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ISSUES ARISING FROM NEW SHORT TERM AND STRUCTURAL INQUIRIES IN IRELAND

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SESSION 6   SHORT TERM INDICATORS

Abstract

Following the 1988 Census of Services the CSO initiated a programme to update statistics on the services sectors on an annual basis. This initially involved annual surveys of the major Retail and Wholesale sectors with most of the remaining sectors being surveyed in rotation over a three year period. In recent years, the sectoral coverage is more extensive in line with the requirements of EU Regulation (EC, Euratom) No 58/97. At the beginning of 1996, separate Quarterly Inquiries covering Stocks, Capital Assets and other variables were initiated by the Central Statistics Office. This paper looks at issues arising from these new surveys and in particular looks at the implications for an existing short term indicator and also addresses the benchmarking issues.

I Historical Background

A Census of Services was undertaken in 1988 in accordance with the Statistics (Census of Services) Order, 1988. The coverage of the Census extended to all permanenet business premises operating at the beginning of 1988 exclusively or principally engaged in distribution (i.e. retail or wholesale trade) or in the provision of personal or business sevices (excluding financial services and the public sector).

Censuses of Distribution were previously taken in respect of the years 1933, 1951, 1956, 1966, 1971 and 1977. In addition to retail and wholesale trade some of these Censuses covered a limited number of other service activities (i.e. 1951, 1956, 1966 and 1971. The 1988 Census was the first to cover all service activities with the exception of financial services and the public sector.

1988 Register.

The mailing register used for the 1988 Census of Services was as comprehensive as possible. A register of all local retail, wholesale and personal/business services outlets trading at the beginning of 1998 was compiled on the basis of public utility, administrative and other records. The absence of a comprehensive national listing or registration of local business premises made the compilation of the register very difficult. The register used for this Census was the starting point for the current business register which is continuing to evolve.

II New Structural Surveys - Annual Services Inquiries

Following the 1988 Census of Services the CSO initiated a programme to update statistics on the services sectors on an annual basis. This involved annual surveys of the major Retail and Wholesale sectors with most of the remaining sectors being surveyed in rotation over a three year period. The first of these surveys was conducted in 1992 for reference year 1991. The 1991 sample survey was undertaken on a statutory basis. It was designed to provide grossed estimates of the principal trading aggregates for all enterprises in the relevant sectors. The sectors covered were essentially *NACE Rev1* 50, 51, 52 and 55.

The sample was selected from the 1988 Census of Services and this frame was also used to gross the sample returns. This grossing arrangement effectively assumed that the business accounted for by new enterprises (since 1988) was approximately balanced by business lost by enterprises which had ceased trading since 1988. An analysis of 'births' and' deaths' of enterprises from 1988 to 1991 indicated that this assumption was reasonably valid. However, it was acknowledged that this approach to grossing would become increasingly inadequate as the survey years became more distant from 1988. Because of this, priority was given to the development and maintenance of an up-to-date,comprehensive register of the services sectors which would provide a more current sampling and grossing frame in future years. Details of the sample design and grossing procedures are given in Appendix 1.

RESPONSE

A total of 8,866 statutory inquiry forms were issued to the names and addresses of enterprises covered in the 1988 Census of Services. Of these issued forms,some 2,811 were not relevant. The bulk of these non relevants were enterprises which had closed down or had relocated away from the contact address. This left an effective sample of 6,055. Completed forms were eventually received

from 5,580 businesses or 92 per cent of the total. A field force of 24 field officers was employed to visit approximately 40 percent of the firms to achieve this response rate. These field officers were also used to follow up non respondents to a Business Register inquiry which was taking place at the same time. The response was fairly uniform throughout the three major sectors surveyed.The Wholesale trade had the highest response rate of **94%** while the Retail and Business Services sectors both had a response rate of **92%.**

Annual sample surveys were conducted for the years **1992 to 1996** and results from
these surveys have been published. The methodology used in these surveys was broadly similar to that described above . As outlined above, the sampling register used related to 1988. Because of this it had been considered appropriate to reduce the level of detail shown for the Retail sector from the 13 business categories identified for 1991 to 5 categories for 1992 and 1993.

Sectoral coverage by year – Nace Rev1 2 digit (approx.)

