Macroeconomics

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Macroeconomics is the study of the entire economy in terms of the total amount of goods and services produced, total income earned, the level of employment of productive resources, and the general behavior of prices. Macroeconomics can be used to analyze how best to influence policy goals such as economic growth, price stability, full employment and the attainment of a sustainable balance of payments.

Origins of Macroeconomic thought

Until the 1930s most economic analysis concentrated on individual firms and industries. With the Great Depression of the 1930s, however, and the development of the concept of national income and product statistics, the field of macroeconomics began to expand. Particularly influential were the ideas of John Maynard Keynes, who used the concept of aggregate demand to explain fluctuations in output and unemployment. Keynesian economics is based on his ideas.

One of the challenges of economics has been a struggle to reconcile macroeconomic and microeconomic models. Starting in the 1950s, macroeconomists developed micro-based models of macroeconomic behavior (such as the consumption function). Dutch economist Jan Tinbergen developed the first comprehensive national macroeconomic model, which he first built for the Netherlands and later applied to the United States and the United Kingdom after World War II. The first global macroeconomic model, Wharton Econometric Forecasting Associates LINK project, was initiated by Lawrence Klein and was mentioned in his citation for the Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel in 1980.

Theorists such as Robert Lucas Jr suggested (in the 1970s) that at least some traditional Keynesian macroeconomic models were questionable as they were not derived from assumptions about individual behavior. However, New Keynesian macroeconomics has generally presented microeconomic models to shore up their macroeconomic theorizing.

Today the main schools of macroeconomic thought are as follows:

- **Keynesian economics**, which focuses on aggregate demand to explain levels of unemployment and the business cycle. That is, business cycle fluctuations should be reduced through fiscal policy (the government spends more or less depending on the situation) and monetary policy. Early Keynesian macroeconomics was "activist," calling for regular use of policy to stabilize the capitalist economy, while some Keynesians called for the use of incomes policies.

- **Monetarism**, led by Milton Friedman, which holds that inflation is always and everywhere a monetary phenomenon. It rejects fiscal policy because it leads to "crowding out" of the private sector. Further, it does not wish to combat inflation or deflation by means of active demand management as in Keynesian economics, but by means of monetary policy rules, such as keeping the rate of growth of the money supply constant over time.

- **Post-Keynesian economics** represents a dissent from mainstream Keynesian economics, emphasizing the role of uncertainty and the historical process in macroeconomics.

- **New classical economics**, which explores the implications of rational expectations. Their original theoretical impetus was the charge that Keynesian economics lacks microeconomic foundations -- i.e. its assertions are not founded in basic economic theory. This school emerged during the 1970s. This school asserts that does not make sense to claim that the economy at any time might be "out-of-equilibrium". Fluctuations in aggregate variables follow from the individuals in the society continuously re-optimizing as new information of the state of the world is revealed.

- **New Keynesian economics**, which developed partly in response to new classical economics. It strives to provide microeconomic foundations to Keynesian economics by showing how imperfect markets can justify demand management.
Supply-side economics, which delineates quite clearly the roles of monetary policy and fiscal policy. The focus for monetary policy should be purely on the price of money as determined by the supply of money and the demand for money. It advocates a monetary policy that directly targets the value of money and does not target interest rates at all. Typically the value of money is measured by reference to gold or some other reference. The focus of fiscal policy is to raise revenue for worthy government investments with a clear recognition of the impact that taxation has on domestic trade.

Austrian macroeconomics presents another laissez-faire school of macroeconomics. It focuses on the business cycle that arises from government or central-bank interference that leads to deviations from the natural rate of interest.

It is important to understand that these schools of thought are not always in direct competition with one another -- even though they sometimes reach differing conclusions. Macroeconomics is an ever evolving area of research. The goal of economic research is not to be "right," but rather to be accurate. It is likely that none of the current schools of economic thought perfectly capture the workings of the economy. They do, however, each contribute a small piece of the overall puzzle. As one learns more about each school of thought, it is possible to combine aspects of each in order to reach an informed synthesis.

