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THE MEANING
AND MEASUREMENT OF
ECONOMIC GROWTH

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FOREWORD

This Supplement on the meaning and measurement of economic growth is put forward in the belief that it is desirable to reach a consensus upon important topics of this kind and that well-informed debate upon them is the most effective means of doing so.

CHAPTER I.—THE MEANING AND MEASUREMENT OF ECONOMIC GROWTH

I

Economic growth has in recent years been accepted almost everywhere as a major objective of national policy. Usually it is discussed in terms of rates of growth—and that implies measurement. Most of the first chapter of this paper is taken up with the question of measurement and the problems associated with it.

The discussion of measurement will attempt to make as clear as possible what it is that is being measured but, as this will raise questions of some complexity, a preliminary word on the meaning of "economic growth" may be useful. For some, no doubt, it is broadly synonymous with "economic development" and is associated with such things as growth of population (more especially the working population), development of resources, technological advance and increasing capital formation. But growth in that sense could not be expressed in a single measure; and is itself clearly dependent upon what the total output of goods and services makes possible.

As generally understood, then, economic growth means growth of output. But output that will meet the multifarious demands of a modern economy is varied in the extreme. Reducing it all—the tangible with the intangible, the like with the unlike—to a single measure and comparing the results for different periods or for different countries where the composition of output has changed or is different—perhaps considerably—must obviously present difficulties, both theoretical and practical. The measurement can never be wholly reliable, let alone precise; it can however be made to give approximations which, used with due care and understanding, can be useful.

It is necessary to say, further, that even if we knew what changes in output had occurred, we would not thereby have sure evidence of the performance of an economy. Performance in this context means the degree of correspondence between actual output and the maximum output that could be realized if, given the pattern of demand, all the resources and the most advanced technology available were used to full advantage. As will later be indicated in more detail, a high rate of growth (as growth is measured) is likely in an economy in which there is rapid technological change and a large movement of labour from sectors in which output per worker is low to sectors in which it is high. That situation may be contrasted with one in which the rate of growth seems slow because, despite full employment of resources and advanced technology, the pattern of demand and hence of output has shifted towards sectors in which output per worker is increasing little or not at all, or where improvements in productivity are understated or do not show up at all in the statistics. In the one case, a high growth rate could be entirely consistent with a performance appreciably worse than the potential maximum; while in the other case, there might be little scope for a better performance within the limits set for production by the pattern of demand. This could occur when, for example, there is a large increase in the demand for personal or other services in the output of which improvements in productivity either may not amount to much or cannot be measured.

It follows that the rate of growth achieved in one country can rarely be a useful guide to what is possible in another. Nor does the rate of growth a particular country achieves at one time indicate reliably what it should be able to achieve at another. Since economic growth can be strongly influenced by changes in determining factors that are either unforeseeable or beyond accurate prediction, forecasts of rates of growth, whether actual or potential, are necessarily subject to varying degrees of error. Disparities between actual and forecast rates of growth are not, therefore, proof in themselves of either satisfactory or unsatisfactory growth. Any judgment on this question must look beyond growth rates to all of the relevant circumstances. But not nearly enough can be known about the complex surrounding circumstances to permit anything better than a broad assessment of what growth might have been had all its potentialities been realised. Estimating the potentialities of the future will, of course, present still greater difficulties.

These are aspects of the problem of measuring growth, which it is hoped may become clearer as the discussion in this first Chapter proceeds. In Chapter II something will be said about the purposes of growth, a fundamental question that seems often to be neglected in discussions of the subject. The object of all economic activity, in the long run at least, is the satisfaction of people's demands, whether for goods and services that can be purchased in the market or for other things, tangible or intangible, that cannot. Over the years, these demands will alter. Thus economic growth comprehends choices, made either by individuals or by governments on their behalf, between alternatives; and in general these alternatives cannot be measured against each other in an objective way. Largely, their relative merits are matters of judgment on which opinions might differ considerably.

One of the more obvious judgments of this kind is the choice between leisure and work. In the modern economy, other things being equal, the choice of more leisure can be expected to reduce the output of goods and services below what it otherwise would be, while the choice of more work should have the opposite result. Less obvious but of equal importance is the choice between the satisfaction of wants at present and in the future—that is, the choice between consumption on the one hand and savings and investment on the other. In general, economic growth will be more rapid the more the choice favours the future and by so doing adds to productive capacity. Finally, there are choices which carry us right outside the realm of economics; for economic growth usually has social side-effects, the desirability of which is a matter of personal judgment.

Thus we do well to bear in mind that, in discussing economic growth, we are dealing with one important aspect of human behaviour, but one aspect only. Policies of maximising economic growth may or may not be reconcilable with other ends that a society wishes to pursue.

II

Most of the discussion of economic growth is conducted in quantitative terms. This means that the choice of a definition of growth is limited by the practical fact that it must permit of measurement. For this purpose it has become customary in most countries to use estimates of changes from year to year in the Gross National Product (G.N.P.) at "constant prices".

Whether estimates of G.N.P. at constant prices, or other statistics, are used, any study of national aggregates must involve approximations and subjective judgments. This is as true of the estimates prepared by official statisticians as it would be of any other; but, with their greater access to data, official statisticians are at least in a position to minimise these difficulties. In Australia's case the Commonwealth Statistician is, for this reason, undoubtedly in the best position to make such estimates; but, for reasons which will be clear from what follows in this chapter, the result will necessarily still be subject to uncertainties. Anyone seeking to use these (or any other) statistics to interpret trends in the economy should therefore be careful to keep these uncertainties in mind.

Statistics of national income and expenditure are useful for a number of purposes and they are particularly useful for overall analysis of the relations between expenditure, employment and prices. As such, they are in constant use in all advanced economies as an indispensable tool of analysis for persons, whether in an official or other capacity, seeking to assess not only past and current trends in the economy but also having an eye to future developments. For these purposes, these statistics, when used with due allowance for their inherent limitations, are a valuable aid to judgment about the course of events. As already indicated, however, they do suffer from a number of deficiencies; and one of the purposes of this chapter is to set out those deficiencies in some detail. But the undoubted value of these estimates is not to be called into question because of the space herein given to describing their limitations.

The fact is, rather, that valuable as the estimates of G.N.P. at constant prices are, the character of the data and the manner of their compilation necessarily limit their unqualified use in studies of economic growth and in comparisons of growth as between different countries. In particular, some distortions are inherent in the use of estimates of G.N.P. at constant prices in the assessment of economic growth because of:

- (a) the identification of the concept of output with the concept of G.N.P.; and
- (b) the limitations of estimates of changes in G.N.P. at constant prices as measures of the rate of change in the quantum of goods and services included in the concept of G.N.P.

The output of an economy consists of a quantum of goods and services, and economic growth occurs as this quantum increases. All goods and services entering the market economy (i.e., which exchange for money) are in theory included in output, whether as intermediate or final products. There are, however, two broad classes of goods and services which do not enter the market. The first class results from unpaid work done by persons on their own or others' account—such as housewives' services, home maintenance and improvement by householders, home vegetable growing and so on. The second class is that deriving from ownership of capital assets which yield services directly to their owners. Thus, owner-occupied houses, cars, television sets, and so on yield services which, solely because of the nature of the *ownership* rather than the nature of the services, do not involve their owners in current money payments equivalent to the value of the services. Similarly, capital assets other than those operated by enterprises yield services to which a monetary value to the community can be imputed. The most obvious examples are public authority (as distinct from public enterprise) capital assets, such as schools or roads; also included in this category are the buildings and equipment of private non-profit organizations such as religious, cultural and sporting bodies. Consider, for example, a society in which education was provided by

commercial enterprises rather than financed through taxation and provided free of charge. In this case the cost of the service provided, education, would incorporate an allowance for the capital costs⁽¹⁾ of the schools and the estimates of Gross National Expenditure (G.N.E.) would be increased accordingly.⁽²⁾

In practice, however, it is not possible to measure all the goods and services produced in an economy, and we normally resort to the approximation provided by estimates of G.N.P., which may exclude a considerable proportion of such goods and services. Although practices in different countries differ to some extent, the Australian practice is the normal one of including, in principle, all final goods and services in the market economy, including some which may be provided without charge but which cost money to produce, such as public authority services. In addition, certain goods and services from the non-market sector are brought in, mainly services of owner-occupied dwellings (to which values are imputed by the statisticians) and, to the extent that it is possible, goods and services produced by persons in the course of their normal occupations and consumed by them.

