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THE STATISTICAL UNIT IN ECONOMIC INQUIRIES

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## I. INTRODUCTION

1. In accordance with the request made by the Statistical Commission at its tenth session,<sup>1/</sup> the Statistical Office has continued its examination of the definition of various types of statistical units and the relationship between the choice of a particular statistical unit and the collection, compilation and analysis of data springing from various economic inquiries. Since the Commission examined and discussed the original document<sup>2/</sup> on this subject, a number of written comments have been received by the Secretariat, a considerable quantity of country material has been analysed and a detailed study of the suggestions and observations of the Expert Group on the Statistical Unit in Economic Statistics<sup>3/</sup> has been made.

2. The purpose of the present paper is to set out the factors bearing on the choice of a particular statistical unit, or combination of statistical units, in an economic inquiry, the practical consequences of that choice and some of the ways of defining and interrelating the various statistical units. Particularly important in the discussion of the choice of a statistical unit are the items of data required and the uses for which these are destined - and the kinds of data required, of course, vary with the type of inquiry. It should be noted, too, that the uses to which data may be put can be both analytical and operational in character, and this leads quite naturally to the question of the relationship between sets of data collected in different inquiries and for different statistical units. Equally important in choosing a statistical unit for which a particular item of data or group of items is to be collected, is a consideration of the organization of activities within the kinds of enterprises to be surveyed and the probability of finding that these enterprises summarize and record the data required at the level desired.

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<sup>1/</sup> See Report of the Tenth Session of the Statistical Commission, L/3126.

<sup>2/</sup> E/CN.3/244.

<sup>3/</sup> The Statistical Unit in Economic Statistics - Report of the Expert Group, Conf. Eur.Stats/81, 17 April 1959.

3. In examining the material emanating from the various countries, one is struck by the fact that the choice of a particular statistical unit or units for economic inquiries has been based largely on assumptions regarding the structure and record keeping practices of enterprises, but only recently has there appeared evidence of a growing interest in systematic investigation<sup>4/</sup> of these factors so important to defining and choosing the appropriate statistical unit or units for specific items of data, kinds of business and types of inquiries. Some of the observations and suggestions contained in this document, therefore, are rather tentative - being themselves drawn from a composite of limited national experimentation in this field. Where ever possible, of course, these observations are buttressed by bringing to bear the relevant experience of the national statistical offices. With these points in view it is perhaps unnecessary to emphasize that it is not the purpose of this paper to set out draft standards with regard either to the definition or the use of the several statistical units discussed.<sup>5/</sup> Also such standards are probably best formulated in conjunction with recommendations concerning all aspects of the different types of economic inquiries into specific subject fields. Rather this paper is a co-ordinated exploration of the many problems related to that of the statistical unit with the emphasis on the importance and desirability of establishing interrelationships between the several types of economic inquiries and statistical units in common use.

4. It should be pointed out that the term "statistical unit" should be understood to mean "the unit for which data are collected". It is distinguished from the "reporting unit" (i.e., "the unit from which data are collected") and the "tabulation unit" (i.e., "the unit for which data may be aggregated and classified

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4/ See, for example, A Survey of Record Keeping Practices of Manufacturing Companies in the United States, E/CN.3/244/Add.1. Also the Netherlands has patterned its new annual questionnaires for the paper, textile and wearing apparel industries on a study of the organization and record keeping practices of these industries.

5/ With the possible exception of the "establishment" - the definition of which is embodied in other standards adopted by the Statistical Commission.

in compilation"). This definition of a statistical unit differs from that adopted by the Expert Group of the Conference of European Statisticians.<sup>6/</sup> In very many cases all three of these units will be identical, but since this is not always the case, it will be useful to make the distinction.

5. At the outset it should be stated that a number of the practical problems of defining various statistical units and determining the items of data appropriate for collection from each - problems to which much of the following discussion is devoted - are of quite a different nature in the countries of Eastern Europe which have a completely managed economy. This is a result of the fact that the production units in these countries are established by the State and given certain forms of organization and certain responsibilities. This organizational framework in turn provides the criteria for defining the units to be used for statistical purposes.<sup>7/</sup> Further there is a standardized accounting and record keeping system - a system strongly influenced by statistical requirements. Consequently it is known at which level within the enterprise any item of data is summarized, or, if the collection of a particular item of data is considered sufficiently important, the enterprises can be required to maintain new or changed records. Other problems, such as the statistical unit required in light of the uses to which data are to be put or interrelating data gathered for various levels of the organization, associated with the choice of certain statistical units are, however, equally challenging in either a centrally controlled or a free economy.

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<sup>6/</sup> Conf. Eur. Stats/81, para. 6. There the statistical unit is defined as the tabulation unit.

<sup>7/</sup> In the USSR, for example, the enterprise is defined as follows: an enterprise is regarded as administratively distinct from other enterprises if it includes:

- a) A single administration, i.e., headed by a director, possessing the right to conclude contracts with other enterprises;
- b) An independent production plan approved by a superior agency;
- c) A current account at the State Bank;
- d) A self-contained system of bookkeeping, of balance sheets and of profit and loss statements.

This administrative distinctness is, in most cases, dictated by the technical unity of the production processes for which the enterprise is responsible.

## II. USES OF ECONOMIC DATA

6. Before embarking on a detailed examination of the role of the statistical unit in economic inquiries, it may be well to restate briefly the purposes for which economic data are collected and the implication of these objectives in terms of the detail in which the data are wanted and the desirability of collecting reliable sets of data.

7. Every productive<sup>8/</sup> enterprise must be concerned with both the techniques, means and "real" results of production and the financing of this production. While these two preoccupations of the enterprise are certainly related, this relationship is not necessarily simple or direct and the management of each is frequently carried on at quite different levels. Obviously information is needed on both the real and financial aspects of production in assessing economic conditions and the factors from which these stem. Although this point has been well understood, investigations into the financial side of economic activity in many countries have been quite independent of investigations into the real aspects of production, and little attention has been devoted to the co-ordination of these separate surveys. In recent years, however, increased use of systems of economic accounts and increased concern with projection of economic conditions has led to efforts to interrelate real and financial data systematically and to eliminate discrepancies between the two sets of data that might be caused by differing coverage or shifts in definitions from one survey to another.

8. Thus the Expert Group of the Conference of European Statisticians pointed out that - "For economic analysis and economic planning it was desirable to have not only isolated data on different items, but also to know the relationship between these items, e.g., between production and income, the distribution of income, consumption and investment as well as the financing of these items"<sup>9/</sup> The Expert Group concluded that to show these relationships the various items of data should be based on the same statistical unit or on statistical units that were reliable.

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<sup>8/</sup> i.e., including services, etc. While the precise scope of the term "productive" depends on the economic system embraced, these differences are not important to the present discussion.

<sup>9/</sup> Conf.Eur.Stats/81, para. 7.

Beyond the desirability of clarifying the relationships between these aggregates for the economy as a whole or for broad areas of the economy, however, there is a real need for knowing the character of these relationships between and within individual industries as well as the varying rates of change over time in the activities of each industry. In the study and projection of business cycle patterns, for example, it is generally accepted that the course of events will differ among industries and that conditions in certain industries - basic steel, various durable goods, etc. - will often indicate the path which the whole economy is likely to follow. In fact, in business cycle analysis, economists, in their efforts to understand the basic factors behind the changes in broad statistical aggregates, have been much concerned with the detailed analysis of the conditions in individual industries and their relationship to one another and to the general trend of business conditions. Similarly, study of the character and trends of production, prices, employment and productivity as well as the study of capital and other expenditures, sources of finance, etc. has required analysis of individual industries. In view of the foregoing, it is apparent that economic inquiries should be designed to produce data covering the same or relatable statistical units and that, as far as possible, the data produced should be allocable to specific industries. In addition, of course, economic analysis or development plans must frequently take account of regional differences within a country. Where this is true, the data needed must be allocable to geographic regions as well as to specific industries.

