

THE USES AND LIMITATIONS OF NATIONAL ECONOMIC ACCOUNTING, WITH SPECIAL REFERENCE TO SOUTH AFRICA

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IN the Republic of South Africa there is not one economic and social system, but at least two. By far the largest proportion of the population work and live for varying periods in the more highly organized and rapidly developing part of the economy, which is closely linked to the world market. Within this geographical area of active movement and lively interchange, of general sensitiveness to economic influences, but separate from it, are a series of zones of sluggish movement of capital and population, of slow response to economic stimuli, and of generally 'backward' conditions, not only in techniques of production and distribution, but also in attitudes and ways of living. These regions of backwardness and poverty are the so-called 'Native Reserves'. They are the areas which were set aside for the exclusive occupation of the indigenous peoples to protect them against the impact of a more dominant culture.

The differential rate of progress of the different parts of the economy, and the increasing absorption of the less-developed people, culturally and economically, White and non-White, into modern economic production, are a fundamental aspect of those processes of economic change introduced as a result of the mineral discoveries in the latter part of the nineteenth century. The statistical magnitude of these changes, the distribution of the growing national product between the different classes of population, the assessment of the efficiency of South Africa's changing productive organization and its economic performance as compared with other countries, have long been the subject of numerous enquiries by both private and official investigators. As a result, there has been a considerable addition to our economic statistics, especially in the field of national income analysis.

The purpose of this paper is to evaluate the usefulness for analysis and policy-making of the national accounting framework, which has been developed to portray the overall magnitude of these changes and their interrelations. Before doing so,

it will be useful to refer briefly to the historical development of these economic statistics as well as the changing emphasis in their compilation.

I. THE EVOLUTION OF NATIONAL INCOME AND NATIONAL ACCOUNTS IN SOUTH AFRICA

Until a decade ago the chief interest of national income calculators was to estimate totals of national income for a year, or for a series of years. This was the original purpose of the pioneering studies of Professors Lehfelddt¹ and S. H. Frankel. Their researches were, however, not confined to providing a series of national income estimates. Thus, Frankel's contributions were especially notable for the range of enquiries undertaken, despite the paucity of available statistics.² Frankel's investigations stimulated great interest in National Income work, and led to the creation of a National Accounts Section at the Bureau of Census and Statistics.

Since its formation the National Accounts Section has been primarily concerned with the estimation of national income totals at factor cost. Two sets of figures are published, namely *Total Geographical Income* and *Net National Income*, that is, after adjusting for the net payments to foreign factors of production. These aggregate figures are published annually and are available since 1946-7.³ Following the practice of Frankel, the Bureau of Census and Statistics also publishes annual sub-totals for 'farming', 'mining', 'private manufacturing', 'commerce',

¹ R. A. Lehfelddt, *The National Resources of South Africa*, 1922.

² For example, he was concerned with estimating national income totals in real terms, the income distribution of the White population, the incidence of income-taxes on such incomes, the distribution of the product between different racial groups, the factors influencing the rate of growth of the economy, and the regional breakdown of South Africa's national income. As a result of his close association with the Treasury during the war, Frankel also did considerable work in isolating the constituents of 'national expenditure'. He succeeded, in particular, in providing a series of estimates of net investment for the years 1922-3 to 1945-6, as well as estimates of 'the national income available for consumption' (that is, national income less investment and less war expenditure). For comments on the shortcomings of Frankel's estimates of investment, etc., see D. G. Franzsen, *Quarterly Bulletin of Statistics*, South African Reserve Bank, September 1951.

³ The Census Bureau has adjusted Frankel's geographical income data in respect of non-resident factor incomes, in order to extend the net national income series to the year 1937-8. The conceptual problems involved in adjusting for non-resident factor incomes have given rise to considerable discussion. For this and other issues see the valuable articles by Franzsen: 'National Accounts and National Income in the Union of South Africa Since 1933', *South African Journal of Economics*, March 1954, pp. 115-26, and also *Quarterly Bulletin of Statistics*, December 1954.

'public authorities', etc., from which the geographic income is built up. This series has been linked to Frankel's estimates and are available since 1917-18, and for comparative purposes for the period 1911-12, that is, after the formation of the Union of South Africa.

In their calculation of the national income the Census Bureau uses the 'net product method', as did Frankel, largely because of the availability of censuses of production for a number of years. Production statistics are supplemented by separate calculations for economic activities not covered by such activities. In recent years, however, considerable additional information has become available for such activities, as a result of a regular Distribution Census, as well as special returns called for other services, such as transportation, accommodation and catering establishments. Considerable difficulties still hamper the use of the income method in estimating national income, although the Bureau does provide estimates of salaries and wages as well as 'other income' for the various statistical groupings into which the geographical income is classified.