1991	50	51	52	55				
1992	50	51	52	55.4	70-74			
1993	50	51	52	60-63	90-93			
1994	50	51	52	55				
1995	50	51	52	55.4	70-74			
1996	50	51	52	55	60-64	70-74	92pt.	93

However, two major improvements to the survey designs were implemented in **1995** with the introduction of the **Nace Rev1** classification of Business activity and more fundamentally, the use of the **new Business Register** as the sampling frame. These two changes allowed for the publication of results at a greater level of detail and accuracy. This also caused some year to year comparability problems and resulted in some discontinuities in the results series. Summary results for 1996 are given in Appendix V.

Comparison of results.
Comparisons were made between the results of these surveys and the existing short term Retail Sales Index (RSI) series. A description of the RSI Index is given in Appendix II. The comparison suggests that the RSI series is understating the level of growth in Turnover over time. The table in appendix III gives a comparison of results from both sources.

Benchmarking issue.
Various comparisons between the ASI and RSI results were carried out in an effort to explain the divergence of the series and explanations have been found for some of the differences. A 1995/1996 comparison is given in Appendix IV.
The comparison of the results of the Structural Annual Services Inquiries (ASI) and the Short Term Indicator RSI raises a number of issues which may also pertain to other short term indicators. These issues include:-

(1) Should the index (RSI) be revised retrospectively and re issued ?

(2) Should the methodology for producing the index be changed to incorporate a more up to date
weighting system based on the latest ASI results ?

(3) Should the index be linked in some way to the Business Register ?

(4) Is there a need to Benchmark Short Term Indicators ?

III New Short Term Surveys

New short term inquiries were initiated by the CSO in 1996. Issues arising from these new surveys are discussed under the following broad headings:-

The requirement for quarterly accounts surveys in Ireland;

The limited usefulness of Administrative Sources.

Limiting the burden on respondents;

Level of response;

Production of results;

Comparability of quarterly data with the annual structural survey; consistency of the time series;

Benchmarking of results with the structural survey.

Requirement.

EU legislation, government demands:-

Quarterly accounts inquiries were initiated by the Central Statistics Office at the beginning of 1996. These inquiries are directed to the Industry, Retail and Wholesale, Services and Building sectors. The motivation behind these inquiries was (a) to meet the increasing analytical needs of government, the EU, and others for short-term economic indicators, (b) to help to fulfil the requirement, under Council Regulation (EC) no. 2223/96, that EU member-states compile, inter alia, quarterly national accounts (including quarterly Gross Domestic Product), and (c) to meet anticipated requirements under the proposed Short-term Statistics Regulation, since passed into law as Council Regulation (EC) no. 1165/98.

The inappropriateness of using administrative sources:-

The only applicable administrative source is the Revenue Commissioners i.e. Taxation Department. There are a number of reasons as to why Revenue records were deemed inappropriate:

(i)There are difficulties in linking CSO records with those in Revenue and there are also confidentiality considerations which complicate the transfer of micro data.

(ii) The annual Corporation Tax and VAT files returned to Revenue are not acceptable as a source of quarterly accounting data because: (a) annual data divided by four will not reflect seasonal patterns

in the data; (b) the time delay involved with an annual return makes this source irrelevant as a short-term indicator; (c) information on variables such as capital assets and stocks is not supplied. It should also be mentioned that turnover as reported in the annual VAT return generally reflects only turnover on goods which are not VAT-exempt e.g. turnover on food sold by Retailers (which is VAT-exempt) is usually not represented. Note that companies registered with the Companies Registration Office (CRO) are required to return their annual accounts, which would contain balance sheet items such as stocks and capital assets, to the CRO; however the CRO does not key these data.

(iii) Apart from the fact that the periodicity of the two-monthly VAT return to Revenue is not consistent with that of the quarterly surveys, this return only gives figures for VAT payable/repayable and value of trade with other EU states.

Cost to CSO of operating quarterly accounts surveys:-

Annual salary costs of 1 Statistician, 1 Higher Executive Officer, 2 Executive Officers, and 7 clerical staff are estimated at IR£ 220,000. Postal charges are approximately IR£ 30,000. Telephone charges, travel expenses, printing costs, and miscellaneous costs amount to IR£ 8,000 approx.

Variables and Coverage:-

The unit of measurement in these inquiries is the enterprise, and the coverage is NACE Rev. 1 Divisions 10 to 74.

The inquiries are conducted by the following five sectoral divisions: Manufacturing, Mining and Energy (i.e. Nace Rev. 1 Divisions 10 to 40); Construction (i.e. Division 45)**; Retail & Wholesale** (i.e. Divisions 50 to 52); **Financial Services** (i.e. Divisions 65 to 67); and **Other Services** (i.e. Divisions 55 to 64 and 70 to 74).

