

PRINCIPLES OF **MACRO** ECONOMICS

40
60% 35
RATE OF TAX
£10,001–12,000+
GROSS INCOME AND NE
1974£65.751976£95.9019
£5,001–5000 350 INCOME (£'s)
AVERAGE (EFFECTIVE RATE) OF TAX
TAXABLE INCOME
£16,201–£19,200
MARGINAL RATES
CORPORATION TA
£2225,000 (9X 25)
CREATED DEPOSIT
UK JAPAN US ITAL
GERMANY FRANCE
CANADA G7 AVER-
MANUFACTURING I
PROFITABILITY OF
UK COMPANIES 2
1960– 1970 3.0 3
MONEY SUPPLY G
GROWTH OF REAL
GNP(%) 4.7 3.4 4.
INTEREST RATES
3M INTERBANK
MONEY SUPPLY
33.2+21.9+25.6
NON-PRICE FAC-
TORS PRICE COMP-
ETITIVENESS
1980-90

Neil Fuller

with revisions by

Nigel Proctor

Principles of Macro Economics

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Introduction

For the new edition of this book it was felt that a more radical revision than usual was required. Hence not only has all the data and background information been up-dated but the entire text has been brought up-to-date to meet the needs of today's readers.

As with the earlier editions, the book is intended to assist students who have little or no prior knowledge of macro economics to rapidly grasp the main principles of the subject. It covers the requirements of most courses including A level, the first year of degree courses, the foundation stages of the professional bodies, graduate conversion courses, and should be particularly suitable for those on single semesters in macro economics. It has proved especially suitable for those students with no knowledge of the subject who need to proceed rapidly to a high level of understanding.

Theoretical aspects of macro economics are covered in detail and are illustrated with actual data wherever possible in order to link the theoretical and applied aspects of the subject. It is essential however that students recognise the need to read widely in the press, journals, and other published sources in order to keep abreast of events in this ever-changing area of study. Chapter 19 provides an up-to-date assessment of the major trends in the UK economy at the time of writing.

In order to aid their learning of the subject students are recommended to read through a chapter of the book and then test their understanding by attempting the end-of-chapter self-assessment questions, all of which can be answered from the material contained within the chapter.

The approach taken in the book is intended to clarify the key issues involved. Where mathematical proofs are involved they have been put into appendices in order to avoid confusing the less mathematical reader.

Material on the single European market and single currency has been included in order to incorporate the growing importance of the European dimension to the UK economy. The chapter on development economics reflects the growing interest in this area of study.

A glossary of terms has been included in order to provide an easy source of reference to the terminology of economics which those new to the subject often find difficult to grasp.

I am grateful for the help given to me by Nigel Proctor both in restructuring the material and for his assistance in up-dating the contents. I would also like to acknowledge Richard Ledward of Staffordshire University for his advice and assistance with the data collection, and my colleague David Barnes for his assistance and comments.

Neil Fuller 1997

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1

National income

1 National product

National income refers to the aggregate, or total, income of the nation which results from economic activity. Income however depends upon how much output is produced and as output is a continuous process rather than a stock, we have to measure this output over a specified time period, usually one year. Total output is referred to as **national product**, and includes all the **goods** and **services** produced each year.

2 A definition

National income was defined by Alfred Marshall as '**the aggregate net product of and sole source of payment to, all the agents of production.**' If this definition is studied closely we can identify three components:

- Aggregate net product of, i.e. total output.
- Sole source of payment, i.e. incomes.
- All the agents of production, i.e. how the national product is distributed, and therefore the source of all expenditure.

3 Measurement of national income

From this definition we can identify three possible methods of measurement:

- **output**
- **income**
- **expenditure.**

Measurement by either of these methods will produce identical results because theoretically:

$$\text{national income} = \text{national output} = \text{national expenditure}$$

4 Circular flow

In order to understand the concept of income as a **flow** it is useful to study the **circular flow of income** in the form of a **flow diagram**. If Figure 1.1 is studied closely it can be

seen that households provide the supply of productive services to firms and in return receive the factor rewards of wages, rent, interest and profit. These are the total of all incomes to households and will therefore form the basis of all expenditures. When expenditures are made with firms in the form of consumption then there must be an equivalent flow of goods and services from firms to households. It is therefore possible to measure each of these flows and achieve the same result, hence the conclusion that national income = national output = national expenditure. In reality the circular flow Figure 1.1 needs to be highly qualified, for example much of national expenditure is in the form of investment expenditure between firms, however it does illustrate the concept of national income as a flow.