However, housewives' services are excluded, as are goods and services produced by persons *not* in the course of their normal occupation and consumed by them. Unlike owner-occupied dwellings, no income is imputed against the services provided by many public capital assets, or against the services provided to owner-users of consumer durables such as motor cars. The reasons for these exclusions are, largely, statistical—the sheer difficulty of measurement.

Another caution against equating G.N.P. with final output derives from the difficulty of separating intermediate and final products. If double-counting is to be avoided, only the latter should properly be included in G.N.P. In practice, too, it is often far from clear whether particular products should be treated as final or intermediate and as a result the treatment adopted may be no more than "conventional". For example, some final products (e.g. personal telephone calls made on business phones) end up being classified as intermediate, and hence excluded from G.N.P., while some products which might equally have been classified as intermediate (e.g. fares paid in travelling to work and some government services) are classified as final and included. Paradoxical situations of these kinds result both from the difficult conceptual problems which arise in any attempt to draw precise dividing lines between intermediate and final products and from the inadequacy of the data available to allow of any other treatment.

One further difficulty in using estimates of G.N.P. as a measure of output derives from the fact that a certain amount of capital is consumed *in the process of production*; in other words, one of the components of G.N.P., namely the estimate of *gross* fixed investment in new assets, overstates the extent to which the capital stock of the economy has been increased during the period in question because it takes no account of the amount of the previously existing capital stock which has become worn out or obsolescent during the same period. There are, of course, great difficulties in making estimates of capital consumption and as a result *net* measures of capital investment are invariably artificial in greater or lesser degree. This renders it necessary to fall back on the more readily estimated gross measures; but it should be recognised in doing so that the *level* of output is thereby inflated and that, depending upon the relationships between the existing capital stock, the rate of consumption of it and the rate of gross investment, the *trend* in output may also be affected one way or the other.

Thus G.N.P. represents an incomplete, and to some extent inappropriate, measurement of total output and, for that reason, movements in the one need not necessarily represent a true reflection of movements in the other. This is not a mere quibble. It would not matter greatly if the portion of output excluded from G.N.P. remained a constant proportion of the whole, but in growing and changing economies such a situation is far from likely. For example, in less advanced economies, with a large non-market sector characterised by subsistence agriculture and barter trade, changes in the way output is organised may, merely by transferring activity from the non-market to the market sector, effect an increase in G.N.P. as measured even though there may have been no change in output. In more advanced economies, the opposite effect may occur as the stock of public and private capital assets to which no income is imputed increases. In short, social and economic factors can result in dissimilar changes in G.N.P. (as defined) and total output.

III

Given these restrictions on our definition of G.N.P., however, there is next the question of estimating G.N.P. as defined. Many approximations have to be made in the course of estimation. As a result, we are usually left with a statistical discrepancy between the two sides of the national income and expenditure accounts. For example, it was shown in material submitted by Counsel for the Commonwealth in the 1964 Basic Wage Inquiry that between 1959–60 and 1962–63 G.N.P. at constant prices increased by 9.6 per cent. with the statistical discrepancy included in the expenditure side of the national accounts, but by

⁽¹⁾ The current costs are, of course, already included in G.N.E., as part of the current expenditure of public authorities.

⁽²⁾ Since it would also be necessary, in this case, to allow for depreciation of the capital assets (schools) involved, the estimates of *net* output would not be increased as much. See below.

11.8 per cent. if the discrepancy were transferred (with sign reversed) to the income side. As the reasons for the statistical discrepancy are quite unknown (i.e., there are no grounds for preferring its inclusion on one or the other side of the accounts) there is nothing to choose between these estimates.⁽¹⁾

The presence of a statistical discrepancy is only a reflection of the more general point that inadequate or, at times, inaccurate basic data render national accounts estimates much less precise than, say, a count of population. In Australia, for instance, data may be inadequate as a result of the difficulty of obtaining any information at all (e.g., losses incurred by unincorporated businesses); of the practical need to adapt for national accounts estimating purposes data collected for other statistical purposes (e.g., some items of personal consumption expenditure); and of the infrequency of collections of some data (e.g., imputed rents of owner-occupied dwellings are based in part on assumptions which derive from census data, while the estimates of wages, salaries and supplements are based in part on employment data related to census data "benchmarks"). Similar inadequacies of data, with similar effects, occur in all countries.⁽²⁾

Data may be inaccurate because of sampling errors and bias in survey collections; or because of confusion, in accounts of trading enterprises, between capital gains or losses and income (a particularly difficult problem in estimating depreciation and changes in the value of stocks). It may also be inaccurate because of the supply of wrong information, e.g., concealment by income earners in making taxation returns, concealment ranging from deliberate and often sizeable attempts to defraud the revenue⁽³⁾ to the more petty but also more numerous cases of failure to return income from spare-time employment and the like.

Inadequacies and inaccuracies of these kinds in the basic data entering into estimates of G.N.P. vary considerably from one country to another and, further, in a particular country they can vary over time—for example, the estimates for the year immediately past are usually subject to more revision than those for earlier years. On the whole, G.N.P. estimates for Australia are thought to be as or more reliable than most of those produced overseas; however, figures for the year immediately past have on occasion been extensively revised, and even in the case of figures for earlier years, the need for wider-ranging revisions arises from time to time as new data (e.g., from census material) become available. In comparisons over time or with other countries, however, the point needs constantly to be kept in mind since all countries are affected to a greater or lesser degree; it is particularly relevant in comparisons with countries with less advanced statistical services.

It may be worth saying a little more on this point because it is essential that users of the figures should be as fully aware of their possible frailties as are, certainly, those who compile them. The Statistician has drawn attention to the fact that the estimates are based on a very wide range of information, some of which is available fairly quickly and some of which is only available a substantial time after the period to which it refers. However, if the estimates are to be of any use in helping to interpret recent trends in the economy they have to be available fairly promptly. It is the Statistician's practice, therefore, to prepare the best estimates he can on the basis of the information available shortly after the end of the period, and subsequently to revise the figures as more and better information becomes available. The estimates

⁽¹⁾ The material submitted in the 1964 Basic Wage Inquiry referred, for reasons pertaining to that Inquiry, to comparisons between the year 1959-60 and 1962-63 (the latest year for which constant price estimates of G.N.P. were available at that time). It should however be pointed out that the cumulative difference between the two alternative calculations of G.N.P. at constant prices resulting from the transposition of the statistical discrepancy was unusually large within that period, as the following table shows. Over the period 1953-54 to 1962-63 as a whole, for example, the two alternative calculations are almost identical. None the less, as the table also indicates, the uncertainty surrounding the statistical discrepancy is one factor which renders any precise conclusions about rates of "real" economic growth from one year to the next, which might be drawn from these statistics, of limited value. Other reasons pointing to the same conclusions are considered in the remainder of this chapter.

GROSS NATIONAL PRODUCT AT CONSTANT PRICES, 1953-54 TO 1962-63
Increase on Previous Year, Per Cent.

With Statistical discrepancy included on:	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62	1962-63
(a) Expenditure Side of Accounts ..	6.2	4.5	1.9	1.7	7.2	3.9	4.2	..	5.1
(b) Income Side of Accounts ..	4.2	5.4	3.1	0.8	8.0	1.6	5.3	0.9	5.2

Source: "Australian National Accounts, National Income and Expenditure 1948-49 to 1962-63", Table 11 (at average 1959-60 prices). The figures for the years 1959-60 to 1962-63 published in this document were somewhat revised from those published earlier on which the submission in the Basic Wage Inquiry was based; they have since been further revised in the White Paper on National Income and Expenditure 1963-64.

⁽²⁾ The obvious need for the most adequate and accurate basic data possible if the quality of these important estimates is to be improved is well recognized by the Commonwealth Statistician, who is engaged continuously in seeking to institute new statistical collections or to improve or extend existing collections. In the process of doing so the Statistician does, of course, also have to have regard to the burdens imposed upon those required to submit returns to the Bureau.