The National Accounts Section has also been investigating aspects of 'national expenditure'. As part of this research, returns of capital expenditure, changes in stocks, and figures for depreciation are now regularly collected as part of the annual statistics called for from farming, manufacturing, mining, trading, and other enterprises. Hitherto, the main stumbling-block has been the inadequacy of statistical information from which to calculate consumption expenditure on goods and services, and savings in the form of increased holdings of cash, securities and other forms of wealth. Little of the Bureau's researches into national expenditure has so far been officially published, though it has issued a number of memoranda presenting, for example, the consolidated balance sheets and appropriation accounts of a representative sample of public companies engaged in manufacturing, commerce and services, whose shares are listed on the Stock Exchange. These balance sheet figures as well as appropriation account throw much light on the capital requirements of these companies and their method of financing; they are also used for the extrapolation of the net products of trade and manufacturing and in the computation of savings of corporate enterprises.

Intensive research in the field of 'national expenditure' is

also being undertaken by the Department of Economic Research and Statistics of the South African Reserve Bank. This work, which has been actively encouraged because of its potentialities for policy formation, has brought about a significant transformation of the national income concept. The emphasis is increasingly on the presentation of what are regarded as significant flows rather than income totals. Income aggregates are broken down and presented in a set of consolidated accounts portraying in summary form the transactions of broad accounting categories of the national economy. Annual figures are available since 1946 for the gross national expenditure at market prices for the economy as a whole, as well as for its related parts. The gross national product totals are constructed from the geographic product as estimated by the Census Bureau. The breakdown of these monetary totals into their constituents of 'national expenditure' is based on the framework and concepts recommended by the United Nations.¹

The types of transactions recorded are for three main sectors, in addition to an external account for recording transactions with the rest of the world. The first account in the system is a 'Private Income and Expenditure Account'; the second is a 'Consolidated Current Account of Public Authorities (including social security funds)'; the third is a 'Gross Saving and Capital Formation Account' for the nation.

There are still a number of statistical weaknesses in these national economic accounts. Their main defects are in regard to the estimates of private saving and personal consumption, which are obtained as residuals in the household income and expenditure and savings-investment accounts. Since these accounts are constructed on a double-entry basis, errors and omissions in recording economic transactions will be reflected in the residual items of saving and consumption. Direct estimates of personal consumption expenditure have now been completed by the Reserve Bank,² while much spade-work has been completed for the direct calculation of private savings. Substantial progress has also been made in filling out our picture of the changes taking place in assets and liabilities.

¹ *A System of National Accounts and Supplementary Tables, 1960; Concepts and Definitions of Capital Formation, 1953; Method of National Income Estimates, 1955.*

² See South African Reserve Bank, *Quarterly Bulletin of Statistics*, Supplement, December 1960.

Thus, tables of liabilities and assets in the banking sector are now available, and these are being extended as part of a broad programme of research to obtain a more complete record of the formation of wealth and its financing.¹ In 1957 the South African Reserve Bank undertook a Census of Foreign Assets and Liabilities in South Africa, and this Census is now being conducted on a regular basis.

II. NATIONAL ECONOMIC ACCOUNTING AS A TOOL OF ANALYSIS

The steady accretion of income and expenditure aggregates in their consolidated or segregated form, and the improving quality of the estimates, have greatly enriched our understanding of the structure and working of the economy. These estimates have enabled economists and other students of the South African society to perceive more clearly the essential characteristics of the economic structure, the changing relationship of its major component parts, and to evaluate the rate of growth of the economy during different periods, the changing proportion of foreign factor incomes in relation to the aggregate, the division of incomes between the different racial groups, the percentage of national product taken for Government use, and so on. It is true that many of the conclusions arrived at could have been distilled from an analysis of statistics relating to foreign trade, production, employment, salaries and wages, etc. But national income aggregates have undoubtedly assisted the theorist and economic practitioner in obtaining valuable insights into the working of the economy.

Thus, Frankel's classical investigation² revealed not merely the magnitude of the rate of growth of the economy, but its exceptional rapidity in the thirties as compared with earlier periods, as a result of the expansion in export production, favourable terms of trade, and the substantial inflow of foreign funds for the exploitation of South Africa's rich productive resources. Frankel also paid much attention to the sharp contrast in the living standards of the African people engaged in modern economic production, and those still lodged in their primitive tribal economies. Though existing statistics and data

¹ See D. G. Franzsen, and J. J. D. Willers, 'Capital Accumulation and Economic Growth' in *Income and Wealth, Series VIII*, Bowes & Bowes, 1959.