9. Statistical analysis involves the summarization or condensation of raw data into an analytical framework that can illuminate questions under study by revealing the relationship of pertinent items of data - be the relationship between two different items or between different periods of time. The frame one chooses for the analysis of a given set of data will, of course, depend on the problem posed. For the market research analyst or the government agency or businessman interested in the construction of a new factory, both economic and demographic data in a wealth of industrial and regional detail may well be required. And for economists interested in the structure of production and the variation in the efficiency and the problems of different kinds and sizes of business units, data classified by size of unit, as well as by kind of business and location, will be needed. It is

to serve purposes such as these that many countries publish infrequent economic census data in great detail. At quite another level there are those interested in studying the flow of goods and services through the economy with a view to clarifying and quantifying the interrelations between various segments of the system. For this, input-output matrices have been constructed which can - if the matrices have sufficient industry detail - provide many of the technical coefficients useful in designing systematic and realistic development plans or in predicting the impact of particular policy decisions on the economy. A number of countries, too, provide, in addition to the summary national accounts, detailed subsidiary tables showing the contribution of the various industry groups to the total product, to capital formation and to income. And in recent years, interest in the process of financing production has led to the construction of source-and-use-of-funds, liquidity and flow-of-funds accounts which, to be most useful for analysis, require sectoring according to type of economic activity to the greatest extent possible.

10. This brief summary of the uses of economic data as a background, the following sections are devoted to a discussion of various possible statistical units and their relation to the problem of collecting information in a useful form for particular purposes. Consideration is also given, of course, to the organization of economic activities and the practical limitations this imposes on the free choice of a statistical unit.

### III. THE ENTERPRISE

#### A. The Enterprise As a Statistical Unit

11. Until relatively recently the enterprise was used primarily as a statistical unit for the collection of a limited range of financial data. And in many cases these data emanated not from special inquiries, but from the administration of tax and other laws. The data, therefore, related to the enterprise as defined in these laws and were subject to the definitions appropriate to their administration. While a number of countries still rely on financial data derived from such administrative sources in establishing benchmark figures for current estimates of certain aggregates such as are included in national accounts, the pressing demand for improved timeliness and accuracy in these estimates, the interest in the

concentration of industrial control and the growing demand for current and forward looking indicators such as inventories, unfilled orders, proposed capital investments, etc., has stimulated the expansion of special inquiries designed to provide these data in convenient form. Benchmark figures for many of these data would come not from tax or other administrative sources, but rather from the usual infrequent and annual economic inquiries into industry, distribution, etc. And these inquiries have, more or less traditionally, made use of statistical units other than the enterprise - or, if the enterprise has appeared in these surveys, its definition has usually deviated from that used by the various administrative authorities. It is, in fact, probably safe to say that an important area of disagreement among statisticians concerning the "best" definition of the enterprise exists because of a difference of opinion on whether it is best to fit the statistical unit to the administrative unit for tax and other administrative purposes, or to define the enterprise in terms more in accord with the objectives of economic inquiries and analysis.

12. In the following sections possible and suggested definitions of the enterprise are discussed, and the question of formulating a definition of the enterprise that might be useful internationally is examined.

#### B. Definitions

13. There are basically two approaches to defining the enterprise. One of these is to view the enterprise, and to try to define the enterprise, as an economically independent unit which is the active participant, and the final arbiter of its own actions, in all transactions with other enterprises or consumers. Implicit, of course, is the idea that the management of such a unit is also the ultimate authority for all decisions concerning the internal operation of the unit, although such authority may be, and often is, delegated. The second approach to defining the enterprise is somewhat more formal. Here the enterprise is conceived of as the smallest unit for which certain records - usually balance sheets and profit and loss statements - are maintained, generally as a result of legal stipulation. In the great majority of cases application of either of these concepts is easy and leads to the definition of identical units. There is, however, particularly in the highly industrialized countries of the , an important number of cases where the difference in approach leads to appreciable differences in the units defined and where reduction of either concept to a practical, operating definition poses a number of problems.



14. In several countries the enterprise is defined as the smallest legal entity - which, in most situations, is the smallest unit for which it is possible to obtain most of the financial data. There are certain difficulties attaching to this definition, however. There are sometimes, for example, two or more statutes which define the enterprise in different ways. In Western Germany, for example, the "turn-over tax" law defines the enterprise - in terms of its responsibility for reporting - in a different manner than does commercial law. And in any complex of legally separate enterprises all of which are owned by a single parent enterprise there would be certain activities and resources that would only with considerable difficulty be allocated to the subsidiary operating enterprises. General office expenses (e.g., wages and salaries), transactions in claims on other enterprises and frequently certain of the advertising costs would be borne on the records of the head office of a combine of enterprises and be unallocable in any definitive way to the subsidiary enterprises. If the "smallest legal entity" is used as the defining criterion of the enterprise, there could be four alternative ways of handling this problem; i) ignore the activities carried on solely by the parent enterprise, ii) attempt to allocate, or have the parent enterprise attempt to allocate these activities and resources among the subsidiary enterprises in some arbitrary fashion, iii) assign all of these activities and resources to the largest of the subsidiary enterprises, or iv) treat the head office of the combine as though it were an independent, separate enterprise - which in many cases it would be in legal fact. It should be noted too that often within a single legally constituted enterprise will be found both a section that functions as a central administrative office for a combine of enterprises and a section which corresponds in most essential respects to any of the other subsidiary operating enterprises. Where this is the case, treating the legally independent enterprises as the statistical unit could introduce serious distortions - particularly in the relationship between the "real" and financial items of data related to each legal enterprise.

15. In addition to the points mentioned earlier, the major advantage ascribed to defining the enterprise to coincide with the smallest legally defined entity is that this delineates the most homogeneous unit for which it is possible to collect the full range of economic data - financial and physical. It is claimed, therefore, that the enterprise so defined is uniquely fitted to be the point at

which all items of economic data are made to converge. Here two or more legal entities are owned subsidiaries of a parent enterprise, however, certain difficulties appear. While all necessary data may be available for each of the subsidiary legal entities, these data are not uncommonly rather artificial - particularly as they reflect transactions between the units belonging to the same parent enterprise. Tax or other legal provisions may, for example, make it advantageous to value all transactions between member units - financial as well as in goods and services - well below that which would obtain in the open market. Aggregated over the whole parent enterprise, of course, such distortions would tend to offset each other, but if the subsidiary entities are independently classified and fall into different groups (for example, into different industry categories) these distortions will be carried along and tend to distort the aggregates for these groups. With respect to transactions in real goods and services, this valuation problem is entirely analogous to that discussed below for sub-division of the enterprise and would be amenable to the same - albeit somewhat arbitrary - treatment. The problem of coping with artificial financial transactions would, however, be considerably more serious. Further, of course, where the enterprise is defined as the smallest legal entity, little light is shed on the question of concentration of ownership or control.

16. In the United States a broader approach is taken in defining the enterprise. The operating definition is couched in terms of ownership and/or admitted control. That is, a group of legally independent entities are considered a single enterprise if 51 per cent of the assets of each one is owned by another member of the group, or if - in the absence of 51 per cent ownership - each admits to being controlled by another member of the group. Thus if there are four legal entities - A, B, C, D, - they would be considered one enterprise if A owned (or controlled) 51 per cent of B, C and D, or if A owned 51 per cent of B, B owned 51 per cent of C, etc. This definition of the enterprise approximates the economically independent unit concept mentioned above, although it leaves out of consideration certain types of control that may be exercised without being admitted or without benefit of direct ownership. This unit is then quite well suited to the study of concentration of industrial ownership and control, and an appropriate relationship between the "real" and financial aspects of the enterprise can be formed. The enterprise so defined, however, is poorly suited for detailed industry analysis.