⁽³⁾ Apart from tax evasion, it is probably fair to assume that there exists a systematic bias in the estimates arising from tax avoidance and the natural desire of taxpayers to minimise tax payments by treating, to the maximum extent possible within the law, expenditure as current and income as capital.

as first published thus aim to provide a broad general summary of trends in the economy but, as indicated, they are based on data which are always incomplete and sometimes conflicting. By placing this material within a comprehensive and consistent framework the estimates provide a background against which the best assessment possible at that time of the significance and importance of trends in particular statistical series can be made. But in using and interpreting the estimates the possibility should be kept well in view that revisions may be made to the figures and these may be significant for the particular purpose in hand. For example, when results of the 1961 census became available the previously available estimates of employment, and consequently of total wages and salaries, were shown to be too low. Year to year revisions from 1954, the year of the previous census, to 1961, though comparatively small, were cumulative so that the effect of this revision was more important when the figures were used for longer term analysis than in studies of current year to year changes.⁽¹⁾ In other cases revisions may seriously affect interpretation of short term trends without necessarily becoming cumulative and affecting the long term. Thus estimates of gross private expenditure on "all other" fixed capital expenditure are based originally on information from current surveys and on statistics of production and imports, whereas final estimates also take into account data from the tabulations of the taxation returns which are only available after two years. For example, the first published estimate⁽²⁾ of private capital expenditure on "all other" fixed capital equipment in 1961-62 was £530 million, a fall of 10.2 per cent. from the equivalent figure for 1960-61. The most recently published figure for 1961-62 is £605 million, a fall of 0.8 per cent. from the equivalent (and also revised) figure for 1960-61.

The following table may serve to illustrate what has been said above. In it are set out (i) the figures (at current prices) for wages, salaries and supplements for the year 1954-55 and for the run of years just prior to the extensive revisions necessitated by the 1961 census data, as they stood before those revisions commenced; and, for purposes of comparison, (ii) the revised figures as first published in "Australian National Accounts, National Income and Expenditure 1948-49 to 1961-62" and (iii) as most recently published in the White Paper on National Income and Expenditure 1963-64. The table also shows a similar comparison of successive estimates of gross private expenditure on "all other" fixed capital equipment for recent years.

Estimates for—	Wages, salaries and supplements.					
	£ million.			Change on previous year—per cent.		
	As published in—			As published in—		
	(a)	(b)	(d)	(a)	(b)	(d)
1954-55	2,450	2,463	2,463	8.7	9.2	9.2
1959-60	3,352	3,439	3,453	10.2	11.0	11.5
1960-61	3,573	3,679	3,720	6.6	7.0	7.7
1961-62	3,646	3,755	3,826	2.0	2.1	2.8
	Gross private expenditure on fixed capital equipment other than dwellings and other new building.					
	(b)	(c)	(d)	(b)	(c)	(d)
1961-62	530	560	605	-10.2	-7.4	-0.8
1962-63		645	670		15.2	10.7

Note: Figures for gross private expenditure on "all other" fixed capital equipment were extensively revised in publication (b) to take account of the major change in concept resulting from the exclusion from this item of expenditure on new motor vehicles for personal use. It is not therefore possible to compare figures for earlier years, published previously, with figures for those years published in "Australian National Accounts, National Income and Expenditure 1948-49 to 1961-62" and subsequently.

(a) "Quarterly Estimates of National Income and Expenditure, March quarter, 1963". (May, 1963.) Figures for wages, salaries and supplements in 1954-55, and the increase therein on the preceding year, are taken from the White Paper on National Income and Expenditure, 1961-62. (August, 1962.)

(b) "Australian National Accounts, National Income and Expenditure 1948-49 to 1961-62". (July, 1963.)

(c) "Australian National Accounts, National Income and Expenditure 1948-49 to 1962-63". (July, 1964.)

(d) White Paper on National Income and Expenditure 1963-64. (August, 1964.) Figures for wages, salaries and supplements in 1954-55 and the increase therein on the preceding year, not given in the White Paper, are taken from source (c) above.

It will be readily seen that estimates compiled on the basis of data originally available may be subject to revisions of considerable magnitude in the light of further information becoming available subsequently, and perhaps not till some years later. Considerations of this kind should be kept well in view if the figures

⁽¹⁾ The resulting revision amounted to about 0.7 per cent. per annum, reaching about 5 per cent. of the total of wages and salaries in 1961. Actually, because of the relative importance of the wages, salaries and supplements item in the total of G.N.P., even a year to year revision of only 0.7 per cent. produces a revision of between 0.3 per cent. and 0.4 per cent. in the annual change in total G.N.P.

⁽²⁾ On the basis of the new concept used in "Australian National Accounts, National Income and Expenditure 1948-49 to 1961-62" See note to table above.

are used for purposes of short-term analysis.⁽¹⁾ For such analysis, the national income figures need to be supplemented by a detailed study of other statistical series bearing on current economic trends. But even then, the possibilities of later revisions should be taken into account.

What has been said so far regarding the second compromise with actuality in attempting to measure the increase in the total quantum of goods and services produced relates to the estimates of G.N.P. at current prices. However, the more important aspect of this matter derives from the defects inherent in estimates of changes in "real" G.N.P. over the years. This is, perhaps, the most difficult problem confronting those seeking to measure economic growth. In what follows an attempt is made to provide an account, in general terms, of the nature of the difficulties involved. The Commonwealth Statistician, in his publication "Australian National Accounts, National Income and Expenditure 1948-49 to 1961-62"⁽²⁾ and again in his publication "Australian National Accounts, National Income and Expenditure 1948-49 to 1962-63"⁽³⁾ has commented upon this same question.

The first part of the problem of estimating changes over the years in "real" G.N.P.—that is, changes that are not due only to movements in money values—is nothing more or less than the well-known "index-number problem". The total output of the economy consists of a vast range of goods and services which cannot be measured as a whole in physical terms as the output of a single homogeneous product can be measured, say, in tons or cubic yards. The one thing common to all of the heterogeneous goods and services making up output is that they can be valued in terms of money. In adding up the total, therefore, no other course is available but to use this common denominator, money⁽⁴⁾. It is necessary also to ensure that, so far as possible, this common denominator should itself be unchanged throughout the period with which we are concerned since, otherwise, movements in the general level of prices would distort the results by producing changes in the totals expressed in money terms that did not correspond to the changes occurring in "real" output. Thus, to obtain an indication of changes in "real" output, G.N.P. is measured at constant prices by valuing the output entering into it from year to year in terms of the prices of a particular year. There is no reason for preferring the price "weights"⁽⁵⁾ of any particular year to those of other years; unfortunately, however, the choice of one year's weights rather than another's will almost certainly give a rather different result. There is, therefore, no uniquely "correct" result.

Some, though far from definitive, indication of the quantitative significance of this problem may be gleaned from an examination of the two series of constant price estimates of G.N.P. published by the Statistician. The first of these series, which is based upon average 1953-54 prices, covers the period from 1948-49 to 1959-60; the second, based upon average 1959-60 prices, covers the period from 1953-54 to 1962-63. The following table sets out the percentage increases in G.N.P. at constant prices from year to year over the period common to both series.

GROSS NATIONAL PRODUCT AT CONSTANT PRICES, 1953-54 TO 1959-60
Increase on Previous Year, Per Cent.

G.N.P. at—	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60
(a) 1953-54 prices	5.8	5.3	2.4	1.1	8.6	3.9
(b) 1959-60 prices	6.2	4.5	1.9	1.7	7.2	3.9

Source: "Australian National Accounts, National Income and Expenditure 1948-49 to 1962-63", Tables 10 and 11. Figures for the year 1959-60 (at the prices of that year) have since been revised in the White Paper on National Income and Expenditure 1963-64.

As would be expected on theoretical grounds, the rise in G.N.P. shown over the period as a whole is greater in terms of average 1953-54 prices (30.2 per cent.) than it is in terms of average 1959-60 prices (28.1 per cent.). The cumulative difference of 2.1 per cent. over the six year period is not great, amounting on average to 0.3 per cent. per annum; however, as the figures in the table show, the differences in some years have been considerably greater than this. Perhaps all that needs to be said is that here is a further reason for caution in too literally accepting the figures for changes from year to year.