² 'An analysis of the Growth of the National Income of the Union in the Period of Prosperity before the War', *South African Journal of Economics*, June 1944.

from various surveys¹ have led to the same conclusions, the computation of income aggregates provided a broad perspective for an analysis of the uneven progress of the different parts of the country. Later studies have largely confirmed the conclusions of these earlier investigations, although there has been a change in emphasis in these later investigations. The stress is on stimulating further an already rapidly growing industrial structure, in order to provide employment for a growing population. As a result of the growing availability of national expenditure statistics, there has also been much discussion of the relationship between investment and the level of activity, and the extent to which South Africa can finance its future development out of its own resources.

The studies of Frankel and later investigators into the growth of South Africa's national income and its changing composition are of great theoretical and practical importance to students of 'Growth Economics' as well as policy-makers. But they raise far-reaching issues in regard to the precise meaning and significance of such aggregates for research and policy-making. Like any other statistical figure, the national income has to be clothed with meaning by suitable interpretation. What is a suitable interpretation will largely depend on the purposes for which the figures are constructed. Though these limitations are well known to their makers, the dangers of their misuse² are great once they acquire currency in a society dominated by material progress. A brief reference to some of these difficulties may not, therefore, be out of place.

National income estimates are intended to provide a measure of aggregate output. It might be thought that the comparison of such time series should provide a fairly satisfactory measure of the rate of change in output as between different periods. But output is a non-homogeneous complex and its measurement, as is well known, bristles with perplexing problems. These magnify when comparisons are made for different

¹ C. F. Houghton, D.H. (ed.), *Economic Development in a Plural Society: Studies in the Border Region of the Cape Province*, Oxford U.P., 1960.

² For example, much use is made in South Africa of 'net products' as a measure of an industry's importance in the economy, and the extent to which it is an engine of growth. Thus, 'manufacturing' is frequently regarded as the largest generator of income because its net product is the largest single component of the statistical gross product. For a criticism of this view see the present writer's comments - 'Some Aspects of Industrial Development in South Africa', *South African Journal of Economics*, September 1959, especially pp. 180-3.

periods during which significant changes take place in the composition of the flows and their valuation. Even if a satisfactory index number can be constructed to record the average change in the movement of prices of a heterogeneous complex of goods and services during different periods, can we really measure the direction of change in real output, or logically interpret the results of such statistical manipulations except in the most restricted circumstances?¹ The awkward fact is that the real incomes of any two periods are physically incommensurable. This does not mean that inferences regarding changes in economic welfare can never be drawn from price quantity statistics. But it does require the investigator to examine most closely the degree of homogeneity and measurability of the real flow of commodities and services, which have been evaluated in monetary terms.

These difficulties of measurement and evaluation raise difficult problems in a country with a multiplicity of racial groups with widely different income levels, patterns of consumption and economic behaviour. What meaning can we give to the income aggregate of a tribal society as recorded in terms of the accounting symbolism of a market economy? The motivation, aims and patterns of economic behaviour of the inhabitants of largely static, undifferentiated tribal economies and members of a highly organized market economy are worlds apart. The constituents of their respective 'incomes' will thus also differ radically.

The statistical problems of the measurement of goods and services, which are not ordinarily exchanged in the market can, of course, be solved according to some accepted convention. But the significance of such statistical income must necessarily always be in doubt, especially in conditions of rapid social and economic change. It may be possible to show that the quantity of goods and services consumed by the African in the Reserves is substantially less than the consumable goods enjoyed by the urban African. The 'Western' economist may be tempted to conclude from such statistics that the urban African is in some sense 'better 'off' than his compatriot in the Reserves. But this is subjective judgement, which is incapable of any decisive test, unless we also take into account a whole range of problems,

¹ See P. A. Samuelson, 'The Evaluation of Real National Income', *Oxford Economic Papers*, January 1950, and subsequent discussion in that journal.

which ordinarily lie outside the province of the economist. Thus, the welfare of the urban African is very much affected by his success or otherwise in developing a new pattern of social relationships in a largely unfamiliar urban environment.¹

Again, what meaning even in an accounting sense, can be given to the valuation of the Reserve output, unless some allowance is made for the destruction of the fertility of land or the 'obsolescence' of tribal economies in conditions of change? This latter issue is, of course, a particular example of a more general problem. One aspect relates to the general question of an appropriate estimate for the consumption of capital. It is not my purpose to add to the voluminous discussions on the subject;² it is salutary, however, to remind ourselves of the magnitude of such depreciation allowances. In South Africa, for example, depreciation allowances have amounted to an average of 38 per cent of the domestic capital formation since 1955, and almost 9 per cent of the gross national product. Errors in statistics of this order can make a significant difference to the available estimates. Unless proper balance sheets of national wealth exist, there is no basis for cross-checking the order of magnitude of these errors, since income estimates reflect the differences in the net change in assets plus consumption as between the two periods.³

