## **The Fischer hypothesis**



US nominal interest rates and inflation (%) 1955-

Figure 1: source US Federal Reserve and the Bureau of Labor Statistics

Figure 1 indicates that over a long period of time there has been a close relationship between US nominal interest rates and the rate of inflation. If the real interest rate is described as the nominal interest rate minus the rate of inflation, then this can be rearranged so that the nominal interest rate equals the sum of the real interest rate and the rate of inflation.

 $r^{no\min al} = r^{real} + \pi$ 

This relationship has come to be known as the Fischer hypothesis (after Irvin Fischer), which states that in the long run the nominal interest rate increases one for one with the rate of inflation. This can be explained by considering the impact of inflation on the demand and supply of money.

The demand for money is essentially determined by difference in the rates of return on money and bonds. Money is an asset that pays no interest, but inflation erodes its real value. Therefore the rate of return from holding money is equal to the negative of the inflation rate  $(-\pi)$ . The rate of return on bonds is equal to the real interest rate, which equal the nominal interest rate minus the rate of inflation  $(r^{real} = r^{no\min al} - \pi)$ . Therefore, the difference in the rates of return on bonds and money is equal to the nominal interest rate:

 $r^{no\min al} - \pi - (-\pi) = r^{no\min al}$ 

Because the rate of inflation does not affect the difference in returns between bonds and money it will have no effect on the overall real demand for money. However, rising prices will reduce the real money supply. Hence the contraction in the supply of money will lead to a position of excess demand in the money market. As the public try to increase cash holding by selling bonds, bond prices will fall and the nominal interest will rise. The increase in the nominal interest rate will then encourage substitution out of money into bonds, and the money market will equilibrate at a higher nominal interest rate.