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MACROECONOMIC IDENTITIES

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Abstract. This article is dedicated to studying one of the key tools of macroeconomic analysis — macroeconomic identities. It examines the main relationships between gross domestic product, consumption, investment, savings, the government budget, and foreign trade. The economic significance of these identities, their role in both closed and open economies, and their practical application in evaluating and forecasting economic systems are analyzed. Special attention is given to the interactions between savings, investment, and government policy. The study can be useful for economic analysis, macroeconomic planning, and policy-making.

Keywords: Macroeconomic identities, Gross domestic product (GDP), Consumption, Investment, Savings, Government budget, Foreign trade, Open economy, Macroeconomic models, Taxes and budget policy, National income, Capital flows, Money market, Economic growth

Introduction. Macroeconomic identities represent the interrelationships and equalities between the main indicators of the national economy, which serve to analyze the overall state of the country's economy. Such identities include the interrelationships between important macroeconomic indicators such as gross domestic product (GDP), gross national product (GNP), national income (NI), employment, unemployment rate, and inflation.

Based on macroeconomic identities, it is possible to analyze the stability of the economy, growth rates, the ratio of investments and savings, and the equality of gross domestic product in terms of expenditures and income. Knowledge of these identities is important for creating economic policy and forming national economic strategies.

Below is information about the main macroeconomic identities and their analysis:

- The difference between gross domestic product (GDP) and gross national product (GNP) and their calculation methods are important in assessing the volume and level of production in the country's economy.
- The relationship between the volume of investments in the economy and savings is an indicator of macroeconomic stability.
- The unemployment rate and inflation rate are monitoring indicators of economic growth and employment level.
- National income and population incomes reflect economic activity and continuity in the economy.

Such identities are important tools for assessing the effectiveness of macroeconomic policy and for predicting and managing economic development.

Main Macroeconomic Indicators. In macroeconomics, main indicators play an important role in assessing the state and growth of the economy. They include:

- Gross Domestic Product (GDP)
- Gross National Product (GNP)
- Gross National Income (GNI)
- Inflation rate
- Unemployment rate
- Volume of investments
- Trade balance

GDP represents the total market value of all final goods and services produced within a country's territory during one year. This indicator is the main criterion for determining the volume and growth rates of the country's economy. This indicator is calculated in nominal and real terms; while nominal GDP is affected by inflation, real GDP shows real economic growth taking inflation into account.

For calculating macroeconomic indicators, there are basic formulas and methods that interrelate the main parameters in the economy such as production, income, expenditures, and prices. Below are the most commonly used formulas:

Gross Domestic Product (GDP) by production method: calculated as the sum of value added created at all stages of production.

GDP by expenditure method: GDP = C + I + G + (X - M), where C - consumption expenditures, I - investments, G - government expenditures, X - exports, M - imports.

Gross National Product (GNP) calculation: GNP = GDP + (foreign income within the country - income paid abroad).

National Income (NI) calculation: NI = GNP - depreciation (decrease in value due to wear and tear of fixed capital).

Unemployment rate: Number of unemployed / Total number of labor force * 100%.

Inflation rate: calculated as the growth rate of price indices (e.g., consumer price index) compared to previous periods.

Inflation deflator: Deflator = (Nominal GDP / Real GDP) * 100%.

These formulas are used to calculate the quantitative values of macroeconomic indicators. With their help, the overall state and development of the economy are analyzed. For each indicator, there are specific data and calculation methods that help economic analysts in decision-making.

Macroeconomic Identities. Macroeconomic identities are economic equations and patterns that represent the main indicators in the country's economy and their interrelationships. Their purpose is to understand and analyze the interrelationships between income and expenditures, production volume, investments, savings, and other economic processes in the economy.

The main macroeconomic identities include:

Equality of income and expenditures: gross domestic product (GDP) produced in the economy is calculated in two ways - expenditures (consumption, investment, government expenditures, exports-imports) and incomes (wages, profits, taxes, etc.). The equality of these two sides represents economic stability.

