



INDIA

CONTRIBUTED PAPERS

9x

SEVENTH CONFERENCE OF
COMMONWEALTH
STATISTICIANS

November 16-28, 1970

VOLUME II
ITEMS 6-9 OF AGENDA

CENTRAL STATISTICAL
ORGANISATION
NEW DELHI

RESTRICTED

Four documents relate to the work of the Conference :

1. Report of Conference :—A technical report of the proceedings highlighting the various issues discussed at the Conference. Report is printed for circulation to delegates/observers, the national statistical Offices of the Commonwealth Countries and the general public.

2. Contributed Papers :—Submitted in writing to the Conference by various countries :

A. Papers contributed on Items 2 to 5 of the agenda (Volume I).

B. Papers contributed on Items 6 to 9 of the agenda and papers contributed on items of the agenda which were not discussed in the Conference (Volume II).

C. Papers Contributed on Items 10 to 14 of the agenda and papers contributed on items which were not discussed in the Conference (Volume III).

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OF
COMMONWEALTH STATISTICIANS
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VOLUME II
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THE COLLECTION OF INDUSTRIAL STATISTICS FROM SMALL UNITS AND
UNORGANIZED OR UNREGISTERED SECTORS

1. Although Canada is a highly industrialized country, its industries include thousands of small establishments which are difficult to survey and edit and indeed, in some cases, to identify. This is because of their location, seasonality, mobility or low capital intensity, as well as the fact that little emphasis is placed on detailed record-keeping. Another point to remember in this context is that there is some evidence to suggest that the reluctance on the part of some small respondents to be included in surveys may stem from the fact that such people are normally not users of statistics.
2. 'Smallness' is, of course, a vague concept when considering industrial units. Even within the manufacturing industries, there is no explicit definition used, with 'smallness' in various industries ranging from annual shipments of \$20,000 up to \$500,000. 'Smallness' for the above purposes is considered to be that point above which a full industrial census questionnaire is sought from respondents and below which a rather more limited amount of data is requested. If an industrial unit is by definition a manufacturer, it will be covered by the Census of Manufactures however small it may be.
3. It is also important to observe that what may be small in terms of national aggregate statistics can have a significantly larger bearing on certain individual industries and provincial or small area statistics. This point is well illustrated in Table 1 where 1966 data for a few selected manufacturing industries as well as total manufacturing are shown in terms of the contribution of establishments with less than \$100,000 in shipments to both the establishment count and to total shipments values.
4. Much the same picture emerges from a similar examination of statistics for both the services sector and wholesale trade. In the case of the latter (see Table 3) in 1961, although only 10.6% of wholesale firms had sales in excess of \$1,000,000, they accounted for approximately 70% of the wholesale market. In services, (see Table 4), again a large portion of service revenue is accounted for by a small proportion of the number of outlets. This latter set of figures must be used with some caution, however, since, although the quality of the data produced in the 1966 Census of Service Establishments was generally good, the coverage of the service sector was by no means complete. It is therefore possible that had additional trades been covered, the structure in terms of size composition and revenue might have been different.

Collection and Processing

5. In general, lists on which surveys are based can often be built up through access to administrative records of various governmental agencies. There remain some difficulties however with certain manufacturing industries which are seasonal in nature, highly mobile or of low capital intensity. The same is true of certain primary industries such as, for example, sea fishing, where at present the Bureau conducts a quinquennial survey by enumeration, employing sampling methods with smaller establishments.
6. In general, there exists the difficulty of coding 'small' establishments to the appropriate industry. It is often the case that establishments of this size are engaged in a number of different industrial activities, which

are not usually segregated in their accounting records. The problem is further complicated in that none of these activities may be the principal one or if one activity can be considered to be principal, it may quite easily be a minor activity the following year. In the area of primary industries where this problem is particularly prevalent, occasional surveys are carried out to determine the appropriate classification of such establishments, but since the resultant distortion in the statistics is believed to be minor, no regular 'profiling' activity is maintained as in the case of the large establishments.

7. In the case of the quinquennial Census of Merchandising and Services, lists are at present obtained primarily through a field enumeration. These lists form the basis of a mail-out program during the Census. However, field enumeration is not the most ideal vehicle for the development of lists, especially in the service area. It has been found that serious under-enumeration can occur in those areas where businesses are located at some distance from main thoroughfares or are located in private homes or in office buildings. It is assumed that generally such firms would be small in terms of sales and employment. Although it appears that field enumeration will again be employed for the 1971 Census of Merchandising, plans are being formulated to lessen substantially the degree of under-enumeration through the creation of lists independent of the field enumeration. It is planned, for example, to obtain membership lists from many of the professional associations; in addition, more effective use will be made of telephone and business directories, provincial government lists, etc. These lists will be checked against the field enumeration lists in order to improve coverage in areas where under-enumeration has been thought to be relatively severe in the past.

8. Since field enumeration will be employed for the 1971 Census program, it will mean that all retail, wholesale and service establishments will be contacted. However, in order to lessen the response burden on small firms (less than 4 employees for retail trade), these will be requested to complete a short questionnaire. The data requested on this form will be considerably less than requested on the long form. A similar technique will be employed in the service and wholesale fields. It is not planned at this time to include, in the published results of the Census, data on firms in retail and wholesale trade with sales of less than \$3,000 and in services with less than \$1,500. Unfortunately, these firms will have to be contacted in order to discover whether their annual sales volume falls below the cut-off level.

9. During the past year, a committee was formed to study the feasibility of using Department of National Revenue administrative records. The successful implementation of plans to use such records could conceivably eliminate the need for any contact with small firms during the Census. The number of such firms could range in excess of 100,000. Obviously, for large size firms, it will still be necessary to obtain data directly since National Revenue records do not contain all the information required by the Dominion Bureau of Statistics.

10. In the case of regular annual series, a fairly comprehensive set of surveys in the three areas of retail, wholesale and services is carried out. Many of these surveys have been full-coverage, thereby including both large and small-sized firms. In a major effort to reduce the workload on respondents, especially the small-sized firms, many of these surveys have been shifted from census-type to sample, a course of action which, we believe, will yield good quality data with far fewer respondents. Those surveys that are being modified in this way do not generate any regional data. If there were requirements for small area statistics from such surveys, sample design and selection would have to be amended.

11. In the Bureau's monthly survey of retail trade, small firms are accorded a more favourable treatment by virtue of the fact that they are sampled, whereas large firms, particularly those with sales in excess of \$500,000 annually, are taken in total in the sampling frame. For example, based on the 1971 Census, there were almost 153,000 locations, of which somewhat less than 5,000 are large enough to be included in full in the current retail trade survey. Of the remainder, a sample of approximately 7% (i.e. about 10,000 firms) is being used. Similar approaches are used in virtually all monthly surveys.

12. The high birth rate of small firms in Canada implies that, at least for those with no paid employees and consequently no statutory requirement to register under the Unemployment Insurance Act which would otherwise provide a source for these firms, there will always be at any given time a number of units which are not included in any of our lists. Further, even those that do enter our lists through the administrative records of other departments typically do so with a lag of several months. One way of meeting this problem is, as in the new Retail Trade Survey, to pick up a sample of units by listing all units in a sample of well-defined areas. These sampled area lists are then matched to the master file and those that are on the master file (whether sampled in any survey using the file or not) deleted from the area sample list. The remainder provide a sample (with probabilities determined by the area sampling rates) of all units not on the master file.

13. It is, of course, true that for both census and current sample surveys there exists some degree of non-response. This is so in both manufacturing as well as the merchandising and services area, amounting to perhaps 10-15% of smaller firms. Its effect, however, is minimized through an emphasis on obtaining actual returns from larger respondents. In the case of the Census of Manufactures, for example, if all normal follow-ups have been attempted without success, including recourse to one of the Bureau's regional offices, then estimations are made, based on perhaps a previous year's return for that establishment, or data reported to another survey, often the current employment series. In most monthly or quarterly manufacturing commodity series the surveys are confined to relatively large respondents, accounting for the great bulk of particular commodities. As well, such surveys have often been initiated at the request of the industry itself, through a national association, which tends to limit non-response. In other current surveys, of the sample type, non-response is usually handled through regular imputation procedures or substitution in the sample.

14. In general, the Bureau is actively working towards minimizing non-response especially amongst smaller firms in a number of ways, including the use of sample surveys, working with the Canadian Institute of Chartered Accountants on the development of simplified and shortened reporting schedules, giving serious consideration to recourse to prosecuting, attempting to remove duplication as between its many surveys, and employing various public relations efforts, including promotion of the more widespread use of statistics.

TABLE 1. Manufacturing Establishments with Less than \$100,000 of Shipments, 1966

Industry	Newfound-land		P.E.I.		Nova Scotia		New Brunswick		Quebec		Ontario		Manitoba		Saskat-chewan		Alberta		British Columbia		Canada	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
1. Bakeries	53	7	88	73	78	17	73	10	72	13	76	12	86	22	83	28	79	22	84	25	77	15
2. Sawmills	96	65	100	100	76	22	52	4	68	8	61	7	92	32	87	20	64	16	41	1	62	4
3. Ornamental & architectural metal industry	0	0	0	0	54	13	50	12	61	8	37	3	64	13	78	61	39	5	64	10	56	16
All manufacturing industries	53	2	61	6	56	3	52	2	46	2	41	1	50	2	59	3	53	3	53	2	46	2

(1) Percentage of establishments to total establishments.

(2) Percentage of shipments to total shipments.

TABLE 2. Retail Trade, Number of Stores, Sales, and Number of Employees and Working Proprietors by Sales Size, 1966

Sales size	Number and sales			Percentage distribution		
	Number of stores	Sales \$'000,000	No. of employees and proprietors	Number of stores	Sales	No. of employees and proprietors
1,000 and over ..	3,287	8,857.8	268,450	2.2	39.1	33.9
100 to 999,999 ..	3,869	2,681.9	71,130	2.5	11.8	9.0
100 to 499,999 ..	12,491	3,742.6	113,713	8.1	16.5	14.4
level	19,647	15,282.3	453,293	12.8	67.4	57.3
100 to 199,999 ..	23,073	3,197.1	114,587	15.0	14.1	14.5
level	23,073	3,197.1	114,587	15.0	14.1	14.5
0 to 99,999	35,338	2,500.9	104,920	23.0	11.0	13.2
0 to 49,999	23,883	937.1	49,555	15.6	4.1	6.3
0 to 29,999	36,149	689.6	51,674	23.5	3.0	6.5
\$10,000	15,530	79.4	17,212	10.1	0.4	2.2
level	110,900	4,207.0	223,361	72.2	18.5	28.2
.....	153,620	22,686.4	791,241	100.0	100.0	100.0

TABLE 3. Wholesale Trade, Number of Locations and Sales by Sales Size, 1961

Sales size	No. of locations	Sales	Percentage distribution	
			No. of locations	Sales
		\$'000,000		
\$10,000,000 and over	196	6,069.5	0.6	31.2
\$5,000,000-9,999,999	286	1,956.1	0.9	10.1
\$1,000,000-4,999,999	2,792	5,561.1	9.1	28.6
First level	3,274	13,586.7	10.6	69.9
\$500,000 - 999,999 ..	3,188	2,220.7	10.3	11.4
\$400,000 - 499,999 ..	1,496	668.3	4.8	3.4
\$300,000 - 399,999 ..	2,052	708.6	6.7	3.7
\$200,000 - 299,999 ..	3,514	864.2	11.4	4.4
\$100,000 - 199,999 ..	6,034	871.5	19.6	4.5
Second level	16,284	5,333.3	52.8	27.4
\$50,000 - 99,999	5,120	374.3	16.6	1.9
\$25,000 - 49,999	3,293	121.2	10.7	0.6
\$10,000 - 24,999	1,829	32.0	5.9	0.2
Under \$10,000	1,055	5.3	3.4	-
Third level	11,297	532.8	36.6	2.7
Total	30,855	19,452.8	100.0	100.0

TABLE 4. Service Trades, Number of Stores, Sales and Number of Employees and Working Proprietors by Sales Size, 1966

Sales size	Number and sales			Percentage distribution		
	Number of locations	Sales \$'000,000	No. of employees and proprietors	Number of locations	Sales	No. of employees and proprietors
\$100,000 and over	9,097	2,804.7	245,966	9.7	61.2	51.2
First level	9,097	2,804.7	245,966	9.7	61.2	51.2
\$50,000 to 99,999	10,077	707.3	72,521	10.7	15.4	15.1
\$30,000 to 49,999	10,198	394.1	43,693	10.9	8.6	9.1
Second level	20,275	1,101.4	116,214	21.6	24.0	24.2
\$20,000 to 29,999	9,742	239.1	30,599	10.4	5.2	6.4
\$10,000 to 19,999	18,109	261.5	41,274	19.3	5.7	8.6
\$5,000 to 9,999	17,499	125.5	25,184	18.7	2.7	5.2
\$2,000 to 4,999	13,772	48.5	15,634	14.7	1.1	3.2
Under \$2,000	5,297	6.3	5,622	5.6	0.1	1.2
Third level	64,419	680.9	118,313	68.7	14.8	24.6
Total	93,791	4,587.0	480,493	100.0	100.0	100.0

THE COLLECTION OF INDUSTRIAL AND DISTRIBUTION
STATISTICS FROM SMALL UNITS AND UNORGANISED
OR UNREGISTERED SECTORS

1. Small scale and unorganised or unregistered sectors in the fields of industry and distributive trade have been playing quite an important role in Indian economy. This sector consisting of units not registered under Factories Act of 1948 for industrial statistics and under Sales-Tax Acts of different States for distributive trade statistics, comprises mainly household units operated singly or jointly in partnership with other households but also includes small non-household units like cooperatives, joint stock companies, societies etc. This paper deals with the attempts made in the collection of statistics from this sector and has been divided into three sections. Section I relates to industry, Section II to distributive trade and in Section III, problems faced in the collection of statistics from small units in general have been posed.

I. INDUSTRIAL STATISTICS

2. Although the number of industrial units in the unregistered i.e. non-factory sector having an employment of less than 10 and working with power, or less than 20 and working without power is very large, not much statistical information is available for this sector. Some ad-hoc surveys have been conducted in different States at different points of time, but they did not follow a uniform pattern in terms of scope or coverage. As such neither comparisons of data thrown by these surveys are possible nor can all India estimates be worked out. At the national level, the National Sample Survey (NSS) has, however, collected data from household enterprises as a part of the multi-purpose survey in some of the rounds.

3. Although some efforts to collect data from small scale manufacturing households were made in earlier rounds of NSS, surveys were conducted on an organised scale with an adequate sample size only in 7th and 8th rounds (1953-55). In these rounds a household was regarded as a manufacturing household if it was engaged, singly or jointly in partnership with other households, in small scale manufacturing on any day during the 365 days preceding the date of listing. The survey covered all such manufacturing activities by households but the results were presented for households and establishments not registered under the Factories Act, 1948. In the 7th

round non-household enterprises such as cooperatives, joint stock companies etc. were also covered, but since a very small number of households engaged in small scale manufacture came from sample villages and blocks, the data were not tabulated. In the 8th round, non-household enterprises were not included. The items of information collected related to (i) general description and particulars (ii) details of land, building, machinery, equipment etc., (iii) consumption of fuel, lubricants and raw materials (iv) products, by-products and subsidiary products (v) gross income from industrial servicing (vi) particulars of personnel (vii) other expenses and (viii) summary of receipts and expenditure. Fixed assets were valued at their purchase price. While information on rent, improvements etc. referred to a period of 30 days preceding the date of enquiry, all other items of information were collected both with 'week' and 'month' as reference periods but only data with month as reference period were tabulated. In the 7th round a stratified three stage random sampling design with tehsil, village and household in rural areas and towns, blocks and household in urban areas as the units in the three stages was adopted. In the 8th round there was a slight change in the design of rural areas. The first stage unit viz. tehsil was omitted and villages were directly selected from each stratum. There was no change in the urban design.

4. In the 9th and 10th rounds of NSS(1955-56) the approach of investigation i.e. through households, and coverage continued to be the same as in the 8th round. In these rounds greater details of information on fixed capital and employment particulars were sought. Additional blocks of queries on draught animals, inventory, source of capital and raw materials and information on marketing facilities were introduced. Data on rent rate per year and rent paid during the last month for land, building and capital assets were collected. For information on repairs and maintenance, improvements made etc. of capital assets, two reference periods viz. 'last month' and 'last year' were used. Employment particulars were collected for the 'last month' only. Data on consumption, production and 'other expenses' related to the previous month as well as the previous year. The sampling design in the rural areas remained the same as in the 8th round. Urban blocks were directly selected from the strata.

5. Again in the 14th round(1958-59), the schedule on small scale manufacture was canvassed with an increased sample size. The approach of investigation was once again through manufacturing households and coverage also the same as in the 10th round. Non-household enterprises continued to be outside the scope of the survey. The data tabulated related to unregistered households only. Although the schedule

of investigation was not as detailed as in 9th and 10th rounds, information on transactions and inventory of fixed capital was collected in addition to other particulars as collected in 7th and 8th rounds. The reference period was 'last month', last month being defined as thirty days prior to the date of enquiry. In the case of capital transactions, the reference period was taken as one year. A stratified two stage sampling procedure continued to be adopted both in rural and urban sectors.

6. In the 23rd round(1968-69) collection of data on small scale manufacture was undertaken by NSS. In this round a renewed effort to extend the coverage of the survey to non-household manufacture was made. Since the objective of the survey in the 23rd round was to provide data on essential characteristics of the manufacturing activities for the unregistered sector to add up with data collected for the registered sector, for the purpose of this survey 'small scale' manufacturing industries were defined to comprise all those household or non-household units which were not registered under the Factories Act and listing was accordingly done for selection at the final stage. Separate schedules of investigation for household and non-household sectors were canvassed. The household schedule, as also the reference period, in this round was almost similar to that used in the 14th round except that details of draught animals, transactions and inventory of fixed capital and other expenses were dropped. New blocks of enquiry on availability of raw materials, State assistance, working capital and outstanding loan were added. The non-household schedule was similar to the household schedule except that it excluded blocks on availability of raw materials and State assistance. The reference period for household schedule was 30 days preceding the date of enquiry for all items except for capital transactions which was one year. For the non-household schedule the previous accounting year was fixed as the reference period. A stratified two-stage sampling design was adopted in this round also, but efforts were made to increase the size of the sample and the representative character of the sample was improved by covering all the villages/blocks (first stage units) which had a high degree of industrial concentration as revealed from 1961 census results. Details of sample sizes in this round and also in the earlier rounds of NSS are given in the table which follows:

NSS Round No.	Rural area		Urban area	
	No. of sample villages	No. of sample households	No. of sample blocks	No. of sample households
7	959	7013	443	3667
8	1120	2451	1911	4058
9	1624	4006	2108	4172
10	1624	6108	1328	2971
14	2552	23415	2086	5977
23	8796	40000	5424	55000

7. Under a Centrally sponsored scheme in the Fourth Plan it has been decided to conduct surveys of small scale manufacturing units to be undertaken by the States on a uniform all India pattern with common listing, schedule of investigation and tabulation programme and a common time schedule. To make these surveys more intensive it has also been decided to limit attention to non-factory units employing only five or more persons, and to also cover only the urban areas and the known pockets of industrial concentration in rural areas. The idea is to get detailed data on the larger and relatively more modern small scale unregistered factory units. This scheme has already been put into operation and it is expected that States would complete listing work by about middle of 1970. The detailed surveys would be taken up thereafter and would be phased over a three year period with different groups of industries being taken up in different years on a uniform pattern in States.

II. DISTRIBUTIVE TRADE STATISTICS

8. In the distributive trade field the registered sector, consisting of dealers registered under the Sales-Tax Acts of the States on the basis of annual sales turnover, varies from State to State. Consequently the coverage of the unregistered sector also varies from State to State. It will, therefore, be advantageous to have the design, schedule and tabulation of the survey of unregistered sector so prepared that the results are additive to their counterpart (registered sector) at the State level.

9. Surveys were conducted by NSS on an organised basis on household trade in four consecutive rounds, 7th to 10th,

during the period 1953 to 1956. These surveys covered trading activity by individual households or with at least one member having usual principal or subsidiary occupation as trading or jointly by two or more households but excluded operations by non-household organisations like joint stock companies, cooperative societies and other public bodies. The intermediaries like brokers or commission agents were also excluded. The coverage of these surveys, therefore, was mainly limited to unorganised sector although it did include registered trade carried on by households individually or jointly. Although data were collected for both wholesale and retail trade, samples for wholesale trading being too few were not taken up for tabulation. The information collected during these surveys related to (i) fixed capital used (ii) employment and labour charges (iii) quantities and values of purchases and sales and (iv) current expenses. It was felt that direct questions on trade margins would not elicit reliable information. Apart from unwillingness to part with such information, the traders would not remember in detail all the various transactions. As such, attempts were made to estimate margins on the basis of total values of purchases and sales assuming that there were no inventory changes between the beginning and end of the reference period. The assumption was considered realistic because the balance was sought for all trading households together. The value of fixed capital was taken to be either the purchase value or value at first use. Information on rent paid and repair etc. on fixed assets and for all other items related to one month prior to the date of enquiry in 7th and 8th rounds and to the previous calendar month in 9th and 10th rounds. In 9th and 10th rounds information on rent rate per year and improvement in building during last calendar year was also collected. A three-stage stratified sampling design was adopted for the rural area, tehsils, villages and households being the three stages respectively. In the urban areas, in the 9th and 10th rounds a two-stage stratified sampling design with blocks and households as the two stages respectively, was adopted. The data relating to fixed capital could not be processed because the collected figures were found on scrutiny to have limitations such as blank returns in regard to values of fixed capital items in most of the cases where these items were inherited by the present entrepreneur.

10. In the 15th round (July '59 to June '60) NSS again conducted a survey of distributive trade in the unorganised sector. Although the approach of investigation continued to be through households engaged in trading activities, households engaged in trade registered under Sales-Tax Acts were excluded. The non-household establishments, even if unregistered, were not covered. The intermediaries like brokers etc., who were excluded during earlier rounds, were covered in this round. Based on the experience of poor

response in earlier rounds, questions on fixed assets and other expenses were dropped in this round. A new block on gross purchase, sale etc. with the reference period as previous month as well as previous week was added. The reference period was changed to previous week for particulars of major purchases and sales and of personnel. The sampling design was the same as in the 10th round.

11. In the 20th round (July '65 - June '66), NSS again sought to collect data from trading households but with a slightly modified approach. Detailed particulars of trading enterprises were collected as a part of Integrated Household Schedule. The sample households for this schedule, however, were selected from a separate frame of trading households prepared by listing the sample villages and urban blocks (common for all NSS schedules). The coverage of the survey, although limited to household enterprises (excluding non-household establishments), did not exclude those households which were registered under Sales-Tax Acts. In this round broad information on capital and 'other expenses' was again sought for. For the first time direct information on trade margins as percentage of turnover was asked for and details of purchases were dropped. While the reference period for most of the items of information sought was the previous month, information on sales, trade margins and personnel was collected for the previous year also. The tabulated results of this survey are not as yet available, but indications are that the non-response for the item of enquiry relating to direct question on trade margin is moderately high.

12. In the 24th round (1969-70), NSS has conducted an intensive survey of unregistered household sector with increased sample size and improved design. The non-household trading establishments have not been covered. The experience of previous rounds has also been taken advantage of in modifying the schedule for collection of data. Although the experience regarding collection of data on fixed assets had not been satisfactory in the earlier rounds, it was felt that one more attempt should be made in this round and a block was introduced with reference period 'last month' for rent and 'last year' for other details. Apart from information on total sales and purchases during the previous month in a block, information on sales and purchases during the same reference period by commodity-groups has been asked for to serve as a check. To get precise information on sales free from recall lapse, data have also been asked for each day for the previous week, separately in another block. To get a complete picture of the balance sheet of the trading enterprise, once again a block on 'other expenses' has been introduced. The reference period of one week and not one month has been kept for information on particulars of personnel. Once again, direct information on 'percentage gross trade margin' has been

sought in spite of unsatisfactory response in the 20th round, but in a slightly modified form. Percentage gross trade margin figures have been asked for by commodity-groups along with data on value of purchase and sales, which it is hoped might produce better results. The sampling design continued to be a stratified two stage one. The first stage units are village/blocks which have been selected with probability proportional to size systematically in the form of four independent interpenetrating sub-samples. The procedure of selection of trading households has been improved in this round by dividing all households engaged in non-registered trade in each sample village/block into two sub-strata before selection of households. Sub-stratum 1 consists of households which have been engaged in non-registered distributive trade at any time during the 30 days preceding the day of listing and sub-stratum 2 consists of the households so engaged in trade at any time during the 365 days preceding the day of listing but not during the preceding 30 days. Sub-stratum 1 is to be completely enumerated for villages having upto 10 households in this stratum, otherwise a linear systematic sample is to be selected using interval two if the total number of households were between 11 and 20, three if the households were between 21 and 30, and so on. In sample blocks, a linear systematic sample is selected from sub-stratum 1 of households after arranging the households first by the category having trade as principal activity and then by those having trade as subsidiary activity. From stratum 2 only one household is to be selected at random. Details of sample size in this round along with the earlier rounds are given below:

NSS Round No.	Rural area		Urban area	
	No. of sample villages	No. of sample households	No. of sample blocks	No. of sample households
7	959	3481	443	3479
8	-	-	443	3820
9	1539	5527	1994	7614
10	1611	8381	1052	4035
15	2598	6581	2215	3945
23	8400	25000	4600	23000

III. PROBLEMS OF DATA COLLECTION

13. The activity in the unregistered sector is carried out by a very large number of households and small non-household establishments spread throughout the country. Industrial activity, in particular, is also carried out intensively in some concentrated pockets. One cannot think of preparing a complete list, valid for a point of time, of all such units, nor of a complete census for collecting data of this sector. The problem is, therefore, to decide about the frame, design and sampling unit for a sample survey. In our country, NSS has been conducting surveys of unregistered small scale manufacturing and distributive trade as a part of the multipurpose design through household approach. Doubts have been raised at times regarding the efficacy of adopting common area units at the first stage for all surveys and household instead of shop or factory as the ultimate sampling unit for industrial and trade surveys. This point has been discussed at length in various meetings and conferences and the consensus has been to continue with the NSS approach on the following grounds:

- (1) In the absence of any other sampling frame and the nature of the spread of these activities, area units as the first stage units meets the requirement.
- (2) It is economical to have common sample villages/blocks for all NSS enquiries. There is no evidence to show that the common first stage units selected as per NSS multipurpose design would in any way vitiate the results and there is enough scope to add any number of special villages/blocks where the activity is expected to be intensively carried out and introduce any refinement in the design for selection of second stage units as any special survey would require.
- (3) It has been seen that in this country a large number of households carry out these activities without having any identifiable shop or establishment and these would be netted only through household approach.

14. The NSS experience, however, has not been satisfactory for unregistered non-household units. The recent experience of NSS in their 23rd round survey of unregistered small scale manufacturing units has been that a sufficient number of non-household units could not be netted in the sample. Based on this experience, the non-household units are not being covered in the 24th round survey of unregistered trade by NSS. The problem remains as to the best method of tackling unregistered non-household units, lists of which may not be

readily available with authorities viz. Registrar of Cooperatives, Registrar of Societies etc.

15. Another question is with regard to the frequency of these surveys. Repeated annual surveys even on a small scale will have the advantage of utilising investigational experience compared to large scale intensive surveys made at distant points of time. But then, many users are in need of detailed data and would be satisfied if they are available at least once in a few years (say 5 years). Repeated annual detailed surveys would entail heavy cost and resources and are, therefore, not feasible. The solution may be in having a detailed survey with a sufficiently large sample size once in five years and repeating thin investigational surveys every year or in alternate years.

16. Most of the households or even units in the unorganised sector do not keep any record of particulars of their activity. The data collection, therefore, will be through the method of interview. The interview should aim at making reasonable estimates of events and magnitudes happening in a reasonably short period in the past. Controversies regarding what should constitute a reasonably short period have been often raised and could be decided only by objective experimentation.

17. Users have been very often demanding sophisticated data on value of fixed capital, addition and depletion of assets and rent paid from the unorganised households maintaining no records whatsoever. In this sector, many households in the rural areas and also some of the households in the urban areas, have inherited most of their assets and are not in a position to provide the information on these items. In many cases assets are also being used for more than one purpose and it becomes extremely difficult to apportion the value attributable to one activity.

18. One of the most important items of information that these surveys should provide is on value added or trade margins, but experience has shown that it is extremely difficult to obtain satisfactory information by direct questions. In case of a distributive trade survey one might have directly asked for particulars on (i) quantity and purchase price of a merchandise actually sold, (ii) its corresponding sale price and (iii) other elements of cost. But it has been invariably found that apart from the informant's reluctance to pass on with such information, he does not also remember in detail all such transactions. The problem, therefore, is whether margins should be estimated on the basis of total values of purchases and sales, as was done in the earlier rounds of NSS, or an attempt should be made to obtain at least data on percentage of trade margins by commodity groups and also information on total purchases, sales and

other elements of cost separately as was done in the 24th round of NSS. The experience of other Commonwealth countries in regard to these and related questions would be valuable.

THE COLLECTION OF INDUSTRIAL AND DISTRIBUTION
STATISTICS FROM SMALL UNITS AND UNORGANIZED
AND UNREGISTERED SECTORS

Introduction

1. The comments contained in this paper though relevant to the situation in large industrial economies are primarily concerned with the problems and experiences in small societies and particularly in small "developing" countries.

It is well known that governments in small countries and the agencies authorised by them to collect and publish statistics usually have little experience in the carrying out of extensive industrial enquiries. They often have even less in investigating the level of economic activity in the distributive sector.

Consequently they face what sometimes seems to be almost unsurmountable problems in starting and completing such major statistical and organizational projects.

Indeed even where the country has a vast fund of experience, expertise and other resources available - say for example in the United States of America, the United Kingdom or perhaps the smaller industrial countries of the Western Europe and the Commonwealth - large industrial enquiries often prove far less productive of reliable statistical material than the marginal economic returns expected.

In some of these countries large scale enquiries directed at small industrial and distributive units have either been omitted in recent times or have been severely limited with little loss in overall capacity to analyse and predict economic performance.

2. It is not possible however for small countries to enjoy this luxury. In Jamaica for example, where banana culture is the second largest agricultural pursuit a Farm Survey carried out in 1962/63 showed that over 50% of commercial production occurred on farms of less than 5 acres.

Again the Survey of Industrial Activity carried out during 1961/62 related to the year 1960 showed that of the 23,057 establishments estimated to comprise the manufacturing sector 470 were described as large (that is employing regularly an average of 15 or more persons). Indeed the following numbers, taken from the report highlight this phenomenon for some of the important sub-sectors of the manufacturing sector.

Survey of Industrial Activity - 1960

Industry Group	Number of Establishments		
	Total	Large	Small
(a) Food Products (excluding Sugar Manufacturing and Bakeries)	2,570	30	2,540
(b) Textile Products	1,129	59	1,070
(c) Curios, Handicrafts and Straw Goods	1,575	5	1,570
(d) Dressmaking and Tailoring	10,500	80	10,420
(e) Footwear and Shoe repairing	3,380	10	3,370
(f) Furniture and Fixtures	837	37	800
(g) Metal Products (excluding Machinery)	1,072	22	1,050

In the Construction Sector which was surveyed under the same programme in 1960 only 470 establishments out of a total of 3,160 could be classified as large (that is establishments employing 15 or more persons).

An interesting sidelight of the situation described above is that in 1960 the industries in the table listed above provided 42% of the Gross Domestic Product at Factor Cost generated in Manufacturing Industry.

3. In respect of Distributive Trades, sample surveys were carried out in 1964 and 1967/68, none of which have proved very satisfying, but which underlined the preponderance of small units in the economy. Large numbers of these were petty traders, itinerant and market vendors (or higglers as they are known in Jamaica). In programming for a projected continuous survey of trading establishments, it was estimated that nearly 17,000 units out of a projected total of 18,500 would have a turnover of less than \$J10,000 per annum.
4. In short therefore, it is clear that in Jamaica as in many small and even in some large developing countries, small units predominate in the sectors under discussion. They cannot be ignored in any sensible statistical programme, and constitute an enormous problem for the limited resources of these countries.

Some Problems identified

5. Whatever the technique employed in investigating small industrial or distributive units certain problems exist which can be listed as follows:-
- (a) Infrequent industrial enquiries tend to become large scale statistical and organizational projects since they involve the collection of a wide range of data from most industrial units operating during a particular year.
 - (b) In virtually every instance where small units are concerned, the data are hard to collect because they involve difficult statistical concepts which the small proprietor or operator is not able to comprehend.
 - (c) Activities are usually required to be reported on over a period of a year, during which performance may be uneven or seasonal and is difficult to measure.
 - (d) Quite often it is difficult for small units to define in any precise way the activities or areas of production in which they are engaged. In most instances household activities are often confused with productive business operations.
 - (e) Additionally, it is virtually impossible in certain circumstances to distinguish the establishment from the enterprise. The grower is often also the processor or the fabricator and or the vendor as well.
 - (f) In most all cases small units (and even many large ones) do not maintain any records from which data may be extracted.
 - (g) Many small units particularly in trade (petty traders, itinerant vendors and peddlars) have no fixed location at which they can be found. Their operations are intermittent or seasonal, often supplementing agricultural or other pursuits. Coverage is thus likely to be very incomplete, and the results obtained, meaningless unless an exhaustive and expensive global search is carried out to update the lists.
 - (h) Finally the level of intelligence of respondents may be a real barrier to communication. They cannot be relied upon to complete the questionnaires themselves or to return them even if they make the attempt.

The Jamaican Experience

6. Earlier reference was made to a survey of Distributive Trades which was carried out in 1964 and a survey of Industrial Activity in 1967 to 1968. Additionally surveys were carried out in 1954, 1958 and 1960. In all these surveys the experience gained has confirmed all the earlier comments set out above. They were expensive, protracted and time consuming yielding results that were wither not reliable enough to be published (in the case of the survey of Distributive Trades in 1964 and in the 1958 Survey of Business Establishments) or available too late to be of current value (in the case of the survey of Industry 1967-1968).

7. In none of these surveys was it possible to secure a great deal of assistance from administrative records (either private or government). Itinerant vendors do not register at any government agency and are not licenced unless they deal in wearing apparel and personal accessories. There is no organization which is responsible for the welfare of such traders.

The same is true of small producers. Those involved in the manufacture of curios and straw goods were however easier to investigate since a large part of their output went to supply tourist demand. They were thus listed or known to hoteliers and/or the National Tourist Board.

8. All the surveys referred to adopted a two stage sampling approach. For example in the 1960 and 1967-68 surveys the country was first stratified simply into Urban and Rural areas.

Lists of establishments classified by type of activity were then prepared by inspecting and enumerating in all premises in the largest towns. In remaining towns a number was selected at random. Approximately 5% of the rest of the Enumeration Districts comprising the "rural" areas of the country. (About 74% of the population live in rural areas).

To the lists (frame) thus derived varying sampling fractions were applied depending on the size of the industrial sub-sector and its importance in the production system.

9. In the 1967 survey small establishments were those employing less than an average of 10 persons regularly, while in Distributive Trades generally, small units were classified as those with an annual turnover of less than \$J10,000.

To the establishments thus selected, interviewers were sent to collect a wide range of information concerning:-

- (a) Management arrangements
- (b) Employment
- (c) Capital Structure and the sources of funds
- (d) Production and Sales by method of disposal
- (e) Operational Costs (in all available detail)
- (f) Inventories

The Approach for the Future

10. Although it is recognized that the scope and quality of statistical work is often determined by forces outside of the Statistical Agency, (for example requirements of the planning agencies, political pressures, satisfying the requests of international agencies) and are not always harmonized with the resources available, it is felt that a distinct effort must be made to prepare and put into effect realistic plans for collecting statistical data from small unorganized and unregistered units.

This is crucial for all developing countries, (and even more so for small ones) where despite the increasing application of modern technology to the productive process, and the introduction of more advanced entrepreneurial and marketing techniques appropriate to large scale production, small establishments and households still make as equally important contributions to the national product as does large scale production.

11. With the experience of the recent past freshly available, Jamaica is giving serious consideration to carrying out large scale surveys or censuses of industry and commerce only at 10 year intervals in years ending in "4" (Population and Agricultural Censuses will be carried out in years ending in "0" and "8" respectively).

The technique therefore will be to establish a permanent unit responsible for the rapid carrying out of smaller sample surveys based on frames derived from the censuses. Periodic field canvassing to record changes in the frame will have to be carried out on a systematic, rotational basis.

Extensive use will be made of records of registration in the National Insurance System, the registers of limited liability companies, lists of co-operatives, and of the internal revenue licensing system for petty traders, pedlars and the like. Small manufacturers and market vendors will be especially difficult to trace, which allied to their diversity of activity make the work all the more onerous.

12. Obviously the high mortality rate of small units will create particular problems for the effective maintenance of a sample. None-the-less the size of the country makes it possible with a properly distributed field team to keep track of most losses from the frame. Special techniques will have to be devised for identifying additions.

13. Nothing in what has been said is revolutionary. It could very well be that many commonwealth countries (particularly in India, and in the African nations) have already developed techniques to solve the problems that have been outlined.

Jamaica would be very happy and interested to learn from their experience.

The Collection of industrial and distribution
statistics, from small units and unorganised
or unregistered sectors

1. The collection of industrial and distribution statistics in Lesotho only began in 1965. Lack of suitable frames for industrialists and traders proved a serious handicap from the beginning and the Bureau of Statistics had to rely on very sketchy details culled from a variety of sources e.g. telephone directory, records of the chamber of commerce etc. A business directory published by the Department of Commerce and Industry in 1968 has proved to be a useful source document although the writers tended to concentrate more on the businesses in the main town of Maseru.
2. There are very few industrial units in Lesotho and the number is increasing steadily; there are no procedural differences in the collection of statistics from the reasonably big and small units (using criterion of number of persons employed). Annual mail questionnaires are sent to all known units and in cases where information cannot be supplied due to insufficient understanding of the questionnaire, officials of the Bureau go out to render whatever assistance they can using available records. Different questionnaires for Manufacturing and Building and Construction were used; the latter differs from the former to the extent that some modifications were made in the "operating account" section to cater for differences in the two sectors.

Specimens of the two questionnaires are attached.

3. There is a wide variety of distribution establishments depending on the type of licence issued. Up to March 1970, all major traders (those possessing general traders' licences) and a sample of the smaller traders were included in the quarterly mail trade inquiry. Unlike most countries, Lesotho does not collect trade figures at her borders as she is in a common customs area with South Africa, Botswana and Swaziland; all imports entering the area are recorded at the South Africa ports on behalf of all members of the union and for their own purposes the other three members have to employ round-about methods of collecting trade statistics (See paragraph 1 of agenda item 13). It is intended, however, to post officials of the Bureau of Statistics at the main points of entry into Lesotho with effect from April, 1970; these men will initially collect figures of imports brought in by migrant workers and day-to-day shoppers who cross into South Africa, they will also record specific types of imports and re-exports e.g. motor vehicles, furniture etc. which will provide checks against figures obtained from other sources. Eventually, it is hoped, the mail enquiry will be dropped and all import figures will be recorded at the points of entry. A specimen of the trade quarterly questionnaire is attached.

4. Inputs in industrial statistics are broadly classified as follows :
 - (a) electricity
 - (b) water
 - (c) fuel and
 - (d) materials

Changes in stocks and payments for services rendered by other firms are shown separately. Output is shown both gross and net (i.e. before

420

and after reduction of value of materials consumed). Only a three-year series of production statistics is available and no attempt has been made to construct production indices; a few more series will be required before these can be constructed and hence reliable indicators produced.

Please answer the following questions:-

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1. Name and address

(a) of the establishment

(i) Name.....

(ii) Street address.....

(iii) Box number (if applicable).....

(iv) Telephone number.....

(b) of the head office in Lesotho (if applicable)

(i) Name.....

(ii) Address.....

(iii) Telephone number.....

(c) Of the firm's accountant/book-keeper to whom queries may be addressed if he is not a member of the firm's own staff:

(i) Name.....

(ii) Address.....

(iii) Telephone number.....

2. Kind of Activity

(a) Give the normal description of your business e.g. joinery, printing, bakery.....

(b) Are you engaged in reselling goods on which no processing has been carried out by you? State Yes or No.....

3. (a) What is the legal form of your business (e.g. Private limited liability company, Co-operative, individual ownership etc.)

.....

(b) Is your firm a branch of a company registered externally or subject to control (i.e. having more than 50 per cent interest) by persons registered outside Lesotho? State Yes or No.....

If yes state country of external control

.....

4. Period to be covered by the form should be for financial year ended year ended during 1968. Twelve months ended

.....

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5. In what year did you start production.....

6. REMARKS:

Please write here any explanation or comments you wish to make on any of the figures you have supplied.

PLEASE READ INSTRUCTIONS CAREFULLY BEFORE 423
ANSWERING

SECTION 1 OPERATING ACCOUNT

ITEM		For Official Use
1. Total turnover (Sum of items(a) (b) (c) and (d) below of which (if necessary estimated)	R.....	.....
(a) Sales of goods not produced by this establishment	R.....	.....
(b) Sales from own production(list main products i to iv)		
(i)	R.....	.....
(ii)	R.....	.....
(iii)	R.....	.....
(iv)	R.....	.....
(v) Other own products Not specified	R.....	.....
Total sales from own production (i - v)	R.....	.....
(c) Charges made by you for repairs and servicing	R.....	.....
(d) Charges made by you for hiring out vehicles, plant, machinery and equipment	R.....	.....
2. <u>VALUE OF STOCK</u> of own produce goods on hand (including work in progress)		
(a) At the beginning of the year	R.....	.....
(b) At the end of the year	R.....	.....
3. <u>GROSS OUTPUT</u> (Sum of items 1, 2(b) minus item 2(a))	R.....	.....

ITEM		For Official Use
4.	Cost of electricity purchased R.....	.....
5.	Cost of water purchased R.....	.....
6.	Cost of all fuels (including fuel for vehicles) R.....	.....
7.	Cost of materials purchased for production R.....	.....
8.	Cost of goods purchased for resale without further processing R.....	.....
9.	Payments made or due for work given out (other than repairs items 15 and 16) R.....	.....
10.	Value of stocks of materials & fuel and of stock of goods purchased for resale	
	(a) At the beginning of the year R.....	.....
	(b) At the end of the year R.....	.....
11.	Total of purchases & changes in stocks (Sum of items 4 to 9 plus item 10(a) minus item 10(b)) R.....	.....
<u>PAYMENTS MADE OR DUE FOR RENT RATE & HIRE CHARGES:</u>		
12.	Annual rent of premises R.....	.....
13.	Hire of plant, machinery & vehicles R.....	.....
14.	Total rent rates & hire charges (Sum items 12 - 13) R.....	.....
<u>PAYMENTS MADE OR DUE TO OTHER FIRMS FOR SERVICES RENDERED :</u>		
15.	Repair and maintenance of building R.....	.....
16.	Repair and maintenance of plant, machinery and vehicles R.....	.....
17.	Advertising R.....	.....
18.	Insurance premiums R.....	.....
19.	Payments for other services (excluding bank charges & interests)+ R.....	.....
20.	Charges raised against you by your Head Office if your Head Office is Outside Lesotho R.....	.....
21.	Total of items 15 - 20 R.....
22.	Item 3 minus item 11, 14 and 21 R.....

SECTION II CAPITAL ACCOUNT

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	New Expendi- ture during the year	Proceeds of Sales during the year	Depreciation	Total Book Value at the end of the year
1. Land Improvement and Civil Engineering Work.				
2. Workshop Office & Storage Buildings				
3. Staff Dwelling Houses and Other Buildings				
4. Machinery & Equipment (incl. Fix- tures and furniture)				
5. Vehicles				
6. Total				

SECTION III

NUMBERS EMPLOYED & SALARIES & WAGES PAID

1. Average Number Employed during the year
 Males.....Females.....Total.....
2. Earnings during the Year
 Cash Wages & Income in
 Salaries... .. Kind..... Total.....
3. Owners & Members of owner's family not Receiving Wages
 No. working part time.....No. working full time.....

DECLARATION

I, the undersigned, certify that the information contained in this report is substantially correct and complete to the best of my knowledge and belief.

Date.....Signature.....

Title.....
(Managing Director, Secretary)

Please answer the following questions :-

1. Name and address

(a) of the establishment

- (i) Name
- (ii) Street address
- (iii) Box number (if applicable)
- (iv) Telephone number

(b) of the head office in lesotho (if applicable)

- (i) Name
- (ii) Address
- (iii) Telephone number

(c) Of the firm's accountant/book-keeper to whom queries may be addressed if he is not a member of the firm's own staff :

- (i) Name
- (ii) Address
- (iii) Telephone number

2. Kind of Activity

(a) Give the normal description of your business e.g. joinery, printing, bakery

(b) Are you engaged in reselling goods on which no processing has been carried out by you ? State Yes or No.

3. (a) What is the legal form of your business (e.g. Private limited liability company, Co-operative, individual ownership etc.)

.....
.....

(b) Is your firm a branch of a company registered externally or subject to control (i.e. having more than 50 per cent interest) by persons registered outside Lesotho ? State Yes or No.

If yes state country of external control

.....

4. Period to be covered by the form should be for financial year ended during 1968. Twelve months ended

.....

5. In what year did you start production

6. REMARKS :

Please write here any explanation or comments you wish to make on any of the figures you have supplied.

PLEASE READ INSTRUCTIONS CAREFULLY BEFORE ANSWERING

SECTION 1 OPERATING ACCOUNT

Item	For Official Use
1. Total turnover (Sum of items A and B below) R
A. Sales of goods not made by business R
B. Total value of work and sales from own production. Specify (if necessary estimate) main type of production or separately :	
(a) Work done for owners including work in progress	
(i) New buildings R.....
(ii) Repair and maintenance of buildings : R
(iii) New civil engineering works R
(iv) Repairs and maintenance of works R
(b) Work done for other contractors, including work in progress	
(i) New work R
(ii) Repairs and maintenance R
Total value of work done. Sum of items (a) (i) to (iv) and (b) (i) and (ii) above R
(c) Sales of other own products (including waste products) R
(d) Charges made by you for hiring out vehicles, plant, machinery and equipment R
2. Value of stocks of own products on hand :	
(a) At the beginning of the year R
(b) At the end of the year R
3. Gross output (Sum of items 1 and 2 (b) minus 2(a) R

PURCHASES

Item	For Official Use
4. Cost of electricity purchased	R
5. Cost of water purchased	R
6. Cost of all fuels (including fuel for vehicles)	R
7. Cost of materials purchased for production	R
8. Cost of goods purchased for resale without further processing	R
9. Payments made or due for work given out (Other than repairs items 15 and 16)	R
10. Value of stocks of materials and fuels and of stock of goods purchased for resale	
(a) At the beginning of the year	R
(b) At the end of the year	R
11. Total of purchases and changes in stocks (Sum of items 4 to 9 plus items 10(a) minus item 10(b))	R
<u>PAYMENTS MADE OR DUE FOR RENT RATE AND HIRE CHARGES</u>	
12. Annual rent of premises	R
13. Hire of plant, machinery and vehicles	R
14. Total rent and hire charges (Sum items 12 - 13)	R
<u>PAYMENTS MADE OR DUE TO OTHER FIRMS FOR SERVICES RENDERED</u>	
15. Repair and maintenance of building	R
16. Repair and maintenance of plant, machinery and vehicles	R
17. Advertising	R
18. Insurance premiums	R
19. Payments for other services (excluding bank charges and interest)	R
20. Charges raised against you by your Head Office if your Head Office is outside Lesotho	R
21. Total of items 15 - 20	R
22. Item 3 minus item 11, 14 and 21	R

SECTION II CAPITAL ACCOUNT

	New Expendi- ture during the year	Proceeds of Sales during the year	Depreciation	Total Book Value at the end of the year
1. Land Improvement and Civil Engineering Work.				
2. Workshop Office & Storage Buildings				
3. Staff Dwelling Houses and Other Buildings				
4. Machinery & Equipment (incl. Fix- tures and furniture)				
5. Vehicles				
6. Total				

SECTION III
NUMBERS EMPLOYED & SALARIES & WAGES PAID

1. Average Number Employed during the year
MalesFemalesTotal
2. Earnings during the Year
Cash Wages & Income in
Salaries KindTotal
3. Owners & Members of owner's family not Receiving Wages
No. working part timeNo. working full time

DECLARATION

I, the undersigned, certify that the information contained in this report is substantially correct and complete to the best of my knowledge and belief.

Date Signature

Title
(Managing Director, Secretary)

STAT/TRD/10
MM/BVT

Bureau of Statistics,
P.O. Box 455,
Maseru, Lesotho.

.....

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.....

.....

.....

Dear Sir/Madam,

Trade Census Quarterly

I enclose a trade questionnaire for the period,
19... to, 19... which should be returned to this office
within 45 days of receipt.

As was pointed out in the letters accompanying the return for the
previous quarters, figures should be broken down into the categories shown
on the return. In a few cases this is still not done. Questionnaires which
do not comply with this breakdown will not be accepted as satisfactory at
this office.

It was also requested that more effort be made concerning the
figures for quantities of imports and exports.

It is felt that quantity figures should be readily available for the
following categories:-

- | | |
|----------------|-----------------------|
| Livestock | Dairy Products |
| Grain | Sugar |
| Coffee and Tea | Beverages and Tobacco |
| Mineral Fuels | Blankets |
| Tractors | Refrigerators |
| Radios | Vehicles |
| Footwear | Wool and Mohair |

I would request that special attention be given to these particular
items.

I would be grateful for your co-operation in this matter.

Yours faithfully,

Makae Moleetsi

for Director of Statistics

STAT/TRD/10
MM/BVT

Bureau of Statistics,
P.O. Box 455,
Maseru, Lesotho.

.....
.....
.....
.....

Monghali/Mofumahali,

Lipalo tsa Khoebo tsa Kotara

Ke hokela fomo ea khoebo ea, 19..... ho isa, 19..... e lokelang ho khutlisetsoa ofising ena nakong ea matsatsi a 45.

Joaleka ha ho boletsoe mangolong a neng a hokeletsoe lifomong tsa khoebo tsa likotara tse fetileng lipalo li hlophisoe ka manane a bontsitsoeng fomong. Batho ba seng bakae ba ntse ba sa phethahatse se batloang. Lifomo tse sa tlatsoang ho latela manane ana ha li na ho amoheleha ofising ena.

Kopo ke hore ho lekoe ka matla hore lipalo tsa bongata ba thepa e kenang ka har'a naha le e tsoang li kene fomong.

Lipalo tsa bongata li lokela ho fumaneha ha bonolo bakeng sa lintho tse latelang:-

Liphoofolo	Literekere
Koro, poone le mabele	Liradio
Kofi le tee	Lieta
Petrol, Mashala le Liparafini	Lebese le tse tsoaloang ke lebese
Tsoekere	Mechini e pholisang li jo
Lino le koae	Makoloi
Likobo	Boea ba linku le ba lipoli

Ke kopa hore lintho tsena li eloe hloko.

Ke tla leboha thuso ea hau tabeng ena.

Oa hau,

Makoa Moletsisi.

for Mookameli, Lekala la Lipalo

TRADE QUESTIONNAIRE

NAME OF BUSINESS Name of Person Completing the form:
 ADDRESS OF BUSINESS Owner/Manager/Employee/Agent.
 Delete whichever is inapplicable.
 ADDRESS (If different from address of business).

Please state below the quantity and the value of the produce imported by you during the period19... to19.....

S.I.T.C. DIVISION	UNIT	QUANTITY	VALUE
<u>FOOD AND LIVE ANIMALS</u>			
00 Cattle	No.....	.....	.....
Sheep and Lambs	No.....	.....	.....
Goats	No.....	.....	.....
Horses	No.....	.....	.....
Mules and Donkeys	No.....	.....	.....
Pigs	No.....	.....	.....
Other Live Animals	No.....	.....	.....
01 Meat and Meat Products(fresh, frozen and tinned)	No.....	.....	.....
02 Milk and Cream(incl. tinned & dried). Butter	gls..... lb.....	..... .....	..... .....
Cheese	lb.....	.....	.....
Eggs	doz.....	.....	.....
03 Fish and Fish Products(fresh, frozen and tinned).....	lb.....	.....	.....
04 Wheat and Wheat Flour	lb.....	.....	.....
Maize and Maize Products.....	lb.....	.....	.....
Sorghum and Sorghum Products.....	lb.....	.....	.....
Rice	lb.....	.....	.....
Beans	lb.....	.....	.....
Peas	lb.....	.....	.....
Other Cereals and Products.....	lb.....	.....	.....
Bakery Products e.g. bread, cakes etc.	lb.....	.....	.....
05 Fruit(fresh, dried and tinned).....	lb.....	.....	.....
Vegetables(fresh, frozen, dried and tinned).....	lb.....	.....	.....
Hops	lb.....	.....	.....
06 Sugar	lb.....	.....	.....
Sugar Confectionery, other sugar products and honey	lb.....	.....	.....

S.I.T.C. DIVISION	UNIT	QUANTITY	VALUE
07 Coffee	lb.....	.....	.....
Tea	lb.....	.....	.....
Cocoa	lb.....	.....	.....
Milo	lb.....	.....	.....
Spices	lb.....	.....	.....
08 Animal Feeding Stuff(excl. unmilled cereals)	lb.....	.....	.....
09 Other Foodstuffs	lb.....	.....	.....
<u>BEVERAGES AND TOBACCO</u>			
11 Non-Alcoholic Beverages	gls.....	.....	.....
Ale, Beer and Stout	gls.....	.....	.....
Wine	bttls....	.....	.....
Spirits	bttls....	.....	.....
12 Cigarettes	thous....	.....	.....
Other Tobacco	lb.....	.....	.....
<u>CRUDE MATERIALS</u>			
21 Hides and Skins	tons.....	.....	.....
24 Wood, Lumber & Cork	tons.....	.....	.....
Firewood	tons.....	.....	.....
27 Other Crude Materials e.g. Salt... Chalk... Stone, Sand & Gravel	lb..... tons.....	..... ..... .....	..... ..... .....
29 Seed for Planting	lb.....	.....	.....
292.6 Live Plants(eg: Seedlings Produced in Agric.& Forestry).....	.....	.....	.....
<u>MINERAL FUELS & LUBRICANTS</u>			
32 Coal	tons.....	.....	.....
33 Petrol & Aviation Spirit	gls.....	.....	.....
Diesel Oil	gls.....	.....	.....
Paraffin	gls.....	.....	.....
Lubricating Oils & Grease	gls.....	.....	.....
Petroleum Jelly e.g. Vaseline.....	gls.....	.....	.....
34 Domestic Gas	Cu.ft....	.....	.....
Other .....	.....	.....	.....
<u>ANIMAL & VEGETABLE OIL</u>			
41 Animal Oil & Fat	gls.....	.....	.....
42 Vegetable Oil and Fat	gls.....	.....	.....

S.I.T.C. DIVISION	UNIT	QUANTITY	VALUE
CHEMICALS			
Methylated Spirits	bttls.....	.....	.....
51 Chemical Elements & Compounds.....	lb.....	.....	.....
52 Tar	lb.....	.....	.....
53 Paints, Dyes, etc.....	gls.....	.....	.....
54 Medicinal & Pharmaceutical Products	items....	.....	.....
55 Perfumes, Cosmetics, Dentifrices & Toilet Preparations.....	items....	.....	.....
Soap, Detergents & Polishes etc....	lb.....	.....	.....
56 Fertilizers (Manufactured).....	tons.....	.....	.....
57 Explosives & Pyrotechnic products..	.....	.....	.....
58 Plastic Materials .....	.....	.....	.....
59 Insecticides, Disinfectants, etc.....	tons.....	.....	.....
Other Chemical Products	tons.....	.....	.....
MANUFACTURES CLASSIFIED BY MATERIAL			
61 Leather & Leather goods (excl. clothing & Footwear) .....	.....	.....	.....
62 Rubber Products(incl. tyres & tubes)	.....	.....	.....
63 Wood Products(excl. furniture).....	tons.....	.....	.....
64 Paper, Paper board(excl. printed matter)	Cwt.....	.....	.....
65 Blankets	No.....	.....	.....
*Other Cotton Fabrics	yds.....	.....	.....
*Other Woollen & Worsted Fabrics...	yds.....	.....	.....
*Other Fabrics	yds.....	.....	.....
66 Lime, Cement & Building Stone	tons....	.....	.....
Bricks	No.....	.....	.....
Glass and Glassware .....	.....	.....	.....
Pottery .....	.....	.....	.....
67 Iron & Steel Products(excl. Pipe)...	tons....	.....	.....
Other Metal Products(excl. Pipe)...	tons....	.....	.....
Pipe and Tube	tons....	.....	.....

* N.B. Including ribbons, sheets, towels, curtains, carpets and rugs, but excluding clothing and blankets.

S.I.T.C.	DIVISION	UNIT	QUANTITY	VALUE
68	Copper wire .....	.....	.....	.....
	Other Metals .....	.....	.....	.....
69	Nails, Screws, Nuts, Bolts, Rivets etc.	.....	.....	.....
	Hand & Machine tools .....	.....	.....	.....
	Domestic stoves, boilers, cookers, heaters etc.	No.....	.....	.....
71	Agricultural Machinery & implements	.....	.....	.....
	Office machines(calculators, typewriters etc.) .....	.....	.....	.....
	Other machinery & equipment .....	.....	.....	.....
72	Refrigerators	No.....	.....	.....
	Radios	No.....	.....	.....
	Telephone & Telegraph Equipment...	.....	.....	.....
	Loud Speaker & Amplifiers.....	No.....	.....	.....
	Other telecommunications equipment.	.....	.....	.....
	Medical & Radiological equipment...	.....	.....	.....
	Electrical lighting & signalling equipment for vehicles .....	.....	.....	.....
	Electrical machinery instruments & apparatus .....	.....	.....	.....
73	Motor Cars	No.....	.....	.....
	Motor Cycles	No.....	.....	.....
	Buses, Trucks & Lorries	No.....	.....	.....
	Motor Vehicles Parts (excl. electrical equipment & tyres).....	items.....	.....	.....
	Bicycles & Parts	No.....	.....	.....
	Other Vehicles	No.....	.....	.....
<u>OTHER MANUFACTURED GOODS</u>				
81	Plumbing & Sanitary Fittings, Baths Sinks, Basins & Cisterns	No.....	.....	.....
	Lighting Fixtures & Fittings	items.....	.....	.....
82	Furniture & Fixtures (incl. mattresses)	items.....	.....	.....
83	Trunks, Suitcases, Handbags. etc..	No.....	.....	.....
84	Clothing .....	.....	.....	.....
85	Footwear	pair.....	.....	.....

S.I.T.C.	DIVISION	UNIT	QUANTITY	VALUE
86	Scientific Instruments .....	.....	.....	.....
	Photographic & Cinematographic supplies .....	.....	.....	.....
89	Musical Instruments	No.....	.....	.....
	Sound recorders & producers	No.....	.....	.....
	Books, Newspapers & periodicals...	.....	.....	.....
	Filing Cabinets, Racks. etc.....	.....	.....	.....
	Office Supplies(e.g. pens, pencils, rubbers etc.) .....	.....	.....	.....
	Candles	pkts....	.....	.....
	Matches	pkts....	.....	.....
	Jewellery	items...	.....	.....
	Other Manufactured Articles .....	.....	.....	.....

EXPORTS

Please state below the quantity and value of
goods exported by you during the period:-

.....19... to19...

S.I.T.C.	DIVISION	UNIT	QUANTITY	VALUE
<u>FOOD & LIVE ANIMALS</u>				
00	Cattle	No.....	.....	.....
	Sheep & Lambs	No.....	.....	.....
	Goats	No.....	.....	.....
	Pigs	No.....	.....	.....
	Horses	No.....	.....	.....
	Mules and Donkeys	No.....	.....	.....
	Other Live Animals	No.....	.....	.....
04	Maize	lb.....	.....	.....
	Maize Meal	lb.....	.....	.....
	Wheat Meal	lb.....	.....	.....
	Sorghum	lb.....	.....	.....
	Other Grains (specify)	lb.....	.....	.....
	Sorghum Meal	lb.....	.....	.....
	Wheat	lb.....	.....	.....
05	Beans	lb.....	.....	.....
	Peas	lb.....	.....	.....
	Other Vegetables(specify)	lb.....	.....	.....
<u>CRUDE MATERIALS</u>				
21	Hides	lb.....	.....	.....
	Skins	lb.....	.....	.....
26	Wool	lb.....	.....	.....
	Mohair	lb.....	.....	.....
29	Bones, Horns and Teeth	lb.....	.....	.....
<u>OTHER EXPORTS</u>				
	Specify			

"Collection of Statistics for the Distribution Sector" -
Malaysia's experience

A Census/Survey of Distributive Trades constitutes a significant statistical undertaking when it is realised that distribution of goods and services represents an essential element in the economic system. This is because the accurate estimation of national accounts, construction of prices indices, estimation of consumer expenditure and input/output studies, are irrevocably wedded to distribution statistics. Facts about the structure and working of the business system are essential for efficient Government planning and policy making and these cannot be ignored. Businessmen themselves will be benefitted in a variety of ways. For example, distribution statistics will help them to evaluate general economic changes, estimate trends and undertake studies for the location of favourable markets and on potential consumers, etc.

2. The 1966 Census of catering, retail and wholesale establishments represents the first attempt to collect distributive trades statistics in West Malaysia. The Census was conducted in two parts - a completely enumerated sector and a sampled sector. Six metropolitan towns and forty-one other towns with a population of 10,000 or more were completely enumerated. Urbo-rural areas (those with a smaller population but having urban characteristics) and rural areas were covered on an area sample basis i.e. certain localities were selected randomly and all businesses situated within the selected localities were listed and enumerated. From data for the selected localities, estimates were calculated for the urbo-rural and rural sector. Regional and national statistics are therefore made up of a completely enumerated element (towns with a population of 10,000 or more) and a sample element (urbo-rural and rural areas).

3. The sample of area units for the urbo-area and rural sectors was drawn from the Department's "National Household Survey Frame" in which the country is divided into small geographical units (of more or less equal size in terms of population) for sampling purposes. These units are referred to as primary sample units or P.S.U.'s. P.S.U.'s are grouped into five strata as under:

- (a) Metropolitan Town: A Metropolitan Town is defined as a Town having a population of more than 75,000 persons;
- (b) Census Town: A Census Town is defined as a Town having a population ranging from 10,000 to 75,000 persons during the 1957 Population Census;
- (c) Non-Census Town: A Non-Census Town is defined as a Town having a population between 7,670 and under 10,000 persons during the 1957 Population Census. These figures were projected to 1966 at 3% compound rate of increase.

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- (d) Urbo-Rural Area: An Urbo-rural Area is one which does not fall into anyone of the above three categories and have urban characteristics, where the population dependence on non-agricultural occupation is likely to be more than 60%; and
- (e) Rural Area: The remaining are all treated as rural areas.

The first three strata cover town areas, which were completely enumerated in this Census and the other two strata relate to urbo-rural and rural areas which were sampled. Altogether, 69 P.S.U.'s were selected in urbo-rural areas out of a total of 223, and 240 P.S.U.'s were selected in rural areas out of a total of 3,828. The sample fraction varied from region to region.

4. The vast number of businesses engaged in the distributive trades, the absence of reliable and manageable lists of such businesses and the fact that so many of them are relatively small family concerns with little inclination to respond quickly or accurately to statistical enquiries are all factors which make the collection of statistics in this field an arduous task.

5. It was found necessary to conduct a special field listing of business establishments for the purpose of the Census even though lists are available from other sources (including registration under various ordinances and certain "trade" lists). Field tests revealed problems which made it impracticable to use such lists as the primary basis of coverage on this occasion. These difficulties included the following:-

- (i) No one list was found to provide complete coverage, particularly of smaller businesses. At the same time there were serious practical difficulties in the way of matching lists because of the very large numbers involved;
- (ii) The particular lists which were accessible to the Department included a large proportion of inactive businesses and significant errors in name and addresses;
- (iii) It was difficult to determine which businesses actually came within the scope of enquiry because the description of activities was not sufficiently precise; and
- (iv) The lists were not suitable for sampling. There was no indication of size, so it was difficult to determine the degree of coverage of even large size businesses. From an area sampling point of view, addresses tended to be imprecise and not readily located. Furthermore,

there were difficulties in restructuring such lists in a form in which they could be used in the field. It was finally decided to combine field listing of trading establishments and collection of the required statistics in one operation and so overcome many of the listing response and reporting problems.

6. The Census relates to businesses which operate from fixed premises, including fixed stalls, shops and sale offices. Collapsible stalls, businesses which are mobile (barrow, vans) and traders who display their goods on the pavement were excluded. Businesses engaged in service trades, e.g. hairdressers, residential hotels, tailors and dressmakers, repairers, did not come within the scope of the Census, unless they also engaged in the resale of goods in significant quantities. Examples of other types of businesses specifically excluded from the Census are the following:-

- Construction and wiring contractors;
- Real estate agents;
- Private clubs;
- Finance businesses;
- Pawnshops;
- Opticians selling spectacles on prescriptions; and
- Clinics and dispensaries run by doctors.

7. Certain industries which might normally have been expected to come within the scope of our Census of Retail and Wholesale Trades had been left out on this occasion. These are discussed below:-

- (i) Motor Vehicle Trade: Quite a number of problems arise in relation to the reporting of sales and stocks of new motor vehicles. There are a number of different stages of distribution, involving major distributors, local dealers, commission agents and sub-agents, and finance companies. There is a corresponding variety in the method of financing vehicle stocks and accounting for sales. In consequence, it is difficult to ensure complete coverage of transactions without duplication in reporting, and it is also difficult to present a realistic picture of the trade in terms of geographical distribution of sales. Unfortunately, it was not possible to sort out these problems prior to the Census and it was reluctantly decided to exclude the industry on this occasion. The sale of used vehicle is allied to the sale of new vehicles to a considerable extent and this aspect has also been omitted.

- (ii) Distribution of Petroleum Products: In this field also, it was not possible to resolve all the problems before the Census commenced. Only two oil companies at that time indicated that they would have no difficulty in supplying the Department with lists of retail and wholesale outlets and much of the statistical information that was required. Further, retail trade in petroleum products is mixed up with trading in spare parts and accessories and also with repairing and servicing of vehicles. Care was needed for the design of questionnaire to ensure that the procedure for reporting this aspect is clear. It was felt that the experience of the oil companies themselves in collecting information from their outlets should be taken into account.

8. Establishments covered in the Census were classified according to the following types of structures:-

Market Stalls (official): These are fixed permanent stalls inside covered market areas.

Fixed Open Stalls: These are substantial structures having a roof which is fixed to the ground or to an adjoining building.

Private Dwelling: These are trading establishments which are operated in private houses.

All Others: This covers all lock-up premises, including shops, shop-houses, lock-up stalls, sales offices, etc.

9. Difficulties were encountered in classifying the establishments according to the above categories and the statistics gathered in the Census therefore are at best broadly indicative rather than definite.

10. Broadly, the following items from distributive trades establishments were collected in the Census:-

- (i) Trading name and location
- (ii) Type of Ownership
- (iii) Nationality of Race of Owners
- (iv) Period of Operation (i.e. during the census year)
- (v) Type of Business
- (vi) Value of Sales and Other Receipts during 1966
- (vii) Purchase of Goods in 1966 for Business Purposes
- (viii) Value of Stocks for Business Purposes at beginning and end of 1966

- (ix) Type of Goods sold during 1966
- (x) Number of Persons working at or near December, 31st 1966
- (xi) Wages and Salaries paid during 1966
- (xii) Hire purchase and other instalment credit.
(Yes/No) explanatory question

However, preliminary investigation prior to the Census indicated that in cases where accounts were not kept it would be difficult to obtain acceptable data for purchases, stocks or wages and salaries. Consequently, these data were not gathered for establishments without accounts.

11. A Survey of Distributive Trades was not conducted for the reference year, 1967. However, the Department has conducted a sample survey for the reference year 1968. The data collected in 1969/70 have since been processed and a report has been issued recently.

12. The same design adopted for strata (ix) and (v), viz., urbo-rural areas and rural areas was the same as described for the 1966 Survey, the sampling fraction and sample size being exactly the same.

