## CHAPTER II

VARIABLES: DATA, TARGETS, INSTRUMENTS (OR POLITICAL PARAMETERS) AND IRRELEVANT VARIABLES; CONDITIONAL AND UNCONDITIONAL TARGETS; STATIC AND DYNAMIC PROBLEMS

1. A systematic exposition of the problems of quantitative economic policy may best be opened by summing up the types of variables involved.

First there are the data i.e., the variables in some sense external to the economic complex considered. Usually such a complex will in this context be a nation; but it may be the world at large or a certain sector of a nation only. External variables are either variables relating to the outer world, i.e. other countries or sectors, or extra-economic variables, e.g. natural, technical, legislative (as far as not under the command of the authority considered), etc. Important examples in our discussions will be "world market prices" whenever only one country is considered; crops, or international policies. Their changes will be considered as given throughout; data will be indicated by  $u_i$ .

The next category consists of the target variables already introduced in chapter I. An attempt to give a more or less complete list of major targets of modern economic policy will be made below. Some examples are real national income, the volume of employment or a certain distribution of national income. Generally they are variables considered relevant to the general well-being. They may also be strategic variables to a state of equilibrium, such as the balance of payments deficit or the degree of employment stability. Target variables are indicated by  $y_k$ ; their number by n.

A distinction between conditional and unconditional targets will prove to be useful, as an expression of a lower or higher

degree of priority that may, under certain conditions, be attributed to the various targets.

The third type of variables involved is that of instruments or political parameters, to be indicated by  $z_l$ , in number n'. These are variables under the command of the government, belonging to the class of the "data" of economic theory, but not in this context. Important examples are various tax rates or the rate of exchange. We will also consider wage rates as instruments of economic policy, though this is not, strictly speaking, correct. More precisely the "autonomous component in the wage rate", as distinguished from the influences exerted by other variables on the wage rate, is such an instrument. It will not, however, be necessary to be as precise as this.

TABLE II 1
Variables included in the examples

| Nr of example | Data   | Target var.  | Instruments                                   |
|---------------|--|--|---|
|               | No variable data included  | Volume of prod. $y$ Balance of payments deficit $D$  | Wage rate $l'$ Government expenditure $\xi_0$ |
| 2             | Import prices $p^m$ Competitive export prices $p^W$ Export shift $e^W$ | Real nat. expend. $x$ Level of employ- ment a Balance of pay- ments deficit . $D$ Real wage rate . $l^R$ | Nominal wage rate $l$ Profit margin $\pi_0$   |

There remains a fourth category of variables, consisting of all economic variables not included in the targets, which we shall indicate as *irrelevant variables*  $x_j$ . They represent all the variables that, though indispensable in a true picture of the economy considered, are not considered interesting for

the economic policy studied. Their number N may be large. They may be nominal incomes, prices etc. or politically irrelevant subdivisions of the target variables.

- 2. Since in the subsequent chapters a certain number of simple examples will be considered in some detail in order to illustrate our general statements, it seems useful to give a list of the variables of each type included in these examples. The foregoing table summarises the list in a systematic way. The irrelevant variables are not given for the very reason of their irrelevancy.
- 3. An attempt will now be made at summing up the most important targets usually aimed at by modern governments.

The first set of targets already existed in the period when government policy was mainly fiscal. It consisted of public expenditure G with certain subdivisions  $G^i$  for the separate tasks of government, such as administration in the narrower sense, jurisdiction, education, diplomatic service and military tasks. To these may be added, at a later stage, the items for certain public enterprises such as the post office, certain public utilities etc. and transfer incomes  $G^T$  for the debt service as well as for certain social benefits (pensions).

With the development of welfare policy transfer incomes to workers, in various circumstances such as invalidity, old age, unemployment, illness, etc. are to be added. Since these are often conceived of as a certain percentage of the wage bill L, they may be represented by that percentage  $\theta'L$ . At a later stage, when the government may feel responsible for the total income of the workers the real wage rate  $l^R$ , supplemented by whatever social benefits may exist, i.e.  $l^R(1+\theta')$  will be the target. To this the volume of employment a should be added. Its subdivisions may be relevant for certain short-run policies.

With the further generalisation of state responsability total

real expenditure x of the nation, supplemented by some measure of income distribution may be among the targets. The simplest expression of this distribution may be the ratio  $\Lambda$  between wages L and total national income Y, or in other cases the ratio  $\lambda$  between the wage rate l and the price level p. In our example (1)  $\lambda$  represents a still somewhat different ratio, viz. the one between changes in the wage rate and the price level. Of course, much more complicated concepts may prove useful, as e.g. the details of tax policy.