17. With reference to the general problem of defining the enterprise in terms of control, the expert group of the Conference of European Statisticians<sup>10/</sup> noted that "while in some countries legal enactments provided a basis for defining control in convenient and reasonably satisfactory terms, this was not true of all countries and that in some cases it was likely to be difficult or impossible to obtain the necessary information on the facts of control either by reference to a legal situation or by direct questions to respondents". Particular reference was made to the difficulties encountered where an enterprise was controlled from abroad.

18. It appears from the foregoing discussion that serious problems are encountered with both the very broad definition of the enterprise in terms of ownership or control and the much narrower definition relating the enterprise to legal provisions. It remains to be seen, then, whether some definition falling between these extremes might not be worth investigation.

19. In formulating a definition of the enterprise it is necessary to bear in mind both the purposes for which enterprise data are required and the practical question of the level or levels within a complex business organization where such data might normally be available. Of course, where a legally independent entity exists which is not owned or controlled by any other legal entity, we have what might be called a "clean" enterprise. If, however, this legally independent entity is owned or controlled by another, two questions arise; i) would the accounts of the owned or controlled entity reflect the "true" facts of its operations or would they contain an element of artificiality, and ii) would consolidated accounts be maintained reflecting the transactions of both the owning (or controlling) and owned (or controlled) entities with outside enterprises. There is some evidence to indicate that in the case of complete ownership, or even majority ownership, the accounts of subsidiary legal entities tend to be rather artificial and that there is a tendency to maintain consolidated accounts for the combined owning and owned entities. However, in those cases where control is exercised by means other

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<sup>10/</sup> Conf. Eur. Stats/81, para. 15.

than ownership, certainly it would not be common to find consolidated accounts which would yield the kinds of data required. In some cases a holding company may own a majority of stock of one or more enterprises and exercise its ownership prerogatives only through the election of the enterprises' directors. Here too it would be rare to find the holding company compiling consolidated accounts for the group of enterprises under its control or ownership. It should be noted that where no consolidated accounts are maintained, the holding company itself would be considered a financial institution regardless of the activities of its controlled enterprises.

20. With these points in view it is suggested that a definition of the enterprise based on ownership criteria may prove to be the most fruitful. That is, the group of legally independent entities wherein at least 51 per cent of the assets of each is owned by other members of the group might be considered a single enterprise. And in practical, operational terms the definition may best be made to depend on the existence of consolidated accounts - i.e., that group of legally independent entities, bound together by ties of ownership, for which consolidated profit and loss statements and balance sheets are maintained may be considered a single enterprise.

21. It should be emphasized, however, that insufficient information is yet available on the facility with which ownership relations can be traced in various countries. It may well be that in some countries only wholly owned subsidiaries could easily be identified, or that only where the interlocking ownership relations are complete, consolidated accounts would normally be maintained.

22. While the above approach to defining the enterprise falls short of the "economically independent unit" concept and is a less homogeneous unit than the "smallest legally defined entity", it is probably fair to state that the first of these concepts represents a statistically unattainable objective while the second may sacrifice a certain "reality" in favour of a homogeneity that could better be obtained by using a suitable sub-division of the enterprise as a statistical unit.

23. The definition of the enterprise adopted has implications also for inquiries in which sub-divisions of the enterprise serve as the basic statistical unit. It has been recommended, for example, that in basic industrial inquiries establishments

be classified by type of economic organization - i.e., according to the number of establishments owned by the same enterprise. Such tabulations are interesting in analysing the concentration of ownership, but quite obviously they are directly affected by the enterprise definition employed.

#### IV. SUB-DIVISIONS OF THE ENTERPRISE

##### A. Why Sub-divide the Enterprise

24. As indicated earlier, many of the most common and most useful analyses of economic data involve the isolation of reasonably homogeneous industry groups; and often the segregation of these data by relatively small regions. A glance at the national publications containing the results of basic economic inquiries offers convincing evidence that these classifications are almost universally considered important. Fortunately a great majority of enterprises<sup>11/</sup> carry on their activities in one identifiable location and are sufficiently specialized that data relating to the enterprise can be assigned a relatively narrow industrial and geographic classification. There are, however, more complex enterprises, diversified with respect to activity and dispersed over a wide geographic area, and though comparatively few in number, such enterprises usually account for a large proportion of total economic activity. If, then, geographic or industry by industry analyses are wanted, some way must be found to carve up these complex enterprises into statistical or tabulation units more amenable to such analyses. In this section the discussion centers on the problem of sub-dividing the enterprise into more homogeneous statistical units.

##### B. The Establishment

25. In concept, the establishment is equated to the simple enterprise which carries on a fairly specialized set of activities at one location. The establishment, then, encompasses not only those activities specifically related to the main marketable production of the enterprise, but also those supporting or ancillary activities without which there would be no production and which themselves exist only because there is a marketable production. Data related to the establishment, therefore, provide a picture not only of the truly productive activities

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<sup>11/</sup> Defined in any of the ways discussed above.

of the enterprise, but also of the peripheral activities which the main production must support. In extending the establishment concept to the complex enterprise, therefore, the objective is to sub-divide the enterprise into a collection of units, each of which is as nearly as possible like a simple enterprise. Such an approach, to the extent that it is successful, has the virtue of producing statistical units which can not only be meaningfully classified by industry, location and size, but, particularly when analysed by industry, the data relating to these units provide a complete view of the activities and resources, both direct and indirect, attributable to each of these groups.

26. In very many instances the multi-unit enterprise is organized into management units that are acceptable approximations to the establishment concept and often records exist for these units that can be the source of data concerning at least the direct factors of production. There are, however, both conceptual and practical difficulties in sub-dividing the multi-unit enterprise into establishment units. Most important of these is that not all of the activities of the enterprise can be uniquely assigned or allocated to one or another of its subsidiary establishments. In general, these would be ancillary activities - activities carried on to facilitate, or in support of, the productive activities of two or more of the subsidiary establishments, or transactions the profits or losses of which accrue to the enterprise as a whole. Many of the financial transactions of the enterprise fall in the latter category, and since these bear little or no relation to the kinds of productive activity engaged in nor to the physical dispersion of the productive facilities, it is virtually impossible to allocate these transactions to subsidiary establishments. It is for this reason that items of data relating to financial activities are not recommended in the Draft Revisions to the International Standards in Basic Industrial Statistics or in the International Recommendations in Statistics of Distribution<sup>12/</sup> which suggest that the establishment be the basic statistical unit.

27. The ancillary, supporting activities carried on centrally by all multi-unit enterprises, has been dealt with in a variety of ways. Examples of these ancillary units are central administrative offices, central warehouses and electric generating stations, etc. The common characteristic of these units is that they

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<sup>12/</sup> E/CN.3/L.40/Rev.1 and Statistical Papers, Series II, No. 26.

provide goods or services to more than one subsidiary establishment - goods or services which do not enter into the final, marketable product of the enterprise. To avoid the difficulties of allocating the activities of these central ancillaries among the serviced establishments, it has been recommended<sup>13/</sup> that such units be conventionally treated as separate establishments, classified to the main activity of the establishments served. A number of countries follow this practice with but minor variations. In other countries - Canada, for example - these ancillary activities are conventionally allocated to the most important of the establishments served. In still other countries an attempt is made to have the enterprise allocate the ancillary activities among the establishments served.