13. Sampling was introduced for the first time in strata (i) to (iii), viz., metropolitan towns, census towns and non-census towns. For this purpose, these towns were treated together as the urban sector. Establishments whose turnover in 1966 was \$50,000 or more in catering, \$100,000 or more in retail and \$1,000,000 or more in wholesale trades were completely enumerated. They numbered 4,512. These establishments accounted for 72% of the total turnover in the urban sector in the 1966 Census. In respect of the establishments below this size, a sample was selected. The size of the sample was fixed using the relationship between the sample size and employment in the urbo-rural and rural sector (strata (iv) and (v)). In other words, the proportion of sample size to employment in strata (iv) and (v) was applied to the employment in the urban sector below the cut-off size to obtain the size of sample to be taken from the sample surveys in the urban sector. This number was allocated to (i) metropolitan (110) and (ii) census and non-census towns grouped together (109) in the proportion of employment in the two areas. The 219 P.S.U.'s to be selected as sampling units were all single P.S.U.'s. In practice, however, there are several multiple P.S.U.'s in these two areas which have not been split on the ground. The number of such P.S.U.'s (Multiple and Single) was 537 in metropolitan and 395 in census and non-census towns. These were converted into single P.S.U.'s of 878 and 734, respectively, and the sample size allocated to each of the multiples in the proportion of their single converted units. The number of areas (Single and Multiple) to be enumerated were then arrived at. Because of the multiples involved the actual areas for enumeration came to be 67 and 58 respectively for metropolitan and census and non-census towns or 125 for both. The sample was selected on the basis of probability proportionate to size (establishment). Sampling was done with replacement. As a result, the actual number of P.S.U.'s (Single and Multiple) enumerated was less than 125, some being selected more than once.

14. It was felt that the sample selected may not adequately provide a reliable basis for estimating the figures in respect of business selling market produce, (i.e. butcher's meat, poultry, fish, fruits and vegetables). As a result, a complete listing of all market stalls selling market produce was done. It was found that there were 635 wholesale and 6,239 retail trade establishments selling market produce. However, a one in ten sample was selected from the list of retail stalls. Care was taken to ensure that there was no duplication or overlapping between these units and the sample units referred to earlier. This was done to improve the efficiency of the estimates.

15. Distribution is of course, a vast field and the statistical problems are considerable. The following are some of the directions in which distribution statistics are likely to be further developed in the future.

- (i) Collection of more information in respect of businesses without accounts which were unable to provide the full range of data in the 1966 Census and the 1968 survey, if warranted.
- (ii) Extension of range of items surveyed to include, for example, capital expenditure and full commodity dissection of sales and purchases.
- (iii) Development of a classification of wholesale businesses in terms of methods of operation (importer, exporter, manufacturer's sales branch, etc.)
- (iv) Extension of industrial coverage to include motor vehicle distribution, distribution of petroleum products and service industries (e.g. hairdressing, laundries, accommodation in hotels, etc.)
- (v) Paralled development of distribution statistics in East Malaysia in order to make available integrated statistics for Malaysia as a whole.
- (vi) Sample surveys should be conducted on a regular basis to provide a statistical series for aspects such as retail sales, stocks and employment. Surveys should be conducted initially on an annual basis but should be extended, for selected items, to a quarterly and/of monthly basis as soon as resources permit.

COLLECTION OF DATA FROM SMALL UNORGANISED UNITS

1. In New Zealand the two main recognised components of secondary industry, namely manufacturing and building and construction, present somewhat different propositions when any censuses of them are organised. It is true that in both cases the collection is carried out through the post, peg-board type schedules are used, and that the questions asked are very similar. However, as in most countries, the organisation of the two industries makes the phase of actual collection for each somewhat different. This is due to the fact that as compared with manufacturing the structure of building and construction is more transitory, a phenomenon not confined to New Zealand.
2. In New Zealand, every manufacturing unit must be registered under the Factories Act. Such registration provides a list of units to be surveyed in the annual manufacturing census. For some fifty years the annual statistical survey of manufacturing has covered all factories, where two or more persons are engaged full time, including working proprietors. One person establishments have never been surveyed but the Department of Statistics maintains an up to date index of these. Any increase in the size of their staff will, of course, warrant an annual questionnaire.
3. However, in 1963-64 and 1968-69 two censuses of the building and construction industries were undertaken by the department. The fact that these censuses were quinquennial meant that each time a new register of names and addresses had to be compiled. Thus one of the most trying aspects of a building and construction census was compounded. This experience emphasized the need for a permanent register of enterprises to cover all industrial enquiries, no matter how irregular. Such a register would be ancillary to all censuses of production, and for this reason only a fraction of its cost would be borne by a quinquennial Census of Building and Construction. At the same time the importance of the industry as a variable in the economy, means that policy makers will need more frequent statistical information from this quarter.
4. For such a permanent register of enterprises the two construction censuses of 1963-64 and 1968-69 provided a fore-taste of what was in store for those who would be responsible for this section of the register.
5. When compiling the register for these two enquiries it was accepted that no single source would provide all the information. In addition to the fact that there was no compulsory registration as in the case of factories, such things as telephone books and commercially compiled directories were even more inadequate than usual when seeking out the units which comprise the building and construction industries.

6. With both main building contractors and sub-contractors (painters, electricians, etc.) there is a continual inflow of new firms and a withdrawal of unsuccessful or retiring units. Many small contractors enter the field and withdraw after only a short period of operation. In fact many individual contractors and partnerships enter the field for only a specific undertaking. Another aspect of flexibility of the business unit is the frequent change by tradesmen from the status of self-employed persons to employees. This appears to be the case particularly among such types of tradesmen as carpenters, painters, bricklayers, etc. where, from time to time, persons engage in work as contractors, and subsequently become engaged as wage-earning employees of a larger business unit. Some employees even conducted business in the weekend. Many cases occur of men leaving employers to take on a short-term contract and later returning to employee status. Such movements did not cease as the register was being compiled or the census itself was in progress.

7. For the 1963-64 and 1968-69 censuses use was made of a run of existing addressograph plates used by the Department of Labour in its six-monthly employment survey. This run excluded one person businesses and it did not cover all building and allied contractors such as plumbers, painters, etc. In order to obtain a complete index of all units in this sector (including all one man businesses) copies of building permits received by the Government Statistician from local authorities were inspected and additional building contractors were located. The period over which this work was carried out preceded the census year (1 April to 31 March) by six months and was discontinued three months before the end of the census year.

8. To complete the index the "yellow pages" (N.Z. Post Office classified business telephone directory) for each district of New Zealand were closely inspected and names and addresses were taken from 42 of the included classifications ranging from acoustic materials to repiling specialists. Indeed this index emphasised the diversity of establishments that had to be approached in a building and construction census. The universal trend towards specialisation was evident here.

9. One advantage of a permanent register of enterprises, would be a specialist to decide the limits of each classified industry. Another drawback of instituting a fresh register for a single industrial census such as this, was that there could be no run-in period to eliminate duplication. Many small firms in this area are incorporated for reasons of legal convenience. This lead to J. Smith, Builder, receiving one schedule at his street address, and the Smith Construction Company, another through a post office box number, when in fact both were separate entities in the legal sense only. Only a permanent staff skilled at compiling such a register could hope to eliminate such duplication entirely. A register of enterprises is needed to unravel the complexities of a multi-establishment

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enterprise or enterprise group. The fact that a viable establishment can consist of one or even two men, whose only fixed property consisted of a van parked outside their dwelling at night, does raise its own problems of enumeration.

10. Such problems could be tackled by having a permanent register relating only to the industrial major division. However the two exercises by the department of compiling registers for this particular major group would suggest that greater benefits as regards economy and efficiency could be obtained from a universal register of enterprises. The proliferation of small units so characteristic of building and construction needs highly skilled officers. It could be that special field staff are needed to check on this particular field. The fact of the matter is that the transition between tradesman and contractor, employee and entrepreneur and vice versa is so fluid, that statistical definitions become anachronisms. To restate and enforce these definitions something more is required than a few instructions to basic clerical staff.

11. As an instance of this necessity for strict definition, there is the problem of distinguishing between main contractor and sub-contractor. No satisfactory solution to this has as yet been found. If the Census of Building and Construction is to provide material for national accounts and input-output studies, classification of these levels within the industry will have to be made and maintained. This is but one problem of sorting out the conglomeration which goes under the name of buildings and construction. It is no comfort to know that the authors of the International Standard Industrial Classification have not as yet penetrated into this problem area.

The Collection of Industrial and Distribution
Statistics from Small Units and Unorganised
or Unregistered Sectors

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1. Like many other developing countries in Africa, Tanzania is only beginning to develop its system of industrial statistics. Although in its earlier surveys of industrial production all establishments irrespective of size had been covered, later series of surveys (which started in 1965) have of necessity been restricted to units employing ten or more persons. Limitations in both personnel and financial resources have made the inclusion of the smaller units (those employing less than 10 persons) in the annual surveys impractical.
2. Very little data alone are presently available on the number, employment and production of such unregistered or unorganised manufacturing units. Although there are a large number of these smaller units in Tanzania it is considered that their overall contribution to the manufacturing activity is relatively small.
3. Two recent attempts to collect data on these small units are worth mentioning here. The nationwide household budget survey recently undertaken by the Bureau of Statistics sought information, inter alia, on household manufacturing activity and it is expected to provide data for the country as a whole on the employment, value of production and cost of production relating to the processing activity carried on by households. It is realised that only such periodic sample surveys will throw light on the unorganised and scattered sector of economic activity. A second such survey, confined to Dar es Salaam, was recently undertaken by the Bureau of Statistics in collaboration with the U.N./E.C.A. Statistical Training Centre at Dar es Salaam. This survey covered all the manufacturing or processing activity carried on in all the establishments employing ordinarily not more than five persons at a time. The results of this survey, though confined to Dar es Salaam would be very useful in assessing the value added or the contribution to GDP of such activity. The main difficulty experienced in organising this sample survey was the lack of a list of such establishments or in other words a population frame for drawing the sample as also to build population estimates. This difficulty was solved in the present case by prior listing of all such establishments along with data on the number of persons engaged in them.
4. When the data collected through the above two surveys became available it would go a long way in filling up, at least temporarily, one of the gaps in the available statistics of this country.
5. Statistics pertaining to distribution are at present almost non-existent, in Tanzania excepting the number of licence holders, categorised by type and regions, and also the quantities and prices of most of the cash crops. It is proposed to organise in future a Section on Distribution Statistics in the Bureau whose primary task will be to conduct periodic censuses and surveys of wholesale and retail trade in the country.
6. Since 1965 Tanzania has been compiling commodity statistics of main imports into and output of industries through its annual surveys of industrial production. From these surveys main materials consumed in selected ISIC (International Standard Industrial Classification) groups and

a selected list of main products manufactured (irrespective of the industry of origin) are published. These commodity statistics have been found to be very useful and of great demand by various consumers of industrial statistics data. However, attempts to extend these lists to cover more industry groups or products have been hampered by the confidentiality clause of Tanzania's Statistics Ordinance.

7. There has so far been no attempt to link the commodity lists compiled from the industrial surveys either with the classification used in the E.A. Trade Reports or the S.I.T.C.

THE COLLECTION OF INDUSTRIAL AND DISTRIBUTION
STATISTICS FROM SMALL UNITS AND UNORGANISED
AND UNREGISTERED SECTORS

This paper on the problems of collecting economic statistics from small firms in the industrial and distributive sectors, comments on the place and importance of the small firm in the various areas of the economy which are covered in Great Britain*. It discusses the ways in which the Business Statistics Office identifies them and some of the methods used to collect data. The need to balance requirements with the ability of firms to supply data is emphasized and the problems of obtaining co-operation and improving response are considered. The paper concludes with a brief summary of the proposal for a Central Register of Businesses.

Introduction

1. The problems which face small firms in Great Britain are currently the subject of an enquiry being carried out by a Committee appointed by the President of the Board of Trade. One of the topics raised is the burden which the collection of statistics, in addition to other government requirements, imposes on these businesses. In Great Britain industrial and distribution statistics are collected by means of a number of periodic inquiries differing in coverage, frequency, and level of detail sought. The most detailed and comprehensive inquiries are the censuses of production covering the manufacturing, mining and construction industries and the censuses of distribution covering the retail trades and some service trades closely related to retailing. These have been held at roughly five year intervals and provide detailed information on employment, turnover, commodity sales, purchases, stocks and capital expenditure. For most of the main distributive and service trades not covered by the censuses of distribution, primarily the catering, wholesale and motor trades, regular inquiries, known as base year inquiries, have been held at approximately five year intervals, but the information collected has not been so detailed as in the case of the censuses of production and distribution. Some of these inquiries have been full censuses in which all businesses coming within the scope of the inquiry have been sent questionnaires but others have been conducted on a sample basis in which the large units have usually been fully covered and the sample reserved for the smaller units.

2. The quinquennial censuses of retailing and related service trades and base year inquiries serve, inter alia, to provide benchmarks for a large number of annual, quarterly and monthly inquiries which are designed to

* In Northern Ireland, the Ministry of Commerce of the Northern Ireland Government is responsible for economic statistics, which are collected and published separately from those for Great Britain. In some cases it is possible to combine the results from the two sources to produce overall figures for the United Kingdom.

measure for specific industries and trades short term changes in such items as turnover, capital expenditure and stocks. Similarly, the censuses of production provide structural information about the industrial economy which, besides being needed for the input/output tables is required for weighting short term series such as the index of industrial production. These short term inquiries are often conducted on a sample basis. A new system of industrial statistics is replacing the quinquennial census of production and the various short term inquiries into production with an integrated system of quarterly industry-based inquiries into sales of commodities, coupled with an annual census of production. These will be supplemented by, on the one hand monthly summary inquiries and, on the other, inquiries perhaps at three yearly intervals into, for example, purchases of materials. In practical terms the collection of data from small businesses presents the greatest problems within the context of the base year inquiries and the censuses into the distributive trades.

3. It is not helpful to seek a unique definition for a small firm or unit. This fact emerges from the section of this paper dealing with the importance of small units in which attention is drawn to the way in which the Business Statistics Office adapts its definitions to deal with the varying requirements of each industry. It notes some aspects which influence the treatment given to small firms and distinguishes the ways in which, for example, statistical requirements for manufacturing industry differ from those of the distributive sector. The size thresholds selected to distinguish between small and other firms, particularly in manufacturing, are probably higher than would be appropriate in less highly developed economies, where small firms are likely to account for a higher proportion of total business.

The Importance of the Small Unit

4. The desirability of treating small firms or units differently from the remainder in collecting economic information has long been recognised. Hence it is necessary to adopt one or more measures of the size of firms. Number of persons employed, annual turnover, value of the assets employed, physical size of the premises, and value of stocks held can all be important indicators of size. In selecting a criterion of size for a particular enquiry and the boundary values to be adopted, account is taken of the objectives of the inquiry; the nature and structure of the industry or trade, the availability of resources for handling the data and the expected standard of response from the firms. For inquiries carried out by the Business Statistics Office in the industrial sector the number of persons employed is generally used to classify the size of establishments* and this information is included in the registers used for enquiries so that selection at appropriate employment levels can be made. Employment, however, is a criterion which cannot be used indiscriminately. With the growth of automation of production factories with a very large output may employ relatively few men. In the

*The establishment is defined in the Standard Industrial Classification 1968 as the smallest unit which can provide the information normally required for an economic census, for example, employment, expenses, turnover, capital formation. Typically it embraces all the activities carried on at a single address, although this is not always the case. The subject of statistical reporting units is complex and a detailed discussion of it is beyond the scope of this paper.

distributive sector turnover is mainly used as the measure of size for classification purposes in preference to employment size which is not such a reliable indicator. In enquiries into transport activities the number of vehicles is usually a more satisfactory indicator of size than is an employment criterion.

5. Table I illustrates the difference between the importance of small units in the mining, quarrying and construction group of industries and in manufacturing industry. For example, in 1963, establishments employing fewer than 25 people in manufacturing industry represented 55 per cent of the total number of establishments but were responsible for only 4 per cent of total net output. In the mining, quarrying and construction group, small units similarly defined accounted for 89 per cent of the number of establishments and 29 per cent of net output.

TABLE I MANUFACTURING AND NON-MANUFACTURING INDUSTRY-UNITED KINGDOM. PERCENTAGE SHARES ACCOUNTED FOR BY UNITS IN SELECTED SIZE BRACKETS

		Establishments employing fewer than 25 persons			Establishments employing fewer than 100 persons		
		No. of Establishments	Employment	Net Output	No. of Establishments	Employment	Net Output
		Percentage of Total					
Manufacturing Industry	1958	55	6	5	74	16	14
	1963	55	6	4	71	14	11
Mining, quarrying & construction (other than coal mining)	1958	92	33	27	98	53	47
	1963	89	31	29	97	52	49

6. In the quinquennial censuses of production with the exception of a few industries such as glove making where the production of small units is significant, establishments employing fewer than 25 persons have been exempted from completing a detailed census form. Instead, a simple questionnaire asking for information about the kind of business and the number of persons employed has been sent to establishments believed to be small in advance of the despatch of the main census forms. Non-respondents or firms who replied to the effect that they employed 25 or more persons were added to the register of firms to receive the main census form. For the few industries where the output of small establishments was significant, simplified census questionnaires were sent. For 1968, for example, no detailed particulars of purchases were required. In the new system of industrial statistics, which is replacing the quinquennial census of production and the related short term enquiries, exemption will generally be given to those firms with fewer than 25 persons employed (reduced to those employing fewer than 11 persons in a few industries where small firms are important) and these will be allowed for according to the information available from a continuously up-dated register. This will provide a reasonable base from which estimates for other data not collected can be made.

7. Table 2 illustrates in terms of turnover size the importance of small traders in the retail trade. The number of units covered in this sector is very much greater than in any other inquiry - over 500,000 shops* are involved. The table shows that in 1966 the turnover size band of less than £5,000 per annum accounted for 22 per cent of the total number of shops, 7 per cent of the total persons engaged but only 3 per cent of the total turnover. In 1966 shops with a turnover of less than £50,000 accounted for 93 per cent of the total number of shops, 65 per cent of the total persons engaged and 57 per cent of total turnover.

TABLE 2. RETAIL TRADES - GREAT BRITAIN. PERCENTAGE SHARES ACCOUNTED FOR BY UNITS IN SELECTED BRACKETS

	Shops with turnover less than £5,000 per annum			Shops with turnover less than £20,000 per annum			Shops with turnover less than £50,000 per annum		
	No. of Shops	Emp-loy-ment	Turn-over	No. of Shops	Emp-loy-ment	Turn-over	No. of Shops	Emp-loy-ment	Turn-over
	Percentage of total								
1961	28	10	4	81	46	37	95	66	61
1966	22	7	3	73	39	29	94	65	57

*Throughout the paper the term shop is used to denote a separate place of retail business covering not only retail shops but also other methods of trading such as market stalls, kiosks in cinemas, mobile shops and depots from which roundsmen work.

8. In the last full census of retail trade taken for 1961 a three-tier structure was used in the questionnaires to firms. In broad terms, trading organisations with a turnover of less than £5,000 were exempted from giving the full range of information required and were asked for total turnover, persons engaged, kind of business and types of commodity sold. Large traders employing 25 or more people were required to supply full census information including an analysis of turnover by commodity groups, details of purchases, employment, capital expenditure, stocks, wages and salaries, book debts and sales on instalment credit terms. A sample of organisations with turnover of £5,000 or more but with less than 25 persons was asked to provide full returns but the remainder in this field were asked the same questions as the traders with a turnover of less than £5,000 per annum. A somewhat similar approach was adopted in the 1966 sample census of distribution although turnover instead of employment was used as the criterion to distinguish large traders. In the next census of distribution to be taken for 1971, which like that for 1961 will be a full census, it is planned to introduce two tiers only with the threshold for small traders raised from £5,000 to £10,000. Traders with a turnover of below £10,000 in 1971 will be asked to supply data only on total persons engaged, total turnover, total purchases, kind of business and types of commodity sold, but all other traders will be asked to supply the full range of census information.

9. There is a requirement in the case of multiple traders to provide certain information in respect of each of their shops. One of the most valuable kinds of data which the census supplies is about shopping area, town or other geographical area. This requires information to be obtained from individual shops, whether single shop businesses or parts of multiple organisations. Because of the burden which this places on multiple traders, who can have as many as 1,300 branches, the information sought for individual shops of multiple groups is restricted to persons engaged, total turnover, kind of business, types of commodity sold and an indication of some methods of trading (e.g. self-service, mobile shop).

10. These examples from the industrial and distributive sectors demonstrate that the small firm cannot be usefully defined without paying regard to the nature of the statistical inquiry and the structure of the industry or trade from which data are sought. In practice the criteria used for drawing any distinction between large firms and small ones depend on the levels below which partial or limited information can be accepted and on the range of information the firm can reasonably be expected to provide. These levels will differ from one inquiry to another and should be reviewed constantly.

The Identification of Small Units

11. There is at present no comprehensive system of registration of businesses in the manufacturing, distributive or service industries in Great Britain. Registers to conduct inquiries have been built up in a number of different ways according to the information which is available, and the requirements of the inquiry. The oldest established register and the one which has, generally speaking, been continuously updated is that for the census of production and except for cottage industries this register is a comprehensive record of all establishments which are mainly engaged on productive activities. Information contained on the register data record enables selection at any employment size level to be made. It is therefore

a relatively simple matter to provide, for different industries, varying levels at which exemption from completing a full return can be granted.

12. For retail trade, because of the large number of reporting units in the sector coupled with high rates of birth and death the situation is different and raises more problems. There is no permanent register of retailers at present, and each time a full census of distribution has been carried out, a full-scale field enumeration of all shop premises in Great Britain has been made. This is an extremely costly operation and for this reason, a full census of distribution is timed to coincide with the census of population in order that the recording of shop premises can be done by census of population enumerators. There are, however, some forms of retailing such as mail order, credit trading, mobile shop, street and market trading which cannot be satisfactorily covered by these means and a variety of sources of information have to be consulted. These include trade directories, lists of members of trade associations, newspaper and magazine advertisements, market superintendents' lists of stall and pitch holders, and records of hawkers' licence holders kept by the police. The majority of traders in most of these categories are, naturally, small firms and account must be taken of the cost of obtaining information in these ways compared with the value of the contribution which the data makes to the total results of the census. Market traders, in particular, are difficult to list because of the itinerant nature of their business. These are recorded on many market superintendents' lists but the amount of work which has to be undertaken to eliminate surplus registrations when compiling the register and examining returns can be high in relation to the significance of the data collected. The census of distribution for 1961 covered them, but they were omitted in the sample census of 1966. Even in the highly organised retail economy of a country like Great Britain, the activities of street and market traders, particularly in certain kinds of business such as green-grocery, are sufficiently important to need measuring at intervals, and it is probable that they will again be covered, in part at any rate, in the forthcoming 1971 census of distribution.

13. For the other sectors of the distributive and service trades, such as the wholesale, catering and motor trades covered at intervals by large scale inquiries, registers have been compiled from trade directories and association membership lists, records of incorporated companies, local authority health inspector records of catering businesses and by the voluntary co-operation of large multiple traders. Permanent registers are not maintained but registers are created as required for each inquiry. The extent by which the registers compiled in these ways are likely to be deficient is usually measured by field enumeration in sample areas. The data collected is then grossed up to provide total estimates. Traders discovered in these sample enumeration checks are almost entirely in the lowsize brackets.

14. For some kinds of business, such as wholesaling, visual enumeration is an unsatisfactory method, particularly for the small dealer or broker who operates from an office or even from his own home. It is hoped that the proposals for a Central Register which are referred to later in this paper will help to solve the problems of register construction in this sector.

Statistical Records Kept by Small Businesses

15. For incorporated companies, the requirements on companies to prepare accounts makes it reasonable to require them in statistical inquiries

to provide information about total turnover, capital expenditure and stocks which can be either obtained or estimated without much difficulty from their accounts. Information about employment and wages and salaries is also sought. Experience shows that in the annual sample inquiries which limit questions to some or all of these items, response is both good and prompt and it is generally possible to produce results from these inquiries by the late autumn of the year in which they are held.

16. Unincorporated businesses, which are almost entirely small units, find greater difficulty in answering any statistical questions and it is becoming increasingly common for questionnaires to be referred to the trader's accountant for completion. Many small firms, because of the complexities of present-day taxation requirements, arrange with accountants to handle the completion of all Government forms and the census questionnaire, however simple, falls into this category. There is a relationship between this practice and response which is discussed later in this paper.

17. Experience suggests that questions which require the analysis of invoices, such as detailed commodity purchases, should be avoided as far as possible as should questions which can only be answered if at least a year's notice is given to the firm concerned that the information is to be supplied. In a major inquiry, notice is given to large firms but it is rarely possible, because of the time taken to construct registers, to give the same service to small firms.

18. In deciding the nature and scope of industrial inquiries the need has always been recognised to keep the information required as simple as possible. Representation by bodies such as market research organisations, universities and by Government Departments to include questions in a census have to be considered very carefully to avoid undue enlargement of the questionnaire. This is particularly important in dealing with small firms who do not, in general, keep detailed records for which they do not recognise a need in running their businesses, and for whom the extraction of information can place considerable burdens on the managers or their accountants. Nor are they always able to judge how far acceptable estimates can be made. Some of the more conscientious go to an unnecessary expenditure of time and effort to ensure 100 per cent accuracy in the answers; others go to the other extreme and provide guesses which cannot stand up to a critical examination. Some guidance is therefore desirable in the explanatory notes sent with the questionnaires on the way in which reasonable estimates can be made.

Co-operation from Small Businesses

19. Large firms, more particularly those with statistical or research departments, generally recognise both the need which the Government has for information and also the use to which they themselves can put such information. The small trader rarely sees the need for census data nor does he make much use of the results when published. There is, therefore, a general lack of enthusiasm among small traders, and, as a result, response is neither as complete nor as prompt as could be desired. In addition, there is a general tendency to await the availability of audited accounts before the inquiry forms are dealt with. The extensive use of accountants for this purpose leads to bottlenecks and to a certain lack of priority in dealing with census forms. The number of reminders which have to be sent and the correspondence which each reminder generates, add to the cost of an inquiry.

20. The impact of correspondence received in the early days of a census of production or distribution can be considerable and resources have to be diverted to clearing a large receipt of queries and complaints, mostly from small businesses. For example, in the 1961 census of distribution, over 200,000 letters and telephone calls were received in respect of 627,000 forms despatched. The 1968 census of production has, to date, received over 30,000 letters and telephone calls in respect of 115,000 forms despatched.

21. In practice response from small traders is often to some degree incomplete and arrangements have to be made to estimate for the remainder. Non-response among smaller traders in the census of distribution for example, is of the order of 20 per cent one year after the despatch of questionnaires. It is necessary to mount a sample follow-up of non-respondents by personal visit and telephone in order to obtain sufficient data for estimation purposes. Ways and means of improving response are receiving a great deal of attention at the present time. With the advice of public relations experts, attempts are being made to evolve an effective way of publicising the need for statistical enquiries and the use that can be made by industry of the published results. Opportunities are taken in discussions with trade associations, talks to groups of businessmen and in the Press to draw attention to the problem of response and to the value of the information collected. Discussions are being held with the professional bodies representing accountants and company secretaries on whom the burden of completing statistical questionnaires often falls. For the 1971 census of distribution, a booklet will be issued to all large traders and another to all small traders explaining the reasons for the census, how the results can be used by them to make comparisons with their own business and emphasising that the form has been designed to enable the firm to complete it themselves quickly from records which are already available to them and by estimates which can readily be made. In the manufacturing sector, the institution of the new form of quarterly inquiries will, it is hoped, lead to better response once firms have become accustomed to providing information at regular frequent intervals. Although the Statistics of Trade Act, 1947, provides for penalties for non-compliance it has always been recognised that the right policy to adopt is to improve response by persuasion rather than by enforcement through the courts.

The Central Register of Businesses

22. The Business Statistics Office has been given the responsibility of creating a Central Register of Businesses. The main function of this register is to provide an up-to-date list of names and addresses of statistical reporting units and other business units, classified by industry, area and size for use in statistical inquiries and, by showing the inter-relationships of the units of large undertakings to improve the correlation between statistics collected in different inquiries. The use for statistical inquiries sponsored by different Government Departments of a central register of this kind offers a number of advantages. Its use will avoid overlap and duplication in the collection of information and also prevent the omission of information. It will provide a standard frame for the choosing of samples and enable statistics on different subjects to be related together to form an integrated system of business statistics. It will also provide a standard frame for storing data.

23. Work on this register has started with the manufacturing sector for which the Business Statistics Offices and the Department of Employment

and Productivity have almost completed the construction of a common register of manufacturing establishments. The next stage will be concerned mainly with developing a register of the names and addresses of businesses operating outside the field of manufacturing. This will be achieved through an exercise involving Inland Revenue as well as the Department of Employment and Productivity and the Business Statistics Office. Inland Revenue will be passing to the Department of Employment and Productivity a list of all the 'pay points' which administer the 'Pay as you Earn' income tax system. Statutory authority for this exercise was provided in Section 58 of the 1969 Finance Act. For the purpose of conducting a census of employment the Department of Employment and Productivity will ask each 'pay point' inter alia, to list the names and addresses of each establishment for which it holds the pay records, a description of the business carried on at the address and the number of people employed. This information will be passed to the Business Statistics Office and stored on a computer. This exercise should produce a comprehensive list of the names and addresses of all businesses in the United Kingdom operating PAYE schemes and it is estimated that up to 2 million addresses will be covered. However this system will not cover small businesses without PAYE schemes and for these a register problem will still remain. The third stage in the development of the Central Register will be to determine and record the interrelationships between the business units identified in the previous stage. Some of these relationships will clearly be varied as well as complex, although in the great majority of cases an address on the register will relate to a single business carried on only at that address.

24. When the Central Register is complete and the means for updating it have been developed it is expected that greater use can be made of sampling techniques for dealing with small firms than has been possible in the past. It will also make it easier to conduct inquiries in sectors of the economy such as wholesaling which, because of the difficulties in compiling adequate registers, it has not hitherto been practical to tackle satisfactorily, if at all. Additionally it will provide a means for obtaining better statistics in the field of distribution and service trades, in which small firms are particularly important, than is possible at present.

COMMODITY CLASSIFICATION OF INPUTS AND OUTPUTS IN INDUSTRIAL STATISTICS

Introduction

This paper on commodity classification of inputs and outputs in industrial statistics reviews the current situation and some proposed developments in this field in Australia.

2. At present, data are compiled for long lists of commodity items of industrial inputs and outputs (i.e. materials used and articles produced). These lists have been developed over a period of time, and consist of approximately 1,200 items of inputs and 3,000 items of outputs. An annual revision of the lists is made to include new items and to modify existing items. Additions or revisions to the lists are made in general only where prior investigation has shown that the items are suitable for collection and publication of data. Although the individual items are identified by means of code numbers, the lists of items could not be said to form commodity classifications because they do not form sets of jointly exhaustive classes nor, in the case of materials, are they mutually exclusive.

3. It has been recognised in Australia for a number of years that our present practice is in need of review, and this was mentioned in a paper on commodity classification systems that was contributed by Australia for the Sixth Conference of Commonwealth Statisticians. But the pressure of other work during the past few years has precluded either an overall review of our present practice or a review of many of the detailed commodity items. An attempt is now being made to resume work on the review and development of commodity classification systems.

4. Australia's proposed work on the review and development of commodity classification systems is based on the widely recognised premise that commodity classifications of industrial inputs and outputs should be considered not in isolation but in conjunction with commodity classifications for other purposes, such as for data on stocks, external trade, transport, etc. in order to derive the maximum advantage from the data collected. Two principal types of structure are generally used by countries in commodity classifications for statistical purposes:

- (a) Those which distinguish commodity categories of general economic interest according to some attribute of the commodities themselves, e.g. food, raw materials; and
- (b) Those which are based on industrial classifications and classify commodities by principal industry of origin.

The remainder of this paper outlines Australia's proposals for development of commodity classifications for industrial outputs using these two

principal types of structure (with reference, where appropriate, to proposals for classifications for other purposes).

Industrial Origin Commodity Classification

5. Industrial origin commodity classifications are often used for presenting arrays of detailed data on industrial outputs, and are also of interest in external trade statistics for the purpose of studies relating to the industrial origin of exports, import competition with local industries, input-output studies and so on. The keying of commodity items to industry classes, as in an industrial origin commodity classification, is necessary in input-output studies because the flow of commodities has to be translated into a flow between industries.

6. Australia hopes to give high priority to the development of an industrial origin commodity classification for presenting detailed arrays of data in production statistics. The commodity classification visualised will be based on the Australian Standard Industrial Classification (ASIC); of which a preliminary edition was issued in 1969 and which is being used for the first time in processing the Australian Integrated Economic Censuses for 1968-69. At first the Australian industrial origin commodity classification (AIOCC) will cover only commodities primary to the mining and manufacturing divisions and the electricity and gas sub-division of the ASIC, and will be used for publishing the commodity output data collected in the 1968-69 Integrated Economic Censuses. It is expected that it will be extended later to cover the primary activities of all the other relevant parts of the ASIC (i.e. the primary activities of the agriculture, forestry, fishing and hunting division, the construction division and, possibly, classes covering some service activities). It is expected that the classification would consist of an array of detailed commodity items grouped according to the industry classes to which they are primary, with a hierarchic structure below the industry class level to provide useful groupings of commodity items.

7. It is proposed to use the existing list of approximately 3,000 commodity items of industrial outputs as a starting point for development of the AIOCC. There is already a substantial and growing demand for data based on the existing list of items; and for which it is known that respondents are able to supply data. For these reasons it is desirable that as many as possible of the detailed items in the proposed AIOCC should be identical or comparable with existing commodity items.

8. The steps considered to be necessary in the development of the AIOCC are as follows:

- (a) Keying the existing commodity items to ASIC classes (This has

already been done so that establishments can be classified by industry on the basis of reported commodity sales for the 1958-69 economic censuses);

- (b) Devising and applying appropriate treatments for the existing commodity items which are primary to two or more ASIC classes;
- (c) Devising and applying appropriate treatments in cases where existing commodity items are not mutually exclusive (There is only a small number of these cases);
- (d) Refining residual commodity items (within ASIC classes) to cover outputs of primary activities which are not already covered by existing commodity items;
- (e) Devising a suitable heirarchic classification structure below the ASIC class level;
- (f) Devising an appropriate order for the commodity items within each ASIC class; and
- (g) Devising a system of code numbers for the items and broader categories distinguished in the classification.

9. In the field of classification of industrial outputs, it is useful to be able to identify not only material commodity outputs (e.g. woodworking machinery) with the industry classes to which they are primary, but also non-material or service-type outputs (e.g. repair of woodworking machinery). Therefore, for the purposes of the AIOCC, it is proposed to extend the notion of a commodity to include the output of activities such as repair work.

10. The treatment of work done on a commission or fee type basis deserves special mention. This type of work normally involves processing materials supplied by the customer, so that the establishment carrying out the processing neither takes title to the materials nor sells the end product, but merely receives a commission or fee for carrying out the work. Generally commission work is treated as a primary activity of the industry class whose primary activities include the production of the same type of goods on its own account (e.g. the production of wine, brandy and fortifying spirits on commission from grapes owned by another enterprise is regarded, in the ASIC, as a primary activity of the wine and brandy manufacturing class, which also covers establishments mainly engaged in

producing wine, brandy and fortifying spirits on their own account). In these cases, it is thought desirable, when arraying data according to an industrial origin commodity classification, to show data relating to products produced on commission separately from products produced by an establishment on its own account by providing, for instance, separate columns for receipts for production on own account and receipts for production on commission, if this is practicable.

11. It may be appropriate at this point to discuss the purposes served by the structure of an industrial origin commodity classification below the industry class level. The structure will, of course, assist in the definition of the detailed items of output, but, in addition to this, its main purpose appears to be in providing useful groupings of detailed commodity items for the presentation and aggregation of detailed data. To develop a structure to fulfil this purpose would require some assessment or investigation of the needs of users of the data, to determine what these groupings should be if they are to be useful.

12. There is a further purpose which could possibly be served by the structure below the industry class level. This would be to make use of only the broadest categories below the industry class level for the presentation of some items of structural data for establishments (e.g. employment, capital expenditure, etc.). In developing categories to serve this purpose it may be necessary to use some of the same techniques used in the development of classes in an industrial classification, for instance, in relation to testing for homogeneity of classes.

13. Use of the AIOCC is expected to make the collection and processing of data easier. The commodity part of reporting forms (used in mining, manufacturing or other relevant censuses) could be designed so that each form will relate mainly to one particular ASIC class or a particular set of ASIC classes. The commodity output part of the form would then seek data for the detailed commodity items primary to the ASIC class or classes to which the form relates as well as commodity items covering the main secondary activities of the class or classes (i.e. products which are primary to other classes but which are often produced by establishments included in the class or classes under consideration).

14. These improvements in form design are expected to lead to a reduction in processing costs, both in the clerical operations related to classifying establishments to ASIC classes and in data preparation for computer processing. In addition, the use of AIOCC codes in processing will remove the need for a key between commodity data items and ASIC classes, which will further reduce processing costs.

15. The development of the AIOCC could possibly benefit by being linked with work on the development of an industrial origin commodity

classification for external trade, and this matter is receiving attention. The proposed United Nations Classification of Commodities by Industrial Origin, which will show the relationship of the Standard International Trade Classification (SITC) to the 1968 version of the International Standard Industrial Classification (ISIC), may provide a starting point for the work on development of an Australian industrial origin commodity classification for external trade. This is because the Australian Import Commodity Classification (AICC) and the Australian Export Commodity Classification (AIECC) are both based on the SITC, and the categories of the ASIC can, in most cases, be converted to the categories of the ISIC. Consequently, it is thought that the ISIC/SITC link could be fairly easily converted to an ASIC/SITC link. The ASIC/SITC link would then form the basis of an ASIC/AICC link and an ASIC/AIECC link, which in turn would form the basis for presentation of external trade commodity data according to industrial origin. The ASIC/SITC link would also form a comprehensive list of commodity categories which could be compared with the existing commodity items keyed to particular ASIC classes in order to systematically identify, for each ASIC class, the residual primary products not covered by existing items. Furthermore, comparison with the ASIC/SITC link could make the definition of the residual items easier so as to improve comparability with detailed commodity items used for external trade statistics.

16. The work on developing the proposed U.N. Classification of Commodities by Industrial Origin has not yet proceeded very far (it is believed) and the revision of the SITC will, no doubt, cause difficulties if this approach is to be followed. But work could possibly proceed using the existing version of the U.N. Classification of Commodities by Industrial Origin (Statistical Papers Series M No. 43) and the 1958 version of the ISIC to which the ASIC is also convertible in many instances.

Standard Commodity Classification

17. For many years it has been intended to develop in Australia a standard commodity classification, to be known as the Australian Standard Commodity Classification (ASCC), to serve at first as a framework for presenting arrays of detailed commodity items within groupings of general economic interest and also as a framework suitable for comparing commodity data on industrial outputs and external trade. Development of the ASCC was started in 1962, but although the need for such a classification is well recognised, its development had to be abandoned in 1964 for lack of resources. An attempt is now being made to resume development of the ASCC.

18. It is considered that the upper structure of the ASCC could be formed, as far as possible, by the Classification by Broad Economic Categories (BEC) which is being developed by the United Nations Statistical Office for presentation of international trade data according to broad groupings of general economic interest.

19. The initial development of the ASCC is seen to involve, firstly, development of a structure down to a level consisting of about 200 categories approximating the degree of detail existing at the 3-digit group level of the SITC; and secondly, keying to these ASCC categories the existing detailed commodity items of industrial outputs, and the detailed items of the Australian Import Commodity Classification (AICC) and the Australian Export Commodity Classification (AECC). It is expected that a set of about 200 ASCC categories would not be too detailed for this purpose, because it is expected that there would be only a small number of existing detailed commodity output and external trade items which would not fit wholly into one such category. The definition of these ASCC categories could be framed so that as many as possible of the ASCC categories will correspond with SITC groups, and in this way the keying of AICC and AECC items to ASCC categories would be made easier.

20. The scheme outlined in the previous paragraph would provide a first version of the ASCC which could then be used for the publication of data on domestic industrial output and external trade. This first version would also serve as a starting point for establishing a system for item-by-item review of comparability of output and trade items, with the object of standardising items at lower levels.

21. The procedure visualised is that one ASCC category, or a limited number of such categories, would be marked for study; the existing detailed output and trade items within the category could be analysed and reconciled, and where possible the items sub-divided or re-defined in order to improve the comparability of the detailed output and trade items. In the course of this process attention would be given to the possibility and desirability of introducing distinctions, made at lower levels in the SITC, into the industrial output items. When one ASCC category had been dealt with in this manner, another would be taken up for study. It is believed that over a period this procedure would bring about a high degree of comparability of detailed output and trade items.

22. Consideration may be given at a later stage to using the ASCC as a framework for display and comparison of commodity data on industrial inputs, stocks, transport, etc., as well as industrial outputs and external trade.

23. In conclusion, it may be appropriate to make some observations about the allocation of usually scarce resources in a situation where there is, on the one hand, a continuing need for resources to be devoted to special and ad hoc reviews resulting from particular problems with individual commodity items or groups of commodity items in the lists or classifications currently in use; while on the other hand, there is also an urgent, but perhaps less immediate, need for overall reviews of commodity

lists and classifications. For example, there may be a need to develop a standard classification structure within which it is possible to carry out systematic reviews of detailed commodity items.

24. In such a situation, there is often a tendency to satisfy, at least partially, the first need (i.e. the need for special reviews) because resources can often be found for short periods at a time; while the second need (i.e. the need for overall review) tends to be neglected since it would require the use of resources over a longer period. Continued allocation of resources in this manner, of course, would delay any planned overall reviews, without which the special reviews cannot be carried out consistently. The respective needs have to be weighed therefore, one against the other, with some long term aim in mind before resources are allocated to the respective tasks.

COMMODITY CLASSIFICATION OF INPUTS AND OUTPUTS IN INDUSTRIAL STATISTICS

1. The subject matter of this paper is of special interest to the Dominion Bureau of Statistics just now because a version of the Standard Commodity(1) Classification (SCC) for use in classifying industrial(2) inputs(3) and outputs(4) is in preparation.
 2. In Canada, the Standard Commodity Classification (SCC) provides a basis for the "working" classifications used in compiling Commodity data from different sources. The SCC contains a standard set of commodity classes which are followed in constructing derived classifications suited to the commodity patterns and collection arrangements found in the different fields of statistics. By this means comparable commodity data in the greatest possible detail, composed of categories useful for a broad range of economic analysis, can become available. Experience has shown, however, that the existence of a standard classification does not by itself achieve this objective. It requires an explicit program of implementation consisting of derived classifications with specific objectives. The commodity classification of inputs and outputs in industrial statistics is one such derived classification. Its specific characteristics are described briefly in this paper in the context of the SCC system.
 3. A commodity classification of industrial inputs and outputs should be designed with two main categories of users in mind, namely: those concerned with very detailed market analysis of specific commodities (mainly business users interested in very current data); and those engaged in more general economic analysis, both short and long-term. Of course, these classes of users have related interests, both being concerned with linking commodity records from different sources such as industrial outputs and inputs, imports, exports, freight shipments on the various means of transport and price data. Most commodity analyses deal with "commodity flows" of one kind or another which depend upon the ability to link information obtained from a variety of sources.
 4. This interrelationship of commodity data is a principal reason for Canada's coordinated approach to the whole field of commodity classification through the Standard Commodity Classification which forms the cornerstone of a coherent multi-purpose classification system. The SCC contains some 6,000 classes each of which is important in at least one aspect of Canadian economic activity with the remaining commodities grouped in a number of residual categories conforming to the structure of the Classification. To provide a multi-purpose vehicle, the SCC is structured in accordance with general criteria related to the characteristics of commodities in general economic terms - i.e. their state of fabrication, chief component material, or purpose. (See also the Canadian paper on item 12 of the provisional agenda).
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- (1) In this paper the term "commodity" refers to a tangible good having commercial value. "Economic goods" or "goods" is taken to cover both tangibles and intangibles (services).
 - (2) "Industrial" is given the same meaning as in the UN System of industrial statistics, i.e. mining, manufacturing and the production and distribution of electricity, gas and water (Division 2, 3 and 4 of ISIC).
 - (3) "Inputs" is taken to mean the commodities (raw materials, process supplies and packaging materials) acquired and used in production by an industrial establishment in a period.
 - (4) "Outputs" is taken to mean the commodities produced for sale or transfer to others or for own use in a period.

5. Working commodity classifications for imports, exports and transportation (freight) have been drawn directly from the SCC, each at a level of detail appropriate to the commodity pattern encountered in its field. Thus in some sections the import classification uses the full detail of the SCC (and there is no inherent reason why it should not sub-divide SCC items) while in other sections it combines detailed SCC items to form groups suitable to its purposes. Other working classifications follow the same practice with the result that the 6,500 items of the SCC are used to form some 3,000 import classes, 1300 export classes and 500 transport (freight) classes for purposes of regular publication of data (additional detailed categories are made available for internal use but cannot be published because disclosure would contravene the Statistics Act). The invariable principle followed in constructing any derived classification is that each commodity class in a derived classification must consist of an aggregation or a disaggregation of the 6,500 SCC classes but cannot be defined by combining elements of two or more SCC classes. Thus the SCC fulfills its purpose of promoting comparability in commodity data from different sources while preserving flexibility of the derived classifications for purposes of collecting commodity detail in each area.

6. The most recent derived classification, currently being developed, is the commodity classification for industrial products and materials. Although this classification may assume a different system of main groups than the SCC (e.g. grouping by principal products of industries) its individual classes are defined on the same criteria as the SCC and they do not cross SCC class boundaries. The following main criteria are relevant to all derived classifications as well as to the 6500 SCC classes:

- (a) Chief component material. The principal material (or materials) embodied is an important factor in determining whether some commodities are sufficiently homogeneous to form a class, particularly those commodities that have undergone limited processing. This criterion is most applicable in the areas of crude materials and fabricated materials, although it has some relevance at the most detailed levels of classification for certain end products. The products concerned are those that are subjected to different industrial processing depending upon their material composition. For example, household utensils of metal are produced by different processes than those of glass or china, whereas wearing apparel is customarily made by the same processes regardless of material.
- (b) The stage of processing. Most materials and articles go through a series of processes either alone or in combination with other materials and supplies in their production cycle. To minimize difficulty in analyses of the data it is helpful if the commodities grouped in a class are as homogeneous as possible with respect to "stage of processing".
- (c) The use or purpose for which the commodities were designed. In this case "use" refers to the type of commodity as determined by its usual function. "Use is, therefore, a characteristic of the commodity itself which does not depend upon its actual function in a particular instance. For example, a household type washing machine can be recognized as such by the manufacturer, transporter, importer or exporter and therefore such a category can be identified in the SCC and in each classification derived from it. Most such machines are used as household equipment but some are used as capital equipment, e.g. in a self-service laundry.

- (d) Industrial origin. This criterion has particular relevance for the preparation of a derived classification of industrial products. In many cases the criterion of chief component material is allied with this one. Although many commodities tend to be associated with particular industries others are products of more than one industry and some, being by-products, have a shifting industrial origin depending upon the output of related products. A more precise statement of this criterion is therefore, "principal industry of origin."
- (3) Similarity of price behavior. In most cases the volume of commodity movements in a period must be inferred from value data. If the required price series are to provide useful "deflators" it is important that the commodity categories be as homogeneous as possible with respect to price behavior. Considering the relatively broad scope of most commodity groups, this criterion is difficult to apply in practice.

7. All the above criteria cannot be applied to all classes quickly and obviously they involve conflicts which must be resolved. The Canadian SCC has been designed to minimize such conflicts by early subdivision of the whole field of commodities into large groupings within each of which only certain criteria need be used. Thus, except for Live Animals and Foods which are treated separately, all commodities are classified by "stage of processing" at the first level of the classification. This serves immediately to segregate the more detailed categories by stage of processing and to a very considerable extent, by industry of origin. Within the broad category of "crude materials" the criterion of kind of material can be used consistently and within "processed materials" the chief component material is used for further subdivision. In the third large category, "end products", the criterion of use or purpose is applicable because this is the most important characteristic of these commodities. In fact, "use" is indeterminate for most crude and processed materials, whereas "chief component material" cannot be applied to most end products which are composed of a mixture of materials. The same end product is often made of alternative materials and the introduction of new materials (e.g. plastics) can change the material composition of these commodities, often in a short time.

8. Thus, the Canadian commodity classification of inputs and outputs is closely related to the commodity classification used in other fields of statistics. Their common source in the Standard Commodity Classification, from which they are all derived, provides each of them with a system of commodity definitions leading to the ability to provide comparable data. To promote the tabulation and publication of comparable statistics to the greatest extent possible, a common list of principal commodities is being developed. This list will constitute another derived classification of the SCC in that it respects the SCC definitions of classes. It is designed to provide a target for those collecting and compiling commodity data of industrial products and materials, imports and exports. Initially the list is to be composed of some 2,000 categories which will be expanded as experience is gained in its use.

COMMODITY CLASSIFICATION OF INPUTS

AND OUTPUTS IN INDUSTRIAL STATISTICS

1. Both for the purposes of statistical surveys and analysis by kind of economic activity a commodity classification of inputs and outputs is indispensable. India has now nearly two decades of experience in collecting from large scale registered factories information in respect of inputs and outputs of industry. However, no national commodity classification has so far been evolved in the industrial sector. A Standard Industrial Classification was, however, evolved as early as 1961. It has since been revised to meet the requirements of the revised ISIC - 1968. This revised classification of industries has been issued in April 1970 and specifies all industries in a 4 digit frame. Besides meeting the needs of international comparability of industrial statistics and conforming to the ISIC 1968, the National Industrial Classification meets the requirements of the Annual Survey of Industries (A.S.I.). While collecting data for the A.S.I. the items of inputs are arranged industry by industry, starting with crude, raw or basic, through semi-finished or intermediate if purchased and consumed, chemicals, packing materials and ending with consumable stores. Products are similarly arranged by industry starting with principal ones with their sub-divisions into varieties/grades and ending with subsidiary and by-products. These lists of inputs and outputs are revised from time to time. An item may occur under more than one industry according as it is consumed or manufactured by different industries. A complete commodity classification could be developed from the list of materials consumed and products made in the ASI.

2. The listing of commodities, both inputs and outputs, could be used to arrive at their total consumption/production by the industrial sector for the whole of the economy. If in the data on imports and exports commodities used as inputs and outputs in industries could be identified, we could have a clear idea of the total demand of commodities for purposes of inputs and the total availability of finished or semi-finished goods demanded in the country in particular lines. In the formulation of trade policies, both of imports as well as exports, the indigenous availability of commodities is an important factor which should be taken into account. A satisfactory commodity classification of inputs and outputs on lines similar to the national trade classification viz., the Revised Indian Trade Classification, (RITC), would therefore go a long way in facilitating the formulation of industrial and trade policies of the country

3. Besides the National Industrial and Trade Classifications which could be utilised in evolving a commodity classification of inputs and outputs the following sources could also be

made use of in this connection:

- (i) The Indian Standards Institution is entrusted with laying down standards for purpose of manufacturing and marketing of products of acceptable quality and size. The ISI has laid down specifications for 2000 to 3000 commodities. These could provide a good source for building up a commodity classification of inputs and outputs.
- (ii) Various associations of manufacturers in India such as Engineering Association, Industrial Fasteners Association, Indian Pump Manufacturers Association, Indian Electrical Manufacturers Association, Indian Chemical Manufacturers Association, have brought out list of items manufactured by their constituent members. This listing of products by various associations of producers could also provide a source for a commodity classification.

4. In the industrial classification used by the C.S.O. for industrial enquiries, the products are identified mostly at a commonly recognised stage of finishing. Information about detailed specifications of inputs and outputs is, however, not gathered. For international comparison of products by specifications this would be one limitation. However, specialised institutions such as the Electrical Manufacturers Association and the Directorate General of Technical Development are known to collect information at finer levels of classification, indicating specifications.

5. A study of our national industrial classification would indicate that a large number of commodities are identified at the 3rd digit level and not beyond. These items include agricultural items which do not lend themselves for further classification except in terms of grades or quality. In addition manufactured items like locomotives, bicycles, footwear, etc., are specified at 3 digit level and not beyond. To that extent the industrial classification degenerates into an ultimate product classification at a much earlier level. However, for the same set of items price data and import-export data are built up at a much finer level of classification.

6. The classification of inputs and outputs of industry is necessary for several purposes. A classification of outputs by industry and inputs by industry is a necessary step in the building up of inter-industry tables and the material balances which are so vital for the planning of industry. A proper commodity classification of outputs and inputs is also an important basis for the trade and tariff policy of the country. Such a classification can also be used as a basis for evolving suitable export promotion policies.

7. In India we possess a classification of inputs and outputs industrywise but we do not know in how many industries a particular item is used as an input and of how many industries it constitutes the output. The aggregation of existing inputs and outputs which are specified for each industry also presents some difficulty as only the most important of the inputs and outputs are listed in the schedules of inputs and outputs of each factory. The aggregation of outputs and inputs over the entire industrial sector is likely to produce figures which would be under-estimates. This deficiency can however be got over by selecting the most important commodities and insisting that if such commodities are used as inputs or are the products of some industries they are necessarily listed by the field staff so that over a limited range at least the coverage is complete in so far as registered factory sector is concerned.

8. In view of the difficulties which are inherent in evolving a satisfactory commodity classification of inputs and outputs in industrial statistics it will be useful if the experience of Commonwealth countries could be pooled and discussed for initiating work on this important subject in a phased manner, particularly in developing countries.

COMMODITY CLASSIFICATION OF INPUTS AND OUTPUTS
IN INDUSTRIAL STATISTICS

1. The current preparation by the Statistical Commission of the United Nations of an ISIC-based Commodity Classification, the interest being shown by the private sector in commodity coding and consciousness of its own problems in the field have prompted New Zealand to recommend that the subject of commodity classification be placed on the Conference agenda. In spite of the work being done by the United Nations Statistical Commission and the Conference of European Statisticians it is suggested that discussion amongst Commonwealth countries can be of value.

2. As seen by New Zealand the subject is wider in scope than is envisaged by the U.N. Statistical Commission in its memorandum of 25 November 1969 (E/CB.3/405). The need for a general classification of commodities in the sense of all goods and services dealt with by all producers is put forward, the definitions of commodity and producer here being more or less aligned to those found in the Glossary of the United Nations System of National Accounts, 1968, and not restricted to only SITC type commodities and to industries producing these. Furthermore, to be of the widest use it is suggested that the classification should also cater for economic entities such as interest, rent, consumption of fixed capital and the like, used in economic exercises.

3. New Zealand's commodity statistics deal with, among other subjects:

External Trade,
Agricultural and Pastoral Products,
Mining and Quarrying Products,
Forest Products,
Manufactured Products,
Buildings,
Wholesale and Retail Trade Commodities,
Stocks,
Prices,
Certain Services produced or used.

Unfortunately the types of classification used have been inward-looking and isolated because they were designed only to serve the main purpose for which the statistics were originally required and collected.

4. Except for statistics of external trade, no commodities of the types now surveyed are classified under a fully recognised system capable of being immediately processed by computer and also consistently presented at various levels of

grouping. The reason for this deficiency is of course that the needs for co-ordinated and reconcilable commodity statistics was not hitherto acutely felt.

5. Absence of standardised commodity classification was notably appreciated when Input-Output studies were begun. It is not appropriate in this paper to deal at any length with this country's experience in processing and reconciling commodity flows in the preparation of input-output tables. But, because very little has been published on the practical difficulties encountered in this work and on the solutions (or otherwise), opportunity is taken of a short description of New Zealand's experience. This might be of interest to others.

6. The first inter-industry study undertaken using commodity analysis to arrive at industry/industry transactions was for the year 1959-60. Mainly as a matter of expediency because the printed publications with alphabetical index already existed, the New Zealand Statistical Classification of Imports and Exports was adopted as the classification system. This was based on the U.N. SITC 1950 edition and used a 7 digit code to identify items. Because of the vast mass of public and private sector statistical material and accounts which have to be analysed for an inter-industry study and the non-standardised commodity descriptions and trade names encountered, it was decided to use a 5 digit level of this code to trace commodity flows in the input and outputs of the economy.

7. This classification level was approximately in line with sub-group headings in SITC (Revised); e.g. "Ball, roller and needle bearings" comprised a commodity. It was necessary to introduce additional items for goods not found in external trade and to devise a complete classification of service commodities. In the event the system, at the level chosen, proved to be only partially successful for use with computerised Input-Output analysis; it was found to be too fine in some areas and too coarse in others. For instance "Bull and hog rings", "Medals" and "Springs for railway vehicles" all appeared as one commodity item whilst at the other end of the scale fibres of flax, hemp, ramie, sisal and manila were each represented as separate items. Because of defects in classification, only a part of the work of tracing commodity flows could be done on the computer and a long and tedious process of clerical reconciliation had to be undertaken to sort out and reconcile many of the commodity inputs and outputs.

8. It is seen from the 1969 publication of the Canadian input-output tables for 1961 that Canada used 644 input-output commodities in processing inter-industry flows for 187 industries. New Zealand chose, on the other hand, 800 commodities for 110 industries but no special criterion was used to arrive at the selection of level of commodity classification. This was rather a pragmatic choice after a short trial with finer degrees of itemisation. Very few papers on the practical side of input-

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output work seem to reach New Zealand and it would be interesting to learn what has governed other countries' selection of levels of commodity classification in this work and what trials have been conducted.

9. For the 1965-66 inter-industry study (not yet completed) attempts were made to devise a classification not centred on principles used for classifying data on international trade. Ultimately, largely because of pressure of time and limited resources, it was decided that the principle of "the devil you know is better than the devil you don't" should prevail. The same code (basically SITC unrevised) has therefore again been used but on this occasion a fixed level of classification as at 5 digits of the code is not being adopted. If any commodity transaction in any type of account or listing can be identified at a 7 digit level, this has been done. The computer will match such inputs and outputs as it can at the finer level and will pass the residual to the next, broader, classification group at 5 digit level. It will repeat the process to a still coarser level, after which a clerical reconciliation will be undertaken. Unfortunately, at time of writing (May 1970), it is too early to say what advantage has been gained by this process.

10. The obvious saving in investigating time and effort which would be made in Input-Output table preparation if a national commodity classification was in use, first emphasised this country's need to pay more attention to the subject. But quite apart from this particular and highly specialised requirement New Zealand has now entered an era of long and short term economic planning. This has involved the establishment of a National Development Council with a network of Sector Councils representing all industrial and social interests; these consultative bodies are responsible for watching the implementation of plans and for the review of various national and sectoral targets. Because existing statistics were found to be inadequate for this purpose of control, a Technical Committee on Statistics recommended the adoption of the United Nations 1968 System of National Accounts (see separate paper under Agenda Item 10(a)) and the integration, as far as possible, of all statistics of economic activity by means of nationwide enterprise enquiries, in place of the existing unrelated surveys.

Also as a more distant objective, the Department of Statistics is to establish a computerised statistical information centre to act as a repository for unaggregated and aggregated economic and social statistics.

11. These requirements all involve, to a greater or lesser degree, the use of classified commodity statistics covering all types of inputs and outputs. In fact, one of the first urgent requirements of the newly formed planning body has been for a comparison of goods found in statistics of domestic production

with commodities exported (statistics not previously linked by a common classification system) so as to pinpoint industries contributing to export. Such developments have underlined for this country the need for immediate examination to find the system which is best suited and wide enough in scope to cope with the multiplicity of end-uses and various aggregations for which commodity data might be used. The end-uses can vary from most compact aggregations required for macro-economic models and policy making at a national level to highly detailed and precise data officially required in the setting of tariff rates by comparing imported items with the equivalent items in domestic production. In between the extreme limits are countless other applications involving goods and services consumed and produced which could be made - particularly with greater access to high speed computers - if commodities could be classified in a consistent and comparable way in all official statistics.

12. Research in the United Kingdom by the National Computing Centre into the possibility of a national commodity code has interested New Zealand. The relationship between the private work being done and the needs of statistical authorities might well be explored. It seems fairly clear that if a system which has the general support of both public and private sectors can be adopted a great step forward will have been taken. Apart from the advantages in handling and communicating official statistics, a classification linked to the internal requirements of enterprises or to communications between industries would assuredly benefit industry and commerce in the same way as standardisation of measurements and specifications of goods. It is realised that the problems are enormous, particularly as large enterprises already have many classification systems of their own, sometimes of worldwide application, but it is suggested that now when the data processing and recording revolution is still getting under way is the time to sow the seeds of a universal system. The time can be looked forward to when everything from the identification of the stocks of a particular commodity to the composition of national balance sheets can be dealt with in the same or fully interchangeable commodity classifications.

13. In presenting this introductory paper, no attempt has been made either to appraise the principles or philosophy which can govern commodity classification or to deal with technicalities of systems. It is hoped only that it will serve to elicit discussion on a subject which must loom larger and larger as the demand accelerates for more exact and speedier information on the products of industry and the uses to which they are put. The pooling of experience in this field will no doubt be of assistance to those Commonwealth countries which, like New Zealand, hope to integrate their official economic statistics into a fully co-ordinated system.

COMMODITY CLASSIFICATION OF INPUTS AND OUTPUTS IN INDUSTRIAL STATISTICS

Introduction

1. Industrial statistics involve the summarising of detailed records of the transactions of the industrial sector of the economy. To achieve this the things which are made, or bought, or sold must be grouped in reasonably homogeneous cells i.e. the smallest units to be recognised for statistical purposes. The identification and organisation of these cells is what is meant by classification. Pure nomenclature, i.e. sample lists of the names of the cells is not sufficient. They must be related together in a structure convenient for purposes of interpretation of the statistics based on them.

2. No single arrangement of the basic cells is suitable for all purposes. A commodity classification for statistical purposes must contain sufficient detail to allow re-arrangement into any number of categories e.g. by method of production, nature of material, and use, and so on. We must expect to have to produce several alternative structures, and at different levels of aggregation. The high level of aggregation needed for the preparation of input/output tables is quite inappropriate for weighting price index numbers.

3. Given the flexibility provided by a large number of basic cells, it is possible to prepare summaries according to subsidiary classifications, for example for different economic categories, and the United Nations Statistical Office has made proposals for regrouping the 1312 items of the Standard International Trade Classification (Revised) in this way. (UN Statistical Commission paper E/CN.3/408). It is indeed desirable to have the probable statistical analyses in mind in preparing the cell descriptions in order to ensure that enough of them are recognised to provide the degree of flexibility needed, and that still smaller groupings do not need to be distinguished at a later stage.

4. A commodity classification drawn up according to these principles will facilitate analyses designed to answer the question: what? This is only one aspect of an economic transaction. For a full account of a transaction other questions would need to be answered:

By whom produced, sold etc?
To whom?
When?

The last of these has a different connotation according to whether variables are measured at a point in time or over a period of a month or a year. It does not however involve any classification problem, for there is no doubt about which period is before or after another or by how much. Frequently users of statistics would like an answer to a fifth question: "For what purpose?" Experience shows that statistics of "end-use" of commodities are extremely difficult to provide for in a recording system. To seek to distinguish the different uses of essentially multi-purpose commodities like certain chemicals, or timber, or valves should generally be avoided.

5. The questions by and to whom pose the complexities inherent in the industrial classification of sectoring of respondents to inquiries about commodities. The classification of businesses is inextricably linked with that

of the commodities which they handle. Because of this link it is possible to estimate from information collected from an industry about its purchases the industrial analysis of the outputs of the supplying industries. But because the link is variable in nature it is necessary to trace the flow of commodities through different hands (manufacturers, distributors, merchants) and different kinds of transaction (a single purchaser may re-sell a commodity in the same condition, or in a refined or otherwise processed form, or consume it, or use it as a constituent of a different final product). International trade transactions are commonly ascertainable from trade accounts more conveniently than by detailed inquiry. Thus the commodity data needed for the analyses of flows is obtained from many sources and not by means of a single questionnaire.

6. Because commodity data must be obtained from a variety of respondents and must depend on what information they can supply it is convenient to consider first the nature of industrial classification (paras.7-10) before that of commodities (paras.11-14). In a later section (paras.15-17) the relationship of the two types of classification is further examined. Finally (paras.18-22) the function of and possible development in commodity coding is discussed.

Industrial Classification

7. Industrial classifications relate to respondents to inquiries, or reporting units, arranged by kind of economic activity. In designing the classification many factors of industrial activity are taken into account such as the usage of materials, the nature of manufacturing processes, or the similar end use of products. At the next stage, these characteristics are in general subsumed in the nature of the commodities produced or services rendered and the great majority of businesses are allocated to particular cells according to their output. (Exceptions in the UK are such things as roadstone produced by quarries, animal feed by millers or household textiles by weavers). Industrial classifications, therefore tend to read like product classifications. Nevertheless the International Standard Industrial Classification (ISIC) (9) is based on two other sets of criteria: first, "the manner in which activities are combined in, and distributed among, establishments"; and second, "the characteristics of the activities, e.g. the type, technology and inputs of the production". The distinction between an industrial and a commodity classification needs to be borne clearly in mind in the conduct of inquiries to avoid confusion between the output of a group of businesses classified to an industry and the production of those commodities which are characteristic of that industry.

8. The ISIC recognises four levels of aggregation, distinguished by a decimal code into major divisions, divisions, major groups, and groups; the number of groups being 159. The United States Standard Industrial Classification is similar to ISIC in structure; the number of industries distinguished in 1963 at the four digit level being 425. (The Bureau of the Census classifies products by extending the number of digits in the industry code. Within the industry classification, 1130 product classes are recognised). The "Nomenclature des Industries etablies dans les communantes Europeennes"((NICE 1963) shortly to be replaced by NACE)) recognises five levels of aggregation with a total of 488 sub-divisions.

9. In contrast, the United Kingdom Standard Industrial Classification (revised 1968) (4) recognises 27 "Orders" identified by capital roman numerals, and 181 "Minimum List Headings" (MLH's) identified by three digit

arabic numbers. Some MLH's are further broken down into "optional sub-divisions" denoted by a fourth arabic digit. The total number of divisions is 254. The UK classification is therefore finer than that of the ISIC but coarser than those used in some other countries. Moreover, while most UK statistics relating to industry are analysed to MLH's, only the census of production normally distinguishes the relevant optional sub-divisions, either as "specialist groups" within a reported industry or, in some cases, in separate industry reports. On the other hand analysis at even the MLH level is finer than has so far been practicable for purposes such as the construction of input/output tables. In the latest edition of these relating to 1963(10) there are 70 industry groups defined in terms of the SIC, though it is hoped that it will be possible to distinguish a larger number in future editions.

10. At the 70-industry level the median index of specialisation (i.e. the ratio of the sales of principal products by firms classified to an industry to their total sales of goods produced and work done) is around 95 per cent. At the finer level of census of production industries the corresponding index is nearer to 90 per cent. Even with the median at this level there are a few industries with constituent businesses so mixed that the statistics for them are of relatively little significance. The finer the classification the narrower the definition of the industry; and the businesses which must be fitted into particular cells increasingly overlap their boundaries. While many thousands of cells may be distinguished in a classification of commodities, it is not useful to recognise more than a hundred or two separate manufacturing industries in a country like the United Kingdom where the total number of reporting units to a census of production is less than 120,000.

Commodity coding and classification

11. There are two distinct systems of coding commodities. The first identifies in successive parts of the code particular characteristics of the product. A draft specification for commodity coding recently issued by the British Standards Institution (3) recommends three elements: industry, manufacturer and commodity. The object of a coding of this kind is to facilitate communication, e.g. between producers and distributors of goods, and not particularly to accumulate totals for groups of commodities. It may be described as a logistical code. It may relate to anything, but need be of no more than limited scope. It can be efficient for its designed purpose though it would become unwieldy if its scope were extended very widely. The arrangement of items will depend on the characteristics specified in the code and the way in which they are ordered. In some cases similar commodities may be differently identified because of differences for example in suppliers or uses, and commodity groups useful for economic analysis may be fragmented. Most development in logistical codes has taken place since World War II and has been reviewed in two reports (1) (2) of the National Computing Centre. The most developed, the NATO code, internationally used for military logistics, is based on 13 digit code number containing 4 digits of a commodity classification.

12. The second kind of commodity code relates to a classification of commodities. Here the items must first be arranged according to a particular principle and the coding reflects the principle. Statistical codes are of this kind. Since these codes must be applied consistently to a wide, or indeed comprehensive, range of commodities they are much less detailed than logistical codes.

1381 The Standard International Trade Classification Revised (SITC) (8) provides one of the most familiar examples of statistical coding. It has a 5-digit code hierarchically organised with each level corresponding to an extra digit in the code, recognising 10 sections, 56 divisions, 177 groups, 625 sub-groups, and 1312 items. National classifications based on the SITC like that of UK, usually recognise more than 1312 commodities, commonly between 5,000 and 10,000. Each 5-digit code number may summarise anything up to several dozen named products, each with its own national code number.