See also

Macroeconomic concepts:


Macroeconomic schools:

Austrian economics -- Keynesian economics -- Monetarism -- New classical economics -- New Keynesian economics -- Supply side economics -- Welfare economics

Macroeconomists:


Related topics:

Development economics -- Economics -- Political economy -- List of economics topics -- List of economic geography topics -- List of international trade topics -- Important publications in macroeconomics

Retrieved from "http://en.wikipedia.org/wiki/Macroeconomics"

Categories: Macroeconomics
Measures of national income and output are used in economics to estimate the value of goods and services produced in an economy. They use a system of national accounts or national accounting first developed during the 1940s. Some of the more common measures are Gross National Product (GNP), Gross Domestic Product (GDP), Gross National Income (GNI), Net National Product (NNP), and Net National Income (NNI).

There are at least two or three different ways of calculating these numbers. The expenditure approach determines aggregate demand, or Gross National Expenditure, by summing consumption, investment, government expenditure and net exports. On the other hand, the income approach and the closely related output approach can be seen as the summation of consumption, savings and taxation. The three methods must yield the same results because the total expenditures on goods and services (GNE) must by definition be equal to the value of the goods and services produced (GNP) which must be equal to the total income paid to the factors that produced these goods and services (GNI).

(GNP=GNI=GNE by definition)

In actual fact, there will be minor differences in the results obtained from the various methods due to changes in inventory levels. This is because goods in inventory have been produced (and therefore included in GDP), but not yet sold (and therefore not yet included in GNE). Similar timing issues can also cause a slight discrepancy between the value of goods produced (GDP) and the payments to the factors that produced the goods (particularly if inputs are purchased on credit).

### Contents

#### Gross National Product

**Gross National Product (GNP)** is the total value of final goods and services produced in a year by a country's nationals (including profits from capital held abroad).

**Final goods** are goods that are ultimately consumed rather than used in the production of another good. For example, a car sold to a consumer is a final goods; the components such as tires sold to the car manufacturer are not; they are *intermediate goods* used to make the final goods. The same tires, if sold to a consumer, would be a final goods. Only final goods are included when measuring national income. If intermediate goods were included too, this would lead to double counting; for example, the value of the tires would be counted once when they are sold to the car manufacturer, and again when the car is sold to the consumer.

Only newly produced goods are counted. Transactions in existing goods, such as second-hand cars, are not included, as these do not involve the production of new goods.

Income is counted as part of GNP according to who owns the factors of production rather than where the production takes place. For example, in the case of a German-owned car factory operating in the US, the profits from the factory would be counted as part of German GNP rather than US GNP because the capital used in production (the factory, machinery, etc.) is German owned. The wages of the American workers would be part of US GNP, while the wages of any German workers on the site would be part of German GNP.

<table>
<thead>
<tr>
<th>GNP Top 10 (2004) (currency exchange rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
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<td>5</td>
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<td>6</td>
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<td>7</td>
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<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

Gross Domestic Product

**Gross Domestic Product (GDP)** is the total value of final goods and services produced within a country's borders in a year.

GDP counts income according to where it is earned rather than who owns the factors of production. In the above example, all of the income from the car factory would be counted as US GDP rather than German GDP.

To convert from GNP to GDP you must subtract factor income receipts from foreigners that correspond to goods and services produced abroad using factor inputs supplied by domestic sources. To convert from GDP to GNP you must add factor input payments to foreigners that correspond to goods and services produced in the domestic country using the factor inputs supplied by foreigners.

GDP is a better measure of the state of production in the short term. GNP is better when analysing sources and uses of income.

