

Lecture 6

The IS-LM Model





Lecture 6: The IS-LM Model

1. The IS Curve

2. The LM Curve

3. Shifts, Points of The IS-LM Model

& Incorporation Into Larger Models



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Precautionary Measure – запобіжний захід

Transactions Demand for Money – попит на гроші для здійснення операцій, транзакційний попит



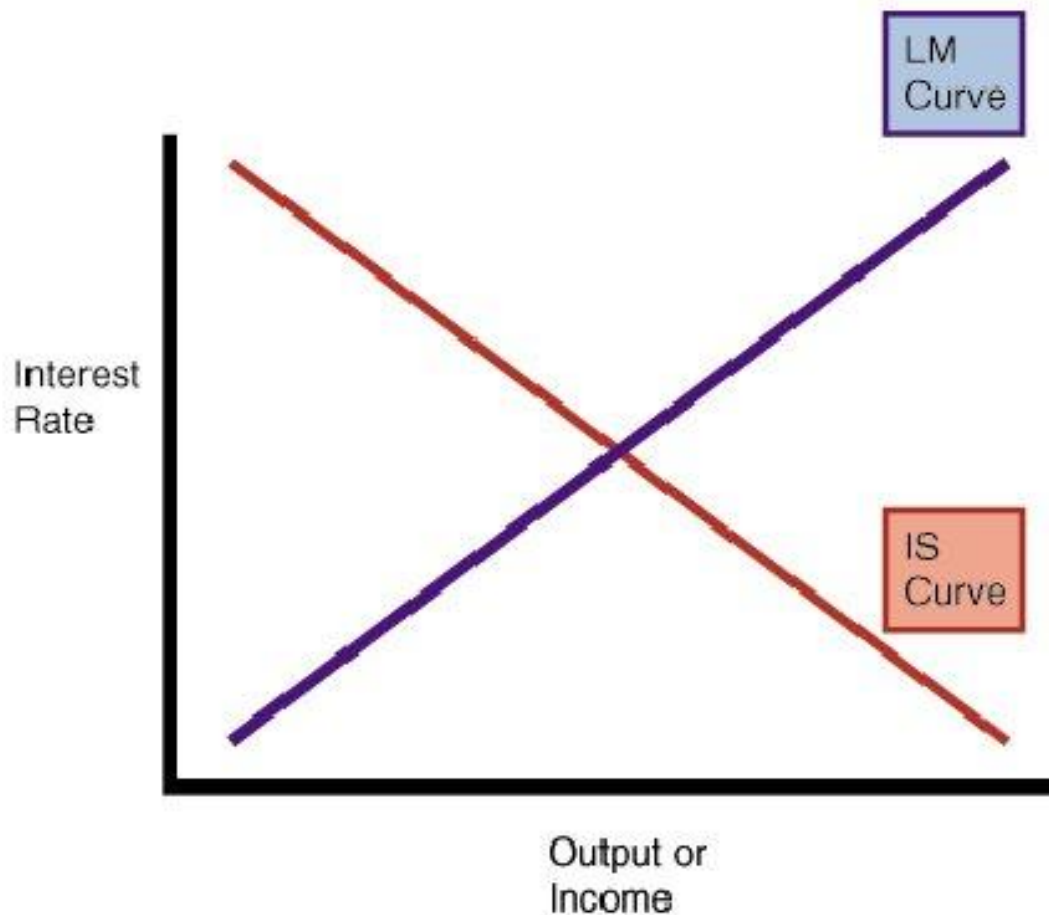
Lecture 6: The IS-LM Model

The IS-LM model is a macroeconomic tool that demonstrates the relationship between **interest rates** and **real output** in the **goods and services market** and **the money market**.

The intersection of the IS and LM curves is the **"General Equilibrium"** where there is simultaneous equilibrium in both markets. IS-LM stands for **Investment Saving — Liquidity preference Money supply**.



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For the **IS curve**, the independent variable is the interest rate and the dependent variable is the level of income (even though the interest rate is plotted vertically).

In equilibrium, all spending is desired or planned; there is no unplanned inventory accumulation (or, equivalently, when "leakages" from the circular flow equal "injections").



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The **IS curve** is defined by the equation

$$Y = C(Y - T) + I(r) + G + NX(Y)$$

where **Y** represents income, **C(Y - T)** represents consumer spending as an increasing function of disposable income (income, **Y**, minus taxes, **T**), **I(r)** represents investment as a decreasing function of the real interest rate, **G** represents government spending, and **NX(Y)** represents net exports (exports minus imports) as a decreasing function of income. In this equation, the level of **G** is presumed to be exogenous, meaning that it is taken as a given.