14. In the UK until January 1970 two separate operational codes were in use for imports and exports, which were both translatable into the Brussels Trade Nomenclature (BTN), the internationally agreed nomenclature used for all tariff matters, and into the SITC. From January 1970 in the UK the separate Import and Export Lists have been integrated with the Tariff into a single nomenclature (7) with 8-digit code numbers of which the first 4 are the digits of the BTN. These 8 digits define the full code entered on documents for individual transactions. The single list presents some problems, because for the United Kingdom, as for most other countries, there are differences between the commodity composition of the import and export trades.

The relationship between industrial and commodity classifications

15. There are three main reasons why it is convenient to relate commodity classifications to the principal products commonly used to define industries:

- (i) Information about commodities produced is used to classify reporting units to industries. Respondents can be asked to classify themselves, but experience shows that their conclusions must be checked, normally by reference to the reported products of their activity. The method is sometimes inadequate, as when an important productive process, like weaving, is not fully reflected in the description of finished products, like made-up textiles.
- (ii) Leontief style input/output analysis requires that each industry should be identified in terms of a group of commodities, notwithstanding any imperfections in the data available. Where there is a lack of correspondence, as when imported goods are of a kind not produced internally, there must be some convention in allocation. Thus UK imports of tobacco are assigned to agriculture, but those of raw and processed cotton, which are partially processed in the country of origin, to cotton textiles.(10)
- (iii) For purposes of economic analysis. For example, in considering the development of an industry in relation to competition from overseas, it is often useful to compile a "balance sheet" (production, inputs, exports and stocks) of its products.

16. For these reasons some countries have established a formal relationship between the industry and the commodity classification as in the "Numerical list of manufactured products" of the US Department of Commerce, (see para.8 above) or the "Nomenclature Commune des Produits Industriels", (NIPRO) now being developed in the European Community. In the UK however

there is no formal product classification for internal statistics. Yet the detailed product statistics published in the UK inevitably give the appearance of some such classification, and there are published alphabetical lists of products whose manufacture as principal products commonly defines the industries of the SIC(5), and of the headings in published census tables (6). Fuller alphabetical commodity indexes listing both product description and computer codes are unpublished tools of the Business Statistics Office. These lists are revised frequently (hitherto in relation to each successive quinquennial census of production) to reflect the changes in the definition of census industries as well as changes in technology.

17. Because of changes of this kind (in part reflecting changes in the administrative structure of businesses) industrial classifications need to be reviewed periodically and may call for major revision. Commodity classifications are inherently more stable, subject to gradual expansion as a result of technological development. It might therefore appear unpromising to base a product classification on an industrial classification. It has not been attempted in the UK. But this is what the United States has done and what the Common Market is now doing with NIPRO. A commodity classification may be based on a SIC but provided it is sufficiently detailed (i.e. recognises several times more items than the SIC has categories) it need not be, for a fine breakdown will allow products to be classified to an industry without excessive loose ends.

Functions of a Commodity Code and possible developments

18. A commodity code for use in statistics fulfils the following purposes:

- (i) To provide the means of reducing a very large number of separate things to a manageable number of headings.
- (ii) To specify, or convey information about properties (but this should not be allowed to dominate the code).
- (iii) To indicate inter-relationships between commodities, as for example the SITC does in assigning low code numbers to foodstuffs and raw materials and high ones to manufactured products.
- (iv) To classify, or divide up the whole collection of items into groups. As has already been mentioned the fundamental point is that a multiplicity of classifications is inevitable, notwithstanding the existence of some standard structures.

19. In the UK a new system of industrial statistics which effectively constitutes a continuous census requires that the commodity detail in the industrial inquiries should as far as possible be congruent with the Overseas Trade Classification so that it may be possible to move from one set of figures to another with confidence. It is also desirable that the commodities recognised as industrial outputs should match, in some sense, those recorded as industrial inputs. The greatest detail is generally that required, after discussion with trade associations, to be recorded as output in new quarterly inquiries. The Headings are being based initially on those of the 1968 detailed census of production, but they will clearly be in greater detail with eventually some 6,000 or 7,000 items. Input data will be collected less frequently, at intervals of three years or so, and will be in less detail -

perhaps some 4,000 or 5,000 items. There are several reasons for the difference in numbers of headings for inputs and outputs:

- (i) Many outputs are of finished products which pass directly into consumption or investment and do not need to be repeated as input headings.
- (ii) Inputs of raw materials often need less detailed breakdown than the very variable output headings.
- (iii) While manufacturers produce on the average a small number of lines (the average number of headings reported on in census of production returns is 7 or 8) they all use a considerable variety of materials (the average number of headings reported being about 30). It is necessary to limit the input detail asked for in order not to prejudice too much the response to inquiries.

In designing the new inquiries it is desirable to take account of any international recommendations or agreements both to facilitate international comparisons and also to take advantage of common developments in coding principles for convenient computer operation.

20. The British Standards Institute propose a commodity coding (see para. 11 above) which would consist of sections of identification, classification, and specification, with each code number consisting of three elements of variable length, to indicate industry, manufacturer and commodity. It proposes that sector coding authorities should be set up by each sector of the economy, which may be an industry, trade, or groups of industries or trades. It would be convenient if these sectors were to correspond to the industries of a SIC, or to the product groups of the SITC, and that the manufacturer identification should be relatable to the register used for statistical purposes. But the relationship of supplier to consumer and the vagaries of trade association power structures may make this unlikely without central direction. And the questions then are: what classification should be used? what is best statistically? which is most acceptable to industry, who will be the principal users of the code? BSI suggest that national authorities may eventually work with other national authorities to form an international system. If so, it might be better to start with an internationally recognised classification. What this should be is a matter for discussion, noting the ambiguities involved: that an industry classification is easily confused with a product group classification that manufacturers are often difficult to identify uniquely, and subscribe in very different ways to trade associations.

21. The diverse requirements referred to in the previous paragraphs might ideally be met by relating all internal commodity classifications to some internationally accepted classification like the SITC or perhaps NIPRO. A hierarchical structure would be helpful in facilitating sectional expansion or contraction in response to local needs, and in providing for the combination of related items where considerations of confidentiality or security so require. An agreed system of coding would promote international comparability. These ideals would however call for some central control. In practice the detailed demands arise locally in relation to particular needs. The task may therefore be better seen as a long-term one of gradually adapting the local needs so as to secure compatibility rather than uniformity. The way forward may be by

the development of coding techniques by means of which the capability may be attained of reclassifying detailed data, to derive any required subsidiary classifications from the primary ones.

22. A still longer term possibility is frequently proposed, that industrial statistics should eventually be compiled as a by-product of routine processing of invoices by businesses on the basis of some such commodity code as that proposed by the BSI. Apart from the technological and registration problems which would need to be solved, this proposal implies an assimilation of an extremely detailed logistical code to the strict form of a statistical classification. If and when this is achieved (presumably by international agreement in order to meet the requirements of multi-national organisations) there will remain the question as to whether industry will be content to supply to official data banks intimate information about its day-to-day operations.

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PRODUCTION STATISTICS AND INDICATORS FOR INDICES OF PRODUCTION

Introduction

In Australia, annual production censuses are held for the agricultural, mining, manufacturing and electricity and gas sectors of the economy. These censuses provide data on the broad structural characteristics of each industry (total output, employment, wages, etc.) and also detailed commodity information on a wide range of articles produced and materials used. The censuses, which have been held for many years, have been supplemented since 1945 by monthly collections of the major commodities produced.

2. At the present time, annual output or production indexes are compiled for each of the areas covered by the annual censuses. The Index of Farm Production is available from 1911-12 onwards using weighting bases of 1923-24 to 1927-28, and 1936-37 to 1937-38 for the periods 1911-12 to 1935-36, and 1936-37 to 1967-68 respectively. The Indexes of Factory Production run from 1949-50 to 1959-60 using a weighting base of 1955-56, and from 1959-60 to 1967-68 using 1959-60 as the base year. An index of mining output has been compiled for the Bureau of Mineral Resources, and published for the calendar years 1951 to 1968 using two weighting bases, 1954-56 and 1959, for the calendar years 1951 to 1959, and 1959 to 1969 respectively. There is as yet no monthly production index.

3. This paper concentrates on manufacturing statistics and their use in the preparation of annual indexes of manufacturing production. The annual indexes of mining and farm production are described at the end of Section 2. Section 1 examines Australian factory production statistics with special reference to those used in connection with production indexes. Section 2 contains a discussion of the Australian indexes of production, particularly the Indexes of Factory Production. Several special problems presented by the manufacturing production statistics in connection with the compilation of Indexes of Factory Production are the subject of Section 3. Section 4 briefly touches on the far reaching changes introduced with the first of the Integrated Economic Censuses, particularly those with implications for future indexes of manufacturing production.

Section 1Australian Factory Statistics up to and including 1967-68

4. Unlike most countries, Australia has traditionally conducted factory censuses on an annual basis. The reference period used in the Factory Censuses was the year ended 30 June which also corresponds with the Australian fiscal year. A number of firms did not balance their accounts on the 30 June and, in some of these cases, quarterly or half-yearly information was used to estimate financial year data. In other cases, firms were

allowed to complete an off-June-year return.

5. Up to and including 1967-68 the scope of the censuses extended to all establishments "where four or more persons are employed or where power (other than manual) is used in any manufacturing process". Since the large majority of firms in Australia use power in their processing activities, the scope of the censuses was very wide, and forms were despatched to some 65,000 factories during the later years.

6. Attention in this paper is focussed on the items used in the compilation of the Indexes of Factory Production. These are of two kinds: structural data on the aggregate value of output and of materials, etc. used, and detailed commodity data.

Structural data:

(a) Value of Output

This item was split into two parts: the value of goods manufactured, and the value of other work done. The former item related to the selling value of the goods at the factory exclusive of delivery cost and excise duties, but included bounties and subsidy payments to the manufacturer. Where charges for installation, erection or transport were included in the selling value of manufactured goods, these charges were excluded from the value of output on the basis that such activities fell outside the manufacturing sector.

The value of other work done covered all commission, repair and assembly work done by the factory. Where the factory operations were confined to assembly or packaging, the value reported excluded the cost of the components assembled or the goods packaged.

(b) Total Value of Materials, etc. Used

This item comprised the materials and stores used in the production of the factory's output, containers and packages used, tools replaced, materials used by the factory's own employees in repairing plant; payments to contractors for repairs to plant and fuel and power used. The value recorded was on a cost delivered basis including freight and insurance charges. Where the factory operations included the assembling or packaging of parts or equipment, the value of these goods was excluded.

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Commodity Data

7. In general, the commodity details collected were quantities and values of materials used and articles produced. However, values only were collected where it was not possible to specify a standard unit of quantity. For items produced for further use in the one factory, or where goods were assembled or produced on commission, quantities only were collected.

8. It has been possible to specify about 1,000 items for materials used and about 3,000 items for articles produced amounting to about 40 per cent of the value of materials used, and approximately 70 per cent of the value of output respectively. The difficulties encountered in the specification of items in both quantity and value terms were as follows:

- (a) The lack of detailed commodity records kept by manufacturers.
- (b) The fast rate of technological progress in some industries e.g. plastics and chemicals, for which there is always a lag between the introduction and specification of new products.
- (c) The "uniqueness" of some products (i.e. the absence of standard units of quantity).
- (d) The diversity of some products, e.g. toys.

It should be noted that the values of unidentified articles produced and materials used were collected on each form as "residual" items. This information was then tabulated by industry.

9. A monthly collection of articles produced currently includes articles which account for approximately 55 per cent of the total annual value of factory output, but the information collected is in quantity terms only.

10. The industry classification in use until June 1968 (the Classification of Factories) was adopted in 1945, and had two levels: Classes (groups of industries) and Sub-classes (individual industries). There were 16 Classes and 178 Sub-classes.

11. The extensive growth and diversification of Australian manufacturing industry since World War II had by 1967-68 rendered the Classification of Factories increasingly outdated. This made presentation of data difficult. Therefore, a new industrial classification based on the International Standard Industrial Classification was introduced in 1968-69 (see Section 4).

Section 2Australian Indexes of Production

12. In the compilation of the Australian indexes of production three formulae are used: the gross output formula, the gross output formula with value added weights, and the net output formula. The gross output formula combines current year quantities revolved at base-year prices. The second formula, gross output with value added weights, as applied to the calculation of the Indexes of Factory Production is described below. Its use involves the calculation of gross output indexes and then combining them by means of the value added weights of the base year. The net output formula, as indicated below, is used in the preparation of (unpublished) indexes for some industries only. Its application gives an index of value added at constant prices which is obtained by, first, subtracting materials etc. used at constant prices from output at constant prices, and then expressing the result in index number form.

Indexes of Factory Production

13. The published Australian Indexes of Factory Production are indexes of output at constant prices for individual sub-classes of industry which are combined into indexes for classes, and all classes combined, by means of value-added weights of the base year. The weights used to combine sub-classes into classes, and classes into the total index, are the proportions contributed by the respective components to the total value added in manufacturing industry. The net output formula indexes which have also been compiled (but not published) relate to a number of sub-classes where there was considered to be sufficient information available on both output and materials. These sub-classes account for about 40 per cent of the total value of factory output.

14. Two series of index numbers have been published for the years 1949-50 to 1967-68. One of these is based on 1955-56, the other on 1959-60 and some overlap between the two series is provided. That is, the first series based on 1955-56 relates to the period 1949-50 to 1959-60; the second with 1959-60 as its base year relates to the years 1955-56, and 1959-60 to 1967-68. The indexes of production are rebased frequently to ensure that the weighting patterns they reflect are kept up-to-date.

15. The Indexes have been compiled within the same framework as the statistics collected at the censuses including the classification of factories mentioned earlier. Indexes of gross output for each sub-class are calculated in the first instance and are then combined into classes and combinations of classes by means of value-added weights. Clearly, the sub-class and class indexes are different in nature; however, in certain circumstances they can both be thought of as indexes of value added at

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constant prices. For example, where the input/output coefficients of individual sub-classes are considered to be reasonably stable over time, the gross output indexes would be reasonably acceptable approximations to net output indexes.

16. The indicators used to calculate sub-class indexes of gross output are predominantly "articles produced", i.e. the output of commodities emerging from a sub-class in a finished state. However, in a few of the industries for which information on output of commodities in quantity and value terms is inadequate, sub-class indexes based on materials used are constructed where it can be assumed that output would vary in fairly close proportion to materials used (e.g. newsprint used in the production of newspapers).

17. The methods used to express the commodity data at base-year prices are:

- (i) to revalue quantities produced at the unit values (or prices) of the base year;
- (ii) to divide values of output by an appropriate price index.

The first method is the most common. The second method is adopted for the range of output for which it is not possible to specify standards in sufficient detail for useful quantity collections, but for which annual value of output figures are collected.

18. The application of method (i) requires that each commodity be sufficiently homogeneous in content and over time. For the application of method (ii), considerations of representativeness, homogeneity and uniformity of quality are shifted to the price or unit value series used.

19. The procedures described in the two preceding paragraphs are devices for expressing in constant-price form the available information on quantities and values of individual commodities produced. Use of an index based on this information as an indicator of change in the total output of a sub-class would only be justified to the extent that changes in the output of recorded items were representative of changes in all output of that sub-class. If the current values of the recorded and unrecorded parts of the value of output have changed in significantly different proportions, it does not seem reasonable to assume that the quantities of the unrecorded items (if they could have been measured) would have shown the same average change as that actually shown by the recorded items. Where information of the total value of output is available, as it is from the factory census, it is usually considered better to revalue by use of price indexes that part of the value of output for which commodity detail is not available than to take

the recorded items only as representative. The problem is to find a suitable price index. To meet this problem for purposes of the Australian indexes, "implicit price indexes" were calculated for sub-classes and classes by dividing the value of recorded items at current prices by their value at constant prices. In any sub-class for which the original coverage of recorded items was half or more of the total value of output, the balance for which details were not available was divided by the implicit price index for that sub-class; in other cases, the implicit price index for the whole class was used. This process is referred to as a "coverage adjustment", and its adoption implies that the price change relevant to unrecorded items of output is the same as that estimated for recorded items: while this can be shown in many instances to be more reasonable than a corresponding assumption based on quantities, it is nonetheless true that the unrecorded part of output frequently contains elements distinctly different from the recorded part (for example, job-lots as against mass-produced items, commission and repair work). The coverage adjustment is simply a method of revaluing the balance of the value of output and, together with the revaluation of the recorded items, in effect achieves complete coverage of the output of each sub-class.

20. The compilation of the Indexes of Factory Production extends over the 178 sub-classes of the Classification of Factories which includes six sub-classes relating to the production of Electricity and Gas. The first stage in the processing of the data involves a close examination of detailed commodity data in an attempt to isolate significant composition or quality changes affecting individual items. This examination consists predominantly of credibility checks applied to movements in reported unit values. The two main movements examined are those between the base year and the current year, and those between the current year and the preceding year. When the items have been examined and accepted, the next stage involves over 7,000 comparisons of values at base and current year prices relating to commodities reported as output in various sub-classes. From combinations of these binary comparisons, measures of price change are obtained and then applied to the total value of output of the respective sub-classes to produce gross output indexes, at sub-class level. Subsequently the gross output indexes are combined using value-added weights of the base year to produce class indexes.

21. It can be seen that the editing of commodity data and the compilation of the Indexes require numerous calculations each year, (upward of 50,000). Because of the volume of calculations, the need to have access to large amounts of data and the repetitiveness of many of the processes, the compilation of the Australian Indexes lends itself to the use of automatic data processing facilities in one form or another. For the first few years of the series processing was carried out with the aid of "mechanical tabulations" facilities and for the last three years, the indexes have been processed by electronic computers.

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Indexes of Mining and Farm Production

22. The production indexes compiled for the Mining industry are of the gross output type and are based on the calendar year 1959. These indexes make use of average unit values derived from the Annual Mining Census. These unit values reflect the selling value at the mine, or after treatment at or near the mine, of the individual items. Value added by the process of reduction of ores, concentrates, etc., to a metal stage is regarded as falling outside the mining sector. The values are usually estimated by deducting transport costs from the selling value at the point of sale (which may be different from the required figure at the "mine head"). The quantities used in the calculations are gross measures, i.e. they relate to the form in which the minerals emerge from the mine and not to their assayed metallic content. This method of measurement means that unit values may differ significantly from mine to mine and the revaluation is, therefore, often carried out on a State by State basis for individual items in an attempt to minimize the effects of this problem.

23. The production indexes for the farm sector are also of the gross output type and are calculated within two separate frameworks;

- (a) Indexes of Total Farm Production
- (b) Indexes of Farm Products for Food Use.

Both indexes are compiled on a 1936-37 to 1938-39 weighting base. As a part of the revisions carried out in 1952, the regimen was extended and modified to include farm products (as defined by the Conference of Australian Statisticians) in all cases. Certain other refinements were also incorporated in the revised indexes, the main one being the omission of quantities of crops used for stock feed in Australia, thus reducing some of the intra-sector duplication inherent in gross output indexes.

24. The "All Farming" group index is dissected in two ways. Firstly it is dissected into the three categories "Agriculture", "Pastoral" and "Dairying, Poultry and Bee Keeping", then it is further dissected into "Wool (Shorn and Dead)" and "Products other than Wool".

25. The Indexes of Farm Products for Food Use require the compilation of separate component indexes for Production and Consumption. The items included are basically in the form in which they are sold when they leave the farm except for livestock sold which are included in terms of carcass weight. The production index relates basically to farm products for food use but it includes all crops exported, some of which may be used for stock feed overseas.

Section 3Special Data Problems Arising in the Compilation of the
Indexes of Factory Production

26. A number of data problems, many of them unavoidable and irremediable, arise and they are due, to a large extent, to the nature, form and level of detail of the data collected at the censuses.

Duplication

27. As mentioned earlier, the factory measure of output contains a considerable amount of duplication in that the same goods at different stages of completion are counted several times. This duplication takes the form of (i) inter-sub-class flows (e.g. textiles used in the manufacture of clothing) (ii) intra-sub-class flows (e.g. wool carding and spinning done by one establishment in the Wool Textile industry and sold to another establishment for the final weaving process in the same sub-class; and (iii) intra-establishment flows (e.g. production of sulphuric acid for further use in the same factory as an input to fertilisers).

28. As indicated earlier the Australian Indexes of Factory Production attempt to eliminate duplication arising from the first source by the use of value added weights. Duplication arising from intra-sub-class flows does not have significant effect unless its incidence changes over time. A well constructed industry classification will help to minimise this problem, but special investigations e.g. of commodity flows can be used as a basis for remedial action where changes in the incidence of this sort of duplication are identified. With regard to the third source, intra-establishment duplication, goods made for use in further processing in the factory are separately collected for a considerable number of commodity items, and it is therefore possible to eliminate this element from the index to a great extent.

The Definition of Output

29. The concept of output outlined in Section 1 is, in many cases, rather difficult for manufacturers to quantify because it does not correspond to ordinary business concepts. In such cases, they are forced to estimate in various ways - for example, by applying unit selling values to production figures, or by adjusting their value of sales for changes in stocks of finished goods. Some manufacturers simply report the total cost of production. For this reason there has always been some doubt about the basis of reporting procedures used, and this has had obvious implications for the compilation of the Indexes.

30. The basis of valuation chosen (i.e. selling value at the factory door) also makes revaluation of output by price indexes an uncertain

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procedure since most of the price indexes available are compiled at the point of "sale" and are often, therefore, not strictly at the same pricing level as that defined for the value of output.

31. The attempt to exclude from the value of output the portion attributable to all non-manufacturing activities also creates reporting and interpretation problems. The problems are caused by the fact that some costs of manufacturing, selling, installing, etc. cannot be accurately apportioned between manufacturing and non-manufacturing activities.

Homogeneity

32. Ideally, the commodities used in index calculations should be specified in sufficient detail for collection purposes so that each item collected covers a narrow range of fairly homogeneous commodities. In Australia, the amount of dissection has been steadily increasing over the years, but there are limits to the number of divisions which can be made, and, in practice, the limits frequently fall short of the point which would ensure true homogeneity. Where complete homogeneity is lacking, the item can still be used in index calculations provided that the "product mix" within the item does not significantly change from year to year.

Quality

33. Even where an item, as collected, is reasonably homogeneous at a particular time, there can be changes in quality which affect the comparability of the figures from year to year. The problem of quality change is thought to be widespread so that it probably affects many items in the index. In practice, remedial action is limited to the most important cases, and an attempt is made to deal with them usually with the aid of "special purpose" price indexes which aim at measuring price change in terms of constant quality.

Repair and Commission Work

34. As mentioned in Section 1, this work is reported in value terms in the structural data section of the census form, but the commodity section of the form specifies only quantity data for commodities produced or worked up on commission for some industries.

35. This treatment in the Census Collection effectively precludes the incorporation of any such work among the recorded items used for the calculation of price measures for index purposes. Commodity data for commission work are excluded as there are no reliable price indicators which can be used in conjunction with the quantities. Repair work is similarly treated.

Assembly Work

36. The special treatment of assembly work outlined in Section 1 avoids some obvious duplication in materials used and articles produced. This treatment, however, causes more problems than it solves because of the difficulty in defining the boundary between assembly and other manufacturing.

37. Assembly work creates special problems also in that the structural data represent "value added" only and consequently it is inappropriate to use "output" price indexes to revalue the value of "work done" on commodities assembled. Furthermore as the information on commodities assembled is collected in quantity terms only, assembly work is revalued in the same manner as the value of repair and commission work, and is, therefore, subject to the same qualifications.

Confidentiality

38. All factory statistics are collected under an Act of Parliament which guarantees that the information on any individual form will remain confidential. This naturally restricts the scope of the indexes which can be published. In general, the criteria for withholding publication of an index are, where one or two factories form a sub-class, or where one or two factories predominate in a sub-class in terms of value of output (i.e. contributing approximately 85 per cent or more). Normally the number of establishments is used as a basis of determination, but care is taken to ensure that the establishments are not owned or predominantly owned by one or two corporate entities.

New Products

39. The method of obtaining the price measures used in the compilation of the gross output indexes amounts to revaluing at base-year prices the set of all suitable data of commodities reported as produced in the current year, and then dividing the resulting constant price estimates into the corresponding values at current prices.

40. The set need not contain strictly the same commodities each year even though uniformity over time is obviously desirable. For this reason, the incorporation of "new" products (i.e. new commodities, newly specified commodities or reclassification of previously specified commodities) can be conveniently carried out. All that is required is that an "acceptable" price-weight be available for each commodity. Accordingly, in most instances, base-year price weights are estimated for any new product by moving backwards the current year unit-value (or price), using the price movement since the base-year of a suitable indicator (e.g. a similar item, or a close substitute).

7(b) - AUSTRALIA

Section 4The Integrated Economic Censuses 1968-69
and Their Implications for Future Indexes
of Production

41. During August 1969 the first of the Integrated Economic Censuses were held by the Commonwealth Bureau of Census and Statistics; they related to mining, manufacturing, electricity and gas production and distribution, wholesale and retail trade and some service industries.

42. Past censuses of these industries were designed primarily to suit the characteristics of the sector of industry covered by the census. The new censuses will have a broader area of usefulness. They are based on standard definitions of business units and statistical terms, as well as a standard industrial classification. The censuses will, therefore, yield statistics that will be used more readily than in the past in comparisons and analyses that cut across industrial boundaries, and in aggregation to national totals.

43. Considerable changes have been made to the items of statistics collected at the previous censuses. For example, a major change made in connection with the manufacturing census has been the substitution of sales of goods for value of output and purchases for materials used (the latter change relates to structural data only). Instead of output, the census now asks for turnover consisting of sales of goods produced, sales of other goods, and other operating income and capital work done for own use. Similar adjustments have been made to the purchases items.

44. The commodity data requested now cover quantities of sales, and transfers (from one establishment to another within the same enterprise) of goods produced. For goods produced on commission, the producer is required to report quantities produced while the principal is required to report sales (or transfers) of those goods. Included in the quantities of goods produced are goods assembled, and those produced for use in further processing in the same establishment.

45. The design of indexes of production based on the new censuses is being considered. However, at this stage the full impact of the change cannot be assessed. Significant improvements to the statistics of production and to the indexes of production are expected to emerge. Among the more important of such improvements is the feasibility of weighting future indexes by contribution to gross national product using data collected at the censuses. This follows directly from the design of the censuses themselves which will collect data from establishments and enterprises, and from the operation of an Integrated Register which relates these two levels. The gross product weights would be based on a conventional distribution among establishments of the expense items collected only on enterprise returns.

46. Another major benefit accruing from the new censuses is the elimination of much of the uncertainty surrounding the interpretation, by informants, of value of output. This concept has been replaced by one based on actual business record keeping practices: i.e. sales and stock changes. It is felt, therefore, that this change will contribute to greater accuracy in the measurement of statistics and in the resulting indexes of production.

47. The new Industrial Classification has been scientifically constructed and is more closely related to the realities of Australian industry. It should therefore provide a better basis for presentation and compilation of indexes of production. In particular it will improve the basis for the coverage adjustment made for each industry.

48. Other areas of potential improvements include assembly and commission work which will now be capable of a more direct and systematic treatment in the indexes and intra-enterprise transfers which are also identified in detail so as to enable them to be treated separately when the indexes are compiled.

PRODUCTION STATISTICS AND INDICATORS FOR INDICES OF PRODUCTION 498

1. Historically, production indices have been compiled and published in Canada by the Dominion Bureau of Statistics since 1926, although the period covered extends back to 1919. These early indexes were restricted to mining, manufacturing and utilities (i.e., the Index of Industrial Production) and were based on the physical output of selected commodities. In 1952 DBS published the results of the first major overhaul of the methodology and data base for the Index of Industrial Production. Major innovations at this time included: (a) the introduction of the 1948 Standard Industrial Classification (SIC) along with expanded industry detail, (b) the use of value added industry weights along with gross value of production weights for aggregating commodity detail to the industry level, (c) the period 1935-1939 was adopted as the new weight and reference base, (d) the adjustment of monthly indexes to independently derived annual levels by industry, based on annual census returns and the double deflation approach wherever possible. The resultant production indexes, although still confined to only the industrial segment of the economy, were for the first time tied in conceptually to gross domestic product at factor cost estimates.

2. The next major revision was released in 1959 at which time a 1949 weight and reference base was introduced. The most notable innovations of this revision consisted of refinements of the industry weighting system and the adoption of the United States' Census Method II seasonal adjustment programme for seasonally adjusting the now nearly 100 monthly series. A further revision of the Index of Industrial Production components was published in 1966 and consisted essentially of the introduction of up-to-date annual levels for the 1950's based on annual census of industry returns.

3. The major Canadian development effort in the area of production indexes during the decade preceding the 1963 release of a basic reference document on Canadian industry real output measures (DBS Occasional Paper 61-505) was the development of annual and quarterly production indexes for all industries in the Canadian economy not already covered by the Index of Industrial Production. The methodology used was similar to that employed previously for calculating the Index of Industrial Production indexes and the same reference and weight base(1) was used (1949). Thus the Index of Industrial Production became an integral part of the system of newly developed real domestic product indexes for Canada. This system of industry production indexes has been published on a regular quarterly basis since the release in the 1963 reference document and has proved a useful tool for analyzing economic production in Canada both in conjunction with the constant price national expenditure estimates and in its own right. The availability of production indexes for the total economy has also made possible the development of productivity estimates for the Canadian (commercial) economy and its major industrial components.

4. In the summer of 1968 another major revision, this time to the entire Real Domestic Product (RDP) system, was completed and released (DBS Occasional Paper 61-506). The outstanding features of this revision were the introduction of a 1961 weight and reference base (the Gross Domestic Product at factor cost distribution by industry having been developed in conjunction with the preliminary 1961 input-output table for Canada) and the adoption of

(1) Industry weights were derived from the 1949 Inter-Industry Flow Table for Canada.

the revised (1960) SIC system. The 1960 SIC featured not only an updated industrial structure but also a redefinition of the basic reporting unit (which for purpose of industrial statistics is the establishment) to encompass all revenue producing activities.

5. Prior to this time most industry surveys, such as the census of manufactures, collected data on only the main (in this case manufacturing) activity of establishments. The new interpretation of the establishment requires the collection and tabulation of data for all activities of each establishment, with sales or shipments valued as they leave the establishment boundary. It has also been generally accepted that intermediate inputs should encompass both goods and services, and work is progressing in planning the systematic collection of such intermediate services. The new SIC definition is closely linked to the concept of "true value added" or the unduplicated contribution of the establishment's output to total gross domestic product, which is derived by deducting intermediate inputs (materials, fuel, purchased services, etc.) from gross output (revenues, shipments on sales adjusted for the changes in finished goods and goods-in-process inventories). The residual (or value added) contains the sum of factor returns (wages, salaries, profits) and non-factor costs (depreciation).

6. The incorporation of the 1960 SIC into the existing RDP system caused serious classification breaks in many series which had to be bridged in order to maintain continuity at least for the more important aggregates. The most severe problems were encountered in the area of manufacturing statistics, where the most radical structural changes have occurred, particularly within durable manufacturing. Moreover, the 1960 SIC was introduced into the annual census of manufactures statistics in three stages thus necessitating several links in order to maintain continuity. The new industry classification structure was first introduced in the 1960 census and the total activity concept was adopted as of 1961. However, the 1959 statistics were retabulated for some 60 industries which were most severely affected by classification changes so as to provide a year of overlap for linking purposes. A multiple link was required for 1961 to introduce the total activity concept and the 1961 weight base.

7. The revisions to the RDP system published in 1968 do not include the total activity concept for manufacturing. This is being introduced as part of the revisions to the 1961 forward period planned for publication at the end of 1970. At that time the total activity concept will be measured in other industry areas, such as mining and trade, for which statistics on the new establishment definition have become available. In the case of trade, establishment data are only collected as part of the quinquennial census of merchandising and services and have thus far been collected for only two years, 1961 and 1966. The intervening and subsequent years will have to continue to be projected on the basis of "location" sales. For certain other industries, establishment data have not been collected by DBS although extensive surveys exist. Two industries stand out in this respect - agriculture, where the emphasis has been on measuring production of agricultural products, and construction. In the latter case a census of construction trades was started in 1968 with the mechanical contractors as the first area to be surveyed. It is hoped to extend this type of survey to eventually blanket the construction trades. But this is a major development project and will take quite a few years to complete. In the meantime reliance has to be placed on the capital expenditures surveys to provide a contract construction industry universe for production index purposes. For certain other industries, notably in the service area, lack of annual or monthly industry surveys have in the past and

will for the time being force reliance on proxy indicators such as population, employment and deflated salaries and wages. In the majority of cases, however, these annual measures can eventually be adjusted to incorporate at least decennial census results.

8. Thus to a large extent the forthcoming 1970 revision can be considered as continuing the effort to extend and refine the "total activity of establishments" base of the production indexes. This will be done mainly through the incorporation of more up-to-date annual levels. Extensive reliance will be placed on price index deflation, especially for manufacturing industries where revised and improved industry selling price indexes (1961=100) have recently become available for the 1960's. This most recent revision will incorporate improved or revised industry statistics which have become available since 1968 and are relevant to the RDP system. Finally the preliminary industrial distribution of gross domestic product at factor cost for 1961 will be revised as necessary in the light of a detailed reconciliation between the final 1961 input-output table and the revised income and expenditure accounts.

9. A major development project which was carried on at DBS simultaneously with the above work was the development during the 1960's of a monthly real domestic product measures for industries outside the Index of Industrial Production. The basic development work on these monthly measures was completed late in 1968 and as of that time they were computed on a regular monthly schedule but on an experimental basis (with limited, confidential circulation). The indexes stood up to this test quite well. The quality and particularly the timing of these estimates were considerably improved during this experimental period and it was therefore decided to release the monthly real domestic product indexes to the public during the summer of 1970. Since the previously published quarterly RDP indexes were the result of averaging the monthly data, rather than being devised as an independent measure, it was felt that users could benefit considerably by making this general economic indicator available to them at an earlier date. Since the monthly indexes are an integral part of the whole system of monthly, quarterly and annual RDP indexes, revisions to the system as a whole inevitably affect the monthly indexes as well. Hence they too will be revised as part of the general revisions scheduled for publication in late 1970.

10. Following the planned 1970 revisions, it is expected that the production indexes will not require further major revisions until a new weight base period is introduced. It is anticipated that major data improvements will be introduced at that time as a result of substantial efforts being made at the present time in DBS to review and extend establishment based survey coverage and content.

11. The whole thrust of work on production indexes in Canada since the early 1950's has been toward developing a fully integrated and conceptually consistent system of industry output measures. A system, moreover, which is an integral part of the much wider system of national accounts for Canada. The links with such related statistics as productivity measures and input-output tables are very immediate and direct and the work on all these estimates is in fact very closely co-ordinated at DBS. The use of similar data sources also facilitate statistical integration in these areas. The necessity to rely on different data sources in preparing estimates for the income and expenditure accounts makes close statistical integration and reconciliation more difficult with these accounts although there are no essential differences in the conceptual framework. Complete statistical integration will only be possible as part of the general DBS effort to integrate basic surveys as

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closely as possible. Of particular relevance here is the work on the reconciliation of company and establishment data presently available in DBS. This work has an added significance in the context of production indexes in that it should eventually ensure the elimination of gaps or duplication in the collection of input and output statistics from establishments through such measures as comparing returns from establishments of multi-unit companies or enterprises with the consolidated returns, with follow-up as necessary. In the age of computer applications such measures become not only possible but increasingly necessary.

12. Although a fully integrated and conceptually consistent system of industry measures will not materialize overnight in spite of the major efforts being made in this direction within DBS, a number of analytical advances flow in a normal manner from those parts of the system already developed. For example, plans for the development of a medium term simulation model for the Canadian economy call for the use of the 1961 input-output table which is a highly disaggregated table. In updating this input-output table in current and constant prices for more recent years the industry Real Domestic Product worksheets can be used. This is possible because the calculation of industry RDP draws on the full range of available detailed commodity and other establishment data for both the input and output of individual industries. These industry measures and the weights used for combining them are consistent with the 1961 input-output table. Statistical integration, when followed through to take advantage of such logical extensions, can make substantial additions to economic analysis possible.

13. Another area of data development work which is of crucial importance for improving or even maintaining the quality of industry production indexes is the expansion and upgrading of surveys for service-producing industries. This applies not only to the need to obtain regular and frequent coverage of the outputs and inputs of these industries but also to price indexes pertaining to these industries, such as special industry price indexes for railway freight, the wholesale trade industry, accountants or architects services, medical services, etc. Similarly, refining the system of industry output measures further, requires that purchased service inputs, as well as the presently collected material inputs, are collected for all industries at regular intervals. Some exploratory work toward this end is presently being undertaken at DBS. Except for the omission of purchased service inputs, the coverage of goods-producing industries has generally tended to be better in the past. In Canada even today the most complete annual data for any industry area are still being collected as part of the census manufactures. As mentioned above, the only two major goods areas with serious statistical deficiencies are agriculture and construction and work has already commenced on improving the latter. Thus the overwhelming priority for developing an adequate data base does indeed lie in the rapidly expanding service area which has already achieved predominance in terms of employment.

14. Within the service area a major development programme has begun in the context of production indexes in the conceptually difficult non-commercial area. A number of pilot studies have been undertaken over the past two years to probe the possibility of deriving meaningful output measures in the area of federal government administration along the lines suggested in the U.N. SNA documents. It is planned to extend these studies gradually to other non-commercial industries as well. Results so far have been encouraging but the number of studies undertaken is still too small to draw any firm conclusions. This is obviously a long term development project of great interest to output and productivity measurement but the magnitude of the task is considerable and

it will be some time before an interim evaluation of this approach can be made. Should it prove to be successful, a new and major dimension will be added to industry output and productivity measurement.

PRODUCTION STATISTICS AND INDICATORS

FOR INDICES OF PRODUCTION

I. AGRICULTURAL PRODUCTION

Field crops

1. Of the total geographical area of 326.8 million hectares in India, statistics of land utilisation and area under crop are available for 93.5 per cent of the area - for about 76.5 per cent of the area through complete enumeration, for about 5 per cent of the area through random sample surveys and for the remaining 12 per cent through ad-hoc estimates. Thus, only for an area covering about 6.5 per cent of the total geographical area of the country, land utilisation statistics are not available. In this area there is practically no cultivation and the area is covered mainly by hills. Statistics of production of crops are obtained as the product of the acreage under crops and the average yield per hectare. In parts of the country, accounting for 74 per cent of the area, the acreage under the crops is determined through field-to-field enumeration by a village revenue agency. In areas like West Bengal, where there is no such village agency, the acreage is determined through sample surveys. The average yield per hectare is determined from scientifically planned random sample surveys. At present, more than 90 per cent of the production of foodgrain crops is based on cropcutting surveys, although the extent differs for different crops. The coverage of production through cropcutting surveys is, however, to be enlarged in respect of small millets, some pulses crops, and non-foodgrain crops such as rapeseed and mustard, and sesamum.

2. A special feature of the surveys in areas with village agency is that it is dovetailed into the existing administrative structure. Under this scheme of sample surveys, the region to be covered is first divided into strata. Generally an administrative unit like tehsil/revenue circle forms a strata and experimental sample units are selected in three stages. In the first stage, villages are selected with equal probability and from each of the selected villages two or three fields are selected at random as second stage units. A sample cut usually of the size of 1/80th of an acre located at random in the selected field forms the ultimate stage of selection. This procedure is now being used in all the States except West Bengal, Orissa and Kerala. In these States, the sample surveys are carried out for simultaneous estimation of both area and yield. The responsibility for the conduct of the sample surveys for estimation of yield of crops rests with the different States. At the Centre, the

Directorate of National Sample Survey(NSS) exercises supervision over the field work in different States and also undertakes technical coordination and provides guidance for the surveys. The sampling error for the district estimates of the average yield is generally four to eight per cent and for the State estimates, one to three per cent. The total number of cropcutting experiments carried out annually through these surveys is of the order of 100,000 in respect of major food crops and 35,000 in respect of major non-food crops.

3. Forecasts are at present being issued in respect of 35 crops. Usually three forecasts are issued except for cotton for which five forecasts are issued. Certain dates are specified for the issue of different forecasts both at all India as well as State levels. The estimates of production are usually given in the last or final forecast. When the final forecast of a particular crop for a given year is prepared, the final estimate of that crop for the previous year is revised on the basis of more detailed and upto date information relating to area and cropcutting results. Such an estimate is called a partially revised estimate of the past year. Efforts are now being made to extend the issue of regular forecasts for other crops.

4. The cropcutting surveys conducted in India are one of the largest sample surveys carried out in the world. The methodology developed has also been successfully applied in other countries similarly placed as India. For instance, cropcutting surveys of food crops developed in Ceylon, Burma and Afghanistan are largely based on Indian experience.

Fruits and vegetable crops

5. Statistics of production of fruits and vegetables, as at present available, are not based on objective methods of estimation. The problems of sampling and field organisation in respect of horticulture crops are somewhat different from those relating to field crops. Sampling techniques for the estimation of production have been developed by the Institute of Agricultural Research Statistics(IARS) through pilot surveys on mango, banana, guava and lime carried out in different parts of the country. In these surveys, information relating to cultivation practices and area was also collected.

6. The sampling design adopted in all these surveys was two-phase multi-stage stratified random sampling. The tehsils or groups of adjacent tehsils formed the strata. The first stage units of sampling were villages and the second stage units were orchards under the crop in the selected villages. A cluster of trees within the selected orchard formed the ultimate unit of sampling. The primary units were selected with probability proportion to area under fruits or total area under fruits

depending on the information available. At subsequent stages the units were selected with equal probability. Information on items such as extent of cultivation of the fruits under study, number of trees according to varieties etc. was obtained by completely resurveying the selected villages. For the study of yield and cultivation practices of fruits, a sub-sample of villages was selected and within each of the villages in the sub-sample, a specified number of orchards, usually three to five, the growing fruit under study, were selected. Within each selected orchard, a specified number of bearing trees usually 9 to 12 were selected at random to collect data on yield, both by counting and actual weighment of the produce, during the entire harvesting season. The data on cultivation practices were collected by enquiry from the cultivators of the selected orchards. State-wise surveys have also been conducted in order to gain experience of technical and organisational problems connected with the conduct of large scale surveys. Appropriate sample survey techniques have also been developed for estimation of cashewnut.

7. Similar pilot enquiries have been taken up recently to evolve suitable sampling techniques for estimation of extent of cultivation of vegetable crops and their production. The villages growing vegetables in the tract to be surveyed were stratified into three size strata on the basis of recorded area under vegetables during the previous year. In each selected village the fields growing vegetables were enumerated every two months over a whole year and their area recorded. A sample of two fields was selected for each of the major vegetable crops during each two monthly period and one plot of size 5 m x 5 m was located at random in each selected field for recording yield data. The average yield per hectare of different vegetable crops was estimated in the pilot study with a standard error of 8 to 12 per cent.

Condiments and spices

8. The major spices crops produced in India are pepper, cardamom, ginger, chillies and turmeric. The village records maintained in the States growing these crops do not give a comprehensive picture of the area under these crops. Only when the crop is sown as pure, the area under these crops is recorded. The IARS has undertaken pilot investigations for evolving suitable sampling techniques for estimating the production of pepper and cardamom and collecting reliable information relating to the existing cultivation practices of these crops. The design adopted in these surveys was one of multi-stage stratified random sampling. In the case of pepper surveys, contiguous taluks approximately homogeneous with respect to intensity of pepper cultivation, formed the strata. The sampling units at successive stages were a census village, a plot and a cluster of three pepper bearing standards. The

yield data were collected from each of the selected pepper standards by repeated visits of the field investigator on the dates of harvesting. The average yield of dry pepper was estimated with a standard error of two to six per cent in different seasons in different areas.

9. Pilot investigations on cardamom were carried out in the two major cardamom growing States of Mysore and Kerala. Thirty clusters, each of three contiguous estates, were first selected at random from the cardamom estates in Kerala. The data on area under cardamom and the number of cardamom plants were collected from all the selected clusters. But the information on yield and cultivation practices was collected from half of the clusters only. The sampling units at the two stages of sampling were a block, and a plot of one-tenth of an acre. In Mysore, taluks or groups of taluks formed the strata. The first stage unit of sampling was a cluster of two contiguous villages. In each selected village, information on area and number of plants was collected from all the estates. Besides, all the survey numbers in the selected villages were surveyed to record the number of stray plants, if any.

Coconut and arecanut

10. Suitable multi-stage stratified random sampling techniques for estimation of area and production of coconut and arecanut crops were also developed. Administrative units like districts, sub-divisions or groups of tehsils formed the strata. In the States where the reporting agencies existed, villages were grouped to form four strata viz., (i) villages reported to be growing coconut only, (ii) villages reported to be growing arecanut only, (iii) villages reported to be growing both the crops and (iv) other villages. Because of the peculiar conditions in Kerala, the strata were formed by the cross-section of the revenue district with natural region as highland, midland and lowland. The primary sampling units were villages in all the States. The coconut and arecanut palms in all the selected villages were completely enumerated in all the States except in Kerala. Because of high intensity of cropping in Kerala, a sample of ten per cent of plots was selected systematically in clusters of ten plots each for complete enumeration. For estimation of production and collection of information relating to cultural practices a sub-sample of villages was selected from the villages selected for enumeration of trees. In each of these villages thus selected, three gardens were selected at random and from each of these selected gardens one or two clusters of bearing palms were further selected for conducting harvesting experiments. Harvesting experiments were also conducted on stray palms in all the selected villages.

11. As the area under coconut or arecanut is not subject to fluctuations from year to year as in the case of annual crops, it was considered that the design of the surveys should be such as to give estimates of changes in area from year to year more accurately than what is given by the estimates obtained from independent surveys carried out every year. Accordingly 20 to 25 per cent of the villages in the sample for enumeration of trees is being retained and the remaining villages are being selected afresh for conducting the survey.

Statistics of livestock products

12. Official statistics available at present for various livestock products are those compiled by the Directorate of Marketing and Inspection of the Ministry of Food and Agriculture from the surveys carried out some years ago. These surveys were not based on any rigorous probability sampling design and physical weighment but were in the nature of subjective enquiries. The statistics were, therefore, of limited utility for planning of livestock development. Only of late, steps have been taken to investigate sound procedures for collection of statistics of livestock products.

Milk production

13. The IARS initiated a series of random sample surveys in typical areas in different animal husbandry regions of the country early during the Second Plan(1956-61) with the object of developing suitable sampling techniques for surveys of milk production and studying the animal husbandry practices, such as feeding and management. An adequate sample size, a representative sample selected according to an efficient design, recording of data on milk and feeds given to the animals by direct weighment by a trained investigator, and intensive supervision over the field work by qualified animal husbandry staff and statisticians were the salient features of these surveys. Each survey was conducted over the whole year in order to study seasonal variations in production. These surveys have demonstrated the use of sample survey technique as a practical and reliable method of obtaining data on milk.

14. The sampling design employed in these investigations was one of three stage stratified random sampling. The tract to be surveyed was suitably divided into three or four homogeneous geographical strata, each consisting of two or more districts. The primary sampling unit was a tehsil or a group of contiguous tehsils. A group of contiguous villages formed the second stage unit of sampling. A cluster of two to five households was the third stage sampling unit. An animal in milk within the selected household formed the ultimate unit of sampling for estimating milk yield. In the urban

areas, a town formed the second stage of sampling unit from which a ward was selected for further selection of households and animals. About half the number of the primary sampling units selected were followed for observation throughout the year, while the remaining were replaced by a fresh sample during each of the subsequent seasons. A critical study of the data collected during these investigations indicated that a survey conducted in a State on the above lines with a primary sampling unit size of about 300 villages/urban wards would provide estimates with sampling errors ranging from 2 to 6 per cent.

Egg production

15. Pilot enquiries for evolving suitable sampling techniques for estimating egg production were also initiated in the early sixties in important poultry keeping tracts. The field work of these surveys was extended over a period of full one year to study the seasonal variations. Either geographical regions or size groups formed on the basis of poultry population formed the strata. Groups of taluks or sub-division were the first stage units and clusters of villages formed the secondary stage units of sampling. These investigations have demonstrated that sampling methods can be successfully adopted for estimating annual egg production with reasonable degree of precision.

Wool production

16. Surveys were undertaken in early sixties to obtain objective estimates of wool production and reliable information on sheep rearing practices in different tracts of the country. For estimating sheep population a two-stage stratified random sampling procedure was followed with groups of taluks as primary units and clusters of three adjacent villages having sheep as the second stage units. For the estimation of the average wool yield per sheep, selected sheep in each of the flocks of the selected villages constituted the third stage units. The estimates of sheep numbers were obtained with a standard error of three to five per cent and the average wool yield per sheep with an error of one to three per cent.

Integrated surveys for livestock products

17. More recently the IAS has initiated pilot surveys for developing an integrated plan for estimation of all the principal livestock products. The plan envisages conducting in each State a major survey in any given year for obtaining estimate for the production of a specified product (say milk) for the State as a whole with sufficient precision, while at the same time samples on a smaller scale would be canvassed in the same State to secure indices of changes in output of other products (say eggs, meat, etc.) from year to year. Next

year another product would be taken up for the major survey, and so on.

Fisheries statistics

18. Appropriate sample survey techniques have been developed for estimation of fish catch. The IARS conducted a pilot sample survey in the Malabar area on the west coast of the country. For collecting data on count of landing units, a three stage stratified sampling plan was followed while information on catch and other ancillary items was obtained by introducing a further stage of selection. The stratification was according to time-space strata of months and administrative areas. The landing centres, days, time intervals and landing boats were the successive stages of sampling. The technique is now being adopted by the Central Marine Fisheries Research Institute for the estimation of annual catch of marine fish. The basic methodology developed in India has been successfully applied in countries like UAR and Uganda.

19. Reliable statistics of total catch of fish from inland resources are not available. Rough estimates given in the reports of marketing of fish and ad-hoc estimates furnished by the States form the only source of statistics of inland fisheries. A pilot survey covering three districts in the Chilka Lake region of Orissa State was carried out by the NSS in the early sixties. The results of the pilot study showed that a simple combination of water areas in a larger sample with observation of catch in a sub-sample will not alone provide estimates of catch with a reasonable degree of precision except at a disproportionately high cost. Further pilot studies adopting different methods for collection of data are envisaged.

Index numbers of agricultural production in India

20. Index numbers of area under crops, agricultural production and productivity are being issued at the all India and State levels. The basic purpose of these index numbers is to study trends over time, to assess the relative contribution of area and yield to the increase in overall production and to compare the performance of different regions in the development of agricultural production. The base period of the existing all India series is the agricultural year 1949-50. In principle, the index of agricultural production should cover, besides the agricultural crops grown in the country, animal products and fish catch, but in the absence of reliable annual estimates of production of minor crops, livestock products and fish catches, the coverage is limited to 26 principal crops which account for 92 per cent of the gross sown area in the country.

crop coverage of the individual State series varies from State to State depending on the importance of various crops in different States. The concept of area used in the existing series is that of gross area under crops. In the case of index of production, the concept of gross output excluding losses in the field is adopted.

21. As area under crops can be added acre by acre, in the existing series of index numbers of area, no explicit weight is assigned to individual crops. The sub-group, group and all crop indices are worked out by taking the total area under them. There is, thus, implicit weighting in proportion to the area under individual crops to the total area under all crops in the base year. As regards production, weights have been assigned to different crops in proportion to the total value of production of each crop during the base period. The production was evaluated at the annual harvest price during the base year.

22. During the last decade there has been a progressive change-over from the traditional subjective methods of reporting area and production of crops to the method of complete enumeration in respect of area and of random sample survey for estimation of yield, and also increase in the reporting area in respect of different crops in different States. To provide for these changes in coverage and methods of estimation, the present index numbers of area under crops and agricultural production are constructed by the chain-base method. Under this method, the area/production of a crop during a year is expressed as a relative of the corresponding area/production in the preceding year based on the same coverage and method of estimation. These relatives for different crops are linked to the base year through the intervening chain relatives to give area/production index for the crop. The assumptions involved in the method are:

- (i) the variation in production/area in the non-reporting areas is the same as that in the reporting areas in the aggregate; and
- (ii) the relative variation in the figures of production based on the cropcutting surveys is the same as that based on the traditional method of crop estimation.

In order that this method might be applicable in the transitional year, i.e., when the method of estimation of production undergoes a change, the estimates of production should be available on the basis of both the traditional method and the crop estimation surveys.

23. The index number of agricultural production for a particular year is prepared when the final estimates of all the crops included in the index of production are available. When the final estimates of production of a particular crop for a current year are available, partially revised estimates of production of that crop on more detailed information relating to cropcutting surveys are available. As such, the index number of production for the previous year will undergo a change when the index for the current year is prepared. Generally, after a lapse of three years, the estimates of production become fully revised. Consequently, the index numbers of production get finally revised after three years.

24. On the basis of the experience gained in the construction of index numbers at the all India and at the State level, a critical review of the scope and methodology of the existing series was made by a Technical Committee in 1966. A major recommendation of the Committee was that the average of three years ending 1961-62 should be adopted as a common base period for all India and State series of index numbers of area under crops, net area sown, cropping intensity, cropping pattern, productivity per net hectare and agricultural production. The other recommendations of the Committee include the following:

- (i) the base period for index numbers should be revised once every five or at the most ten years;
- (ii) the coverage of the series of agricultural production should be enlarged to include production of important animal products and fish;
- (iii) to bring consistency between the State and all India series, all India indices may be built up from the State index numbers;
- (iv) margins of error of the index numbers should be worked out periodically;
- (v) work on regional index numbers should also be initiated by dividing the State into suitable agricultural regions;
- (vi) when the base period of the index number series is shifted to the triennium ending 1961-62, the new series may be linked to the old series so as to provide fairly long series of index numbers for purposes of assessment of long term trends;
- (vii) for measuring changes in land productivity, a new 'index of productivity per net hectare' should be built up.

Action has been initiated to revise the present series of index numbers and also develop new series on the lines recommended by the Technical Committee.

II. INDUSTRIAL PRODUCTION

25. Statistics of industrial production are collected in India both annually and on a monthly basis. With effect from 1959 an Annual Survey of Industries (ASI) is being carried out. This is a basic industrial enquiry covering the entire registered factory sector. Data under the ASI are collected on a statutory basis under the Collection of Statistics Act, 1953 and Collection of Statistics (Central) Rules, 1959. Factories employing 50 or more persons and using power, or 100 or more persons and not using power are covered on a complete enumeration basis. Factories employing 10 to 49 workers and using power, or 20 to 99 workers and not using power are covered on probability sampling basis.

26. The sampling design is stratified uni-stage, the strata being the State/industry cells and the sampling unit being a factory. A random sample of about 6000 factories (16 per cent) is being selected. It is first allocated to the different industries in proportion to their total number of workers. Sample allocated to each industry is reallocated to the States in proportion to the Statewise total number of workers in that industry. Allocations are modified subsequently to provide estimates with about 10 per cent relative standard error for (i) each industry at all India level, (ii) each State for all industries taken together and (iii) for most of the major industries within States.

27. The industries covered by the ASI are classified according to the National Standard Industrial Classification based on the ISIC. The statistical unit of enquiry is the establishment. The results of the census sector are published in ten volumes in addition to the advance issue giving the provisional summary results. The results of the sample sector are published in the form of a summary report followed by a detailed report. The detailed census reports give seven basic tables for all India and individual States by industrial classification at 3-digit to 5-digit level of classification. The sample sector tables give estimates for industrial aggregates on 3-digit level for all India and usable estimates for two major industrial products in each State. Tabulations, whether in the census sector or in the sample sector of the ASI, are not available at the district level. In case of the census sector the district code is mentioned in the schedules but districtwise tables are not prepared. In the sample sector the preparation of districtwise tables is not possible as the number of units left in each cell would be so small that the

identity of the factories is likely to be disclosed if an attempt is made to tabulate the data districtwise.

28. Estimates of production for the non-registered residual sector have not been prepared on a regular basis. Under the schemes of collection of socio-economic data through the National Sample Survey(NSS), ad-hoc enquiries were made for the collection of production estimates for this sector in relation to household sector in the 7th, 8th, 9th, 10th and 14th rounds. In the 23rd round of the NSS the scope was widened and it was sought to cover production both in the household as well as non-household sectors. Detailed tabulations in respect of the 23rd round are not yet ready but from a preliminary scrutiny of the schedules it appears that some estimates of production in this important sector will come to hand though not at the State or district level or beyond the 2-digit level of the National Industrial Classification. A centrally sponsored scheme of statistical surveys in the States will be launched with a view to collect information with regard to non-factory units employing five or more persons. In the first year, 1969-70, all units are proposed to be listed in the frame by the State SSBs and the Directors of Industries of State Governments. Detailed surveys will be staggered over a period of three years with different groups of industries being taken up in different years on the basis of the all India pattern. The tabulations will also be on the basis of a uniform all India programme. The units of the unorganised non-factory sector employing less than five persons are sought to be covered later.

29. At the instance of the Ministry of Industrial Development, Internal Trade and Company Affairs, selected groups of industries of the small-scale factory sector(factory units having an investment in plant and machinery not exceeding Rs.C.75 million) are being taken up for complete enumeration since ASI-1966. In ASI-1966 and 1967, a complete enumeration was made for small-scale factories of the Metal Group of industries(Basic Metal Industries, Metal Products, Non-Electrical and Electrical Machinery). For ASI-1968 the Chemical Group of industries(Chemicals, Chemical products, Leather and Fur products and products of Rubber, Petroleum & non-metallic minerals) has been taken up for complete enumeration. For ASI-1969 a third group of industries is also proposed to be taken up viz., textiles, wood, etc. Food and the remaining industries will be covered in the fourth group. Thus all the industries will be completely enumerated in a phased programme and a very detailed picture of small-scale industries of the entire factory sector will emerge. Summary results for the first priority group of industries(Metal group) have been tabulated. The bulk of the small-scale industrial units are, however, in the non-factory sector having an employment of less than 10 with power or less than 20 without power. Though the number of such industrial units in the country and their economic contribution are considerable not much statistical

information is available on a comprehensive all India basis for this sector, there being no regular collection of information about them. Some ad-hoc surveys have been conducted in different States from time to time, but they have followed no uniform pattern in terms of scope or coverage. From such surveys neither comparisons are possible nor can an all India picture be drawn.

30. Yet another type of production data is available on a monthly basis. These statistics relate to finished-goods only. The basic material for this publication is collected from 14 different authorities some of which collect data on statutory basis while others collect the data on a voluntary basis to meet their administrative needs.

31. Whereas the coverage of the annual series under the ASI is uniform and relates to the total output, in case of monthly statistics this is not so. The coverage of the monthly series varies from source to source and is fixed with reference to their administrative needs. The index of production in India is based on the monthly data and although for this reason the coverage of the index is not complete, it is believed to give fairly reliable trends of total production. The basic underlying assumption is that the production trends of the items not covered by the index are the same as the items which are included in the index. Continuous efforts are, however, being made to improve the coverage of the index of industrial production. It might be added that no effort has been made so far to compile the index of industrial production on the basis of the annual series of basic statistics collected under the ASI although the weighting diagram of the index is based on the value added by production at the 3-digit level of classification in the base period.

32. The year 1960 is taken as both the comparison base and the weight base of the current index of industrial production. The index is calculated every month covering 315 items of products. An annual index is also calculated covering 124 additional items for which annual production figures alone are available. The weights have been distributed on the basis of value added. In case of mining, the value added was estimated from returns collected by the Indian Bureau of Mines. In case of manufacturing sector, this was estimated from the Annual Survey of Industries 1960, after adjusting for non-response. In case of Electricity this was obtained from the Central Water and Power Commission. The items of the index are classified according to the National Classification of Industries. The weights are given in proportion to value added by manufacture at 3-digit level of industrial classification. For groups and sub-groups within the 3-digit level of classification of industries, the weights are given in proportion to value added by manufacture, if available, otherwise in proportion to gross value of output. The weights

have been allotted to all the 439 items. At the time of calculating the monthly index, the weights of items not covered in the monthly index are dropped at the ultimate level of classification of such items. In other words, the weights allotted at the 3-digit level and above are fixed. The index is calculated by the formula of weighted average of production relatives. The indicator chosen for calculation of the index is physical output generally. In case of machinery group only the production by value is used. The index from value series is deflated by the wholesale price index of the machinery group. To the extent the deflator is not based on the representative items of the machinery group the index of industrial production shows the weakness of the wholesale price index of the machinery group.

33. The general index is first calculated from actual production figures. This is called the crude index. It is then adjusted for seasonality by seasonal index numbers - calculated from the monthly crude index numbers starting from 1960. The seasonal index numbers are calculated by the method of moving averages and revised at the end of each year by including the crude indices of the year that has closed.

34. The index is calculated every month. Its usefulness depends on the speed with which it is available. It is, therefore, necessary to strike a balance between the increased accuracy derived from a larger number of items in the output series and the quick availability of the index based on a shorter but representative series. Because of this a selected number of items in each industry group is included in the index to represent that industry. The faithful presentation of the trend of production by the index depends upon the series so selected.

35. In selecting the indicators, it is found that in certain groups of industries the available production series are deficient in the sense that they are not available covering all the items manufactured in those groups. In such cases, one thinks of substitute series if the same are available and can be made use of. Failing that, industrial groups for which data are not available have to be omitted. In case of omission, however, though not explicit, it is assumed that output of industries omitted taken collectively moves with the index of output of all the other industries.

36. The above assumption may give a satisfactory index for the industry as a whole but it may be less so for groups and sub-groups covering a smaller field. That this is so in certain cases is evident from the index of industrial production compiled in India. The index of industrial production is calculated every month covering certain selected indicators for which regular monthly data are available. As a supplementary exercise an annual index is also calculated where additional items are included. For these additional items the monthly production figures are not available. But their annual production

figures are available. The general index calculated on the basis of monthly indicators and the index covering additional items show more or less comparable trend.

37. The most commonly used indicators for the index of industrial production are of four types, viz., production in physical units, deflated value of production, input of materials, and employment. In India the physical output and the deflated value of output in the case of machinery items are used, as discussed in the succeeding paragraphs. Input and employment which are substitute series have not been used in the compilation of Index of Industrial Production in this country.

38. The type of indicator which is normally considered best is the record of the physical quantities of the goods produced i.e. goods 'completed' by the industry. This indicator is preferred because it relates directly to what we want to measure. But its reputation as an indicator is not so well deserved as it might appear. The trouble arises on two counts; most industries produce a large number of different products and most products vary considerably in quality. The first demands collection of data for a vast number of 'items' or 'headings'. The second involves collection of industrial statistics with reference to specification of items produced. The task of compiling a perfect index, therefore, becomes difficult though not impossible, if such theoretical requirements are to be accommodated.

39. The first requirement if not fulfilled may lead to an error from incomplete coverage of all the various products. Take for example, the case of chemical industry where the number of different products is very large. Monthly and even annual statistics are not available for a vast number of them. Hence statistics of selected products and product groups are used despite the obvious danger that selection will not show the same movement in output as the industry taken as a whole might show. It is really difficult to say to what extent the error arising from incomplete coverage exists. Further, new products which develop after the index is started have no chance of being selected until the next revision of the index. To that extent also the index remains deficient.

40. In using the production in physical units as indicator for the index, another type of error may arise. This is known as an error from inadequate analysis of the product. Take for example the case of pig iron. It is an aggregate of various types of pig iron - basic foundry and others. If the proportion between varieties changes from what it was during the base year, the indicator pig iron will not measure correctly the movement in the industry's output. The risk of errors from

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such a situation could be reduced if statistics of different types of products are collected for purpose of using as indicator in the base period.

41. The value of goods, produced by the industry in a period is also a type of indicator. This type of indicator has the merit of providing a single figure to cover a large and varied assortment of goods for which there would have to be a correspondingly large number of separate series if the output were recorded in physical terms. The manufacture of machinery is such a group where specification of products plays an important part. The collection of statistics by specification for varieties of products is a formidable task. We are, therefore, using value of various items of machinery produced as indicator for this industry. As stated earlier to eliminate the effect of price upon the indicator, the value series is deflated by the index of wholesale prices.

42. It is felt that a basic choice is involved as regards industrial surveys. Either, one can have a survey every year, as at present, or else, there can be an establishment census once every five years, summary data alone being collected during the intervening years. Again, a benchmark survey every five years may be combined with intensive surveys in one or two States during each of the intervening years. As far as the index of industrial production is concerned, the problem in India is to organise the timely flow of requisite data direct to the authority which is charged with the responsibility of bringing out the index. This will ensure the uniformity of treatment in respect of all groups in matters of coverage, methodology of data collection and presentation. Another important problem relates to the close examination group by group of the items constituting the index so that it can be determined whether they adequately represent the production trends at the group level.

Production Statistics And Indicators
For Indices Of Production

AGRICULTURE

1. Introduction

In a developing country as in Tanzania, agriculture is predominant among all the sectors. The value of agricultural output in 1968 has been estimated as Shs. 2,973 millions, accounting for about 40 per cent of the G.D.P. The role of agriculture remains crucial as internal resources for development will continue in near future to come largely from increased agricultural production. Agricultural commodities at present account for nearly three-fourths of total value of domestic exports.

The sectors of agriculture can broadly be divided into four sections, namely, crop husbandry, animal husbandry, forestry and fishing. Crop husbandry is the major one with 70 per cent of the total value of agriculture. The collection and compilation of primary data is made mainly by the Ministry of Agriculture, Food and Co-operatives and the Bureau of Statistics in the Ministry of Economic Affairs and Development Planning who, in their turn, depend on various regional and district returns and marketing organizations for obtaining periodic statistics on agricultural production. Apart from these, several surveys on various agricultural aspects have been conducted mainly by the Bureau of Statistics, Ministry of Agriculture and F.A.O.

2. Statistics on Agricultural Production

a) Crop-Husbandry

The marketing of all major export crops like sisal, cotton, coffee, tea, tobacco, pyrethrum, etc., are controlled by various marketing Boards and the production statistics in respect of their crops are, by and large, reliable. The statistics of production of food crops like maize, paddy, etc. on the other hand, are sadly inadequate. Household consumption data as well as data regarding marketing of crops outside official channels are grossly incomplete. Available data on cost of production are also very meagre. The Bureau of Statistics has just completed the fieldwork of a nationwide household budget survey whose results should be extremely useful in evaluation of levels of household consumption and also in throwing light on some of the gaps in information such as production cost, sales etc.

b) Animal Husbandry

Statistics on sales of livestock at primary and secondary markets as well as exports of hides and skins are available from Ministry of Agriculture; but there is no regular collection of comprehensive data of livestock products like meat, milk, eggs etc. The results on the current household budget survey would be useful in the estimation of livestock production for sales as well as for subsistence consumption.

c) Forestry

Output of sawlogs, poles and firewood from all public lands and forest reserves are available from Forest Section of Ministry of Agriculture; but the records of timber cuts are not complete. A study of Wood Consumption and Requirements was undertaken by F.A.O. in 1960-61 which still serves as a basis for projection and analysis. Presently a Forest Industries Development Project (FAO) is also engaged in improving the availability of statistics of production of forest products.

d) Fisheries

The Fisheries Section of Ministry of Agriculture provides information on quantity of fish landed at all inland and coastal waters, though in sufficient detail only in respect of Lake Victoria. However, in the absence of co-ordinated marketing facilities, the information available is still incomplete. During 1961-62 a survey of Marine and Inland Fisheries was undertaken jointly by F.A.O. and Kilimo to provide a seasonal coverage of the major fisheries, both inland and marine, in the fields of production, marketing and processing.

3. Agricultural Surveysa) General

Several surveys covering different aspects of agriculture have been conducted by the Bureau of Statistics from time to time. The estimation of crop harvest from acreage and yield surveys has not been very successful on account of their incomplete coverage and inadequate sample size resulting in estimates with higher error margins.

b) Census of Agriculture

Tanzania is participating in the Programme of the 1970 World Census of Agriculture by F.A.O. It is expected that the census would provide, among other basic data, reliable statistics on agricultural production. With proper sampling design, it should be possible to obtain reliable estimates of production of crop husbandry and livestock, even at the regional levels.

4. Indicators for indices of Production

No attempts have yet been made to compile regular indices of agricultural production though in future it should be possible to start an index number.

INDUSTRY

Between 1956 and 1963 Tanzania conducted some surveys of industrial production every other year. These surveys had several limitations in both coverage and scope and were carried out more as ad-hoc exercises than as regular enquiries.

Since the establishment in 1965 of a permanent division within the Bureau of Statistics to deal with industrial statistics more extensive and comprehensive surveys of industrial production have been conducted by the Bureau of Statistics annually. These surveys cover various items of inputs and outputs as well as capital expenditure and installed power capacity mainly

in manufacturing industries. Although for the past two years both mining and the generation and distribution of electricity have also been included in these annual surveys a considerable amount of information relating to these sectors can be compiled from administrative sources. The construction activity has not so far been covered in these annual surveys.