The preceding paragraphs have been largely concerned with the limitations of national income totals for research and analysis. The problems of definition, measurement and interpretation are not diminished because of a different presentation of the fundamental national income and expenditure statistics, however elaborate the classificatory framework adopted for recording transactions. The mechanism of double-entry book-keeping is simply a convenient tool for recording economic

¹ For an acute analysis of the issues involved see S. Herbert Frankel 'Concepts of Income and Welfare and the Intercomparability of National Income Aggregates', *The Economic Impact on Underdeveloped Societies*, Central News Agency Ltd., South Africa 1953. Also *Income and Wealth, Series III*, Bowes & Bowes, 1953.

² 'Consumption of capital is a hidden process which is known only *post factum* and not too clear even then. All we can see and all that circulates is gross product. How much of reproducible capital, and particularly of some of the natural resources, has been consumed in the process is not visible, and many of the available measures are mere conventions. What is worse, for some types of capital no measures of consumption are at all available.' Quoted from Kuznets' article, 'Measurement of Economic Growth' in *Problems in the Study of Economic Growth*, New York, 1948, p. 147.

³ Even if such balance sheets existed they could not – being a record of past transactions – take into account 'obsolescence'.

transactions; it cannot increase the meaningfulness of such estimates, unless it presents the available statistics in a more illuminating manner or exhibits transactions, which may not appear in the consolidated aggregates of income and expenditure. Indeed, it is all to the good that economists should ask themselves how a system of accounts can best be developed to assist in general economic analysis. But it is equally important to perceive the nature and limitations of an accounting picture of the functional relationships in which the economist is interested.

A system of national accounts provides no more than definitional relations between items in money terms, which appear once as a receipt and once as an expenditure from the point of view of each accounting entity. The summary of transactions so recorded may have little significance for an analysis of economic behaviour; indeed, it may present a distorted picture of the flows actually resulting from the decisions and procedures of business enterprises and other meaningful economic entities.¹ Thus, the distinction assumed between the production of income and its use is fundamental for the construction of national income and expenditure accounts. Yet, this distinction may have little relevance to the productive activities of a substantial proportion of the South African population, who still live in the Native Reserves. For the most part the output of the population in the Reserves is not clearly differentiated from their consumption.

Again, the construction of a logical coherent system of accounts requires the inclusion of transactions, which have no counterpart in the world of reality. The classic example is the case of imputed net rent on owner-occupied dwellings. Such rental incomes are properly included to provide a comparable treatment between rented and owner-occupied houses. But the result of including an imputed value for the services flowing from an owner-occupied house is to show an accounting increase in personal consumption expenditure and a decline in personal savings. The system of accounts will still formally balance,

¹ For example, the Personal Sector in the South African accounts includes a miscellany of activities relating to private institutions as well as unincorporated businesses, which are numerically important in the economy. Again, personal saving, which is necessarily a significant variable in any study of income-consumption relationships, is a residual, including errors and omissions, in an excessively aggregated total.

since the decline in personal savings is matched by a notional entry for depreciation on the house, thereby reducing net private capital formation. What precise conclusions can an economist draw from accounting categories in terms of which the household sector is shown as a consumer of services resulting from the ownership of a house, as an owner of durable goods capable of investment or dis-investment, and as a payer of tax on imputed rental incomes?

III. NATIONAL ACCOUNTS AS A GUIDE TO POLICY

National accounting data have long been used to assess the performance of the economy, and as a guide to policy. It is, however, an extraordinarily difficult matter to evaluate to what extent the increasing output of such data has contributed to a more productive use of resources. One difficulty stems from the variety of views regarding the aims of policy. There is also a practical difficulty. At any given point of time it is impossible to measure what the results would have been in the absence of such accounting data. I propose, therefore, to survey briefly the uses, which have been made of national accounts data in South Africa as well as to analyse the significance of the available statistics of income and expenditure for policy.

