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MONEY & INFLATION (*)

1. Quantity Theory of Money

Inflation is defined as a sustained and persistent increase in the general level of prices. The price level is measured by a price index such as the consumer price index (CPI). If we denote the price level at time t by P_t, then we can define the inflation rate between time t and t + 1 as:

$$\pi = \frac{P_{t+1} - P_t}{P_t} = \frac{\Delta P}{P}$$

Milton Friedman stated that "[in the long run] inflation is always and everywhere a monetary phenomenon." That is, inflation is completely due to a growing money supply. This view of the link between money and inflation arises from the quantity theory of money. Recall that the quantity theory starts with the basic identity of exchange:

$$MV \equiv PY$$

where M denotes the money supply, P denotes the price level, Y is the level of real GDP and V is the velocity of circulation of money. Velocity of circulation of money is the average number of times that the outstanding quantity of money (M) is passed round the economy as people make transactions (PY), that is,

$$V \equiv \frac{PY}{M}$$

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The identity of exchange is turned into the quantity theory of money when we put forward some behavioral assumptions. We will assume that the money demand is stable. This is the same as to say that V may be regarded as being stable over time at some level $\overline{V}$. With this assumption, we can write the following equation:

$$M\overline{V} = PY$$

Since $\overline{V}$ can be regarded as constant, if we take percentage changes on both sides of this equation, we arrive at the following expression:

$$\frac{\Delta M}{M} = \frac{\Delta P}{P} + \frac{\Delta Y}{Y}$$

re-arranging,

$$\frac{\Delta P}{P} = \frac{\Delta M}{M} - \frac{\Delta Y}{Y}$$

and defining,

$$\pi = m - g$$

where π, m and g are the percentage change in the price level (inflation rate), the money supply (money growth rate) and real GDP (real output change rate), respectively. The quantity theory thus predicts that the inflation rate will be equal to the money growth rate minus the output growth. This relation for a selected sample of countries is shown in Table 1.

Table 1. Money growth & Inflation

		Average annual rate of growth			
Country	**Period**	π	**m**	**g**	**m-g**
Ecuador	1958 - 85	7.4 %	12.5 %	5.6 %	7.9 %
Yugoslavia	1960 - 85	15.8%	21.1 %	5.6 %	15.5 %
Spain	1960 - 85	9.6%	14.0 %	4.2 %	9.8 %
USA	1960 - 85	4.8%	7.2 %	2.7 %	4.5 %
Bolivia	1960 - 85	403%	350%		

Source: IFS, IMF

Why are π and m so different in the case of Bolivia? (hint: the annual rate of growth of output, g, was not near 50%)

The empirical evidence for the long-run relation between money growth and inflation is so robust that today the bulk of the economic profession agrees with the above statement by Friedman. Some of this evidence is presented in the following figures.

Figure 1. Money and Inflation
(average annual growth: 70-95)

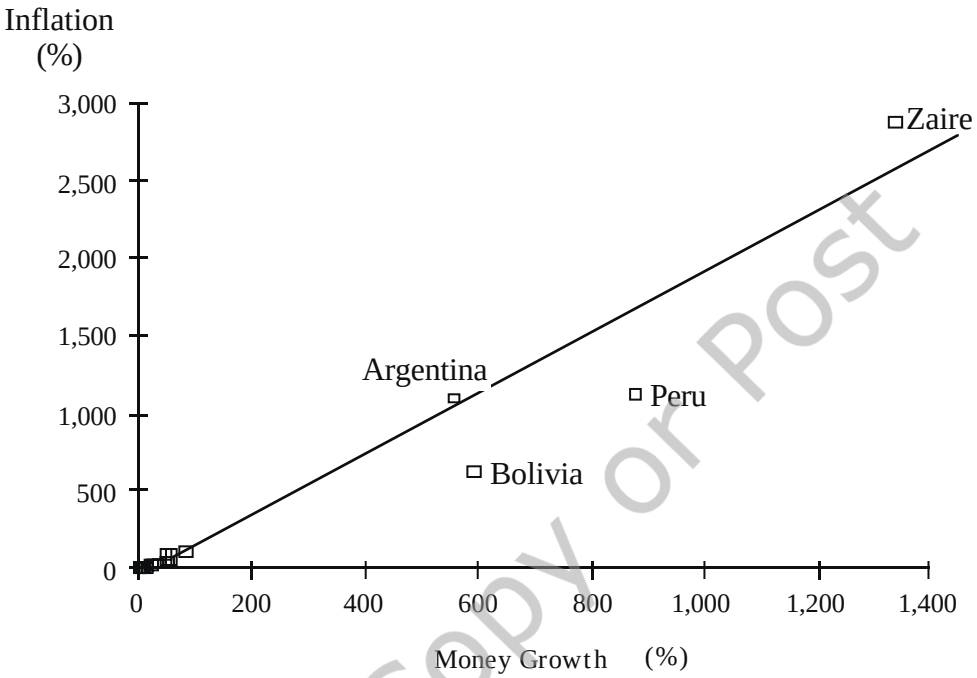
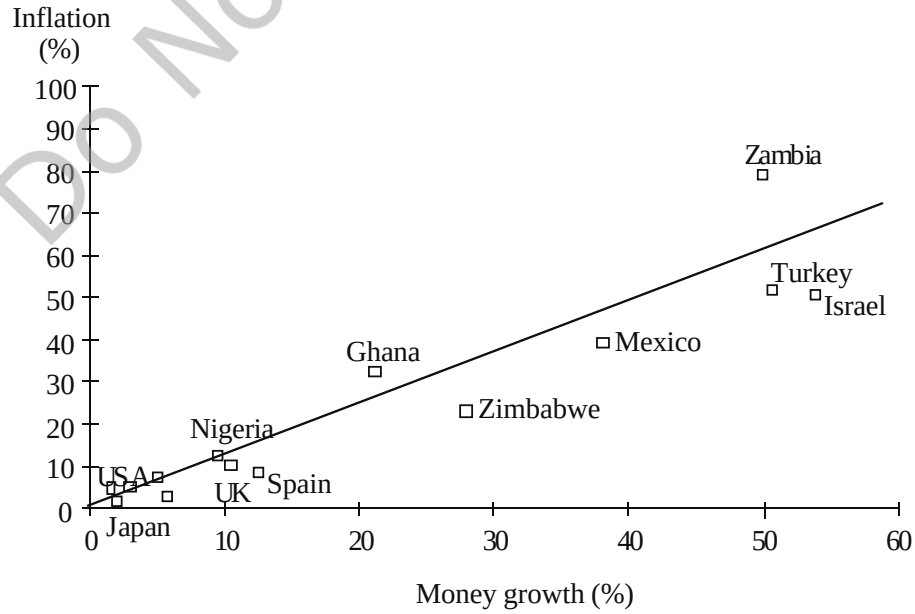


Figure 2. Money and Inflation
(average annual growth: 70-95)



This quantity theory approach to money and inflation can be illustrated in terms of our aggregate demand-aggregate supply diagram (see Figure 3 below). Starting from a long-run equilibrium where aggregate demand intersects short-run aggregate supply at $\underline{Y}$ (at the LAS curve), an unanticipated increase in the money supply causes AD to shift up and to the right: A to B. This is so, because the expansionary monetary policy will drive interest rates,