Among the major problems faced while conducting surveys of industrial production have been lack of adequately trained personnel, lack of suitable facilities for processing the data as well as for printing the results - all of which have resulted in long time lags between the carrying out of the surveys and availability of the results to the various users. With the implementation of Tanzania's plan for statistical development it is hoped that gradually solutions to these problems will be found.

The construction of a stable index of industrial production demands the availability of reliable series of data not only annually but also monthly or quarterly. As we in Tanzania are only in the process of establishing a system of industrial statistics we have not so far attempted to construct such an index.

A start was, however, made in 1969 to expand the coverage and scope of a monthly survey of industrial production which had up till then been restricted to compiling only the volume of industrial production of a selected group of industries. The new monthly survey covers in addition to volume of production, value of such production (with major products itemised), data on employment and earning, details of working (covering number of shifts and man-days worked) as well as sales and exports.

It is hoped that the results of this monthly survey together with those of the annual surveys will provide enough material to enable the construction of a stable index of industrial production for Tanzania using various indicators as appropriate.

PRODUCTION STATISTICS AND INDICATORS FOR INDICES OF PRODUCTION

1. In the national accounts of the United Kingdom gross domestic product at constant prices is measured in three ways: from income data, from expenditure data and from output data. In the last case, the gross domestic product is estimated to be the sum of the output of all industries, whether the output is in the form of goods or services. All these industries are classified under the Standard Industrial Classification, but there is a further subdivision of industries into those covered by the Index of Industrial Production and those falling outside it. The industries so covered are mining and quarrying, manufacturing, construction and gas, electricity and water (ie Orders II to XXI of the 1968 SIC). The boundary for this index of production is determined primarily by the quinquennial census of production which covers the industries mentioned and also partly by the availability of monthly and quarterly data on output. The concept of production limited to these industries has many practical uses, and is so recognised internationally.

Index of Industrial Production

2. The purpose of this index is to show in one series the changes in the volume of activity in the industrial sector of the economy as a whole. Within this aggregate, the main component, manufacturing as a whole, is separately distinguished. In concept the index measures changes in the aggregate net output of the industries covered, ie the difference between the gross output of products and services and the input of materials, products and services provided by other industries, adjusted for changes in the levels of stocks and work-in-progress. The base year for the current index is 1963.

3. In addition to the main index of industrial production and the index for manufacturing, certain other sub-index numbers are compiled, the purpose of which is to give some general indication of the main contributors to the overall changes.

4. For the compilation of the current index of production 892 individual series with separate weights are combined. These separate series can, of course, be amended in scope, unit of measurement and frequency as better information becomes available.

5. There are three main ways of measuring gross output, viz:

- (1) quantities delivered or produced. The advantage of this type of indicator is that it does not have to be adjusted for price changes, and is most satisfactory where output is in the form of a continual stream of homogenous products. However, an industry may produce a large number of products which cannot all be covered by a physical output series, or may produce goods of the same general description (eg metal castings, machine tools) which vary in quality or technical specification. A price basis has to be used in combining them together and the problems of pricing arise again.

- (ii) deflated values of goods produced. Information about the value at current prices of an industry's output is often most readily available from a firm's records. It includes all output however varied and automatically takes into account new products. The accuracy of the deflated series is, however, critically dependent on the accuracy of the adjustments made for price changes, including adjustments for quality changes.
- (iii) inputs. These indicators are used only where more direct measurements of output are not available, the assumption being that changes in the amount of work done in an industry is proportional to the change in the use of one of the factors of production. Raw materials provide the best information in these circumstances, though the actual information available may not relate to the amounts consumed by an industry during a given period, but only to the amounts delivered by a supplying industry, thus masking any effects of stock changes. As a last resort, the number of persons employed may be used. The objections are obvious. Generally, the only information available relates to numbers on the pay-roll and takes no account of hours actually worked. Nor does this method make any allowance for changes in labour productivity.

6. The types of series used in the current index of production can be seen from the following table:

	No of series	Percentage of weight
<u>Output</u> (i) Quantities produced	676	42.8
(ii) Deflated values	160	43.8
<u>Input</u> (i) Materials received	50	11.2
(ii) No of persons employed	6	2.3

It is impossible in practice to cover the whole of industrial output by means of production series directly related to particular classes of goods. The percentage coverage of the overall index or its components is estimated by expressing the value of the gross output of the products represented by the indicators used as a percentage of the total gross output of the industry as shown by the Census of Production for 1963. It should be noted, however, that where the output of an industry is represented by an input series, it is assumed that this is a proxy measure for all the work done. Similarly the value of total sales of all products is also assumed to represent all the work done (except where an industry did work on its own capital account). On this basis it is estimated that 94% of total output is covered by the 892 individual series. In terms of SIC Order, the coverage ranges from 80% for the chemical and allied industries (Order V) to 100% for engineering, shipbuilding and construction.

7. Finally all the series to be used in computing the index for a given month will not have become available, certainly not in final form, at the time when the overall index is being prepared. Some of the monthly figures are revised when more comprehensive quarterly figures are received. In addition some information is

received only quarterly and these figures are not usually available until three months after the end of the quarter to which they refer. The consequence of all this is that when the overall index is being prepared only about a quarter of the information can be regarded as firm. But if the index were collated only when complete and firm data were available there would be a delay of between three and six months before the index for a month could be issued. Moreover, from time to time individual series undergo improvement and revision so that figures which had hitherto been regarded as final may occasionally be revised back for several months or in some cases even years. These adjustments and revisions necessarily lead to corresponding revisions in the index, although only the larger ones will have any noticeable effect on the total index.

Production of the Engineering Industry

8. So far the paper has briefly described only the general structure of the Index of Industrial Production. Some of the statistical and operational problems which arise may be more clearly seen by examining in more detail the methods by which some of the sub-indices are compiled. The area chosen is the engineering industry:

- a) because it is an important sector of manufacturing industry;
- b) the present system has been operating for 12 years and the results obtained from it can be examined statistically;
- c) it exemplifies most of the types of problems likely to be encountered in the general approach to measuring industrial production outlined in the previous paragraphs.

The Comprehensive Enquiry (KS/Eng)

9. The KS/Eng enquiry was introduced by the Board of Trade in 1958 as a means of obtaining comprehensive and timely indicators of trends in output and orders for the very important mechanical and electrical engineering sector of industry. Prior to 1958 current statistics for these industries had been based on a large number of separate forms, each for a separate category of products. Many of these forms were completed at quarterly, or longer, intervals while the figures for some items were incomplete and some types of production were not covered. Estimates of changes in the activity of the whole group of industries had therefore to be based on inadequate and out of date information. Attempts to improve the timing and coverage of the existing separate enquiries would have made expensive and time-consuming demands on industry and government.

10. Under the present scheme figures of delivery and orders on hand are obtained from mechanical and electrical engineering establishments classified to Orders VII-IX of the Standard Industrial Classification other than ordnance and small arms (ie the enquiry covers establishments classified to Minimum List Headings 331-369 excluding 342). From 1958 all firms in these industries employing 25 or more persons were asked for returns of their total deliveries and orders on hand, separately

distinguishing those for export, analysed under a number of headings relating to broad categories of products. Many firms, including all the largest, are asked for monthly returns, the remaining firms for quarterly returns. From these returns monthly estimates are made of changes in the activity and order position of the group of industries as a whole to provide the Orders VII-IX components in the Index of Industrial Production as well as many other indices. These totals are finalised when the quarterly returns have been received and at this stage the data relating to deliveries and new orders for each heading on the form can be made available.

11. In a complicated field such as engineering this type of comprehensive approach ensures that firms with activities falling within several different headings are covered without omission or duplication while making it possible to achieve consistency of treatment and economy of operation.

12. Firms are asked to report their deliveries (ie despatches from makers' works) during the period covered by the return at net selling values defined as the amount charged to customers less such items as purchase tax, discounts, agents' commissions, allowances for returnable cases etc. The output covered consists of deliveries of the products covered by the return, plus the amount charged for other work done for customers, capital equipment made for use in the unit covered by the return and charged to capital account, and the value of goods made by other firms from materials given out to them. Goods sold without being subjected to any manufacturing process (merchanted or factored goods) are excluded. Orders on hand at the end of the period covered, that is the value of orders booked but not delivered, are reported on the same basis as deliveries as far as possible.

13. Firms are asked to allocate their deliveries and orders on hand to product groups defined so as to correspond as closely as possible to characteristic products of the MLHs and subdivisions of Orders VII-IX of the SIC. There is, however, some duplication between headings and within headings to the extent that firms purchase for incorporation in their own products certain goods produced by other manufacturers and returned as such.

14. The quarterly figures of deliveries and orders include estimates for missing returns but not for the output of small firms employing less than 25 persons nor for firms outside the industries covered by the return but who make goods of the kind covered as a subsidiary activity.

Use of KS/Eng Figures

15. The first use to which these figures are put is in the calculation of the Index of Industrial Production by the Central Statistical Office. Monthly provisional figures are supplied to be amended or confirmed when the full quarterly data becomes available.

16. In addition index numbers of deliveries, orders on hand and net new orders are published in total as well as for both home and export markets. These index numbers are used extensively

within economic Departments as indicators of past and future trends. These index numbers are also provided monthly and amended in the light of the full quarterly data.

17. Further index numbers of deliveries, orders on hand and net new orders are provided for capital goods, for total, home and export markets and broken down between mechanical and electrical, heavy and light. These index numbers are only provided quarterly.

18. Actual value figures of deliveries, orders on hand and net new orders for the various headings shown on the forms are also produced and published.

19. In addition to these regular and systematic uses to which the KS/Eng figures are put, there are a great many ad hoc exercises within the mechanical and electrical engineering industries where these figures are at present very useful - concentration of particular industries, export performance of different firms, product mix within a company. Some of these will ultimately be obtainable from the new quarterly enquiries to be conducted over the whole of manufacturing industry by the Business Statistics Office, but our experience of conducting both the KS/Eng and the more detailed enquiries shows that the former will always provide the more up-to-date information because the response is much quicker.

Method of Calculation

20. It will be noted that the information obtained from the comprehensive engineering enquiry provides both monthly and quarterly information about the output of the industries. In the quarterly case, information is processed at the Minimum List Heading level to produce index numbers of each industry and combined into an index at Order level (group of industries eg Mechanical Engineering) using net output weights of the constituent industries of the Order. In the monthly case information is processed at Order level only, to give provisional indicators of changes or output at that level of aggregation.

21. The method of calculation is essentially a simple one whereby information relating to the current period is linked to comparable information for an earlier period. The link is produced for each industry or group of industries by obtaining a matched set of returns for the current and immediately preceding period, that is a return for the current period from a reporting unit is used only if the same reporting unit made a return for the immediately preceding period also. The two matched sets are aggregated to produce totals T_i and from these a link L_i can be obtained. When the quarterly index is being calculated, the link is simply:

$$L_{it} = \frac{T_{it}}{T_{i(t-1)}}$$

Where i = industry
 t = period
 T = total of the matched sets

22. All firms with over 25 employees are asked to respond to the quarterly enquiry. For the monthly index a sample of firms only is approached. This sample is broken down into 3 size strata: all large firms are included, 1 in 5 of medium firms and 1 in 10 of small firms. Each return is then weighted by the reciprocal of the sampling fraction and the link therefore is:

$$L_{it} = \frac{\sum_{j=1}^3 W_j T_{ijt}}{\sum_{j=1}^3 W_j T_{ij}(t-1)}$$

$$W_j = 1, 5, 10$$

In both these cases the link is used to derive a total value of output, Y_i for the current period:

$$Y_{it} = Y_{i(t-1)} L_{it}$$

When an estimated total value of output for the period has been obtained it is then:

- I. corrected for the number of working days in the period
- II. deflated by the appropriate wholesale price index
- III. divided by the base period value
- IV. combined with other indices by net output weights

i) In the simplest possible form the correction for working days is the ratio of the number of working days in the base period to the number in the current period:

$$\frac{D_{i0}}{D_{it}}$$

ii) The wholesale price index is a Laspeyres index with base year gross output weights of the form:

$$\frac{\sum_j P_{ijt} Q_{ijo}}{\sum_j P_{ijo} Q_{ijo}}$$

A simple index for industry i is therefore:

$$I_{it} = Y_{it} \times \frac{D_{i0}}{D_{it}} \times \frac{\sum_j P_{ijo} Q_{ijo}}{\sum_j P_{ijt} Q_{ijo}} \times \frac{1}{Y_{i0}}$$

For a number of industries each with net output weights V_i the combined index will be:

$$I_t = \frac{\sum_i I_{it} V_i}{\sum_i V_i}$$

This index is then seasonally adjusted. This is done by a multiplicative factor obtained by means of the Shiskin method. (Census Method II X 11 variant)

23. Observation of the way in which the current system and its predecessors have operated over the years, backed up by a limited amount of statistical analysis, has given some clues to the factors affecting the timeliness and reliability of the index numbers thus produced and to the statistical defects to which such a system is prone.

24. As has already been said, there is a general desire to have both accurate and timely indicators of the levels of and changes in industrial production. The comprehensive engineering enquiry provides the basic data from which the sub-index numbers are derived and these form an important ingredient in the calculation of the Index of Industrial Production itself. It is therefore particularly important to see by what means the engineering enquiry can be made more reliable, without increasing the time taken to collect and process the data, and without imposing undue additional burdens on industrial respondents. In principle there are two main ways by which some improvement might be achieved, by administrative action or by improved statistical analysis and procedures.

25. There are a number of imperfections which appear capable of improvement by administrative action. Unfortunately closer examination shows that the improvement either in reliability of or timeliness likely to be achieved by this means alone is not very great. Indeed in a complex enquiry such as the one into engineering deliveries, a good deal of effort is required merely to maintain the system at its present level of efficiency.

26. There are a large number of factors which affect the speed with which respondents reply to an enquiry. Their relative importance is difficult to estimate and they do not necessarily remain constant over time. Some of them stem directly from the design and operation of the enquiry itself; some are completely external to it. In the first category are:

- a) the apparent complexity of the enquiry form;
- b) the ease with which respondents can obtain the data;
- c) respondents' familiarity with the style of the enquiry. A change of form design can significantly affect response for a time.
- d) the ability to identify key contributors to particular cells of an enquiry;
- e) the effectiveness of the methods used to remind non-respondents;
- f) the speed and reliability with which data can be processed.

There are also extraneous influences which from time to time can assume considerable importance. For example, when significant structural changes are taking place within an industry, typically by mergers, or organisational changes are occurring within a firm, often consequent upon a merger, the management information system is radically altered and the individual employees of the firm, with whom some personal rapport may have been established, change

also. This can seriously interrupt, or at least delay, the flow of information. Secondly, the speed of response may be affected by the political or business environment. When the industrial community feels itself out of sympathy with the Government of the day, it may react by refusing the answer Government questionnaires quickly. When pressure on resources causes firms to try to cut down on their 'unnecessary' overheads they may respond similarly. In this respect the comprehensive engineering enquiry may be thought to be particularly vulnerable since it is voluntary though even enquiries, response to which is a statutory requirement, may suffer if not by refusal to respond at least by a slowing down of the rate of response.

Statistical Problems

27. There were a number of reasons why the index numbers derived from the comprehensive engineering enquiry were not subjected to detailed scrutiny until relatively recently. Until the end of 1968 the index appeared to be relatively stable and consistent with movements in the Index of Industrial Production as a whole, and there were other more pressing problems associated with the development of short-period commodity enquiries for engineering for which there was a growing demand. However, during 1969, the index began to display an unusual volatility. With hindsight, it can be seen that a good deal of this can be attributed to operational changes in the system of data collection and processing introduced at the beginning of that year. A new form of enquiry was instituted taking into account the most recent (1968) industrial classification, and this gave rise to some of the problems outlined in the previous section. At the same time the data was processed by means of a new computerised system, which for a time suffered from unforeseen difficulties both in the hardware and software. Nevertheless, these difficulties provided the occasion for a more fundamental examination of the system from the statistical point of view and highlighted the importance of a number of assumptions on which the system is based. It became clear that insufficient was known about the validity of these and the extent to which the results were sensitive to errors in them. These are currently being investigated. Among the more important assumptions are:

- a) Early returns are not biased in any way or at least not significantly;
- b) The speed of response does not vary with size of firm;
- c) Deliveries in a period bear a constant relationship to the number of working days in that period;
- d) Deliveries of goods which are the principal products of an industry are a good proxy measure of the total deliveries of that industry;
- e) Deliveries of goods have a constant relationship to output (eg to work in progress);
- f) The structure of firms in the sample does not change rapidly ie when a firm has been assigned to a particular size structure it is unlikely to move out of it for a considerable time;
- g) The error associated with the wholesale price index used as a deflator is not significant.

28. A study to investigate these problems should make a significant contribution to our understanding of the behaviour of this index and indeed indices of this general type. It has become the more urgent in the case of engineering, however, since in a year or so a radical change in the data collected for the purpose of constructing this index will be required.

29. By that time the new system of quarterly sales enquiries, managed by the Business Statistics Office, will be progressively introduced throughout the engineering sector. These will in many cases be a good deal more detailed than present enquiries, where they exist at all, and apparent duplication with the existing form of comprehensive engineering enquiry will be marked. Such duplication, if allowed to persist, is likely to have adverse effects on the response rate both to the new quarterly sales enquiries and to the comprehensive engineering enquiry. It has been decided, therefore, that this situation should be avoided completely or at least reduced to a minimum.

30. In formulating proposals for a new-style enquiry we have the following objectives in mind:

- a) It should be a monthly enquiry not a monthly/quarterly enquiry as at present;
- b) It should be an 'industry' enquiry not a hybrid industry/commodity enquiry as now. This would mean that reporting units classified to an industry (at Minimum List Heading level) would be asked to report total deliveries only. No commodity detail would be sought and the complexity of the engineering form thereby reduced;
- c) It should, if possible, be conducted on a sample basis;
- d) Some estimate should be made available, at least within Government, of the probable error associated with the index number produced and by implication with the change in output as measured by the movements of the index.

Work is, therefore, proceeding in association with the Central Statistical Office, the Business Statistics Office and the University of Edinburgh, on the basis of which it is intended to design the new system. It remains to be seen, however, whether the objectives above and particularly (c) and (d) can be achieved.

31. The preceding paragraphs have been talking solely in terms of an index of production based on figures of total deliveries. The KS/Eng comprehensive engineering survey collects figures of export deliveries also, plus figures of orders on hand both total and export. The investigation of the basic data, which is discussed in the following paragraphs should be considered to apply to both orders and deliveries.

Purpose and Methods of Investigation

32. The present investigation has three main objectives:

- 1) To extract as much descriptive information as possible from individual firm's data in order to produce a

greater understanding of the characteristics of the population.

- 2) To produce some measure of the variance of the calculated links and discover whether any bias arises in our estimation methods.
- 3) To make recommendations on the most suitable sample enquiry to be used when the new quarterly comprehensive BSO enquiries start.

In order to satisfy the first objective distributions are being produced of the estimated or actual annual values of the population by size of firm. This part of the exercise will test out ability to access the information at present on the computer but it will also provide a useful description of the population. This can be done on both deliveries and orders, and if necessary on sub-sets of the total figures eg for particular products.

33. Bias in our estimates can arise from the pattern of response and an investigation of the early responders performance in relation to late or complete response will be undertaken. Bias may also arise from the chained linking method described in section 3.12-14 of the Table Processing System Specification and a theoretical investigation of this method is desirable.

34. It is not clear at this stage whether a measures of the variance of the links in the normal probability sense is possible. It has been suggested that an analysis of variance approach might help to isolate some factors which contribute to the oscillations in the index thus leaving some basic 'random' element of variance.

35. This analysis of variance may also be useful as a means of identifying suitable stratification criteria. Four criteria which are considered worth investigating are stratification by size, industrial classification of firm, products of firm and length of order book (ie orders on hand divided by deliveries). As a result of these investigations it may be possible to suggest an acceptable sample of firms to be used in future.

36. For these variance investigations the percentage change between one period and the next seems the most appropriate observation to use as this measure forms the basis of our indices. This raises the point of whether ratio methods should be used in order to calculate the variance.

MEASURABLE CONCEPTS IN SOCIAL STATISTICS

This item is interpreted as relating to the problem of developing measurable concepts capable of integrating social statistics, which has been discussed rather widely recently. (A recent discussion of a working group of the Conference of European Statisticians is particularly pertinent and, for ready reference, a summary of its report is given in the Appendix, which also gives other references.) Accordingly, this paper does not deal with specific developments in Australian statistics of education, health, crime, etc., though many of these have involved the development of measurable concepts.

2. The development of national accounts over recent decades has led to an integration of statistics, whereby statistical series relating to economic activity and to financing are seen not only in their own right but as fitting into an apparently all-embracing framework. The defined economic aggregates of production, consumption and investment, the business classification into legal ownership categories, and into industries, and the parallel flow-of-funds, national balance sheet and input-output accounts are evidence of the possibility of a consistent overall appraisal of the economy and exert a powerful influence towards the development of statistics which will improve that appraisal. The fact that all measures are in terms of monetary units is an essential feature of the accounts. Parallel with the value statistics in many of the constituent series are quantity statistics, and links between quantity and value in the form of prices or unit values are in themselves important statistics.

3. Demographic and social statistics present a set of measures which cover a different field from that covered by economic and financial statistics. So much so, that it is possible to consider economic statistics and demographic statistics as being separate areas, complementing each other and overlapping in many ways, but also contrasting. It is therefore possible to concentrate on their differences rather than their similarities.

4. Because this paper deals with the search for national measures of population, population movement, social conditions and social activities, a distinction is made between these measures and economic measures integrated into "national economic accounts".

5. One contrast between these measures is in the overriding importance of flow statistics in the economic accounts. Although information on assets and liabilities may underlie some of the economic accounts, the latter are almost exclusively statistics of flows. By contrast, many demographic and social measures will be in terms of stocks, the population census itself being an important stocktaking measure. Nevertheless, there are important flow statistics in this field - migration, vital events, visits, hospital admissions and discharges being examples.

6. A second contrast lies in the use of the monetary measuring unit throughout the economic accounts, whereas in demographic measures the unit is the person, and in social measures the person is again the most important unit although units such as families, households, schools, hospitals and other institutions are used.

7. The monetary unit is, however, often used in the common ground between the economic accounts and the social measures. Insofar as social activities involve monetary expenditure, the relevant money flows have a place in the national economic accounts, for example, government expenditure on education and health services, and private expenditure on these services. There are also certain social measures evaluated in money units which are not included in the present economic accounts - for example, the sources of income and details of expenditure in different types of household and socio-economic groups, or groups of different education levels. The criteria for a definition of "poverty" are essentially social measures, and are drawn largely in terms of money. Extension of economic accounts into the area of "distribution of income", which is under development by national income statisticians, ought to yield social statistical measures. Interest by the International Association for Research into Income and Wealth in extending the national economic accounts usefully into the social field is evident from the agenda of that Association's recent and projected meetings.

8. Examination of national economic accounts will throw little light on, say, the composition, characteristics or distribution of the population or on its activities which fall outside of the definition of economic activity. The national economic accounts deal most fully with the economic activity of production, although significant productive activity may lie outside its boundaries. Its necessarily arbitrary boundaries are rather more restrictive with regard to consumption because so much of the consumption which makes up the quality of life is produced outside the market - the free gifts of the national environment, clean air, health and leisure, for example. Hence, there is an immense field of activity for social statistics to chart beyond that part which is comprehended by the national economic accounts.

9. An interface between economic activity and social activity can be distinguished in many situations. Household consumption expenditure gives many examples where the purchaser's activity is of social interest because it bears on nutritional, recreational, educational, health or cultural matters whereas the seller's activity is economic. This is also true of the teaching situation, where the teacher is economically active but the pupil is not.

10. It is not possible to point to an all-embracing framework for demographic and social statistics like that for economic accounts. The population census is, however, a most important integrator of demographic and social statistics. It has long been the chief source of demographic material, although it has had less to contribute on education, health and welfare and other social matters. It yields information on housing and households, on the degree of urbanisation, as well as individuals' occupational and professional skills. It is being developed to yield educational information and, in some countries, income. Incidentally, it also yields economic information, one set of questions being described specifically as relating to "economic activity" and it contributes certain benchmarks for series in the economic accounts.

11. Substantial intervals of time must separate the censuses of population. Ten years is the commonest, although some countries are using a five-year interval. By contrast, economic accounts are compiled annually or even quarterly. The elements of national accounts provide annual (or more frequent) indicators in the economic field. There are obvious needs for such indicators in demographic and social statistics. The successive census figures

are themselves valuable indicators and are adequate for many purposes. However, for other purposes the interval between censuses is too long, and the delay in making detailed census results available is a disadvantage. Measures are needed to update the census benchmarks. Post-censal estimates of the national population and its geographical constituents are perhaps the best-known of such measures; others are the current estimates of persons in particular age groups, married population, employed population, population of occupational groups, agricultural population, dependent population, and dwelling numbers.

12. Census benchmarks are updated by the use of such flow statistics as births, deaths and marriages, international migration, internal migration (wherever possible), housing construction and demolition, monthly employment and many others. The regular household sample survey also has an important role to play in updating census benchmarks. The process of updating usually calls for the use of a model in which the census and post-censal information are input to produce the updated indicators.

13. Household surveys have a much wider use than the provision of updating for a census. They yield indicators of social activities and social conditions which are beyond the range that could reasonably be covered in a periodical census. This extension of scope is possible for two reasons. First, the surveys may be held at frequent intervals and with a changing content so that the total scope of a succession of surveys is very wide indeed. Secondly, trained interviewers can question respondents more closely in surveys than at a census in matters where definitions are more complex. Surveys covering household expenditure and aspects of daily living such as journeys to work and the care of children of working mothers, surveys of chronic illness and disability, surveys depending on recall such as recent hospitalisation, recent illness and recent holiday travel are examples. To meet the needs for indicators of social change, it is necessary that the particular subject matter surveys should be repeated at suitable intervals.

14. Other indicators in the social field are derived from statistics of hospitals, schools, universities, libraries, welfare agencies, law enforcement agencies, courts of justice and prisons. Financial statistics of these institutions, as already indicated, have their place in the supporting tables to the economic accounts. Also, insofar as these institutions are conducted by government, there are opportunities of developing financial indicators in the course of analysing public finance statistics. However, the social activity and social condition aspects of such institutions do not derive from their finances but rather from operational and other aspects.

15. For these institutions, numbers and qualifications of staff, use of facilities, and numbers of inmates, students or beneficiaries are statistics of a "stock" nature, and are indicators which it is worthwhile to compile regularly, an annual statistical return being the most favoured method of collection.

16. In addition to stock statistics of institutions, some flow statistics are also collected, such as numbers of persons coming within the care or custody of institutions during a year, persons entering, persons passing out. These statistics provide valuable indicators in the social field.

17. Statistics of production and trade, while yielding financial

information for economic accounts, also yield quantitative information, much of which has a social interest and provides indicators for social statistics. Food consumption as estimated by production and imports less exports is an obvious example. Production of books and newspapers is another.

18. The foregoing comment visualises social conditions and social activity as being depicted by appropriate statistical indicators. It is not yet evident that these indicators can be integrated into "social accounts" analagous to the economic accounts. For instance, it is not clear whether the model needed should take the form of a system of accounts. However, there is scope for model building in areas of the social field in which the integrated use of many of statistical series could be visualised. The transition in education from the situation is one year to the situation in the next has been the subject of an interesting model constructed by Mr P. Redfern of the United Kingdom Department of Education and Science. The numbers of persons of pre-school age, in school, in the labour force other than teaching, in teaching, in teacher training, in university education and other post-school education were assessed at successive annual dates and the flows accounting for the transition from one year's numbers to the next were estimated. This kind of model points up the need for better statistics both of the stock type to assess the position at specific points in time and the flow type to enable the transitions to be measured.

19. A most useful indicator is often based on statistics coming from two or more different sources. The changing proportion of students in a population of a particular age is a good example. This proportion may be estimated directly from repeated household surveys. It may also be estimated by successive comparisons of enrolment statistics from institutions with successive estimates of population by age. The quality of the components from which such an indicator is constructed must reach satisfactory levels before the composite indicator could be used.

20. Social indicators are required for different groups of the population to a greater extent than economic indicators. Social policy tends to be increasingly concerned with recognition of groups which fall below the norm in some aspect of living, with a view to ameliorative action. It may be therefore that the recognition of norms and of departure from these norms will give a useful guide to developments in social statistics. Mortality rates, morbidity rates, income levels, housing densities, educational enrolments at specific ages and delinquency levels may all be related to norms, and there may be possibilities here of developing in the future composite measures of social conditions which would in turn help in the assessment of relative values of the statistical indicators. One advantage of this approach is that it would take account of the interaction of social policies. Solving one problem, for example, may make another worse, and composite measures would take this into account. Clearly there is scope for much research in this area.

21. In economic accounts the growth of the aggregates, after allowance has been made for price changes, gives a measure of achievement in the economic field. There is no direct measure of the achievements in social fields. The amount of resources being devoted to solve a social problem is not a measure of the size of the problem. It seems important to bring to light the unstated norms of social welfare that underlie a community's attitudes at any point in time,

and to make use of these norms in developing a framework for measurement. This is the true analogy with national accounts, as these forms would take the place of prices in providing measuring rods.

22. A list of references and a note on a significant meeting held in January 1970 of a working group of the Conference of European Statisticians are shown in the Appendix.

1. References

Conf. Eur. Stats/273 : An Integrated System of Social and Demographic Statistics (Memorandum by C. A. Moser)

Conf. Eur. Stats/WG.34/2 : Report of Meeting of Working Group on a System of Demographic and Social Statistics

Conf. Eur. Stats/WG.23/17 : Report of Second Session of Working Group on Statistics of Education

Conf. Eur. Stats/WG.23/11 : Educational Statistics in relation to Systems of Socio-demographic Accounts and Economic Accounts (Memorandum by R. Stone)

Eleventh Conference of the International Association for Research in Income and Wealth - 1969. "Challenges of Social Indicators to Economic Accounting" - by Kilton Moss

Input-output Analysis and its Application to Education and Manpower Planning - P. Redfern. Treasury. CAS Occasional Paper No. 5, H.M.S.O. 1967.

2. Note on the Working Group meeting of January 1970

The memorandum of Professor Moser is dated 29 May 1969 and was written for the 17th plenary session of the Conference of European Statisticians in response to a request made at the preceding session. In it, reference was made to the "most promising, and certainly most advanced" approach by Professor Stone, which is described in greater detail in Professor Stone's memorandum. Professor Stone's memorandum was prepared for a working group (on statistics of education) of the Conference of European Statisticians in June 1969. The memorandum refers to "socio-demographic accounts" in connection with education. The second session of this working group which met in December 1969, considered this and other papers and issued its report on 29 December 1969. Another working group (on a system of demographic and social statistics) met in January 1970 and issued its report on 30 January 1970. It had been requested by the Conference of European Statisticians to draw up "a comprehensive and phased work programme". The working group was informed that the UN Statistical Office would convene an Expert group in July 1970 to consider these matters; that the Senior Economic Advisers to ECE governments (SEAs) were planning a seminar on techniques of planning in the social area in 1971, and joint research on long-term studies with the use of social indicators in 1970-71. The working group also noted the work of the UN Research Institute for Social Development (UNRISD) and of ILO, UNESCO, WHO, Statistical Office of the European Communities, OECD and the Nordic Statistical Secretariat. The working group recommended that a group of rapporteurs should meet in the (European) autumn 1970 to study methods and problems of systematising statistical inputs for, and uses of, an integrated system of demographic and social statistics; a second session of the working group should meet in the (European) spring of 1971 to study classification systems; a third session should be held early in 1972 to consider draft proposals for the system as a whole; a joint working

group with WHO should be held in April or May 1971 to consider the health sub-system; a further session of the working group on statistics of education should be held in 1972; and that a seminar of the Conference of European Statisticians in 1971-72 should consider demographic accounts in an integrated system.

3. Topics

The working group on a system of demographic and social statistics set down the substantive and statistical aims of the system and its basic features. Its object is to cover all major aspects of the social life and conditions of people including data on population, the structure of society, and social conditions, including economic components. The individual, the family (or household) and the institution are the primary units of observation. These, and also the monetary units and time, would be used as units of measurement.

The three main components of the system would be a system of socio-demographic accounts, a set of accounts for different social services, and a system of statistics of the distribution of income, consumption and wealth. The socio-demographic accounts would consist of a purely demographic sub-system, four "life sequences" (active life, health, delinquency and family groupings), and a sub-system relating to inter-generational mobility. The active life sequence would be further subdivided between learning activities, earning activities (man-power) and the educationally and economically inactive. The second component (social services accounts) is illustrated by detailed accounts for education and health and the general production accounts in elaboration of the system of national accounts and man-power statistics.

The system of socio-demographic accounts in matrix form, as it is being developed by Professor Stone, might be a centrepiece of an integrated system, but it may not be suitable for all areas. Another main component should be the accounts for social services, and the system of statistics on the distribution of income, consumption and wealth, which is complementary to SNA and MPS. The system should provide the data needed for compiling social indicators. Because of the difficulty of finding objective, meaningful weights, great care was needed in using composite indices.

Although much of the system can be developed from aggregated data, individual records would be particularly useful in the recording of individual histories and of multiple changes within a period, in linking the sub-systems of the system as a whole, and in making regression analyses of micro data.

A comprehensive set of classifications is of central importance and work on the more detailed aspects of the classifications should be given high priority in the preparation of the system.

MEASURABLE CONCEPTS IN SOCIAL STATISTICS

1. The designation "social statistics" has come to encompass the whole spectrum of population related statistics such as vital statistics, census data, labour force, education, distributional statistics on income and expenditures as well as health and crime statistics. In countries such as Canada the most significant increases in government expenditures in recent decades have been in the social welfare areas such as medical and hospital insurance, social assistance plans and old age pensions. Social welfare expenditures have many objectives such as the redistribution of income, the provision of certain goods and services to the population, the alleviation of want. Implicitly, the social statistics now include not only the population based statistical series but also statistics on the government programs which affect the well-being of the population such as statistics on the amount and purpose of government expenditures, statistics on the institutions providing goods and services such as hospitals, and schools, and statistics on the beneficiaries of such expenditures such as the number of old age pensioners and the size of pensions received, the number of patients treated in hospitals, the number of children of different ages attending school. It is increasingly suggested that the range of statistical data should be broadened to include statistics on the quality of life as well - freedom and human rights, the amount of leisure and leisure activities, the cultural environment and the ecological environment.

2. As this summary indicates, this topic covers the whole range of social, economic and demographic statistics about the population and all of those aspects of population characteristics, flows and behaviour which are the legitimate concern of governments. The statistical problems are so enormous and varied that, even a series of conferences devoted exclusively to this topic could only scratch the surface of the problem.

3. Discussions at international working group conferences suggest that no country in the world has, as yet, the capability of generating in the near future all of the major statistical series which have been identified as important to the evaluation of population behaviour and well-being. The social and economic problems are often too complex for our present state of statistical knowledge.

4. One can perhaps only discuss the subject by highlighting conceptual issues and problems in some specific areas, outlining some significant areas of ignorance where problems appear to be intractable, discussing what we are already doing, and what extensions of the social statistics are being considered within, for example, the next decade.

Conceptual Problems in Developing Statistical Measures

5. Our title is subject to such a variety of interpretations that it is appropriate to indicate at the outset the particular interpretation that guides our discussion. Our starting point is notion of "measurement". When we measure we determine the value of a specified characteristic for a specified unit of observation. To obtain this measurement we need to devise a relevant scale of values (the measurement is effected when we indicate where the characteristic falls along the scale of values), and to stipulate the measurement operations and instruments.

6. To further clarify our point of view we must now deal with the idea of a "concept" within the context of measurement of the values of characteristics. It seems appropriate to stipulate that within this context the term "concept" is used in regard to the characteristic that is being measured. We can then say that our concept is a network of ideas that we have about the nature of the characteristic in question. In more concrete terms, the concept is our statement of the defining properties of the characteristic. In what sense then should we say that a concept is measurable?

7. We may say that a concept is measurable if for the characteristic which it defines we can devise a suitable scale of values and an internally consistent set of measurement operations and instruments. Thus the phrase "measurable social concepts" refers, in our interpretation, to measurable concepts in the range of social variables - or, more simply, measurable social characteristics. (It is understood that a social characteristic is measurable only if we can identify the units of observation with respect to such a characteristic.)

8. Having interpreted the phrase "measurable social concepts", what are we to say about such concepts? In order to have a coherent discussion we must select from among the variety of things that might be said about measurable social concepts. Because of the short time available for this discussion we shall confine ourselves largely to an effort to identify certain examples among three kinds of social characteristics in regard to measurability, paying particular attention to characteristics covered in Dominion Bureau of Statistics data. Our first category of social concepts are those that are measurable in principle (in terms of the ease with which we can secure a suitable stable scale of values) and in practice (in terms of the ease with which we can precisely apply the measurement operations and instruments). Secondly, we have social concepts that are measurable with relative ease in principle but with considerable difficulty in practice. Thirdly, we have concepts that are measurable only with considerable difficulty in principle (and hence are also measurable with at least considerable difficulty in practice, since if the principles are not clear we will have a great deal of trouble determining what the results of the practice really mean). The following tables gives some examples of social concepts classified into categories in regard to measurability.

Degree of susceptibility to measurement
for selected social concepts

Measurable in practice	Measurable in principle	
	Without major difficulties	With major difficulties
Without major difficulties	Sex Age Marital Status Years of formal schooling Mother tongue	
With major difficulties	Geographic mobility Occupational mobility Languages spoken Religious denomination Highest grade level of schooling attained Type of vocational and on the job training	Ethnic origin Religiosity Degree of command over knowledge and skills as a result of education Social class mobility

9. An attempt to discuss the classification of each of the items included in the preceding table is beyond the scope of the space available in this paper. However, we may close by making a few remarks about one or two of the items that may be of some interest to this audience. Before we can get very far in any comment on these items we must immediately take cognizance of a qualification to our discussion of measurability. Many characteristics have more than one aspect which cannot all be measured along the same scale of values, or even with the same measuring instruments. (In technical terms we say that such characteristics are multi-dimensional.) We may find from time to time that some dimensions of a characteristic are measurable with relative ease while others are measurable only with great difficulty. In locating such a concept within our table we must then identify each of its major dimensions and determine for each of these separate dimensions, the relative ease of measurability. Thus in our table we have not used the term "mobility" without qualification even though this is one of the most well-known social concepts, and instead we have identified particular types of mobility.

10. Even a concept like geographic mobility has a variety of aspects that must be measured separately. These aspects include change of residence, commuting from home to work on a daily or weekly basis, commuting between home and shopping on a daily or weekly basis, and commuting between home and recreation. For some of these types of mobility (for example, residence change) we must identify a particular set of boundaries which must be crossed before we will consider that mobility has taken place. It is sometimes even necessary to make some definite stipulation about the length of time spent in a particular location. For example, in regard to residence change we must explicitly consider whether we want to include recurrent changes by the same person from a summer address to a different winter address.

11. In practice, given the availability of adequate personnel in the design of questionnaires or interview schedules and in the conduct of data-gathering field operations, the measurement of geographic mobility should not present formidable problems. Unfortunately, except in special surveys designed to measure mobility, we often find that whereas several questions on a schedule are required to obtain all the information that is necessary to identify mobility precisely, only one or at most two questions may be asked within the context of a general purpose survey - this is particularly true of the census. Within the context of one or at most two mobility questions we are unable to provide for precise measurement of geographic mobility, and thus various kinds of geographic mobility may be missed by a census question on the subject. For example, in the 1961 Census of Canada, and again in the 1971 Census, Canadians are asked to indicate their place of residence at a date exactly five years preceding the census date. Such a question misses the residential mobility of those who have left the country, or who have moved since the beginning of the mobility reference period but have died before the census data; and it also fails to count multiple moves by a given individual over the five-year period. In order to tap these missing dimensions of mobility supplementary questions are needed. The 1971 Census provides for the asking of one such supplementary question - a question on the number of residence changes that have taken place over the mobility reference period. In general, we will often fail to measure all of the relevant aspects of a given social concept within the context of a general purpose survey or census where we can ask only a fraction of all the questions that must be asked of respondents in order to obtain all the information needed to identify the phenomenon precisely. (Even if we can ask all the relevant questions we always have to contend with misinformation provided by respondents due to lapses in memory or to lack of access to relevant information about members of the respondents' households.)

12. When we turn to the subjects of occupational mobility or industrial mobility, our problems in setting up suitable measuring instruments increase significantly over those that exist in regard to geographic mobility. We must set up rules to identify when a person has changed occupation, and the boundaries between occupations that we establish will not be satisfactory for all purposes to which the data might be applied. In addition, our reports on occupational change are usually very deficient in regard to changes of occupation with the same firm, and, except where we have a special set of questions on occupational mobility, we will have difficulty setting up suitable measuring instruments. The problem is further compounded by the fact that a large proportion of the respondents may have great difficulty in describing their occupation according to some standardized terminology in a reliable and accurate way.

13. When we move to the question of social class mobility we meet fundamental difficulties in principle. These difficulties turn on the basic problems involved in defining the concept of a social class for the purposes of statistical measurement. It is not at all clear at the present time that the concept of social class mobility is measurable in principle, and even if it were so measurable, it is not clear that a sufficiently high proportion of respondents would refer to the same phenomena in using this concept so as to permit useful and reliable application of measuring instruments. We thus have a basic problem in locating the boundaries between class lines.

14. We have mentioned the notion of mobility to illustrate how different aspects of the same general concept (mobility) can vary markedly in their measurability both from the standpoint of measurability in principle and from the standpoint of measurability in practice.

15. Another social concept that presents formidable difficulties of measurement in practice, if not in principle, is the concept of the stock of educational attainment levels in a given population. Interest in knowledge about the stock of educational attainment levels in a given population has been increasing along with growing interest in the systematic assessment of the quality of the human resources available to a given economy or society. Essentially, the level of educational attainment of a given individual depends upon the length of time that he has spent acquiring education, the knowledge and skills over which he has effectively gained command in that process, and the subject matter covered by the knowledge and skills. Some portions of this educational attainment may have been gained through formal schooling in a formally constituted school system, but significant portions are also gained through (a) private study and life experience outside the context of any formal school system, (b) on the job training and (c) special courses pursued in connection with a particular vocation (which may be pursued outside the context of a regular school system). Thus it is clear that the stock of educational attainment in a given population is multi-dimensional, and we need several different scales of measurement to evaluate different aspects of educational attainment. The length of time spent in formal schooling is one dimension, and the grade level at which formal schooling was terminated is another dimension requiring a separate measurement scale; but there are still other dimensions covering the content of the education acquired both formally and informally and the degree of command over the relevant knowledge and skill in particular subjects. Furthermore, when we turn to measurement of the stock of educational attainment, in practice we must pay careful attention to the variety of sources from which educational advancement may be secured and we should not be content to confine ourselves to formally constituted primary, secondary and university institutions.

16. It should be clear from the foregoing comments that any thorough examination of the stock of educational attainment levels in a given population will require a questionnaire or interview schedule that contains many parts concerning this one subject matter. Seldom has such wide-ranging enquiry about educational levels been undertaken. Traditionally we have been content to ask a mere handful of questions about formal education within the context of a national census. Up to the year 1961 the Census of Canada had examined educational attainment through a question on the number of years of schooling. In 1961 the question on number of years of schooling was dropped in favour of a question about the highest grade level attained. In the 1971 Census this question will be supplemented by questions aimed at determining types and amounts of vocational training obtained. It should be clear, however, from the preceding discussion that these particular questions only begin to tap the surface of all of the various dimensions that must be tapped in a thorough enquiry about the stock of educational attainment levels in a given population.

17. Thus, in developing new social concepts for which statistical data are to be gathered, it is extremely important to be as explicit as possible in identifying the different aspects of the concept. We must also be careful in identifying the relevant unit of observation and the particular types of unit that will be included or excluded at different values of the measurement scale for the concept. Even when we are quite clear about the different aspects of the concept and about the characteristics of those units that would be located at different points on the measuring scale, we will have major measurement problems if there is great variation among respondents' understanding in regard to the properties of the concept. If the concept means very different things to different respondents we may be faced with insurmountable measurement problems in the sense that the data that one obtains in an attempt to measure the concept through responses of respondents may be wholly unreliable. Of course, even when there is insignificant variation among respondents in regard to the meaning of the concept we must still contend with mistakes made by respondents due to lapses of memory or lack of relevant knowledge and with mistakes made in the application of the data gathering instruments. Thus, many careful plans must be laid in determining the measurability of a social concept and in putting the measurement criteria into practice.

Non-Measurable Concepts in Social Statistics

18. The preceding section has provided some examples of concepts which can be measured readily and examples of concepts which can only be measured with moderate or considerable difficulty. The next section will summarize the current state of social statistics and our immediate plans for extensions of our statistical system. This summary, in effect, reflects our views of what is currently measurable in the Canadian context. Before presenting this outline it may be useful to comment upon statistical problems which, to the present, we have not considered it possible to consider including in our statistical system.

19. The Canadian emphasis has been on the collection and organization of data which provides information on observable characteristics which are measurable with some degree of precision. We have not, in the past, collected data on attitudes, expectations or intentions. We have not ventured into those fields in which the statisticians' evaluation of a problem may have to be largely based upon value judgment rather than objectively observed facts.

20. The primary purpose of social statistics has now become the evaluation of government programs and the setting of priorities. Our inability to measure more intangible characteristics means that we, more and more, may be using statistics that we can collect as proxies for data which are not collectible and in the process may proceed to draw the wrong conclusions as to the nature of our problems or the effectiveness of the solutions attempted. Our data are usually gathered from administrative records or from surveys or censuses which provide still photographs of the population rather than motion pictures. Adequate evaluation of many problems in future will probably require the development of longitudinal data about people. Observations will have to be made as to characteristics before events occur, while events are in progress and after events are completed. If one initiates medical care, one should evaluate the health of the population before care is extended as well as the health after the services have been available for some time. The detection of population problems and the measurement of the effectiveness of the proposed cures presents major problems because the statistician has to venture into the realm of other types of expertise such as that of the psychologist, the sociologist, the medical practitioner or the nutritionist. It is obvious, for example, that the statistician by himself is not competent to answer the basic question of what are people's minimum physical and psychological needs. As a result statisticians have usually confined their activities to the measurement of those problems with which they are at ease. In the future the development of social statistics may have to become much more of an inter-disciplinary effort.

21. In Canada we can compare what proportion of the population aged 14 to 24 is in the school system in different regions. We cannot make any statements as to whether the quality of the education or the progress of these students is uniform between regions. Evaluation of progress would require skill and aptitude testing of students, something beyond the competence of the statistician. Statistics can be produced on the extent of health services provided to the population but we have only indirect indications of the general health of the population and no data as to whether the extension of health services has improved the health of the population, or what proportion of the population may be disabled or in poor health or why. Our Department of National Health and Welfare is considering a national nutritional survey of food consumption which will evaluate nutritional adequacy. Part of the survey will involve a medical check-up of individuals. In problems such as this, the statistician may have much less of a role to play than other types of experts. This suggests that, in the future, the statistician may have to be a project leader for a team which includes varied specialties.

22. Examples of unanswerable questions exist in all the social statistics fields. We can quantify how much income families received but we cannot answer objectively the question as to what level income is a minimum to meet basic needs and what proportion of our population may be in serious want. We can count how many persons are sentenced to correctional institutions and how many are repeat criminals but we have little knowledge of why they may have become law-breakers.

23. Our statistics show that the higher the level of education the higher the level of earnings. This observation has exerted a substantial influence on government policy. For example, in some provinces educational expenditures have been expanded to provide a place in some post-secondary institution for every student wanting an advanced education. Currently, more than 75 per cent of the cost of educating students at universities is being borne by governments and less than one-quarter by students and their parents. Critics of this

policy have argued that higher earnings in many cases may reflect the higher innate ability and intelligence of a particular category of workers rather than a return to their formal education. That is, that some of the observed differences in occupational earnings should be attributed to the personal qualities of the individual rather than to education he has received. Such critics suggest that we may be greatly overestimating the improvements in national productivity which will result from providing a higher education to an increasing proportion of the younger population.

24. As these comments suggest, our social statistics only go part of the way to providing answers to the problems confronting policy makers. Statistical offices will undoubtedly have to venture into the collection of more nebulous and controversial data to answer the increasing number of difficult questions being asked about welfare of the population. Some of the measurement problems may not be solved in decades, let alone years.

Canadian Social Statistics

25. The main cornerstones of the present Canadian social statistics program consists of the following major statistical series.

A. Statistics Collected Through Surveys and Censuses

(i) Census Statistics

26. The next Canadian census which will be undertaken in June 1971 is the most comprehensive, as far as contents are concerned, ever to be carried out in Canada. In addition to the traditional statistics on age, sex and marital status, the census will contain twenty-nine questions on housing characteristics on subjects such as household facilities (number of rooms, household facilities such as bathrooms, automobile ownership etc.), value of dwellings, amount of rent paid, and indebtedness.

27. Persons of all ages will be asked eleven questions about place of birth, period of immigration, birthplace of parents, citizenship, ethnic origin, religion and languages spoken, school attendance and level of schooling reached. For persons fifteen and over there are a further nineteen questions. These include a further series of questions about education such as education obtained beyond the secondary school level, type of degrees, the most significant vocational courses completed, migration patterns, date of marriage, the number of children born to married women, war service and statistics about labour force participation - hours worked the preceding week, hours usually worked, employment status, occupation and industry and class of worker data for those working currently or since January 1970, place of work, number of weeks worked in 1970. In addition, there are 10 questions on amount and source of income.

28. These data in themselves will be a formidable body of socio-economic statistics. In addition, D.B.S. will be carrying out a Census of Agriculture at the same time as the Census of Population. A linkage will be made of the two census questionnaires so that studies can be carried out of the population and family characteristics by farm characteristics.

(ii) Household Survey Statistics

29. Census data are supplemented by a continuing program of household surveys carried out through our labour force sampling frames. There are four major household surveys - the monthly labour force survey, the family expenditures survey, the survey of consumer finances and the household facilities survey.

(a) Labour Force Survey

30. This survey was first initiated nearly 25 years ago as a quarterly household survey designed to measure the extent of employment and unemployment by individual characteristics. Subsequently this became a monthly survey collecting data from 35,000 households. The survey periodically collects data on a range of characteristics such as occupation, industry, weeks worked, education, immigration status.

(b) Family Expenditures Surveys

31. The first Canadian survey was carried out in 1935-36 among urban families. However, it was not until the post-war period that family expenditures surveys began to be conducted on a continuing basis. In 1948 a major national survey was conducted to collect data on income and expenditures. Experience with this survey led to the conclusion that separate income and expenditures surveys were needed. Income distributions were changing rapidly so that frequent surveys were needed while samples had to be large enough to provide income distributions by significant characteristics such as family size, age of head, work activity. It was felt that family expenditures surveys would be too unwieldy for production of income statistics. Further, at that time, the primary interest in family expenditures data was for reweighting the consumer price index.

32. A regular program of family expenditures surveys was initiated in 1954 and between 1954 and 1968 seven surveys have been conducted. These surveys have been surveys of urban family expenditures, restricted to small samples usually 2,000 family units. The data have not been used to produce weighted aggregate estimates for the urban areas sampled. The questionnaires, however, have been very comprehensive so that detailed information has been secured on expenditure patterns.

33. For 1969, two separate but closely related surveys of family expenditures during that year were conducted, covering all families and unattached individuals in Canada, excluding Yukon and other northern territories. The 1969 surveys, one on weekly Food expenditures and one on the Full Budget of consumer goods and services for the year, are distinguished from the biennial surveys of the past fifteen years primarily by their expanded geographic coverage and greatly increased sample size. The earlier surveys were small-scale yielding about 2,000 family records and were confined to urban centres. The 1969 Full Budget survey, employing personal interview and respondent recall over the full year, was planned to provide about 15,000 usable family records; the food survey, using the diary record technique, was designed to and has yielded close to 20,000 weekly records, composed of two weekly records each month from changing monthly samples of 800-900 families per month.

34. The expanded surveys will provide a much improved data base, particularly for studies concerned with levels of living and differences among

population groups in Canada. The number of consumer items in the Full Budget Survey questionnaire is in excess of 500 and the number of food items from the open record schedule in the Food Survey approximates 200. In addition to dollar values of expenditures, data on quantities purchased has been included for most items. The Full Budget Survey included questions on the total of expenditures on food consumed at home and away from home and home-grown food for family use. Previous small scale surveys have indicated such totals are consistent with annual totals obtained by food diary records and provide an essential link between statistics from the two surveys. Further linkage of statistics from the two surveys is provided through information on personal characteristics of individuals and families, (age, sex, marital status, labour force status, place of residence, period of immigration) and eleven sources and amounts of their incomes which were recorded in both surveys. In addition to planned tabulations of expenditure patterns and levels by classes of families according to characteristics such as place of residence, family size (and composition), income, et al, the survey content and available computer facilities provide the capacity for a wide range of cross-sectional statistics by multi-characteristic population groups.

(c) Surveys of Consumer Finances

35. The development of a program of income surveys began in 1952 with a sample survey which collected income data from approximately 5,500 family units. To date, eleven surveys have been undertaken and from 1972 on income surveys will be conducted annually. Through time, the scope of these surveys has been expanded considerably - much more detail is now collected and the sample sizes have been increased. A recent survey secured income data from some 22,000 family units. Some surveys have also collected statistics on family balance sheets in respect to assets and debts. The amount of detail on assets and debts has been expanded steadily and a major survey is being undertaken in 1970 to collect data on income in 1969 as well as asset and debt holdings.

36. This survey plans to obtain comprehensive data on income and balance sheets from 12,000 family units through direct interviews. The statistics will be collected from individual family members, but they can be aggregated into family data. For each individual, information will be collected on the following personal characteristics - age, sex, marital status, relationship to head of family, labour force status, occupation, class of worker, weeks worked in 1969, education, language spoken, period of immigration. In addition to some 15 questions on sources of income and other money receipts, each respondent will be asked to report on assets in the form of deposits, cash, bonds, stocks, real estate, mortgages as well as investment in incorporated and unincorporated businesses and farms. Each family, as well, which owns its own home is asked to report the purchase price, current market value and amount of indebtedness on the home. The questionnaire has attempted to obtain as complete a picture of personal financial and business assets as possible. The major exclusions are savings in private pension funds and through life insurance holdings. The conceptual and statistical problems of collecting data on such equities appeared to be insoluble at the present time. However, respondents are being asked to report on premium payments and pension plan contributions.

37. Another exclusion is that of consumer durable goods with the exception of automobiles which will be valued at current retail prices. Data on inventories of consumer durables are included on the family expenditures survey. The two surveys jointly will provide the most complete statistics we have ever collected on personal, financial and durable assets.

38. The questions on indebtedness are equally comprehensive so that it will be possible to calculate the net worth position of individuals and families.

(d) Household Facilities Surveys

39. For the last 15 years an annual survey has been taken in conjunction with the labour force survey on household characteristics such as size, number of bedrooms, plumbing facilities etc. as well as the ownership of selected durables such as automobiles, refrigerators, washing machines etc.

B. Institutional Statistics

(i) Health Statistics

40. Health statistics are usually developed from administrative records or collected from institutional sources. Some very limited health data has been occasionally collected in connection with the monthly labour force surveys. Canadian vital statistics are produced from the compulsory registration of births and deaths. These statistics are now comprehensive and, for example, provide data on detailed causes of death, life expectancy trends, infant mortality trends, by age, sex, cause, and locality.

41. Canada now has government sponsored hospital insurance coverage of the total population while many provinces now also have population medical care plans. D.B.S. produces very detailed statistics on patients treated in hospitals, causes of hospitalization, number of days of hospital care etc. Other types of hospital statistics collected and published are statistics on the characteristics of hospitals - number of beds and type of accommodation provided, hospital personnel, hospital finances - revenues, expenditures etc. Institutional statistics are also published about institutions such as mental institutions and sanatoriums.

42. The statistical data are primarily collected from the administrative records of institutions. There is no regular program of data collection from individuals or families so that there are no statistics on non-hospitalized illness or on the general health of the population. A major sickness survey was conducted in the early nineteen-fifties but this survey has not been updated.

(ii) Judicial Statistics

43. On an annual basis, statistics are published on criminal and other offences, juvenile delinquency, crimes and on the population in correctional institutions and training schools.

(iii) Education Statistics

44. As with health and judicial statistics, the primary sources of our educational statistics are administrative records and data collected from institutions. Among the annual statistical series already developed are statistics on school enrolment, salaries and qualifications of teachers in elementary and secondary schools and universities, financial statistics on all levels of education. Other subjects which have occasioned special studies

periodically are surveys of university students, their income and expenditure, in-service training in a number of major industries, student progress through schools as well as reports on cultural institutions such as museums, art galleries and libraries.

45. As this summary indicates, Canada already has a well-developed structure of social statistics. Some of the priorities for the seventies for expansion of this framework are summarized below.

C. Future Programs

(i) Censuses

46. Canada now has a quinquennial population census. However, in the sixties the 1966 Census was simply a population enumeration of the basic population characteristics - age, sex and marital status. Only the 1961 and 1971 Censuses collected data on education, labour force participation, income etc. Representations are already being received that the 1976 Census of Canada be expanded to include more data on population characteristics. A decision will have to be made within the coming year as to the probable contents of the 1976 Census. There is a fair likelihood that this Census will be a more extended one than the 1966 Census.

(ii) Household Survey Statistics

47. The seventies will also probably see a considerable expansion of family and individual statistics collected through household surveys. The Surveys of Consumer Finances which are the primary source of family and individual income statistics will become annual surveys in 1972. The demand for more frequent and better data on family expenditures patterns is such that comprehensive national family expenditures surveys will have to be conducted more frequently; it would be desirable to have one such major survey at least every ten years.

48. To the present time, D.B.S. has largely restricted its household survey program to the continuing surveys such as the labour force survey which also, on occasion, includes supplementary questions on special topics such as smoking, recreational activities etc. D.B.S. is giving a high priority to an expansion of its household survey capability with a view to undertaking special ad hoc surveys for its own internal needs or for other government departments. We are receiving an increasing number of requests to undertake surveys for special purposes - for example, in depth surveys of low income families or regional surveys in depressed areas. Such surveys cannot be accommodated within the existing survey framework.

49. Another priority in the population statistics area is better integration of data collected from surveys and censuses. We are now getting into the position where the problem is not to collect more statistics but to make more effective use of data already collected. In this respect we have not as yet exploited the full potential of computer technology. For example, many users of census statistics have specialized needs which can only be met by producing data to the users' specifications. After the 1961 Census our ability to provide such a service was limited and a very substantial proportion of requests for special data were refused even though users were prepared to reimburse us. Major attention has been given in the planning of the 1971 Census to the problem of retrieval of data to meet user needs. Geocoding systems are being developed which will allow tabulation of data for geographic areas of concern to

users and not necessarily conforming to standard geographic areas such as municipalities. Generalized programs are also being developed so that special programming will not be required for the retrieval of data. Although we have a series of household surveys rather than one multi-purpose survey, the surveys are characterized by a common core of concepts. These can be the basis of developing integrated sets of population and family statistics. Possible approaches to integration will be discussed in the next item on the agenda.

50. D.B.S. at present does not have official access to individual income tax records for statistical purposes. Legislative amendments are pending which would authorize such use of tax data in the future. Canadian taxation statistics are now available on an annual basis and are very widely used. However, it is recognized that the full potential of these statistics has not been exploited. In Canada, nearly all persons working during the year file income tax returns, so that the tax files cover virtually the total labour force. The only significant part of the population not filing is the inactive or retired population. If the tax form could be revised to improve the information on occupation of tax filers, tax returns could provide annual statistics on earnings by occupation. Some major changes in the tax structure are under consideration and these will probably involve changing the tax forms.

51. Income tax records are now completely computer stored. The tax files contain income data for five consecutive years for each tax filer. These records could, therefore, now be used to develop income histories or a "permanent income" series for sex and age cohorts. Annual income statistics have always been criticized as not necessarily indicative of permanent income status because of short-run fluctuations in income. To obtain income histories through longitudinal surveys would be administratively difficult and probably prohibitively expensive. One of our priorities for the next decade is the development of income history samples.

52. These samples in respect to income tax records are examples of new statistics we can consider developing in the seventies which we could not contemplate ten years ago, because at that time income tax statistics were not as comprehensive in coverage and because records were not in machine readable form. This is one example where the impossible of yesterday becomes the possible of today.

(iii) Health, Education and Criminal Statistics

53. The emphasis here will be on the development of better data in a variety of aspects of the health and education sector - more data on the expenditures on such services, better statistics on the capital investment in these sectors and on the manpower utilized in the provision of health and education, better statistics on the stock and flow of students through the educational system, better statistics on the number of persons utilizing hospital and medical services and the kind of treatment provided by such services. For example, we are trying to develop better data on the stock and qualifications of skilled personnel such as teachers, nurses and doctors. In respect to students we hope to develop better statistics on what happens to students in the school system - on the flows through the school system, the exit points from the school system, the type of training acquired.

54. Our Education Division also has responsibility for developing statistics on cultural activities. Surveys of libraries, museums, art galleries and related institutions have been part of the regular statistical program for some years. Libraries are now being studied in greater depth with

special emphasis placed on populations served and the degree of specialization of services provided. The development of other data on artistic and cultural activities is now being studied. A pilot project is being undertaken relating to facilities, personnel and finance in drama.

55. In Canada, the administration of justice is usually through provincial and municipal courts. The provinces and municipalities are also responsible for the detention of persons convicted for terms of less than two years while the federal government is responsible for persons with longer sentences. Most of the statistics in respect to the administration of justice thus must be derived from the provinces and municipalities. Close co-operation exists between the Dominion Bureau of Statistics and the provinces and a great deal of progress is being made in developing improved statistics on crime and the functioning of the judicial system. For example, in one province an administrative statistical reporting system has been developed which documents each case in the criminal courts in such a way that information on the status of the case is available on a continuing basis so that problems and delays in court procedures can be detected readily. It allows provincial administrators to evaluate the efficiency of each agency involved in the administration of justice and the effectiveness of the system and of the laws. Other extensions of computer stored records are planned for judicial statistics, for example, censuses of penitentiary inmates and, eventually, post-discharge rehabilitation records for each inmate.

Conclusions

56. As this summary indicates, social statistics are multi-faceted because they focus on the economic, social and physical well-being of the population. Obviously such statistics must have a high priority in any statistical office but equally obviously, resource and financial constraints require that some programs must be given higher priorities than others. In Canada, the Census is a constitutional requirement at the national level at ten year intervals. The question then is not whether to take a census but what form the census should take and how extensive the questionnaire should be. Experience with censuses and field surveys suggests that the major costs are incurred in the planning, the setting up of the field organization, and the training of the enumerators; and that the basic costs are only marginally influenced by the length of the questionnaire. That is, a census consisting of thirty questions may not cost much more than a census of ten questions.

57. Decisions as to priorities are influenced by a number of factors such as the strength of the need for the data, the ease of securing the data and the cost of securing the data. It is usually less expensive to develop statistics from administrative records than to launch new statistical programs such as household surveys. This is a factor in why we have developed health statistics from administrative records but not health statistics through household surveys. Similarly some household surveys can be conducted more readily and less expensively than others. Most of our surveys on family incomes have been conducted in conjunction with our labour force surveys using the same sample and enumerators. The additional cost incurred by adding income statistics has been modest so that the labour force survey framework allows us to collect income data relatively inexpensively. Family expenditures statistics cannot be collected in a similar fashion so that the field costs per household for this type of survey are many times those of the normal income surveys. This means that it has been possible to collect more frequent and comprehensive income data than family expenditures data.

58. The initiation of major new government programs may require a statistical agency to give priority to the development of new statistics for the evaluation of such programs even where costs may be substantial. Until the last decade the financing of education has been primarily a provincial responsibility in Canada. Now the federal government plays a major role in the financing of higher education in the country. This means that education statistics have assumed a new importance and must be one of our major priorities in the near future.

59. Financial limitations have been one factor, in the past, inhibiting the development of new statistical series. The previous practice has been that D.B.S. has financed nearly all statistical activities it undertook from the budget allocated to it by the government. Arrangements are now being developed which allow D.B.S. to enter into agreements with other government departments and other levels of government to collect statistics on their behalf with the other departments providing the funds to undertake the work. This will be a new element in priority setting and such arrangements may have an increasing effect upon our decisions as to the development of new programs, especially in the field of social statistics.

MEASURABLE CONCEPTS IN SOCIAL STATISTICS1. Summary of Major Points

(a) Although there has been considerable development in New Zealand social statistics over the years, the planned extension, updating, and presentation of these statistics is comparatively recent in this country. Over the past couple of years there has been increased interest in the future extension and reorganisation of social statistics, to bring them in line with developments in economic statistics, and a good deal of this planning follows lines advocated in other countries.

(b) Social statistics should highlight the most important social features of society. These include the social institutional elements such as the family; social structural features such as socio-economic grouping; and social problem areas in society, such as poverty.

(c) Not all concepts are equally capable of accurate measurement. Some concepts give a comparatively accurate indication of the area under consideration, while others can only give partial understanding of the field. This means some areas of social statistics may be of little social significance which in turn may make international comparisons very difficult.

(d) Social statistics are not an isolated field in statistics since they draw on economic, demographic and health statistics, as well as including the more social-type statistics.

(e) In New Zealand the population census is the most important method of collecting social statistics, although for more specific information sample surveys will need to be extended, and Household Budget Surveys are planned in this country to provide a good deal of these additional social statistics.

Measurable Concepts in Social Statistics

2. The purpose of social statistics is to provide a numerical description of the social life of populations. To obtain this quantitative picture, a series of concepts capable of being measured must be developed. These measurable concepts, used in association, give the required numerical description of society.

3. The quantitative picture of society provided by social statistics is useful in planning and administrative procedures. In this way social statistics are implemented in an applied way. They provide the base by which various social plans and social policies can be made, and their efficacy assessed.

4. When considering the concepts which are capable of being measured, it is important that they reflect the most important structural features of society. Furthermore as the field of social statistics is potentially large, there is the

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additional need to limit the concepts to those that are the most important. The concepts listed below, therefore, centre (1) around the "social institutional" features of society, comprising the economic institution, the institution of family and kinship, the quasi-institution of education, and the religious institution; (2) a number of concepts are organized around the so-called "problems" elements of society - health, welfare and social security, social defence and level of living; (3) there are also the social structural elements of community and social stratification which can be considered quantitatively with the aid of other concepts; (4) finally, there are concepts which are more independent than those already mentioned and should be considered separately. These refer to the more general features of how man relates to the physical environment, and the concepts leisure and recreation.

The concepts considered measurable are:

- | | |
|--------------------------------|---------------------------|
| 1. Population | 10. Work and Employment |
| 2. Income | 11. Education |
| 3. Expenditure | 12. Family and household |
| 4. Occupation | 13. Housing |
| 5. Health | 14. Leisure |
| 6. Nutrition | 15. Environment |
| 7. Welfare and Social Security | 16. Social Stratification |
| 8. Social Defence | 17. Level of Living |
| 9. Religion | 18. Community |

5. Within a number of these concepts there are sub-categories which are of considerable importance. The concept "population" for instance, can only be observed through the demographic elements of age, sex, marital status, ethnic grouping and migration. Taken a step further each of these concepts can be considered as either single system concepts or composite system concepts. Single system concepts measure only the concept in question. Examples of this type of concept are income, education and housing. On the other hand composite system concepts make use of a number of indicators. In other words, composite system concepts use a number of concepts in combination. For example, in achieving a numerical understanding of social stratification, a socio-economic index, using the concepts of occupation, education and income, needs to be developed.

6. There are two further problems associated with measuring these concepts. In the first instance, there is the danger of inaccuracy in what the concepts measure. That is, while there may be no bias in collecting the data, there could well be the danger of a concept indicating something of little social significance. In regard to the concept religion, for example, enumeration of religious adherence may be accurate, but what this indicates may be of little social significance. What is important is the degree of religious participation for it seems likely that a number of people claiming adherence to a certain religion may have only very loose ties with that religion. It becomes difficult in some circumstances to generalise as to the significance of religion in society from traditional religious statistics.

7. The second problem relating to the measurement of the concepts, is the reliability of the measure. This, of course, is a methodological problem and if biases do occur they can be reflected in problems of under-enumeration or in errors of registration.

8. In conclusion, therefore, not only must the concepts be of some useful social significance, but the concepts must also be easily and accurately measured.