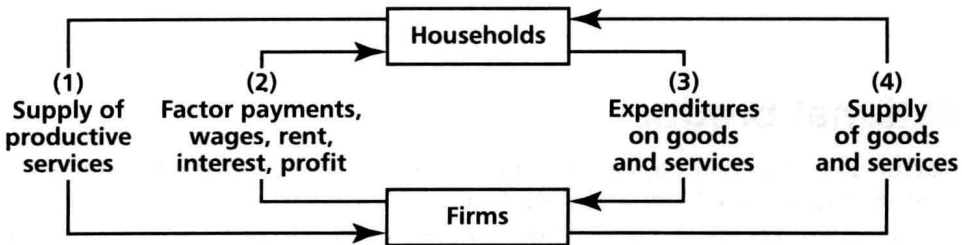


Figure 1.1

5 A summary

To summarise therefore national income can be regarded as:

- the total value of the goods and services produced by all the industries and public services during the year.
- the total expenditure on final goods and services for consumption and investment purposes during the year.
- the factor cost of national output in terms of all the earnings in producing the national output.

✓ 6 Real values

National income is estimated in money terms because money is the most convenient 'measuring rod', however care must be taken in comparing national income over time as a rise in the monetary value of national income does not necessarily imply a rise in living standards. The only real measure of whether national income has grown is whether the real value of output has increased, and it is possible that any apparent increase is a result of rising prices. For this reason data must be 'deflated' by a suitable index before comparisons of national income between different time periods can be made. One method of deflating data is to use the retail price index.

$$\frac{\text{national income at current prices}}{\text{RPI}} \times 100$$

This method produces national income at **constant prices**. If the index was based on prices in 1995, i.e. 1995 = 100 then the index could be said to be 'at 1995 prices'. As inflation has been removed from the data comparisons over time become more meaningful. National income and expenditure (The Blue Book) presents national income data in both current and constant prices. (See Chapter 9, Appendix for example).

7 GNP and GDP

Gross **National Product (GNP)** and Gross **Domestic Product (GDP)** differ because some output produced within the UK is produced by foreign owned firms and the profits and interest are paid abroad to the owners. Similarly some productive resources overseas are owned by UK residents and the profits and interest are remitted back to them. The difference between payments made abroad and payments received from abroad is referred to as **net property income from abroad** and constitutes the difference between GNP and GDP. Gross domestic product as the name suggests, refers to the output of all domestically (i.e. UK) **located** resources, whilst GNP is the output of all resources **owned** by UK residents, i.e:

Gross National Product = Gross Domestic Product + net property income from abroad

N.B. domestic product is output produced within the UK.

✓ 8 Capital consumption

During the course of production assets become worn out and require replacement. This is referred to as **capital consumption** or more commonly, **depreciation**. This is a cost which must be incorporated within national income accounting and is deducted from gross national product to obtain the **net national product**; also referred to as the **national income**, i.e.

Gross National Product less depreciation = Net National Product = National Income

We can now consider the three methods of estimation separately.

9 The expenditure method

This method measures the total amount of final expenditures in the course of a year. It includes:

- Consumer's expenditure on goods and services.
- Investment expenditure by firms.
- Additions to stocks are included as nominal expenditure.
- Expenditure by public authorities on goods and services.

A number of adjustments must be made to the data in order to arrive at the final figure:

- Because the data collected is at market prices a number of adjustments have to be made in order to find the factor cost, i.e. market prices may be distorted by taxes and subsidies, and may not reflect the true cost. As subsidies artificially reduce the market price they are added back on, and as indirect taxes raise the price they are deducted, i.e.

Factor cost = market price + subsidies – indirect taxes

- An adjustment has to be made for the sale of output abroad (exports) and the purchase of goods from abroad (imports).

The expenditure method of calculation is therefore as shown in Table 1.1.