**Gross Value Added**

The Gross value added is

\[
\text{GDP} - \text{taxes on products} + \text{subsidies on products} = \text{GVA}
\]

\[
\text{GVA} + \text{taxes on products} - \text{subsidies on products} = \text{GDP}
\]

**Depreciation and Net National Product**

Not all of GNP is available to produce final goods and services - part of it represents output that is set aside to maintain the nation's productive capacity. Capital goods, such as buildings and machinery, lose value over time due to wear and tear and obsolescence. **Depreciation** measures the amount of GNP that must be spent on new capital goods to offset this effect.

In the Income Approach:

- **Net National Product (NNP)** is GNP minus depreciation
- **Net National Income (NNI)** is NNP minus indirect taxes
- **Personal Income (PI)** is NNI minus retained earnings, corporate taxes, transfer payments, and interest on the public debt
- **Personal Disposable Income (PDI)** is PI minus personal taxes, plus transfer payments.

no C = personal consumption

PDI = personal disposable income

T_p = personal taxes paid

T_P_p = personal transfer payments received from governments

PI = personal income

RE = retained earnings
TC = corporate taxes
TPC = corporate transfer payments from governments
IG = interest on the public debt
NNI = net national income
TIN = indirect taxes
NNP = net national product
D = depreciation
GNP = gross national product

\[
S + C = PDI \\
S + C + TP_p - TP_p = PI \\
S + C + TP_p - TP_p + RE + TC - TPC - IG = NNI \\
S + C + TP_p + RE + TC - TPC - IG + TIN = NNP \\
S + C + TP_p - TP_p + RE + TC - TPC - IG + TIN + D = GNP
\]

**Real and nominal values**

**Nominal GNP** measures the value of output during a given year using the prices prevailing during that year. Over time, the general level of prices rise due to inflation, leading to an increase in nominal GNP even if the volume of goods and services produced is unchanged.

**Real GNP** measures the value of output in two or more different years by valuing the goods and services adjusted for inflation. For example, if both the "nominal GNP" and price level doubled between 1995 and 2005, the "real GNP" would remain the same. For year over year GNP growth, "real GNP" is usually used as it gives a more accurate view of the economy.

**National income and welfare**

GNP per person is often used as a measure of people's welfare. Countries with higher GNP often score highly on other measures of welfare, such as life expectancy. However, there are serious limitations to the usefulness of GNP as a measure of welfare:

- Measures of GNP typically exclude unpaid economic activity, most importantly domestic work such as childcare. This can lead to distortions; for example, a paid childminder's income will contribute to GNP, whereas an unpaid mother's time spent caring for her children will not, even though they are both carrying out the same economic activity.

- GNP takes no account of the inputs used to produce the output. For example, if everyone worked for twice the number of hours, then GNP might roughly double, but this does not necessarily mean that workers are better off as they would have less leisure time. Similarly, the impact of economic activity on the environment is not directly taken into account in calculating GNP.

- Comparison of GNP from one country to another may be distorted by movements in exchange rates. Measuring national income at purchasing power parity can help to overcome this problem.

- GNP does not take into account many factors that may be important to quality of life, such as the quality of the environment and security from crime. This can lead to distortions - for example, spending on cleaning oil spill is included in GDP, but the negative impact of the spill on well-being are not taken into account.

Because of this, other measures of welfare such as the Index of Sustainable Economic Welfare (ISEW) and Genuine Progress Indicator have been suggested.

**National accounting formulas (expenditure approach)**
C = Personal consumption expenditures
I = Gross private domestic investment
G = Government consumption expenditures
X = Net exports of goods and services
M = Net imports of goods and services
NR = Net income from assets abroad (net income receipts)
CC = Consumption of fixed capital
IBT = Indirect business taxes

\[ GDP = C + I + G + (X - M) \]
\[ GNP = C + I + G + (X - M) + NR \]
\[ NI = C + I + G + (X - M) + NR - CC - IBT \]

United States income and output

To give an example of the components and their size. ([3](http://www.federalreserve.gov/Releases/ Z1/))