9. When social statistics are used for comparative purposes, in the international sense, other problems can arise. Comparative problems are directly associated with what various concepts measure. For example, no comparison can be made between divorce statistics in New Zealand and those in Italy, simply because there is it is understood no divorce in Italy. This is perhaps an extreme example, but what is dangerous in making comparisons between the social statistics of two or more countries is a failure to understand the meaning of the concepts as used by the different countries and what in fact the concepts are attempting to measure. This means that there is the need to understand the wider social implications of the concepts to the two societies in question. This includes a realization of the mores of a legal and a social nature which could have an affect on what is being measured.

10. From a perusal of the concepts suggested for measurement, it can be seen that they draw on economic statistics, demographic statistics and health statistics. Thus, the field of social statistics belongs to the domain of demography, economics, sociology, public health, etc. and economic, demographic, health and social statistics cannot be regarded as mutually exclusive.

11. The methods for collecting social statistics vary, but a useful collection vehicle has been found to be the population census. However, the census is such a broad and blunt instrument that it cannot hope to give detailed information, this being due largely to limitations of space in the census schedule. Nevertheless, it does provide a good framework around which to devise suitable sample surveys enabling greater detailed information to be obtained on such information. In fact the population census is one of the most important means for obtaining social statistics in New Zealand and this is particularly the case with demographic statistics, as well as family and household data, occupation, work and employment, education, housing and religion. The remaining concepts are measured by other methods but in considering the concepts listed, it is important to acknowledge that each can be measured to a greater or lesser degree.

12. Before discussing in detail each of the concepts, a few comments can be made on the effect of social and moral concerns of societies on the development of social statistics. It has already been stated that a number of concepts in social statistics are oriented around "social problems", representing such deviant behaviour as divorce, illegitimacy, crime, as well as ethnic problems, etc. While many basic social

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statistics on social problems are available now, it does seem worthwhile to extend these statistics. One area that could be looked at is the development of a level of living index. Furthermore, statistical concern needs to be directed towards health problems resulting from alcoholism and other forms of drug addiction. Associated with health is the factor of leisure opportunities and the use made of these opportunities. Finally some form of statistical data should be provided on the role of women in contemporary society - their place in employment, in the family, their leisure time, etc.

13. What is being shown is that concepts termed "social problems" are termed social problems because the society, or segments of the society interpret them as problems. It seems possible there are a considerable number of other problems existing within society which are not recognized as such by that society.

14. A more detailed study of each of the listed concepts will indicate the degree to which each is measurable and the problems of measurement. Each of these concepts will be discussed from the point of view of:

- (a) Definition of each concept
- (b) Degree to which each can be measured
- (c) What in fact each measures
- (d) How measurement can be improved

Although these concepts are discussed independently, they are linked together to some degree, since social life is unified and not fragmentary.

Population

15. This concept deals with the demographic composition of societies or parts of societies and the changes within these demographic elements. These demographic data are measured comparatively accurately, and cover age, sex, marital status, race/ethnic group, vital statistics and migration. Nevertheless there are a number of problems associated with measurement.

16. Sex is probably the most accurately measured of all the demographic statistics. Age in years and completed months is also fairly accurate although some difficulties can occur from misreporting, showing an over-representation at ages ending in 0 and 5. This problem may be overcome by asking in the census, the day, month, and year of birth. Regarding marital status this can be measured with a reliable degree of accuracy. Problems do exist, however, in consensual relationships where a man and a woman may have lived together for several years and have children, but because their relationship has not been legalized neither partner would be classified as married, unless of course each had stated they were married previously to some other person, or said they weremarried to their present partner.

17. In association with marital status, data can be obtained from the census on the number of children born to ever-married women. Outside of birth registration and sample surveys, this will be one of the few sources of data on fertility, and will provide an indication of the average number of children in families.

18. The registration of births and deaths is achieved with a fair degree of accuracy, although the method can pose problems if there is failure, for one reason or other, to register births and deaths.

19. In the study of birth-rates, the problem of ex-nuptial (or illegitimate) births is being given increasing attention. The collection of statistics on these births, as well as pre-marital conceptions, is comparatively reliable. However, what illegitimacy means to the society is more difficult to understand. The increasing trend of removing impediments and difficulties for the illegitimate child lessens these problems in some ways as far as the general public are concerned, and although the social consequences for family life are still present, they may often be no more adverse than is the case for children of widowed and divorced persons. Nevertheless, it seems worthwhile to maintain the distinction between ex-nuptial births and pre-marital conceptions, and nuptial births.

20. The concept of race or ethnic grouping is a fairly difficult concept to measure. For example, the New Zealand census asks respondents to state, where possible, their degree of blood. Furthermore, they are expected to indicate the race or ethnic group to which they belong. It is possible, therefore, that a respondent acknowledges belonging to a particular ethnic group although he has a degree of blood less than the prescribed rate for membership of that ethnic group (as stated by the Census). For example, a person with $\frac{1}{4}$ Maori blood and three-quarters European blood may regard himself as a Maori, but by the census definition ($\frac{1}{2}$ or more) he is European.

21. It seems worthwhile to extend statistics to as many homogeneous ethnic groups living within a country. In New Zealand considerable attention has been given to the Maori for the obvious reason that this group is the largest ethnic minority in the country and because these data are used to draw the Maori electoral boundaries. Greater statistical concern could be given to smaller ethnic groups living in New Zealand and so gain a more comprehensive understanding of the total homogeneous ethnic groups residing in the country.

22. Migration statistics present a number of problems. Total migration from overseas can be measured with a certain degree of accuracy by frontier registration, although problems exist when determining when a person is an immigrant and when he is a visitor. This exists because the definition of an immigrant is given as a person who resides a certain length of time in a particular country. Problems also exist in attempting to measure internal migration. Internal migration

in New Zealand is measured from census questions, with these questions obtaining internal migration information by asking place of residence at some specific date in the past. If the place of residence at the time of the census differs from the place of residence at the date in the past, the individual is classified as a migrant. The limitation of this method is that it measures only a certain proportion of the total internal population moves. It gives no indication of total moves.

23. The Census appears adequate in assessing the streams of population movements only, and the most satisfactory method is doubtless to develop some form of registration as operated by some European countries. This registration system, however if introduced into New Zealand could evoke strong opposition from groups regarding it as an invasion of personal privacy.

24. In addition to measuring the volume, distance and direction of migration, there are many social and psychological processes behind migration, i.e. the motives for moving. These, however, are difficult to measure and certainly call for methods other than the census approach since the reasons for movement stem from a combination of complex economic, psychological and sociological factors. Again, only some indicators of movement could be measured, although it would be very difficult to get a complete understanding of the process involved.

Family and Household

25. To a large degree the concepts family and household are measurable since it is comparatively easy to count the number of people in a particular household, and also in many cases the two are commensurate. Obtaining accurate counts of members of families is a little more difficult since families are principally enumerated from the census by relationship to the head of the household. If members of a family within a particular household are not related to the head, this familial relationship may have to be obtained through a separate coding operation. Only some form of sample survey could indicate with any greater accuracy these familial relationships to cover cases of absentee persons at census time, etc.

26. There is the additional concern of defining household and family. A household is a group of people sharing the same facilities and living together as a social unit. A family is a group of people living together who are related by blood, marriage and adoption, and this includes the primary or nuclear family (a man, his wife with or without unmarried children), as well as other kinds of families which possess less direct blood relationships (e.g. brother-sister household).

27. Statistics on the family are of considerable importance since this is one of the limited times social statistics look at groups of people rather than individuals. The family is additionally important since it is one of the basic groups in society. Household and family statistics have been produced in limited form from the 1966 Census of Population and Dwellings.

Housing

28. Associated with interest in families and households is the factor of housing. Housing relates not only to conventional houses, but to other forms of dwellings such as flats, and to building policies.

29. Housing increments are measured by the number of houses, flats, etc., being built, less those demolished, converted or otherwise disposed of, although there is a need to know the total stock of houses and dwellings existing in specified areas, as well as the particular type of dwelling.

30. From a social statistics point of view what is of importance is the rental for various types of dwellings and the cost of buying or building a house. Furthermore, the standard of dwelling of the family and household also needs to be considered; considerations such as size, geographic area, amenities, or other qualities considered necessary or desirable.

31. The principal features of housing should all be capable of being measured, with the exception perhaps of an accurate account of the cost of buying or building where geographical divergencies on the costs of sites, site development, materials, differential labour costs, etc., affect such costs. This type of measurable has not yet been developed in New Zealand.

Income

32. This is distinct from wealth, and is regarded as a flow of monetary resources accruing to the individual over a period of time. An approximate measure of income (subject to limitations of the respondent's knowledge, etc.), can be gained by individuals answering a Census question. To obtain a reasonable response from the Census, the question is asked in New Zealand in the form of a series of optional income ranges which cover the individual's total income rather than specific parts of it, such as a salary, or income from secondary employment, or other forms of income.

33. In some circumstances income should be measured not only according to the individual but also according to the family. Often families, if both husband and wife work, pool their income. This type of situation is shown in the household and family analysis where the incomes of the family members are aggregated to indicate such pooling. However, although total income of family can be assessed, the degree of pooling may be too variable to be reasonably assessed since it could be assumed that not all families pool their income.

34. For statistical improvement of this concept it may be of some use to seek the structural subdivisions of income. Because of the difficulties of respondent's awareness in many cases, this subdivisional data may be obtained in New Zealand by means of the household sample survey that is currently being planned.

Expenditure

35. 'Expenditure' is used not only in connection with both individual and household units, but particularly with family units and various groupings of individuals of different income levels and social circumstances. It measures how these units spend their income and on what commodities and services these expenditures are made.

36. Accurate measurement of expenditure depends on maintenance of adequate records by the individual, and this would only be practicable on a sample basis under supervised methods of recording over relatively brief periods. It is hoped to get this type of information from the planned household sample survey.

37. There may also be some use in briefly indicating how Government redistributes monetary resources through systems of social security, welfare and health benefits, differential rates of taxation, etc., and how these are related to personal expenditure.

Work and Employment

38. Work and employment are closely related to occupation and they point to the areas in which individuals are occupied in earning a living. Statistics point to the numbers employed in various industries and at various occupations, and of the unemployed. The data also includes wages, salaries and hours of work.

39. Many of these statistics are available through censuses and supplementary surveys, and usually cover the type and nature, and the geographical distribution of employment.

Occupation

40. This is comparatively difficult to measure with the detailed precision required for many purposes. Some indication of the occupation of individuals is obtained from the Census, although the respondent's clarity of response is not always as good as would be obtained from, say, an employer's award classification of the worker.

41. Finally, some consideration could be given to an improved socio-economic classification of occupation.

Education

42. This concept centres around problems of literacy and the potential for education. Concerning the degree of educational attainment of a population, problems can develop over the relationship between years of attendance and educational qualifications of an academic or vocational character. Educational problems can become particularly evident at the tertiary level where this comprises a great range of educational courses.

43. Some distinction must be made between the merits of the alternative measures of the length of time spent at school and the educational qualifications. Furthermore there are difficulties in making comparative studies between various countries according to educational levels because of the widely differing structures of educational systems and educational opportunity.

44. Difficulties attached to measuring education centre on the primary objectives of measurement and the best methods of assessing indirectly the educational achievement reached; i.e. determining what educational qualifications or courses should be measured, since the quality of education is elusive in nature and somewhat difficult to measure directly.

45. Questions on educational attainments and years of attendance are now asked in the quinquennial survey of New Zealand population. Other educational statistics are obtained from the records of the various educational institutions.

Health

46. Ideally health statistics should measure the incidence of physical and mental well-being of individuals in a society. This can be indicated indirectly by age-specific mortality rates, showing age groups at a high degree of risk.

47. Perhaps the gravest problem concerning health statistics, is that health is often measured by its absence, i.e. through the numbers in hospitals and the diseases causing death. In other words, health is determined by the most serious maladies. No account, however, is taken of people who are forced to rest because of a less serious illness (e.g. a cold or influenza).

48. Recently there has been increasing statistical interest in certain areas relating to health. This is shown in New Zealand, as elsewhere, in the growing concern regarding drug use and alcoholism as well as in the establishment of various clinical and educational groups aimed at reducing either morbidity or the adverse effects of it, in certain illnesses - e.g. the Cancer Society.

49. It is unfortunate that there are few statistics (other than those mentioned) on the overall health of the society. In fact it appears difficult to collect these statistics since what is regarded as illness by one individual may not be so regarded by some other person. It is possible that loss of work days through sickness could be one additional measure. Moreover, it is likely that minor incidences of sick leave could be the result of psychological factors rather than one of the traditionally classifiable types of illness.

Nutrition

50. Nutrition generally refers to the amount and quality of food intake. It is associated with age, economic activity, physical and mental health and social welfare. It is also directly associated with food production, the availability of food resources, income levels, and the consumption patterns of individuals.

51. In New Zealand the statistics on nutrition are general and only cover national consumption figures and calories per day, and it seems data for specific groups and classes of individuals could be obtained, possibly through some form of household survey. The most useful survey for obtaining such data would be one covering household expenditure.

Welfare and Social Security

52. These are very important fields, but there appears to be a dearth of published statistics in some areas. Who in fact receives voluntary welfare assistance other than through the social security system needs to be shown, and particularly special attention should be given to statistics on the aged, the handicapped, youth and children and the poor.

53. It does appear that it may be difficult to gather data on all people who receive welfare assistance and social security. In the case of New Zealand, a more organised system of abstraction of statistical data from existing administrative files is needed, with the major problems likely to be concerned with obtaining full use of data from administrative files. Record linkage would be a practicable method if the population could be persuaded both of its value and of the preservation of confidentiality.

Social Defence

54. While data on criminal convictions have been published for a considerable length of time there are particular problems in this regard. Social defence refers largely to how a society protects itself from deviant behaviour. Therefore statistics should present reported criminal acts as well as criminal convictions.

55. Difficulties arising from these statistics measuring crime, centre on the fact that a considerable number of criminal acts may not be reported. Furthermore, what is defined as criminal may differ not only between countries but within countries from year to year because of legislative changes. Therefore, total criminal or deviant acts may not be known and it may be difficult to make valid comparisons between societies and within a society over a period of time.

Religion

56. Religion generally refers to the grouping of people according to a spiritual belief. As pointed out earlier it is easy enough to ask people the religious group to which they belong, but their answers do not necessarily show their degree of participation or strength of belief.

Leisure

57. Leisure simply refers to the active time available to individuals outside working hours. However, difficulties in definition arise when some people engage in secondary employment apart from usual hours of work, and when it becomes difficult to easily distinguish the leisure hours of housewives.

58. As far as can be judged, there are comparatively few statistics on leisure. The only indication seems to be inference from recorded hours of work data from censuses. The lack of such specific data seems to be a result of little concern in the past with problems of leisure, and the lack of methods for collecting such statistics.

59. While it may appear possible to ask how much time (e.g., per week) an individual spends on leisure, it will be much more difficult to measure how this leisure is spent, and the different ways people interpret leisure and recreation. Because there is such a potentially large number of recreational activities, it would appear necessary to group, in some way, these various activities.

Environment, Social Stratification, Level of Living and Community

60. Environment broadly refers to the relationship of man to his physical environment and covers such factors as use of National Parks and tourist facilities. Observations for example can be made of these centres which become demographic, social and economic boom-towns over a few weeks during the summer.

61. Environment also refers to the effect of the physical environment on man. For example, study can be made of how air pollution can affect health, or how the topography of a country affects communication. This is a recently developed concept and there appears to be little work undertaken in the field. Therefore, before any further collection of statistics is attempted, careful consideration should be given to what the concept could cover. The problem underlying this conceptual development is what indicators can be used in studying relationship to the physical environment, and all that can be done now is to devise the available statistical indicators which can be measured and probably concerned with the contact man has with the land through tourism, urban development, rural development schemes, changes in the transport and communication facilities, pollution, etc.

62. Socio-Economic Grouping is an important concept since through this social distribution it is possible to study the socio-economic factors affecting people's lives. However, for an understanding of this concept some sort of index needs to be developed which correlates occupation, education and income. These three will therefore provide socio-economic groupings.

63. Such a measure will be difficult, and could only be developed within statistical offices since there are few other organisations which would have access to data on the variables mentioned from which such groupings could be developed.

64. Level of Living will also need to be developed as an index, but using the variables income, expenditure on basic requirements, occupation, employment, housing and amenities, health, nutrition and leisure. It seems likely that difficulties will arise in developing this index since more variables are used in this index than in the one for socio-economic grouping. Again, because of the availability of data, this index is possibly best developed by statistical offices.

65. Community indicates the day to day activities of people who live within a particular territorial unit and acknowledge this social and geographic distinction. Statistics on community can only indicate a number of demographically and socially structural elements. In New Zealand some development has already been made in this field for the five main urban areas. However, the statistics that can be presented for each community can cover all the 17 concepts presented above. Obviously not all communities within any one particular country can be covered by such a study, and therefore it is suggested that a typology of communities be developed, if this is feasible. If individual communities have some knowledge of how their community is structured, planning can be initiated on the basis of this information, e.g., transport, shopping facilities, social amenities, etc. Therefore social statistics of communities will be a microcosm of the social statistics for the wider society.

Concluding Comments

66. The principal conclusion is that all the concepts mentioned can be measured, although the degree to which they can be accurately measured varies widely and some will obviously have more social significance than others, depending on priorities of the time and national milieu.

67. Over-riding all the concepts is the problem of the individual being the normal unit of measurement. While this is necessary methodologically, the social statistics themselves, because they represent social features, have also to be organised into grouped data. To some extent this is carried out already but it does appear as though there is a need for more statistics on social groups as such.

68. Finally, it seems desirable in any consideration of social statistics that mention be made of the inadequacies of these social statistics whenever the data are presented. If care is taken to do this as well as giving some guideline to users of these social statistics, the misuse of social statistics could be lessened, and it is the responsibility of the producer of social statistics to indicate the inadequacies or limitations in these statistics.

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Measurable Concepts In Social Statistics

Social statistics might be defined as covering statistics on health, social welfare, criminal or deviant behaviour, standard of housing. Education might be added to the list, though it is mainly connected with man-power problems.

A brief account of the situation in regard to each one of these fields is given below:

1. Health

Besides specialized surveys, covering only small parts of the country, statistics on health are collected only from hospitals, dispensaries and similar services. The statistics, compiled by the Ministry of Health, give the number of hospitals and beds, and the attendance rates. Similar figures are compiled for maternity and child health services, dispensaries and leproseria.

Regular statistics on morbidity and mortality are based on returns from hospitals with resident physicians. The classification follows the International Classification of Diseases and Census of Death, and is given for in-patients and out-patients separately.

2. Social Welfare

Social welfare activities such as orphanages, destitute homes, homes for the aged etc. are still on a very small scale, and no extensive statistics are warranted. However, the Social Welfare and Probation Division regularly published reports on these activities in different parts of the country. The reports show the attendance rates etc. for various types of homes, and also lists some details on probationers.

National Provident Fund is a Government pension and insurance scheme for workers not in permanent Government service. Insurance premiums are paid compulsorily through the employers. The NPF make regular summaries of the number of insured, with some details as to the amounts paid in.

The National Insurance Corporation of Tanzania provides regular reports on the development of the insurance activities. However, a more detailed description of the customers is still lacking.

3. Education

The statistics produced by the Ministry of National Education give a detailed account of the number of students in various types of schools and grades. A breakdown by sex gives a good insight into the recruitment pattern.

As a long awaited supplement to these data, the 1967 population census provides a complete picture of the school attendance for each age and sex-group, in the various divisions of the country. Similarly, the adult population can be studied in regard to school education.

An attempt was made in the census to study the degree of literacy. However, the data are not likely to be of a useful standard, and will therefore be supplemented by the results of a literacy test issued to households in the 1969/70 household budget survey.

4. Criminal or deviant behaviour

The public statistics produced are as follows: Cases of crime reported to the police are presented together with the number of cases brought to court and the result of the court hearing. The cases are presented by type in a fairly detailed classification. Similarly, the number of prisoners and police are recorded in the statistics.

5. Housing standard

Statistics on housing standard are not a recurrent programme. Data are collected only via special surveys. The two most recent ones are the 1967 population census and the 1969/70 household budget survey.

In the census, the urban questionnaire contained a set of extra questions on housing standard, worked out in collaboration with town planning and housing authorities. The results, which are in preparation, cover such items as construction material, number of rooms and density, access to piped water, electricity and hygienic facilities, tenure and rent.

In the Household Budget Survey (1968-69) considerable data on housing conditions throughout Tanzania was collected.

In questionnaire A used at the beginning of the survey, information was collected on the type of the housing unit (whether accommodation 1 or more households), on tenure and building construction costs. The households were also asked about the details of building material used in (i) the foundation, (ii) the floors (iii) the walls (iv) the roof and its frame. The survey also probed about the various housing facilities - kitchen, toilet, bath-room, electricity and drinking water.

In questionnaire C, which was used to close the survey, more details of housing were collected. Here some 14 categories of house-types were created. The classes were based on the shape and the structure of the housing unit - and the groups ranged from Beehive - type and Masai - type to modern buildings. Information was also collected about the surrounding yards - whether those existed, whether the yards were fenced or not. Information was gathered on clustering of houses - how many dwelling units were visible within a radius of 100 yards? The latter information is deemed useful in the planning of resettlement of rural households.

MEASURABLE CONCEPTS IN SOCIAL STATISTICS -
SOME GENERAL DEVELOPMENTS IN THE UNITED KINGDOM

I. GENERAL INTRODUCTION

The Definition of Social Statistics

1. In official and academic fields, those statistics descriptive of society are broadly divided into "social" and "economic" statistics. Since economics is a social science the distinction gives to the word social a more restricted interpretation than is usual. However the distinction is well understood. Economic statistics are concerned with matters of finance, trade, industry, commerce and employment, etc. Social statistics may be thought of as concerned with the remaining aspects of society and include in particular the following:

- i. The majority of statistics descriptive of the personal characteristics and housing conditions of individuals and households; some such statistics are of both economic and social interest. This is true of statistics of employment (classified by both occupation and industry), manpower statistics generally, and statistics of income, expenditure and savings.
- ii. Statistics descriptive of institutions which give a direct service to individuals and households, excluding those of an industrial or commercial nature (eg retail establishments). There is a special emphasis here on social service institutions such as schools, hospitals, local authority social services, etc. However, such a definition can only be approximate and one might reasonably include, for example commercial establishments in the field of culture and sport or some public institution which gives a general rather than a personal service eg police services, religious institutions, etc. Statistics in this area would cover not only those descriptive of the facilities available (eg numbers of schools, hospitals, etc) but also the volume and nature of services provided.
- iii. Statistics of the resources (money and manpower) required to maintain such institutions.
- iv. Statistics of environment (including the housing fabric and land-use statistics).

Measurable and Non-measurable concepts in social statistics

2. In categories ii, iii and iv as listed in the last paragraph, in spite of considerable technical problems and problems of cost, for probably the majority of variables, there is in theory no inherent difficulty in making statistical observation as intensive as may be necessary. Category i is rather different. Whilst many aspects of our lives are measurable and form the subject matter of most population censuses and other kinds of surveys, there are innumerable facets of our personal lives which are very relevant to our happiness but are extremely difficult to diagnose, classify and measure in any comprehensive way. Some such factors are psychological, some

medical, some a matter of personal relationships with other people, and so on. Some are of genetic origin, others arise by pure chance in the course of one's life, some are the result of changes in the structure of local communities. It is a fact that for many individuals such difficult-to-measure characteristics are dominant in deciding happiness or unhappiness.

3. On the other hand, the personal characteristics which are most easy to observe comprehensively and for which there is the best defined need, arise from the interaction of individuals with existing social institutions particularly where the latter are either public institutions or where (if private, or partially private) they are large in scale and closely affected by public policy. For example, in most countries today some or all of the education facilities are controlled by the public sector. There is thus a clear motive for measuring, amongst other things, the educational characteristics of the population in terms of educational qualifications achieved. Nor is there any great difficulty in principle in so doing.

4. Similar considerations apply to such fields as housing, health, publicly administered welfare services, etc. In all these areas, problems of statistical measurement of this particular kind are usually capable at least of definition, since the social institutions exist to confer (eg education) or observe (eg health) the particular personal characteristics of interest.

5. This is not to imply that there are no problems. Thus, desirable measurements of the true incidence of morbidity in the population at large might be capable of definition but are difficult to acquire; measurements of the quality of education as opposed to the nominal level of education, are even difficult to define; and so on.

6. Moreover, the difficulties of this measurable field of personal statistics will vary from one country to another because of the differing degrees to which social services are administered by public rather than by private organizations. Thus in a country where welfare services (eg for old people, handicapped people, children, etc) are administered entirely by a multitude of voluntary organizations, the collection of relevant statistics of individuals in their need is that much more difficult.

7. Nevertheless, it remains true that so far as can be foreseen statistical development is much more likely to flourish in this second area where people interact with social institutions. Nor is this an admission of defeat. Large scale development of regular social statistical intelligence is best justified by its use in the development and planning of the more essential social services. This is because it is only in these areas that governments can effectively take measures to improve the quality of life.

Future development in social statistics

8. It is historically true and will probably be true in the foreseeable future, that the area of "measurable" personal statistics tends to increase in scope and the "non-measurable" area to decline. Modern governments often hold vast amounts of personal data which 50 years ago it would have seemed totally impracticable to acquire. This is due both to the increasingly complex nature of society and the ever expanding direct role of central governments in many fields of activity. Moreover, the advent of computers has made the management and effective use of large data systems much easier.

Other technological developments as yet unforeseen could in theory make the area of "measurable" personal statistics even greater.

9. It is increasingly asked whether this expansion in the level of detailed observation of the individual citizen is a desirable phenomenon. It is a fact that because of the extremely large resources expended on social services in some countries, there will certainly be official pressure to increase the amount of data available, simply to meet the needs of management and planning. The resulting data systems are only dangerous to human rights in so far as they offer the potential for abuse. It might in fact be argued that any government intent on the infringement of freedom would not be deterred by any temporary lack of data. This conflict of interest can only be settled at the political level. However, it is a very real factor which government statisticians in many countries have to take into account in their thinking on the further development of social statistics.

10. None of this implies that the social statistician is concerned only to develop entirely new kinds of measurement which had not been attempted before. There is a vast amount of work necessary to improve the coverage, integration, reliability and frequency of social intelligence of a perfectly familiar and conventional kind. The rest of this paper discusses certain developments of this type which are presently being pursued in the United Kingdom.

II. RECENT DEVELOPMENTS IN THE UNITED KINGDOM

A new Journal of Social Statistics

11. The range of social statistics from official sources in the United Kingdom is large and there are a number of separate official publications which regularly treat in some detail of special areas such as health, education, housing, etc. What has not up to now been available is a publication which draws together from these and many other sources, a selection of key statistical series presenting a comprehensive picture of the social scene. The Central Statistical Office has been working on the compilation of a new journal to be called "Social Trends" which attempts just this. The first volume is expected to be published in the Autumn of 1970. The emphasis will be on trends, though there are also tables showing differentials and distributions within the country at a particular time. The underlying theme is information about people rather than about government or institutions.

12. An important function of "Social Trends" is to identify gaps in the statistical framework. Many statistics are the by-product of administrative and accounting procedures and concentrate on aspects of social conditions and problems which are already being attended to. The challenge is to illustrate those aspects, frequently involving acute social problems, which are relatively poorly served by regular statistics. An example is the absence of satisfactory information about the kinds of people who fall within the purview of the available social services without benefiting from them. Moreover, the information which is available is often confined to the "average" person and hides a wide range of individual situations. What is needed is an understanding of the variety of people and households who make up the social scene, taking account of their educational background, housing conditions, income groups, age, and so on. In this way the extent to which social factors, or problems are interrelated begin to become clearer. It is hoped that the new Journal together with other developments outlined later in this paper will gradually help to fill these gaps.

13. "Social Trends" opens with a series of articles followed by tables and charts. The first set of these tables and charts is concerned with public expenditure and brings together the main financial resources devoted to the social services in the United Kingdom. This is followed by a section on population: changes in the demographic structure are basic to an understanding of social developments and must set the scene for any study of social conditions. The two subsequent sections, one on employment and a short one on leisure, are designed to show how people spend their time. The next section is primarily concerned with people's income and wealth and the way it is spent: this is followed by one on social security indicating some of the means of support, both temporary and long term, which people draw upon when they are unable to keep themselves and their dependents. The remaining five sections on welfare, health, education, housing and justice and law, describe different aspects of social conditions on a fundamental basis.

14. "Social Trends" will only contain a selected range of those social statistics available at the time of publication and is not explicitly linked with new development projects. It will however be a valuable medium for reporting new developments in the future, through both written articles and new kinds of data.

Linked Social Data

15. Government Departments dealing with social services are usually concerned with the management or policy oversight of large institutions or groups of institutions. Therefore, the emphasis in such Departments is on data which arises as a by-product of administration (as in social security administration); or is collected routinely from external sources to provide a description of the volume and nature of services, eg returns from local government on housing, education, etc. Such information is usually perfectly adequate for day-to-day administrative purposes, but is often ill suited for other purposes. This is particularly true of data on people and households since the figures deal in any one instance with one particular aspect of our lives.

16. Beyond the internal management problems of the social services there is a need to acquire a better understanding of:

- a. the ways in which needs for social services arise.
- b. the impact of social policies upon the community.

This is necessary for the guidance of policy formation and for intelligent forward planning of the services. It is therefore essential to acquire a better understanding of the inter-relationships between the various characteristics and requirements of people and households eg the extent to which health affects educational attainment, housing conditions affect health, higher education affects social mobility, etc.

17. It is in this area of linked social data that some of the more urgent needs for new statistical developments are to be found. In those social surveys undertaken for particular policy problems it is usual to introduce such linkages by studying the particular group of people (the aged, the handicapped, the poor, etc) in a variety of relevant aspects, eg their environment, family background, demographic characteristics etc. However, it is when one seeks for data sources about people for planning and

monitoring purposes that the lack of linked data which is both regular and frequent becomes most apparent. The principal source has up to now been the Census of Population and Housing, conducted, at most at five yearly intervals. It will continue to be important, but it has inevitable limitations. Firstly, it is too infrequent for many purposes. Secondly, the questionnaire must be capable of being completed by the respondents themselves. This limits its capacity and range. Thirdly, the sheer size of the Census means that the analysis of the figures takes a long time to complete. For technical reasons, it is unlikely that these limitations can be overcome to any significant extent.

18. There are two ways of improving the situation which are complementary rather than alternative. The first would be to investigate the possibility of linking together the various registers of data on individual persons held for different purposes, in different Government Departments. One way of doing this might be by the use of a common identifying number in place of the various numbers (National Insurance Number, National Health Service Number, etc) presently used. This would not necessarily imply that all the data would be combined into a single Population Register, but that the facility for deriving linked statistics would be implicit via computer techniques. However, this approach although under intensive investigation and development in certain countries is fraught with political and technical difficulties. There are at present in the United Kingdom no plans for work in this area except for certain work which is proceeding on medical record linkage.

19. Another way of improving the situation is to develop the concept of a Multipurpose Household Survey. This is seen as a large continuous sample survey on a national scale which simultaneously investigates a wide range of social characteristics. To this extent it resembles the Census in producing linked data. However, because it uses a considerably smaller sample and is conducted by skilled interviewers, its total impact on the community is smaller; its range and depth of topics is greater; its frequency of analysis can be much greater (at least annual); and the speed of analysis is in terms of months rather than years.

20. Such a survey has been sponsored by the Central Statistical Office and preliminary development work is in progress. A pilot survey of 1,000 households was undertaken in February 1970 and although a full assessment of the outcome is not yet complete, first indications are very promising. If permission is given to go ahead with the main survey, this will begin sometime in the last quarter of 1970. The first year of the survey will take in a sample of 15,000 households distributed over Great Britain. This sample size may be expanded in later years if the survey is successful and circumstances warrant such expansion.

21. The survey will be continuous in the sense that interviews will take place in a steady stream throughout the year gradually building up to the annual quota. The structure of samples over time will be such as to make possible quarterly analyses of data from certain questions where this would be useful. Normally however the data will be analysed on an annual basis.

22. The questionnaire comprises two schedules, one for household data and the other for personal data. The household schedule seeks information on household composition, migration patterns of the household (or groups within the household), and on a wide range of aspects of housing accommodation

including such matters as tenure, reasons for moving, etc. The personal schedule is asked of every household member over the age of 15. It seeks information on several aspects of employment, travel, education, health, family history and family intentions and income, including social security benefits. Clearly the simultaneous survey of such a wide range of topics will make possible a considerable variety of investigations into the interactions of the different observable aspects of life.

23. One of the most important aspects of such a survey is its frequency of analysis and the consequent facility for rapidly establishing trends. To this end, it is intended that there shall be a core of relatively permanent questions. However there will also be a facility for attaching to the questionnaire occasional questions of special importance particularly where the topic needs to be linked to the information contained in the core questions.

24. Such a survey has peculiar difficulties. The fact that the questionnaire is bound to be rather long and complex is not an insuperable difficulty. This is true of many other quite successful surveys. What is more difficult is the wide ranging nature of the subject matter which makes it hard to hold the attention of the respondents in the course of a relatively long interview. This is one of the few surveys of its kind ever to be attempted on this scale, and first indications from the pilot survey are that there is a good chance of success.

A System of Social and Demographic Statistics

25. One requires in the field of social statistics to consider whether there should be developed an all-embracing framework of tabular presentation of social data designed explicitly to support fundamental tasks such as policy formation, forward planning and the monitoring of progress towards social goals. Over the past 20 years there have been extensive efforts both nationally and internationally to develop a framework of this kind for economic statistics. These have culminated in very detailed specifications for a set of National Accounts which are implemented to varying degrees in many countries. There is now widespread interest in the development of a set of "social accounts". This interest is stimulated not only by the natural desire of statisticians to extend the same kind of reform and rationalization into the second major area of statistics, but also by factors like the growing scale of social problems (especially in urban areas), the rapidly expanding proportion of public expenditure on the social services and the far reaching implications of demographic changes foreseen over the next few decades.

26. International discussions on this subject have already begun. Thus in January 1970, a Working Group of official statisticians was convened under the auspices of the Conference of European Statisticians. The purpose of the Group was to recommend a programme of work at international level leading to the specification of a "System of Social and Demographic Statistics" (SSDS). One method of developing such a system is that due to Professor Richard Stone whose work is derived in part from his own economic work on the National Accounts and on input-output analysis. The methodology is most highly developed in the field of education statistics and the basic concept is the simple one that all people who leave a particular category of the educational system must turn up in some other category, and that it is only a matter of logical structure building and of statistics to account for

all the human stocks and flows in the total system. The problems are to derive basic input data and to calculate the transition probabilities between one part of the educational system and another. Such a method could for example be extremely useful in projecting the output of the educational system under various assumptions about human input and resources invested. Professor Stone's work in this area is very advanced in the educational, demographic and to some extent, the employment fields. It has been suggested that it could theoretically cover any aspect of the human life cycle and work is in fact proceeding on investigating its application to such matters as health. However the system is very demanding of statistical data in that it requires data on human flows as well as stocks. Data on flows requires a more elaborate form of enquiry and a greater frequency of collection than is common. It would seem that governmental systems based on individualized data (population registers) would form the most effective input for such an arrangement. Clearly this kind of analysis could be a very important tool but it is felt in some quarters that it might not in fact provide all of the answers which are needed, for example, in the context of modern planning. Nevertheless, the working group recommended that further work should be done on this approach.

27. A principal item on the agenda of the working group was a paper from Professor C A Moser of the United Kingdom Central Statistical Office recommending that a particular line of development should be followed for a set of social accounts which would be complementary to the analyses recommended by Professor Stone. This recommendation was accepted in all main essentials and an outline of these accounts is as follows. The scheme of accounts is focused on the social services. It would start from a social capital formation and expenditure account showing the expenditure (both capital and revenue) on various forms of social services and would link directly with the National Accounts. In parallel there would be a social services manpower account showing the stocks of manpower used in the various social services (eg doctors, nurses, teachers, social workers) and the flows into and out of these groups. Then there would be a set of tables relating to the recipients of the services - who uses them, who receives various kinds of benefits, and so forth. Here the emphasis will be on differentials between different parts of the population (regions, social groups, household types) and between different stages of the life cycle. There would be tables on financial social service benefits, on services in kind received by the individual and household, on the utilization of services such as hospitals and schools, on participation in community services, and so forth.

28. At the level of people and households it will also be necessary to present data which have an important bearing on social conditions generally even though not directly related to the interaction between individuals and social service institutions. Thus, elements of personal and household income other than cash, goods and services received from social service institutions, will need to be tabulated. Proposals for analyses of personal and household income, expenditure and savings are already under close study by international groups concerned with systems of National Accounts. However for the purposes of SSDS, the tabulations will probably require more elaborate classification of the person and household axes than are likely to be required for purely economic purposes. There will also be a need for greater disaggregation of certain items of income and expenditure. Thus it might be desired to demonstrate the pattern of change in income over the life cycle and at various stages of family grouping; also of interest are differences between socio-economic or ethnic groups, and between households

with different kinds of housing accommodation. Some items of expenditure may need to be shown explicitly eg rents, mortgage repayments, expenditure on private education, expenditure on particular items of durable goods etc.

29. Although not specifically mentioned in the report of the Working Group, there will also be a need for other social condition tables of a more general kind. These may often represent attempts to quantify certain kinds of social hypotheses eg the effects of housing conditions upon health, of health upon education, of education upon social mobility, etc. One purpose of such tables would be to throw light on the most effective ways of achieving fundamental social goals insofar as the latter can be identified.

30. The final element in the supporting background material should be tables of demographic data analysing such matters as age/sex distribution over time and over regional areas; of family and household composition and of the components of population change, namely fertility, mortality and migration.

31. Important aspects of this total spectrum of tables, are first that it will consist in practice of a series of sub-systems covering the main topic areas (health, housing, education, etc); and secondly that these sub-systems will be linked statistically both between and within themselves in all useful and relevant ways. Such linkages will take a variety of forms. There will be those arising from a unified system of classifications and concepts; others will come from attempting to apply normal accounting and balancing principles to stocks and flows of money, people, goods and services which are shown in more than one part of the system; others may be introduced by special tables bridging two or more sub-systems (eg on social services manpower). Some of the 'social conditions' tables mentioned in paragraph 29 would obviously be bridging tables of this kind.

32. The basic input data for many of the tables in SSDS will not be currently available. One virtue of specifying the nature of such a system in detail is that it may help to identify more explicitly many of the gaps and deficiencies in current social statistics. A mention has been made in paragraph 26 of the potential usefulness of individualised data (population registers) as a very flexible form of basic input. However registers of this kind are surrounded by many political and technical difficulties. In those countries where they seem unlikely to be feasible, more emphasis will be placed on the use of surveys like the Multipurpose Household Survey earlier described and on a limited degree of linkage of certain kinds of personal data already collected for administrative purposes (eg medical record linkage).

33. Clearly, such a system should be designed to serve as wide a range of descriptive and analytical purposes as possible. Not every such purpose can be identified in advance, but in the United Kingdom as in certain other countries, one of the most important roles it could play would be to serve as a system of regular and comprehensive social intelligence in support of the task of the long term planning of the social services. Several central Government Departments in the United Kingdom are developing planning-programming-budgeting systems (PPBS) in this connection. One of the principal requirements of PPBS is the prior identification of goals and targets. It follows that identification of social goals would provide important guidelines for the development of SSDS if the latter is seen as an essential informational background to long term planning. Moreover, PPBS

implies continuous reassessment of progress towards such goals and the corresponding pattern of resource allocation. Thus it gives rise to the need for social indicators which will reflect trends in certain basic characteristics of society. Work on the development of these indicators should therefore interact closely with work on SSDS.

34. The Central Statistical Office aside from playing a leading role in international discussions on this topic, has recently begun certain pilot investigations into the broad implications of the SSDS concepts outlined in preceding paragraphs. These are so far on a modest scale and are essentially of a research character. They are intended to throw light on the existence of any fundamental difficulties in establishing such a system and on the likely scale of an "ideal" system. These studies are still in progress. At a later stage, consideration will be given to how development can take place on a broad front with the collaboration of those Government Departments and other organizations most closely concerned.

The Office of Population Censuses and Surveys

35. Important instruments for the generation of new kinds of social data at the level of people and households are national censuses and sample surveys. In the United Kingdom this has recently been recognized by reorganizing the available facilities for conducting such activities into a new Office of Population Censuses and Surveys (OPCS). The intention is that this will lead to better use of scarce professional resources, justification of a better range of operational facilities (eg computers) and rationalization of the respective roles of censuses, continuous sample surveys and ad hoc sample surveys. OPCS was formed by the amalgamation of the former General Register Office (responsible for censuses and registration of births, deaths and marriages) and the former Government Social Survey (responsible for certain continuous and ad hoc sample surveys for Government Departments). OPCS will be more closely integrated with the Government Statistical Service and an inter-departmental Policy Committee chaired by the Director of the Central Statistical Office will be concerned with the development of the programme of work of the Office. A major item in that programme will be the Multipurpose Household Survey previously referred to.

PROBLEMS OF MEASUREMENT IN THE FIELD OF LEVELS OF LIVING
INCLUDING THE DISTRIBUTION OF INCOME AND EXPENDITURE

1. It may be useful before discussing measurement of levels of living to define the term. The term level of living is used to describe the reality experienced by individuals or groups such as families. Some of the major elements of the levels of living are the complex combination of consumption patterns, the distribution of income, health conditions, working conditions, financial and physical possessions, access to education, recreation and leisure, freedom and security. It is generally agreed that a national level of living is not a uniquely quantifiable concept. That is, one cannot construct an overall index which can measure changes and progress in levels of living, for example, in the way in which we measure per capita GNP or an index of real output. Rather, levels of living can only be measured in terms of many statistical series and indices which provide insights into the different social and economic attainments of society. Such statistical series and indices may also provide the basis for evaluating or setting a society's goals or standards.
2. Many of these statistics are labelled "social indicators" which have been defined as "statistics, statistical series and all other forms of evidence that enable us to assess where we start and are going with respect to our values and goals, and to evaluate specific programs and determine their impact". There has been a growing interest in the development of social indicators and perhaps an impression created that social indicators are statistical series in their own right. In fact, if one examines "social indicators" one discovers that social indicators are by-products of social statistics and the better the social statistics the better the social indicators. The problems of the measurement of levels of living then implicitly reside in the measurement problems of social statistics and some of these aspects have been already commented upon in the discussion of social statistics.
3. One can readily enumerate some of the more significant indices of levels of living. In the field of health one can cite life expectancy, infant mortality rates, incidence of illness such as tuberculosis, ratio of dentists, doctors, nurses and hospital beds to total population etc. In respect to working conditions suitable indicators may be minimum wage rates, level of wages and salaries, the length of the legal work week, the proportion of workers covered by unemployment insurance, workmen's compensation and retirement pension plans. Crime indices are characteristics such as extent of juvenile delinquency and ratio of crimes to population, ratio of population in correctional institutions.
4. Family and individual personal well-being is evaluated by series such as the proportion of the school age children attending school, the quality of the housing stock, the extent of overcrowding, the extent of ownership of consumer durables such as automobiles, refrigerators and washing machines, the degree of inequality in the income distribution, the quantity and variety of goods purchased, the amount and duration of unemployment, the extent of population under-employment.
5. As these examples indicate, the statistical series required to measure levels of living are many and varied and range from very simple statistics to statistics which are complex to collect and tabulate. Further, through time, there is a growing realization that there are interrelationships

between social indicators which have been overlooked and consequences which are only now becoming evident. That is, that social indicators may lead society to set the wrong long term goals. For example, for years the growing ownership of automobiles has been favourably regarded as evidence of the growing prosperity of the economy. Sales of automobiles have been an important factor in maintaining high levels of employment. The adverse effects of such ownership are only now becoming to be appreciated - the pressures on governments to build more and more highways and expressways, the resultant destruction of housing stock, especially in inner cities and the impact of this on remaining housing in terms of deterioration and overcrowding, the resultant deterioration of public transportation systems, the increased problem of air pollution as well as the problem of the disposal of obsolete automobiles.

Income and Expenditure Statistics as Indicators of Levels of Living

6. Statistics on the distributions of income and expenditures of the population are usually considered to be among the most significant indicators of levels of living. However, the importance of such surveys for this purpose has only come to be recognized rather slowly. Even now few countries collect and publish income and expenditures data on a regular basis. Family expenditures surveys are probably among the first household surveys to be undertaken by statistical offices, even in underdeveloped countries. The early interest in such data tended to be for the collection of data for weighting the consumer price index and for data for national accounts estimates. In the case of income statistics the events of the nineteenth century and the first third of the twentieth century led to a public concern about income inequality and its diminution. In North America in the forties and early fifties much of the research centered upon the question of inequality, its extent, its measurement and the long run trends. Interestingly enough this interest has abated considerably and although research in respect to the income distribution has expanded greatly, little of it appears to be directed to the problem of inequality as such. Rather, many new areas of interest have developed. What is the direct and indirect incidence of government taxation? Who pays and who benefits and what is the extent of benefits from government expenditures? Who are the poor and what are causal factors of poverty? How much are existing government programs benefiting the poor? What are the returns to investment in education? What is a subsistence income and what proportion of the population live below what might be considered a socially desirable standard of living? What proportion of the population have access to the more commonly produced consumer durable goods such as refrigerators and television sets? How adequate is the housing accommodation of the population and is satisfactory housing out of the financial reach of the low income groups? In a period of inflation, which group is most likely to be affected by inflation?

7. These are only a sample of the problems for which income, asset and expenditures data are now required. Along with this is the growing need to develop micro or cross-sectional household accounts as complementary statistical systems to the SNA framework. This tremendous demand for data has increasingly highlighted some of the inadequacies of current statistics for answering the problems posed to statisticians. Summarized below are some of the major inadequacies of current data as well as an indication of future directions of research.

Problems and Plans

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(a) Conceptual Framework

8. In the past the general framework of the Canadian surveys has been to measure money income and money expenditures, i.e. actual market transactions. That is, the surveys have not attempted to measure income in kind or household production of commodities and services for home consumption nor have the surveys obtained data on the value of goods and services provided to the household by employers, governments, institutions or individuals outside the household. In the Canadian context these are becoming increasingly serious omissions and one of our major objectives for the future must be the expansion of the conceptual framework to provide a more adequate measure of real income and consumption. The Canadian tax structure, for example, offers an inducement to workers to accept some of their reimbursement in the form of fringe benefits which are usually not taxable in preference to cash income which is taxable. Statistics suggest that wages and salaries in the form of fringe benefits are of increasing significance. No attempt as yet has been made to measure the extent and nature of this supplementary income which may take many forms - as, for example, subsidized housing, the provision of automobiles, free medical and life insurance. Along with this trend has been the very great growth of government expenditures on social welfare. The statistics, as collected in the past, only measure cash benefits received from the various levels of government. There has been no attempt, as yet, to directly collect statistics which can be the basis for imputation of the impact of government policy on levels of living. Some of the data collected on characteristics, of course, allows for inferences as to which families or individuals may be affected by government expenditures but the data are such that imputations based upon them may be subject to wide margins of error.

9. In summary, the surveys in the past have concentrated upon measuring the receipts of sources of spendable income and upon measuring how the income is spent - the quantities and values of goods and services purchased directly by the family. For evaluations of real levels of living the conceptual framework will have to be broadened to measure income in kind and goods and services provided to households by governments and employers. An expansion of the conceptual framework is also necessary for the development of the system of income and expenditure accounts which are being proposed by the UN as a complementary system to the SNA accounts.

(b) Integration of Data

10. As outlined previously, Canada conducts separate income and expenditures surveys rather than omnibus surveys encompassing all of the relevant data. Expansion of the data framework in the future along the lines suggested above may mean the initiation of further household surveys which may be taken independently of the continuing surveys. This means that the statistics required for improving the data on real income and consumption levels may have to be developed from different sources. This presents problems in developing income, balance sheet and expenditure accounts in an integrated framework. Before computer storage of data, inconsistencies between series presented insoluble problems. The availability of computers has made integration of data from surveys and censuses a feasible possibility.

11. As a first stage, Canadian household surveys and the Census have adopted a consistent conceptual framework in the collection of data for

individuals, families and households. The integrating framework will be the common building blocks which exist within each data series. The conceptual framework which can be used is the set of characteristics by which individuals, families or households can be classified in each statistical series - for example, age, sex, family size (or composition), place of residence, class of worker, occupation, education.

12. There are a number of possible approaches to integration. One possibility is the development of a data set consisting of statistics which have some degree of aggregation. That is, computer stored statistical series which collapse data on family and personal characteristics from the Census or Surveys for families with homogeneous characteristics in respect to variables such as size of income, family size, place of residence, age and education of head. This could be considered a type of socio-economic population model. Although the statistics being collected in 1969-71 would be the primary input other data could be added from future surveys if these surveys contained the appropriate core of linking information.

13. An alternative possibility is to attempt a one-to-one matching of individual questionnaires collected from different surveys. Because the various surveys are independent of each other the same families are not interviewed in the different surveys. However, each set of data contains families with similar characteristics as to age, family size, place of residence, income level, etc. These common characteristics could be used to link data on individual records; in effect, one would assign one record to another combining the data on the two records. This could be considered a form of imputation of data. Such a procedure would make the data even more useful but is a potentially more difficult approach to the development of data sets because the linkage procedure would have to avoid the linkage of data which are contradictory or incompatible. For example, one set of statistics may consist of data on families, by size, place of residence, age of head, income and balance sheets, etc. However, some families are home-owners and others tenants. Another set of statistics may contain data on the expenditure patterns of families by similar characteristics. If individual records are to be combined, then the linkage must be on entirely homogeneous characteristics, that is, the records of home-owners must only be linked to the records of home-owners since this characteristic has an effect on shelter expenditures.

(c) Research and Analysis

14. The development of integrated data sets would greatly enhance the usefulness of the data for research purposes, for projection purposes, and for the testing and hypotheses regarding the effects of social and economic events and policies upon the income and consumption distribution. Such an integration is a prerequisite for the development of macro-socio-economic household accounts on a consistent conceptual framework. Integration would also be of great benefit in the long range planning of surveys and censuses because it would inevitably expose the weaknesses and gaps in existing statistics.

15. Income and expenditures data as traditionally collected and tabulated often raise more questions than they answer. The interpretation of the data now requires that the data themselves be the starting point for research and for the development of additional statistical series.

16. For example, statistics are needed on constant dollar distributions as well as current dollar distributions to evaluate long term trends for

sub-groups of the population such as the employed as compared to the retired population. Canada started producing income distributions in constant dollars by a number of family and individual characteristics. It would be desirable to extend these series to expenditures by income level as well. The development of such estimates in any detail can only be attempted through the use of a computer. Such data are needed for any studies of real income trends through time.

17. The question of poverty and of minimum living standards is of great current concern. The family expenditures statistics have already been the basis for the development of crude "poverty lines". A great deal of research is needed as to what constitutes inadequate incomes and inadequate consumption patterns in modern Canada. One major input into such research may be the construction of standard budgets for different levels of living such as low levels or moderate levels. An essential ingredient to the construction of such budgets is family expenditures data of a high calibre.

18. Because of its size Canada is a country with significant regional disparities in economic conditions and problems exist in equating levels of living between regions.

19. Population groups could be arrayed according to increasing dollar value of total expenditure as a first, though imperfect, indicator of relative levels of living. Given price indexes of comparative costliness, the dollar value indicator could be deflated to a common dollar purchasing power, preferably with adjustment for environmental differences (e.g. climate) which condition costs of similar levels of living in differing locations. The affect of differing patterns of expenditure on levels of living could be examined by conversion of quantities to non-monetary values. For example, given unit conversion factors, quantities of food might be convertible to nutrient content and total nutrient used in place of total dollar expenditure. Further, the availability of values and quantities permits study of the rate of change of quantity and value as income levels increase and the location of turning points of rates of change may throw light on the relative priorities among consumer goods and services in the preference scales of various population groups and relative levels of living associated with given levels of income or total expenditure. It is expected that approaches of this type will be explored using data from the 1969 surveys and that actual applications will point the way to supplementary or alternative techniques in measurement of levels of living based on family expenditure statistics.

20. These are a few examples of possible directions of research with the data currently being collected. As this summary indicates, income and expenditures statistics are not only indispensable in their own right but can also form the data basis for extensive research on many problems.

PROBLEMS OF MEASUREMENT IN THE FIELD OF
LEVELS OF LIVING INCLUDING DISTRIBUTION
OF INCOME AND EXPENDITURE

INTRODUCTION

1. In the context of economic planning in this country the twin social objectives of improvement in the levels of living, especially of the poorer sections, and reduction of disparities in income and wealth have been claiming perhaps more attention than any other. Right from the beginning of the past decade, this subject has been receiving increasing attention of the Government as well as of individual economists and statisticians and research workers and organisations. In fact, towards the end of 1960 the Government of India set up a committee of experts under the chairmanship of Prof. P. C. Mahalanobis to study changes in the levels of living during the first two Plans (1951-1961) to examine the trends in the distribution of income and wealth and to study the extent to which the operation of the economic system had resulted in concentration of wealth and means of production. The committee devoted considerable time and attention to the task entrusted to it and submitted its report in two parts, the first part dealing inter-alia with the distribution of income and the second and final part with changes in levels of living.⁽¹⁾ This paper draws largely on the published and unpublished work carried out for the committee.

2. Before any attempt can be made to study changes in levels of living, it would be necessary to consider carefully the concept of the level of living. It is generally agreed that it is not possible to adopt any single measure or index of the level of living. There are many aspects or components of living such as availability of food, clothing, housing, employment, education, health, social and cultural amenities etc., each of which requires to be assessed separately. The subject has evoked considerable interest at the international level also over the past several years. The problems of defining the levels of living and measuring changes in such levels for purposes of international comparison were considered by a committee of experts set up by the United Nations which recommended for the purpose, several components of the level of living and suitable indicators under each. These recommendations are contained in the Report "International Definitions and Measurement of Standards and Levels of Living - 1954".⁽²⁾ The recommendations were generally approved by the U. N. Statistical Commission in 1960. Some of the important components recommended were health, food consumption

and nutrition, education, housing, etc.

3. In 1955, the ILO Working Group on Family Living Studies studied in detail the type of information which should be collected under each of the several components and examined the feasibility of collection of data taking into account the statistical sources and conditions existing in less developed countries.^(3,4) The Working Group suggested that data on consumption and savings of household (including home produced goods often encountered in the economy of less developed countries) might be collected through household enquiries, as such information would provide valuable indicators of levels of living. The Group, however, was of the view that as there were often difficulties in attempting international comparison of economic characteristics it would be easier to compare the rates of change rather than absolute levels in different countries.

PROBLEMS OF MEASUREMENT OF LEVEL OF LIVING

4. As will be clear from the foregoing, there can be more than one indicator for any of the components and in any case, it will not be possible to use a single indicator to cover all aspects. It is likely that there may be an improvement in some of the components while the position remains stationary or might have even deteriorated in the case of others. As a way out of this difficulty a comparison of various components of expenditure on consumer goods and services would provide an operationally feasible method for the assessment of changes in the level of living over a given period of time. In order to allow for the effect of variations in prices, it would be necessary to express all prices in terms of the prices in the base year, i.e. the comparison is to be made at constant prices. Although most of the goods and services are usually purchased by the consumers themselves, there is an increasing tendency for certain services and goods being supplied free of charge or at nominal charge by Government; for a comprehensive assessment it would thus be necessary in principle to isolate the relevant components of public consumption and add the same to private consumption in order to represent the total consumption of the population.

5. Comparison of consumption may be attempted in a number of ways which in the ultimate analysis should be complementary to each other. To start with, one may make a comparison over time of aggregate consumption expenditure at the national level. Current consumption arises either in the form of Government or public current expenditure or in the form of private consumption of persons and households and of private non-profit organisations. Government current expenditure consists mainly of two parts of which one including

expenditure on education, health services, cultural amenities, etc., contributes directly to the level of living of the people and has to be taken into account together with private consumption. The other part of Government current expenditure on defence, administration of justice, general administration etc., is essential for security, preservation of essential human rights and the stability of the society, as a whole, but need not be considered as contributing directly to the level of living.

6. The increase in national income can be considered from three aspects. A part of it goes directly to raise the level of private consumption and improve the level of living; a part is used to increase the consumption of Government (a part of which again is redistributed to improve the level of living) and the rest representing the savings of the nation provides an index of the possibilities of future development of the economy. The trend of national income analysed by the basic components of private consumption, Government current expenditure and savings would thus furnish a broad idea of changes in the general level of living of the population as a whole and also of the prospects of future growth of the economy. For an analysis on these lines, national income and its components, at constant prices, reduced in terms of per capita, would provide convenient indicators.

7. Trends in consumption, especially private consumption so identified, could then be meaningfully associated with the change in the per capita availability of various consumer goods and services as derived from national aggregates. Changes in the availability of facilities for education, medical care, transport, communications, housing etc. per unit population may, all be studied in this context. This is a relatively simple analysis. The whole exercise may be supplemented by an examination of the variations in the consumption of the population as revealed by data thrown up by surveys on household consumption. Deeper analytical methods may have to be employed in this case. Both the approaches, if based on valid and reasonably precise data, should lead to fairly consistent results. The former approach depends essentially on general averages and can furnish only an overall picture of the population as a whole. An increase in the average per capita consumption may be brought about by a large increase in the level of consumption of one or more sections while the rest of the population might have actually suffered; a general average cannot, therefore, reflect changes of this nature occurring within the population. A study of variations in the consumption of the population based on survey data on household consumption is particularly valuable in so far as it throws

light not only on the changes in the general level of consumption but also on the disparity within the population. This is really more useful from the point of view of analysis of the pattern of distribution. It may be noted, however, that the study cannot easily take into account the impact of governmental efforts in the form of various social services and welfare measures on the levels of living of individual households.

Study of disparities in the level of living

8. Our analytical studies in the field of levels of living over the past few years are based largely on the data available to us on household consumption. Study of the distribution of household consumption expenditure apart from being a valuable approach by itself in studying disparities in the level of living, has also gained a special importance in so far as it is expected to give some idea, although indirectly, of the salient features of the distribution of income as the two distributions are likely to be somewhat related, though the distribution of income will generally be more unequal. In India as well as in many other developing countries, the available data on distribution of income are known to be mostly inadequate mainly from the point of view of coverage and further, it is generally admitted that the concept of income is more difficult than that of expenditure from the point of view of the respondent in any census or large scale sample survey. In fact the 13th Session of the U.N. Statistical Commission which discussed the subject of income distribution statistics had taken cognizance of this difficulty.

National Sample Survey data on Household Consumption

9. In India the National Sample Survey, an organisation engaged in conducting socio-economic enquiries on a countrywide scale, has from its inception been collecting data on household budgets from sample households. We have, therefore, in this country, statistics of household consumption from the fifties. Consumer expenditure includes the value of all cash purchases in addition to the imputed value of all items of household production used for home-consumption. Information is generally available showing the distribution of the population in a fixed set of twelve or fourteen classes of monthly per capita total consumer expenditure. These data are being largely used by Governmental agencies and research organisations and individual research workers for the purpose of studying shifts in the distribution over the past decade or so.

Fractile Graphical Analysis⁽⁵⁾

10. For studying disparities in the level of living the distribution of population by fractile classes of per capita

total consumer expenditure would be perhaps more convenient and advantageous than the conventional distribution by actual size - classes of expenditure. The fractile classification consists in ranking the households according to the level of per capita expenditure and then dividing them into a specified number of classes such that the estimated population in each of these classes will be equal. Such equi-frequency classes are known as fractile classes.

11. The fractile graphical analysis is a relatively new but by now a well established method for the comparison of economic data relating to the same population over time or to any two populations that differ as to geographical region or in any other way. The method can be employed for any variate on the basis of which the population may be ranked. It would be worthwhile to contrast this approach with that of frequency distribution of the more usual type in which the class ranges would be fixed, say, in terms of the money value of the per capita income or expenditure. In economic data, the money value of the expenditure or income would, in general, change with changes in price. While there may not be much difficulty in comparing the condition of the entire population of the same country or region at two points of time, there might be greater difficulty in comparing over two periods, the conditions of, say, the poorer sections of the population defined on the basis of consumer expenditure. For example, the population of rural households as a whole in a given round of the National Sample Survey may be compared in a meaningful way with the population of rural households as a whole in any other round. A specified fixed range expenditure class would represent different groups in the two rounds because of price changes and would not, therefore, be comparable in any important sense. The use of the same fractile groups in the two rounds would avoid conceptual difficulties involved otherwise in making comparison over time or space. In the fractile approach, the bottom 10 per cent or the top 5 per cent, etc. of households in one round of the survey can be considered to be the counterpart of the bottom 10 per cent or the top 5 per cent etc. of households in another round of the survey. This would also be true for comparisons between two States or two geographical regions for the same round. These fractile groups, in other words, may be treated as so many economic 'strata' of the whole population and comparisons over time or space of the same stratum would be meaningful for many purposes.

12. Data on household consumption may be tabulated by fixed size-class of total consumer expenditure as is usually done or alternatively by fractile classes determined on the basis of total per capita expenditure. In the latter case the population is divided into a convenient number of fractile classes by per capita consumer expenditure and it would, then be possible to comprehend easily the significance of any comparison between any one fractile class with another,

more particularly the bottom with the top for any round of the survey, at any given point of time; and it is also equally convenient to study meaningfully how specified fractile groups have fared individually and relatively over time.

Analysis of household consumption data

13. Whatever the method of tabulation, fractile or otherwise, it would be possible to get an idea of the variation in the overall disparity of the distribution by drawing Lorenz Curves of expenditure for different rounds and examining their relative position or by comparing the Lorenz Ratio (vide appendix). Changes so identified will be valid, however, only in terms of the money value of consumption. This limitation is a very important point which requires further examination. A fall in the disparity of expenditure over time as indicated by the Lorenz Curves or as measured by the Lorenz Ratio is likely to be interpreted sometimes as indicative of the distribution becoming less unequal in real terms. That this need not necessarily be so will be clear from the following considerations. It may often happen that over a period of rising prices, the incidence of price increase may be far from uniform in different fractile classes. If the differential price variation happens to affect the poorer sections of the population more adversely than the rich, the share of expenditure of the former may register a higher increase than that of the more affluent sections with the result that the disparity of distribution of expenditure may be found to have decreased over the period. To associate such a phenomenon with a lessening of disparity in real terms would thus be sometimes fallacious. A straightforward and simple method to overcome such a difficulty would be to apply appropriate differential consumer price index numbers for different fractile classes while working out their share of expenditure and then to compare the Lorenz Curves for the distribution of expenditure so adjusted. But unfortunately such price deflators are not often available. In the course of its analytical work the Committee on Distribution of Income and Levels of Living was actually confronted with difficulties of this nature. After examining the variation in the distribution of total consumer expenditure over different rounds of the National Sample Survey, the changes in the distribution of the quantity and value of a major item of consumption viz., cereals, were studied by the pre-determined fractile classes. As data on quantity and value of cereals consumed were available by fractile classes, it was possible to obtain the price as value per unit quantity in respect of each decile

*As the consumer basket of cereals was not homogeneous, consisting as it did, of different cereals, the derived price should be treated as a weighted average price for the group of cereals.

It was found that variation in the general price so obtained over the period under study** was appreciably different for the different fractile classes, the poorer sections being affected more adversely than the rest. At the same time, it was also noticed that the distribution of the money-value of expenditure on cereals was getting less unequal over the period(1952-61) whereas the distribution of quantity of cereals(of all kinds taken together) consumed was showing the opposite trend. Such an inverse relation between the distributions of quantity and value of cereals could be explained partly by the differential variation in the general price of cereals which was found to hit the poorer strata of consumers more adversely. The trend was more marked in the rural areas than in the urban.

14. But it is possible that there could also be another factor contributing to a lessening of inequality in the distribution of expenditure on cereals, namely, change in the composition of the consumer's cereal basket over time. Detailed data available for a few rounds of the NSS tend to show that the quantity share of fine cereals in the poor consumer's basket registered some amount of increase with the result that he had to incur more expenditure on cereals on account of qualitative improvement therein apart from the rise in the general price level of cereals. Qualitative improvement of this nature may be regarded as a sign of betterment in the level of living if it is voluntary and is achieved within the economy of a free market but the same need not necessarily be the case when the supply and distribution of foodgrains is controlled and regulated by the State in times of scarcity. The consumer has then little option to exercise and his basket may not be properly reflecting his real preferences in the matter of consumption. In such a situation any qualitative change for the better brought about by external forces such as rationing and State control cannot possibly be interpreted as a sign of improvement in the level of living if there still remains any appreciable unsatisfied demand in regard to the total quantity of foodgrains. This illustration may serve to highlight some of the difficulties involved in interpreting the results without taking proper cognizance of the economic environment of the consumer.

Ranking household by two different criteria and reduction of household size to adult equivalent units

15. Before concluding this discussion on fractile analysis of consumption data, it would be proper to mention briefly some of the limitations of the method of(classifying or) ranking households by the criterion of per capita consumer expenditure. There is obviously an alternative criterion for classifying and ranking, viz. total household

**This finding is due to Prof. Mahalanobis vide paras 2.4 and 2.5 pp 28-29 of the Committee's report, part II(1).

expenditure. The object of ranking by either method is to arrange the households approximately in accordance with the level of living. Ranking by total household expenditure does not take into account the size of the household, which may vary from one household to another. Per capita expenditure which allows for variability in the size of the household would appear to provide prima-facie a better approximation to differences in the level of living. But at the same time, in this method of ranking the same weight is given to each member of the household, that is, no notice is taken of the differences in the level of consumption between persons of different sex and age. In principle, allowances can be made for differences in the consumption of cereals, arising from differences in age and sex by finding the 'adult equivalent' size of each household, and by ranking the sample households on the basis of consumption expenditure per adult equivalent unit. The reduction of household size in terms of adult-equivalent is based on the concept of a 'normal' level of consumption of an adult conforming to certain optimum specifications. The normal consumption of a person of given age and sex is then expressed as a fraction of this unit and the fractions are to be added together in order to arrive at the adult-equivalent size of the household which will be equal to or less than its actual size. If, on the other hand, household expenditure is taken as the criterion for ranking, the procedure will be practically tantamount to treating the size and composition of each of the households to be the same. Thus the ranking by adult-equivalent size of any household will lie in some sense between the ranking by household expenditure and the ranking by per capita expenditure. It follows that any relationship or pattern of change which is found to be similar for both ways of ranking would remain unaffected had the adult equivalent size of the households been used as the basis for ranking. As some exploratory analytical work was found to reveal reasonable agreement between both the methods of ranking, the need for deriving the adult equivalent size of households was not seriously felt in the study carried out for the Committee on Distribution of Income and Levels of Living. As completely satisfactory methods for ranking for the adult equivalent size are not yet available, such an exercise in refinement was not considered worthwhile to attempt at present.

DISTRIBUTION OF INCOME

16. So far we have been discussing the use of consumption data as a useful tool for measuring changes in the disparity of the level of living. Although consumption may sometimes be a better indicator of the level of living than income, studies on distribution of income are equally important in several respects. As spelt out in the United Nations Statistical Commission's document for the 13th Session (E/CN.3/323 dated the 2nd Feb., 1965), the basic objectives of income

distribution studies fall under three heads viz. (1) to measure the distribution of economic welfare among the population (2) to establish relationships between the distribution of income among the population and the pattern of productive activity and (3) to establish relationships between the distribution of income and the pattern of expenditure and savings. In India also there has been ample recognition of the significance of each of these objectives, the first among these having been of special interest in the context of our national development programmes which are directed inter-alia towards a progressive reduction in disparities of income and wealth.

17. As economic welfare and the level of living are very closely related concepts, it will be obvious that studies of distribution of income and of changes in the level of living or consumption are really complementary. As already mentioned, for a study of the levels of living, data on household consumption usually collected through field enquiries cannot directly provide any idea of the impact of the social services and other amenities provided free or at nominal cost by public authorities, in any micro-economic approach, although it is believed that it is the economically or socially weaker sections who benefit more from such welfare measures. Analysis of data on the distribution of money incomes also may suffer from a similar drawback. It would appear that in order to get at a correct and realistic picture of the distribution of income, a number of complementary studies may have to be attempted. One might start with a comparison of per capita national income over time which will, of course, be a crude indicator of the general level of income. This has to be supplemented with studies of distribution of income among income-receiving units of the population either taken as a whole or classified into very broad groups such as rural and urban. In addition, intensive studies of the distribution of income of different functional and occupational groups will have to be attempted. If the results of all such efforts are integrated, it might be possible to achieve to some extent, the objectives envisaged in the Statistical Commission document already cited.