Quite apart from the index-number problem, however, there are the practical statistical difficulties involved in estimating G.N.P. in terms of the prices of a base year. A great deal of approximation and a goodly number of arbitrary assumptions are necessary to produce such estimates. The uses to which the

⁽¹⁾ Even more care is required in interpreting quarterly figures upon initial publication. For example, gross private expenditure on "all other" fixed capital equipment totalled £495 million in the first three quarters of 1963-64 according to "Quarterly Estimates of National Income and Expenditure, March Quarter, 1964". However, in the June quarter publication these figures were revised upwards to £536 million, 8.3 per cent. greater than the earlier published figure. Simultaneous upward revisions to the figures for each quarter of 1962-63 resulted in the increase between the first three quarters of the two years rising by less than the revision to the 1963-64 data alone would have indicated, namely by 9.4 per cent. compared with the increase of 4.9 per cent. indicated by the March quarter figures. However, what had appeared, on the basis of the earlier figures, to be an important sector of expenditure lagging behind the rate of increase in other sectors appeared, on the basis of later revised figures, to be subject to a greater rate of increase than most other sectors.

⁽²⁾ Pages 17-18, 123-125.

⁽³⁾ Pages 11, 90-91.

⁽⁴⁾ The fact that money may be used as a common denominator to add up the innumerable and diverse forms of output in this way should not be allowed to obscure the fact that output is not homogeneous; a consideration which may lead to legitimate questions as to the meaning to be attached to an increase in output so measured.

⁽⁵⁾ It will be evident that the quantities of particular goods and services that happen to enter into the composition of output for a particular year also determine the value of G.N.P. for that year. As the quantities and the proportion they bear to the whole vary from year to year, they influence the results obtained from taking as constant the prices of one year rather than another.

results can legitimately be put can only be determined by detailed enquiry into the estimates for any particular country. In Australia's case no official estimates have been made from the production side of the accounts; to date it has been possible to approach the problem only by revaluing Gross National Expenditure plus exports of goods and services less imports of goods and services. The process of revaluation raises a number of major problems.

First, revaluing expenditure on products may be frustrated by lack of accurate data. For example, in preparing the Australian national accounts adequate quantity data on clothing are not available. Revaluation of expenditure on clothing is therefore by means of a price index which, of course, has quantities weighted in accordance with a base period.⁽¹⁾

Secondly, changes in the quality of goods and services are continually occurring so that, in effect, the relevant goods and services are not the same in different years. Quality changes in houses, cars and other consumer durables spring most readily to mind; but the same is true of innumerable other goods and also of services such as medical care, transport and the like. Clearly, changes in quality are as much a change in levels of output as changes in the numbers of goods and services produced. Yet it is exceptionally difficult to take objective account of quality changes in revaluing expenditure in terms of prices of a base year; the process of doing so is essentially a matter of judgment. While, therefore, statisticians may try, in respect of certain items of personal consumption expenditure, to allow for quality changes as best they can in the process of revaluation to constant prices, the outcome can by its very nature never be more than subjective. In other fields of expenditure it would be even more difficult to apply judgments of this kind; in such cases statisticians tend to assume that their judgments are little better than those of others and that, if only for that reason, the straightforward course is not to seek to impose their own judgments at all. Certainly, there are no generally agreed criteria on which judgments of the extent of quality change might be based. To what extent, for example, is the quality of a motor car improved by an increase in its horse-power? Opinions differ.

The view which the statistician is thus almost forced to take is, therefore, understandable; but the fact needs to be faced that it does to a considerable though indeterminate extent alter the significance of the constant price estimates by the understatement which it imparts to increases in standards which are actually occurring. In the Australian national accounts, for example, no allowances have been made for quality changes in houses over the period covered (1948-49 to 1962-63)—a period in which housing design, to name only one aspect of the matter, has undoubtedly shown a marked improvement. The same assumption is made of motor cars, for which none the less it is a matter of common observation that there has been a notable improvement in quality over the years.

In addition to these more obvious and important examples, there is also considerable variation in the extent to which quality change is allowed for in the extensive array of other goods in which it occurs. In the case of services, too, the inbuilt assumption (if only for lack of any reliable alternative) tends to be that there has been no change in the quality of the service (e.g. medical care) provided.

A third statistical problem in the way of achieving accurate constant price estimates concerns the introduction of new products, such as television or air-conditioning, or new services, such as anti-poliomyelitis injections, which were not available at all in the "base year". These raise difficulties akin to those raised by quality changes; there is no statistically water-tight way of handling them and inevitably arbitrary decisions have to be made.

A further problem is in the treatment of "unique" goods, which comprise a good deal of both private and public capital expenditure (steel mills and civil engineering works, for example). As in the case of new products (which, from a statistical viewpoint, they here resemble) there is no way open to the statistician to fit such products into a homogeneous series for the purpose of revaluation at constant prices, other than by making an additional *assumption* about changes in productivity in their production. As the Commonwealth Statistician puts it (our italics):

"For most items of public capital expenditure, and for private construction expenditure other than housing, lack of data made it necessary to adopt the assumption that the expenditure could be revalued in terms of the prices of labour and materials. *The estimates resulting from such a method therefore have considerable limitations for many uses, for example, in studies of productivity.*"⁽²⁾

Implicit in this is the assumption that there have been no changes in the productiveness of the processes whereby the labour and material inputs are employed. One implication would be that the Australian constant price estimates thereby assume that engineering operations are no more efficient today in their use of labour and materials than they were in the base year 1948-49.⁽³⁾

⁽¹⁾ "As the available price indexes were of the type in which the prices are weighted by consumption in a base period, the results of this division were an approximation only to the desired results. (It can be shown that for consistency with the direct revaluation a price index should be weighted by consumption in the given year rather than by that of the base year.)" ("Australian National Accounts, National Income and Expenditure 1948-49 to 1962-63", page 10.)

⁽²⁾ "Australian National Accounts, National Income and Expenditure 1948-49 to 1962-63," page 10.

⁽³⁾ The unreality of this implication can perhaps be more readily seen if we consider what it would by now have meant had the estimates of G.N.P. at constant prices been based, say, on 1848-49 rather than 1948-49 (or, equally, what it will imply by 2048-49). This indeed is one reason why the Statistician does not extend the estimates more than a few years from base dates.

A somewhat comparable difficulty arises in the case of current expenditure by public authorities; here too it is implicitly assumed that there has been no productivity change in the output of the goods and services supplied by public authorities, and that increases in output in money terms reflect changes in the prices of labour and materials used.⁽¹⁾

The revaluation of changes in stocks presents yet another problem. Here the difficulty arises from the need to break down changes in the value of stocks between volume changes and valuation changes.⁽²⁾ Apart from the fact that this process itself raises on a smaller scale the "index number" problems referred to earlier, there are in any case insufficient data available for the Commonwealth Statistician to do this with any certainty in the Australian accounts. Indeed, so little confidence is held in the stock valuation adjustment that the Statistician refrains from showing it explicitly in the accounts.

Lastly, there is a problem, more conceptual than statistical, relating to the revaluation of exports of goods and services. If we are interested in changes in the physical volume of output in the economy, it is appropriate to revalue exports of goods and services at constant base year prices (as in the Australian national accounts). If, however, we are interested in changes in total "real income", it would be more appropriate to revalue exports of goods and services according to the change in their command over imports, that is, by taking account of relative changes in export and import prices (the "terms of trade") compared with those obtaining in the base year. In an economy as subject as our own to changes in the terms of trade, the difference between estimates arrived at on the different bases can sometimes be considerable. For example, between 1962-63 and 1963-64 Australia's terms of trade improved by about 12 per cent. and this in itself added about 2 per cent. to real income.

It will be clear by now that constant price adjustments involve assumptions and varying degrees of subjective judgment. They do not purport to, and cannot, result in a measure of quantity in any physical sense, although the word "volume" or "real" is frequently (and incorrectly) used to describe the resulting figures. Rather, constant price estimates indicate, over comparatively short periods free from substantial institutional change, whether economic growth appears to be taking place and whether it appears to be accelerating or slowing down. It is but a broad indicator; it certainly is not intended to be interpreted in any precise quantitative sense. Concepts such as "real G.N.P." and "real national income" are thus quite hypothetical and statements that these, or related concepts, have increased by x per cent. mean no more than that a somewhat arbitrary kind of index based to a substantial extent on assumptions and subjective judgment has so increased.