(a) The use of national income and expenditure statistics in interpretation of past trends

Until recent years aggregate income estimates and their subdivision according to industrial origin, or into their constituents of national expenditure, have been used mainly in the interpretation of past trends.¹ The estimates have also provided a framework for analysis and discussion of policy, for example, in the Budget statements of the Minister of Finance, and in the annual addresses of the Governor of the Reserve Bank. They have not, however, played a significant role in policy-making. This has been due, in part, to the availability of estimates only on an annual basis, thereby obscuring the frequently wide fluctuations taking place in the economic magnitudes within each annual period. A more important reason has been the delay in the compilation of the figures, as a result of the somewhat

¹ See, for example, the annual or quarterly appraisals of economic trends by Professor D. G. Franzsen and Dr. T. W. de Jongh, published in the *Quarterly Bulletin of Statistics*, South African Reserve Bank.

leisurely appearance of a wide range of statistical information necessary for their calculation. Thus, Census estimates of the national income for the year ending 30th June are usually only available about the end of the following February – in time to be quoted in the Budget Speech, which usually takes place in March or April, but too late to have much influence on the fiscal decisions contained in the Budget.

(b) Recent developments in national accounts and their influence on policy

More recently, national accounting has assumed great importance for practical policy as a result of the increasing pre-occupation of the authorities with the foreign balance and with the level of activity and employment. There is now an increasing emphasis on the need for more up-to-date and frequent estimates; and this has brought about subtle changes in the character and purposes for which the data are computed. Instead of being regarded as a purely evaluative instrument, the stress is on the potentiality of such accounts as a tool for the prediction of economic behaviour and economic planning.

To meet this demand, the Reserve Bank has been developing techniques for producing more rapid estimates of national income and expenditure. One significant result of this work appeared in a recent annual address of the Governor of the Reserve Bank, which presented preliminary figures for the gross national product for the year ended 30th June 1960.¹ These figures indicated an up-swing after the lower turning-point was reached during the middle of 1959, mainly as a result of the increase in South Africa's exports of merchandise and the continued rise in gold production. The figures also indicated the failure of private fixed investment to revive, the decline in public investment, and the recommencement of a re-stocking process after the first quarter of 1960. Much of this information could have been derived from a close study of the available business and other indices and discussions with strategically placed enterprises. But it would not have been an easy task to have obtained a comprehensive picture of changes in the economy or an insight into changes in the constituents of national expenditure.

¹ Report of the Fortieth Ordinary General Meeting of the South African Reserve Bank, 10th August 1960.

It is still too early to determine the margin of error attaching to these more up-to-date estimates of gross national product, which were built up from quarterly estimates of the national income. These estimates are being made by the Research Division of the Reserve Bank in conjunction with the Bureau of Census and Statistics and the Division of Agricultural Economics and Markets. The technique of compiling quarterly estimates of income and expenditure is still at an experimental stage. The treatment of items such as dividends and interest, which may be paid annually, half-yearly or quarterly, for example, raises a number of practical problems. Difficulties also arise as a result of the seasonal character of farm production. What is the most efficient procedure will largely be dictated by the practical experience of compiling quarterly estimates.

The quarterly estimates are being computed as far as possible within the framework of the annual estimates, thereby providing a check on their accuracy when annual figures become available. To increase the reliability of the figures and provide a system of cross-checks, independent estimates are being made as far as possible of national income as well as of national expenditure. The basic information required for the quarterly estimates of transactions in the private sector is being obtained on the basis of forms issued to almost 700 firms.¹ Quarterly figures of foreign assets and liabilities, which are now being collected on a regular basis, are an invaluable source of information, because of the economic importance of foreign-controlled enterprises in the economy.

The compilation of quarterly figures marks a distinct advance in the field of national accounting in South Africa, and is likely to extend the usefulness of these estimates for policy-making. Thus, the availability of fairly detailed national income statistics and preliminary estimates up to December will provide the framers of budgetary policy with a much clearer picture of economic and financial trends, when considering their

¹ Returns are asked for capital expenditure on construction, plant, machinery and equipment, stocks, net profit or loss (before providing for tax and dividends), dividends and interest and income tax payments actually made during each quarter. Figures of wages and salaries are available for most industries from the Bureau of Census. Estimates of purchases of goods and services by public authorities are based mainly on the monthly figures of expenditure of the Government. Personal consumption has so far been estimated as a residual, while the balance on current account has been available for some years on a quarterly basis.

budgetary policies in January and February of each year. Aggregate totals and particularly consumption and investment statistics ought to reveal the weak spots in the general economic situation, while reliable estimates of investment, especially in the key field of stocks, may assist in judging the trend of imports and framing import policy. Up-to-date income figures may also enable the Treasury to improve its estimates of tax revenue for the ensuing financial year. Naturally, such national accounts data will have to be interpreted in relation to current statistics of production, sales, employment, bank credit, and so on.