The IS curve describes **equilibrium in the product market** in terms of **r** and **Y**. The IS curve is **downward sloping** because as the interest rate falls, investment increases, thus increasing output.



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For the **LM curve**, the independent variable is income and the dependent variable is the interest rate.

The **LM curve** shows the combinations of interest rates and levels of real income for which the **money market is in equilibrium**. The initials **LM** stand for "Liquidity preference and Money supply equilibrium".



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Two basic elements determine the quantity of cash balances **demanded** (liquidity preference) and therefore the position and slope of the function:

- 1. Transactions demand for money:** this includes both the willingness to hold cash for everyday transactions and a precautionary measure (money demand in case of emergencies). Transactions demand is positively related to real GDP. This is simply explained - as GDP increases, so does spending and therefore transactions.
- 2. Speculative demand for money:** this is the willingness to hold cash instead of securities as an asset for investment purposes. Speculative demand is inversely related to the interest rate.



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The LM curve shows the combinations of interest rates and levels of real income for which **money supply equals money demand** — that is, for which the **money market is in equilibrium**.

The LM curve is **upward sloping** because higher income results in higher demand for money, thus resulting in higher interest rates. The intersection of the IS curve with the LM curve shows **the equilibrium interest rate and price level**.



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The **money supply** is determined by the central bank decisions and willingness of commercial banks to loan money. Mathematically, the LM curve is defined by the equation

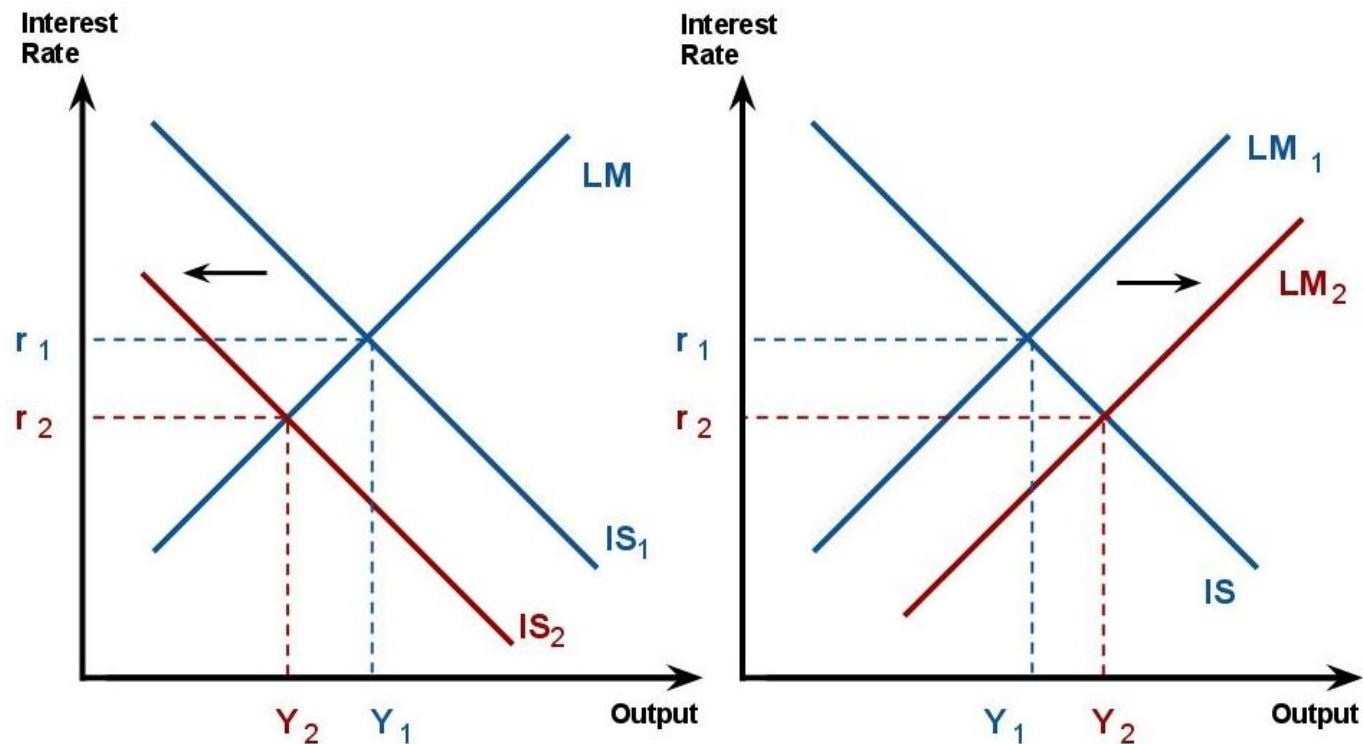
$$\mathbf{M/P = L(i, Y)}$$

where the supply of money is represented as the **real amount M/P** (as opposed to the nominal amount M), with **P** representing the price level, and **L** being the **real demand for money**, which is some function of the interest rate i and the level Y of real income.