To sum up, for a very large proportion of Gross National Expenditure constant price estimates do not provide a measure of the quantitative trend in economic growth (or economic growth per head).⁽³⁾ Inadequacies and inaccuracies of the current price data are aggravated in the process of adjustment to constant prices by the index-number problem, the difficulties presented by quality change and new products, and the assumptions necessarily made about productivity change in respect of large sectors of total expenditure. Even in the field of personal consumption expenditure (62.6 per cent. of G.N.E. in 1959-60) where for most of the items concerned reasonably good data for the measurement of quantities of goods and services going into final use, or reasonably good price series for the revaluation of expenditure on them, are available, the index number problem remains, as to some extent do the problems of quality change and new products notwithstanding the efforts that are made, in respect of part of this field of expenditure, to allow for these. Current expenditure by public authorities (which, together with that by financial enterprises, accounted for 10.8 per cent. of G.N.E. in 1959-60) is revalued for constant price purposes on the implicit assumption that no changes have occurred in the productivity of labour employed by public authorities. The same is true for a considerable proportion of private fixed capital expenditure other than dwellings (10.9 per cent. of G.N.E. in 1959-60), including all non-dwelling construction (3.0 per cent. of G.N.E. in 1959-60). Mention has already been made of the fact that no allowance has been made for quality change in dwellings over the period covered by the accounts (1948-49 to 1962-63); in 1959-60 expenditure on dwellings accounted for 4.3 per cent. of G.N.E. (while dwelling rent⁽⁴⁾, both actual and imputed, made up a further 5.4 per cent.). For most items of public fixed capital expenditure (8.2 per cent. of G.N.E. in 1959-60) the implicit assumption is that no increases have occurred in the productivity of labour. Revaluation of changes in the value of stocks is, as we have seen, even less firmly

⁽¹⁾ See, for example, "Australian National Accounts, National Income and Expenditure 1948-49 to 1962-63", page 10: "... it was impractical to measure and revalue the goods and services supplied by public authorities, and the revaluation was applied to the goods and services bought by them, including the services of employees."

⁽²⁾ Strictly speaking, the stock valuation adjustment is required to arrive at G.N.P. at current prices and the problem of arriving at the value of the physical change in stock levels thus belongs to the group of problems discussed on pages 7-9. (A further and separate problem is then involved in revaluing this volume change in terms of the prices of the base year.) This is the more usual international practice but it is not followed in the Australian national accounts, partly because inadequacies of data would render it pretentious to attempt to do so. Again, however, it should be noted that the effect of not doing so is to include in the value of the national product an item (the change in the value of the level of stocks equivalent to that existing at the beginning of the period) which does not require the employment of factors of production and which cannot therefore be said to have been "produced".

⁽³⁾ Whether per head of population ("real income") or per member of the work force ("productivity").

⁽⁴⁾ Included in personal consumption.

based. All told, by going through each of the components of G.N.E. in turn, it will be seen that only about one-quarter of total gross national expenditure can fairly be said to be free of problems of revaluation of the kind described above.⁽¹⁾

Put another way, for about three-quarters of G.N.E., assumptions about changes in quality or productivity (usually by way of deciding not to allow for either) are made before the constant price estimates are prepared and are incorporated in those estimates. It should be obvious that any subsequent attempt to use the resulting estimates of G.N.P. at constant prices to draw any but broad and inexact conclusions about changes in "real income" or in "productivity" must fail, being based upon circular reasoning. Since the in-built assumptions involved virtually always err in the same direction—it is reasonable to believe that quality change has generally even if not always been upwards, and that productivity in the service and capital goods producing industries has tended to rise—a considerable element of understatement is imparted to the estimates.⁽²⁾ Further, the more advanced an economy, the more important this qualification becomes, since in such an economy growth tends increasingly to reflect itself, not in a simple adding to the numbers of goods available, but in improvements to the quality of existing goods, in the devising of new products, and in a relatively growing services sector (including public authority services). There are implications here for the relative growth performance of more advanced vis-à-vis less advanced economies as measured by estimates of the growth of G.N.P. at constant prices.

In passing, it might be noted that, even if a measure of changes in "productivity" per worker could be obtained, allowance would still have to be made for changes in the composition of labour inputs. For example, if in a given period the increase in the work-force is more than usually heavily weighted with juniors (as it is in Australia at present), it is reasonable to suppose that overall productivity as measured by such a calculation would show a smaller increase than otherwise. In the same way, there is a strong tendency (again, particularly in advanced economies such as Australia) for the participation in the work-force of females, notably married women, to increase at a faster rate than males. Since female productivity tends on average to be somewhat lower than male, the resulting increase in production will be less than commensurate with the increase of the total work-force—in other words, average "productivity" per worker will tend to fall or to increase less rapidly.

It should by now be abundantly clear that we can only measure economic growth in a rather indirect and inaccurate way. One result of this is that the setting of statistical targets for growth has meaning only in terms of achieving a statistical result the relationship of which to a real result is obscure and not ascertainable. Further, a point of practical significance that emerges is that particular rates of economic growth as such cannot be treated as ends in themselves. In the Australian economy and others like it, the pattern of growing demand is continuously changing and the pattern of output is changing with it. Given the same full use of resources at any particular time, one pattern of maximum output will yield a different growth rate (as measured by G.N.P. at constant prices) from that given by some other pattern of maximum output. What the community wants, as expressed through effective demand, is thus the final arbiter of the pattern (and hence will affect the measured rate) of growth.

If then, the aim is to be the maximum output that best meets the demands of the community (and here the needs of the future as well as of the present will be relevant) the most effective practical course would appear to be that of promoting conditions favourable to the maximisation of that output (whatever the resultant growth rate as measured by G.N.P. at constant prices proves to be). What these conditions are is discussed in the next chapter.

IV

Before turning to the next chapter, however, it may be as well to reiterate what was said earlier on the use of, and value to be placed upon, estimates of G.N.P. Nothing that has been said so far, however, should be taken to mean that estimates of G.N.P. (or of G.N.P. at constant prices) are to be regarded as valueless. On the contrary, they represent a convenient "short-hand" means of roughly appraising what is happening to the economy, of analysing the requirements of policy from time to time, and of portraying the inter-relationships between incomes and expenditures of the different sectors of the economy. The observations on estimates of G.N.P. at constant prices made above have been set down because it can easily happen that statistics of this kind, through indiscriminating use, come to be accepted as having an authenticity and significance which no-one familiar with their construction, and least of all their authors, would think of attaching to them. These apparently technical matters, moreover, can have a marked significance when the debate ranges into international comparisons of growth rates and questions of that sort. The fact is that, like all tools of trade, estimates of G.N.P. are meant for a particular job and they do it as well as can be expected. Difficulties arise only where they are used for jobs for which they are less well suited.

⁽¹⁾ The "index number problem" referred to on pages 9-10 applies to the whole field of gross national expenditure when revaluation is carried out.

⁽²⁾ The obverse of this is, of course, that the "implicit" index of overall price change for the economy as a whole (derived by comparing the estimates of G.N.P. at current and at constant prices) commensurately overstates the extent to which prices as a whole have in fact risen. That is, any understatement of the rate of increase in productivity is reflected in an equal understatement of the actual rate of increase in real incomes.

CHAPTER 2.—THE CONDITIONS FOR ECONOMIC GROWTH

I

From a strictly economic standpoint the growth in a nation's total production which results from an increasing population and work-force may have less significance than the growth in production per head.⁽¹⁾ This, which is sometimes described as the increase in "productivity", is the chief dynamic element in the process of growth, the element which can transform the way in which people work and live.