TABLE 1.1 The expenditure method

	Consumers' expenditure
Plus	Public authorities current expenditure on goods and services
Plus	<u>Gross capital formation (investment) at home including increases in stocks</u>
=	Total domestic expenditure at market prices
Plus	Exports and income from abroad
Less	Imports and Income paid abroad
Less	Taxes on expenditure
Plus	<u>Subsidies</u>
=	Gross national product at factor cost
Less	<u>Capital consumption (depreciation)</u>
=	National income

10 The output method

This method measures the total output of all consumer goods and services, and investment goods, produced by all the firms in the country during the year. This measure can be obtained by totalling the **final** goods and services produced, or by taking the totals of **value added**. For example, imagine a firm which mines nitrates and sells the crude product to a chemical extracting company at £80 per ton. After refining it is sold to a fertiliser company at £100 per ton who produce and package garden fertiliser for sale to the retail trade at £150 per ton. The retailer sells it to his retail customers at the equivalent of £250 per ton. This is represented diagrammatically in Figure 1.2.

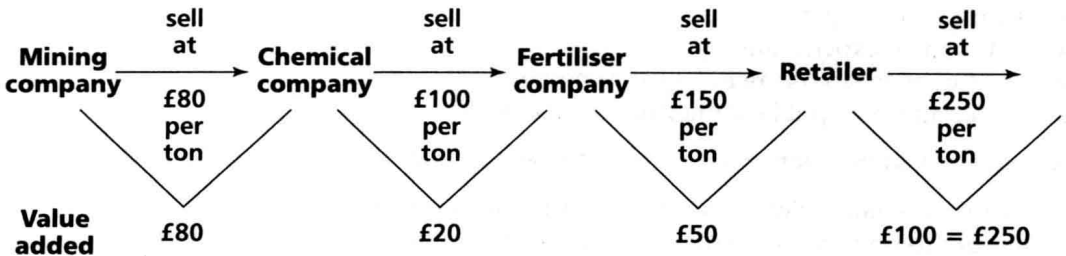


Figure 1.2

It should be noted that the sum of the value added (£250) is the same as the value of retail sales. Therefore either the value of the final goods or the total of value added can be used. What cannot be done is to add the value of output at each stage because this would involve counting the same item more than once, i.e. the £100 to the fertiliser manufacturer includes the £80 to the mining company. This error is referred to as **double counting** and can be a serious source of error in national income accounting.

The output of all industry is classified according to the official Standard Industrial Classification (SIC) and is added together to obtain total output.

A number of 'adjustments' have to be made to the output figures:

- Artificial increases in stock values due to inflation (stock appreciation) have to be deducted.
- Net property income from abroad.
- The 'residual error' (statistical discrepancy).

TABLE 1.2 The output method

	Agriculture, forestry and fishing
Plus	Mining and quarrying
Plus	Manufacturing
Plus	Construction
Plus	Gas, electricity and water
Plus	Transport
Plus	Communication
Plus	Distributive trades
Plus	Insurance, banking and finance
Plus	Public administration and defence
Plus	Public health and educational services
Plus	Other services
Plus	<u>Ownership of dwellings</u>
	Total domestic output
Less	Stock appreciation
Plus/Minus	Residual error
Plus/Minus	<u>Net property income from abroad</u>
=	Gross national product at factor cost
Less	<u>Capital consumption</u>
=	National income

11 The income method

- This method measures the total money value of all incomes received by persons and firms in the country during the year. These incomes may be in the form of wages, salaries, rent or profit.
- Care must be taken to exclude **transfer payments** such as student grants, pensions and unemployment benefit. These are excluded because they do not represent payment for a contribution to output but are transfers of income from one group to another.
- Adjustments have to be made for the undistributed profits of companies and the surpluses of the nationalised industries which are paid to the government.
- Adjustments also have to be made for stock appreciation and net property income from abroad.

