goes up people spend less of their nominal income and hence the velocity of money falls. Money however is sometimes risky. In a period of unpredictable inflation, even if the nominal return on money is fixed, the real return on money (which accounts for inflation) may become quite uncertain making money risky. Therefore demand for money will fall, as people will switch to other assets such as bonds, property, consumer durable goods, gold etc. As demand for money will fall the velocity of money will increase due to the reasons mentioned above.

Another factor that may affect money demand is the liquidity of alternative assets. The more quickly and easily alternative assets can be converted into cash, the less need there is to hold money. In recent years the joint impact of deregulation, competition, and innovation in financial markets has made alternatives to money more liquid. For example, with a home equity line of credit, a family can now write cheques that are backed by the value of its home. Hence as alternative assets become more liquid, the demand for money falls. This in turn will increase the velocity of money.

The third factor affecting the demand for money is payment technologies, which have been designed for making and receiving payments. For example the introduction of credit cards allowed people to make transactions without money – at least until the end of the month, when the payment must be made. Cash machines (ATM's) have probably reduced the demand for cash, as people know that whenever they need cash they get it out of the cash machine. Hence this has already caused a fall in demand for money and in the near future new innovations will probably be invented which will help people operate with less and less money. This in theory raises the velocity of money, however the cash is normally put into a bank and then it stays there- it does not change hands that quickly- therefore the effect of this on the velocity of money will probably be insignificant.