TOPIC 11: MONEY GROWTH, MONEY DEMAND, AND MODERN MONETARY POLICY*

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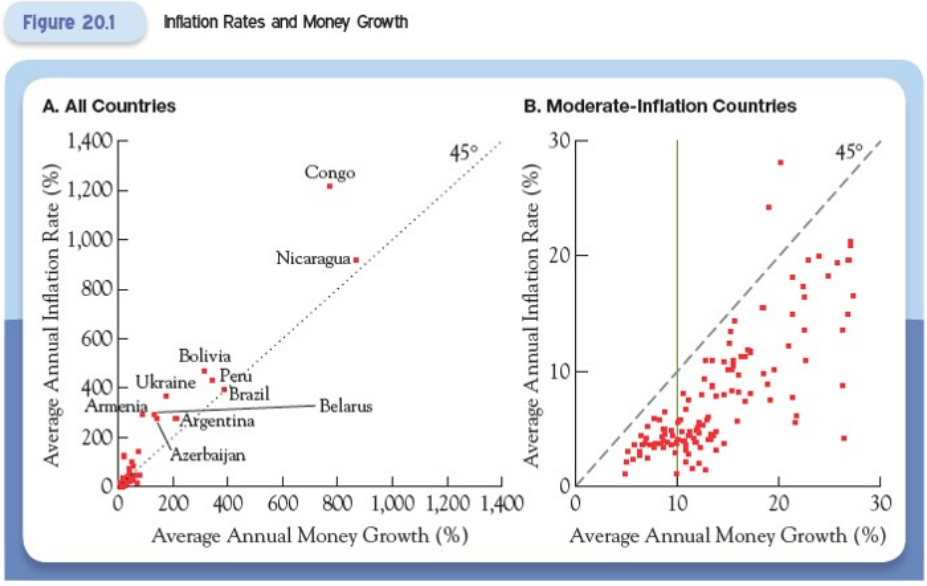
This lecture examines the link between money growth and inflation and explains the logic underlying central bankers' focus on interest rates. Even though most of the discussion about monetary policy these days seems to focus on interest rates and exchange rates, central bankers do care about money.

1 WHY WE CARE ABOUT MONETARY AGGREGATES

We begin by looking at the relationship between money growth and inflation rates. See Figure 20.1 below. Two observations:

- The two variables move together: the higher the money growth rate, the higher the inflation rate is likely to be.
- Countries with very high inflation tend to lie above the 45-degree line; countries with moderate to low inflation tend to fall below the line.



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Disclaimer: these are notes that I used by myself to lecture from and for educational purposes only. The material presented here is largely based upon the undergraduate textbook by Stephen Cecchetti and Kermit Schoenholtz (2014), *Money, Banking and Financial Markets*, 4th Edition, McGraw-Hill/Irwin. Please do NOT circulate.

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2 THE QUANTITY THEORY AND THE VELOCITY OF MONEY

If we think about the value/purchasing power of money in terms of goods and services needed to get money, then the price of money is determined by supply and demand. Given steady demand, an increase in the supply of money drives down the price of money, creating inflation.

The quantity theory of money. We focus on money as a means of payment. The quantity theory of money begins with the **equation of exchange**

$$\underbrace{M}_{\text{quantity of money}} \times \underbrace{V}_{\text{velocity of money}} = \underbrace{P}_{\text{price level}} \times \underbrace{Y}_{\text{real output}} \tag{2.1}$$

where M is the equilibrium quantity in the money market, the **velocity of money** is number of times each dollar is used (per unit of time), and PY gives the nominal output.[1] Several remarks:

- Using the relation that the percentage change in xy approximately equals the percentage change in x plus the percentage change in y, (2.1) becomes

$$\underbrace{\%\text{ change in } M}_{\text{money growth}} + \underbrace{\%\text{ change in } V}_{\text{velocity growth}} \approx \underbrace{\%\text{ change in } P}_{\text{inflation rate}} + \underbrace{\%\text{ change in } Y}_{\text{real growth}} \tag{2.2}$$

- Monetarists assume that V is unaffected by monetary policy at least in the medium run and so the velocity growth is zero. This implies that

$$\text{inflation rate} \approx \text{money growth} - \text{real growth} \tag{2.3}$$

  where real output growth is determined by the rate of technological progress and the rate of population growth.

- (2.3) suggests that money growth translates directly into inflation, an assertion that is termed the **quantity theory of money**. For example, doubling the quantity of money doubles the price level. As Milton Friedman put it, "inflation is always and everywhere a monetary phenomenon."
  - it explains why money growth and inflation tend to move together;
  - it explains the tendency for moderate to low inflation countries to fall below the 45-degree line because they are experiencing real growth.

[1] Recall that money supply M^s is determined by the central bank and the behavior of the banking system, money demand M^d depends on the nominal income and the interest rate, and equilibrium in the money market means that $M^d = M^s = M$.

- Historical data suggests that the velocity of money is stable in the long run, so that controlling inflation means controlling the growth of the monetary aggregates. But the short-run velocity of money is subject to great unstability.

- The short-run fluctuations in the velocity of money mainly depends on changes in money demand. People hold money in order to pay for the goods and services they consume—**transactions demand for money**—and as a way of holding their wealth—**portfolio demand for money**. See Table 20.1 below. The more money demanded (all other factors equal), the lower the money velocity.

Table 20.1 Determinants of Money Demand: Factors That Cause Individuals to Hold More Money

	Transactions Demand for Money
Nominal income	The higher nominal income, the higher the demand for money.
Interest rates	The lower interest rates, the higher the demand for money.
Availability of alternative means of payment	The less available alternative means of payment, the higher the demand for money.
	Portfolio Demand for Money
Wealth	As wealth rises, the demand for money goes up.
Return relative to alternatives	As the return on alternatives falls, the demand for money goes up.
Expected future interest rates	As expected future interest rates rise, the demand for money goes up.
Risk relative to alternatives	As the riskiness of alternatives rises, the demand for money goes up.
Liquidity relative to alternatives	As the liquidity of alternatives falls, the demand for money goes up.

3 TARGETING MONEY GROWTH IN A LOW-INFLATION ENVIRONMENT

Assigned as reading. While reducing money growth can be the solution to bring inflation down in a high-inflation environment, it may not work in a low-inflation environment. The use of money growth as an intermediate policy target depends on two criteria: [i.] a stable link between the monetary base and the quantity of money (money multiplier); and [ii.] a predictable relation between the quantity of money and inflation (relying on a stable velocity of money). You should know why the Fed and the ECB have both chosen the interest rates—the link between the financial system and the real economy—as their conventional operating target.