<table>
<thead>
<tr>
<th>National income and output (Billions of dollars)</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period Ending</td>
<td></td>
</tr>
<tr>
<td>Gross national product</td>
<td>11,059.3</td>
</tr>
<tr>
<td>Net U.S. income receipts from rest of the world</td>
<td>55.2</td>
</tr>
<tr>
<td>U.S. income receipts</td>
<td>329.1</td>
</tr>
<tr>
<td>U.S. income payments</td>
<td>273.9</td>
</tr>
<tr>
<td>Gross domestic product</td>
<td>11,004.1</td>
</tr>
<tr>
<td>Private consumption of fixed capital</td>
<td>1,135.9</td>
</tr>
<tr>
<td>Government consumption of fixed capital</td>
<td>218.1</td>
</tr>
<tr>
<td>Statistical discrepancy</td>
<td>25.6</td>
</tr>
<tr>
<td>National Income</td>
<td>9,679.7</td>
</tr>
</tbody>
</table>

External links

- GVA - Gross Value Added ([http://www.tbr.co.uk/consultancy/projects/one_gva/](http://www.tbr.co.uk/consultancy/projects/one_gva/))


Categories: Macroeconomics

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National Income and Product Accounts

From Wikipedia, the free encyclopedia.

National Income and Product Accounts (NIPA) use double entry accounting to report the monetary value and sources of output produced in a country and the distribution of incomes that production generates. Data are available at the national and industry level.

The example is from the United States but the concept is general, varying mainly in the ways different countries collect taxes. The most recent U.S. report (updated quarterly) is available in several forms, including interactive, from links on the Bureau of Economic Analysis (BEA) NIPA ([1](http://www.bea.doc.gov/bea/dn1.htm)) page.

The NIPA summarizes national income on the left (debit, revenue) side and national product on the right (credit, expense) side of a two-column accounting report. The bottom line on both sides of the report is labeled "Gross Domestic Product." Since the report summarizes a set of accounts generated according to accepted practices, GDP must have the same value on both sides; income and expenditure must balance. The left side is presented first for convenient screen display.

## Contents

### Accounting for National Income: The Left Side of the Report

The income side of the National Income and Product Account report begins with the kinds of income people might have. Employee compensation includes the wages and salaries paid to anyone whose income is subject to income tax withholding. Since wages and salaries affect more individuals and families directly than the other sources of income, it has by far the largest value.

### Table 1: The Revenue Uses of GDP

National Income and Product Accounts of the U.S.

<table>
<thead>
<tr>
<th>Income Accounts</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee comp.</td>
<td>6,289.00</td>
</tr>
<tr>
<td>Proprietors’ inc. with IVA and CCA</td>
<td>834.10</td>
</tr>
<tr>
<td>Rental income of persons with CCA</td>
<td>153.80</td>
</tr>
<tr>
<td>Corporate profits with IVA and CCA</td>
<td>1,021.10</td>
</tr>
<tr>
<td>Net interest and miscellaneous payments</td>
<td>543.00</td>
</tr>
<tr>
<td>Taxes on production and imports</td>
<td>798.10</td>
</tr>
<tr>
<td>Less: Subsidies</td>
<td>46.70</td>
</tr>
<tr>
<td>Business current transfer payments (net)</td>
<td>77.70</td>
</tr>
<tr>
<td>Current surplus of government enterprises</td>
<td>9.50</td>
</tr>
<tr>
<td>National Income (NI)</td>
<td>9,679.60</td>
</tr>
<tr>
<td>Statistical discrepancy</td>
<td>25.60</td>
</tr>
<tr>
<td>Net National Product (NNP)</td>
<td>9,705.20</td>
</tr>
<tr>
<td>Consumption of fixed capital</td>
<td>1,353.90</td>
</tr>
<tr>
<td>Gross National Product (GNP)</td>
<td>11,059.10</td>
</tr>
<tr>
<td>Plus: Income payments to the rest of the world</td>
<td>273.90</td>
</tr>
<tr>
<td>Less: Income receipts from the rest of the world</td>
<td>329.00</td>
</tr>
<tr>
<td>Gross domestic product (GDP)</td>
<td>11,004.00</td>
</tr>
</tbody>
</table>