Data on Distribution of Income

18. One of the regular sources of income data is the 'All India Incometax Revenue Statistics' published annually by the Central Board of Revenue of the Ministry of Finance. It furnishes valuable information on the distribution of various mutually exclusive categories of assessee (individuals, firms, companies etc.) by size classes of gross and net income, their total assessed income, total tax collection and so on. These statistics do not, however, serve much

purpose from the point of view of income distribution studies for various reasons. In the first place incometax data cover only those at the top of the income-pyramid, who account only for a microscopic fraction (less than 1 per cent) of the population or even the total number of income recipients in the country. Again, income covered by these statistics are derived only from non-agricultural sources. Though agricultural incomes are taxed in some of the States, detailed information relating to such assessments is not available. Further, because of tax-evasion, substantial concealment of income and manipulation of accounts, income-tax statistics may not accurately reflect the incomes of non-salary earners. Moreover, there are conceptual problems connected with the legal definition of income and the recipient or the assessee which also make it difficult to attach a rational interpretation to the distribution of taxed income among the recipients.

19. Despite such limitations incometax data have been analysed and utilised to the extent possible. However, there may be difficulties in reaching valid conclusions from such material even in respect of the minority at the top of the income pyramid covered by these statistics. The following quotation from the Income Distribution Committee's Report (Part I) will be worthwhile to note in this connection.

"Studies based on income tax statistics in some countries reveal an apparent reduction in inequality over historical periods. Many discerning students of the subject could not regard this as a real change. They feel that there is a continuing social transformation by virtue of which the entities which enjoy income are today willing to accept a lower nominal income compensated by a large increase in security, title to assets of various sorts, economic power and overall stability and improvement in the level of living spread over the life span taken as a whole - all acquired in lieu of sacrifice of some current income. Thus more egalitarianism in terms of nominal income observed in the recent past may be consistent with possibly increased inequality in terms of what incomes actually buy for entities enjoying it."

20. Information is available regarding the earnings or wages of several occupational categories such as Government employees, factory workers, mining workers etc. as this is regularly collected and published by different Government agencies. However, the scope of such data leaves much to be desired from the point of view of study of distribution of income. For example, salary statistics of Government employees do not include various allowances accruing to them.

Wages of factory workers do not take into account several monetary benefits they may be in receipt of, when data are available on the magnitude of the total amount incurred on pay, allowances and other monetary benefits and the money-value of non-monetary benefits in respect of workers in a particular group of industry, the distribution by size-classes of income may not be forthcoming. Further, there are several occupational or functional groups about whose earnings no regular data are available. These include self-employed or own-account workers who constitute a sizable proportion both in rural and urban areas. In view of this any effort to study the distribution of income of the general population of earners of this country, from the available data relating to particular occupational groups, cannot be very rewarding although such information may be useful for several other purposes.

21. In this country, the decennial population census is not intended to serve as a source of basic information on income because of the broad scope of the census questionnaire and the difficulties that would obviously be encountered in interpreting the income concept to millions of respondents. The Committee on Distribution of Income and Levels of Living has, however, suggested that it would be worthwhile to examine the possibility of collecting data on income from a sample of census households, as is being done in some countries. Attempts have been made by official and non-official organisations by means of household sample surveys to collect among other things statistics of income which, very often, happens to be one of the several purposes of such enquiries. Household Budget studies conducted with the main object of constructing consumer price index numbers are such instances. (6) Apart from this a few surveys have been conducted in this country with the specific objectives of estimating household income together with consumption and savings, but these have not been able to throw sufficient light on the trend in the distribution of income over time because of their limited scope and coverage or because they relate to only one specified period. (7) (8) The Committee had recommended that surveys and enquiries of this nature be continued at suitable intervals on an expanded scale so that the results may be utilised for making comparisons over time. The Committee's recommendations are now under consideration.

22. The National Sample Survey has introduced with effect from the 19th round (1964-65) what is known as the integrated household schedule with a view to collecting comprehensive information on the household characteristics and activity as a whole, such as demographic and employment particulars of household, consumer expenditure, receipts and disbursements, production and output of household enterprises, housing condition and so on. As households, especially rural households often produce and consume several commodities and

services for either domestic purposes or for purposes of the household enterprises, it is considered desirable to keep in view the integrated activity of the household as a whole while collecting comprehensive material on several aspects of the household. Such an attempt also provides scope for a built-in system of cross-checks at the point of collection of data as any serious inconsistency in the information as furnished by the respondent is likely to be detected and reconciled on the spot by the investigator. The need for such internal cross-checks is all the more important because in the socio-economic field we have to rely on the interview method of eliciting information as there are hardly any written or reliable records available with the respondents. It will be some time before we are able to say to what extent such efforts have been able to fill in a major statistical gap in regard to household activity especially household income.

23. The first instance of large scale analytical work done in the field of level of living and income distribution is the study undertaken by the Committee on Distribution of Income and Levels of Living. Of course, several research organisations and individual research workers have also done in this and allied fields considerable research work including fitting of distribution functions. The basic data used for such exercises are mainly sample survey data on consumption expenditure or income tax statistics or a combination of both. With the availability of more reliable data on income and consumption at national as well as regional levels and also in respect of several socio-economic groups of the population, it should be possible to extend the scope of income and expenditure distribution studies. Research workers may also be able to graduate the distributions by suitable mathematical functions, estimate the parameters involved and evaluate the concentration ratios with greater precision; they will also be in a position to estimate more satisfactorily other important parameters such as income elasticity of consumption expenditure, elasticity of demand of major items of consumption etc. which will be very useful tools in economic planning.

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APPENDIX

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Lorenz Ratio and Lorenz Curves

Lorenz Ratio

1. When the data on distribution of consumer expenditure (or any similar variate) are available in the form of frequency tables by fixed size-classes or fractile classes, it will be possible to obtain a rough estimate of the Lorenz Ratio by the following method.

2. Where the tabulation is by fixed size-classes, let the number of such classes be 'n' and the percentage of individuals or units in the 'i'th class be p_i such that

$$\sum_{i=1}^n p_i = 100$$

If P_i (≤ 100) represents the cumulative percentage of persons or units i.e. the sum of percentages p_1, p_2, \dots, p_i in size classes 1 to i, the classes arranged as is often done, in ascending order and Q_i (≤ 100), the corresponding cumulative per cent share of the variate, the points (P_i, Q_i) ; $i=1, 2, \dots, n$ will determine the Lorenz Curve in a rectangular system of coordinates and an estimate 'L' of the Lorenz Ratio may be obtained as

$$L = 1 - \frac{1}{(100)^2} \left[\sum_{i=1}^n (P_i - P_{i-1})(Q_{i-1} + Q_i) \right] \dots \dots \dots (1)$$

where $P_0 = Q_0 = 0$ and $P_n = Q_n = 100$ and $Q_i \leq P_i$ for all values of i other than 0 and n.

3. When the distribution is available by fractile groups instead of size-classes, p_i remains constant for all values of i i.e. $p_i = p$ (say) so that the number of groups i.e. $\frac{100}{p}$ will be an integer. In that case, the formula assumes the simple form

$$L = \left(1 - \frac{p}{100}\right) - \frac{2p}{(100)^2} \sum_{i=1}^{\frac{100}{p}-1} Q_i \dots \dots \dots (2)$$

Concentration curves other than Lorenz Curves

Once the population is ranked according to any suitable variate like per capita consumer expenditure and the fractile classes fixed, it would be possible to study the distribution

of any other variates such as the quantity and value of cereals by the same fractile classes. If p_i and P_i have the same interpretation as before, if Q_i (≤ 100) represent the cumulative percentage share of the quantity or value of cereals corresponding to the cumulative percentages P_i , then the new set of points (P_i, Q'_i) will determine the position of a special kind of concentration curve for the distribution of the new variate under study. Such auxiliary concentration curves which are different from the ordinary Lorenz Curves, may be utilised to study the distribution of several variates (other than total consumer expenditure) over fractile groups already determined on the basis of per capita consumer expenditure. If the ranking of the population would remain identical for the original as well as the auxiliary variate and $Q'_i = Q_i$ for all i then the new type of concentration curve would be identical with the Lorenz Curve for the distribution of the latter variate. Such a situation may not ordinarily arise. It will be noticed that in the case of any variate for which the auxiliary concentration curve is such that Q'_i is also $\leq P_i$ as was Q_i , a ratio of inequality analogous to the Lorenz Ratio may be obtained as

$$L^1 = \left(1 - \frac{p}{100}\right) - \frac{2p}{(100)^2} \sum_{i=1}^n q'_i \dots\dots\dots (3)$$

If the tabulation is by fixed size-classes, the formula would be

$$L^1 = 1 - \frac{1}{(100)^2} \sum_{i=1}^n (P_i - P_{i-1})(Q'_{i-1} + Q'_i) \dots\dots\dots (4)$$

In studying the inequality in the quantity and value of cereals consumed by fractile classes (already fixed on the basis of per capita total consumer expenditure) special concentration curves of the type described above together with inequality ratios as given in equation (3) above may be used with great advantage.

7th Conference of Commonwealth Statisticians
Scheduled to be held in New Delhi,
India, from 16 November 1970

Corrigendum No. 2

The following may please be added to the
foot-note on page 7 of paper 8(b)-INDIA :-

"A scientific paper on the subject
by Professor P. C. Mahalanobis, in
his personal capacity, is to be
published as an appendix to the
report of the Income Distribution
Committee."

PROBLEMS OF MEASUREMENT IN THE FIELDS OF LEVELS OF
LIVING, INCLUDING DISTRIBUTION OF INCOME AND EXPENDITURE

Introduction

1. There comes a time in the statistical development of any country when more sophisticated censuses and surveys become necessary, or indeed, possible. Having established a basic pattern of surveys giving a minimum coverage from perhaps somewhat elementary ventures the need eventually arises for more elaborate patterns of statistical initiative consonant with the general economic and social development.
2. The realisation by a demanding public that quantitative measures of various facets of the economy and levels of living are in fact possible leads to increasing demands for adequate statistics and spurs the statistician on to more refined stages of enumeration, analysis, presentation and interpretation of the many interacting features of human resources and activity. Where once the population census was regarded as the ultimate for demographic and social statistics about a nation, it now also provides the benchmark data for the sampling expert to extend the range of statistical coverage in greater depth than hitherto.
3. Because of the difficulty of asking for or obtaining precise income details and other economic and social data on population census enquiries independent surveys have been launched in particular fields of enquiry. However, surveys of, or administrative data available on, incomes etc., are difficult to relate to the demographic or family household unit and this has led to the development of family or household surveys for more precise and realistic social statistics and expenditure patterns.

Household Surveys

4. As a result of the recommendation of the National Development Conference in 1969 that New Zealand's entire social and economic statistics should be reviewed to better serve the needs of indicative planning the Government set up a Technical Committee on Statistics to undertake this review. Amongst the main features of the report of the Technical Committee was the item - "periodic surveys of household incomes, expenditures, and savings will provide valuable information for national accounting and social purposes".
5. The Technical Committee considered that there was a shortage of statistical information on the patterns of economic behaviour and intentions of New Zealand households of relevance for economic planning purposes and agreed with the view of the Monetary and Economic Council that -

"the effectiveness of economic policy measures depends upon the way in which they affect the spending and saving decisions of the 680,000 households in New Zealand, with whose welfare economic policy is ultimately concerned. The aggregate results of these individual household decisions can be seen, for example, in statistics of retail trade or of housing construction. Such information is extremely valuable in itself in indicating broad trends of economic activity. It does not, however, provide insights into the motives, preferences, and expectations about the future which underlie householders' decisions, and which depend upon factors such as total household income, and the number, ages, and occupational status of those dependent on that income. The lack of knowledge about these determining factors makes it difficult to design measures of economic and social policy with a sufficient degree of confidence that they will have their intended results. Such policies continue to be made, but in their making there is a much larger element of guesswork than there should be". *

*Report No. 5, November 1963, page 17.

6. . Another use of household surveys is to provide more accurate information for the preparation of the national accounts and inter-industry studies. One of the central items in the national accounts is consumption expenditure by households. At present this is estimated as a residual item. Retail trading surveys are of limited assistance, because a significant proportion of goods sold through retail outlets is not bought by households and over 40 percent of all household expenditure is on services, which are not covered by retail trading surveys. As a result, the ideal method for directly estimating household expenditure for national accounting purposes, used by some countries, is by means of a continuing survey of households. Inter-industry studies require data on the pattern of final consumption goods purchased by households and a household survey is the most convenient and accurate source of such data.

7. Other uses of household surveys are to provide the following categories of statistics (the list is not exhaustive):

Statistics of household expenditures in different expenditure fields, classified by household type and income - Such statistics would provide a part of the data ideally needed for setting the weighting pattern of the Consumers' Price Index which is at present obtained from estimated aggregate household supply statistics. Fairly frequent household expenditure surveys would enable more frequent updating of the weighting pattern, as in the United Kingdom. Household expenditure analyses for special types of household, for example lower-income wage-earner households or old-age pensioners would also be feasible from household surveys. Such statistics would have value for welfare policy purposes.

Statistics on the distribution of household incomes - These would permit the assessment of the effects of possible taxation changes

on various classes of households, and the redistributive effects on income of taxation and social benefits.

Statistics on household indebtedness, assets, and expenditure intentions (including intentions to purchase consumer durables) - These would supplement the expenditure and savings statistics already referred to and would have the same general economic value.

Statistics on demographic and labour force characteristics - Included in this category are statistics on employment status additional to those on the registered unemployed and other statistics prepared by the Department of Labour. Examples of both economic and social importance are statistics of persons on the fringe of the labour force who accept occasional employment, and on the employment desires of married women.

Statistics serving some ad hoc purpose - such as statistics of internal migration, sickness, household energy consumption (much along the lines of the survey now being organised by the Department of Statistics in association with the New Zealand Electricity Department and selected electrical supply authorities) and on social conditions for particular groups of households.

8. There are two main types of household surveys being considered for use in New Zealand. First, there is the household budget survey in which all income-earning and spending members of a representative sample of households record their pattern of expenditure on different items over a specified period of time. The sample records provide the basis for estimating statistics of expenditure patterns and savings for all and particular groups of households. The second type is a general survey conducted to seek information on specific topics such as indebtedness and employment status of household members. This does not involve the keeping of records by householders. These two types of survey are likely to be considered in New Zealand although emphasis in the initial surveys will be on incomes and expenditures.

9. Most official surveys in New Zealand can be carried out by postal methods, with only limited recourse to more expensive use of field interviewing staff. A household budget survey, however, is completely dependent on personal interviewing staff to explain the procedures to be followed to the sample householders and to generally supervise the maintenance of individual householder records and to ensure continuing co-operation. The burden on individuals in the survey households in the case of expenditure surveys, where an analysis of expenditure into various goods and services is wanted, is such that the United Kingdom and other countries make a small payment to survey householders who maintain full records satisfactorily. New Zealand would also have to follow this practice, which, of course, would increase the survey cost. However, it is now considered that if New Zealand is to have an adequate statistical service for indicative planning purposes it must accord high priority to the conduct of surveys of this type, in spite of their relatively expensive nature.

10 Some relevant experience is currently being obtained by the Department of Statistics conducting for the Fuel and Power Authorities, a survey of household usage of electrical energy in various categories. Some worthwhile socio-economic information should become available from this survey.

Summary

11. For some years the Department of Statistics, and technical opinion generally, in New Zealand, has considered that household sample surveys are now long overdue to fill the gaps in statistical knowledge of the social and economic characteristics of New Zealand households, and therefore, of the economy generally.

12. A household survey will not be restricted to seeking information on expenditure patterns. Other fields of study which may be investigated by means of subsidiary questionnaires include living conditions of the aged, employment and unemployment, indebtedness, internal migration and health.

13. In designing a national household survey there is also the need to look at the wider administrative requirements of Government and other users of statistics on household characteristics. In New Zealand the periodicity and scope of subsequent surveys will be determined after an evaluation of the initial survey and the value to users of the resultant statistics obtained.

Problems Of Measurement In The Field Of Levels Of Living,
Including Distribution Of Income And Expenditure

1. The Bureau of Statistics has been involved in a 13-month survey of households' income and expenditure on a countrywide basis.
2. The H.B.S. has two target populations: (1) the households of Dar es Salaam city, (2) the households of Tanzania mainland (excluding Dar es Salaam and Zanzibar).
3. The frame used for the sampling has been the list of households prepared during the Population Census in August, 1967. For the Census work the country was divided into some 18,000 enumeration areas. For Tanzania mainland (excluding Dar es Salaam) 259 E.As. were sampled. In each E.A. 9 households were selected. In all the survey covered some 2,500 households which were stratified according to income. For a particular household selected in Tanzania mainland the income and expenditure was recorded for the whole of the year 1969. (Using questionnaire A to start the survey and B questionnaire to record monthly interviews. The survey was closed by using C. questionnaire).
4. For Dar es Salaam city, where one particular household was surveyed for a period of two months only, six independent samples of households have been selected. Within such a sample 7 households (excluding substitution households) have been sampled from each enumeration area belonging to the stratum of lower income areas, whereas from an enumeration area belonging to the stratum of higher income areas about 5 households have been sampled.
5. The main objects of the survey are to provide reliable estimates of private consumption, produce weights for price indices, demand analysis and provide bench mark data to assess efficacy of government economic policies.
6. Before the Bureau launched the year-long National Household Budget Survey, a pilot survey was conducted in which approximately 30,000 households were listed. The listed households were asked about their income and expenditure for the preceeding year. The listing of households' incomes provided a sample frame of income stratified households. The pilot survey also enabled us to provide estimates of the over all cost of the National sample survey. For administrative purposes the survey was divided into 5 rural zones and there was a special zone created to survey Dar es Salaam city. Each zone office administered about 2 to 4 regions (Tanzania mainland consists of 17 Regions) and was headed by the Zone Chief who had a Deputy, 2 to 4 Field Supervisors, each in charge of about 5 Field Enumerators. To ensure the quality of field interviewers 2 checkers were appointed per zone office.
7. Field problems encountered during the countrywide survey were numerous. The sheer size of the country, with poor roads which during the long rains were almost impassable, was challenging enough to the success of the survey. The survey also suffered from bad communication and fairly poor quality of field staff. It was difficult to attract the more intelligent calibre of employee because of the seasonal nature of the work and low salary. The Bureau could not afford a very detailed training programme. The field supervisors, whose function was to make all field operations a success and to ensure the quality of interviews, at times

functioned only as transport officers.

8. The design of the questionnaire was too ambitious. It was very detailed, exhaustive and too sophisticated for a developing country. The field interviewer invariably was too bored and exhausted with nearly 30 pages of the questionnaire. The respondent was, of course, in much worse shape.

9. Special forms ("Matumizi forms") were devised for the households to record their income and individual expenditures. These were kept well sometimes. More often there had only isolated items recorded. The enumerator was supposed to interview the household about its expenditure usually he was happy just to collect the "Matumizi form".

10. The housewife had particular difficulty in giving us the breakdown figures for consumption of various fruits and vegetables. It appeared difficult to know which type of vegetables were purchased in case of an item recorded as "bought vegetables: 4/50 Shs." These difficulties implied that proper weights of the food items consumed had to be estimated. The weights of food items had an headache of their own. We can just think of variety of fish available not to mention eggs, poultry and fruits.

11. Women in general were difficult to interview by the male enumerators. There was considerable reluctance in answering questions on female underclothing and expenditure of cosmetics.

12. The presence of the husband and wife together led to discretion in answering questions on personal expenditure items. The husband was not willing to commit himself to the money spent on extra drinks, the wife probably on a new dress. The enumerator also failed to enquire from each member of the household about his/her individual expenditure. This has led to considerable underestimation.

13. Since substitute households were available the enumerator often selected a new household in favour of difficult households. People engaged in fishing, transport work were sometimes substituted unnecessarily.

14. There was usually a reluctance to give information on consumption items which conflicted with religions or tribal beliefs. Muslims on alcoholic drinks, Hindus on beef. Some tribal members refused to answer questions on marriageable young girls.

15. Most households refused or were terribly reluctant to give information on savings, insurance policies, investments, income (especially second incomes) and loans.

MINISTRY OF ECONOMIC AFFAIRS AND DEVELOPMENT PLANNING
Central Statistical Bureau

QUESTIONNAIRE A

THE HOUSEHOLD BUDGET SURVEY OF TANZANIA 1968/69

E. A. Code No.	Income group	Hh No.	Weight factor																
<table border="1" style="width: 100%; height: 20px;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>								<table border="1" style="width: 100%; height: 20px;"> <tr><td></td></tr> </table>		<table border="1" style="width: 100%; height: 20px;"> <tr><td></td></tr> </table>		<table border="1" style="width: 100%; height: 20px;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>							Hh Listing No.
Name of head of household				<table border="1" style="width: 100%; height: 20px;"> <tr><td></td><td></td><td></td></tr> </table>															

Region:.....
 District/Town:.....
 Division/Ward:.....
 Village/Street:.....
 Ten cell leader:.....

Interview / 19.... Started.....o'clock
 Interviewer:.....
 Supervisor:.....date / Checker:.....date /

Information about Head of household

1. a) Tribe:.....

 b) Mother tongue:.....

- | | | |
|---|---|---|
| Circle applicable code figure under c) and d) | c) <u>Ethnic origin</u>
1 = African
2 = Asian
3 = Arab
4 = European
5 = Not stated | d) <u>Religion</u>
1 = Christian
2 = Moslem
3 = Other world religion
4 = Local belief
5 = Not stated |
|---|---|---|

Remarks:.....

b. Relationship to head of household

- 1 = Head of household
- 2 = Wife to hoh
- 3 = Child to hoh
- 4 = Other relative
- 5 = Cook or other servant
- 6 = Other person (even guest)

c. Sex

- 1 = Male
- 2 = Female

e. Marital status

- 1 = Never married
- 2 = Married and living together
- 3 = Married but temporarily separated
- 4 = Widowed, divorced or permanently separated

f. School completed

- 1 = No school year completed
- 2 = 1 - 3 school years (grades)
- 3 = 4 - 6 " "
- 4 = 7 - 9 " "
- 5 = 10 - 11 school years (form II - III)
- 6 = 12 - 13 " " (" IV - V)
- 7 = Form IV + at least 2 years vocational courses
- 8 = Form VI academic
- 9 = Form VI + at least 2 years at university

g. Economic activity

- 1 = At work the whole last month
- 2 = At work at least half the month but not the whole month
- 3 = At work at least one day but not half the month
- 4 = No work but earlier working (seeking work)
- 5 = No work and not earlier working (seeking work)
- 6 = Unpaid home-maker
- 7 = Student
- 8 = Income recipient
- 9 = Other (old persons, children)

h. Sector

- 1 = Private
- 2 = Co-operative
- 3 = Parastatal
- 4 = Public

i. Industry

- 1 = Agriculture, husbandry, forestry, fishing
- 2 = Manufacturing, mining, electricity
- 3 = Handicraft
- 4 = Building and construction
- 5 = Transport and communication
- 6 = Commerce and trade
- 7 = Administration, education, health, security and other services

j. Economic status

- 1 = Own account worker with permanent labourer
- 2 = Own account worker without permanent labourer
- 3 = Employee, wage earner
- 4 = Family worker - unpaid and working at least 1/3 or normal working time

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CODES TO QUESTIONS 3 AND 43 b. Type of house

- 1 = Improvised dwelling (cave, tent, etc.)
- 2 = Local type for 1 - 2 households
- 3 = House made of cement or red bricks, for 1 - 2 households
- 4 = House for 3 - 6 households
- 5 = House for more than 6 households

3 d. Tenure

- 1 = Owned by the household
- 2 = Rented at normal market price
- 3 = Rented cheaper from a relative or employer
- 4 = Given free from a relative or employer
- 5 = Government house or flat

3 e. Builder

- 1 = The household itself without paid labour
- 2 = The household itself with paid labour
- 3 = National Housing Corporation
- 4 = Other contractor
- 5 = Bought second-hand

3 h. Credit/loans for building

- 1 = No credit or loan
- 2 = Relatives or friends
- 3 = Employer
- 4 = Bank
- 5 = Co-operative
- 6 = National Housing Corporation
- 7 = Permanent Housing Finance Co.
- 8 = Other money lender

4 b. Foundation

- 1 = No foundation
- 2 = Stones
- 3 = Stones and mortar
- 4 = Concrete

4 c. Floor material

- 1 = Earth
- 2 = Whole surface of cement or concrete
- 3 = Tiles of cement, concrete or stone
- 4 = Wood
- 5 = Other floor material

4 d. Wall material

- 1 = Poles, branches and grass
- 2 = Poles and mud
- 3 = Mud bricks
- 4 = Red bricks
- 5 = Cement, concrete or stone
- 6 = Other wall material

4 e. Roof material

- 1 = Grass, palm leaves
- 2 = Mud
- 3 = Concrete
- 4 = Metal sheets
- 5 = Asbestos sheets
- 6 = Tiles
- 7 = Other roof material

4 f. Roof frame

- 1 = Poles
- 2 = Sawn timber
- 3 = Iron rafters
- 4 = Other frame material

4 g. Drinking water supply, dry season

- 1 = Lake, river, riverbed, spring
- 2 = Rainwater cistern
- 3 = Shallow well
- 4 = Water storage magazin (charco)
- 5 = Well with handpump
- 6 = Storage tank with watertap
- 7 = Pipeline with watertap outside the house
- 8 = Pipeline with watertap inside the house

4 h. Drinking water purification

- 1 = No purification at all
- 2 = No chemical purification but water boiled
- 3 = Chlorine or other chemical purification
- 4 = Chemical purification and water boiled

4 i. Toilet system

- 1 = No toilet
- 2 = Bucket or pit-latrine, shared
- 3 = Bucket or pit-latrine, private
- 4 = Water prevey, shared
- 5 = Water prevey, private
- 6 = Water toilet, shared

3. Then we need some information about housing conditions.

Observe, separate recording for each building used by the household to live in

House Serial No.	Type of house	Number of rooms used for habitation	Tenure	If house owned by the household			
				Builder	Year of building	Building costs	Credit/loans for building
a	b	c	d	e	f	g	h
1							
2							
3							
4							
5							

Remarks:

.....

4. Building material and facilities

House Serial No.	Foundation	Floor material	Wall material	Roof material	Roof frame	Drinking water supply during dry season	Drinking water purification	Toilet system	Bathroom/shower 1=No 2=shared 3=private	Separate kitchen 1=No 2=Yes	Electricity 1=No 2=Yes
a	b	c	d	e	f	g	h	i	j	k	l
1											
2											
3											
4											
5											

Remarks:

5. If 3d: 2, 3 or 5 How much do you pay in rent
..... shillings per month

Remarks:

6. If 3d: 1,3,4, or 5 Suppose that you let your house/flat, then how much do you think you would get per month?
..... shillings per month Do not know

Remarks:

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If 3 d: 1

If you should build a new house, would you then like to have technical advice about how to build it ?

1. No 2. Yes 3. Do not know

Remarks:

8. Has the household any crops, vegetables, or fruits for sale or own consumption during the last 12 months ?

1. No 2. Yes

If yes, circle the item No.s for grown crops and ask the following questions

9. Have you a stock of any of the crops ?

1. No 2. Yes

If yes Can you give an estimate of the stored quantity ?

Kind of Crop a	Stock at the time of the interview Quantity in		Remarks d
	Local units b	Lbs c	
1. Maize			
2. Paddy			
3. Rice, husked			
4. Millet			
5. Sorghum			
6. Wheat			
7. Peas			
8. Beans			
9. Groundnuts			
10. Cashewnuts			
11. Coconuts			
12. Sesame			
13. Sunflower			
14. Cotton			
15. Sisal			
16. Pyrethrum			
17. Castor seed			
18. Tobacco			
19. Coffee			
20. Tea			
21. Cassava			
22. Sweet potatoes			
23. Yam, cocoyam			
24. Irish potatoes			
25. Onions			
26. Sugar canes			
27. Bananas			
28. Other:			
.....			
.....			

Remarks :

10. Has the household tended any animals (even chicken) during the last year ?

1. No 2. Yes

If yes, ask the following questions

a. Which of the following kinds of animals have you tended during the last 12 months ?

Circle the figures for animals tended by the household

b. What type of return have you had from them either for sale or for own consumption ?

Write code figures for kind of produce

Kind of animals	Type of produce or return 1 = Live animals for sale 2 = Skins or hides 3 = Hair or wool 4 = Meat and fat 5 = Milk and milk products 6 = Eggs 7 = Manure (fertilizer) 8 = Work (hiring)	Remarks
a	b	c
1. Cattle		
2. Sheep		
3. Goats		
4. Pigs		
5. Horses		
6. Donkeys, mules		
7. Chicken		
8. Ducks, geese		
9. Other:		
.....		
.....		

Remarks:

11. It is valuable if persons who have made purchases or prepared food are present during the rest of the interview.

Most of the purchases are made by hh-member No.
and the cooking by No.

Remarks :

12. Now I want some information about your consumption of food, clothes, and other goods and services. First I will ask you which of the following items have been consumed by your household since the beginning of this year.

Read the complete list of items in col. b and underline code figures in col. a for consumed items. Ask about each consumed item if it has been purchased in cash or credit, as barter received against some other item, received as gift in kind, salary in kind, from own shop, or from own shamba (incl. collected wild vegetables and fruits, caught fish, etc.)
Observe, that more than one code figure can be applicable in col. c.

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop 6 = Own produce	Remarks
a	b	c	d
I	<u>FOOD AND DRINK</u>	-	
10100	<u>Cereals</u>	-	
10101	Paddy		
10102	Rice, husked		
10103	Maize grain		
10104	Maize flour		
10105	Millet grain		
10106	Millet flour		
10107	Sorghum grain		
10108	Sorghum flour		
10109	Wheat grain		
10110	Wheat flour		
10111	Barley and other cereals		
10001	Cost of grinding		
10200	<u>Cereal products</u>	-	
10201	Bread		
10202	Biscuits		
10203	Buns, cakes and small bread		
10204	Macaroni, spaghetti, etc.		
10205	Corn flakes and other cereal products		
10300	<u>Starchy roots and starches</u>	-	
10301	Cassava		
10302	Sweet potatoes		
10303	Yam, cocoyam		
10304	Irish potatoes		
10305	Other starchy roots		
10306	Starches, pure, dry		

Code	Item of consumption	Consumption type: 1= Cash, credit 2= Barter 3= Gift in kind 4= Salary in kind 5= From own shop 6= Own produce	Remarks
a	b	c	d
10400	<u>Sugar and sweets</u>	-	
10401	Sugar		
10402	Honey		
10403	Syrup, jam, marmalade, jellies		
10404	Chocolate and other sweets		
10500	<u>Pulses, dry</u>	-	
10501	Peas, dry		
10502	Beans, dry		
10503	Lentils and other pulses		
10600	<u>Nuts</u>	-	
10601	Groundnuts, in shell		
10602	Groundnuts, shelled		
10603	Groundnuts, roasted/salted		
10604	Coconuts, mature		
10605	Coconuts, immature		
10606	Cashewnuts		
10607	Almonds and other nuts		
10700	<u>Seeds</u>	-	
10701	Sesame seeds		
10702	Sunflower and other seeds		
10800	<u>Vegetables</u>	-	
10801	Carrots		
10802	Radishes, beets, turnips		
10803	Garlic		
10804	Onions		
10805	Leeks		
10806	Other roots, bulbs, tubers		
10807	Spinach, etc.		
10808	Lettuce		
10809	Cabbage		
10810	Other leafy vegetables		

Code	Item of consumption	Consumption type:	Remarks
		1= Cash, credit 2= Barter 3= Gift in kind 4= Salary in kind 5= From own shop 6= Own produce	
a	b	c	d
10811	Tomatoes		
10812	Ngogwe, nyanya, chungu		
10813	Ladies' fingers		
10814	Cauliflower		
10815	Cucumbers, pumpkins		
10816	Brinjals (eggplant)		
10817	Green peas		
10818	Green beans		
10819	Fresh greenpepper		
10820	Other cultivated vegetables		
10821	Other wild vegetables		
10822	Dried vegetables		
10823	Canned vegetables		
10900	<u>Fruits</u>		
10901	Cooking bananas		
10902	Ripe bananas		
10903	Oranges and tangerines		
10904	Grapefruits		
10905	Lemons, limes		
10906	Mangoes		
10907	Pawpaws		
10908	Guavas		
10909	Pineapples		
10910	Melons		
10911	Sugar canes		
10912	Jackfruits		
10913	Avocado pears		
10914	Apples		
10915	Pears		
10916	Other cultivated fruits		
10917	Other wild fruits		
10918	Dried fruits		
10919	Canned fruits		
11000	<u>Meat and meat products, poultry and insects</u>		
11001	Goat, sheep		
11002	Cattle meat		
11003	Pork		
11004	Other domestic animals		

Code	Item of consumption	Consumption type: 1= Cash, credit 2= Barter 3= Gift in kind 4= Salary in kind 5= From own shop 6= Own produce	Remarks
a	b	c	d
11005	Wild animals		
11006	Offals (liver, kidney, etc.)		
11007	Minced meat		
11008	Sausages		
11009	Dried meat		
11010	Canned meat		
11011	Other meat products		
11012	Chickens		
11013	Ducks and other domestic fowls		
11014	Wild birds		
11015	Insects:		
11100	Eggs		
11200	<u>Fish and shellfish</u>		
11201	Fresh fish		
11202	Shellfish		
11203	Fish, dried or salted		
11204	Canned fish and shellfish		
11300	<u>Milk and dairy products (excl. butter)</u>		
11301	Fresh milk		
11302	Cream		
11303	Cheese		
11304	Yogurt and other fermented milk		
11305	Canned milk		
11306	Milk powder		
11307	Ice cream		
11308	Other dairy products		
11400	<u>Oils and fats</u>		
11401	Cottonseed oil		
11402	Other cooking oil		
11403	Butter, ghee		
11404	Margarine and other cooking fat		
11405	Mayonnaise, dressings		
11406	Other oil and fat products		

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Code	Item of consumption	Consumption type:	Remarks
		1= Cash, credit 2= Barter 3= Gift in kind 4= Salary in kind 5= From own shop 6= Own produce	
11500	<u>Spices and other foodstuffs</u>	-	
11501	Red pepper		
11502	Curry powder		
11503	Other spices		
11504	Salt		
11505	Vinegar		
11506	Yeast, baking powder, etc.		
11507	Cocoa, cooking chocolate		
11508	Baby food		
11509	Purchased prepared meals consumed at home		
11510	Other foodstuffs:		
10002	Processing of foodstuffs other than cereals		
11600	<u>Raw material for drink</u>	-	
11601	Tea, dry		
11602	Coffee (beans, ground)		
11603	Instant coffee		
11604	Other raw material for drink		
11700	<u>Non-alcoholic drinks</u>	-	
11701	Coca-cola, Fanta and other bottled soft drinks		
11702	Canned and bottled juices and squashes		
11703	Fresh fruit-juices and other non-alcoholic drinks		
11800	<u>Alcoholic drinks consumed at home</u>	-	
11801	Tanzania bottled beer		
11802	Other African beer		
11803	Other imported beer		
11804	Wine, sherry, etc.		
11805	Pombe, Chibuku and other local brews		
11806	Imported spirit (whisky etc.)		
11900	<u>Meals and drinks consumed outside home</u>	-	
11901	Tanzania bottled beer		
11902	Other African beer		
11903	Other imported beer		
11904	Wine, sherry, etc.		
11905	Pombe, Chibuku and other local brews		
11906	Imported spirit (whisky etc.)		
11907	Breakfast, lunch, dinner (even schoolmeals)		
11908	Tea, coffee, snacks		
11909	Soft drinks, ice-cream, sweets		

Observe, that you, for the following items, even will ask about purchases and other money expenditures since the beginning of 1968.

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Purchases and other money expenditures since 1.1.69 in shillings	Remarks
a	b	c	d	e
II	<u>HOUSING</u>	-	-	
20100	<u>Rents and water costs</u>	-	-	
20101	House rent			
20102	Water			
20103	House tax			
20104	Fire insurance, N.I.C.			
20105	Fire insurance, other company			
20106	Burglary insurance, N.I.C.			
20107	Burglary insurance, other co.			
20200	<u>Fuel and light</u>	-	-	
20201	Charcoal			
20202	Firewood			
20203	Kerosene (paraffin)			
20204	Gas			
20205	Electricity			
20206	Other fuel and light			
20300	<u>Repairs and redecoration</u>			
20400	<u>Furniture</u>	-	-	
20401	Beds			
20402	Chairs, sofas			
20403	Tables			
20404	Cupboards, wardrobes			
20405	Shelves, bookcases			
20406	Chest of drawers, chests			
20407	Mirrors			
20408	Wall-clocks			
20409	Pictures, carvings and other decorations			
20410	Lamps			
20411	Carpets, rugs, mats, linoleum			
20412	Animal skins			
20413	Other furniture			
20414	Repairs to furniture			

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Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Purchases and other money expenditures since 1.1.69 in shillings	Remarks
a	b	c	d	e
20500	<u>Linen bed clothes</u>	-	-	
20501	Sheets			
20502	Blankets			
20503	Towels			
20504	Table cloths			
20505	Napkins			
20506	Bedsread, covers			
20507	Pillow cases			
20508	Curtains			
20509	Pillows			
20510	Mattresses			
20511	Mosquito nets			
20512	Other linen and bed clothes			
20600	<u>Household durables</u>	-	-	
20601	Stove, oven, gas-cooker			
20602	Refrigerator			
20603	Fans			
20604	Airconditioner			
20605	Water heater			
20606	Sewing machine			
20607	Washing machine			
20608	Electric iron			
20609	Other household durables			
20610	Repairs to durables			
20700	<u>Other household equipment</u>	-	-	
20701	Pans, pots, bowls, kettles of metal			
20702	Pots of clay for cooking and water			
20703	Wooden bowls, trays and other wooden utensils			
20704	Dishes, plates			
20705	Cups, glasses, mugs			
20706	Knives, forks, spoons, household tools			
20707	Thermos			
20708	Torches, batteries, bulbs			
20709	Lanterns			
20710	Buckets, washing tubs			
20711	Brooms, brushes			
20712	Other household equipment			

Code	Item of consumption	Consumption type:	Purchases and other money expenditures since 1.1.69 in shillings	Remarks
		1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop		
a	b	c	d	e
III	<u>CLOTHING</u>	-	-	
30100	<u>Clothing for men and boys over 15 years</u>	-	-	
30101	Turbans			
30102	Khanzus			
30103	Other national garments			
30104	Hats, caps			
30105	Suits			
30106	Trousers			
30107	Shorts			
30108	Jackets			
30109	Pullovers			
30110	Shirts			
30111	Underwear			
30112	Socks			
30113	Neckties			
30114	Rainclothes			
30115	Other readymade clothes			
30116	Handkerchiefs			
30117	Cloth, cotton			
30118	Cloth, wool			
30119	Cloth, other:			
30120	Tailoring, new clothes			
30121	Repairs to clothing			
30122	Leather shoes, handmade			
30123	Leather shoes, machine made			
30124	Slip-ons			
30125	Other footwear for men			
30126	Repairs to footwear			
30200	<u>Clothing for women and girls over 15 years</u>	-	-	
30201	Kangas			
30202	Kitenges			
30203	Sarees			
30204	Other national garments			
30205	Dresses, frocks			
30206	Gowns			
30207	Skirts			
30208	Blouses			
30209	Headgears			
30210	Underwear			
30211	Stockings, socks			

Code	Item of consumption	Consumption type:	Purchases and other money expenditures since 1.1.69 in shillings	Remarks
		1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop		
a	b	c	d	e
30212	Rainclothes			
30213	Other readymade clothes			
30214	Handkerchiefs			
30215	Cloth, cotton			
30216	Cloth, wool			
30217	Cloth, other:			
30218	Tailoring, new clothes			
30219	Repairs to clothing			
30220	Leather shoes, handmade			
30221	Leather shoes, machine made			
30222	Slip-ons			
30223	Other footwear for women			
30224	Repairs to footwear			
30300	<u>Clothes for children 15 years and less</u>	-	-	
30301	National dresses			
30302	Shorts, trousers			
30303	Gowns			
30304	Skirts			
30305	Shirts, blouses			
30306	Dresses, frocks			
30307	Socks, underwear			
30308	Baby clothes			
30309	Other readymade clothes			
30310	Cloth, cotton			
30311	Cloth, wool			
30312	Cloth, other:			
30313	Tailoring, new clothes			
30314	Repairs to clothing			
30315	Footwear			
30316	Repairs to footwear			
30400	<u>Other personal effects</u>	-	-	
30401	Yarn and sewing material			
30402	Umbrellas			
30403	Handbags, wallets, purses			
30404	Watches			
30405	Sunglasses			
30406	Ornaments of gold			
30407	Ornaments of silver			
30408	Other ornaments			
30409	Other personal effects			

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Purchases and other money expenditures since 1.1.69 in shillings	Remarks
a	b	c	d	e
IV	<u>MISCELLANEOUS</u>	-	-	
40100	<u>Medical care</u>	-	-	
40101	Government hospitals, dispensaries (Vaccination, grade 1 etc.)			
40102	Other hospitals, dispensaries (voluntary agencies)			
40103	Private practitioners			
40104	Local doctors			
40105	Dentistry			
40106	Prescribed medicine			
40107	Household medicine			
40108	Spectacles (inc. eye testing)			
40109	Other medical care:			
40200	<u>Personal care</u>	-	-	
40201	Toilet soap			
40202	Tooth paste			
40203	Hairtonic, shaving cream			
40204	Razor, shaving blades			
40205	Perfume			
40206	Lipstick, face cream, powder			
40207	Sanitary articles			
40208	Combs, hairbrushes			
40209	Toilet tissues			
40210	Baby articles			
40211	Other toilet articles			
40212	Hairdressing			
40213	Other personal care			
40300	<u>Education</u>	-	-	
40301	School fees			
40302	School equipment, school books			
40400	<u>Entertainment, recreation</u>	-	-	
40401	Books			
40402	Magazines, newspapers			
40403	Transistor radio			
40404	Radiogramophone, record player, tape recorder, TV			
40405	Records, tapes			
40406	Radio licence			
40407	Musical instruments			

Code	Item of consumption	Consumption type:	Purchases and other money expenditures since 1.1.69 in shillings	Remarks
		1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop		
a	b	c	d	e
40408	Toys			
40409	Sport equipment			
40410	Cameras, binoculars, etc.			
40411	Films, processing			
40412	Repairs to above			
40413	Studio photography			
40414	Cinemas, theatres			
40415	Sport fees			
40416	Clubs, associations (subscriptions)			
40417	Flowers, garden			
40418	Dogs, cats, other pets			
40419	Other recreation and entertainment			
40500	<u>Transport</u>	-	-	
40501	Private car			
40502	Motorcycle, scooter, etc.			
40503	Bicycle			
40504	Petrol, oil, etc.			
40505	Repairs and maintenance of own vehicle			
40506	Spare parts, accessories not included in repairs			
40507	Registration tax, road tax, driving licence			
40508	Insurance for vehicle			
40509	Train			
40510	Bus, truck			
40511	Taxi			
40512	Boat			
40513	Airplane (incl airport fee)			
40514	Moving and storage of household goods			
40600	<u>Telephone and postage</u>	-	-	
40601	Telephone and telegrams			
40602	Stamps and other postal services			

Code	Item of consumption	Consumption type: 1= Cash, credit 2= Barter 3= Gift in kind 4= Salary in kind 5= From own shop	Purchases and other money expenditures since 1.1.69 in shillings	Remarks
a	b	c	d	e
40700	<u>Cleaning material etc.</u>	-	-	
40701	Omo, Surf and other washing powder			
40702	Detergents in liquid			
40703	Washing soap			
40704	Cleaning powders (for brass, toilet etc.)			
40705	Insecticides for the household			
40706	Polish for floor, furniture, shoes, etc.			
40707	Matches			
40708	Other material for the household			
40800	<u>Domestic household services</u>	-	-	
40801	Laundry, dry cleaning			
40802	Domestic servants			
40900	<u>Cigarettes and tobacco</u>	-	-	
40901	Cigarettes			
40902	Snuff			
40903	Pipe tobacco			
40904	Other smokables			
41000	<u>Contributions to religious and other societies</u>	-	-	
41001	TANU and NUTA fees			
41002	Religious contributions			
41003	Professional societies			
41100	<u>Other expenditure on goods and services</u>	-	-	
41101	Legal fees			
41102	Other consumption expenditure			

Code	Item of consumption	Money expenditures since 1.1.69 in shillings	Remarks
a	b	c	d
V	<u>NON-CONSUMPTION MONEY OUTLAYS</u>	-	
50100	<u>Taxes and fines</u>	-	
50101	Personal tax		
50102	Local rate		
50103	Income tax, surtax		
50104	Site tax		
50105	Other taxes and fines		
50106	Local voluntary contributions to funds		
50200	<u>Losses</u>	-	
50201	Theft		
50202	Lottery, gambling		
50203	Other losses		
50300	<u>Money transfers</u>	-	
50301	Remittances to relatives		
50302	Gift to others (not hh-members)		
50303	Dowry (bride price)		
50400	<u>Savings</u>	-	
50401	Deposits to National Bank of Commerce		
50402	Deposits to National Co-operation Bank		
50403	Post office deposits		
50404	Savings in Credit unions		
50405	Savings in Co-operatives		
50406	Shares, bonds		
50407	Community trusts		
50408	Government securities		
50409	Life insurance to N.I.C.		
50410	Life insurance to other companies		
50411	Other insurances to N.I.C. (not vehicle or house)		
50412	Other insurances to other companies (not vehicle or house)		
50413	Loans given out		
50414	Payment of debts for goods/services		
50415	Repayment of other loans (incl. interest)		
50416	Increase in cash holdings		
50500	<u>Investments</u>	-	
50501	Purchase of plot for own house		
50502	Costs for building of own house		
50503	Costs of alterations or extensions to own house		
50504	Other investments		

13. To farmers Which of the following handtools and agricultural equipment are purchased and still possessed by the household? Can you also tell me about home-made tools? 624

Item	Number of things possessed by the household		Total value in shillings		Number of homemade tools
	Purchased new	Purchased used	At purchase	At present	
a	b	c	d	e	f
1 Hoes					
2 Axes					
3 Pangas					
4 Other handtools					
5 Ox-ploughs					
6 Other tools for animals					
7 Tractor					
8 Tractor tools					

14. Which of the following items are purchased and still possessed by the household? About the furniture I also want to know if they are made mainly of wood or other material.

Item	Number of things possessed by hh		Total value in shillings		Number of furniture made of wood
	Purchased new	Purchased used	At purchase	At present	
a	b	c	d	e	f
01 Beds					
02 Chairs					
03 Tables					
04 Cupboards					
05 Chest of drawers					
06 Lanterns					
07 Cups and saucers					
08 El./gas stove with oven					
09 Other stove					
10 El. sewing machine					
11 Other sewing machine					
12 Refrigerator (private)					
13 Water heater (")					
14 El. fans (")					
15 Airconditioner (")					
16 Watches					
17 Ornaments of gold/silver					
18 Books, other than schoolbooks					
19 Radios					
20 Radio-gramophone					
21 Record player (tape recorder)					
22 Bicycles					
23 Motorcycles					
24 Cars					

15. **625**
 Only to household in rural areas

Can you tell me which is the nearest place for the following:

Item	Name of place	Distance in Kilometres
a	b	c
01 Water supply, dry season		
02 Place to collect firewood		
03 Market for food		
04 Duka		
05 Dispensary		
06 School		
07 Church/mosque		
08 Local court		
09 Divisional headquarter		
10 Flour mill		
11 <input type="checkbox"/> If farmer Co-operative society (Buying post)		
12 <input type="checkbox"/> If farmer Shamba		

Remarks:

16. Are you now saving for any particular purpose ?

1. No 2. Yes If yes a) Can you describe the purpose of saving ?

b) What is the total value of the object for saving ? c) How long a time do you think it will take to save enough money to reach your goal ?

Purpose of saving	Total value (shs)	Time for saving (months)
a	b	c

Remarks:

17. **Information about the interview**

- a) Main respondent = hh member No.
- b) Other person(s) interviewed = hh members No.
- c) Interview finished o'clock, Interview time min.

18. **Information about the note-book; circle applicable figure**

- 1 Note-book(s) given to the household
- 2 Note-book not given because :

19. **Information about volume measures: circle applicable figure**

- 1 Volume measures given to the household
- 2 Volume measures not given because:

General remarks:

.....

.....

.....

MINISTRY OF ECONOMIC AFFAIRS AND DEVELOPMENT PLANNING
Central Statistical Bureau

QUESTIONNAIRE B

THE HOUSEHOLD BUDGET SURVEY OF TANZANIA, 1968/69

E.A. Code No.	Income group	Hh No.	Weight factor														
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			Hh. Listing No.														

Name of head of household	
---------------------------	--

Region:.....

District/Town:.....

Division/Ward:.....

Village/Street:.....

Ten cell leader:.....

Interview / 19..... Started..... o'clock

Interviewer.....

Supervisor:..... date / Checker:..... date /

CODES TO QUESTION 2f. Marital status

- 1 = Never married
- 2 = Married and living together
- 3 = Married but temporarily separated
- 4 = Widowed, divorced or permanently separated

g. School completed

- 1 = No school year completed
- 2 = 1 - 3 school years (grades)
- 3 = 4 - 6 school years
- 4 = 7 - 9 school years
- 5 = 10 - 11 school years (form II - III)
- 6 = 12 - 13 school years (form IV - V)
- 7 = Form IV + at least 2 years vocational courses
- 8 = Form VI academic
- 9 = Form VI + at least 2 years at university

h. Economic activity

- 1 = At work the whole period since the last interview
- 2 = At work at least half the period
- 3 = At work at least one day but not half the period
- 4 = No work but earlier working (seeking work)
- 5 = No work and not earlier working (seeking work)
- 6 = Unpaid home-maker
- 7 = Student
- 8 = Income recipient
- 9 = Other (old persons, children)

i. Sector

- 1 = Private
- 2 = Co-operative
- 3 = Parastatal
- 4 = Public

j. Industry

- 1 = Agriculture, husbandry, forestry, fishing
- 2 = Manufacturing, mining, electricity
- 3 = Handicraft
- 4 = Building and construction
- 5 = Transport and communication
- 6 = Commerce and trade
- 7 = Administration, education, health, security and other services

k. Economic status

- 1 = Own account worker with permanent labourer
- 2 = Own account worker without permanent labourer
- 3 = Employee, wage earner
- 4 = Family worker - unpaid and working at least 1/3 of normal working time.

4. a. Has the household grown any crops, vegetables, or fruits for sale or own consumption during the last year?

1. No 2. Yes

If yes, circle the item No. for grown crops and ask the following questions.

b. Have you harvested anything since the last interview and if so, can you estimate the quantity harvested during this period?

c. d. Have you since the last interview got any income from sales of what you have grown?

e. f. Have you during that period given food to labourers or paid any other production costs from your produce.

Kind of crop	Quantity harvested in lbs	Sales		Production costs paid in kind	
		Quantity in lbs	Gross income in shs	Quantity in lbs	Value in shillings
a	b	c	d	e	f
01 Maize					
02 Paddy					
03 Rice, husked					
04 Millet					
05 Sorghum					
06 Wheat					
07 Peas					
08 Beans					
09 Groundnuts					
10 Cashewnuts					
11 Coconuts					
12 Sesame					
13 Sunflower					
14 Cotton					
15 Sisal					
16 Pyrethrum					
17 Castor seed					
18 Tobacco					
19 Coffee					
20 Tea					
21 Cassava					
22 Sweet potatoes					
23 Yam, cocoyam					
24 Irish Potatoes					
25 Onions					
26 Sugar canes					
27 Bananas					
28 Other:.....					
.....					
.....					
		Total (shs)		Total (shs)	

Remarks:

.....

.....

5. a. Has the household tended any animals (even chicken) during the last year?

1. No 2. Yes

If yes, circle the Nos. for tended animals and ask the following questions:

b-c. Has the household got any income from the animals since the last interview? If so, can you tell me how much in shillings?

Register separately for each type of produce

Type of produce or return:
 1= Live animals
 2= Skins or hides
 3= Hair or wool
 4= Meat and fat
 5= Milk & milk products
 6= Eggs
 7= Manure (fertilizer)
 8= Work (hiring out)

d. Have you given food to labourers or paid any other production costs by your products?

e-g. Have you sold or slaughtered any animals or had any dead from disease since the last interview?

h-i. Have you bought any animals or got newborn during the same time?

Kind of animals	Sales		Cost of production in kind in shs.	Number of animals				
	Type of produce or return	Gross income in shs		Sold	Slaugh-tered	Dead from disease	Bought	New born
a	b	c	d	e	f	g	h	i
1. Cattle								
2. Sheep								
3. Goats								
4. Pigs								
5. Horses								
6. Donkeys, mules								
7. Chicken								
8. Ducks, geese								
9. Other:								
.....								
.....								
Total (shs)								

Remarks:

.....

.....

631

Questions 6 - 8 only to farmers

6. Capital investments in agriculture since the last interview

Investments	Description of investment	Total value in shillings	Payment in cash (shs)
a	b	c	d
1. Tractors and tractor tools			
2. Ox-ploughs and other tools for animals			
3. Handtools			
4. Animals for breeding and milk production			
5. Farm buildings and construction			
6. Irrigation and other improvement of land			
Total payment in cash (shillings)			

7. Productions costs for agriculture since the last interview

Production item	Description of production cost	Quantity	Total value in shillings	Payment in cash (shs)
a	b	c	d	e
01. Hire of tractor				
02. Hire of farming tools				
03. Repairs and maintenance of tractor and farming tools				
04. Fertilizers				
05. Insecticides				
06. Seed, seedlings				
07. Animals for meat production				
08. Fodder, vaccination of animals				
09. Hired labour				
10. Transport, marketing and other production costs				
Total payment in cash (shillings)				

8. Have you had any paid farm-workers since the last interview?

11632

1. No 2. Yes

If yes, fill in the following information

Number of paid workers		Total number of paid man-days c	Main agricultural operation for employment of farm-workers d
from same district a	from other district b		

Remarks:

9. Income and other receipts in cash from other source than own agriculture during the period since the last interview

Income earner household member No. a	Income and other receipts in cash - in shillings								Total cash receipts j
	Wages Salaries b	Income from trade c	Income from other enterprise or profession d	Rents (even from lodger) e	Interest and dividends f	Remittances and gifts g	Sale of assets h	Other cash receipts (lottery scholarships etc.) i	
Total									

Remarks:

10. If merchant or other entrepreneur (not farmer)

(a) Have you made any investments in your enterprise since the last interview - paid in cash?

Investments	Shillings
1. Building of own enterprise premises	
2. Improvement of own enterprise premises	
3. Increase of stock of own business	
4. Other investments:	
Total payments in cash (shs)	

(b) Have you had any production costs since the last interview - paid in cash?

Production costs	Shillings
5. Hired labour	
6. Transport	
7. Trade licences	
8. Other production costs:	
Total payments in cash (shs)	

11. Have you taken any loans since the last interview?

1. No.

2. Yes

If yes

Can you (for each loan) describe the purpose of the loan, from where you got it, duration, and how much you have to pay in interest?

Loan from	Purpose of loan	Duration		Amount in shillings	Interest - to pay
		Years	Months		
a	b	c	d	e	f
1.					%
2.					%
3.					%
			Total (shs)		

Remarks:

12. Have you used any savings since my last interview, for instance money you had in cash before that time, withdrawals from bank account, or other savings?

Read examples of savings from item group 50400

1. No

2. Yes

If yes, fill in the following table

Description of used saving	Purpose of use	Amount in shillings
a	b	c
1.		
2.		
3.		
		Total

Remarks:

13. Has your household had any special expenses in connection with marriage, birth, or death (funeral) since the last interview?

1. No

2. Yes

If yes, note here the total cash expenditure and register then in

question 14 the same amount split up on different foodstuffs and other consumption items + consumption in kind.

Expenses in connection with	Shillings
1. Marriage (except dowry)	
2. Birth	
3. Death (funeral)	

Remarks:

14. I now want detailed information about your households' consumption of food, clothes, and other goods and services - including what you have used from own shamba/garden, own caught fish, received gifts (and what is taken from own shop).

Register goods/services which have been either received by the household according to consumption type 1, 2, 3, and 4 or consumed according to consumption type 5 and 6 since the last interview. If local units (heaps, bundles etc.) are used, register first quantity in col. d and convert it then to equal quantity in standard units in col. e. Use the following standard units: lb = pound(s); oz = ounce(s); hg = hectogram; dl = decilitre; gal = gallon(s)

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop 6 = Own produce	Quantity in		Price per used unit	Total value in cents	If c:1 Payment on delivery in cents
			Local units	Standard units			
a	b	c	d	e	f	g	h
I	FOOD AND DRINK	-	-	-	-	-	
10100	<u>Cereals</u>	-	-	-	-	-	
10101	Paddy						
10102	Rice, husked						
10103	Maize, grain						
10104	Maize flour						
10105	Millet grain						
10106	Millet flour						
10107	Sorghum grain						
10108	Sorghum flour						
10109	Wheat grain						
10110	Wheat flour						
10111	Barley and other cereals:						
10001	Cost of grinding						
Page 9, total							

Code	Item of consumption	Consumption type: 1 - Cash, credit 2 - Barter 3 - Gift in kind 4 - Salary in kind 5 - From own shop 6 - Own produce	Quantity in		Price per used unit	Total value in cents	If c:1 Payment on delivery in cents
			Local units	Standard units			
a	b	c	d	e	f	g	h
10200	Cereal products	-	-	-	-	-	
10201	Bread						
10202	Biscuits						
10203	Buns, cakes and small bread						
10204	Macaroni, spaghetti, etc.						
10205	Corn flakes and other cereal products:						
10300	Starchy roots and starches	-	-	-	-	-	
10301	Cassava						
10302	Sweet potatoes						
10303	Yam, cocoyam						
10304	Irish potatoes						
10305	Other starchy roots:						
10306	Starches, pure, dry:						
10400	Sugar and sweets	-	-	-	-	-	
10401	Sugar						
10402	Honey						
10403	Syrup, jam, marmalade, jellies:						
10404	Chocolate and other sweets:						
10500	Pulses, dry	-	-	-	-	-	
10501	Peas, dry						
10502	Beans, dry						
10503	Lentils and other pulses:						

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop 6 = Own produce	Quantity in				Price per used unit in cents	Total value in cents	If c:1 Payment on delivery in cents
			Local units		Standard units				
a	b	c	d		e		f	g	h
10600	<u>Nuts</u>	-	-	-	-	-	-		
10601	Groundnuts, in shell								
10602	Groundnuts, shelled								
10603	Groundnuts, roasted salted								
10604	Coconuts, mature								
10605	Coconuts, immature								
10606	Cashewnuts								
10607	Almonds and other nuts:								
10700	<u>Seeds</u>	-	-	-	-	-	-		
10701	Sesame seeds								
10702	Sunflower and other seeds:								
10800	<u>Vegetables</u>	-	-	-	-	-	-		
10801	Carrots								
10802	Radishes								
10803	Garlic								
10804	Onions								
10805	Leeks								
10806	Other roots, bulbs/tubers:								

Page 11, total

Code	Item of consumption	Consumption type: 1 - Cash, credit 2 - Barter 3 - Gift in kind 4 - Salary in kind 5 - From own shop 6 - Own produce	Quantity in		Price per used unit	Total value in cents	If c:1 Payment on delivery in cents
			Local units	Standard units			
a	b	c	d	e	f	g	h
10807	Spinach etc.:						
10808	Lettuce						
10809	Cabbage						
10810	Other leafy vegetables:						
10811	Tomatoes						
10812	Ngogwe, nyanya chungu						
10813	Ladies fingers						
10814	Cauliflower						
10815	Cucumbers, pumpkins						
10816	Brinjals (eggplant)						
10817	Green peas						
10818	Green beans						
10819	Fresh greenpepper						
10820	Other cultivated vegetables:						
10821	Other wild vegetables:						
10822	Dried vegetables:						
10823	Canned vegetables:						

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop 6 = Own produce	Quantity in		Price per used unit in cents	Total value in cents	If c:1 Payment on delivery in cents
			Local units	Standard units			
a	b	c	d		f	g	h
10900	Fruits	-	-	-	-	-	
10901	Cooking bananas						
10902	Ripe bananas						
10903	Oranges and tangerines						
10904	Grapefruits						
10905	Lemons, limes						
10906	Mangoes						
10907	Pawpaws						
10908	Guavas						
10909	Pineapples						
10910	Melons						
10911	Sugar canes						
10912	Jackfruits						
10913	Avocado pears						
10914	Apples						
10915	Pears						
10916	Other cultivated fruits:.....						
10917	Other wild fruits:						
10918	Dried fruits:						
10919	Canned fruits:						

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop 6 = Own produce	Quantity in		Price per used unit in cents	Total value in cents	If c:1 Payment on delivery in cents -
			Local units	Standard units			
a	b	c	d	e	f	g	h
11000	Meat and meat products, poultry and insects	-	-	-	-	-	
11001	Goat, sheep						
11002	Cattle meat						
11003	Pork						
11004	Other domestic animals:						
11005	Wild animals:						
11006	kidney, etc) Offals (liver,						
11007	Minced meat						
11008	Sausages						
11009	Dried meat						
11010	Canned meat						
11011	Other meat products:						
11012	Chickens						
11013	Ducks and other domestic fowls:						
11014	Wild birds:						
11015	Insects:						
11100	Eggs						

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop 6 = Own produce	Quantity in		Price per used unit in cents	Total value in cents	If c:1 Payment on delivery in cents	
			Local units	Standard units				
a	b	c	d		e	f	g	h
11200	Fish and shellfish	-	-	-	-	-		
11201	Fresh fish							
11202	Shellfish							
11203	Fish, dried or salted							
11204	Canned fish and shellfish							
11300	Milk and dairy products (excl. butter)	-	-	-	-	-		
11301	Fresh milk							
11302	Cream							
11303	Cheese							
11304	Yogurt and other fermented milk:							
11305	Canned milk							
11306	Milk powder							
11307	Ice cream							
11308	Other dairy products:							
11400	Oils and fats	-	-	-	-	-		
11401	Cottonseed oil							
11402	Other cooking oil:							
11403	Butter, ghee							
11404	Margarine and other cooking fat:							
11405	Mayonnaise, dressings:							
11406	Other oil and fat products:							

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Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop 6 = Own produce	Quantity in		Price per used unit in cents	Total value in cents	If c:1 Payment on delivery in cents
			Local units	Standard units			
a	b	c	d	e	f	g	h
11500	Spices and other foodstuffs	-	-	-	-	-	
11501	Red pepper						
11502	Curry powder						
11503	Other spices:						
11504	Salt						
11505	Vinegar						
11506	Yeast, baking powder, etc:						
11507	Cocoa, cooking chocolate:						
11508	Baby food:						
11509	Purchased prepared meals consumed at home						
11510	Other foodstuffs:						
10002	Processing of foodstuffs other than cereals: ...						
11600	Raw material for drink	-	-	-	-	-	
11601	Tea, dry						
11602	Coffee (beans, ground)						
11603	Instant coffee						
11604	Other raw material for drink:						
11700	Non-alcoholic drinks	-	-	-	-	-	
11701	Coca-Cola, Fanta and other bottled soft drinks						
11702	Canned and bottled juices and squashes						
11703	Fresh fruit-juices and other non-alcoholic drinks						

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop 6 = Own produce	Quantity in		Price per used unit in cents	Total value in cents	If c:1 Payment on delivery in cents
			Local units	Standard units			
a	b	c	d	e	f	g	h
11800	<u>Alcoholic drinks consumed at home</u>	-	-	-	-	-	
11801	Tanzania bottled beer						
11802	Other African beer						
11803	Other imported beer						
11804	Wine, sherry, etc.						
11805	Pombe, Chibuku, and other local brews						
11806	Imported spirit (whisky, etc.)						
11900	<u>Meals and drinks consumed outside home</u>	-	-	-	-	-	
11901	Tanzania bottled beer						
11902	Other African beer						
11903	Other imported beer						
11904	Wine, sherry, etc.						
11905	Pombe, Chibuku, and other local brews						
11906	Imported spirit (whisky, etc.)						
11907	Breakfast, lunch, dinner (even school meals)						
11908	Tea, coffee, snacks						
11909	Soft drinks, ice-cream, sweets						
Page 17, total							

Code	Item of consumption	Consumption type: 1 - Cash, credit 2 - Barter 3 - Gift in kind 4 - Salary in kind 5 - From own shop 6 - Own produce	Quantity in				Price per used unit in cents	Total value in cents	If c:1 Payment on delivery in cents
			Local units		Standard units				
a	b	c	d		e		f	g	h
II	HOUSING	-	-	-	-	-	-	-	-
20100	Rents and water costs	-	-	-	-	-	-	-	-
20101	House rent	-	-	-	-	-	-	-	-
20102	Water	-	-	-	-	-	-	-	-
20103	House tax	-	-	-	-	-	-	-	-
20104	Fire insurance, N.I.C.	-	-	-	-	-	-	-	-
20105	Fire insurance, other company	-	-	-	-	-	-	-	-
20106	Burglary insurance, N.I.C.	-	-	-	-	-	-	-	-
20107	Burglary insurance other company	-	-	-	-	-	-	-	-
20200	Fuel and light	-	-	-	-	-	-	-	-
20201	Charcoal	-	-	-	-	-	-	-	-
20202	Firewood	-	-	-	-	-	-	-	-
20203	Kerosene (paraffin)	-	-	-	-	-	-	-	-
20204	Gas	-	-	-	-	-	-	-	-
20205	Electricity	-	-	-	-	-	-	-	-
20206	Other fuel and light.....	-	-	-	-	-	-	-	-
20300	Repairs and redecoration	-	-	-	-	-	-	-	-
20400	Furniture	-	-	-	-	-	-	-	-
20401	Beds	-	-	-	-	-	-	-	-
20402	Chairs, sofas	-	-	-	-	-	-	-	-
20403	Tables	-	-	-	-	-	-	-	-
20404	Cupboards, Wardrobes	-	-	-	-	-	-	-	-
20405	Shelves, bookcases	-	-	-	-	-	-	-	-
20406	Chest of drawers, chests	-	-	-	-	-	-	-	-
20407	Mirrors	-	-	-	-	-	-	-	-
20408	Wall-clocks	-	-	-	-	-	-	-	-

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Total value in cents	If c:1 Payment on delivery in cents
a	b	c	d	e
20409	Pictures, carvings and other decorations			
20410	Lamps			
20411	Carpets, rugs, mats, linoleum			
20412	Animal skins			
20413	Other furniture:			
20414	Repairs to furniture			
20500	<u>Linen, bed clothes</u>			
20501	Sheets			
20502	Blankets			
20503	Towels			
20504	Table cloths			
20505	Napkins			
20506	Bedspreads, covers			
20507	Pillow cases			
20508	Curtains			
20509	Pillows			
20510	Mattresses			
20511	Mosquito nets			
20512	Other linen and bed clothes:			
Page 19, total				

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Total value in cents	If c:1 Payment on delivery in cents
a	b	c	d	e
20600	<u>Household durables</u>	-	-	-
20601	Stove, oven, gas-cooker			
20602	Refrigerator			
20603	Fans			
20604	Airconditioner			
20605	Water heater			
20606	Sewing machine			
20607	Washing machine			
20608	Electric iron			
20609	Other household durables:			
20610	Repairs to durables			
20700	<u>Other household equipment</u>	-	-	-
20701	Pans, pots, bowls, and kettles of metal			
20702	Pots of clay for cooking and water			
20703	Wooden bowls, trays, and other wooden utensils			
20704	Dishes, plates			
20705	Cups, glasses, mugs			
20706	Knives, forks, spoons, household tools			
20707	Thermos			
20708	Torches, batteries, bulbs			
20709	Lanterns			
20710	Buckets, washing tubs			
20711	Brooms, brushes			
20712	Other household equipment:			
Page 20, total				

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Total value in cents	If c:1 Payment on delivery in cents
a	b	c	d	e
III	<u>CLOTHING</u>	-	-	-
30100	<u>Clothing for men and boys over 15 years</u>	-	-	-
30101	Turbans			
30102	Khanzus			
30103	Other national garments			
30104	Hats, caps			
30105	Suits			
30106	Trousers			
30107	Shorts			
30108	Jackets			
30109	Pullovers			
30110	Shirts			
30111	Underwear			
30112	Socks			
30113	Neckties			
30114	Rainclothes			
30115	Other ready made clothes:			
30116	Handkerchiefs			
30117	Cloth, cotton			
30118	Cloth, wool			
30119	Cloth, other:.....			
30120	Tailoring new clothes			
30121	Repairs to clothing			
30122	Leather shoes, handmade			
30123	Leather shoes, machine made			
30124	Slip-ons			
30125	Other footwear for men			
30126	Repairs to footwear			
Page 21, total				

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Total value in cents	If c:1 Payment on delivery in cents
a	b	c	d	e
30200	<u>Clothing for women and girls over 15 years</u>	-	-	-
30201	Kangas			
30202	Kitenges			
30203	Sarees			
30204	Other national garments			
30205	Dresses, frocks			
30206	Gowns			
30207	Skirts			
30208	Blouses			
30209	Head-gears			
30210	Underwear			
30211	Stockings, socks			
30212	Rainclothes			
30213	Other ready-made clothes:			
30214	Handkerchiefs			
30215	Cloth, cotton			
30216	Cloth, wool			
30217	Cloth, other:.....			
30218	Tailoring, new clothes			
30219	Repairs to clothing			
30220	Leather shoes, handmade			
30221	Leather shoes, machine made			
30222	Slip-ons			
30223	Other footwear for women			
30224	Repairs to footwear			

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Total value in cents	If c:1 Payment on delivery in cents
a	b	c	d	e
30300	<u>Clothes for children 15 years and less</u>			
30301	National dresses			
30302	Shorts, trousers			
30303	Gowns			
30304	Skirts			
30305	Shirts, blouses			
30306	Dresses, frocks			
30307	Socks, underwear			
30308	Baby clothes			
30309	Other ready-made clothes			
30310	Cloth, cotton			
30311	Cloth, wool			
30312	Cloth, other:			
30313	Tailoring, new clothes			
30314	Repairs to clothing			
30315	Footwear			
30316	Repairs to footwear			
30400	<u>Other personal effects</u>			
30401	Yarn and sewing material			
30402	Umbrellas			
30403	Handbags, wallets, purses			
30404	Watches			
30405	Sunglasses			
30406	Ornaments of gold			
30407	Ornaments of silver			
30408	Other ornaments			
30409	Other personal effects:			

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Total value in cents	If c:1 Payment on delivery in cents
a	b	c	d	e
IV	MISCELLANEOUS	-	-	-
40100	<u>Medical care</u>	-	-	-
40101	Government hospitals, dispensaries (Vaccination, grade I etc.)	-		
40102	Other hospitals, dispensaries (Voluntary agencies)	-		
40103	Private practitioners			
40104	Local doctors			
40105	Dentistry			
40106	Prescribed medicine	-		
40107	Household medicine			
40108	Spectacles (incl. eye testing)			
40109	Other medical care:			
40200	<u>Personal care</u>	-	-	-
40201	Toilet soap			
40202	Tooth paste			
40203	Hairtonic, shaving cream			
40204	Razor, shaving blades			
40205	Perfume			
40206	Lipstick, face cream, powder			
40207	Sanitary articles			
40208	Combs, hairbrushes			
40209	Toilet tissues			
40210	Baby articles			
40211	Other toilet articles			
40212	Hairdressing			
40213	Other personal care			
40300	<u>Education</u>	-	-	-
40301	School fees	-		
40302	School equipment, school books			

650

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Total value in cents	If c:1 Payment on delivery in cents
a	b	c	d	e
40400	<u>Entertainment and recreation</u>	-	-	-
40401	Books			
40402	Magazines, newspapers			
40403	Transistor radio			
40404	Radiogramophone, record player, tape recorder, TV			
40405	Records, tapes			
40406	Radio licence			
40407	Musical instruments			
40408	Toys			
40409	Sport equipment			
40410	Cameras, binoculars, etc.			
40411	Films, processing			
40412	Repairs to above			
40413	Studio photography			
40414	Cinemas, theatres			
40415	Sport fees			
40416	Clubs, associations, (subscriptions)			
40417	Flowers, garden			
40418	Dogs, cats, other pets			
40419	Other recreation and entertainment:			
40500	<u>Transport</u>	-	-	-
40501	Private car			
40502	Motorcycle, scooter, motor-bike			
40503	Bicycle			
40504	Petrol, oil, etc.			
40505	Repairs and maintenance of own vehicle			
40506	Spare parts not included in repairs			
40507	Registration tax, road tax, driving licence			
40508	Insurance for vehicle			
40509	Train			
40510	Bus			
40511	Taxi			

Code	Item of consumption	Consumption type: 1 = Cash, credit 2 = Barter 3 = Gift in kind 4 = Salary in kind 5 = From own shop	Total value in cents	If c:1 Payment on delivery in cents
a	b	c	d	e
40512	Boat			
40513	Airplane (incl. airport fee)			
40514	Moving and storage of household goods			
40600	<u>Telephone and postage</u>	-	-	-
40601	Telephone and telegrams			
40602	Stamps and other postal services			
40700	<u>Cleaning material etc.</u>	-	-	-
40701	Omo, Surf and other washing powder			
40702	Detergents in liquid			
40703	Washing soap			
40704	Cleaning powders (for brass, toilet etc.)			
40705	Insecticides for the household			
40706	Polish for floor, furniture, shoes, etc.			
40707	Matches			
40708	Other material for the household:			
40800	<u>Domestic household services</u>	-	-	-
40801	Laundry, dry cleaning			
40802	Domestic servants			
40900	<u>Cigarettes and tobacco</u>	-	-	-
40901	Cigarettes			
40902	Snuff			
40903	Pipe tobacco			
40904	Other smokables			
41000	<u>Contributions to religious and other societies</u>	-	-	-
41001	TANU and NUTA fees	-		
41002	Religious contributions	-		
41003	Professional societies	-		
41100	<u>Other expenditure on goods or services</u>	-	-	-
41101	Legal fees	-		
41102	Other consumption expenditure:			
Page 26, total				

Code	Item	Money expenditure in cents
a	b	c
V	<u>NON-CONSUMPTION MONEY OUTLAYS</u>	-
50100	<u>Taxes and fines</u>	
50101	Personal tax	
50102	Local rate	
50103	Income tax, surtax	
50104	House tax, site tax	
50105	Other taxes and fines	
50106	Local voluntary contributions to funds	
50200	<u>Losses</u>	
50201	Theft	
50202	Lottery, gambling	
50203	Other losses:	
50300	<u>Money transfers</u>	
50301	Remittances to relatives	
50302	Gift to others (not hh-members)	
50303	Dowry (bride price)	
50400	<u>Savings</u>	
50401	Deposits to National Bank of Commerce	
50402	Deposits to National Co-operation Bank	
50403	Post office deposits	
50404	Savings in credit-unions	
50405	Savings in Co-operatives	
50406	Shares, bonds	
50407	Community trusts	
50408	Government securities	
50409	Life insurance to N.I.C.	
50410	Life insurance to other companies	
50411	Other insurances to N.I.C. (<u>not</u> vehicle or house)	
50412	Other insurances to other companies (<u>not</u> vehicle or house)	
50413	Loans given out	
50414	Payment of debts for goods/services	
50415	Repayment of other loans (incl. interest)	
50416	Increase in cash holdings	
50500	<u>Investments</u>	
50501	Purchase of plot for own house	
50502	Costs for building of own house	
50503	Costs of alterations of extensions to own house	
50504	Other investments:	
Page 27, total		

15.