(c) *Economic forecasting*

The development of quarterly estimates is regarded by some as opening the way to more precise short-term forecasting. We need not doubt that more frequent and improved statistics, especially on the expenditure side, may render the social world more intelligible and thereby provide a more rational basis for decision-making. But we cannot hope that the assembled facts can go beyond mere description and correlation. Estimates of income and expenditure are merely a record of past transactions. However much we improve the figures, they can only reflect the choices which have been made. They cannot show the influence of factor prices upon these choices; nor can they show the choices that would have been made if factor prices had been different. We are dealing with realized magnitudes, which can throw no light on significant aspects of economic behaviour, since they cannot incorporate expectations, which are the causal element in the situation. There is room only for *ex-post* magnitudes.

The data, which are the result of countless transactions within the economy, can, therefore, tell us nothing about the role of windfall losses or profits, whether the investment recorded in stocks was planned or unintentional, whether the realized savings reflect 'forced levies' as the result of inflationary credit and fiscal policies, whether the expected rates of profit were the main determinants of investment, or whether they were simply the result of other factors influencing investment. The difficulties multiply with the 'openness' of the economy. This is an aspect of the utmost importance for territories in Africa and elsewhere, since their levels of output are greatly

influenced by shifts in the terms of trade, changes in capital transactions on external account, and so on. The simple fact is that we cannot wring from the statistics at our disposal the likely time-path of these variables.

Some of the above difficulties could theoretically be overcome by constructing a system of accounts on the basis of the *ex-ante ex-post* techniques of the Swedish economists. Thus, it may be feasible to make a national diagnosis of all the plans that the economic units intend to put into operation during the coming year. The gathering and combination of the plans will in some cases refer to real plans reported by public authorities and industrial firms, and, in other cases, to imaginary plans on the basis of what seems to be the probable development of production and income at the existing price level. Several alternatives will need to be presented corresponding to different assumptions as to productivity, terms of trade, income developments, etc. These plans of total planned demands for goods and services can then be compared with total planned supply.

The construction of such a system of accounts for short-term forecasting is in reality an attempt to forecast what the *ex-post* figures will actually be. Frequent adjustments in these estimates in the light of experience and accumulating statistical information would doubtless contribute to an understanding of the reasons for the inconsistency between *ex-ante* and future *ex-post* figures. No attempt has yet been made in South Africa to construct such a national Budget; indeed, it would be an unbelievably complicated task in conditions of rapid economic change, which have characterized the modern development of the South African economy. Much cruder procedures have, in fact, been followed.¹

Some economists, both inside and outside the Government service, have used income totals for quantitative forecasts of the more distant future. But these so-called 'projections' are nothing but statistical opinions, indicating a possible order of magnitude, which one may be disposed to accept or not.² Extrapolations of *per capita* income levels into the obscurity of the future lack any fundamental intellectual justification. They overlook the simple fact that national income statistics are no

¹ But see next section.

² C. G. W. Schumann and F. van den Bogaerde, *Economic Diagnosis and Business Forecasting with special reference to South Africa*, Bureau for Economic Research, University of Stellenbosch (Publication No. 4), 1955.

more than an abstract symbol of a whole socio-economic complex, which is influenced by a diversity of choices and circumstances at any moment of time. There is no reason why present circumstances should reduplicate themselves in an ascertainable and orderly fashion in the distant future.

IV. NATIONAL ACCOUNTING AND ECONOMIC PLANNING

The conscious allocation of resources for the attainment of a chosen end or ends is characteristic of all types of human activity, whether such activity is organized on an individual or collective basis. But 'planning' may imply more than simply purposeful action; it may also involve a conscious alteration of existing objectives and patterns of activity. During the post-war years, for example, policy-makers in South Africa have sought to limit the free choice of consumers by restricting expenditures abroad, and substituting domestically produced products for imports. They are also committed, in one respect at least, to bring into existence a new regional pattern of productive activity, which deserves some reference.

The declared policy of the present Government is to rehabilitate the Native Reserves and increase their capacity to sustain their growing population. To assist in this process manufacturing and other activities are to be induced to locate around the borders of these areas. The enlargement of the present narrow basis of existence in the Reserves is the cornerstone of the present policy of 'separate development' of the different racial groups. What is visualized is not merely a change in the location of productive activity but a quantitatively larger national product.

In 1951 a Commission was appointed to consider the implications of a policy of Reserve development. To assist in defining more closely the magnitude of the problem, the research staff of the Commission made special calculations of the 'National Income' of the Native Areas on a 'conventional' basis.¹ The Commission also provided estimates of cost of the development programme for the first ten years. What the cost of such a diversion of resources might be in terms of economic opportunities foregone, and hence its effect on the future growth of the national income, was not a question asked or answered.