28. In most cases the magnitude of the central ancillary functions of an enterprise are relatively so small that there is little practical significance attaching to the kind of treatment accorded them. In a few instances, however, and for some kinds of ancillary activities this may not be true. Own account production of electricity and capital construction for own use constitute, in some countries, an important part of the total of such activities. Where this is the case, treating ancillary construction units and power stations as though they were separate establishments has obvious advantages in that these units can then be classified either to the activity of the establishments served or, by supplementary classification, to their own activity, depending on the purpose for which particular tabulations are being made. A further advantage of treating central ancillary units as separate establishments is that it assures that these units are not overlooked. This may be important where both the enterprise and the establishment are used as statistical units and it is desirable to establish links between the two.

29. Another, sometimes serious problem can arise when the multi-unit enterprise has been sub-divided into establishments. The problem occurs primarily for the vertically integrated enterprises where transfers of goods and services between the subsidiary establishments are important. The difficulty is that in the records of the subsidiary establishments, these intra-enterprise transfers are often

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<sup>13/</sup> See E/CN.3/L.40/Rev.1

valued in an artificial way that bears little or no relation to the market value of the goods transferred or to their actual cost of production. At times this failure (from the economist's point of view) of an accounting system to yield the kind of value figures desired reflects simply the accounting convenience of the enterprise. In other cases tax legislation conditions accounting practice in this respect. This problem has been noted in a number of countries, but the responses to the problem have varied rather widely. From Finland, for example, it is reported that the sales tax provisions occasionally make it more profitable for a multi-unit enterprise subject to this tax to value intra-enterprise transfers at the smallest possible figure - the result being that an extraordinarily large margin appears at the point where goods leave the enterprise while the subsidiary establishments show a very low, and often negative margin. On the other hand, in areas where the sales tax does not apply, the manufacturing establishments may, for simplicity's sake, record their shipments at retail values. In the Netherlands this same problem has been encountered, and in the new system of annual inquiries it is avoided by requesting only quantity figures for intra-enterprise transfers of goods. Presumably value figures for these transfers are, if needed, to be imputed by the statistical office. The United States has probably gone to greater lengths in trying to effect a solution to this difficulty in those industries where intra-enterprise transfers are important - in the petroleum and paper industries, for example. The United States Census Bureau has in these cases worked closely with the large companies in an effort to revalue these transfers in economically realistic terms.

30. Aside from the practical difficulty of getting the kind of value figures desired for intra-enterprise transfers, it is not easy to decide precisely what value figures should apply. Often the approach taken has been to value these internal transfers at the open market price of the same commodities, but it is by no means certain that this represents an economically meaningful valuation for these goods when they are flowing through an enterprise. Possibly an "ideal" solution would be to value such goods at the direct cost of their production plus all overhead costs, including an appropriate proportion of the general overhead



costs of the enterprise and an appropriate proportion of the profits. It is apparent, however, that this approach simply transfers the problem to defining what is "appropriate" when it comes to allocating general overhead costs and profits among a group of subsidiary establishments.

a. The operational definition of an establishment

31. To apply the establishment concept effectively in practice, a reasonably clear idea of what is meant by "single activity" or "kind of business" is required. Quite obviously "single activity" should not be so narrowly defined that only the most specialized unit qualifies as an establishment. On the other hand, a definition that would allow too broad a grouping of diverse activities would defeat the objective of producing data assignable to usefully homogeneous industry groups. The problem here, then, is essentially the same as that attending the compilation of an industrial classification - in both cases it is desired to define the narrowest, most homogeneous groupings of economic activities that can relatively easily be delineated in the real world. To be able to isolate a particular grouping of activities in practice implies that in the great majority of cases, industry is organized and records are maintained in such a way that the data related to the technical aspects of this group of productive activities are separately available. Approaching the problem of defining the establishment along these lines, some countries have created the headings of an industrial classification through an investigation of the usual groupings of activities and then defined the establishment in terms of the narrowest headings of that classification.

32. Similarly the problem of defining "separate location" is solved in a practical way by reference to the record keeping and organizational arrangements of industry. One of the most important results of the imposition of the single location restriction, of course, is that it allows for analysis of the collected data by small areas. This attribute can often be retained, however, with a relatively broad interpretation of "single location" so long as the unit defined falls entirely within the smallest area by which the data are to be classified. In other respects, however, varying definitions of "single location" may have a marked effect - e.g., on the number of units counted and, of course, on size tabulations.

33. In order to make clear to enumerators and respondents that the basic establishment concept should be modified, where necessary, to fit the actual organization and records of a particular enterprise, some countries have found it necessary to include in their establishment definition an explicit statement relating the establishment to existing organizational and record keeping arrangements of the enterprise. With a view to defining the establishment in operational terms, the dependence of the definition on business organization and records and on the types of data sought might be phrased in the following manner.<sup>14/</sup>

"That group of activities, carried on under a single ownership or control at one location, which contribute indirectly as well as directly to the production of the most homogeneous group of products or services for which separate records are maintained (or separate estimates can be made) that can provide the data concerning production and the materials, labour and other resources (both direct and indirect) going into the production of this group of products or services."

In some cases records - most commonly those relating to employment, payroll and the like - will be kept only on the basis of separate plant location, without regard to the similarity of the separate activities carried on at that location (a "local" unit). Other records such as sales, might be maintained for separate activities without reference to the separate locations at which these activities are carried on (a "kind of activity" unit). In the limiting case it may be that the enterprise maintains no separate records for either separate activities or separate locations. In very many cases, however, the enterprise will delegate some authority to the management of a "single kind of business" carried on at a "single location", and this delegation of authority will generally carry with it an obligation to maintain at least some operating records.

34. While it is suggested that the establishment definition, for practical reasons, be geared to the record keeping practices of the usual multi-unit enterprise, it is not intended that the establishment be defined simply as the

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<sup>14/</sup> See also Draft Revisions to the International Standards in Basic Industrial Statistics, E/CN.3/L.40/Rev.1, Annex I; and the International Standard Industrial Classification of All Economic Activities, Statistical Papers, Series H, No. 4, Rev.1.

"unit for which each respondent wishes to report". Once a definition to which most respondents can conform has been established for each industry group, it is important that all respondents conform in all major respects to that definition. Of course, where deviations are minor it would not be worthwhile to attempt to eliminate them.

C. The Technical Unit

35. An establishment is composed of both technical and ancillary units. The technical units within the establishment comprise all those activities going directly into the production of the particular types of goods and services that in toto constitute the main business of the establishment, whereas the ancillary unit provides goods or services to the establishment which do not themselves enter into any of the products of the establishment.<sup>15/</sup>

36. While there have been attempts to use the technical unit as a basic statistical unit, the difficulty of relating all the required items of data to this subdivision of the establishment and the lack of consistency in the way production is organized in different establishments have led to the abandonment of this approach. Attempts to use the technical unit as a supplementary statistical unit, however, have met with much greater success. As pointed out earlier, the establishment is best defined operationally in terms of the availability of records for the items of data needed. With the establishment so defined, there will be, within each industry group, a variation between establishments in the precise scope of their activities. Thus, one establishment manufacturing machine tools may produce castings in its own foundry while another may purchase its castings from an independent unit. If, in this situation, certain key items of data (particularly numbers employed and, possibly, output) can be obtained regarding the foundry as a technical unit, the two original establishments can be more meaningfully compared and a more complete picture can be drawn of all foundry activities. Even when the pragmatic establishment definition yields a set of homogeneous units within an industry group, the broad range of activities encompassed within each establishment may prompt the use of the technical unit for the collection of certain items of data concerning the separate subsidiary activities.

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<sup>15/</sup> See ISIC, Statistical Papers, Series M, No. 4, Rev.1, P. 3.