This is not to say that growth of population and of total output are unimportant. On the contrary, in some circumstances (in a war-economy for example) it is the level of and growth in a nation's total production which is the significant matter. There are, moreover, links between population growth and changes in productivity. To name only a few examples, increased population will provide greater possibilities of economies of scale in production processes⁽²⁾; by providing one of the main bases for a growing total market it will serve to underpin business confidence and expectations of growth and thus to sustain investment in new plant and production facilities; and, to the extent that rapid growth of the population and the work-force provides a steady stream of new labour resources, it may contribute towards greater flexibility in the economy and hence towards easing the impact of changes which are inevitable in a growing economy.

There are, of course, some factors relating to rapid population growth which operate against productivity. Of these, perhaps the most important is the extent to which it pre-empts capital resources for so-called "capital widening" and limits the availability of capital for the "capital deepening"⁽³⁾ investment which more directly relates to the process of increasing productivity. Views may well differ as to whether, in the overall outcome, the rate of increase in productivity (or growth of output per head) for a given economy will be greater or less when its population is growing fast than when it is growing more slowly. In this paper we shall not be concerned with that question; a high rate of population growth has for long been accepted as a national objective by all Australian governments. Here we are concerned, rather, to examine influences other than population on economic growth in the sense of growth of output per head.

Before proceeding to that, however, there is perhaps one further preliminary point which should be made. In the eyes of many, a nation's growth is not to be evaluated merely by the growth in output per head, or even by the growth in total production. Those who take a view of this kind would point to other aspects of the national scene, such as the work proceeding on major developmental projects, as an index of the extent to which "growth" is proceeding. Or again, there are those for whom "growth" is measured by the increase in their standards of living, which may be variously defined in individual cases and which may bear no necessarily direct relationship (though they will usually bear an indirect one) to growth in the sense of the increase in output per head of the work-force. Views of these kinds are to be found in most public discussion of these matters. In this paper, however, we are concerned only with the concept of growth as increasing output per head.

Economic activity involves the interaction of labour, capital and natural resources. The existence of all three does not, however, ensure that economic growth will occur. In the historic past, labour and other resources have both been present and so, at times, has a substantial amount of capital. Generally speaking, however, what we would today term technical progress⁽⁴⁾ was then less evident. It has been technical progress—using that term in the widest sense—that, in comparatively recent times, has been the main catalyst to growth; in conjunction with the application of capital it has unlocked natural resources which had previously remained valueless and it has transformed labour skills. It has not, of course, been entirely uninfluenced by the results it has itself helped to produce; once economic growth gets under way technical progress may itself become a "product" of growth.

The precise nature and duration of the process of economic "take-off" is still debated; partly for that reason, but more particularly because the discussion is of little more than academic significance in Australia's case, it is not proposed to pursue it here. However, before we consider some of the particular factors which can influence the rate of growth in more advanced economies, there is one point in particular relating directly to this matter of technical progress which is so important in explaining differential growth rates in different economies that it probably deserves a prominent place in any discussion of the topic. The point is concerned with the distinction between increasing output through extending the limits imposed on productivity by the present state of technical knowledge, and growth made possible by raising productivity up to those limits. Two examples may illustrate the matter.

⁽¹⁾ Of even more interest than the growth of production per head, of course, is the growth of "real income" per head. This may be affected by changes in the terms of trade (see page 12).

⁽²⁾ If there were no impediments to international trade, economies of scale would not need to depend upon the growth of a country's own population; even as things stand, of course, economies of scale may often be open to particular industries through development of export markets to supplement domestic sales.

⁽³⁾ See page 15.

⁽⁴⁾ And, of course, at times, an adequate level of demand.

Take the case of a country already in the technical forefront. The United States of America is the most obvious example. So far as technical progress is concerned, such a country can increase the productivity of its workers in only two ways. One is through new knowledge and, just as important, innovation—the translation of the new knowledge into the processes of production. This is a relatively slow process—the technical frontiers are expanding all the time, but the pace made by the pioneers will usually be slower than that at which others can follow. The other way is to try to ensure that all the country's productive units are taking full advantage of existing techniques—that is, to ensure the spread of "best practice" through industry as a whole.

The other example concerns an economy, already growing but still well behind the leaders in all or part of its technology. Such a country has open to it the second process mentioned above, not merely on the national scale (bringing all its firms up to the "best practice" of its own leading ones), but on the international scale also (bringing its industry as a whole up to the "best practice" prevailing in the leading countries of the world—but here we must always allow, of course, for the fact that differences in relative prices of factors of production may mean that what is "best practice" in one country might not be so in another). For a country starting well behind the technological field, such a situation offers an enormous scope for growth. This probably serves as much as any other single factor to explain, for example, the remarkable growth achieved by the Japanese economy⁽¹⁾ in the post-war period; while by contrast it has obvious implications for the lower growth rates achieved by such countries as the United States, the United Kingdom and Australia.

This general point is, in fact, of first-rate importance; it should never be lost sight of either in looking at a country's potential for growth or comparing its experience with that of other countries.

II

The possible future advance of technical knowledge is beyond our scope here. Suffice it to say that those countries which mainly depend on it to improve their technology have the potential for only moderate rates of economic growth by comparison with those that are further behind in the application of existing technical knowledge but have begun to catch up. Countries in the first category thus show up unfavourably in current international comparisons with less advanced countries in the second category.

In what follows, therefore, we shall concentrate upon those factors which influence growth in the modern economy by affecting the movement of productivity towards the limits imposed by existing technology at any given time.

One of the most important of these factors is the availability of capital. While it would be going too far to suggest that a country's rate of growth is chiefly a function of the proportion of its output devoted to capital investment, it is clear that a country usually requires capital to take advantage of superior techniques and skills (and, indeed, much of what is generally thought of simply as capital replacement has the incidental effect of incorporating advances in technology). Hence, if a higher level of techniques is to be applied in an economy, capital will be needed and, other things being equal, the higher the proportion of current output that can be devoted to capital investment, the greater will be the opportunity to achieve a high rate of economic growth.

Other things, of course, are not always equal. In particular, a country such as Australia, where population and the work-force are increasing rapidly, will have to devote a good deal of its capital investment simply to providing for these increased numbers—whether by way of houses, roads, schools and the like, or of work places and machines for the additional workers to use in their employment. This so-called "capital widening" tends, in the main, to provide the capital facilities for increased numbers at the same levels of output per head—though it may, as already noted in the case of capital replacement, serve to introduce improved technology into the production processes at the same time. To the extent that capital is needed for this type of investment, there will tend to be less available for the so-called "capital deepening"—the process of choosing, from alternatives simultaneously available, the more capital-intensive method of production, generally associated with an increase in output per worker.

The opportunity to increase the rate of growth through increasing the proportion of current output devoted to capital investment may moreover be missed, or be less than fully exploited, if investment is directed into relatively unproductive projects or is pushed ahead without adequate regard for the pattern of final demand. Thus, investment which makes use of labour and physical resources in demand elsewhere without producing a reasonable rate of return on their use is inimical to a country's rate of economic growth, as is investment which results in increasing the output of products beyond the demand for them.

⁽¹⁾ In some aspects of industry, Japanese technology today may well be in the forefront. What is said here is meant to apply to the past two decades and to cover the economy as a whole.

Examples of the first kind would probably be more commonly found amongst public works, partly because it is difficult to apply the normal price mechanism to the products of such works, so that the criteria for judging their relative economic merits do not exist or exist only in a rudimentary form.⁽¹⁾ Examples of the second kind tend to occur wherever distortions are imparted to the businessman's normal calculations of profit and loss. Such distortions can arise simply from miscalculations of future demand or supply, whether by individual businessmen or by central planning bodies; or from the creation of protected positions which permit operation under conditions of excess capacity to continue to yield a satisfactory profit.

Another important general influence on the rate and pattern of growth results from the tendency for average physical output per worker to increase at different rates in different sectors of the economy, partly because of differences in the scope for technical progress. This does not imply, however, that the average product per worker will *necessarily* be increased by a shift of labour into industries in which physical output per worker is growing fastest. Since product per head is measured in value terms, much will depend upon the level of demand for the products of the industry concerned. In many of the industrial economies of Western Europe, for example, average physical output per worker in agriculture has been rising very fast in the post-war period but, for reasons chiefly associated with the level and pattern of demand, the value of product per worker (in effect, wage rates) has remained lower than in most other sectors of the economy. In these circumstances, in a growing economy, labour tends to shift from the sectors where the value of its product is lower to those where it is higher, thereby increasing the average value of product per worker over the whole economy.⁽²⁾ If, meanwhile, these changes encourage the adoption of labour-saving techniques in the sectors losing labour (as is generally the case), the average gain is so much the greater.