¹ For a more recent study of economic and social conditions in the Border Regions of the Cape Province see D. H. Houghton, *op. cit.*

Since the publication of the Commissions' Report,¹ no 'plan' has been published expressing the problem of modernization and adaptation in the productive structure of the Reserves in quantitative terms. Nevertheless, much statistical work has been done, and is being undertaken, to indicate the minimum rate of growth of the Reserve economy necessary to ensure a rising *per capita* income, the pre-conditions for such a rate of development, the kind of industries which may be established, and the implications of such industrialization, translated into estimates of employment, materials and productive facilities required to produce these goods and services.

No logically coherent analysis, as far as the writer is aware, has so far been made of this system of ideas. The closest approximation to a 'model' is the construction of an input-output matrix, which is still at an experimental stage.² The work is being undertaken at the request of the Economic Advisory Council, an advisory body to the Prime Minister. The conceptual problems in drawing up such a table are thus subsidiary to the more pressing interest in its application. Its main purpose is to reveal the shortcomings in available data for a more refined analysis in the future, as well as to provide a preliminary picture of the technical relationships of the productive system for the purpose of tentative forecasts of industrial output and inter-industry transactions. No attempt is being made at this stage to examine the variability of input coefficients over time or to consider the problems involved in inter-regional aspects of development.

The design of the input-output table corresponds, in general, to the officially published summary matrix constructed for the United Kingdom for 1950. But it differs in several important respects; for example, sixty sectors³ have been distinguished as compared with ten in the United Kingdom study. The other features of the table largely follow conventional procedures:

¹ Summary of the report of the Commission for the Socio-Economic Development of the Bantu Areas within the Union of South Africa. U.G. 6, 1955. Some of the key recommendations of the Commission were rejected by the Government.

² For an earlier study of input-output tables, and, in particular, the problems involved in their construction and application see unpublished thesis of R. R. Tussenius, 'Die Teorie en Praktyk van die Interindustrievloei-Tegniek', Pretoria, 1957. A full description of the preliminary work already done is to be published in a forthcoming issue of the *South African Journal of Economics*.

³ The number of sectors may be reduced in the final presentation as a result of further subdivision.

primary inputs distinguish the income of employees, gross operating surplus, indirect taxes less subsidies, and imports. Final output is divided into consumer expenditure, current expenditures by public authorities, gross capital formation and exports. All transactions are valued at sellers' prices.

The quantitative analysis of inter-industry relations raises a number of difficult problems relating to definitions and methods of treatment. The solution of some of these problems is complicated in South Africa because of the relatively unspecialized character of the output. Other difficulties have arisen as a result of the limitation of the official statistics; for example, significant data do not refer to the same period or region.¹ The Industrial Census data, again, which reflect the prices paid by purchasers, record the amount purchased instead of the amount actually used, thereby affecting estimates of changes in stocks. Finally, the Industrial Census does not distinguish between inputs which are produced domestically or are imported. Although the difficulties have been minimized as a result of the re-classification of South Africa's foreign trade statistics to reflect the use and stage of production, the problem still remains of allocating imports among the various industrial sectors according to use.²

The input-output table will undoubtedly provide an extremely interesting statistical picture of certain features of the economy. Whether this particular presentation of data justifies the cost and trouble involved in the construction remains to be seen. But the belief that it can be a useful predictive device is bound to arouse scepticism, if only because the assumptions underlying the table do such obvious violence to the world of reality. There is no reason why production coefficients for output aggregates should be fixed in any valid economic sense; there is even less cause to believe that inputs in each industry remain proportional to outputs, irrespective of the level of output into which they enter or of the movement in relative factor prices, or that the proportional composition of inputs in terms of

¹ For example, the industrial census data refer to the year 1956-7, the accounts of governmental or quasi-governmental bodies to the fiscal year ending in March, foreign trade statistics to calendar years. The latter covers, in addition, South West Africa and the three Protectorates, whilst the industrial and Government finance statistics relate only to the Republic of South Africa.

² See *Foreign Trade Statistics*, Vol. IV, 1957-8. These statistics, which are due to the work of Mr. P. G. Riekart, are part of a study being undertaken for the calculation of the gross national product on a commodity-flow basis.

domestic and imported supplies should be fixed in any sector. On the contrary, the available statistical information indicates quite striking changes in coefficients, and in the product composition of sectors. Since the end of the war the composition of production has changed dramatically, as a result of spectacular new mining and industrial developments, while there has been a continuous reshuffling of factor combinations in response to growing domestic and foreign demands, shifts in tastes, changing wage and other price-levels, or as a consequence of technical progress.