Equality between investments and savings: investments made in the country depend on the amount of savings, which determines the volume of capital in the economy.

Price indices: used to measure inflation and price changes (e.g., GDP deflator).

With the help of macroeconomic identities, the interrelationships between indicators such as economic growth, inflation, unemployment, aggregate demand and supply are understood. At the same time, they serve as an important tool for forming economic policy and assessing the overall state of the economic system.

Importance of Macroeconomic Identities. Macroeconomic identities represent economic equilibrium, that is, they help ensure the efficient allocation of resources in the economy and opportunities for sustainable growth in the long term. This equilibrium ensures interrelationships between national production, employment level, inflation, and other macroeconomic indicators. Disruption of macroeconomic equilibrium in the economy can lead to economic crises and problems.

Indicators used in analyzing the national economy. These indicators are determined as a result of the activities of all economic entities, and the basis for their calculation is the System of National Accounts (SNA). The SNA, acting as the country's accounting system, allows for the calculation of macroeconomic indicators based on its standards and for making international comparisons. To study the real state of the country's economy and to give it a systematic assessment, it is necessary to use all the indicators mentioned above, otherwise a one-sided approach may be taken.

In macroeconomic statistics and analysis, the indicators of gross national product and gross domestic product have been used equally for a long period. Although both aggregate indicators characterize the level of economic activity in the country, they differ from each other due to the existence of capital and labor force migration.

National product is the total volume of goods and services created in the country's economy. Gross national product is the total value of the total volume of goods and services created by national companies located in their own country or abroad.

Value added is the part that remains after subtracting current material costs from the market price of the enterprise or gross product (excluding depreciation).

According to the new interpretation of the UN SNA adopted in 1993, clarifications were introduced to the concept of Gross Domestic Product (GDP).

GDP is the total sum of market prices of final goods and services produced by the residents of a country for a certain period.

The System of National Accounts is used to calculate Gross Domestic Product (GDP).

The System of National Accounts (SNA) is a system of interrelated macroeconomic indicators, classifications, and groups that describe all basic economic processes, conditions of repeated production, processes and results.

The SNA began to be used in international statistics as a standard system based on the document "System of National Accounts and Auxiliary Tables" published by the UN in 1953. Since that period (from 1953) to the present day, the SNA has been changed and improved four times. However, it still needs improvement. Currently, it is used in more than 100 countries of the world.

GDP is calculated in three ways:

1. Production method;
2. Expenditure method;
3. Income method.

The volume of GDP calculated by all three methods should be equal to each other, excluding statistical errors. At the same time, specific requirements must be met when calculating the GDP indicator by all three methods.

Conclusion. This article is dedicated to studying macroeconomic identities, one of the fundamental analytical tools in macroeconomics. The main idea of the article is that these identities are fundamental equations representing the relationships and equalities between key indicators in a country's economy, such as Gross Domestic Product (GDP), national income, consumption, investment, savings, the government budget, and foreign trade.

As noted in the article, these identities, particularly through the expenditure method of GDP (GDP = C + I + G + (X-M)), enable an understanding of the equilibrium in both closed and open economies. The three methods of calculating GDP (production, expenditure, and income) and their mutual equality form the foundation of economic statistics.

The primary importance of these identities lies in the following:

1. **Economic Analysis:** They serve as a basis for assessing the overall state, growth rates, and stability of the economy.
2. **Policy Formulation:** By analyzing the relationship between savings and investment, they help in developing the government's budget, tax, and monetary policies.
3. **Forecasting:** They are an essential tool for anticipating changes in the economy and evaluating their consequences.

In conclusion, macroeconomic identities represent complex processes in the national economy in a simplified yet profoundly meaningful form. They are an indispensable tool for understanding the economy, identifying its problems, and making scientifically grounded decisions. Therefore, they are of paramount importance to economists, analysts, and policymakers.

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