7/26/2005
Proprietors' income is the payments to those who own non-corporate businesses, including sole proprietors and partners. Inventory Value Adjustment (IVA) and Capital Consumption Adjustment (CCA) are corrections for changes in the value of proprietor's inventory (goods that may be sold within one year) and capital (goods like machines and buildings that are not expected to be sold within one year) under rules set by the U.S. Internal Revenue Service (IRS).

Rental income of persons excludes rent paid to corporate real estate companies. Real estate is capital rather than inventory by definition, so there is no IVA.

Corporate profits with IVA and CCA is like the entries for proprietors' income and rental income except that the organization is a corporation. Corporate profit is shown before taxes, which are part of Taxes on Production and imports, two lines down.

Net interest and miscellaneous payments is interest paid minus interest received plus payments to individuals and corporations that are not elsewhere classified (NEC). Taxes on production and imports includes corporate income tax payments to the states and to the federal government. While the report includes the net value of interest payments and receipts, both the taxes paid and subsidies from the government are shown.

National Income (NI) is the sum of employees, proprietors, rental, corporate, interest, and government income less the subsidies government pays to any of those groups.

Net National Product (NNP) is National Income plus or minus the statistical discrepancy that accumulates when aggregating data from millions of individual reports. In this case, the statistical discrepancy is US$25.6 billion, or about 0.23% of Gross Domestic Product. A discrepancy that small (less than three-tenths of one percent) is immaterial under accounting standards.

Gross National Product (GNP) is Net National Product plus an allowance for the consumption of fixed capital, mostly buildings and machines, usually called depreciation. Capital is used up in production but it does not vanish.

Finally, Gross Domestic Product (GDP) is Gross National Product plus payments from the rest of the world that are income to residents of the U.S. minus payments from the U.S. to the rest of the world that count as income where they are received.

**Accounting for National Product: The Right Side of the Report**

Macroeconomics defines GDP, from the production perspective, as the sum of personal consumption, investment, net exports, and government expenditures; \( GNP = C + I + (X - M) + G \).

### Table 2: Production Sources of Gross Domestic GDP

**National Income and Product Accounts of the U.S.**

[Billions of current US$]

<table>
<thead>
<tr>
<th>Product Accounts 1</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durable goods</td>
<td>950.70</td>
</tr>
<tr>
<td>Nondurable goods</td>
<td>2,200.10</td>
</tr>
<tr>
<td>Services</td>
<td>4,610.10</td>
</tr>
<tr>
<td>Personal consumption expenditures</td>
<td>7,760.90</td>
</tr>
<tr>
<td>Nonresidential</td>
<td>1,094.70</td>
</tr>
<tr>
<td>Residential</td>
<td>572.30</td>
</tr>
<tr>
<td>Change in private inventories</td>
<td>-1.20</td>
</tr>
<tr>
<td>Gross private domestic investment</td>
<td>1,665.80</td>
</tr>
<tr>
<td>Exports</td>
<td>1,046.20</td>
</tr>
<tr>
<td>Less: Imports</td>
<td>1,544.30</td>
</tr>
<tr>
<td>Net exports of goods and services</td>
<td>-498.10</td>
</tr>
</tbody>
</table>


7/26/2005
The production side report also begins with individuals and families, in this case their Personal Consumption Expenditures on goods and services, C in the definition. Durable goods are expected to last more than a year (furniture, appliances, cars, etc.) and to have little or no secondary resale market. Nondurable goods are used up within a year (food, clothing (especially children'!), medicine, ...). Services includes everything else, everything we buy that has little or no physical presence, like banking, health care, insurance, movie tickets, and so on.