The pre-war and even more so the post-war chronicle of failures in prognostication is hardly encouraging. However carefully we proceed from the best available information and measures at the starting dates, we cannot expect to forecast what in the nature of things cannot be foreseen. How are we to know about all the changes in techniques or in organization in process at any moment of time, or become aware of the innovation and inventions still to be conceived in the future? Indeed, the changing relations between the different parts of the economic structure, and the kind of institutional and social arrangements necessary to facilitate rapid change, are precisely what ought to interest us in a rapidly growing economy. It is sometimes argued that if the assumed stability of structural relations does not hold, and produces misleading forecasts, we can apply a more sophisticated dynamic model. But this is a confession that the very simple hypothesis implicit in input-output analysis is a failure.¹

These objections need not by themselves be fatal. Input-output may still prove a valuable technique, whatever its simplifications, if it is shown in practice to be superior to any alternative instrument of forecasting. But decisive evidence on this score is still lacking, although input-output matrices have been constructed for some two decades. On the contrary, such tests as are available² provide no reason for abandoning one's scepticism regarding their predictive capacity.

The case for a cautious use of the technique, which is still in its earliest stage of development in South Africa is, therefore, at least strong. The case is particularly strong in countries where

¹ cf. M. Friedman, *Input-Output Analysis: An Appraisal*, National Bureau of Economic Research, Princetown, 1955, p. 170.

² See C. F. Christ, 'A Review of Input-Output Analysis', op. cit., pp. 159 et seq.

there is a narrow margin of resources available for experimentation. There is ample evidence in South Africa of the costs of misdirected and wasteful forms of capital expenditure as a result of decisions made on the strength of doubtful statistical calculations. One need point only to the failure of large-scale capital investment programmes during the post-war years, at any rate in some fields of investment, to produce a commensurate expansion in real income-creating capacity of the population. In consequence, South Africa has experienced a considerable degree of inflation leading to a further investment of substantial resources in property and other assets, specifically undertaken to offset the consequences of an inflationary growth in prices and incomes.

V. CONCLUDING COMMENTS

The development of national economic accounts has led to a substantial addition to our statistical knowledge of the structure and working of the modern economy. In the absence of such quantitative data, administrative decisions can only be made on the basis of experience, intuition, or simply ignorance. There is no need, therefore, to elaborate further the value of such a broad picture for the purpose of analysis or as a guide to decision-making.

The main disadvantage of quantitative estimates is that they encourage a far too mechanistic approach to economic and social problems; in a word, they lead to a 'penny-in-the-slot' attitude towards life and its myriad manifestations. So many of the 'models' constructed on the basis of these statistics assume that nature will always be bountiful, that the defects in the working of the administrative machine or the sway of political interests are irrelevant, or, at the more technical level, that simple relationships govern output to capacity over the trade cycle, or that the share of wages is a fairly constant proportion of the value of output, or that there is a simple functional relationship between capital and output, and so on. The truth is that the value of any plan depends on the experience, imagination and judgement of the planners involved, as well as a knowledge of facts more detailed than can be possibly provided by the summary transactions embodied in the form of national accounts.

A system of accounts can portray only a limited set of trans-

actions, which are not necessarily the most important for social action. Moreover, they cannot 'solve' the problem of the policy-maker, though they may assist by presenting in an intelligible manner the facts which are relevant in arriving at policy decisions. Accounting data ought not, therefore, be expected to yield information for which they are not equipped. The point is, of course obvious. Yet there is always a natural though dangerous inclination to override one's instincts, when pressing problems such as poverty and unemployment require urgent answers.

The ultimate weakness in all forecasting techniques, whether they be input-output tables or capital/output ratios, is our inability to know what future expenditures are likely to be. We can always draw up a so-called 'bill of goods', but can we know whether the allocation of income between savings and investment in any time period will correspond to the pattern of demand in the future? Thus, what is produced as a result of a conscious diversion of resources may not necessarily be what is wanted. We may then be faced with malinvestment, which fails to increase the real income-creating capacity of the economy, thereby raising prices and money income, thus leading to intractable balance-of-payments difficulties. The estimates of national income and expenditure will simply record the transactions taking place during the period. They may even show that there has been a decline in output. But input-output tables or any other form of national accounts can throw no light on the causes of the diminished flow of goods and services, or, indeed, separate cause from effect.

There is always the danger of a valuable tool falling into disuse, because of the exaggerated claims made for it by its more ardent practitioners. This would be a pity. Frank recognition of the uses and limitations of national accounts can only strengthen their claim as a useful addition to our technical equipment for the analysis of social and economic phenomena.