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The IS curve and the LM curve **shift** in response to economic activities.



The IS curve shifts outward as a result of increased government purchases, exogenous increases in investment, decreases in taxes, and exogenous increases in consumption, and vice versa.

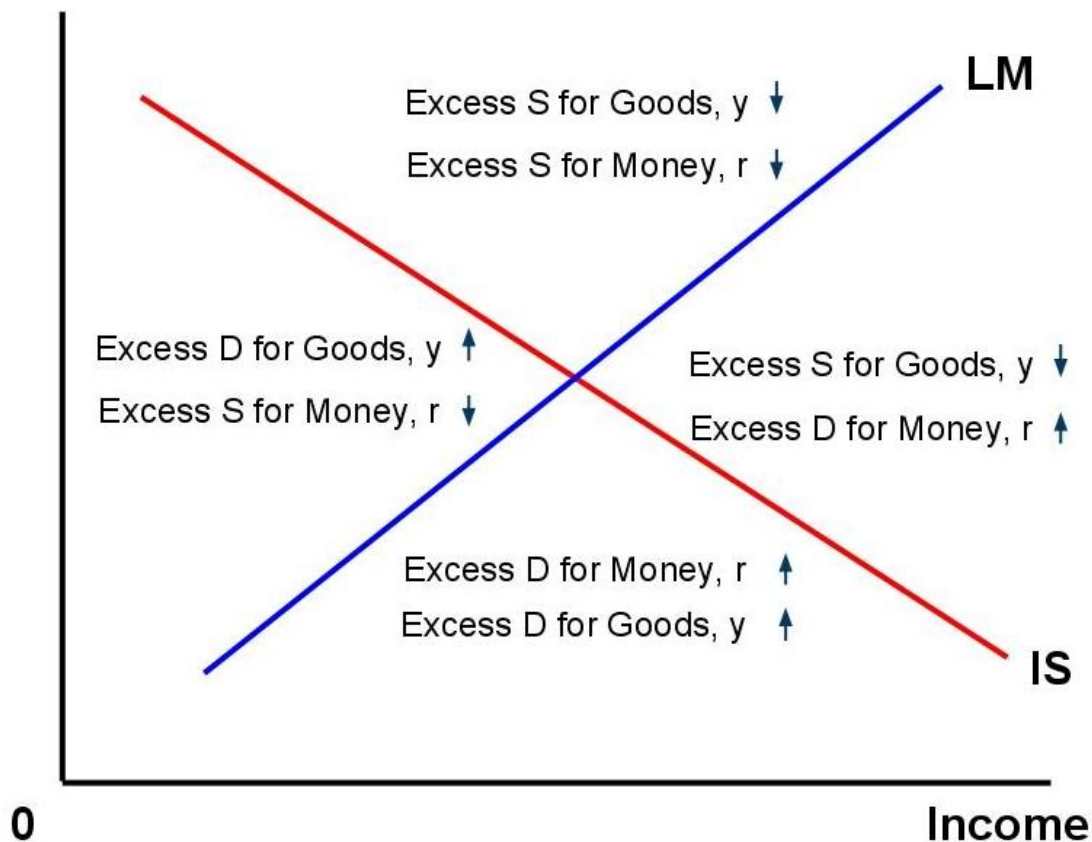
The LM curve shifts outward as a result of increases in the money supply and decreases in the price level, and vice versa.



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Points of IS-LM

Interest Rate



By itself, the **IS-LM model** is used to study the **short run** when **prices are fixed** or sticky and no inflation is taken into consideration.

But in practice the main role of the model is as a **sub-model of larger models** (especially the **Aggregate Demand-Aggregate Supply** model) which allow for a flexible price level.



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In the AD-AS model, each **point on the AD** curve is an **outcome of the IS-LM** model for aggregate demand Y based on a particular price level.

Starting from one point on the AD curve, at a particular price level and a quantity of aggregate demand implied by the IS-LM model for that price level, if one considers a higher potential price level, in the IS-LM model the real money supply M/P will be lower and hence the **LM curve** will be **shifted higher**, leading to lower aggregate demand; hence at the higher price level the level of aggregate demand is lower, so the AD curve is negatively sloped.



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Ring-ring!