Tutorial 4: IS-LM Framework

ECON 3123: Macroeconomic Theory I

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Example 1: No-arbitrage

Consider a one-year risk-free bond with face value \$1,000. Suppose the risk-free interest rate is 5%. The bond is sold at \$980 today.

1. Is there any arbitrage opportunity? Describe how to make a profit. Assume that you are allowed to lend and borrow at the risk-free interest rate.
2. To avoid arbitrage, the issuer would like to provide some coupon. A coupon is an additional payment to investors, distributed at the end of each period Assume that coupon is distributed annually. Then what should be the coupon rate, i.e., the ratio of the amount of coupon to the face value?

Example 2: No-arbitrage

Consider a zero-coupon one-year bond with face value \$1,000. The risk-free interest rate is 5%. However, there is default risk on this bond. It has probability of 20% to pay only \$800 back to the investor and 80% probability to pay \$1,000 back.

1. What is the risk premium for this risky bond?
2. Describe how to make a profit using only the risk-free and risky asset.

Example 3: Numerical IS-LM

Consider the following behavioral equations:

$$C = 200 + 0.5(Y - T)$$
$$I = 500 - 2000(r + x) + 0.3Y$$

and the real money demand:

$$\frac{M^d}{P} = Y(0.8 - 5i).$$

Suppose that $G = 100$ and $T = 200$. The price level is 10, and the nominal money supply is 13000. The expected inflation is 2%, and the risk premium is 5%.

Example 3: Numerical IS-LM

1. Solve for the equilibrium output. What is the target nominal interest rate?
2. Can the central bank expand the money supply to 21,000? What nominal interest rate is it targeting?
3. What is the lower bound for real interest rate target? What is the upper bound for nominal money supply?
4. Keep the target rate as in part (1). Find the upper bound of tax such that there exists a positive equilibrium output.

Example 4: Policy Analysis

Consider an economy like Argentina in 2001. Due to rampant corruption from the government, massive tax evasion, and money laundering activities, both consumers and investors become very pessimistic about the Argentine economy. Suppose initially, the economy is in an equilibrium.

Example 4: Policy Analysis

1. Explain what happens to the economy in the short run when people become pessimistic about the economy. What will happen to output and the real interest rate?
2. If you are the government of Argentina, what would you do with government spending in order to offset the effects of the pessimism? What will happen to output, the real interest rate, investment, and the consumption as the result of the government's action?
3. If you are the central bank of Argentina, what kind of monetary policy that you can implement in order to offset the effects of the pessimism? What will happen to output, the real interest rate, investment, and the consumption as the result of the central bank's action?