Establishments in the basic steel industry, for example, may engage in blast furnace operations and steel making and rolling operations. Even though every establishment in this industry covers all of these operations, it may be of considerable interest to collect some data regarding each activity. The Netherlands has used the enterprise, local unit and technical unit in this kind of combination for their regular decennial census of industries with considerable success.

37. Another and important reason for using the technical unit as a supplementary rather than as a basic statistical unit is that by definition it excludes all those activities which depend on, but are not directly connected with the main productive function. Were the technical unit, therefore, to be used as the sole statistical unit, only a partial accounting of the totality of industrial activities would be obtained.

38. What has been said above concerning the use of the technical unit as a supplementary statistical unit is, of course, equally applicable to the ancillary units of the establishment.

#### D. The Local Unit

39. As mentioned above, the local unit is that portion of an enterprise occupying a single location. Unlike the establishment, no restriction is placed on the range of activities to be included in the unit. In practice, of course, the local unit and the establishment are most often identical. There are in most countries, however, enough cases of local units engaged in diverse activities that are separately reportable that the systematic adoption of the local unit as the sole or the most narrowly defined statistical unit can result in the collection of data for less homogeneous industry classes than would be desirable or necessary.

40. While from the point of view of the analytical use of industrial statistics it is undesirable to give up a restriction on the range of activities, practical consideration of the level at which the necessary records are maintained may dictate considerable relaxation of this restriction. Even in those countries where the establishment approach is accepted in principle, the conditions under which any attempt is made to split the local unit are limited. The United States, for example, specified these conditions in the following manner:

"Where a single physical location encompasses two or more distinct and separate activities for which different industrial classification codes seem applicable, such activities should be treated as separate establishments and classified in separate industries, provided it is determined that: (1) such activities are not ordinarily associated with one another at common physical locations; (2) no one industry description in the United States Standard Industrial Classification includes such combined activities; (3) the employment in each such economic activity is significant (usually 100 or more employees in mining or manufacturing activity, and 50 or more employees in activities other than these); (4) reports can be prepared on the number of employees, their wages and salaries, and other establishment type data."

It is apparent that, operating under specifications such as these, an attempt to split the local unit would be made only where the secondary activities of the unit are particularly important and the record keeping practices of the unit make possible the split.

41. Among those countries making specific use of the local unit, definitions vary considerably. In the Federal Republic of Germany, for example, the local unit (Arbeitsstätte) is defined as that part of an enterprise occupying a single piece of land undivided by any public street, road or railroad. Such a piece of land could, in some instances, be sufficiently large to contain several buildings and a number of activities. It could, for example, have a mine and smelter. Where this kind of situation occurs it might in fact be easier for the enterprise (assuming that the enterprise consists of more than this one local unit) to provide a separate set of data for each of these quite different and separately housed activities.

42. The local unit, while it is both practically and conceptually suited for certain operational uses - e.g., as a sampling unit where area sampling techniques are employed<sup>16/</sup> - it is probably best viewed as the closest approximation to the establishment which it is generally desirable to try for. This should not obscure the fact, however, that the overriding importance of "kind of activity" analysis

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<sup>16/</sup> Even here, of course, certain conventions must be adopted for those cases where an indivisible (statistically) industrial unit falls in more than one defined area.

will require the examination of the local unit in each important instance to make sure that avoidable and undesirable mixtures of activities are not included by the too ready acceptance of the local unit as the statistical unit. A number of countries using the local unit as a basic statistical unit recognize these difficulties and take steps to avoid the undesirable results of unqualified acceptance of the local unit. The Federal Republic of Germany, for example, in its monthly industrial survey uses the "Betrieb" (a local unit except that all auxiliary units whether or not separately located are included) as the basic statistical and reporting unit. The "Betrieb", however, is requested to provide certain items of data separately for each of its lines of activity. Yugoslavia uses the local unit in a similar manner in some of its inquiries.

#### E. The Kind of Activity Unit

43. In essence, the definition of this unit retains the "single economic activity" idea of the establishment and discards the single location restriction. As in the case of the establishment and the local unit, the determination to use the kind of activity unit should be based on a knowledge of the organization and the record keeping practices of industry.

44. The most obvious application of the kind of activity unit is in those industries having, by their nature, no fixed location for their activities. Construction and transport and communication are industries of this type, and for them the kind of activity unit has commonly been used. A second use of this unit has been in current industrial and other inquiries where there is an emphasis on analysis of the data by homogeneous industry groups, but where structural information and classification by area are unimportant. In this case, of course, its use depends on whether the respondent enterprise maintains its records along kind of activity lines for the items of data required. In the Netherlands, the kind of activity unit is now being used as a supplementary statistical unit in annual inquiries into employment and certain inputs and outputs of the pulp and paper industry, and the textile and wearing apparel industries. The use of the kind of activity unit for these items of data was based on an investigation of the organization and records of the industry.

45. A third area in which organization and record keeping have called for some use of the kind of activity unit has been wholesale and retail trade. The United Kingdom in the 1957 Census of Distribution and Other Services, for example, obtained all data (except employment and salaries) on a kind of activity basis for multi-unit retail enterprises with more than 10 outlets. The United States, while accepting the kind of activity unit in special cases, has specified no general conditions for its use - treating it rather as an acceptable deviation from the establishment when necessary. Also, it should be noted, recent studies in the United States indicate that wholesale enterprises are organized and maintain their accounts along kind of activity lines - i.e., the enterprises tend to be departmentalized according to the kind of commodities handled. This and other studies in the United States suggest that in that country it may often be possible to use the activity unit for the collection of the entire range of real and financial items of data.

46. There are two ways of defining the activity unit in current use. The definition used by the United Kingdom, the United States and Finland makes an activity unit equal to the sum of all of the establishments within an enterprise that would be classified to a particular industry. In the Netherlands, on the other hand, the activity unit is defined to be the sum of all technical units that would be classified in one industry group. In reality this variation in definition produces two quite different statistical units. One of the advantages of defining the activity unit as the sum of the establishments in each industry group is that, with the exception of the central ancillary activities of the enterprise, the items of data relating to each activity group add up to the total for the enterprise. In other terms this means that more of the enterprise's activities and resources are allocated to specific industry groups. This would be true, for example, in the case of employment. Using the Netherlands' approach only the operatives directly engaged in technical units are included in the activity units - other operatives or manual workers and administrative, clerical workers being grouped together for the whole enterprise. On the other hand, a finer and more homogeneous division of the enterprise's directly productive activities may be possible using the Netherlands' approach, and where very detailed data regarding

narrow industry groups are wanted - as, for example, in certain productivity studies - this has advantages. There is, however, the factor that with the growing automation of industrial processes, the line between operatives and overhead technical personnel is becoming increasingly less clear. Because of this, it has been suggested that the direct relationship of the technical staff to the proper functioning of any process should be taken account of in productivity analyses. It should be noted that the activity unit defined as a collection of technical units must be used as a supplementary statistical unit if the aim is to cover all activities. In the Netherlands, of course, it is used as a supplement to and in conjunction with the enterprise.

#### V. THE STATISTICAL UNIT AND INTERNATIONAL COMPARABILITY

47. The definition of the various statistical units - to the extent that they vary from one country to another - will affect international comparison of economic data in several ways. Most importantly, comparison across national boundaries of individual industries is of great interest and in so far as the statistical units employed vary with respect to the mixtures of activities carried on within the units chosen, the comparison will be rendered less meaningful. Classification of economic data by the size of the units to which these data refer is also of considerable importance. And here the effect of varying the definition of the units employed is apparent. It is quite impossible, for example, to compare size distributions of enterprise data from two countries one of which defines the enterprise in terms of the smallest legal entity while the other defines this unit in terms of ownership or control. Such differences would be immensely important in studies of the comparative concentration of control of business. Similarly it would be impossible to compare the size distribution of units within individual industries where the unit used was in one case the establishment and in the other the activity unit - even though in respect to the mixture of activities the two units were identical. Such analyses as these are of considerable importance to the study of the structure of productive activities. The definition of the statistical unit will also, of course, affect geographic classification, but while this is often an important consideration within a country, it is of no consequence for the international comparison of data.