The income method of calculation is therefore:

TABLE 1.3 The income method

	Income from employment
Plus	Income from self employment
Plus	Profits of private companies and public enterprises
Plus	<u>Rent</u>
=	Total domestic income
Less	Stock appreciation
Plus/Minus	Residual error
Plus/Minus	<u>Net property income from abroad</u>
=	Gross national product
Less	<u>Capital consumption (depreciation)</u>
=	National income

In theory the three methods must balance, but in reality they may differ due to errors and delays in returns; the residual error is added to ensure that they do balance. The source of some of these errors is found later and the figures are adjusted in subsequent years.

12 Problems of calculation

A number of problems are encountered in the calculation of national income, the main ones being:

- The problem of double counting (see 10).
- Transfer payments (see 11).
- Underestimates may occur where goods and services do not enter the market and are therefore unrecorded. For example, goods consumed by those producing them, as is the case with farmers; or farm labourers who receive part of their income in kind.

- Unpaid personal services are excluded, e.g. the work of housewives. Housework is an indirect contribution to output in that it enables others in the family to make a more direct contribution.
- Data collection may be inadequate due to firms failing to send in returns or making errors. Also much of the information is originally collected for different purposes, e.g. tax returns.
- The growth of the 'black economy'; in recent years it has been suggested that as much as 7½% of GDP may go unrecorded. The 'black economy' refers to that part of economic activity which is undeclared and therefore unrecorded for tax purposes, and is therefore deemed to be 'illegal'. Research suggests that there has been considerable growth in this sector over recent years.

13 International comparisons

International comparisons of national income as a basis for comparing 'standards of living' is subject to a number of qualifications:

- Whether or not a particular level of national income implies a high material standard of living also depends upon population size, and measurement requires an estimate of **per capita** income, i.e.

$$\text{NNP at factor cost} = \frac{\text{Per capita income}}{\text{Population}}$$

Therefore the growth of NNP must be greater than population growth in order for living standards to rise.

- 'Standard of living' is a subjective evaluation and other nations may put more value upon non-material aspects which do not enter national income accounting.
- Climatic differences may mean that although national income may be lower in some countries they have to spend less on fuel and clothing to keep warm.
- Transport in large countries where there are dispersed centres of population may absorb a higher proportion of national income.
- The use of exchange rates to convert national income statistics into a common currency unit may produce unreliable results for comparison purposes.

14 Living standards

Whether or not an increase in national income is the same thing as an increase in welfare is a matter of some discussion as national income measurements fail to include factors which many would suggest were an essential aspect of 'welfare', but which cannot be measured purely in terms of material goods. In particular they would indicate:

- 'Externalities' such as environmental pollution which may actually become worse as the rate of growth of national income increases.
- The level of provision of 'merit' goods such as education, health and welfare.
- The production of 'demerit' goods such as alcohol and tobacco.
- The level of provision of government transfers such as pensions, grants and social security benefits which are specifically excluded from the statistics in order to avoid double counting, but it could be argued that they cannot be omitted from any measure of welfare.

National income measurements do provide however an indication of whether or not output, and therefore incomes, is rising, and provided the qualifications are borne in mind during interpretation they do provide a useful indication of the trends in the economy.

The following page shows national income statistics for the UK 1995 measured by each of the three methods.

Self assessment questions

- 1 What is meant by the circular flow of income?
- 2 State the three methods by which national income can be calculated.
- 3 How does the problem of 'double counting' occur?
- 4 What are 'transfer payments'?
- 5 Outline the problems which occur in making international comparisons of national income.
- 6 Describe in detail one method of national income calculation.

TABLE 1.4

UK National Income 1995 (millions £)

Income	
Income from employment	377,900
Income from self employment	67,700
Gross trading profits of companies	91,000
Gross trading surplus of public corporations	4,600
Gross trading surplus of general government enterprises	600
Rent	62,800
Imputed charge for consumption of non trading capital	4,700
Total domestic income	609,300
Less stock appreciation	-4,800
Residual error	-200
Gross domestic product at factor cost	604,300
Net property income from abroad	9,600
Gross national product	<u>613,900</u>
Less capital consumption	73,300
National income (net national product)	540,600

(Continued)