The value of output will thus be increased most by diverting labour to those industries in which the value of its product⁽³⁾ is greatest. This may well be in industries in which physical output per worker is not growing at all, or is growing only slowly. Let us say, for argument's sake, that physical output per worker in housing construction is growing more slowly than in, say, sections of manufacturing industry. The average value of output will still be increased by more if labour moves to the former than to the latter if the relative demand for houses and the manufactured goods in question is such as to value the product per worker in the one case above that in the other.⁽⁴⁾

This is not merely a matter of theoretical possibilities but is, in fact, what has happened on a large scale in growing economies everywhere, whether we are considering the industrial revolution in 19th century Britain or the more advanced economies of today.

The opportunity for growth afforded by such shifts of labour varies according to the level of advancement of an economy. Typically, in countries where agricultural productivity is low but where technical know-how and capital are available, industrialization may raise the value of product per worker in manufacturing far above that in other sectors. A flow of labour into manufacturing then takes place. The rate of growth is thus raised not only as a result of the increased value of the product of the workers who have moved into manufacturing but also from improved efficiency of the workers remaining in agriculture through the reduction in under-employment and in other ways.

Changes of this kind can have a marked impact on a country's rate of economic growth over a relatively short time. What is equally important is that, by their very nature, the extent of such changes differs widely between different countries in any given period. In Western Germany, for example, the proportion of the work-force employed in agriculture fell from nearly 26 per cent. in 1950 to just over 13 per cent. in 1961. In France, there was a somewhat smaller, but still considerable change of a similar kind. In Japan, there was an even more rapid fall of this kind from 43 per cent. of the work-force in 1953 to 29 per cent. in 1962. Compare these movements with the comparable change in the United Kingdom, where the proportion of the work-force employed in agriculture fell only from 4.9 per cent. in 1951 to 3.7 per cent. in 1962. Similarly, in our own case, the proportion fell only from 13.3 per cent. to 10.9 per cent. between the censuses of 1954 and 1961.⁽⁵⁾ Even in the absence of other considerations, these figures alone would imply large differences in the relative capacities of the countries concerned for achieving comparable rates of economic growth over the same period.

⁽¹⁾ It is also conceivable, however, that for the same reason less weight may be given to the need for public investment than would be merited by the demand for the services resulting if a measure of such demand existed (e.g., if the services were purchased in the market).

⁽²⁾ The value of product per worker is a function not only of the quantity of goods (or services) produced but also of the price such goods (or services) command in the market at the time. Changes in relative prices thus affect the value of product per worker in different sectors of the economy and, of course, if resources were perfectly mobile, would tend to equalize sectoral product per worker through shifts of labour in the manner described.

⁽³⁾ Strictly, marginal product.

⁽⁴⁾ The value of product per worker is not, of course, the same thing as the value added in the industry, which is a function not only of the return to labour (including management) but of the return on capital. In capital-intensive industries the value added per worker will be high relative to labour-intensive industries simply as a result of the differences in capital ("embodied labour") employed per worker.

⁽⁵⁾ Since the volume of production increased very considerably, the average physical output per worker in Australian agriculture rose very sharply over this period.

Growth resulting from changes of this kind may be regarded as a particular illustration of the generalization noted earlier, namely that the level of advancement attained by an economy is itself a most important influence upon the rate of further growth attainable. In our earlier example, reference was made to the extent to which, in an advanced economy, the benefits of existing technology have already been realized. But, as has already been noted above, the level of advancement of an economy also influences its future attainable rate of economic growth through the pattern of demand. Broadly, experience suggests that growth tends to proceed rapidly as manufacturing outgrows other sectors; but at some point the community's need (as expressed through what it buys) for further rapid additions to manufacturing output begins to diminish and final demand by consumers, acting through changes in relative price levels in the private sector or through the decisions of public authorities, begins to give rise to a relatively faster increase in the provision of services (including many services, such as education, provided by public authorities). This point has clearly been passed by a number of the more advanced countries in the world, including Australia.

The true effect upon the rate of economic growth of labour transfers to the production of services is obscure; but, as indicated in the preceding chapter, the effect as measured by national accounts statistics is certainly to *diminish* the rate of growth of G.N.P. at constant prices because of the assumptions built in to the constant price adjustments of the data.

This point has some implications of practical importance. If it were desired solely to achieve a high rate of overall "productivity" increase as measured statistically by figures of G.N.P. at constant prices, efforts might be directed towards inducing the community to buy more and more of the kinds of output that appear to enhance the growth performance most—cars and other products of highly mechanized operations, for example. If, however, it were thought desirable instead to increase the proportion of national expenditure devoted to education, health and the like, or to travel or the patronage of the arts, the statistical growth in "productivity" would be very much lower even though, in the view of many, the quality of life might thereby be much improved. Pursuing the latter course could, in that event, look like allowing the economy to stagnate and of failing to keep up with other countries in the comparative tables of international economic growth rates. (The fact that most of the other countries in question are themselves trying to catch up in terms of output per head—or standards of living—is one which may sometimes be overlooked). The real question here is not how the growth rate compares internationally but whether, given the pattern of demand, the output required to meet that demand has failed to grow as fast as it might if all available resources had been used with the highest efficiency. As observed above, that is a question that can be answered only in very broad terms.

A further very important factor affecting a country's rate of growth resides in the levels of education and skills of its population. Clearly, a skilled work-force will be more productive than an unskilled one and, from that viewpoint, investment in education and technical training can be as important for increased future production as investment in new machinery. Of course, the argument can be taken too far—there are diminishing returns from investment in this field just as in any other and, in fact, there are within any society those for whom further training and education will be of doubtful value in any *economic* sense. But this qualification would be important only in the most advanced economy where the level of education was already high and where skills were already widely disseminated throughout the work-force. Even in such an economy there would, no doubt, be much that could still be done with beneficial long-term effects on growth.

Apart from such general improvements in the level of skills of the work-force, the rate of growth can also be affected in the shorter term by the changing structure of the population, different groups of which are possessed of different levels and types of skill. The age structure of the population is important in this regard through its effects, mentioned in the preceding chapter, on the nature and extent of changes in the composition of the work-force. So, too, is the rate of net immigration and the types of manpower which predominate in the net immigration pattern.

Changing social conventions may also affect economic growth in various ways. In more advanced economies the most notable such effect is through the tendency for more women, particularly married women, to enter the work-force, with effects on real output, and output as statistically measured by G.N.P. data, which were mentioned in the preceding chapter.

Although it is usually hard to assess their effects in quantitative terms, it is also undeniable that institutional factors can have an important effect on a country's economic growth rate. For example, restrictions on output per worker, so called "demarcation disputes" between different trades, restriction of entry to skilled trades, and so on, can slow down the growth of output. So too can restrictive business practices and excessive protection against oversea competition. Some institutional practices restrictive of output arise from social conventions or are closely associated with them—a reluctance to employ women or more particularly married women (perhaps through increasing opportunities for part-time employment) would be cases in point.

These are only examples of institutional factors which may affect economic growth—there are many others and they differ greatly from country to country. The one thing they have in common is that implicitly they result from the valuation of certain other ends above economic growth. Choices of this kind *may* be made quite deliberately; often, however, it is open to doubt whether the effect on economic growth of one alternative as against another is clearly seen.

III

Finally, but by no means least importantly, economic growth can be affected by government policies.

Governments can seek to create the optimum conditions for economic growth, and so far as they fail to do so, growth will be impeded. But it is also true that active government intervention can, in some cases, retard rather than help growth; for example, by continuing to support and preserve declining industries wherein scarce labour is employed at relatively low productivity levels.