48. As the establishment is defined in terms of the combinations of activities for which records are available on all or most of the items of data recommended for collection and compilation in annual and benchmark surveys, differences will occur between countries in the "activity" composition of establishments. In calling attention to this fact, the Expert Group of the Conference of European Statisticians<sup>17/</sup> suggested that it would be helpful if countries could "indicate which combinations of activities were important".<sup>18/</sup> As suggested by the Expert Group, publication of a detailed list of commodities produced or services rendered by the establishments classified to each industry category provides both an indication of the kinds of combinations that exist and a measure of the magnitude of secondary activities. A number of countries do in fact publish commodity output classified in this way from their industrial inquiries, and the United States specifically segregates the output of commodities belonging to the industry in which the establishment is classified from those that are the result of secondary activities. In addition, the United States computes and publishes "specialization ratios" for each separately tabulated industry group - i.e., the ratio of the value of output in commodities belonging to the defined industry group to the total value of output of the establishments classified to the industry group. Such measures of the degree of specialization of establishments in each country would provide not only a useful tool in assessing the comparability of data, but would also be internally helpful in indicating the practically attainable depth in the industrial classification of establishments.

49. With regard to the industrial classification of the enterprise, the Expert Group concluded that - "Even if, for national purposes, the enterprise would yield useful information, one could not expect to obtain industrial groupings of enterprises which were comparable internationally".<sup>19/</sup> This may be true, but there is not as yet very much organized data which would show for each country the activity composition of its enterprises - particularly for enterprises similarly defined. A technique roughly similar to that described for evaluating

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<sup>17/</sup> See Conf.Eur.Stats/81, 17 April 1958.

<sup>18/</sup> Op. Cit., para. 38.

<sup>19/</sup> Op. Cit., para. 14.

the activity composition of establishments might be used to study the extent and kind of activity mixtures that exist within enterprises. Thus, a cross classification of multi-activity enterprise (classified by main activity) that would show the main activity of the constituent establishments, would provide an excellent tool for the design of a meaningful industrial classification for enterprise data and at the same time would furnish a basis for determining the feasibility of making international comparisons of enterprise data classified by industry. It would not, of course, be practicable to cross classify more than a few items of data on such a basis - perhaps only employment and value added.

#### VI. THE RELATIONSHIP BETWEEN THE STATISTICAL UNIT AND THE ITEMS OF DATA TO BE COLLECTED

50. The foregoing discussion has emphasized the role played by the record keeping practices of the business enterprise in determining the kind of statistical unit that can be successfully employed for an economic inquiry. In the present section specific items of data are presented together with the reasons, or conditions under which, records might be expected to exist at the level of the various statistical units already described.

51. It is well to bear in mind that the problems discussed here are, in a sense, rather limited. For the typical enterprise that carries out its business at a single location and engages in a narrow range of activities, no problem of splitting the enterprise exists. Such enterprises - numerically speaking - constitute the vast majority of the business community in every country. As pointed out earlier, however, the multi-location, multi-activity enterprises are often very important in terms of the magnitude of their operations<sup>20/</sup> - though there is, even here, a tendency to specialize activities at particular locations.

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<sup>20/</sup> In this connexion it may be interesting to note that tabulations from the 1954 Censuses of Business, Manufactures and Mineral Industries in the United States reveal that of the 2,783,977 companies (enterprises) included in the census only 68,133 (i.e., 2 per cent) were considered multi-unit. These multi-unit companies, however, employed approximately 52 per cent of the 29.5 million persons employed by all companies within the scope of the census. See Company Statistics, 1954, Censuses of Business, Manufactures and Mineral Industries, Bulletin CS-1, United States Department of Commerce, Bureau of the Census, Washington, D.C.

52. In view of the economic importance of the multi-unit enterprises and their relatively small numbers, a detailed investigation of their record keeping practices would seem to be both practicable and highly desirable. Certainly a knowledge of these practices would greatly facilitate the design of a realistic system of economic inquiries. In addition, if these studies were carried out in a number of countries, it would aid materially in drawing up realistic international recommendations regarding the choice of an appropriate statistical unit for the collection of specific items of economic data.

A. Items of Data Appropriate to the Establishment, the Local Unit or the Kind of Activity Unit

53. The items of data suggested as appropriate to the establishment, the local unit or the activity unit (defined in terms of the establishment), are employment; wages and salaries; capacity of power equipment; expenditures for fixed assets; inventories; sales,<sup>21/</sup> shipments and production; purchases,<sup>21/</sup> deliveries and consumption of goods and materials the cost of industrial services (repair, maintenance, etc.) and transport and communication supplied by others and the cost of sub-contract work let out.<sup>22/</sup> These items of data are frequently referred to as "establishment type" data.

54. The subsidiary statistical units chosen for an enterprise for which the foregoing items of data are to be collected, should meet two conditions: (i) in order to be able to relate establishment and enterprise based data as well as to obtain complete coverage of the enterprise's activities, the aggregation of each item of data over all the subsidiary statistical units should be equal to that which would be reported for the enterprise as a whole and (ii) for each subsidiary statistical unit, summary records must be available which provide the items of data required. The first problem - that of covering the whole of the enterprise's activities - can be solved by making provisions to ensure that the activities of each element of the enterprise are included in one or another of the statistical units delineated. This can often be accomplished by treating central administrative offices, warehouses and other ancillaries serving more than one subsidiary unit of the enterprise as independent statistical units as suggested earlier. The second

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<sup>21/</sup> "Sales and purchases of a subsidiary establishment" are understood to mean "sales to or purchases from other enterprises".

<sup>22/</sup> A list of these items of data will be found in the Annex I.

condition can only be met with certainty through a knowledge of the record keeping practices of the enterprise. Where an investigation of the record systems of respondents indicates that the records vary with respect to the kind of unit for which different items can be provided, either the list of items must be truncated to fit a narrowly defined statistical unit or the definition must be broadened to the point where the whole list of items can be uniformly related to the same kind of unit. In view of the fact that the relationship between the various items of establishment-type data are of considerable interest, the second alternative has advantages. If, then, in certain areas of industry, this more broadly defined statistical unit encompasses too heterogeneous a grouping of activities, a restricted number of items of data may be obtained on the basis of a sub-unit more restrictively defined. The specific items of data and the kind of sub-unit to which they might be related in particular cases can, of course, be ascertained from an investigation of the available records.

55. Almost of a necessity, records regarding employment and wages and salaries are maintained on a local unit level - except, of course, in the highly mobile industries such as construction, transport, etc. To collect these data on an establishment basis, however, may sometimes require the splitting of a local unit along kind of activity lines. Here there may be a problem of allocating to each kind of activity the personnel engaged in ancillary activities - administrative and technical personnel, persons engaged in maintenance, ancillary power plants, etc. In the majority of cases, however, since it is only rarely that it is necessary to split the local unit, little difficulty has been encountered in obtaining labour data on an establishment basis.