Information about the interview

- a) Main respondent = hh member No.....
- b) Other person(s) interviewed = hh member(s) No.....
- c) Interview finished..... o'clock Interview time.....minutes

Remarks:.....

16.

Information about the note-book; circle applicable figure

- 1 Note-book(s) not given to the household

If note-book is given

- 2 The household seems to have kept full records about expenditures
- 3 The household has at least made some notes
- 4 The household has not made any notes

Remarks:.....

17.

Information about volume measures; circle applicable figure

- 1 Volume measures not given to the household

If volume measures are given

- 2 Volume measures used by the household
- 3 Volume measures not used by the household

Remarks:.....

18. Summary Sheet.

Household Incomings.		Expenditure			
Question	Shillings	Question/page	Shillings	Page	Shillings
a	b	c	d	e	f
4:a		Question 6:d		Page 17:h	
5:c		" 7:d		" 18:h	
9:j		" 10:a		" 19:e	
11:e		" 10:b		" 20:e	
12:c		Page 9:h		" 21:e	
Total money to the household		" 10:h		" 22:e	
		" 11:h		" 23:e	
		" 12:h		" 24:e	
		" 13:h		" 25:e	
		" 14:h		" 26:e	
		" 15:h		" 27:c	
		" 16:h		Brought Forward	
		Carried forward			
				Total ex-	

$$\frac{b - f}{b} = \dots\%$$

Problems of Measurement in the field of levels of living,
including distribution of incomes and expenditure

GENERAL

Introduction

1. The term 'level of living' cannot be defined in relation to population groups in such a precise way that it can be quantified by a single standard statistical measure. Consequently overall changes in level over time within a group, or differences at a particular time between different groups, cannot be portrayed simply. The general approach to measurement in the field of levels of living must therefore be of a piecemeal nature, i.e. developing a range of measures of particular distinct aspects of social conditions. Initially priority will probably be given to means of assessing changes over time within a given country or particular groups within a country. This involves selecting elements which should be measured having regard to policy requirements and the actual or potential availability of data. The nature of these data will largely determine what is measured and the form in which it is measured. The differences in environment, in institutional arrangements and so on are such that meaningful international comparisons are very difficult; it is nevertheless desirable to aim to make such comparisons possible for at least a number of broad measures.

2. In recent years, there has been growing pressures for improvements in statistics in the social field, going beyond what can be derived from censuses of population and as by-products of administrative procedures. This has led to special arrangements, principally sample surveys, to obtain the required basic data. At the same time much interest has developed, at both the national and international levels, in ways of summarising facts about social conditions by means of what are described as "social indicators". It is of course recognised that many components which contribute to living standards cannot be quantified e.g. congenial environment, work satisfaction, human liberties. Nevertheless many aspects of social conditions can be measured and, although weighting problems are formidable, further study may show that some groups of measures may lend themselves to combined indices.

3. Generally people are most concerned about such matters as having enough to eat, being healthy and living out a natural span of life, being housed in congenial environment, carrying out some form of satisfying activity at work and in leisure hours, having sufficient education to be able to make the most of their abilities, social security, having security against war and crime and being assured of personal liberty and justice. The weight put on each of these components varies from person to person. Consequently there can be no objectively agreed weighting system to combine measures of health, housing and so on, even if overall measures of each of these components could be designed and agreed. Nevertheless in practice such weighting, according to some set of values, is taking place all the time and is implicit in statements on social policy and in social development programmes.

4. One ultimate aim of the studies going on at various levels is an integrated system of social and demographic statistics, incorporating a range of indicators, each of which provides a means of assessing progress in a particular field. There must be a purpose enabling one to judge whether the behaviour of the indicator shows progress or decline. The starting point of work on social indicators must therefore be an analysis of aims and purposes.

5. Once a decision has been taken to measure a particular aspect of living, decisions are needed on the concepts and units of observation and of measurement, on the means of collecting data from the various sources, and on how to analyse the data and to present the resulting statistics.

Units of observing and of measurement

6. Social statistics concern people and a primary consideration is the unit of observation. The basic data may relate to an individual, a family, a household or broader groups, and these may be classified in various ways based on socio-economic and other criteria. Some data may be aggregates relating to the whole population and, at the other extreme, other data may relate to individuals. To allow for changes in the size of the population covered, the measures will usually be expressed on a "per head" or "per household" basis. From the welfare point of view, there is special interest in particular population groups in need of special arrangements to assist them.

7. For income, expenditure, savings, wealth etc, measurement will be in monetary units; but, to allow for changes in purchasing power, value measures will often need to be compiled in terms of constant prices. Ideally, separate price indices are needed for each population group, taking account of their expenditure patterns. On the other hand, physical units will be used to measure amenities such as housing, hospitals and schools, for demographic indicators such as mortality, doctors, and teachers, and for ownership of types of assets or consumption in terms of volume.

Sources of data

8. Many data already available within national statistical systems may be drawn upon. In general, such data will only facilitate the compilation of measures of a global nature relating to the whole or very broad groups of the population e.g. GNP, income or expenditure per head. These do not show how the position varies between different sub-groups. The compilation of more informative measures will require the development of special arrangements to obtain separate data for such sub-groups - for example particular categories of households. Household data are obtainable to some extent from censuses of population, possibly including incomes, ownership of durable goods etc. but not, for example, expenditure. Other data may only be obtainable from household surveys. The different types of source are complementary.

9. Household surveys are major and costly undertakings. To achieve comparable degrees of reliability, the sample size needs to be as large for a small as for a large population. Continuous surveys such as the Family Expenditure Survey in the United Kingdom offer advantages over larger but infrequent surveys. For many purposes, annual data are needed. Results of infrequent surveys may be affected by abnormal events but the effect of such disturbances can be reduced by averaging results of continuing surveys. A cadre of experienced skilled staff can be employed on continuing surveys and consequently higher standards of field work achieved.

INCOME AND EXPENDITURE

10. It is not practicable in the present paper to consider measurement problems throughout the field of levels of living. The remainder of the paper is therefore restricted to income and expenditure.

11. Although some expenditure is associated with the individual, much is on a household basis and so the household is a more appropriate unit of observation than the individual; a household of course may not consist solely of members of one family. To throw light on variations in living standards, separate data are needed for categories of households classified by income and other characteristics i.e. the kind of data obtainable from household surveys.

12. Income and expenditure data from other sources may be of a global nature or relate to other units such as taxation units or individual taxpayers or social security contributors. Some of these data can however incorporate elements (particularly within the field of public expenditure) which cannot be apportioned between different categories of households. Although the concepts used for measures based on these data may differ from the concepts used for measures based on household data, it is desirable that such differences should be minimised, if the aim of developing an integrated system of statistics on income and expenditure is to be achieved.

Concepts

13. Income is one of the major determinants of levels of living and differences in income between different groups account for some differences in their levels of living. There are various forms of income, and income is measured in different ways in different statistical systems. In the context of measuring living standards, the ideal concept is the income which is available to the group of people for use in meeting their needs. Thus in so far as some needs are met by public expenditure (for example health and educational services), by social security payments or by benefits in kind, these elements should be included. Conversely direct taxes and compulsory contributions to social security schemes reduce their resources available for consumption and other forms of expenditure or for saving. The extent to which this ideal can be approached depends on the availability of data and limits on which estimates can be made for some components not directly measured in the statistical systems.

14. Items which may be taken into account in measuring income include:-

- (a) wages and salaries of employees (excluding benefits and payments in kind)
- (b) income in kind of employees
- (c) net income from self-employment
- (d) income from property (including sub-letting)
- (e) notional income from owner or rent-free occupancy of dwellings
- (f) income from other investments
- (g) social security pensions
- (h) occupational and other pensions and annuities
- (i) social security payments (other than pensions)
- (j) grants from public funds
- (k) education scholarships etc.
- (l) housing subsidies
- (m) services provided free or below cost from public funds (e.g. education, health, welfare)
- (n) services provided by employers
- (o) value of home grown produce
- (p) employers' contributions to state social security schemes for employees

17. In association with marital status, data can be obtained from the census on the number of children born to ever-married women. Outside of birth registration and sample surveys, this will be one of the few sources of data on fertility, and will provide an indication of the average number of children in families.

18. The registration of births and deaths is achieved with a fair degree of accuracy, although the method can pose problems if there is failure, for one reason or other, to register births and deaths.

19. In the study of birth-rates, the problem of ex-nuptial (or illegitimate) births is being given increasing attention. The collection of statistics on these births, as well as pre-marital conceptions, is comparatively reliable. However, what illegitimacy means to the society is more difficult to understand. The increasing trend of removing impediments and difficulties for the illegitimate child lessens these problems in some ways as far as the general public are concerned, and although the social consequences for family life are still present, they may often be no more adverse than is the case for children of widowed and divorced persons. Nevertheless, it seems worthwhile to maintain the distinction between ex-nuptial births and pre-marital conceptions, and nuptial births.

20. The concept of race or ethnic grouping is a fairly difficult concept to measure. For example, the New Zealand census asks respondents to state, where possible, their degree of blood. Furthermore, they are expected to indicate the race or ethnic group to which they belong. It is possible, therefore, that a respondent acknowledges belonging to a particular ethnic group although he has a degree of blood less than the prescribed rate for membership of that ethnic group (as stated by the Census). For example, a person with $\frac{1}{4}$ Maori blood and three-quarters European blood may regard himself as a Maori, but by the census definition ($\frac{1}{2}$ or more) he is European.

21. It seems worthwhile to extend statistics to as many homogeneous ethnic groups living within a country. In New Zealand considerable attention has been given to the Maori for the obvious reason that this group is the largest ethnic minority in the country and because these data are used to draw the Maori electoral boundaries. Greater statistical concern could be given to smaller ethnic groups living in New Zealand and so gain a more comprehensive understanding of the total homogeneous ethnic groups residing in the country.

22. Migration statistics present a number of problems. Total migration from overseas can be measured with a certain degree of accuracy by frontier registration, although problems exist when determining when a person is an immigrant and when he is a visitor. This exists because the definition of an immigrant is given as a person who resides a certain length of time in a particular country. Problems also exist in attempting to measure internal migration. Internal migration

in New Zealand is measured from census questions, with these questions obtaining internal migration information by asking place of residence at some specific date in the past. If the place of residence at the time of the census differs from the place of residence at the date in the past, the individual is classified as a migrant. The limitation of this method is that it measures only a certain proportion of the total internal population moves. It gives no indication of total moves.

23. The Census appears adequate in assessing the streams of population movements only, and the most satisfactory method is doubtless to develop some form of registration as operated by some European countries. This registration system, however if introduced into New Zealand could evoke strong opposition from groups regarding it as an invasion of personal privacy.

24. In addition to measuring the volume, distance and direction of migration, there are many social and psychological processes behind migration, i.e. the motives for moving. These, however, are difficult to measure and certainly call for methods other than the census approach since the reasons for movement stem from a combination of complex economic, psychological and sociological factors. Again, only some indicators of movement could be measured, although it would be very difficult to get a complete understanding of the process involved.

Family and Household

25. To a large degree the concepts family and household are measurable since it is comparatively easy to count the number of people in a particular household, and also in many cases the two are commensurate. Obtaining accurate counts of members of families is a little more difficult since families are principally enumerated from the census by relationship to the head of the household. If members of a family within a particular household are not related to the head, this familial relationship may have to be obtained through a separate coding operation. Only some form of sample survey could indicate with any greater accuracy these familial relationships to cover cases of absentee persons at census time, etc.

26. There is the additional concern of defining household and family. A household is a group of people sharing the same facilities and living together as a social unit. A family is a group of people living together who are related by blood, marriage and adoption, and this includes the primary or nuclear family (a man, his wife with or without unmarried children), as well as other kinds of families which possess less direct blood relationships (e.g. brother-sister household).

27. Statistics on the family are of considerable importance since this is one of the limited times social statistics look at groups of people rather than individuals. The family is additionally important since it is one of the basic groups in society. Household and family statistics have been produced in limited form from the 1966 Census of Population and Dwellings.

index and a number of indices of retail prices. The latter are chain Laspeyres type indices with weights changed every year on the basis of recent information on expenditure patterns obtained mainly from the Family Expenditure Survey. There is a general index measuring price changes over the whole field of goods and services, covering all households other than high-income households at one extreme and "pensioner" households at the other. Separate indices have now been introduced for one-person pensioner households and for two-person pensioner households. The introduction of indices for geographical regions or areas is under consideration.

28. Since the field of expenditure covered by the Family Expenditure Survey is the same as that covered by these indices, the FES expenditure data can be deflated to facilitate study of changes over time in household expenditure on goods and services after allowing for price changes. This can be done at the overall level, or as in Appendix B to this paper at the group level, or at a section level.

29. The consumer price index, which is a Paasche type index, is derived by dividing consumers' expenditure in the national accounts at current prices by the corresponding expenditure figures at constant base-year prices.

30. It will be noted that in the United Kingdom indices measuring changes in the cost of a fixed or standard basket of goods and services are not compiled.

GENERAL DISCUSSION

Expenditure

31. Much experience has been gained in collecting information about expenditure of households through sample surveys. A major problem is to secure the co-operation of households and this is dependent of skilled interviewers. Since transactions are made by individual members of households, the co-operation of all members is needed. Given this co-operation the main problem is to obtain complete and accurate detailed information. Single payments are often made for a variety of items which need to be separated and classified under different headings. There are wide variations in frequency between different types of expenditure. Where the payments are neither regular nor frequent, e.g. the purchase of expensive items, there are problems. If the period of observation is short, the number of observations is small and the sampling errors are high. If respondents are asked to recall purchases over a long period, the information obtained may be less reliable and incomplete. An appropriate compromise may be to adopt reference periods of different lengths for different types of expenditure. Nevertheless despite these and other practical problems, the collection of data from households is probably less difficult as regards expenditure than income.

32. The main problems arising are associated with non-response and inaccurate reporting of a few items of expenditure and types of income. Representation of households without children tends to be slightly low and representation of high-income households tends to be erratic. Earnings data tend to be slightly low, partly due to under-reporting of earnings of women in part-time employment. Expenditure on alcoholic drink, tobacco and to a lesser extent meals bought outside the household, some confectionery and ice-cream (often purchased from amounts recorded as children's pocket money) are understated. On the other hand, some items are overstated, where for example rebates are subsequently received on slot meter payments for gas and electricity.

33. There are also problems in measuring expenditure on goods purchased through mail order, clubs, budget accounts and similar schemes for buying goods on credit; also in assessing housing costs for owner-occupiers and households living rent-free. Only partial information about incomes in kind is collected.

Incomes

34. Income, other than from employment, may be received either occasionally or at regular but possibly infrequent intervals, such as once a year. Thus a reference period of twelve months is probably appropriate and the information will be subject to a time lag. Information about income from self employment is also generally only obtainable for a recent past year. Income from employment as an employee on the other hand is usually received at much shorter intervals but the employee may not work regularly throughout the year and his earnings in a particular short reference period may be abnormal. Where there is an interruption of earnings, the consequential effect on expenditure behaviour may be delayed. His expenditure behaviour is probably mainly dependent on his average or normal income and so again a reasonably long reference period in censuses and surveys is desirable, if for example family or household expenditure is to be related to income at that level or if households are to be classified by income group for expenditure analyses.

35. Income data are of course available from other sources such as taxation and social security systems and usually relate to a period of twelve months. Such data cannot be related to household expenditure data. Moreover they probably do not cover all income recipients (e.g. those with low incomes) nor all forms of income (e.g. non-taxable incomes) and special definitions and methods of measuring income may apply. There are thus problems in integrating data from different sources.

Standard Budgets

36. In international discussions (e.g. an OECD Group of Experts in 1968) measurement of the proportion of persons in households with incomes below a "standard budget" has been considered: a standard budget being the amount of money which a family of given size would need to maintain a decent but minimum standard of living in the particular country. Theoretically this could be defined without reference to existing income distribution and consumption patterns. However, in developed countries at least, a minimum standard would only be acceptable if it had regard to existing conditions and even then the choice of the standard could be a major political issue.

37. However there are important arguments against the adoption of such a measure. They are arbitrary, in that the change during a period in such an index is dependent on how the standard is chosen. If for example the standard were chosen at the lowest decile of the income distribution at the beginning of a period, the index would change very differently than if it were chosen at a higher point of the distribution. Thus although these measures are considered useful and are used in some countries in connection with low income groups, they are not suitable for international use. Another limitation is that these measures do not show how the position of low-income groups is changing relative to other groups.

Income Distribution Quantiles

38. Studies have shown that distributions of incomes are often approximately lognormal and that despite very large changes in their means over long periods there has been very little change in the standard deviations of the logarithms. This stability in the relative dispersions of the distributions implies that the ratios between the mean, median, quartiles etc. have changed little. Where the distribution of incomes of families of a particular type is lognormal, the incomes of such families at all levels of the distribution increase at a common rate, namely the rate of increase of the average income per family. It would then be appropriate to regard this rate of increase as a good measure of the change in their level of living.

39. Where the quantiles of a distribution do not behave in this way, it would be useful to examine how the rates of increase of the quartiles compare with the rate of increase of the mean. For example, in relation to families in the lower part of the distribution, a useful measure might be the rate of increase of the income of the family at the lower quartile (or other selected point of the distribution) after the income distributions have been divided by a price index. Such measures would relate to families of particular types or sizes, but possibly an acceptable system of weighting could be designed to provide a combined measure. An alternative approach might be to express the income of each family in the form of income per adult equivalent, (using a set of equivalences for children etc.) and so obtain a single distribution for all types of families and then measure the rate of change of, for example, the lower quartile.

International Comparisons

40. Because of variations in economic and social development, climate, environment, transport and so on, needs vary between countries. Also there are important differences in institutional arrangements as regards for example the provision of education and health services, and taxation and social security systems. These clearly need to be taken into account in any international comparisons of levels of living. There are consequent major problems in designing measures which are suitable for such uses.

APPENDIX AFAMILY EXPENDITURE SURVEY

1. The Family Expenditure Survey (FES) is a continuous sample survey introduced in 1957. It does not cover persons living in institutions, commercial undertakings, public houses, hotels, guest houses, boarding houses etc. but only what are described as private households. Each year a sample is selected of about 11,000 addresses which are visited by skilled interviewers. The sample design ensures that each household in the country has an equal chance of selection. The visits are spread evenly over the year. Private households at these addresses are invited to co-operate by providing the interviewers with information about the household, incomes and certain types of expenditure such as annual, quarterly and other periodic and special payments and also in maintaining record books for 14 consecutive days showing details of all expenditure by each member, other than children, of the household. The addresses contain about 10,400 households (an address may contain none or more than one household). The survey is voluntary and about 70 per cent of the households co-operate fully.

2. A household comprises one-person living alone or a group of persons living at the same address having meals prepared together and with common housekeeping, including resident domestic servants. In surveys of this kind, conventions are required to determine who is to be regarded as head of the household and whether or not a person is a member of the household when he is not present as much as others.

3. Individuals are classified by sex, age group, whether working, retired or has other status and, if working, industry and occupational group. Households are classified by type of area (Greater London, provincial conurbation, other urban, semi-rural, truly rural), geographical region, type of dwelling occupied, size and composition of household, gross weekly income of household, gross weekly income of head of household, employment status of head of household, occupation of head of household and age of head of household.

4. In the assessment of income, the following are excluded:-

- (a) transfers from one member to another (except wages paid to a resident domestic servant);
- (b) withdrawal of savings, maturing insurance policies, proceeds from sale of houses, cars, furniture, etc., legacies and other windfalls, winnings from betting;
- (c) value of educational grants and scholarships not paid in cash;
- (d) loans and money in repayment of loans;
- (e) except for the value of rent-free accommodation, the value of income in kind, including the value of goods received free, the abatement in the cost of goods and services received at reduced prices and the value of non-cash benefits received as an employee from the employer;
- (f) home-grown produce etc.;
- (g) employers' contributions in respect of an employee under social security schemes;
- (h) re-imbursments of business expenses.

5. Apart from earnings as an employee and social security payments, most types of income are measured by gross receipts in the preceding twelve months before deduction of income tax, social security contributions and other deductions at source. An imputed rental value of an owner-occupied dwelling is included in the income of the head of household; this represents the value to the occupier of the services of the dwelling for which he would pay if he were not himself the owner. He is regarded as receiving this amount as the owner and paying this amount as the occupier. For households in rent free accommodation, an imputed amount to represent the gain through the absence of a charge for rent is included in the income of the head of household. Where dividends, interest and pensions are received after deduction of tax, the tax paid is added back.
6. Employees report actual gross earnings for the latest pay period and, if different, the normal amount, since the latter is more relevant in relation to expenditure behaviour. If he has been off work without pay for a short period, his normal earnings are used for income classification purposes, in preference to any short-term social security receipts. Incomes from wages and salaries and from self-employment include earnings from subsidiary occupations and also bonuses and other periodic additions.
7. Income is classified by source: wages and salaries, self employment, investment, annuities and non-social security pensions, social security pensions and benefits, subletting or imputed income from owner or rent-free occupancy, and any other source.
8. Special analyses are made in which income is assessed differently by adding employers' contributions in relation to employees to the social security schemes and national health services, and the value of certain benefits provided from public funds, viz. state education and school health services, scholarships and education grants, school meals, milk and other welfare foods, national health services, housing subsidies. These studies, which are described more fully in Appendix D, assess the net effect on particular categories of households of the payment of taxes (direct and indirect) and the receipt of benefits in cash and kind. (See also Economic Trends, February, 1970.)
9. In the survey, expenditure is restricted to current expenditure on goods and services. This convention excludes payments which are a form of savings or investments such as life insurance premiums, pension scheme contributions; also direct tax, social security contributions, mortgage and other payments for the purchase of or major additions to dwellings. Business expenditure to be reimbursed is excluded. In general, expenditure is measured on the basis of payments within the relevant period, whether or not the goods or services are received within the period. Special rules apply for goods supplied from the household's own shop or farm, hire purchase and credit sales. Expenditure on second hand goods is included but only net payments where goods are traded in as part-exchange. Where imputed rental values have been included in income, the same amounts are included in expenditure as if actual disbursements on housing.
10. Expenditure on goods and services is classified under 94 headings within 11 broad groups: housing, fuel light and power, food, alcoholic drink, tobacco, clothing, and footwear, durable household goods, transport and vehicles, services, and miscellaneous.

11. Income and expenditure data are all expressed on a weekly basis.
12. Information about the ownership of items such as cars, telephones, washing machines and refrigerators is obtained in the survey.

APPENDIX BSOME CLASSIFICATIONS USED IN THE FAMILY
EXPENDITURE SURVEY IN THE UNITED KINGDOM

1. Classifications used in a survey of this kind depend on the scope, nature and purpose of the survey and also on social conditions and customs within the country. They thus may differ from those found to be appropriate in other surveys and in other countries, particularly in developing countries.
2. A population may be regarded as comprising clusters of one or several persons and a survey may exclude certain types of clusters either because of difficulties of collecting data about them or because of large differences in the degree to which members of the cluster pool their income for outlay on housekeeping. Special consideration may be needed for instance for the armed forces, those living in institutions, staff of institutions, those who spend part of their time in institutions and part with their families (hospital patients and pupils at boarding school), those who live in institutions but pool their income with others living in households (married soldiers, merchant seamen), and those whose personal expenditure is so intermixed with expenditure of a commercial undertaking that it cannot be separated.
3. In the FES, the basic unit is the household rather than the family. A household comprises one person living alone or a group of people living at the same address having meals prepared together and with common housekeeping. The members are not necessarily related by blood or marriage. Rules are necessary to determine which persons are to be regarded as members of the household; some may spend a substantial time away and others may be living temporarily with the households. Relevant considerations include:-
 - (a) are they available to provide information and keep records?
 - (b) to what extent do they take meals with the household?
 - (c) how much are they separated from the household?
 - (d) if absent, when will they return?
 - (e) if present, when will they leave?
 - (f) what changes occur during the period of observation?
4. Households vary in composition as regards the total number of members, the number of males and females, the number of adults and children and the number who are unrelated by blood or marriage. However in a sample survey it is not practicable to use more than a limited range of classifications of households by composition. In the United Kingdom, classification according to the numbers of adults and children (a child being under 16 years of age) is considered the most useful when studying expenditure; it is less essential to distinguish between the sexes and still less according to marital status. For some purposes it may be useful to take account of the number of young children (under 5 years of age). Households with the same total number of members can have many different composition. A household of 5 persons for example can include from one to five adults and, if account is taken of sex, there are 20 types. Some will of course be far more numerous than others. The general aim is to distinguish those types which are most numerous and those in which there are policy interests.

APPENDIX CPERSONAL INCOMES AND EXPENDITURE IN THE UNITED KINGDOM

The following tables give estimates of

- (a) personal income before tax
- (b) personal disposable income i.e. after tax and national insurance etc. contributions
- (c) consumers' expenditure

per head of population in the United Kingdom for the years 1946 to 1969, at constant (1963) prices.

ESTIMATES PER HEAD OF POPULATION AT 1963 PRICES,
in £s sterling

				Personal income before tax	Personal disposable income	Consumers' expenditure
1946	..	..	..	332	286	273
1947	..	..	..	331	287	280
1948	..	..	..	322	279	270
1949	..	..	..	330	285	280
1950	..	..	..	335	290	287
1951	..	..	..	332	287	283
1952	..	..	..	333	290	280
1953	..	..	..	346	303	292
1954	..	..	..	357	313	303
1955	..	..	..	373	327	314
1956	..	..	..	382	333	316
1957	..	..	..	388	338	321
1958	..	..	..	397	342	328
1959	..	..	..	414	358	340
1960	..	..	..	439	378	350
1961	..	..	..	457	391	356
1962	..	..	..	460	390	360
1963	..	..	..	476	404	374
1964	..	..	..	495	418	384
1965	..	..	..	511	425	388
1966	..	..	..	522	431	395
1967	..	..	..	532	436	401
1968	..	..	..	544	441	407
1969	..	..	..	547	440	407

DISTRIBUTION OF HOUSEHOLD EXPENDITURE (UK FAMILY EXPENDITURE SURVEY 1963-9)

The following shows the estimates of weekly household income and expenditure on goods and services averaged over all households cooperating in the survey during the year and the distribution of expenditure between broad expenditure groups at current and at constant prices.

	1963	1964	1965	1966	1967	1968	1969	1963	1964	1965	1966	1967	1968	1969	Percentage change 1963 to 1969
	shillings							shillings							
AVERAGE WEEKLY HOUSEHOLD INCOME	441	472	493	515	565	600									
	AT CURRENT PRICES							AT CONSTANT 1963 PRICES							
AVERAGE WEEKLY HOUSEHOLD EXPENDITURE	383	390	425	446	466	499	524	323	378	393	395	405	413	412	+8
Housing	41	44	50	50	54	63	65	41	42	45	43	43	48	48	+17
Fuel, light and power	25	25	27	28	29	31	35	25	24	25	24	25	25	27	+8
Food	112	112	119	125	127	132	138	112	109	111	114	113	112	110	-2
Alcoholic drink*	15	16	17	19	20	21	23	15	15	14	16	16	17	17	+13
Tobacco*	22	22	24	26	28	26	27	22	21	20	21	21	20	20	-9
Clothing and footwear	35	36	41	41	41	44	47	35	35	40	39	38	40	41	+17
Durable household goods	22	25	27	29	30	34	31	22	24	26	27	27	30	26	+18
Other goods	27	27	30	32	34	36	38	27	26	28	29	30	30	29	+7
Transport and vehicles	45	43	53	52	58	65	72	45	42	50	48	52	55	58	+29
Services	37	39	38	42	47	46	47	37	38	35	36	39	36	34	-8
Miscellaneous	1	2	2	2	2	2	2	1	1	2	1	1	1	1	.
	PERCENTAGE DISTRIBUTION							PERCENTAGE DISTRIBUTION							
Housing	10.6	11.2	11.7	11.3	11.5	12.7	12.5	10.6	11.0	11.4	10.7	10.7	11.7	11.7	
Fuel, light and power	6.6	6.3	6.3	6.2	6.3	6.2	6.7	6.6	6.3	6.3	6.1	6.2	5.9	6.5	
Food	29.1	28.8	27.9	28.2	27.3	26.4	26.3	29.2	28.9	28.4	28.7	27.8	27.1	26.8	
Alcoholic drink*	3.9	4.1	3.9	4.3	4.2	4.1	4.3	3.9	4.1	3.7	4.0	4.0	4.0	4.1	
Tobacco*	5.7	5.7	5.5	5.7	5.4	5.2	5.1	5.7	5.6	5.1	5.3	5.2	5.0	4.8	
Clothing and footwear	9.3	9.2	9.6	9.3	8.8	8.7	8.9	9.3	9.3	10.1	9.8	9.4	9.8	10.0	
Durable household goods	5.8	6.4	6.3	6.5	6.4	6.7	5.9	5.8	6.5	6.5	6.8	6.8	7.2	6.3	
Other goods	7.1	6.9	7.0	7.1	7.2	7.3	7.3	7.1	7.0	7.1	7.2	7.4	7.2	7.1	
Transport and vehicles	11.8	11.0	12.4	11.7	12.5	13.1	13.8	11.8	11.1	12.6	12.1	12.8	13.4	14.2	
Services	9.7	10.0	9.0	9.3	10.0	9.1	8.9	9.7	10.0	8.9	9.0	9.5	8.7	8.3	
Miscellaneous	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	
Number of households in the sample	3151	3244	3392	3274	7366	7184	7008								
Average number of persons per household	3.02	3.06	2.95	3.03	3.00	2.96	2.96								
under 16	0.82	0.85	0.80	0.84	0.84	0.83	0.83								
16 to 64	1.87	1.89	1.81	1.86	1.85	1.81	1.78								
65 and over	0.33	0.32	0.35	0.33	0.31	0.32	0.34								
workers	1.35	1.37	1.33	1.36	1.32	1.41	1.40								

In real terms, the increase in expenditure between 1963 and 1969 has been mainly under the headings transport and vehicles, clothing and footwear, durable household goods and housing; expenditure on food has been relatively stable.

* Expenditure on alcoholic drink and tobacco are known to be understated.

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APPENDIX DREDISTRIBUTION OF INCOME

1. When the FES was first planned it was realised that, provided both income and expenditure data were collected in sufficient detail, it would be a most valuable source of information for estimating the incidence of direct and indirect taxes and benefits on different types of household at different levels of income. Indeed, estimates of the distribution of taxes on expenditure can only be made by questioning households themselves in a survey of this type. With a knowledge of the taxes paid and social service benefits received by different households it is possible to estimate the extent to which income is redistributed as a result of government fiscal policy.

2. Arrangements were made to collect information on income in as detailed a form as possible, so that household income could be defined and classified in various ways according to the type of analysis in view. For redistribution of income purposes households are classified by income before the addition of benefits received from public authorities and before the deduction of taxes, that is, broadly speaking, income in cash and kind received from work and property, now usually called original income.

3. Payments of direct taxes (taxes on income and national insurance contributions) and benefits in cash (e.g. state retirement pensions, family allowances) are estimated from information provided by the households themselves. Benefits in kind from government expenditure on education and health are estimated and allocated according to the type of education being received by members of the household or, for the national health service, in the absence of information about the extent to which different people use the service, according to the age/sex composition of the household. Housing subsidies are assigned to households living in local authority owned dwellings. The amounts paid in indirect taxes are estimated from the detailed information provided by households either in answer to oral questions (for regularly recurring items of expenditure such as local rates, licences) or in the daily records of expenditure during fourteen consecutive days.

4. Once the amounts of taxes paid and benefits received by different households are known it is possible to compare the gains or losses of households in different circumstances and to measure the distribution of income after some or all of the taxes or benefits have been taken into account. Social service benefits, all of which are progressive, make their greatest impact at the lower end of the distribution; progressive taxes, of which the most important are income tax and surtax, are most effective at the upper end of the distribution. For this reason it has been found useful to study the quantile incomes for different types of household before and after taxes and benefits. A comparison of the distances between the lowest or highest quantile income and the median before and after taxes and benefits gives an indication of the extent to which redistribution is effected by raising the incomes of the poorest or reducing the incomes of the richest households in the distribution. The results of part of this work - estimates of the incidence of taxes and social service benefits in the years 1957, 1959 and 1961-1968 - have been published in articles in *Economic Trends*, the latest being in February 1970. The definitions of the taxes and benefits and a detailed description of the methods so far used to estimate benefits in kind and indirect taxes are given in these articles.

5. Besides the straightforward analysis of taxes paid and benefits received by different types of household at different levels of income, estimates are also made of changes in the inequality of the income distribution brought about by different taxes and benefits. For this purpose Gini coefficients⁽¹⁾ of inequality are calculated for each type of household, first for original income and subsequently for a number of successive stages of income as taxes are deducted and benefits added.

6. A study of Gini coefficients for different types of household at different stages of redistribution throws light on the extent to which taxes and benefits change the degree of inequality in an income distribution and shows which are most progressive taxes or benefits (reducing inequality) or the most regressive (increasing inequality).

7. The Gini coefficients mentioned above are used to measure changes in the 'vertical' distribution of income, i.e. the amount of redistribution occurring between households of a particular type at different levels of income. In addition, 'horizontal' redistribution takes place between households of different size and type. In order to estimate vertical and horizontal redistribution combined it is necessary to express households of different size and type in terms of an equivalent unit, so that households can be pooled and a single Gini coefficient calculated for each successive stage of income. The work of determining equivalent scale factors for this purpose is still at a very early stage and many conceptual and practical problems remain to be solved. Many different factors contribute to the standard of living of a household of a particular type, age composition and level of income and the first need is to express at least the most important of these factors in a simplified formula which can be adapted for different types of household. The FES is a valuable source of data for an investigation of this kind but a great deal of experimental work has still to be done before results which are generally acceptable can be achieved.

(1) The Gini coefficient of an income distribution is defined as 'mean difference in incomes divided by twice the mean income'. It varies between 0, for complete equality, and 1, where all the income goes to one income unit.

MEASUREMENT OF COMPARATIVE COSTLINESS IN CITIES OF
DIFFERENT REGIONS AND COUNTRIES

Introduction

In Australia, there is a continuing demand for statistics of comparative costliness between cities and between metropolitan and country localities. The Bureau of Census and Statistics receives requests from governmental and private bodies for comparative cost-of-living type figures, mainly for use in setting differential payments or allowances for employees. Similar requests are also received from persons who are moving or considering moving to another locality. Virtually all of these requests ideally seek measures which would reflect not only price differentials but also those parts of cost differentials which arise e.g. from the effects of climatic and supply differences on the quantities, qualities and types of goods needed to equate levels of living.

2. This paper proceeds to describe official statistical practice concerning price and cost comparisons within Australia. (It does not deal with the Bureau's assistance, limited almost entirely to the supply of ad hoc prices information, to governments and some international bodies and businesses in their determination of allowances paid to employees stationed in other countries or away from headquarters.) It goes on to discuss problems mainly of "Comparative Retail Price Levels", with a further brief reference to "Comparative Living Cost Indexes". Comments offered on the problems are drawn mainly from findings and impressions derived from Australian experience.

Official Practice

3. During the 1930s the then official retail price index purported to supply some indication of relativity between the main cities and towns in addition to its prime purpose of measuring price change over time. This secondary use of the index was dependent upon the existence of a pre-determined basis of measurement which was accepted by the major users (wage fixing tribunals) and which was deemed to be reasonably constant. With the major exception of the housing and transport components, the basket of goods used in the comparison was identical in all localities. Basically, the housing and transport components reflected the different average expenditures on rents and fares in the various localities, by wage-earner households in the base period. At best, this secondary use of the index supplied only a broad assessment of comparative prices or living costs. It is not surprising that, as substantial and disparate changes in modes of living occurred after the Second World War, the different city and town indexes became unreliable as indicators of relativity between localities. This became so whether they were thought of as indicators of price levels or of living costs.

4. The resolutions of the 1953 Conference of Australian Statisticians included the following -

"That attention be drawn again to the statement already published that the "C" Series Retail Price Index cannot measure changes in relative price levels as between capital cities consistently with its main purpose of measuring periodic changes in retail price levels for each city."

"That the problem of measuring comparative retail price levels as between cities at any point of time differs in principle from the problem of measuring periodic variations in price levels in an individual city."

5. The current Consumer Price Index which replaced the "C" Series Retail Price Index was designed specifically for the purpose of measuring temporal price movements in specified cities individually. Although common weights are used for the majority of items, some important areas (e.g. housing, fuel and light, fares, meat, soft drinks) have separate weights for individual cities. The items priced include many local and store brands which often differ significantly between cities both in quality and specifications. No attempt has therefore been made to use the Consumer Price Index as even an approximate measure of relativity. Since the discontinuation (in 1960) of the "C" Series Index, no general measure of retail price relativity has been available, but the Bureau has always been prepared to compile data as to relative price levels in cities on a basis specified by a major industrial tribunal.

6. A series of Food and Grocery Index Numbers has been developed since 1962. These indexes are based on a common basket of selected food and grocery items which is priced in each of 217 (in 1970) cities and towns throughout Australia on 15 March each year. Generally speaking, the collection in the cities is made by field officers and that in the towns (which include some small localities) by post. The weights are those used in the Consumer Price Index for the majority of the six State capital cities. These indexes are calculated to show relative levels of retail prices. The selected items cover approximately 26 per cent by value of the total of the Consumer Price Index and include brand lines of identical or similar specification commonly available in all localities, as well as other foodstuffs (e.g. fresh meat) where the matching of prices rests on specification by type and quantity with no further attempt at allowing for any quality differences which may exist.

7. The Food and Grocery Index Numbers have not as yet been generally published (except for those in one of the six Australian States). They are supplied on request to users of the type indicated in paragraph 1 together with an indication of the main qualifications which should be borne in mind when applying them. These qualifications are illustrated in the discussion in the following sections of this paper.

Comparative Retail Price Levels

8. Any measure of comparative price levels should correspond to the general principles of pure retail price indexes and should be based on a common basket of goods with common weights appropriate to both localities; prices used for each item should relate to an equivalent quality. In practice temporal price indexes only approximate such a system but the assumptions made concerning the sampling of items and the approximate weights used appear to be of much less significance in temporal indexes than in spatial comparisons. In a temporal index most items in any homogeneous subclass generally exhibit similar price movements and thus their relative weighting has only a minor bearing on the final index. Observation suggests that price dispersion between localities will in a number of instances be greater than that over time. This factor plus the fact that the spatial comparisons basically relate to absolutes calls for more precise sampling of items and more precise weighting in spatial indexes. Since a common basket is not usually valid for two (or more) localities various alternatives such as cross-weighting are suggested and sometimes used in studies of this nature. However, as with most compromise solutions, it is difficult to describe the resultant measure, or measures, and difficult to convey the meaning to the general user.

9. Associated closely with the problem of determining appropriate weights is that of choosing representative items to be priced. It seems reasonable to expect that only the selection of commodities with reasonable volumes of sales in both localities would yield indexes that represent entire categories in a sampling sense. Australian experience is that it is difficult in a number of areas of expenditure and sometimes impossible to select commodities that satisfy some rule of matching and which are also representative of the market in two or more places for the purpose of an index. What may be a suitable indicator for temporal comparisons may not be for spatial comparisons.

10. It might be desirable to investigate the reasons for any general price dispersion between localities and to rearrange, on this information, the framework from which representative items are selected. For example, goods subject to similar transport costs could constitute a useful classification. Within a classification it may be necessary to make a selection of the indicator along different lines. For example, washing machines are approximately all the same size and would therefore attract approximately the same transport costs to each locality. This transport cost, if it were added to the cost of each machine, represents a smaller proportion of total cost for the more expensive fully automatic machines. Even if the cheapest model were the volume seller in both places it would not be correct to use it as an indicator for the whole range of washing machines in a spatial comparison. (It could, of course, be quite representative for temporal comparisons.) To obtain a correct spatial measure, prices of various models ranging from the cheapest to the most expensive would have to be used. This

example illustrates that a larger sample of indicators may be needed in the case of spatial comparisons. The volume seller can frequently be used as an indicator of temporal price movements but no such simple formula gives a guide to a suitable indicator for spatial comparisons.

11. A strict price level comparison can only be achieved if prices are obtained in each locality for goods of the same quality. At first glance it may appear to be best to select those branded lines that are widely distributed. However, for a number of these goods the manufacturer may bear the cost of freight to all parts of the country or at least to regional distributing centres and therefore, such items, if used on their own, may not truly represent the price difference between localities. In Australia, the production of many important goods is carried out by a few large companies which distribute nationally and by many smaller companies which are oriented towards local markets. Account should also be taken of goods produced by these local firms and the usual problems of matching specifications are again encountered. One of the main methods of adjustment for quality difference followed in temporal indexes - namely, adjusting for the price differential where the goods are selling normally at the same time in the same market - is not available for spatial indexes.

12. Associated with the quality of the goods is their method of distribution. A pound of ham or can of beans obtained from a city self-service supermarket may be considered to be of different quality to apparently identical goods obtained from a store still retailing in the old tradition. Consumers may put a premium on the available selection of goods and the available hours of regular service. Prices may be higher in Canberra when compared to Sydney because the Canberra retailers, unlike those in Sydney, are open for business on Friday nights. A related problem, which appears to be more significant for spatial than for temporal indexes, occurs in the selection of reporting stores and the averaging of their prices. Dispersion of prices for the same item in the same locality for the same type of store can generally be handled reasonably satisfactorily so far as its effects on temporal indexes are concerned. In the case of spatial indexes dispersion of prices within any of the localities being compared requires additional information so that the index maker may arrive (ideally) at the actual average price in each locality for the selected item in each type of store.

13. Because the Australian indexes of comparative food and grocery prices relate only to one point of time each year and also because of the nature of some of the food items represented, the comparisons include whatever different effects of normal seasonal influences exist, as well as the different effects of abnormal seasonal etc. influences from time to time. Sufficient data is not available to adjust for the former factor. In cases where the latter factor is believed to be significant, attention is drawn to this and to the comparison for preceding years.

14. An additional problem would arise in Australia if the comparison were to include rents of dwellings. In some cities the average rent paid by existing tenants is influenced by the proportion of those whose rents are affected by rent controls or still reflect the influence of rent controls. Most new tenants pay a much higher market rate. Whilst the average rent paid is normally regarded as the suitable price for use in a temporal index the current market rate for new tenancies would be more appropriate for some purposes, in spatial comparisons e.g. for a city to which migration was intended.

Comparative Living Cost Indexes

15. The compilation of these indexes calls for assumptions and assessments dependent on subjective judgment. It appears that the bases adopted in many areas of expenditure (in particular for housing, transport, and fuel) must reflect either the acceptance of existing differences in quality, quantity, and type or depend on the selection of different qualities, quantities, and types in an attempt to approach a fixed utility index. The problems seem akin to those of compiling a temporal "cost of living" index, an exercise which is not normally undertaken by official statisticians.

Conclusion

16. Experience in Australia has been that the demand for measures of comparative costliness is generally for relative cost-of-living type assessments. It has not been considered possible to supply statistical series which meet this demand, mainly because the compilation of such measures calls for subjective judgments similar to those which are usually accepted as preventing official statistical measurement of temporal changes in cost of living.

17. Relative price levels are an important element in relative living costs, and the Bureau supplies some measures of these, albeit to a limited degree. Additional data have been supplied to major users on an ad hoc basis, and intentions are to extend the regular supply of prices data for localities.

18. But even comparison of "prices" between localities poses problems which are additional to, of greater degree than, and different in principle to some extent to those which are faced in measuring "price" change over time for the same locality. The practical solutions of these problems result in limitations of some consequence.

MEASUREMENT OF COMPARATIVE COSTLINESS IN CITIES OF DIFFERENT
REGIONS OR COUNTRIES

I. Introduction

1. The question of how much more or less it costs to live in one location than another is of long standing and one for which only bits and pieces of an adequate answer have been devised. The importance of measurement of comparative costliness arises from two principal categories of use. One concerns decisions of individuals to move or not to move from one location to another to better themselves. Other things being equal, if living costs are higher in the new location those dependent on fixed incomes would be worse off, and those on wages or salaries would require additional remuneration to compensate for higher costs. Similarly, when business firms, governments and other employers require to relocate their employees, it is the practice of many to adjust remuneration paid to compensate for differences in living costs encountered in new locations. In these applications, measure of comparative costliness are wanted to answer the question how much more or less money does an individual or family require in a new location to achieve the same level of living already achieved in his present location. The second principal category of use concerns determination and analysis of differences in levels of living among separately located population groups as evidenced by differences in incomes and expenditures. Measures of comparative costliness are wanted to "deflate" money incomes and expenditures to real terms, by reduction of them to a common level of purchasing power of income or costliness of purchases. This constitutes a first step in further analyses of the causes or sources of regional disparities among population groups.

II. Conceptual and Statistical Framework

2. In its broadest terms, measurement of comparative costliness among locations presents the same conceptual issues as does measurement of changes in the cost of living through time. The statistical definition of appropriate concepts and the gathering of necessary data are, however, more difficult for spatial cost comparison than for temporal comparisons.

3. Conceptually, the spatial living cost comparison requires the costing of an aggregate of goods and services in two locations at a given point in time, in which (1) the level of living reflected by the two aggregates is identical, and (2) the combination and amounts of goods and services in both locations reflect only substitutions caused by differences in relative prices and other non-price conditions beyond the control of the two populations, e.g. environmental conditions such as climate and social custom. Similarly, for temporal living cost comparisons, aggregates at two points in time in a given location are required to be costed, in which the two represent an equivalent level of living and substitutions are permitted for changed price relationships and uncontrollable environmental conditions. In both types of measurements, acceptable techniques for meeting requirements of equivalence in level of living, with substitutability allowed, have not proven operationally feasible and resort has been made to statistical conventions to approximate the conceptual ideal.

4. In practice the operational concept of a fixed basket of consumer goods and services has been adapted in most countries for measurement of

changes in living costs through time, with the basket relating to a base period and being representative of the combinations and amounts of goods and services actually purchased by a specified population of consumers in the base period. In short, the statistical definition generally adopted has been the Laspeyre's type price index which is traditionally written:

$$I_n = \frac{\sum P_n Q_0}{\sum P_0 Q_0} \times 100$$

where I_n is the index of prices in period n ,

Q_0 represents quantities of the various goods and services in the consumer basket,

P_0 and P_n represent comparable prices per unit of such goods and services, and

Σ indicates summation of cost over all items included in the basket.

5. This same type of index may be adapted to measures of comparative costs between locations, with the quantities and prices with "o" subscripts relating to the base location and P_n relating to prices in another location, costs for which are to be compared with that of the base location.

6. The adequacy of the above type of measure of comparative costliness depends on the degree to which the fixed basket represents comparable levels of living in the two locations -- or in the case of temporal comparisons in the two time periods. Techniques for comprehensive evaluation of the levels of living implicit in the basket have not been developed and large elements of subjectivity enter into judgements on the adequacy of the indexes as useful indicators of comparative living costs. In most countries, price indexes of the fixed basket type are accepted as the best attainable measures of changes through time in the cost of maintaining a constant level of living. The belief that they are useful approximations is generally based on the judgement that changes in consumer baskets through time, associated with minimizing costs of maintaining a level of living as relative prices and environmental conditions change, are not a sufficiently significant element of cost change to invalidate the indexes in important uses. The often implicit qualification that the judgement is likely more valid for shorter-term measurements is evidenced by the general practice of updating baskets periodically and linking indexes based on separate baskets to provide a longer term historical index for less critical uses. Further, it is a familiar fact that the fixed basket cannot be costed over lengthy periods because some goods and services disappear entirely from the market and many are changed in characteristics or quality. Of necessity, then, substitute specifications are priced and used in the indexes after adjustment by conventional techniques to eliminate the price (cost) difference attributable to the changed specifications.

7. Without labouring further the identity of the conceptual framework for measurement of comparative costliness over time or between locations, it is contended that, with some exceptions, the statistical problems in achieving useful approximations to desired measurements are more difficult in the case of comparisons of costliness among locations. This is so because differences in baskets among locations tend to be more significant than changes in consumer baskets for a given location, primarily owing to the effect of environmental differences, particularly climate, and variations in the availability

of goods and services in locations to be compared.

8. The availability of goods and services in turn is a product of differences in natural resources and stages of economic development among regions and the transportation and tariff structures entering into the comparative economic advantages among regions. As a result, the sets of locations for which reasonably useful comparative living costs measurements can be made become quite limited, unless methods are devised for establishing comparable though different baskets.

III. The Canadian Experience

9. Despite the statistical problems in measurement of comparative costliness, federal government operational requirements have necessitated development and continuing production of indexes of comparative living costs between Ottawa and a large number of cities in other countries at which Canadian federal government employees are stationed, for purposes of adjusting living allowances for differences in living costs. More recently, a program of development of indexes measuring differences in living costs between major urban centres and northern or other remote locations in Canada has been instituted, primarily for federal government living allowance purposes. In addition, inter-city comparisons of prices in eleven larger urban centres across Canada were recently expanded and published covering approximately 75 per cent of the consumer budgets in those cities, and a special study has been completed on comparative costs of fuel and utilities in such locations. Finally, an interim study of comparative urban price levels in Canada and the United States was completed a few years ago. In the remainder of this paper, these developments are described with particular reference to the conditions under which use of them was to be made.

10. The several Dominion Bureau of Statistics' approaches to the measurement of comparative costliness between locations, referred to below, are characterized by a number of common elements. All have been heavily influenced by the source of the most pressing demand for spatial indexes and by the specific purposes which such indexes are required to serve. There has, therefore, been a priority accorded to the production of measurements needed by agencies of government for staffing and allowance purposes and, to a lesser extent, for regional economic analysis. This has led to a tailoring of such indexes or index systems for specific, rather than general, application by developing or adapting techniques to yield useable results in the particular context in which the indexes are to be used. These measurements are also characterized by a propensity towards the development of gauges of the living cost differentials encountered by fairly similar, and sometimes quite narrow, groupings of the population in the various locations being compared. This implies drawing place-to-place comparisons of living cost conditions under circumstances where broadly similar baskets of goods and services in the different locations, with certain important exceptions, would not be unreasonable. In turn, this leads to a common tendency for a good deal of stress to be placed on the development of valid price differentials at the item level, and for spatial indexes produced in the Bureau to be more influenced by disparities in prices than in spending patterns. To cope with problems stemming from major differences in spending patterns between locations (for example, differences attributable to domestic fuel and utility requirements due to climatic conditions) which arise even when one is concerned with fairly homogeneous population groups, a number of ad hoc techniques have had to be developed to meet the requirements for reasonably valid and useable spatial indexes.

(a) Comparisons of Living Costs - International

11. Indexes measuring comparative living costs between Ottawa and various foreign cities, as currently computed by D.B.S. for nearly 200 centres in 70 countries, stemmed from the Federal Government's need for a method of adjusting and maintaining the purchasing power of emoluments of its foreign service personnel abroad so as to make the particular location of their posting, in theory at least, a matter of financial indifference to them. Consequently, these indexes have been developed to reflect the particular circumstances of a relatively homogeneous group of Canadian expatriate personnel who reside in other countries for relatively short periods of time and who tend to cling to Canadian patterns of living to the extent that circumstances allow. Their living costs may differ sharply from those of the indigenous populations in countries where they are serving, both because of income level and because of the frequent availability of special duty-free purchasing facilities in respect of some of the commodities they consume. Canadian foreign service allowance indexes, therefore, are not considered valid reflections of relative costliness as between various foreign cities for the general population living in them and, because of their specialized nature, are not published. They are, however, made available to an increasing number of organizations employing staffs abroad who find them useful in the operation of their own compensation systems.

12. These Post Indexes, as they are called, express the spatial retail price relationship for a range of goods and services at each foreign city as compared with Ottawa. They encompass comparisons for such family expenditure components as food consumed in the home, meals taken in restaurants, clothing, public and private transportation, personal care, household supplies, domestic fuel and utilities, dental care, alcoholic beverages and cigarettes. Rent and education cost differentials are excluded from the comparison because separate allowances, with which D.B.S. is not directly concerned, compensates Federal Government staffs for any such excess costs while abroad. Furthermore, since Canadian public servants pay Canadian rates of income tax regardless of their place of service, income tax differentials are also excluded.

13. Post Indexes are derived from foreign retail price and family expenditure data collected, according to specification, from staffs serving abroad. This information may be augmented by supplementary data gathered from various statistical agencies and business firms as well as through periodic visits abroad by members of the D.B.S. section responsible for calculating these indexes. The method of measurement used for most categories of expenditure is to produce average prices for a selection of some 200 specified items at the foreign location, compare these prices to those prevailing in Ottawa for similar items, and combine the ratios according to a weighting pattern which reflects, in a general way, the broad outlines of the spending habits of the Canadian foreign service abroad. A foreign service family expenditure survey conducted in the mid 1950's revealed average spending patterns which, except for domestic help and household fuel and utilities, were not markedly different from those of the same small population group in Canada. A more recent expenditure survey, reflecting 1969 foreign service spending habits, is currently being processed.

14. Often, average prices at a foreign post will be a composite of prices paid in local retail outlets and those paid through some other source of supply such as a military commissary or a direct duty-free import from

abroad. The relative importance of each source of supply is established at the time of each survey on the basis of the actual purchasing practices of the Canadian staffs whose allowances are regulated by the resulting indexes.

15. The vexing problem of maintaining comparable quality of items being priced from one time period to another in the construction of temporal price indexes is more difficult still in respect of spatial indexes because of the great geographic distances involved and the absence of overlaps or common yardsticks by which to compare the quality of items in different countries. Consequently, relatively few adjustments are made for quality differences. If the price collector can find and price an item which appears to meet the required specification it is either accepted as being of identical quality or, alternatively, rejected altogether. There are, however, a number of exceptions depending on circumstances: prices for chicken purchased live are adjusted to their dressed weight equivalent, gasoline prices may be adjusted to take account of octane rating, etc.

16. Two areas of the budget where relative costs are compared directly, rather than relative prices, are household fuel and utilities and domestic help. Electricity rates, coal prices, etc. are not compared between Ottawa and foreign locations. Instead, the concept aimed at is to compare the cost of maintaining equivalent levels of comfort and convenience. At each foreign post, foreign service families submit completed questionnaires relative to the type and quantities of domestic fuel and utilities actually consumed as well as information regarding the accommodation they occupy. On the basis of this information, together with knowledge of the climatic conditions at each post, a norm is established for a middle-ranking foreign service officer at each location -- his expected requirements for the various fuels and services are costed and an overall figure is computed for the year. This figure is then compared to one which reflects the typical fuel and utility expenditures of the same level of officer living in Ottawa and a place-to-place cost relationship is arrived at. This relationship, in the context of the foreign service allowance index system, will yield varying dollar amounts in allowance terms, depending on salary level, marital status, number of children, etc. This allowance coverage is computed for each individual at the foreign post to determine if it is sufficient to compensate for reported heat, light and water expenditures. If many at the post are not adequately covered, the norm tentatively established for the target person may have to be altered. Usually, however, the relationship established for a middle-ranking officer is reasonably accurate for others at the post as well because those with lower salaries generally occupy more modest accommodation with consequently lower fuel and utility costs and the converse is equally applicable. A similar method is followed for determining relative costs of domestic help and compensating for these expenditures through the Foreign Service Allowance Index System.

17. In an effort to maintain the relevancy of Post Indexes to actual living costs being encountered, efforts are made to ensure that a full-scale price survey is undertaken at each foreign location at least at three-year intervals, and more frequently when volatile economic conditions so warrant. Post Indexes, once established, are subsequently reviewed regularly in the light of foreign exchange rate movements, and changes in the relationship between Ottawa and foreign city prices as derived from the most appropriate official or unofficial measurements of retail price movement available to us. Because these Post Indexes reflect the current price relationship between a foreign location and Ottawa, they tend to

remain unchanged for periods when price movements are broadly similar at both locations. On the other hand, as soon as relative price movements in Canadian dollar terms vary enough to alter an existing Ottawa-post relationship significantly, usually by five per cent or more, the Post Index (and the resulting allowance level) is adjusted.

18. Despite its theoretical and practical shortcomings, this system of comparative indexes of international living costs has served well in the context of the specialized application for which it was developed during the 20 years that it has been in operation.

(b) Comparisons of Living Costs - Remote Locations Within Canada

19. For a number of years the Dominion Bureau of Statistics has been measuring certain elements of the living cost differentials encountered by Federal Government staffs serving at some 300 locations in the more remote parts of Canada to assist in the establishment of appropriate allowance levels for the recruitment and retention of personnel serving at isolated locations. Initially, indexes of comparative costliness were limited to food only; more recently, the budget components were amplified to also include a variety of supplementary goods and services so that these comparative indexes now embrace the following:

Food

Meat, Fish and Poultry
Dairy Products
Fats and Oils
Fruits and Vegetables
Miscellaneous Groceries

Supplementary Goods and Services

Household Operation

Laundry soap, detergent and Other Household Care Articles
Laundry and dry cleaning
Telephone

Transportation

Automobile Operation (substituted by snowmobile operation
at locations where automobiles are not used)
Local Transportation
Inter-city Transportation

Personal Care

Recreation and Reading
Tobacco and Alcohol

It will be noted from the above listing that important components of the typical Canadian family budget such as shelter costs, clothing and automobile purchase are not included in the measurements. Furthermore, even in the case of the groups of items listed above, it is sometimes necessary to introduce adjustments at locations where certain items may not be available.

20. For purposes of measuring comparative living cost levels, the country was divided into seven geographic regions with the retail price levels encountered by government employees at isolated posts being compared with those experienced by the large modal group of consumers in the base city of each particular region. Since personnel serving at remote communities are frequently recruited from metropolitan areas of the country and strive, to the extent that conditions allow, to maintain the spending patterns they have been accustomed to, the basic weighting diagrams used in the construction of isolated post indexes reflect the basket of goods and services purchased in the respective base cities, with modifications necessitated by local circumstances. Base cities, usually large urban centres, were selected because they constitute normal supply sources for the isolated communities in the region. Insofar as possible, retail price and living cost data are collected through visits by D.B.S. personnel to the various remote locations. In view of the limited availability of retail outlets at many such locations, and the special conditions underlying purchasing and consumption habits in these areas, a number of adaptations to index number construction methodology have been necessary to resolve specific problems. Some examples follow:

- (1) Though, in the main, measurements of comparative retail price conditions reflect the relative price situation encountered by personnel patronizing local retail outlets in remote areas, there are occasions when the inadequacies of local supplies will cause staffs, generally, to make certain purchases elsewhere than in the place of their employment. In such circumstances it becomes necessary for the comparative living cost measurement to reflect this situation. This is accomplished by obtaining information on the actual sources of supply of the employees concerned together with basic price and transportation cost information for goods purchased away from the remote location.
- (2) While regional base city expenditure patterns provide the general framework for computing indexes of living cost differential for isolated communities, special conditions arising from their location may give rise to departures from "normal" spending patterns. These are most frequently noticeable with respect to purchases of meat, fish and poultry (high proportion of tinned), milk (heavy reliance on powdered), bread (high proportion baked at home), fruit and vegetables (limited availability of fresh), private transportation (substitution of snowmobiles for automobiles).

21. One technique employed to derive suitable milk cost comparisons between remote locations and large urban centres, having regard for differences both in relative prices and in the types of milk consumed, involves the establishment of factors whereby given quantities of evaporated, skim powder and whole powder milk can be converted to their fluid whole milk equivalents. On the basis of the proportions, in expenditure terms, of milk consumed in its various forms in both the base city and the remote location, and the retail prices of the different types of milk at each location, identical amounts of whole milk equivalents can be costed and compared.

- (3) Comparative living cost surveys are planned for each remote location at roughly two-year intervals. The problem of seasonal supply and price variations, both at the remote locations and in the base cities, is only partially solved through staggering the timing of the comparative surveys from one two-year period to the next. To some extent,

also, seasonality is taken into account through personnel reporting purchases from different supply sources throughout the year. For example, they may buy part of their annual supply of a commodity from the local retailer and part from an outside source, in which case both price differentials would influence the spatial measurement. While the problem of seasonality has by no means been solved by resort to the aforementioned expedients, it should be noted that it can manifest itself either in over- or under-estimates of differential indexes, which has certain advantages in a system aimed at providing rough justice in the payment of allowances.

22. In practice, although indexes comparing living costs at remote locations with those in urban centres are actually computed to the nearest tenth of a percentage point, they are released and used in the context of the Federal Government's Isolated Post Allowance System only after being grouped in categories of 10-point intervals. Thus, any indexes in the range 100.0-109.9 are given a value of 105, 110.0-119.9 a value of 115, etc. This procedure not only serves to avoid any undue impression of precision in the use of the indexes but also simplifies the administrative work associated with the payment and the revision of the employee allowances stemming from them.

23. In addition to the indexes described above for use in the Federal Government's system of allowances for service in isolated locations, the Bureau has produced measurements of comparative costliness derived from surveys of retail price and living cost differentials for a few somewhat less isolated, bigger communities where large-scale industrial developments in hydro-electric generation, mining, etc. have suddenly created relatively large town sites. These indexes which have generally been required in the context of wage negotiations between private employers and their work forces, are not published but are made available to all parties concerned. These studies have tended to encompass a broader basket of goods and services than that cited above for isolated post indexes, in reflection of the generally larger population groupings concerned and of the much better supply and shopping conditions being encountered.

(c) Comparisons of Retail Prices - Canadian Urban Centers

24. Inter-city indexes expressing differentials in retail prices as at May 1969 among 11 major Canadian cities -- one in each of the 10 provinces plus Ottawa -- were published by D.B.S. early in 1970. While indexes comparing food price levels between major Canadian cities had been published previously, the latest results expand the scope of spatial retail price measurements to take in such other elements of the family budget as clothing, transportation, household operation, health and personal care, recreation and reading, and tobacco and alcohol. In all, inter-city price comparisons were drawn for commodities and services comprising nearly three-quarters of the budget on which the Consumer Price Index for Canada is currently based. Major omissions are shelter (both rented and owned), domestic utilities (see (d) below), and restaurant meals. While recognizing the importance of shelter differentials in any over-all comparison of the general price level being encountered by consumers in different urban centres, the problems inherent in drawing valid rent and homeownership cost comparisons between cities is such as to require a good deal more research. Meanwhile, it was considered that publication of retail price comparisons for many elements of the budget other than shelter would

go some distance towards serving the varied needs of users.

