

MACROECONOMIC MODEL AND ITS APPLICATION

by Dr. LÊ KHOA

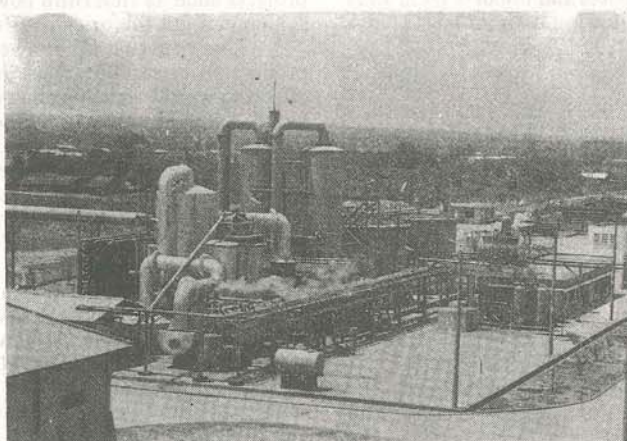
The economic model could be defined in common language or in the language of econometrics.

1. In common language, an economic model is a pattern with its own characteristics. For example, the Japanese fast development model is a pattern incorporating many characteristics of the fastest developing period of Japan (from 1950 to 1973). All of these characteristics are incorporated into a model.

Japan has no remarkable natural resources but its coast is favorable for building ports. The Japanese have made a real effort to build ports and industrial estates on the coast, and then, raw materials (agricultural products, ores...) bought from foreign countries at low prices were brought there and made into high quality products and sold at high prices. Technicians and scientists are held in high regard by the society. Excellent students from famous universities such as Tokyo are offered jobs of high salary and high positions in companies or administrative machinery. They will become real leadership of the nation.

The Japanese government spends only 1% of GDP on national defense and reduces the administrative expenditure, so the government need not impose heavy taxes on businesses but still have the ability to support private investment. In Japan, gross investment usually represents 30% of GDP (30% of which come from the government, 60% from businesses and 10% from private persons). Taxes on imported goods are heavy, on locally made goods are light. The lending rate of banks is low but the supply of credit is abundant. Therefore the return on investment of Japanese businesses is higher than that of American or European companies.

Just because of these measures, Japanese GDP has surpassed GDP of many leading European countries such as England, Germany and France in the 1960s, the Soviet Union in the 1980s. At present, the Japanese GDP is



second only to the American GDP.

Thus the fast development model of Japan is characterized by: holding high regard for technicians and scientists, importing raw materials only, developing the production of capital goods, developing high technology, minimizing expenditure on national defense and administrative machinery, maximizing investment, publicizing the public finance, etc. Any nation could follow its footsteps to develop the economy.

2. In the language of econometrics, because total goods sold is equal to total goods bought, so we have:

Aggregate demand = Aggregate supply (1)

GDP = expenditure + investment (2)

The equation (2) didn't take exports or imports into consideration. In fact, the aggregate supply is reduced by exports and increases because of imports, so the equation (2) should be as follows:

GDP + imports: Expenditure + Investment + Exports (3)

We can find out values of imports and exports in statistics yearbook and add values of illegal imports and exports but we should make calculations to find out values of GDP, expenditure and investment based on the SNA proposed by the UNO.

One of effective methods of finding out the GDP is the French accounting model. In French accounting, the economy is divided into four sectors: foreign sector, production sector, government sector and family sector. In each sector, there is a goods and service account and a capital account. The balance of the capital account is analyzed minutely in the stock market account and money market account. Another sector is the bank sector comprising money and near money account derived from balance of the money market account of four said sectors.

All entries are entered twice according to double entry accounting method. For example: salary and wage

is entered as a debit in production and government sectors, but as a credit in family sector; Vietnam exports: credit in production sector and debit in foreign sector, and so on. If all the entries have been correctly made, the total of all the debits must at any time equal the total of all the credits, that is, the balance must be zero. All these calculations will be made by computer. In addition to the national accounting summary, the computer will produce also the checklist, a list of basic equations and smart charts which change as variables change.