56. To a number of these items of data (e.g., inventories, shipments and production, deliveries and consumption, current expenditures on fixed assets, etc.) both physical and value measures apply. Of these two it is a realistic value measure that may be difficult to obtain. To the extent that shipments of products and deliveries of goods and materials involve transactions of the subsidiary establishment with other enterprises, the valuation problem is no different than for a single unit enterprise. Frequently, however, the subsidiary unit obtains its materials and ships its products to other subsidiary units of the enterprise and

no realistic market value attaches to these transactions.<sup>24/ 25/</sup> In certain countries, for some lines of activity - notably wholesale and retail trade - use of the kind of activity unit has proven better than the establishment in that it better fits the usual arrangement of accounts. In both the United Kingdom and the United States, for example, it has been found that records of the type needed to provide all the data required are not generally maintained on a locational basis by wholesale and retail enterprises. On an activity unit basis, however, it has been found not only that data were more readily available, but that the valuation problems mentioned above largely disappeared.

57. In addition to presenting the same kind of valuation problems as shipments and deliveries, the valuation of production and consumption involves ascertaining the price or value appropriate to the time at which production or consumption takes place. In general, this value can only be approximated and the degree of approximation is independent of the statistical unit chosen.

58. When dealing with statistical units that are sub-divisions of an enterprise, the problem of incomplete coverage of the enterprise's total activities has been most acute in terms of the reporting of expenditure for or value of physical assets and inventories. A problem occurs when assets such as trucks or other mobile equipment are shared between two or more units or more than one unit draws upon a common stock of materials. The suggested treatment of ancillary units serving more than one unit of an enterprise as independent statistical units frequently provides a solution to this problem. Similarly complete coverage of the sales and purchases of an enterprise can be assured by treating the central sales or purchasing organization of the enterprise as a separate statistical unit.

59. Except for sub-contract work let out, the cost of industrial services (repair, maintenance, transport, etc.) may, in many cases, be more difficult to collect for sub-divisions of the enterprise than the items discussed above - more difficult because, being less directly related to the production units in a physical way, there may be a greater tendency to maintain summary records only at the enterprise level.

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<sup>24/</sup> In the United States, however, it has been found that, to a much greater extent than has been commonly supposed, multi-unit companies tend to approximate market values in their internal records of inter-plant transfers.

<sup>25/</sup> See also para. 30.

B. Items of Data Appropriate to the Enterprise

60. Most of the items of data appropriate to the establishment or other subdivisions of the enterprise are also appropriate to the enterprise, in the sense that such data could be summarized at that level. In many cases, however, reporting details on labour, production, wages and salaries at the enterprise level would prove to be burdensome on the respondents - particularly if the enterprise has been broadly defined. In addition, as already mentioned, the establishment-type items of data are considerably more meaningful when collected on a basis that allows for the maximum possible distinction between kind of activity and location.

61. A list of the items of data specifically appropriate to the enterprise is included in Annex I to this paper. These items relate primarily to activities associated with the functioning of the enterprise as a whole. One of the most important areas covered by these data is net income and its distribution. Related to these, of course, are the costs and receipts of the enterprise. A number of the sources of costs and receipts are also included in the list of items appropriate to sub-units of the enterprise. However, certain costs - advertising, business services, interest, etc. - are not generally allocated among constituent units of the enterprise. Similarly, there may be elements of the total gross income that arise out of purely financial transactions and these, in general, would not be allocated to the sub-units. Financial data of the kind found in a balance sheet are also included in the list of enterprise statistics - indebtedness, net worth, capitalization, etc., all of which are meaningful chiefly at the enterprise level. It should be noted, however, that financial data, such as found in balance sheets or profit and loss statements, and general overhead costs will often be allocated among the legal entities or even the kinds of activity units (e.g., divisions making up the enterprise). If this is so, it would, of course, be desirable to take advantage of the possibility of classifying the data into more homogeneous categories according to kind of industrial activity than when the enterprise is utilized as the statistical unit.

62. Another area covered by the list of enterprise statistics relates to intended activities - intended investment in fixed assets and planned changes in inventory holdings, for example. These data are of increasing interest to economic analysts

and considerable effort is going into a refinement of the survey techniques in order to make these statistics reflect future actions more accurately. These data, as in the case of many of the items of financial and over-all cost data, may also be available for sub-divisions of the enterprise into kind-of-activity units.

C. Items of Data Appropriate for Collection From Both the Enterprise And Its Sub-Divisions

63. As noted earlier, the Expert Group of the Conference of European Statisticians suggested that in major economic inquiries at least the main item of data should be tabulated on the basis both of the enterprise and of one or more sub-units of the enterprise. Normally, of course, such tabulations would be made on the basis of sub-units of the enterprise that were actually used as statistical or tabulation units for the various economic surveys conducted. These tabulations would provide both a description of the internal structure of enterprises and benchmark data which could be the base for subsequent surveys employing a variety of statistical units. And, as suggested earlier, they could be used for inter-relating sets of data collected for different units and for analysis of the activity composition of the enterprise.

64. In most countries it is only at infrequent intervals that economic inquiries of sufficiently broad coverage are conducted in which it would be profitable to collect the same data on the basis of both the enterprise and one or more sub-units of the enterprise. And in broad, general economic inquiries, it is the usual practice to gather a very limited range of information. These considerations, plus the fact that relatively few items of data are readily collected in a consistent fashion at both the enterprise and sub-unit level, make it apparent that very few items of data should be collected and tabulated on more than one basis. In addition, of course, items of data to be collected for both the enterprise and its sub-units will generally be those which can be gathered from the sub-units in such a way that the sum of the sub-units will equal the totals reported for the enterprise as a whole. Most important of such items of data are employment and sales. Not only is employment a good measure of the importance and size of the enterprise and of the various kinds of sub-units within the

enterprise, but it is an item of data for which good records are most likely to exist at all levels of the multi-unit enterprise. Further, requesting employment data on two or more bases provides a convenient check on the completeness of coverage of the survey. Also, data on sales and employment that are gathered for both the enterprise and its sub-units may be useful in sub-dividing figures gathered for the enterprise only among its constituent units.

65. Other items of data too could usefully be gathered on more than one basis in major economic inquiries. Value of inventories and expenditures for fixed assets are two items of data that collected and tabulated both on an enterprise and sub-unit basis could provide valuable benchmark figures for current inquiries. In current surveys, for example, actual and planned changes in inventories are frequently collected on an enterprise basis. In basic inquiries, however, inventory data have commonly been gathered for the establishment. Data relating to actual and planned expenditures for fixed assets have been similarly gathered, but in both cases there has been considerable interest in obtaining more detailed industry distinctions for current and forward looking series - particularly with regard to what might be called the sensitive industries. Data, therefore, that could serve as a benchmark for both enterprise and establishment based surveys would be most valuable.

## VII. RELATIONSHIP BETWEEN THE CHOICE OF A STATISTICAL UNIT AND OTHER SURVEY FACTORS

### A. Statistical and Tabulation Units

66. The end point of any economic inquiry is the compilation and publication of a set of tables setting out the data from the inquiry in some useful form. In most systematically planned surveys, the design of these tables is one of the first, and certainly one of the important steps in that it serves to codify the objectives of the survey. In addition to specifying the items of data to be tabulated, the table plans indicate the characteristics by which these items are to be analysed. This, of course, determines the kinds of tabulation units that will be needed. Having established the tabulation units to be used, it remains to decide whether each item of data can be or must be collected for an equivalent



statistical unit. In some instances a single, narrowly defined statistical unit can be utilized which by successive aggregation will produce the tabulation units required. Where, however, the list of items of data to be collected includes those that are collectable only at the enterprise level and the proposed analysis of such items calls for tabulation by more detailed kind of activity, for example, some means must be found to effect the distribution of such items among the various activities of the multi-activity enterprise. This is not an uncommon problem. A number of countries, for example, show domestic or national product by industrial origin - often in considerable detail. Frequently this distribution is based on the value added data by industry which are a product of various economic surveys. In general, however, certain elements of cost that go into the computation of the contribution to the domestic or national product may not be collectable at a kind of activity level. For this and other reasons, it has been argued that the value added concept is appropriate only to the enterprise, but this contention does not eliminate the need felt by most countries to know in which activities their national product or income is generated. Facing this and similar problems, the usual practice has been to collect as many of the items of data relevant to the aggregate desired for a statistical unit that matches as closely as possible the tabulation unit to be used, thus reducing the magnitude of the allocation problem to those marginal items that can only be obtained on an enterprise basis. It should be noted, however, that this requires that certain items of data be available both for the enterprise and its sub-units.