If the preoccupations of the government develop into future levels of well-being, the volume of investment i will be a matter of major concern as well as the stability of production or employment. This may, in simple cases, be represented by a small number of levels at different time periods; in a more complete treatment the dampening degree  $\varrho$  of the fluctuations in production or employment may be taken as a target variable.

In addition to these primary targets certain other ones may be mentioned that might also be introduced in the form of conditions (cf. chapter III), since they are not in themselves elements of well-being but rather technical expressions of a "sound policy". The most important example nowadays is the balance of payments deficit D that should be either equal to zero or to "foreign assistance receivable". For the world as a whole the other measure of monetary equilibrium, viz. the balance of expenditure over income has to be taken instead.

4. This list may be followed by a list of instruments for quantitative policy.

The oldest instruments are of course the various tax rates 1)

<sup>1)</sup> Some of the symbols used have been chosen identical to the ones used by R. Frisch: "A Memorandum on Price-Wage-Tax-Subsidy Policies as Instruments in Maintaining Optimal Employment",

of which the most important nowadays are the average rates of the income tax ( $\theta_1$ ) and of such general indirect taxes as e.g. the turnover tax ( $\tau$ ). Various subdivisions are important too; such as excises for specific articles and, in particular import duties. Not only the average rates are important, but for many problems and in the first place for the income tax, the complete functional relationship between income and tax, with all the possible details nowadays prevailing. Apart from the income tax there may be similar taxes such as a profits tax, a surtax, an excess profits tax, taxes on dividends etc. and taxes assessed on total wealth such as death duties, wealth tax, capital levies, etc.

In the last few decades the system of social charges has been developing, creating instruments comparable to indirect taxes, but with total wages L as a basis, whose rate we shall indicate by  $\theta_2$ .

Next, the category of negative indirect taxes now known as *subsidies* and the older kind of subsidies yielded for various reasons to weak industries should be mentioned.

Apart from its significance as a target, certain types of "additional" government expenditure are considered as possible instruments, above all in anti-depression policy.

An important incidental instrument is the rate of exchange k. In marginal cases before World War II and more generally in some countries after that war the wage rate l has been brought under the control of the government and hence become an important instrument of economic policy. Even if it is not under the formal control of the government it may, because of the organised state of the labour market, be an important subject for direct negociations between the government and the trade unions and thus become an instrument of group policy as well as of public policy. More correctly it

The University Institute of Economics, Oslo (published as a U.N. Document, E/CN.1/Sub 2/13; April 1949), but they are not applied to national income but to the basis of assessment.

is the autonomous component in wage rates, defined e.g. as the difference between the wage rate and the influence exerted usually by some important other variables as the cost-of-living index that is more or less controllable, but for practical purposes it will be simpler to consider the wage rate as such an instrument. We will do this, deviating by so doing, from the formal definition of instruments as belonging to the class of traditional "data".

As far as a separate set of measures can be taken to promote labour productivity, the complex of these measures may be represented as instruments, by introducing as one instrument labour productivity h itself. Here again it is the autonomous component rather than the variable itself that represents the instrument.

The variables summed up so far are the more important instruments of an "overall" policy or an "indirect" policy, in contradistinction to a "detailed" or "direct" policy where the specific acts of the entrepreneur are subject to regulation, viz. the determination of volumes of production or sales and the setting of prices. The instruments are then rations or allocations  $x^{ri}$  of specific commodities j and their prices  $p^{ri}$ . They may be many in number.

5. The variables summed up in this chapter may either be introduced as single variables relating to one time period or as multiple variables relating to a series of time periods. The first of these two possibilities presents itself when we are faced by a static set-up of our problem, i.e. if the targets are conceived of as constant levels and no attention is given to their possible change in time, whereas the same applies to the other variables. The second possibility occurs if such a change in time is considered as an essential element of the problem. It must then be assumed that  $\Omega$  depends on the target variables at various time points, or, more precisely, on the development in time of the targets. Such is the case

e.g. with problems of cyclic policy as well as with problems of development policy. It will be clear from the outset that this second type of problem is far more complicated than the first one; in fact so complicated that our statistical knowledge is hardly sufficient to apply the second method numerically. As a rule even problems of that nature will in practice be simplified in such a way as to reduce them to static setups. In particular, problems of business cycle policy will almost always be dealt with "year by year"; towards the end of year t programs will be made up for year t + 1, in which the unknowns will be the instrument variables for year t+1, practically without taking account of further developments. No doubt this is only a temporary approach; but it seems wise to restrict ourselves, for the time being, to it. This study will therefore be confined to static problems in the above sense. This does not preclude the study of economic policy under changing conditions, sometimes referred to as "dynamic" in another sense: the change of data will be fully taken account of (cf. ch. IV and VI).