Broadly, in economies such as our own, governments chiefly aim to assist growth by maintaining a favourable environment for it; in particular, by encouraging the maintenance of a steady but not excessive expansion of demand. By the use of general fiscal and monetary policies and in other more specific ways they seek to ensure that demand will continue to grow at a rate appropriate to absorb the growth in the work-force⁽¹⁾ and to take account of the steady improvement in techniques and hence productivity per worker that is proceeding—at a rate, in other words, that will ensure full employment within an improving technological context and without strong pressure on costs and prices. In so doing they seek to moderate fluctuations that otherwise tend to be inherent in the economy and thus to protect the economy from the misallocation of resources that goes with an inflationary boom or from the waste of resources that go unused in a recession.

One particular area of the economy in which government intervention can be important, and which often plays a crucial role in determining the rate at which an economy grows, is the external sector. Access to imports is generally essential if growth is not to be impeded and if competition is to be preserved in the domestic market. Dearth of imports can produce costly shortages and dislocations within industry, or shortages and restrictions upon the choice of final consumers, usually associated with rising prices. It can also encourage production in the industries protected by the restrictions, and this, in conditions of full employment, can only take place if resources are transferred from other activities, possibly export production or other sectors previously capable of competing with imports. In these circumstances growth will generally be retarded by such transfers.

This is not to argue that domestic industries should never be protected against imports; on the contrary, the maximisation of growth in the long-term may frequently require that domestic industries be reasonably protected, as need be, against foreign competition. Furthermore, as has been pointed out, economic growth is not an objective to be pursued without regard to other national aims such as, for example, an industrial structure which will be viable in the event of threats to national security; for such reasons, protection of local industries may be judged desirable even though at some cost in terms of growth. In either case, what is important is that protection should be looked at in a long-term rather than in a short-term light.

If this is done, it is important, as an aim of policy in this field, that the balance of growth as between one kind of production and another should be such as to ensure that receipts of foreign currency are adequate, one year being taken with another, to finance the level of overseas payments that has to be met and that international reserve holdings (including drawing rights upon the International Monetary Fund) should be sufficient to carry the country through the inescapable fluctuations in the balance of payments. One important element in the securing of these results, and one which in any case has a considerable importance in its own right, is the maintenance of a stable level of costs and prices in the internal economy.

The inflation of costs and prices makes it increasingly difficult for export producers to obtain an economic return and, particularly where exports consist largely of primary products traded in world markets at internationally determined prices, leads to the likelihood of declining investment and technical progress in the export sector. The effects are, of course, aggravated if domestic costs are rising faster than costs in a country's major trading competitors. Similarly, inflation, particularly of the kind manifested through excessive demand, usually pushes up demand for imports; if this goes on, increasing quantities of supplies are imported, not because they are superior to domestic products in quality or price but simply because supplies from domestic sources cannot meet the demand for them.

⁽¹⁾ In our own case, of course, the rate of growth of the work-force is itself actively influenced through immigration policy.

In addition to these general aspects of the balance of payments, some countries, including Australia, can encounter difficulties in preserving a balance in external transactions because of marked changes in the terms of trade. Countries which depend mainly on primary commodities for their export income have been considerably affected by fluctuations in export prices over which they have little or no control. Such swings in export income not only disturb external stability but also make the maintenance of a steady upward trend in the growth of output extremely difficult. Unlike other aspects of the balance of payments, swings in the terms of trade are almost entirely beyond the control of individual governments. It is commonly agreed, however, that if future economic growth in the major industrialized countries of the world can be kept reasonably steady, that should offer some prospect of less violent movements in demand for primary commodities and hence in the terms of trade of those countries which principally depend upon them for their exports. But the production of many primary commodities remains subject to varying seasonal conditions and other sources of substantial fluctuation in supply and hence price.

None of the more advanced economies seems to have been affected as severely as Australia by changes in the terms of trade. In the ten years to 1962-63, our terms of trade deteriorated (from an historically high level) by 27 per cent. By contrast, countries such as Western Germany considerably improved their terms of trade over the period, while other countries such as France, Sweden and Japan experienced little change. Moreover, apart from the movement over the period as a whole, Australia has suffered more than most from year to year *fluctuations* in the terms of trade. In four of the ten years to 1962-63 our terms of trade changed by more than 10 per cent.; in eight of the ten by more than 5 per cent.⁽⁴⁾ Contrast this, for example, with the experience of Sweden, where in no year of the decade 1953-63 was the change as much as 5 per cent.

Balance of payments difficulties such as these have had important effects upon economic growth in many countries. In Australia's case large changes in export returns and sharp and unsustainable increases in internal demand have had, at times, disruptive effects upon the balance of payments. There is no doubt that economic growth could have been smoother, and might conceivably have been somewhat greater, in their absence.

IV

Of course, while the maximum practicable economic growth is an objective which any government is likely to accept as desirable, it would be entirely unrealistic to expect a government completely to subordinate all of its policies to that aim. There will be occasions when, for one reason or another, decisions in some degree inconsistent with the objective of maximum economic growth will be taken.

Amongst the many choices that might be made at the expense of economic growth, one in particular may be worth noting, namely spending on defence. In this the choice is between growth and the risk that the country will be unable to do enough in its own defence in the event of external aggression. This latter consideration aside, it is broadly true that the diversion of output to defence results both in some slowing down in the rate of growth of output and, no doubt, in living standards lower than they might otherwise have been. In particular, to the extent that resources devoted to defence are provided (as in a fully employed economy they must be) by their diversion from the private sector, not only is private consumption likely to be affected but also the level of fixed investment, both public and private, may be lower than it would otherwise have been, probably with adverse effects upon the rate of growth.⁽²⁾

There are, of course, qualifications to this generalisation. Before the second World War, when unemployment was considerably greater and more widespread than it is today, some increase in defence spending could stimulate economic activity generally and so increase growth; and, in those circumstances, it could not have been said with certainty that resources released from defence production or the armed forces would necessarily be taken up into other productive activities. There are, however, probably no advanced economies of which this is true to any great extent today. Another qualification is that undoubtedly a good deal of useful technical knowledge, innovation and training in skills occurs as a result of defence expenditure, and that some of this in due course feeds back into the civilian economy. Similarly, some defence spending can add to industrial capacity or research facilities of value outside the defence field. While there is force in these points, it remains true that expenditure of these kinds forms only a small part of the total.

⁽¹⁾ The recovery in Australia's terms of trade which took place in 1963-64 reduces the deterioration in the terms of trade over the ten year period to 1963-64 to 19 per cent. However, it also means that in five of the ten years to 1963-64 our terms of trade changed by more than 10 per cent. and in nine of the ten by more than 5 per cent.

⁽²⁾ It is also true that the rate of growth of productivity in that part of output induced by defence expenditure tends to be lower, as measured in the national accounts, than in other areas. See, for example, "Australian National Accounts, National Income and Expenditure 1948-49 to 1962-63", page 10 ("Defence presented particularly difficult problems in this respect, . . .") and the discussion on pages 11 and 12 above.

Since different countries have different needs and responsibilities in this field, the proportion of output devoted to defence thus varies considerably from country to country; the rate of growth of those countries for which it is high is likely to be to some extent adversely affected relatively to that of countries for which it is low.

Another objective commonly presented as being in conflict with the policy of economic growth is that of price and cost stability. It is sometimes suggested that governments must choose between economic growth and stability of costs and prices. Were this choice a real one the case for choosing economic growth would be, within limits, irresistible. But in fact a large part, though not all, of the case for maintaining stability of costs and prices resides in the proposition that without it economic growth will not proceed at its maximum rate in the long run.

We have already noted the adverse effects which failure to maintain stability can have upon the balance of payments; and efficient economic growth is unlikely to occur in the absence of a manageable balance of payments. If, however, we ignore the effects of instability of costs and prices upon the balance of payments, there remain its direct effects upon the internal economy. Physical growth will be distorted by bottlenecks; labour shortages will appear; and efficient firms will find it difficult to attract labour to permit their expansion without bidding up wage rates inordinately, because even inefficient firms will be making profits. In contrast, there do not seem to be any *a priori* grounds for assuming that physical growth must be impeded by price stability. So long as total demand in the economy is maintained at a level sufficient to provide employment for the growing work-force in a context of improving technology and hence output per worker, it seems reasonable to think that economic growth is likely to occur as fast as it can, other things being equal. In short, reasonable stability of costs and prices is not an alternative to maximum economic growth but appears to be a necessary (though certainly not a sufficient) condition for it in the long-run.

in which government

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