B. Relationship of the Statistical Unit to the Type of Inquiry and to the Problem of Co-ordinating a System of Economic Inquiries

67. A system of economic inquiries is intended to cover a nation's economy in two dimensions - it should provide, on the one hand, a picture of all economic activities and, on the other, a view of the change and development of the economy over time. To produce this overall picture a number of countries have relied on a series of independent censuses - each covering a different segment of the economy. Particularly with such a system of independent surveys it is important to make sure not only that no segment of the economy remains uncovered, but that there is no overlapping of the surveys. This means that the statistical units chosen for

each inquiry must be consistent with one another. So, for example, it would be unwise to adopt an establishment approach in a census of manufacturing and then adopt a purely enterprise approach in the census of distribution. If the statistical units were so chosen, it is probable that the very appreciable portion of the distribution activities carried on by essentially manufacturing enterprises would escape both inquiries.

68. The choice of a statistical unit to define the field of coverage of a survey is also important. If, for example, there is to be a survey of manufacturing, defining the field to be covered as "all enterprises whose main activity is manufacturing" would result in something quite different from defining the field as "all establishments whose main activity is manufacturing". In many instances, particularly for surveys that are intended to cover only one sector of economic activity, one would like to choose as a basic statistical unit that one which covers as completely as possible the activities to be surveyed and as little else as possible. Since in most cases the range of related data required can only be obtained on an institutional basis, and since it is usually desirable to cover all activities of the units in question, a statistical unit is chosen whose total range of activities generally includes several different kinds of activity in addition to those of primary interest. Only in this way can the totality of the activities associated with the main activity be covered and a broad range of items of data collected. In some cases, of course, the range and kind of data required may be such that use of a unit as broad as the enterprise is indicated, in other cases only establishment type data may be needed and a sub-division of the enterprise chosen as the statistical unit. This choice of a basic statistical unit would not, of course, preclude the use of supplementary units for certain items of data. The United States, for example, in the 1954 and 1958 censuses of business, manufactures and mineral industries, defined the field of coverage in terms of the establishment, but in addition collected employment data for the enterprise concerning both in and out of scope establishments.

69. When designing an annual survey, which is generally on a sample basis, it is a common practice to use the results of a previously conducted census as the basis for planning the inquiry and for inflating the results to cover the whole field of inquiry. Such a technique is, of course, much more efficient than that of taking a sample independent of the census. Similarly, current inquiries and surveys of intentions may be rooted in both the annual and benchmark surveys.

70. To be able to interrelate these various surveys, however, implies that the statistical units used for each are relatable. Thus, if the enterprise is the statistical unit employed for a programme of sample inquiries on intended expenditures for fixed assets, it would be highly desirable to be able to relate the sample estimates to the actual expenditure for fixed assets of all enterprises in the field under study during some base year. This can only be done, however, if data in the base year have been collected or can be aggregated on an enterprise basis for the same set of enterprises to be included in the field of study.

Similarly, it may be required to plan a survey of all enterprises whose main activity is wholesaling based on the results of a more general inquiry that covered all establishments engaged in wholesaling and manufacturing. To be able to do this effectively, however, and to be able to relate the data from the survey of wholesaling to this more general inquiry would require a knowledge of the distribution of the different kinds of establishments within enterprises classified according to their own major activity. It is for this among other reasons that the Expert Group recommended that national statistical offices should consider publishing key data for two or more tabulation units in major or benchmark inquiries and "should study the possibility of preparing common registers in which would be listed both enterprises and their sub-units, or of adding such information to existing registers of various units."<sup>26/</sup>

71. A register of enterprises which also delineated the important sub-units of these enterprises and contained a few key items of data tabulated on each basis would be extremely useful. With such a register a system of individual inquiries could be designed and carried out on a consistent basis and the results of these

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<sup>26/</sup> Op. Cit., para. 12 and 13.

different surveys could be brought to bear on problems of allocating, comparing and classifying various kinds of data. Thus, for example, data on new orders or anticipated capital expenditures gathered on a current basis for the enterprise could be related to actual sales and capital expenditure data collected on an establishment or kind-of-activity basis in a basic economic inquiry. Similarly, a register of this type would afford a basis for allocating to the constituent kind of activity unit or establishment, items of data such as profits, costs of business services, advertising, etc., which in most countries are only rarely collectable on other than an enterprise basis. Further, it would make possible a more consistent coding and classification of the various statistical units in that each unit could be coded in terms of the classification of its constituent elements. It would, too, provide an excellent basis for analysis of the concentration of ownership in the various branches of economic activity.

72. Many countries have made no systematic attempt to establish statistical links between the enterprise and its constituent elements - often viewing establishment and enterprise based data as the products of unrelated statistical programmes designed for different purposes. Increasingly, however, with the growing interest in interlocking systems of national accounts and other analytical tools, there is recognition of a need to determine with some precision the structure of the enterprise and the relationship between its activities and the activities of its constituent elements.

73. An investigation of bookkeeping practices would make possible a more precise delineation of appropriate statistical units within the multi-unit enterprise and provide a qualitative picture of the organizational structure of these enterprises. In addition, however, certain facts or items of data are needed concerning each multi-unit enterprise and each identified sub-unit of these enterprises in order to furnish the bridges across which enterprise and establishment type data may be joined and to provide a frame for the design of a subsequent system of interrelated economic surveys.

74. Since the enterprise itself can, and often does, span two or more major divisions of economic activity, a general economic census programme could be an excellent channel for obtaining the data needed for constructing a general directory of economic units showing the structure of the economy and the internal structure of the enterprise. A number of countries already include an infrequent general economic census in their survey system, but few to date have utilized this census to describe the structure of the enterprise. Through such a census the structural items of data as well as selected flow items can be requested both for the enterprise and for its constituent elements, and these could provide the necessary links between subsequent surveys and between sets of data based on the enterprise and its sub-units.

ANNEX I

ITEMS OF DATA APPROPRIATE TO THE MAJOR TYPES OF STATISTICAL UNITS

A. Establishment Type Data

1. Shipments (including shipments of individual goods)
2. Production (including production of individual goods)
3. Deliveries (including deliveries of individual goods)
4. Consumption (including consumption of individual goods)
5. Cost of industrial services
6. Cost of sub-contract work
7. Duties and indirect taxes
8. Employment
9. Man-hours worked
10. Wages and salaries

B. Enterprise Type Data

1. Intended capital expenditures
2. Planned changes in inventories
3. New orders
4. Cost of business services such as advertising
5. Rent received
6. Royalties paid and received
7. Interest paid and received
8. Dividends received
9. Capital gains and losses
10. Distribution of income
  - a. Direct taxes
  - b. Dividends paid
  - c. Undistributed income
11. Financial assets
  - a. Cash
  - b. Investments
  - c. Loans
  - d. Other financial assets

12. Intangible assets
  13. Financial liabilities - loans and other indebtedness
  14. Net worth
    - a. Paid-in capital
    - b. Earned surplus
- C. The Enterprise, the Establishment or Related Statistical Units
1. Value of inventories
  2. Value of and expenditures on fixed assets
  3. Sales (including sales of individual goods or services)
  4. Purchases (including purchases of individual goods or services)
  5. Unfilled orders
  6. Rents paid
  7. Accounts payable
  8. Accounts receivable