Output	
Agriculture, forestry and fishing	11,900
Mining, quarrying, including oil and gas extraction	14,600
Energy and water supply	15,800
Manufacturing	131,700
Construction	31,800
Wholesale and retail trade, repairs, hotels and restaurants	84,700
Transport, storage and communications	50,800
Financial intermediation, real estate, renting and business activities	158,200
Public administration, defence, social security	39,500
Education, health and social work	73,000
Other services	23,200
Adjustment for financial services	-30,700
Statistical discrepancy	<u>-200</u>
Gross domestic product at factor cost	<u>604,300</u>
Net property income from abroad	9,600
Gross national product at factor cost	<u>613,900</u>
Less capital consumption	73,300
National income (net national product)	540,600

National income

(Continued)	
Expenditure	
Customers expenditure	447,200
General government final consumption	149,500
Gross domestic fixed capital	105,400
Value of physical increase in stock and work in progress	3,900
Total domestic expenditure	706,000
Exports of goods and services	197,600
Total final expenditure	903,600
Less imports of goods and services	-203,100
Statistical discrepancy	400
Gross domestic product at market prices	<u>700,900</u>
Net property income from abroad	9,600
Gross national product at market prices	<u>710,500</u>
Less taxes on expenditure	-103,600
Subsidies	7,000
Gross national product at factor cost	<u>613,900</u>
Less capital consumption	73,300
National income (net national product)	540,600

2

International trade

1 Reasons for trade

Nations engage in international trade for a variety of reasons:

- Due to **climatic differences** some goods would not be available in many parts of the world without trade. For example, coffee grows prolifically between the tropics, but not elsewhere. This is true of many natural commodities.
- **Natural resources** are not evenly distributed throughout the world, for example many countries have no coal or oil reserves whilst others have a surplus over their domestic requirements.
- **Skills and technology** are also not distributed evenly and whilst some countries have a high level of technological development others have a much lower level, both will therefore tend to produce goods of a different nature.
- Because factors of production and natural resources tend to be **immobile** it is more convenient to specialise in the production of those goods in which there is a natural, or acquired advantage, and trade the surplus not required for domestic consumption for those goods which cannot be produced.

2 Specialisation and trade

Although it was stated above that certain crops would not grow naturally in some regions of the world, it is not true that they could not be grown given sufficient diversion of resources to their production. For example, bananas can be grown quite successfully in heated greenhouses in the UK, but the cost would be very high and therefore the output would only be available to the wealthiest people. It is far more efficient for each country to use its resources in the production of those goods in which they have a cost advantage and trade with other nations to obtain those goods which are not produced. For example, the UK has an advantage over the West Indies in the production of machinery whilst the West Indies for climatic reasons can grow an abundance of bananas. It is therefore more efficient for Britain to **specialise** in the production of machines and trade with the West Indies for bananas. Both countries then enjoy the **gains from trade** which result from **specialisation**.

Specialisation and trade increase world output and enables everybody to enjoy a higher standard of living than would be otherwise available. A wider variety of goods are made available to more people.

3 The law of comparative advantage

The **law of comparative costs** shows that countries can gain from specialisation and trade provided that there is some difference in the **relative costs** of producing those goods. The **opportunity cost** of producing a good domestically may be too high, for example the growing of bananas in the UK quoted above.

To illustrate the law of comparative costs, suppose there are two countries X and Y. Both produce just two goods, beef and cars. Both countries have an equivalent amount of capital and labour but X has abundant grasslands and suitable climate for beef production whilst Y has less favourable climate and agricultural conditions but a more highly skilled workforce. There are no unemployed factors in either country. When both countries are using their resources equally to produce both goods output is as follows:

Country	Beef (Units)	Cars (Units)
X	1000	200
Y	<u>200</u>	<u>1000</u>
Total production before specialisation	1200	1200

If however each country specialises in the production of those goods at which they are most efficient, i.e. X specialises in beef and Y in cars, then output is as follows:

Country	Beef (Units)	Cars (Units)
X	2000	NIL
Y	<u>NIL</u>	<u>2000</u>
Total production after specialisation	2000	2000

(Note: It was originally assumed that each country was using half of its resources in the production of each good, therefore if country X could produce 1000 units with half its resources logically it could produce 2000 with all its resources.)

The **net gains** from specialisation are 800 units of beef and 800 units of cars (note: in specialising X gave up the production of 200 cars and Y the production of 200 beef units