Gross Private Domestic Investment includes expenditures on goods that are expected to be used for an extended period of time, I in the definition. Residential investment includes owner occupied and rental housing. Nonresidential investment includes buildings, machinery, and equipment used for commercial or industrial purposes (small business, agriculture, manufacturing, service, etc.). The last element of Investment accounts for any change in the value of previous investments that are still in use, called inventory.

Net Exports reports the balance between goods produced domestically but consumed abroad (X) and goods produced abroad but consumed domestically (M). There is no distinction between consumption and investment or between the private and public sectors; a consumer's imported television, a corporation's imported lab equipment, and the government's use of imported food on military bases count equally. When Net Exports are positive, the country has a trade surplus. When Net Exports are negative, there is a trade deficit.

Government Consumption Expenditures and Gross Investment includes all government expenditures on domestically produced goods and services. Like an individual or family, the government consumes food, clothing, furniture, and other goods and services in its administrative, military, correctional, and other programs. Governments also invest in buildings for program use and in improvements to harbors, rivers, roads, and airports.

The sum of the four production categories is Gross Domestic Product, the value of all domestic expenditures on goods and services. GDP (Income) must equal GDP (Production) except for any rounding error that accumulates when the data used to prepare a table includes rounding at prior stages of analysis, as appears to have happened in this case.

Notes

1 On 17 Sep 2004 the U.S. Bureau of Economic Analysis National Income and Product Accounting (US BEA NIPA) web site was http://www.bea.doc.gov/bea/dn1.htm. At that time, the tables cited here were downloaded as a wk1 format spreadsheet in a zip file through a button on that page.

The BEA's table and line numbers were removed for clarity and the sums were recalculated. Copies of the downloaded BEA NIPA tables used to construct the example, including table and line numbers, are in a pdf file.

The BEA offers the NIPA tables interactively and as txt, zipped wk1, exe, csv, and pdf files. Footnotes to the BEA's tables are available in their pdf file only. The downloads include the two most recent annual values and the five most recent quarterly values for each item. The quarterly values are seasonally adjusted at annual rates; they do not add to a reported annual value.

The income side of the report is derived from BEA NIPA Tables 1.7.5 (Relation of Gross Domestic Product, Gross National Product, Net National Product, National Income, and Personal Income) and 1.12 (National Income by Type of Income).

The production side of the report is derived from BEA NIPA Table 1.1.5 (Gross Domestic Product). There is a 0.1 (US$100M or 0.00091%) rounding error from the official GDP (11,004.0) in the recalculated sum on

Federal 752.20
State and local 1,323.30
Government consumption expenditures and gross investment  2,075.50
Gross domestic product (GDP) 5  11,004.10

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7/26/2005
2 Employee compensation includes wages and salaries plus employer payments for government insurance and pension programs.

3 IVA refers to Inventory Valuation Adjustment and CCA refers to Capital Consumption Adjustment; they are features of U.S. tax law.

4 Corporate profits reported here are before taxes. They are divided among Tax payments (234.90), Net dividends (395.30), and Undistributed profits (also known as Retained Earnings) (390.90).

5 GDP includes all goods and services produced within a country.

See also

- Macroeconomics
- Measures of national income and output


Categories: Macroeconomics | Economic indicators

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IS/LM model

From Wikipedia, the free encyclopedia.

The IS/LM model, first developed by Sir John Hicks and Alvin Hansen, has been used from 1937 onwards to summarize a major part of Keynesian macroeconomics. It can be presented as a graph of two intersecting lines in the first quadrant.

The abscissa represents national income or real gross domestic product and is labelled $Y$. The ordinate represents the interest rate, $r$. The graph thus represents the interface between the "real" and the "monetary" parts of the economy.