Besides equations (1), (2) and (3), there are many other equations:

gross investment = investment in production sector + investment in government sector + investment in family sector (4)

gross investment = imported capital goods + local capital goods (5)

imports = imported capital goods, raw materials, consumer goods (6)

Loans to production sector = investment credit + other credits (7)

Based on numerical data from the 1994 Statistics Yearbook converting into the US dollar and adding estimates of the value of illegal exports and imports from 1991 to 1994, we worked out the following estimates.

	1991	1992	1993	1994
GDP	8,760.5	10,048.6	12,329.20	14,836.3
+imports (1)	3,057.5	3,271.5	5,101.50	6,187.5
= aggregate supply (US\$ m.)	11,818.0	13,720.1	17,430.34	21,023.8
Investment	895.5	726.5	2,320.40	2,664.6
+exports (2)	2,320.4	2,944.3	3,350.20	3,966.7
+ expenditure	7,875.6	8,664.9	10,537.10	12,302.0
+inventory	726.5	889.3	1,413.50	2,105.5
= aggregate demand (US\$ m.)	11,818.0	13,720.1	17,430.34	21,023.8

Converting into the US dollar, it seems as if the Vietnam GDP increases faster than its 8% to 9.5% rate when it was calculated in VNĐ fixed price, because the VNĐ rises against the USD. Investment and expenditure also increase fast because of foreign investment, foreign aid and immigrant remittance.

Returning to the problem of economic model, all above mentioned data are ex post values. The important problem is that we should find out ex ante values. The ex ante econometrics method is called macroeconomic model.

According to this method, we get the following equations:

$$GDP = k \times \text{imports (8)}$$

This equation means that GDP is a function of imports. To increase imports is one of measures to increase GDP, because we have more machines and materials needed for production when imports increase.

In order to work out k, we put values obtained from 1992 to 1994 to the equation (8):

	1991	1992	1993	1994
GDP	8,760.50	10,048.60	12,329.20	14,836.30
+Imports (1) (1)	3,057.50	3,271.50	5,101.50	6,187.50
GDP/Imports =k	2.86	2.76	2.41	2.39

The value of k in 1995 is estimated at 2.38. Putting it into the equation (8), we obtain equation (9) which is called the model of relationship between GDP and imports:

$$GDP = 2.38 \times \text{imports}$$

We can forecast the Vietnam economic situation in 1996:

+ If Vietnam imports in 1996 are US\$ 8,000 - 8,500 - 9,000 million, GDP in 1996 will be US\$ 19.4, 20.2 and 21.4 billion respectively.

+ The value of k of Japanese economy is 10, of Vietnam is around 2.89, because Vietnam imports finished or semi-finished products at high prices and produces consumer goods or goods for export of low prices, whereas Japanese buy raw materials of low prices and sell high-price products.

We can alter the structure of imports by decreasing importation of consumer goods and increasing importation of machines (capital goods) and raw materials. Thus we can raise the value of k to 3.2 or 3.3 thereby increasing GDP in 1996.

Three equation (4), (5) and (6) show that we have many ways to increase investment:

- The equation (4) expresses the ability to increase investment in government, production and family sectors. In 1993, gross investment increased considerably because of increase in foreign and private investment. But the public investment was small because there is no big projects such as Hòa Bình power plant or Bim Sơn, Hoàng Thạch cement factories in previous years.

- The equation (5) shows that we had better develop production of capital goods in Vietnam. This is the most effective way to develop the economy, but unfortunately it is not realized properly in Vietnam.

- The equation (6) shows that we can increase investment by increasing importation of capital goods and reducing importation of consumer goods.

Combining three above equations, we can have a new model:

$$\Delta GDP = k \cdot \text{Investment}$$

In this model, the increase of GDP is a function of k and gross investment (k is investment efficiency). We can get high return on investment if we invest in production of high - tech products. An appropriate diplomatic policy can have good effects on the economic development if it can attract foreign aid, foreign investment or find out new markets for local products, etc.

Thus, we can use economic model to predict, intervene or make plan for national economic development ■