25. The data base of this study was, to a large extent, the wide range of retail price quotations collected in the course of production of the national and urban Consumer Price Indexes. In addition, however, a certain amount of supplementary pricing was undertaken specifically for place-to-place comparability. In developing these spatial price comparisons, efforts were made to achieve comparability by equating qualities of goods and services and by matching types of retail outlets, as far as possible. To optimize price comparability between locations, differential price measurements were initially derived separately as between 12 separate pairs of cities.

26. Within each city pair, price quotations were matched at the item level on the basis of identical specifications including brand names whenever possible, and also having regard for comparability of retail outlets and merchandising practices. The price relationships thus derived were aggregated into group and sub-group indexes to reflect the differentials existing within each of the pairs of cities and were converted to a common base of Winnipeg prices equalling 100 to facilitate comparisons over the whole range of cities. To some considerable extent the original price relationships between cities were developed in the context of an earlier study which utilized May 1965 price data. The updating of these measurements of inter-city retail price differentials to May 1969 was accomplished by application of the relative movement of prices, at the item level in each city, over the intervening four-year period as derived from the relevant city consumer price indexes.

27. All indexes up to and including those for major budget groups were computed on the basis of the average spending habits of the large, modal group of Canadian urban families as reflected in the weighting pattern used to derive the national Consumer Price Index. The validity of this approach in this specific context was tested by computation and analysis of the alternative indexes derived from the application of individual city, rather than average urban-Canada, weighting patterns. Among more than 200 comparative indexes produced on the basis of city weights, nearly 91 per cent were within one per cent and 98 per cent were within two per cent of the corresponding index derived from average Canada weights.

28. Because of the aforementioned absence of shelter price relationships, which could be of considerable significance in any overall comparison of inter-urban retail price differentials, aggregative indexes beyond major budget groupings were not published. Nevertheless, considerable evidence has been forthcoming to suggest widespread use of these inter-city comparisons of retail price levels in government, business and among the general public.

Comparisons of Domestic Fuel and Utility Costs - Canadian Urban Centers

29. A study of comparative domestic fuel and utility costs in a selection of eight major Canadian cities was undertaken to enlarge upon and to complement the published measurements of retail price differentials between urban centers for other components of the consumer budget described in (c) above. While it was considered that for some groups of commodities and services, valid inter-city retail price comparisons could be derived by use of a single Canadian average urban expenditure pattern, this ap-

proach could not be realistically employed in relation to domestic fuel oil, gas and electricity costs. Variations in the quantities and types of fuels required from one city to another, because of climatic and other factors, called for a different measuring technique.

30. A formula development by heating engineers, known as the corrected degree-day formula, was applied to yield estimates of fuel quantities in British thermal units (BTU's) for space heating in each city. Some of the factors influencing the quantity of fuel required for space heating which this formula takes into account are the following:

1. The difference as measured in degree-days between the temperature to be maintained inside the house and the outside temperature.
2. Those characteristics of the house which determine its ability to retain heat.
3. An adjustment factor which takes into consideration the amount of heat generated by sources other than the heating system itself (e.g. lights, appliances, solar radiation, etc.).

After ascertaining the number of BTU's required for space heating the specified type of house in a given city, an estimate of the quantity of fuel oil or of natural gas needed to deliver this amount of energy is derived from information about the heating value of each type of fuel and its efficiency of utilization.

Differentials between cities in annual domestic fuel and utility costs were presented in index number form. These specific indexes, unlike the place-to-place retail price indexes which maintain quantities constant and compare only prices, reflect inter-city differentials arising from variations in both prices and quantities. Separate index series were computed for houses heated by fuel oil, for houses heated by natural gas and for a combination of both methods of heating.

31. To conclude this resume of the recent Canadian experience in the development of measurements of comparative costliness, mention should also be made of study of comparative urban consumer price levels in the United States and Canada in May 1965 which was the direct forbear of the Canadian inter-city indexes referred to in (c) above. This work was undertaken, with extremely limited resources, to meet the need of the Economic Council of Canada for an indication of relative price conditions for use in the measurement of differences in real income between the two countries. As in the case of the Canadian inter-city indexes previously described, the data base was largely derived from prices collected in the context of the ongoing production of temporal consumer price indexes, although a limited amount of additional price information was collected in both countries to meet the specific requirements of the comparison. In addition to national urban retail price comparisons, derived from averages of prices in eleven United States cities and seven Canadian cities, three further city-to-city retail price comparative indexes were calculated by pairing sets of cities on both sides of the border. The spatial measurement of relative retail prices between urban United States and Canada was calculated on the basis of the spending habits of the modal group of Canadian urban families, as reflected in the weighting pattern of the Canadian Consumer Price Index. The weighting pattern used in deriving each of the

ice indexes was the pattern appropriate to the Canadian city con-
h case. Prices prevailing in both countries were compared on a
llar basis without adjustment of the exchange rate differential.

ally, in the context of plans for future developments of improved
measurements of comparative costliness within Canada, reference
e large-scale program of national family expenditure surveys
the Canadian paper on Problems in Measurement of Levels of Living
which are currently being processed. These surveys cover all
ding units, urban and rural, all income levels and family size
ddition to dollar values of expenditures, data on quantities
l be available for many items. This material will provide a data
in the development of standard or comparable budgets and the
ving cost relationships which can be derived from them, possibly
es of those developed by the United States Bureau of Labor Sta-
cent years.

MEASUREMENT OF COMPARATIVE COSTLINESS IN
CITIES OF DIFFERENT REGIONS AND COUNTRIES

INTRODUCTION

1. The consumer price index number indicates the change in the cost of a fixed basket of goods and services over time. The composition of the fixed basket of goods and services depends on the consumption pattern of the centre to which the index relates. The consumption pattern and level of prices at the base period being different for different centres, a mere comparison of the consumer price index numbers for different centres even with the same base period does not give any idea about the comparative costliness in these centres. There are several problems which require for their satisfactory solution, the working out of indices of comparative costliness. The most important one is the need to determine local allowances payable to employees posted at different cities and towns, which, it is generally recognised, should be related to the cost of living in the localities concerned. There are, however, several conceptual difficulties and different possible approaches to the compilation of the indices of comparative costliness.

Procedure for compilation of index of comparative costliness

2. As is well known, the following procedures are generally used for compilation of index of comparative costliness:-

- (i) 'Common standard' approach: For the estimation of comparative costliness it seems reasonable to prescribe a common standard and to arrive at a basket of goods and services taking into consideration the local needs and practices. The basket may be determined for a family of given size and composition enjoying a certain economic level of living. A comparison of standard baskets valued at local prices would indicate comparative costliness.
- (ii) Fisher's ideal index: This method is essentially a price comparison weighted according to the pattern of expenditure in two centres. Let p_{01} and q_{01} be the current price and base quantity of the articles consumed by an average family in centre 'A' and p_{11} and q_{11} be the corresponding prices and quantities for centre 'B'. Then the index of costliness of centre 'B' as compared to centre 'A' is given by

$$100 \times \sqrt{\frac{\sum P_{11} q_{01}}{\sum P_{01} q_{01}} \times \frac{\sum P_{11} q_{11}}{\sum P_{01} q_{11}}}$$

If this index is higher than 100, centre 'B' is costlier than centre 'A', and vice versa if it is less than 100.

Index of comparative costliness compiled in India

3. An attempt was made by the Labour Bureau in 1954 to compile index numbers of comparative costliness for the three major cities, viz., Bombay, Calcutta and Delhi (with Delhi as base) on the basis of price data collected for the working class consumer price indices and the average budgets of working class families used as weighting diagrams in the construction of these indices. Fisher's ideal index formula was utilised in the compilation of these index numbers. Subsequently, in 1957, attempts were made in the Central Statistical Organisation (CSO) to compile similar indices for a few major cities in relation to Delhi as well as for certain other centres with different centres adopted as bases. These studies were of exploratory nature. The calculation of index number of comparative costliness was, however, taken up on a systematic basis by the CSO in 1963 in view of continued pressure from the Ministry of Finance and as a sequel to the recommendation of the Second Pay Commission that index numbers of comparative costliness may be compiled in respect of various cities at regular intervals. The required compilations were done by the common standard method based on the middle class family living survey. The details of these compilations are given in a subsequent section. The Labour Bureau has also recently taken up compilation of index of comparative costliness for a few centres in relation to Delhi on the basis of weighting diagram thrown up by the family living surveys among industrial workers conducted in 1958-59 and the price data that are being collected regularly for the purpose of compilation of the consumer price index numbers for the individual centres. In the Labour Bureau's calculations, both the methods viz., common standard and Fisher's ideal index are being used. The Labour Bureau's study indicates that the indices obtained by the two methods are comparable if the cities under study have similar consumption patterns. When the consumption patterns are appreciably different, Fisher's ideal index is unsuitable, and common standard method appears to be the only answer.

4. The CSO conducted a family living survey relating to the middle class** in 45 cities/towns on an all India basis during 1958-59. The results of the survey are being utilised to compile centre-specific and all India consumer price index numbers for the middle class employees in the income group of Rs.100-750 per month. The data on expenditure collected during the survey provided the necessary basis for calculation of the index numbers of comparative costliness by the method of common standard. Utilising this method, the CSO has compiled annual index numbers of comparative costliness for all the 45 cities/towns covered during the survey mentioned above for the years 1960 and 1966, and for 15 Capital cities out of these 45 centres for the years 1961 to 1964, adopting Delhi as the base.

5. The common standard of living chosen for purposes of the index was represented by the minimum needs in the case of food and housing and the average level of living enjoyed by middle class families at Delhi as adjusted for local needs in the case of other items of expenditure. The costs were worked out in respect of a standard family of five members consisting of one adult male, one adult female and three children, together equivalent to 3.7 adult consumption units in terms of food requirements and belonging to the monthly family income range of Rs.100-750. The consumption patterns adopted were those observed in the middle class family living survey conducted in 1958-59. The estimates of the costs of standard basket, however, related to 1960 and onwards. In evaluating the cost for 1960, the price data for this year, as collected for compiling the middle class consumer price index, have been used in conjunction with the quantity figures for 1958-59 (adjusted to conform to the standard basket), wherever quantity figures were available. Where quantity figures were not available, the expenditures observed in 1958-59 were adjusted for price changes between 1958-59 and 1960 as per best available indicators (usually wholesale price index numbers) and raised or reduced as needed to bring them in line with the standard basket. In some cases, where no such evaluation was possible, the Delhi expenditure was adopted as the common standard. In a few other cases, where the costs of unevaluated expenditures were expected to bear a direct relationship to certain evaluated expenditures the usual

**For the purpose of this survey, a 'middle class family' was defined as a family which derived 50 per cent or more of its income during the reference month from the earnings of its members who were gainfully occupied as employees in non-manual work in non-agricultural sector. Primarily 'manual' jobs were defined as those involving mainly physical labour and 'non-manual' jobs as those involving mainly intellectual work. If a job, though essentially involving physical labour, required a certain level of general, professional, scientific or technical education, it was treated as non-manual. On the other hand, jobs not involving much of physical labour, but at the same time not requiring much of an educational background, were taken as manual.

methods of imputation were adopted. For arriving at the cost of the standard basket for subsequent years, i.e., 1961 and onwards the estimates for 1960 were simply multiplied by the ratio of price level in the concerned year to that of 1960 utilising the retail price data collected for compiling the middle class consumer price index numbers with base 1960 =100. For each centre, expenditures for broad common standard baskets of thirteen groups of items were obtained separately and compared with those of the base centre, i.e., Delhi for obtaining group index numbers, apart from comparing the overall expenditure for obtaining the overall index. The details of the methods adopted in respect of the different groups of items are given in the following paragraphs.

Food and beverages

6. The common standard adopted for food was the minimum daily requirement of 2400 calories per adult consumption unit prescribed by the Nutrition Advisory Committee(1944)*. The quantitative data on food consumption of middle class families as observed from the middle class family living survey was evaluated in terms of their calorific value using the calorific value of various food items as indicated in the food balance sheets of the FAO and the bulletins of the Nutrition Research Laboratory, Coonoor, India. The observed food basket for each centre was then reworked pro-rata to yield the total calories required by the standard family and evaluated at the average retail prices obtaining at the centre in the year considered. In the case of rice and wheat which are subject to wide quality variations, the medium varieties were selected for the calculation of average prices. In the other cases no such restriction on specifications was imposed. However, to ensure broad homogeneity in varieties priced, extreme quotations on either side were excluded and the computations of average prices were based on the middle two-thirds of the quotations only. Expenditure on non-alcoholic beverages and prepared meals and refreshments were imputed to the other directly evaluated sub-groups in the proportion observed at Delhi.

Tobacco and pan-supari@

7. The local expenditure as evaluated at local prices in the year considered on these two sub-groups at the various centres was adjusted to the quantitative level of consumption at Delhi by using a quantity deflator specially constructed for the purpose with Delhi prices as weights. No adjustment was made for family size.

*The Nutritional Value of Indian Foods and the Planning of Satisfactory Diets, Special Report Series No.42, Indian Council of Medical Research(1963)

@Betel leaf and areca nut.

Fuel and light

8. The average monthly consumption of electricity at Delhi, estimated from the observed average monthly expenditure on electricity by using the unit price of electricity at Delhi, was adopted as the common quantitative standard for all the centres and was evaluated at the local prices to arrive at the local costs of electricity.

9. As regards the other fuels such as coal, charcoal, firewood, kerosene and dung-cake, the quantities of consumption at the various centres were derived from the observed expenditures adjusted for price changes between 1958-59 and 1960 (as indicated by the relevant wholesale price indices) by using the local prices of 1960. The heat content of the quantitative levels of consumption were worked out in terms of the calorific values of the various fuels (as indicated in "Domestic Fuels in India" published by the National Council of Applied Economic Research). The mean temperatures (centigrade) of the various localities were ascertained from the India Weather Review published by the Indian Meteorological Department. The heat content (Q_D) of the fuels consumed by middle class families at Delhi was adopted as the standard for the mean temperature (T_D) of Delhi and the heat requirements of the various places were fixed in relation to the local temperature (T_C) by the formula

$$Q_D \times \frac{(100 - T_C)}{(100 - T_D)}$$

The observed fuel basket (excluding electricity) for each centre was then reworked pro-rata to yield the requisite calories and evaluated at the average retail prices obtaining at the centre in the year considered.

10. In regard to electric bulbs and match boxes, the expenditure observed at Delhi was adopted as the common standard for all centres on the assumption that the prices of these items are likely to be the same at all the places. No adjustment was made in this case for family size.

House rent

11. A house with two living rooms of a total floor space of 300 sq. ft., a kitchen, a bath room and a lavatory was taken as the common standard. The reported monthly rents of all two-roomed houses in the current house rent survey sample and the corresponding particulars of floor area of living rooms and availability of kitchen, bath rooms and lavatories were tabulated and the average observed rent was adjusted to conform

to the prescribed standard on the assumption that the availability of a kitchen, a bath room and a lavatory would push up the basic rent of two living rooms by 20 per cent, 10 per cent and 10 per cent respectively. The adjustment for floor space of the living rooms was made pro-rata.

Household requisites

12. This group was broken up into three components, viz., (i) furniture, (ii) household appliances, such as, utensils, and (iii) household durables, such as, bicycles and sewing machines. In all these cases, the Delhi level of consumption was taken as the standard. While in the case of components (i) and (ii), the observed Delhi expenditure was adjusted for price differences between Delhi and the centres concerned, in the case of component (iii) no such adjustment was made on the assumption that the prices of standard varieties of household durables such as bicycles and sewing machines were the same all over the country. The price indicator used for adjustment in the case of (i) was based on the reported prices of simple sitting chairs. The price indicator used for adjustment in the case of (ii) was based on comparable quotations such as metal containers per kg., leather containers per inch of length, ordinary glass tumblers, cups, etc.

Clothing and bedding

13. The observed family expenditure on clothing and bedding was split up into woollen and non-woollen goods and adjusted for (i) price changes between 1958-59 and 1960 (on the basis of relevant wholesale price indices) and (ii) equalisation of the family size. The adjusted expenditures on woollen clothing were taken as such. The adjusted expenditures on non-woollen clothing were further adjusted so as to reduce or raise the quantitative consumption to the requisite standard. The requisite standard for each centre was worked out by the formula -

$$Y_C = Y_D + K(W_D - W_C)$$

Where Y_D is the yardage of non-woollen clothing consumed at Delhi W_D and W_C are the yardages of woollen clothing consumed at Delhi, and the centre concerned, and K is a co-efficient indicating the yardage of non-woollen clothing saved per yard of woollen clothing used. The yardages of clothing consumed were worked out from the expenditure data by using standard price data (mostly of Delhi and converting the quantities of ready-made clothing and piece goods into yardage by means of standard norms). The coefficient K was determined approximately by comparing the consumption patterns of middle class families at Delhi and Chandigarh where the clothing standards were assumed to be about the same. Considering that Y_C and W_C in the

above notations relate to Chandigarh,

$$Y_D + KW_D = Y_C + KW_C$$

which gives $K = \frac{Y_D - Y_C}{W_C - W_D}$

In this manner K, the co-efficient, worked out to 4.75. The expenditure for the requisite standard for a year beyond 1960 was evaluated by adjusting for price changes between 1960 and year concerned on the basis of data collected for compiling middle class consumer price index numbers.

Footwear

14. The expenditure at Delhi, adjusted for family size, was adopted as the common standard on the assumption that the prices of standard varieties of footwear were the same at all places.

Education and reading

15. The reported data on school fees indicate that tuition at the primary school stage was free in most States. Data on fees at the middle school stage were not readily available. Data on fees at the high school stage were, therefore, used to estimate the education costs at various places. It has been assumed that of the three children in the standard family, one is at the high school stage, one is at the middle school and one is at the primary stage. The education costs were, therefore, estimated at one and a half times the high school fees plus the observed expenditure on school books. The total cost of the most popular English daily and the most popular local language daily was added as the local standard for reading.

Medical care

16. The observed expenditure on medical care, adjusted for changes in the prices of drugs between 1958-59 and the year considered and for equalisation of family size, was included as such in the local standard budgets.

Transport and communications

17. This sub-group was split up into three components, viz., (i) rail transport (ii) other transport and (iii) postal communications. In the case of (i) and (iii), the Delhi expenditures were adopted as the common standard. In regard to (ii), the average number of miles covered by all forms of road transport at Delhi was taken as the standard for Delhi. The standards for other centres were determined roughly in

proportion to the square root of the population of the centre on the assumption that the area of the centre was roughly proportional to its population. The local standards were then evaluated according to the local pattern at the local prices.

Recreation and entertainment

18. The average cost of two tickets of the middle stall for cinema shows was adopted as the common standard and one rupee was added for other entertainment.

Personal care and effects

19. The Delhi level and pattern of expenditure adjusted for family size was adopted as the common standard and evaluated at the various centres by the application of price differentials as indicated by a comparison of the prices of identical or equivalent varieties of priced items.

Services

20. This sub-group was split up into six components, viz., (i) tailoring, (ii) dry cleaning, (iii) other laundry, (iv) maintenance of footwear, (v) barber charges and (vi) domestic services. In the case of (i) and (ii) the local expenditures adjusted for family size was taken as the local standards. In regard to (iii) and (v) the Delhi expenditures adjusted for family size were adjusted further for price differences to arrive at the local expenditures. As regards (iv), the Delhi expenditure adjusted for family size was adopted as the common standard. Expenditure on domestic services at Delhi was adjusted by an indicator of service charges (which in the absence of data on rates charged by domestic servants was based on rates charged by barbers). No adjustment for family size was made in this case.

21. The common standard method is subject to limitations. Conversion of the common standard method in terms of the local pattern of living raises several difficult methodological problems which we have been able to resolve somewhat arbitrarily. Furthermore, as in the case of any spatial comparisons of prices, it is difficult to ensure comparability in the specifications of items priced at different centres.

Concluding remarks

22. Apart from the methodological difficulties listed earlier we are not sure whether the index of comparative costliness should be compiled separately for different socio-economic groups or it should be compiled for the population in general with or without any income limits. While the frequency for

compiling index numbers of comparative costliness cannot be uniformly laid down, arrangements for the collection of the needed price data and for the up-dating of the weighting diagram will have to be linked with the related centre-specific consumer price index numbers.

23. The concept of a common standard appears to be unrealistic in a vast country like India with great variations in climatic conditions and food habits. It might be convenient to use such a concept in regions having similar consumption patterns. A satisfactory solution is yet to be found to the problem of measuring the comparative costliness in the case of inter-regional/inter-country variations in consumption habits.

MEASUREMENT OF COMPARATIVE COSTLINESS IN
CITIES OF DIFFERENT REGIONS AND COUNTRIES

Introduction

1. This is one of the topics on which information is most sought after by government departments, business interests, agencies and the general public.
2. Provision of the required data would involve a great amount of time and effort and expense out of proportion to the benefits accruing and for this reason indirect, rather than direct, means are sought to provide a modicum of information of a general nature on the subject. However, this results in an unsatisfied demand and no ready means are generally available to give the desired integrated type of data so keenly sought after. With the accent on more and more regional information of an economic nature this lack of coverage is all the more to be regretted.

Internally

3. In New Zealand the Consumers' Price Index is the only widely-known and used indicator of movements in the levels of prices internally. With the exception of the Rent sub-group and the Transportation group the index weighting pattern for the Consumers' Price Index is uniform through all towns and the same regimen is used from Whangarei in the North to Invercargill in the South.
4. Two index series for each centre (or grouping of centres) and for all 25 centres combined, are produced. One series, referred to as the "each-on-each" series, measures for a centre the particular price changes which have occurred in that centre from the base period. It can be compared too, with the corresponding series for other centres to obtain comparative measures of price changes between the centres.
5. A second series, referred to as the "each-on-all" series, give direct measures for all periods of relative price levels in the different centres and groupings. However, they should not be interpreted as measures of relative costs of living in the different centres, since residence in each of these enforces some variations in the mode of living.
6. Even as measures of relative price levels some limitations on their usefulness should be recognised:
 - (a) Since the requirements for and availability of transport differ for the various centres it has not been possible to adopt a uniform regimen for this group, and an

identical total base expenditure for Transportation has been assumed for all centres, but variously distributed over the different modes of transport.

- (b) Since the availability of rented dwellings differs for the various centres a different regimen for rented dwellings has had to be used for each centre.
- (c) Some items of the regimen can be priced only in the largest centres, and these prices have to be imputed to other centres.

7. So far as can be ascertained the Department of Statistics appears to be unique among national statistical agencies in its regular publication of these measures of relative price levels for different centres, other countries with index numbers for more than one centre confining their regular compilations to "each-on-each" series, which merely show price movements over time in each centre. Publication only of "each-on-each" series would permit these countries to vary their specifications of priced items or even their regimens to suit the conditions in the different centres. In this country rigid adherence, so far as this is possible, to identical specifications for all centres is necessary to preserve the usefulness of these "each-on-all" series.

8. Other interested departments and organisations compile information for their own and general use e.g. Ministry of Works on the cost of building a standard state house in the four main centres, and the N.Z. Institute of Valuers on the cost per square foot of building a modal house in twenty-four cities and larger towns. The need is for an integrated range of data for more general usage and the planning and implementation of regular family expenditure and other surveys requires the allocation of sufficient resources to achieve this objective as part of the service of a central statistical office.

Externally

9. Various attempts have been made to compare price levels in Australia and New Zealand. Apart from privately published studies the only officially published material available is a recent study by the N.Z. Institute of Economic Research entitled "Australia-New Zealand Salary Equivalents". This paper also attempted a comparison of the cost of living in the two countries for different salary and wage ranges.

10. Intermittent ad hoc comparisons have also been made between Sydney and Wellington prices from time to time. The latest unpublished study used the N.Z. regimen of the Consumers' Price Index and the Australian cities regimen of their Consumers' Price Index as the basis of comparison between Sydney and Wellington prices respectively. The relationship between prices

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in each pair of countries can be assessed on the geometric mean of prices for items in the regimen of the opposite country. The pricing work needs to be meticulously accomplished because of the complexities caused by different brand names, qualities, packagings, etc. when attempting to price as nearly as possible, identical items in different countries.

11. The published retail price comparisons for international salary determination, made on the basis of U.N. Statistical Papers Series M No.14, give a uniform means of comparisons for various cities (New York City = 100) and this topic appears to be best left for treatment in this fashion rather than by the conduct of sophisticated surveys to get direct comparisons from country to country.

Summary

12. Consumers' or Retail Price Index data do not provide the required measurement of comparative costliness in various cities or regions within a country. The need for a Family Budget Survey in New Zealand has long been felt and would provide better weighting patterns for the Consumers' Price Index as well as yielding some useful relative information on comparative costliness, given sufficient coverage. Many problems need to be resolved in setting up such a survey and, in fact, a continuing series of surveys for internal comparisons.

13. Various ad hoc surveys in an attempt to compare price levels between Wellington, New Zealand and Sydney and London have not provided a good basis for international comparisons and have had to be regarded as rather tentative. The mounting of such surveys is not feasible within existing resources. Admittedly, the consumption patterns of expatriate personnel surveyed under the U.N. scheme to determine salary differentials (as opposed to the indigenous population) does not permit the indexes so computed to be taken as reflecting the relationship of general price levels between the various cities surveyed. However, the indexes do appear to give a useful general indicator where the means are not readily available for more sophisticated surveys.

Measurement of comparative costliness in cities of different regions and countries

Introduction

1. The Government of Tanzania has paid an increasing attention to the question of income and price policy, and in the Government Paper No. 4 of 1967, such a policy is outlined. High priority is to be given to the improvement of price statistics, and for this reason the Bureau of Statistics started in the beginning of 1968 to plan a system of price collection in all regional centres of Tanzania Mainland (plus the city of Lindi), a total of 18 cities.

After listing the retail shops in the different centres, the price quotations and purchases started on a small scale in June 1968. Since then the survey has gradually improved and developed. At the end of 1969 it was considered to have reached the scale aimed at, although necessary changes are continually being made to give as clear as possible a picture of the prevailing price situation.

The contents of the forms for price statistics

2. From the 1st of July, 1969, the following 9 forms are used:

Form 1: Central Market Purchases (29 items)

Form 1B: Fish Purchases at the Central Market in 3 cities (13 items)

Form 2: Price Quotations on Food Items (27)

Form 3: Price Quotations on Meat Items (8)

Form 4: Price Quotations on Personal Care and Health Items (20)

Form 5: Price Quotations on Clothing (20)

Form 6: Price Quotations on Housing and Household Goods (32)

Form 7: Price Quotations on Radios (14)

Form 8: Price Quotations on Miscellaneous Items (52)

The total items in this investigation are presently 215, all started in the month of February, 1969. Price collectors were given the option to replace missing items with those that are similar and commonly found in the area (for instance makes of radios and shirts). Also items quite different from those included in the forms could be added, if generally used. With this system, a quick follow-up of the changes in the commodity market was made possible.

The time schedule for price quotations and purchases

3. The first price collections concerning all regional centres took place in June, 1968 and have been carried out regularly from February, 1969. Since the price figures are going to be used, among other things, for the calculation of quarterly consumer price indices, it has been considered

suitable to collect prices of commodities and services at least once a quarter. However, the market purchases should be carried out every month due to the importance of the price changes, and take place before noon on the first Thursday, Friday and Saturday of each month. The reason for choosing this time is that it is then that people are usually in possession of cash and the retail price level is subsequently affected. Price collectors indicate on Form No.1 the dates the central market purchases were carried out and also how many dealers were used each day.

The sample of shops surveyed in price collections

4. The listed shops have been classified in 13 groups and 58 items arranged into a draft of a Retail Trade Directory. (Please note that three centres have missing areas). From this directory the samples (systematic samples) are drawn. The problem in this connection is the changes of commodities in the shops and the opening and closing down of shops. The price collectors are instructed to keep the Bureau of Statistics posted in this matter, but up to now this has not come out quite satisfactorily.

The recruiting of price collectors

5. The interest shown by the National Bank of Commerce in the establishment of price statistics made it possible for the Bureau of Statistics to recruit price collectors from various bank branches. One price collector was selected for each regional centre including Lindi, a non regional capital. In Dar es Salaam, on the other hand, the staff of the Bureau collects the prices. With a few exceptions, all price collectors are trained at a personal visit paid by our officer from the Bureau. Written detailed instructions are distributed with circular letters.

The collection of retail prices

6. The target is to be able to publish the new retail price figures within the month of collection of the data, and for this reason the complete forms are anticipated to be received from all regional centres by the 20th of each month. The purchases from central markets are carried out every month, while the other price quotations only once every quarter according to a special list.

From the Household Budget Survey 1968/69 it is possible to get comparable figures for 1969. The most important results from this survey are the comparisons between prices in the regional centre and outside the centre but within the region. These comparisons answer the question whether or not the price figures from a regional centre can represent the whole region.

The calculation of the consumer price indices

7. By comparing the different cities, it is possible to observe the relation between:

- a) the retail prices of each commodity
- b) the total expenditures and
- c) the consumer price indices

For the last two comparisons budgets for the families concerned (i.e. different income groups, urban groups on total Tanzania Mainland) are

to be available. In the absence of better information the intention is to use the Dar es Salaam budgets, perhaps split up in income groups. Since the Methodology Report concerning the calculation of the consumer price index is not yet published, no decision can be made on the system.

The weights (portions) from the Dar es Salaam budgets are multiplied by the different retail prices from the different centres. The different products for the same region and period are added together. The sums received are then compared with each other, and the centre with the highest sum is assumed to be the highest in costliness. From these sums the consumer price indices will also be computed.

Measurement of Comparative Costliness in cities
of different regions and countries

I. Introduction

1. This paper gives examples covering three areas in which the United Kingdom has been concerned with problems of measuring comparative costliness viz., (1) the determination of the higher costs of living in London compared with the rest of the United Kingdom (2) the compilation of inter-regional indices of prices for the economic planning regions of the United Kingdom and (3) the techniques of computing overseas allowances in the British Diplomatic Service. A brief account is also included of a United Nations project for international product and purchasing power comparisons in which the United Kingdom is collaborating.

II. The determination of London "weighting"
in Pay Scales

2. It is only in recent years that interest has developed in the measurement of differences in the cost of living or of the level of retail prices between different regions of the United Kingdom or between the large conurbations and other areas of the country. But many collective agreements about wage-rates of manual workers have for a long time included provisions requiring higher minimum rates for those working in certain areas, particularly in London. A number of large employers have also adopted the practice of paying higher rates for clerical and salaried staff working in London. All these arrangements however have taken into account not only differences in the cost of living conditions but also market conditions of the supply of labour. The most important example of an agreement providing for an area differential is the supplement given to non-industrial Civil Servants who work in London. The regional or area differentials in wage-rates collectively agreed were not based on any precise estimates of differences in the cost of living and until 1967 even the Civil Service "London Weighting" as it is called, was not based on any official indices of regional or area differences in the cost of living. It was generally recognized that in a small country like the United Kingdom with relatively homogeneous patterns of consumption and low internal transport costs, the higher cost of living in London was due mainly to two items viz. - housing costs and the costs of travel-to-work.

3. In 1967 there were some 265,000 office staffs and other non-industrial civil servants working in London and receiving additions to the national rates of pay in the form of London weighting. These amounts varied according to salary and also whether the staff worked in Inner London (a radius of 4 miles from Charing Cross) or Outer London (a radius of 16 miles from Charing Cross). These rates were due for review towards the end of 1966 and it was necessary to ensure that any proposals for increases were consistent with the provisions of the Prices and Incomes Act of 1966. The Government therefore referred to the National Board for

Prices and Incomes for examination the question of London Weighting in the non-industrial Civil Service. The Prices and Incomes Board presented a report (Report No. 44 Cmnd. 3436) in October 1967 which contained a careful statement of the principles and considerations which determine London weighting in the Civil Service and a recommendation of new differentials based mainly on a special survey of the extra travel and housing costs of Civil Servants working in London over those of their colleagues working in the Provinces. The Report also recommended a statistical procedure for adjusting these differentials every three years in accordance with movements of travel costs and of housing costs in London and the Provinces by means of special indices compiled by the Department of Employment and Productivity from the prices they collect for the compilation of the official Index of Retail Prices.

4. Although there were at the time serious shortages of staff, particularly in London and in some junior grades, the Prices and Incomes Board rejected labour supply difficulties and, by extension, comparison with other employers as a basis for determining London weighting and accepted as a sole basis for their considerations the additional cost of living in London.

5. The Prices and Incomes Board did not attempt to measure all the elements that make up the difference between the cost of living in London and elsewhere. The Board thought that travel to work and housing were the two most important items of expenditure making for higher costs of living in London and set out in some detail the methods they used to measure the extra costs of travel to work and of housing for these Civil Servants working in London. In view of its interest the part of the report setting out how the Board arrived at its estimates of these extra costs is reproduced in full in Appendix I.

III. The compilation of regional indices of retail prices

6. The development in recent years of regional economic planning and the publication and use of economic statistics for the standard regions of the United Kingdom have stimulated interest in the compilation of regional indices of retail prices or cost of living which could be used to measure the real value of inter-regional differences in incomes and earnings. The Cost of Living Advisory Committee was accordingly asked to consider the possibility of compiling inter-regional indices of prices and devoted a large part of their report (Cmnd. 3677 July 1968) to this subject. Section IV of this report is reproduced in Appendix II.

7. The Committee drew a careful distinction between inter-regional price indices and regional inter-temporal indices. The first are designed to compare the average levels of prices in different regions at a given point of time. The latter show changes over time in the average price level in each region. The Committee thought that the main need was for inter-regional price comparisons and that the compilation of such indices raised difficult problems of a conceptual nature as well as the practical difficulties of obtaining the statistical information needed which were additional to the problems encountered in compiling inter-temporal indices of the traditional kind. The Committee identified the most important problems that would have to be solved in compiling reliable inter-regional price indices including (a) the choice of the pattern of consumption or "basket of goods" on which the inter-regional comparisons

should be based, (b) the problem of allowing for differences of quality between the goods and services consumed in the various regions and (c) the problem of allowing for the cost of travel to work which varies considerably from region to region even where there is no difference in the price of transport in terms of pence per mile. The Committee decided that no decision could be taken on whether to compile regional price indices until these technical problems had been examined. A technical committee was accordingly set up with the task of reporting on the possibility of compiling reliable inter-regional indices. The Committee has not yet reported but is expected to do so shortly.

IV. The techniques of computing Overseas Service Allowances

8. The Diplomatic Service uses a system of calculating overseas allowances which is based broadly upon the Treasury Foreign Service Allowance system, modified to suit its particular needs. The guiding principle is to provide all officers serving overseas with the means to live at at least the same standard that they would have in the United Kingdom, taking account of salary, family needs and local conditions, and to provide additional allowances to cover the needs of those officers who have representational and entertainment commitments.

9. The basic allowance payable to officers of the Service, except the most senior, who have individually calculated allowances, is the Local Allowance. Local Allowance is calculated for staff at two salary levels approximately equivalent to Clerical Officer (Band V) and First Secretary (Band I). The Local Allowances for married and single officers of these Bands are arrived at by compiling budget totals covering all headings of expenditure, excluding those which are provided for by other means, (such as housing, children's education, medical expenses and children's travel to the post during holidays) and deducting from the result (after conversion of the currency figures into sterling), a "contribution" based on the mean of the appropriate salary grade less a deduction for Income Tax depending upon the officer's marital status and an element in respect of savings. The Band I and Band V allowances are used respectively as the maximum and minimum of the structure, and local allowances for intermediate grades are deducted by interpolation at three levels between them.

10. The local allowance budget consists of sections covering expenditure on utilities, servants, services (laundry, dry-cleaning, shoe repairs, hairdressing and watch repairs) household and toilet requisites, food, mess charges (where applicable) and downtown lunches, household equipment, clothing, recreation (cinema and theatre visits, club membership, sports and games, meals out etc.) transport, holidays, newspapers etc.). Items such as utilities, servants, etc. are calculated in local currency, and the standard provisions for clothing, car depreciation, the depreciation of household goods and other items normally bought in the United Kingdom, appear in sterling. In some posts abroad it is necessary to include provision for expenditure in a third currency where for example food is regularly imported from a non-sterling source.

11. The provisions of each section depend, in varying degree, on local custom, conditions and resources; for example, the difficulty of finding domestic servants in a particular country may be the governing factor in deciding how much should be provided in the budget for servants' wages rather than a hypothetical assessment of the number of hours of domestic help to which an officer may be entitled. Conversely, in countries where there is an abundance of domestic help, it may be reasonable to allow at least one full time servant as the minimum if this reflects actual local practice. Similarly, differences between the patterns of expenditure on electricity, gas, fuel oil and coal in different places will be due to the need for air-conditioning or central-heating and different means of cooking or heating the domestic water supply. These provisions are assessed on the spot in the process of inspections, but others are based on standards which apart from slight variations of detail, are universal. Such detail variations cover, for example, differences in diet and clothing requirements as between tropical, temperate and cold climates. These standards are laid down in London and are varied only by agreement between the official and staff sides.

12. Salary contributions are kept up to date in the light of increases in United Kingdom pay and are applied to overseas budgets when the latter are re-calculated during an inspection (inspections normally take place at three-yearly intervals). They may also be applied when allowances are revised as a result of changes in the cost of living or in the rate of exchange at the post. In order to ensure that due account may be taken of fluctuation of these two important factors, posts are required to submit at regular intervals details of any changes in prices of the "local currency" budget items and of the rate of exchange. The figures are inserted into a "variability formula" which is expressed as follows:-

$$\frac{\text{(Current cost of living figure)}}{\text{Base-date cost of living figure}} \times 100 \times \frac{\text{Base-date Rate of exchange}}{\text{Current Rate of Exchange}} - 100$$

This formula produces a figure for the percentage change in the cost of living in terms of currency since the allowances were last calculated. In the event of a sudden fluctuation of more than ten per cent, a correction is applied to allowances with effect from the first of the month following that in which the ten per cent figure is reached. For more normal, i.e. slower, increases, a variation of seven and a half per cent or more must be held for more than four months, when allowances are varied with effect from the middle point of the period concerned. When allowances are varied on this formula, the last day of the month before the revised allowances come into effect becomes the new base data, and the new prices and rate of exchange become the base for future calculations. Changes in the standard sterling provisions of allowances are made at the same time, based on movements of the United Kingdom General Index of Retail Prices.

13. Officers who have representational functions are provided with a further allowance to take account of their extra expenditure on servants, utilities, clothing, transport etc.; attributable to these functions. These officers always have diplomatic rank and are involved in the entertainment of their official contacts as part of their duties.

Additionally, they receive entertainment allowances which are calculated with regard to their grades, appointments, and entertainment commitments and are based on their extra expenditure on food and drink and other items which can be attributed directly to such commitments.

V. Methods for international product and purchasing power comparisons

UN International Comparison Project

14. A new and wide comparison of prices in different countries is being sponsored by the United Nations, supported initially by the Ford Foundation, and carried out under the direction of Professor Kravi at the University of Pennsylvania. This project aims to provide the purchasing power comparisons needed for country to country comparisons of national product, income and expenditure. Precedents exist for making purchasing power comparisons between relatively homogeneous groups of countries such as the OECD countries and Latin American countries, but this project aims to make comparisons between countries heterogeneous with respect to their geographical location and stage of development as well as their economic and social systems. In the initial stages of the work, scheduled to last through 1971, the initial set of comparisons will relate to the following countries: Colombia, Hungary, India, Japan, Kenya, Poland, United Kingdom and United States. In addition, the European Economic Community will be co-ordinating its work with the project and the co-operation of the Economic Commission for Africa may make it possible to add a North African and a West African country.

15. The method of approach is to make comparisons in terms of the expenditure on gross domestic product and its subdivisions (consumption, capital formation, etc.) rather than in terms of the production aspect of gross domestic product because the statistical difficulties are less great. Expenditure has been subdivided into some 160 'multilateral' categories, to be used in all comparisons, following closely the classification of the United Nations System of National Accounts. In drawing up this classification an attempt has been made to draw the line of division between 'consumption' and 'government' in a uniform way for all countries by, for example, including in consumption all expenditure on health services by households and by government other than that for general administration and regulation in government departments. The study will thus provide comparisons of the purchasing power of currencies in terms of final product at market prices and not, without further analysis, comparisons of the purchasing power of currencies in terms of household expenditure or expenditure by one group of transactors. Within the list of multilateral categories, expenditure on stockbuilding will probably be treated as one item and the average purchasing power ratios derived from the other categories will probably be applied to stockbuilding regardless of composition, instead of combining ratios appropriate to each commodity included in stockbuilding. Similarly, the formidable task of making price comparisons for exports and imports will be avoided by assuming that the prevailing exchange rates adequately relate the prices of one country's net exports to the prices of those of other countries.

16. For each of the other multilateral expenditure categories a number of representative goods will be selected for which price and quantity information can be made available. The most important goods, in expenditure terms, will be selected, subject to the condition that each good also be important or at least common in the partner country and the price relatives are typical of the price relations between the two countries for the category. If a specification that satisfies this criterion in both countries at once cannot be found, two specifications should be selected, one meeting the criterion in each country. It will be necessary to find in common not only general types of goods, such as a man's shirt, but also identical or equivalent specifications so that country to country comparisons are made for goods of equal quality. But comparability may sometimes be established on the basis of physical identity. Since the aim will be to compare the average prices of the products, the specification should not be identical with respect to the size of package. But the comparison should reflect the prices paid in all regions of each country and existing data on inter-regional price variations within each country will be used to adjust observed prices to national averages. The number of representative goods selected for a given multilateral category may vary from one for relatively homogeneous categories such as butter, to a large number of heterogeneous categories such as passenger cars. Where more than one representative item is selected some form of averaging of the price ratios has to be decided upon and a simple unweighted geometric mean will be used if the dispersion is not large. If the dispersion is large, then the price relatives will be weighted by each country's expenditure weights and the geometric average of these two weighted ratios will be used. Should there be a case of unique goods, when there is no expenditure on any goods within a multilateral category in one country, the omitted category will probably be assigned the price ratio observed for the multilateral category thought to be representative of it.

17. As well as using specification pricing, the traditional technique for getting the raw data for price indices, regression techniques, will be used for products for which price variation in each country is largely explained by a few continuous variables usually related to size or capacity. Once these key variables have been identified and their empirical relation to price determined, prices in different countries can be readily compared. Regression methods, where they can be used are superior to the traditional method because they are more systematic and because they can take account of all the models in the market. For the United Kingdom/United States comparison their use is being investigated for certain producer and consumer durables.

18. For most multilateral categories the selection of the representative goods will be made with the objective of arriving at a price or purchasing power comparison and the quantity comparison will be derived by dividing the purchasing power ratio into the expenditure ratio. Where a quantity comparison is also available it will be used as a check on the price comparison by their joint consistency with the expenditure comparison but, in the absence of other evidence, the price comparison will be retained since price ratios are subject to smaller dispersion and smaller sampling errors than quantity ratios. The aggregation of the price comparisons for the multilateral categories will be accomplished in each binary comparison using both countries' expenditure weights in turn and their geometric mean will also be computed.

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to publish comparisons in terms of the last year for
available at the time the project is drawing to its close.
analysis has to be carried out mainly in terms of an earlier
and 1957 has generally been taken for this purpose.

APPENDIX IExtract from Report No. 44 of the National
Board for Prices and IncomesLONDON WEIGHTING IN THE NON- INDUSTRIAL CIVIL SERVICETHE EFFECTS OF APPLYING THE COST-OF-LIVING
PRINCIPLE

1. The Ministry of Labour has told us that travel and housing are responsible for the most important differences in the cost of living between London and the rest of the country. Food is no more expensive in London than elsewhere. (1) Fuel and power prices vary regionally. Coal and electricity prices are generally higher in London than in other regions, but this is not true of gas and fuel oil. (2) Car insurance rates and repair costs are higher in London, and services in general are probably more expensive in London if only because of the higher wages paid there. On the other hand, the wider market in London compared with the generally smaller local markets outside London may result in the price of many consumer goods being on the whole lower in London. Some civil servants working in London live outside the London conurbation but the foregoing is generally true of the surroundings of London as well as the built-up area. Possibly, on balance, the cost of living, aside from travel and housing, is rather higher in London and its surroundings than elsewhere, but this cannot be established conclusively and we do not take account of it.

2. There are no statistics available from which the differences for civil servants in travel and housing costs between London and the rest of the country can be properly measured. We therefore thought it necessary to conduct a survey of travel and housing expenditure among civil servants, although we recognised from the outset that such a survey had its limitations so far as housing was concerned, in that it would merely show the present pattern of expenditure by civil servants on housing and not necessarily the real pattern of expensiveness of houses. (3) To deal first with transport compared with less than half of those working in Outer London and in the rest of the country. Most of those who do not use public transport travel to work by car or motor-cycle. We do not know to what extent civil servants use their own transport for travel to work simply as a matter of personal convenience, and to what extent an element of necessity enters into their choice. Probably, those who have no real alternative to using their own transport are in a small minority. For those who travel to work by private

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- (1) Annual reports of the National Food Survey Committee.
 (2) Table 4 of the Ministry of Power Statistical Digest for 1966.
 (3) The survey was also limited in that it extended only to permanent officials. This was because there exists no central register of temporary staff from which a sample could be drawn. We see no fundamental reason, however, why, grade for grade, the experience of permanent staff should not be regarded as representative of the experience of all staff - permanent and temporary.

transport we have made alternative calculations of the cost - one using a rate of 3½d. a mile - the current rate allowed in the Government Service for cars used on official business where public transport is available as an alternative - and the other using a rate of 2.6d a mile which was the actual average cost of travel by public transport as revealed by our survey.

3. Average travel expenditure in Inner London, Outer London and Great Britain outside London at different salary levels is shown in APPENDIX D. Two sets of figures, on the alternative bases for costing journeys by private transport, are given. The differences in travel expenditure between London and the rest of the country are much the same, whichever basis is taken. Granted this and granted the fact that travel by private transport is a matter of choice rather than necessity, we have costed private transport at the public transport rate (2.6d per mile). On this basis the average difference (1) in cost between Inner London and the provinces is £38.4 per annum and between Outer London and the provinces £6.7 per annum. At all salary levels the difference between Outer London and the provinces is very small. The differences between Inner London and the provinces range from £19.7 to £51.3 per annum and they tend to increase with salary.

4. We turn now to housing expenditure. It is here that the divergence between expenditure and expensiveness is critical. So far as transport costs are concerned our survey measured differences in expenditure at current price levels. In assessing the differences in housing costs it would seem desirable also to have regard to current prices. A London weighting computed in this way would more accurately reflect the differences in actual real costs which must play an important part in a civil servant's decision whether to move to London or not.

5. However, so far as civil servants already living in London are concerned and who are owner-occupiers, the average expenditure measured by our survey shows only the pattern of costs determined by the dates of purchase of houses over two or more decades, and these are much lower than current costs. We would not think it right to compute a present-day cost-of-living differential allowance based on costs related to house prices of a decade or more ago. To do so would be inequitable to those buying a house for the first time today. We have thought it right, therefore, to assess the housing element of the London weighting in terms of house prices falling roughly mid-way between the prices originally paid by owner-occupiers and present-day prices. We set out below the costs of housing as revealed by the survey followed by a reassessment of the same costs at current house prices.

6. We have to take into account rented accommodation as well as accommodation which is owner-occupied. In doing so, we have to recognise that one quarter of civil servants have no direct responsibility for housing costs even as the tenants of furnished or unfurnished accommodation because they are married women or single persons living with their parents. Figures of average housing costs may be calculated by leaving this quarter out of the reckoning or by including them on the basis that their costs are nil. Their inclusion would be consistent with the fact that London weighting is paid to all civil servants without discrimination - and we accept that discrimination

(1) In calculating the average we have weighted the difference for each salary range with the number of civil servants working in Inner London or Outer London (as the case may be) in that salary range.

would be administratively impracticable. We have, therefore, decided to include all civil servants, even though some of them may not be paying for their accommodation. The objection may be made that those without direct responsibility for housing costs may be making a contribution to the member of the household who has the responsibility, and that it is, therefore, unfair to assess their housing costs as nil. On the other hand, we have included the housing costs of householders in full despite the fact that many of them receive contributions from other members of the family. On balance, therefore, the two factors tend to cancel each other out. About three per cent. of civil servants live in lodgings and hostels. We have not attempted to assess the rent element in their outgoings and have, in effect, assumed that they have the same average housing costs as other civil servants.

7. The average housing costs of those with direct responsibility for such costs (whether in rented or owned accommodation) and of all civil servants are given in APPENDIX E. As far as owner-occupied houses are concerned, these figures are based on the price originally paid. The housing costs of those who work in Inner London rise with salary but they rise more sharply in relation to salary in Great Britain outside London. Thus the differences between Inner London and Great Britain outside London tend to get less as salary increases. This is not true of the differences between Outer London and the provinces. In this case there is no clear tendency, one way or the other. One reason for the tendency for housing costs to rise more steeply according to salary outside London than in Inner London appears to be that, among the highest-pay group (£3,001 and over), a relatively low proportion of owner-occupiers in Inner London have bought their houses in recent years, when prices were highest, compared with other pay groups and with the same pay group in the provinces (see APPENDIX F). Perhaps this is because this group changed its place of work less frequently, because the group was on average older than other groups, or because the high price of the type of accommodation occupied by this group inhibited movement.

8. The average difference⁽¹⁾ in housing costs between Inner London and the provinces on the basis of the costs of the housing and rented accommodation of all civil servants, including those without direct responsibility for housing costs, and taking into account house prices originally paid, is £46.6. The corresponding figure for Outer London is £44.3.

9. We have indicated, however, that some account must be taken of the increase which has taken place in the price of houses. Our survey provided information about the housing costs of owner-occupiers who bought their houses from 1960 onwards. We increased these costs by 25 per cent to bring them more into line with present-day values. We then substituted these present-day costs for the costs incurred by all owner-occupiers. The results, and a detailed account of the method of recalculating the original figures on this basis, are given in APPENDIX G. Compared with the average differences between Inner London and the provinces of £46.6 and between Outer London and the provinces of £44.3, when the prices at which the houses were originally bought were taken into account, the recalculated figures show average differences of £64.9 and £57.2.

(1) See note (1) to paragraph 3.

10. Adding housing costs on both bases - i. e. both on the basis of the price originally paid and of the up-graded price to take account of the increase in house values - to the difference in travel costs, we obtain the following alternative sets of figures:

TABLE I

Additional annual costs of travel and housing of civil servants working in Inner and Outer London compared with the rest of Great Britain, contrasted with London weighting by salary band

National salary	Inner London			Outer London		
	Additional travel and housing costs compared with Great Britain outside London		Present London weighting	Additional travel and housing costs compared with Great Britain outside London		Present London weighting
	using original or actual costs of owned houses	using up-dated costs of owned houses		using original or actual costs of owned houses	using up-dated costs of owned houses	
	£	£	£	£	£	£
Post Office departmental grades						
Up to £500 ...)			60			30
£501 - £750 ...)	75	86	65	65	69	40
£751 - £1,000 ...)	104	110	70	38	39	45
Other civil servants						
Up to £500 ...)			60			30
£501 - £750 ...)	91	91	65	57	70	40
£751 - £1,000 ...)	90	88	70	30	35	45
£1,001 - £1,250 ...)	88	100	75	47	64	50
£1,251 - £1,500 ...)	88	100	75	47	64	55
£1,501 - £3,000 ...)	75	113	85	55	86	65
£3,001 and over ...)	75	170		(1)	(1)	
Weighted averages ..	85	103	-	51	64	-

Sources: N. B. P. I. enquiry and Treasury

(1) The numbers in the sample in Outer London are small and the averages are not significant.

11. Neither alternative taken by itself provides a wholly satisfactory basis for calculating the appropriate rate of London weighting, since there are other factors that ought to be considered.

12. The first is that some of the largest differences in travel and housing costs between London and the provinces are at the lowest salary levels. Thus, on the basis of the actual costs of owned houses, the difference in travel and housing costs between Inner London and the provinces was £104 for Post Office departmental grades in the salary range £751 - £1,000 compared with an average difference of £85 for all civil servants; and the difference between Outer London and the provinces was £65 for Post Office departmental grades on salaries up to £750 compared with an average difference of £51 for all civil servants (see Table 1). It is at the lowest levels of salary that the need for compensation is greatest. On grounds of equity the rates of London weighting should be at least sufficient to cover in full the additional expenses of the lowest paid.

13. Secondly, it appears that civil servants in London occupy a lower quality of accommodation than their colleagues elsewhere. The reason for this is presumably that civil servants living in London, faced with the high price of houses there, choose to live in accommodation of a lower standard than they would choose if they were in the provinces. Figures provided by the Ministry of Housing and Local Government show that the prices of houses of comparable age and type are mostly between 40 per cent. and 80 per cent. higher in Greater London than in the provinces, with a median difference of about 65 per cent. If the area is extended to cover a radius of about 20 miles from Central London the difference falls to about 60 per cent. An estimate derived from our enquiry of the value at current prices of civil servants' houses shows an average difference in values between the houses of those working in Inner London and those in the provinces of only about 45 per cent. This suggests that the difference in standards of civil servants' housing between London and the provinces may be substantial - of the order of 15 per cent. of the provincial price. If allowance were made for this difference on the assumption that civil servants in London had the same standard of housing as civil servants in the provinces, the average original (or actual) costs quoted in Table 1 would be increased by some £20 for Inner London and some £10 to £15 for Outer London.

14. The third consideration is that of travelling time. According to our survey, the average time spent on travel to work in Inner London is 51 minutes per journey, compared with 27 minutes in Outer London and 21 minutes in the rest of the country (see APPENDIX H). Civil servants working in Inner London, therefore, spend 5 hours a week more than civil servants outside London in travelling to and from work. Their standard working week is, however, one hour less than that elsewhere. On average, their job thus requires four hours a week more of their time than that of civil servants in the provinces. This is a clear disadvantage of working in Inner London and is an aspect of the high cost of housing in Inner London. Any attempt to translate it into money terms is difficult and must, in some degree, be arbitrary. Nevertheless, we are satisfied that some allowance should be made in the rates of London weighting for additional travelling time.

15. Fourthly, since the object of the exercise is to give roughly comparable real pay for comparable work, some allowance should be made for the fact that the London weighting is subject to income tax. We do not think that this allowance need be more than marginal. One reason is that the interest on mortgage loans, which is one element in housing costs, is already the subject of tax remission. Nor does the fact that we are allowing marginally for tax infer that taxation should be taken into account generally when pay claims are made. We are here concerned, not with adjusting pay upwards,

but with equating real pay for comparable work in a single service covering the entire country.

16. Finally, it is argued that London has more to offer than the provinces in the spheres of culture, entertainment and education and that this should be taken into account in computing the London weighting. On the other hand, the price of leisure activities is higher in London and there are also advantages, such as easier access to the countryside and avoidance of crowds, in living outside London. Any judgment as to where, on grounds of amenity, the balance of advantage lies as between London and the provinces must be largely subjective and, for our present purpose, we have assumed that the balance is even.

17. To sum up: we have alternative calculations of the differences in travel and housing costs between London and the provinces. The first is £85 for Inner London and £51 for Outer London reckoning, for the purpose of housing costs, on the basis of the original prices paid for houses. The second is £103 for Inner London and £64 for Outer London calculated, for the purpose of housing costs, on the basis of more up-to-date housing values. Looking no further than these figures we would say that the true cost lies roughly mid-way between the two. But we would also give weight to the fact that some of the greatest differences are at the lowest salary levels; that civil servants in London live in accommodation of lower standard than civil servants in comparable grades in the provinces - equivalent to differences of some £20 for Inner London and some £10 to £15 for Outer London; that, so far as Inner London is concerned, some allowance should be made for the extra time spent in travel to and from work compared with the provinces; and finally that some marginal allowance must be made for the fact that the London weighting is taxed. Taking all these factors into account, we suggest that the appropriate rate of London weighting for Inner London is £125; and for Outer London £75.

18. We have developed the argument largely in terms of averages and reached conclusions as to the appropriate rates in terms of averages. It remains to consider whether the rates should be the same at all salary levels, i.e. flat rates, or whether they should be graduated - either to rise (as at present) or to fall with salary. The differences in travel and housing costs between London and the provinces quoted in Table 1 tend, on the whole, to fall with salary on the actual cost basis but to rise with salary on the current price basis. Taking all the factors together we think it reasonable to suggest that in both Inner and Outer London flat rates of London weighting would be appropriate, while recognising that the effect of taxation and the incidence of travel time (see APPENDIX H) are greater, the higher the pay group to which the individual belongs.

APPENDIX IIExtract from Report of the Cost of Living Advisory CommitteeCmnd 3677 July 1968RETAIL PRICES INDICES FOR REGIONS

1. We turn now to consider the desirability of publishing retail prices indices for special social and income groups and for regions. Although some of the problems of compiling indices for these different classes or groups of households are similar, the construction of regional indices raises difficult problems of a conceptual nature. In this section of our report we deal with regional indices.
2. In considering the question of regional price indices, it is important at the outset to distinguish between two quite distinct types of index. The first type would be designed to show the changes over time of the prices in each region; in other words, to provide for each region an index like that which is at present compiled for the country as a whole. This would simply show the extent to which prices have changed since some base date: it would make inter-temporal comparisons, but would not show how the prices in one region compare with the prices in another region at the same point of time. The second type of index, designed to make this comparison between the cost of living in different regions at a given point of time, we may describe as an inter-regional index.
3. The possibility of compiling inter-temporal indices was considered by the Cost of Living Advisory Committee in 1951, but was rejected on the grounds that they would not provide an inter-regional comparison. The relevant passage from the Committee's Interim Report was as follows:-

"Perhaps it is thought that a separate index for rural areas would show that the cost of living in those areas is less than in urban areas and the great cities. In fact, however, separate regional indices having the same characteristics as the index of retail prices would not provide the information required for these comparisons. The present index of retail prices is designed only to measure the changes in prices over a period of time. The existing index compares the level of prices today with that in June 1947. If similar indices were prepared for different areas they would not show whether the cost of living or the average level of prices in one area was higher than in another area. They would only show whether prices in one area were rising or falling more rapidly than prices in another area. We think that the publication of such separate indices might give rise to considerable confusion. For example, it would be possible for the level of rents in the London area to be rising less rapidly than the level in other parts of the country while at the same time the average payments for rent in the London area remained considerably higher than the corresponding charges for rents in other areas. As a result of circumstances such as these it might very well happen that

the index figure for London at any given moment might be lower than for other areas while the average level of prices or cost of living in London was known to be much higher than in other areas."

4. Since that time, there has been a growing interest in regional questions and the demand for regional price comparisons has increased. In its Fourth Report of the Session 1966-67, on the Government Statistical Services, the Estimates Committee said:-

"... The index of retail prices would be made more useful if it were supplemented by periodical indications of changes in the cost of living for particular groups of households and for regions. Your Committee are aware that the Cost of Living Advisory Committee in 1951 were unanimous in recommending that only one retail price index should be published. Since then, however, the annual Family Expenditure Survey has made detailed examination of expenditure by special groupings a regular practice. Your Committee recommend that the Advisory Committee on the Cost of Living be asked to re-examine the desirability of publishing retail price indices for special social and income groups and by regions."

5. The Estimates Committee did not distinguish between inter-temporal and inter-regional comparisons, nor did it give any specific reasons in support of its recommendation, but it is reasonably clear from the context of their discussions that they were concerned with the subject of regional planning. Those of our members who are concerned with this subject are satisfied that the demand is a real one, and that the prime need is for inter-regional comparisons, though inter-temporal changes in these comparisons would also have relevance. Statistics showing regional differences in family incomes, earnings, or incomes assessed to tax do not, for example, reliably indicate differences in levels of prosperity unless allowances can also be made for inter-regional price differences. It is possible that regions with high incomes may nevertheless, because of price differences, be less well off in real terms than other regions where incomes are lower. There has been a particular interest in separate indices for Scotland, Wales and Northern Ireland.

6. We observe also that the National Board for Prices and Incomes have recently recommended in their 44th report that the "London Weighting" for Civil Servants should be based on a comparison between the cost of living in London and the rest of the country. More generally, many people changing jobs are often faced with a choice of where to go and information about regional variations in prices, to supplement the information about earnings, would be of assistance to them.

7. It has been suggested to us that publication of detailed inter-regional comparisons might lead to proposals that national insurance and other benefits and various fees, charges and grants which are at present fixed on a national basis should be made subject to regional variation. Changes of this kind would, however, present great administrative and other problems. It has also been suggested that it might complicate national wage negotiations and even have an inflationary effect. Furthermore, it might lead to movement away from the present pattern of having national minimum wage rates and to pressure for a return to regional rates. On the other hand, such

information might assist those concerned in national negotiations to have a fuller appreciation of their impact on different parts of the country. We are not in a position to assess the relevance of the Government's productivity, prices and incomes policy to these considerations.

Technical considerations

8. The usefulness of inter-regional comparisons depends on whether inter-regional price differences can be reliably measured. Our discussions have however revealed a number of technical points which will need to be investigated before the nature of the indices which might be constructed and their reliability can be determined. The most important of these points are:-

- (a) The choice of the pattern of consumption or "basket of goods" on which the inter-regional comparisons should be based.
- (b) The problem of allowing for differences of quality between the goods and services consumed in the various regions. This is particularly important in the case of housing.
- (c) The problem of allowing for the cost of travelling to work, which varies considerably from region to region even where there is no difference in the price of transport in terms of pence per mile. Associated with this is the imputed cost of time spent in travelling.
- (d) The choice of regions for which the inter-regional comparisons should be made e. g. planning regions (or groups of planning regions) on the one hand, or conurbations, urban areas and rural areas on the other.
- (e) The margin of error which should be regarded as tolerable in inter-regional comparisons.
- (f) The frequency with which inter-regional comparisons should be made.

There are several ways of dealing with these problems and some of the choices are difficult. We therefore regard it as important that, before any attempt is made to publish official inter-regional comparisons, a thorough study should be made to try out the various methods and evaluate them. In the following paragraphs we have endeavoured to indicate the points which, in our view, require particular attention, and to give our views on those questions on which the Departments undertaking the study will require guidance.

The choice of the "basket of goods"

9. One method of comparing the cost of living in two regions, A and B, would be to take the average "basket" of purchases made by households in region A and then to value this basket, firstly at the prices in region A, and secondly at the prices in region B. The ratio between these two valuations of the "basket" would give a measure of the relative cost of living in the two regions for a person whose pattern of consumption is similar to that in region A.

10. This is not the only method of comparison, because one could also make a similar calculation based on the average "basket" of purchases made by households in region B. In general this will give a different answer, because the average basket in region B will be different from the average basket in region A. This is not because one answer is right and the other wrong, but because they are answers to two different questions. The apparent increase in the cost of living for a person who moves from Northern Region to London, and tries to buy in London the things he used to buy in the North, will not necessarily be the same as the apparent fall in the cost of living for a Londoner who moves to the North, and tries to buy there the things he used to buy in London. There is no unique answer to the question "how much more does it cost to live in London than to live in the North."

11. In principle one could apply both methods of comparison to each pair of regions, so that if there were (say) 10 regions there would be 90 published comparisons. This would be highly confusing and we would not recommend this approach. In our view the practical course lies between either,

- (a) valuing the average national basket of purchases at a national prices and at the prices prevailing in each region; or
- (b) valuing each regional basket at the prices prevailing in the region, and also at national prices.

The choice between these two courses is not obvious. Course (a) might seem to be the simpler course, but would not reflect the differences in the purchasing habits of different regions as course (b), using regional baskets, would do. The make-up of a regional basket will depend on a number of different factors. Northern regions may have a higher weight for fuel and possibly for warm clothing. The composition of the household - and especially the number of children - varies appreciably between one region and another. Variations in taste for different foods and in average incomes will affect the whole spread of purchases.

12. The technical problems which require further study in considering the respective reliability and meaningfulness of the two courses are:-

- (i) How on alternative (a) to treat items which appear in the national basket but have no quoted price in a particular region.

Apart from the crucial case of housing, which is considered below, there are other examples such as town gas, which is not available to many consumers in Northern Ireland and in North Scotland. In such cases it will be necessary to agree on a "substitute item".

- (ii) Whether on alternative (b) the average basket can be determined with sufficient accuracy to apply that method in small regions.
- (iii) Whether on either alternative the regional variations in prices can be determined with sufficient accuracy without an unreasonable expansion of the present system, which already involves the collection of some 120,000 prices per month for

the national index alone. It may be found on detailed study that many items have such similar prices in different regions that there is no need for further collection except at fairly long intervals.

Housing

13. Comparing the cost of housing in different regions presents a major problem because of the wide differences in the quality and composition of housing. One method of comparison might be to establish regional samples of housing specified closely not only by number of rooms and availability of services, but also perhaps by age. A study of the practicability of doing so needs to cover not only local authority dwellings but also both rented and owner-occupied flats and houses in the private sector. One of our members, Professor A. J. Brown, has estimated from housing expenditure per room, food prices, and daily travel costs, derived from the Family Expenditure Survey, and Labour Census of Population, Household Food Expenditure Survey, and Labour Mobility Survey, that variations in housing costs may account for about three-quarters of the variation in the costs of living between regions. Unless therefore a satisfactory method can be devised which will take the quality differences into account, inter-regional comparisons could be seriously misleading.

Travel

14. One question for consideration is whether the cost of daily travel to work should be regarded in the same way as rent on housing. The argument is that because people in, e.g., the South East often live far away from their place of work and the price of housing therefore is less, in effect the additional amount spent on transport is a substitute for rent. It is true that some commuters may choose to live far away from work because they prefer to live in the country, but the physical impossibility of housing them all near where they work must account for the great bulk of the money spent in travelling. We therefore consider that the inclusion of travel-to-work costs with rent costs would provide a more realistic inter-regional comparison than would its exclusion.

15. It has also been suggested that it might be appropriate to treat in the same way the imputed cost of the time spent in travelling, which could otherwise have been spent in leisure or in earning more. We note that the National Board for Prices and Incomes have recommended that allowance should be made for this (Report No. 44, paragraph 36). However, the retail prices index is designed to measure movements in actual expenditure and we do not favour the inclusion in either the national or in regional indices of a national assessment of the value of travelling time.

Choice of regions

16. There appear to be two distinct interests in regional comparisons. Regional planners are, understandably, interested in differences between the standard planning regions looked at as a whole. In addition, it is reasonable to suppose that the most important cost differences fall not between the planning regions as such, but rather between conurbations, and other areas. It would be right to study whether any difficulties would arise in making comparisons on both bases. The possibility of grouping the planning regions should not be excluded, if their separate treatment would be unduly expensive.

Margin of error and frequency

17. The present retail prices index is published each month to the nearest 0.1 per cent. In order to compile this, about 120,000 price quotations are collected each month, together with data on rents, and the weights are based on a three-year average of the Family Expenditure Survey. The cost of collecting the price quotations and rents is about £45,000 per annum, and the cost of collecting the data for the Family Expenditure Survey is about £135,000 per annum. In addition there are processing costs.

18. To compile an index for each of 10 regions on exactly the same basis and with exactly the same frequency and accuracy as the national index would cost several times as much. We do not consider such an increase in expenditure would be justified, and in our view both a lower precision and a reduced frequency must be accepted for inter-regional comparisons. As regards frequency, we suggest that it should be sufficient to publish the comparisons once a year, based on the annual averages of the price quotations, most of which are already collected on a regional basis. Even then it will be necessary to collect more quotations than at present for many items. The question of accuracy is more difficult, but we consider that inter-regional comparisons should be regarded as acceptable provided that the sampling error in the total value of a "basket" in a particular region, due to the use of a limited number of price quotations, is unlikely to exceed one per cent (i. e. if the standard error is less than 0.5 per cent).

Conclusion

19. Whether the need for information enabling comparisons to be made between levels of retail prices in different regions or areas can be met adequately at reasonable expense requires a detailed study of the technical problems involved. These technical problems include, in particular, the choice of the basket of goods (paragraphs 30-33), the treatment of housing (paragraph 34) and the most appropriate grouping of geographical areas (paragraph 29(d)). The study of these complex problems is a major task which is bound to take some considerable time. We recommend that the Department of Employment and Productivity should accept responsibility for initiating it as soon as possible, in consultation with other Government Departments concerned. We should in due course wish to consider the results of this study.