The IS schedule is drawn as a downward-sloping curve. The initials IS stand for "Investment/Saving equilibrium" but since 1937 have been used to represent equilibrium in the product market, where total spending (Consumer spending + planned private Investment + Government purchases + net exports) equals an economy's total output and income. To keep the link with the historical meaning, the IS curve can represent the equilibrium where total private investment equals total saving, where the latter equals consumer saving plus government saving (the budget surplus) plus foreign saving (the trade surplus). Either way, in equilibrium, all spending is desired or planned; there is no unplanned inventory accumulation (i.e., no general glut of goods and services).[1] (http://cepa.newschool.edu/het/essays/classic/glut.htm) The level of real GDP ($Y$) is determined along this line for each interest rate.

Thus the IS schedule is a locus of points of equilibrium in the "real" (non-financial) economy. Given expectations about returns on fixed investment, every level of interest rates ($r$) will generate a certain level of planned fixed investment and other interest-sensitive spending: lower interest rates encourage higher fixed investment and the like. Income is at the equilibrium level for a given interest rates when the saving consumers choose to do out of that income equals investment (or, more generally, when "leakages" from the circular flow equal "injections"). A higher level of income is needed to generate a higher level of saving (or leakages) at a given interest rate. Alternatively, the multiplier effect of an increase in fixed investment raises real GDP. Either way explains the downward slope of the IS schedule. In sum, this line represents the line of causation from falling interest rates to rising planned fixed investment (etc.) to rising national income and output.

The LM schedule is an upward-sloping curve representing the role of finance and money. The initials LM stand for "Liquidity preference/Money supply equilibrium" but is easier to understand as the equilibrium of the demand to hold money as an asset and the supply of money by banks and the Central Bank. The interest rate is determined along this line for each level of real GDP.

Rising GDP ($Y$) implies an increased transactions demand for money and liquidity preference. With a given and inelastic money supply curve, the equilibrium interest rate ($r$) rises. This explains the upward slope of the LM curve.

The point where these schedules intersect represents a short-run equilibrium in the real and monetary sectors (though not necessarily in other sectors, such as labor markets). In IS/LM equilibrium, both product markets and money markets are in equilibrium. Both the interest rate and real GDP are determined.

Shifts

One Keynesian hypothesis is that a government's deficit spending has an effect similar to that of a lower saving rate or

increased private fixed investment, increasing the amount of aggregate demand for national income at each individual interest rate. An increased deficit by the national government shifts the IS curve to the right. This raises the equilibrium interest rate (from \(r_1\) to \(r_2\)) and national income (from \(Y_1\) to \(Y_2\)), as shown in the graph above.

The graph indicates one of the major criticisms of deficit spending as a way to stimulate the economy: rising interest rates lead to crowding out – i.e., discouragement – of private fixed investment, which in turn may hurt long-term growth of the supply side (potential output). Keynesians respond that deficit spending may actually "crowd in" (encourage) private fixed investment via the accelerator effect, which helps long-term growth. Further, if government deficits are spent on productive public investment (e.g., infrastructure or public health) that directly and eventually raises potential output.

The IS/LM model also allows for the role of monetary policy. If the money supply is increased, that shifts the LM curve to the right, lowering interest rates and raising equilibrium national income.

**History**

The IS/LM model was born at the Econometric Conference held in Oxford during September, 1936. Roy Harrod, John R. Hicks, and James Meade all presented papers describing mathematical models attempting to summarize John Maynard Keynes' *General Theory of Employment, Interest, and Money*. Hicks, who had seen a draft of Harrod's paper, invented the IS/LM model. He later presented it in "Mr. Keynes and the Classics: A Suggested Reinterpretation" (*Econometrica*, April 1937).

Hicks later agreed that the model missed important points from the Keynesian theory. The problem was that it presents the real and monetary sectors as separate, something Keynes attempted to transcend. In addition, an equilibrium model ignores uncertainty. A shift in the IS or LM curve will cause change in expectations, causing the other curve to shift. Hicks therefore created the new Hicks-Hansen IS-LM Model to resolve some of the problems. Most serious macroeconomists see the IS/LM model as being at best a first approximation for understanding the real world.

**See also**

- IS-MP Model
- AD-IA Model


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