Multiple-variable information is sought on each inquiry. These variables are as follows:

Manufacturing, Mining, and Energy:
Number of persons engaged; stocks of materials, fuel, work-in-progress, finished goods, and goods purchased and held for resale without further processing; trade creditors and trade debtors; capital acquisitions and capital disposals of vehicles, computer equipment, computer software, machinery and fixtures, land and buildings, and other capital assets.

Construction:
Turnover; number of persons engaged; stocks of materials, fuel, work-in-progress, finished goods, and goods purchased and held for resale without further processing; trade creditors and trade debtors; capital acquisitions and capital disposals as for categories listed under manufacturing, mining, and energy.

Retail & Wholesale:
Turnover; numbers of full-time employees, part-time employees, and other persons engaged; wages and salaries (this variable included as from the first quarter of 1998); stocks of goods held for sale; trade creditors and trade debtors; capital acquisitions and capital disposals as for categories listed under manufacturing, mining, and energy.

Financial Services:
Numbers of full-time employees, part-time employees, and other persons engaged; trade creditors and trade debtors; capital acquisitions and capital disposals as for categories listed under manufacturing, mining, and energy.

Other Services:
Turnover; numbers of full-time employees, part-time employees, and other persons engaged; wages and salaries (this variable included as from the first quarter of 1998); trade creditors and trade debtors; capital acquisitions and capital disposals as for categories listed under manufacturing, mining, and energy.

As at quarter 2 of 1998, the survey sizes are as follows:

Manufacturing, Mining and Energy:	1,936 enterprises
Construction:	975 enterprises
Retail & Wholesale:	3,361 enterprises
Financial Services:	247 enterprises
Services:	4,489 enterprises

Other CSO business surveys (annual and short-term) to the same sectors:-

See Appendix V for a list of other CSO inquiries to sectors surveyed in the quarterly accounts inquiries.

Efforts to limit the burden on respondents:-

Care was taken initially to ensure that, with the exception of the variable Total Persons Engaged, there was no overlap of QSI survey variables with variables sought on other CSO surveys. (This partially explains the non-uniform structure of the inquiries to the various sectors.) The variable total persons engaged was necessary for imputation/grossing purposes, and also for carrying out reliability checks on data returned.

Furthermore, the information sought was structured so as to make it easier for enterprises to comply e.g. no particular accounting technique was specified for valuing stocks; only aggregate "full-time" and "part-time" employment information was sought; only actual acquisitions and disposals are asked for i.e. anticipated changes in capital assets are not sought. In addition, enterprises were allowed to return best estimates where exact figures (i.e. accounts) were unavailable.

Care was also taken to limit the coverage of the QSI surveys as far as practicable.With respect to the **Manufacturing, Mining, and Energy** sector, the QSI survey is limited to enterprises with 20 or more persons engaged, of which a census is taken. (In the 1995 Census of Industrial Production, such enterprises accounted for 94% of the total stocks held and 96% of total capital acquisitions.) The results of this 20 or more persons engaged element are grossed up to population level using Census of Industrial Production variables.

For the **Construction sector**, the QSI survey coverage is a Census of all enterprises with 10 or more persons engaged, plus a 1/8th sample of enterprises with 5 to 9 persons engaged. The enterprises in the 5 to 9 persons engaged category were selected so as to exclude all such enterprises surveyed in the quarterly Construction Earnings surveys.

The QSI surveys to the **Retail & Wholesale, Financial Services, and Other Services** sectors is a census of all enterprises with 20 or more persons engaged, along with a sample of the remainder of the population, in order to arrive at an overall survey sample of 10%. Enterprises in the less than 20 persons engaged category were selected so as to exclude as far as possible any such enterprises surveyed in the Annual Services Inquiry or in the Business Profile Inquiry.

The following table shows the survey sampling rates (as percentages of population) by sector and persons engaged for the first quarter of 1998.

Emp. Gp. Sector	0-19	20-49	50-99	100+	Total
Industry	0	100	100	100	40
Cons.	10	100	100	100	15
Ret./Who.	7	100	100	100	10
Services	6	100	100	100	10

Any smaller enterprises (i.e. those with less than 20 persons engaged) which indicate that they have an excessive form-filling burden are treated sympathetically, and may be excluded from some or all future QSI surveys. Since the inception of the QSI surveys, only 125 enterprises have ever sought such relief. It was essential that SMEs were included in the surveys because of their importance.

Importance of SMEs in the economy

Small and medium sized enterprises (SMEs) contribute significantly to the Irish economy. Accurate estimates of business activity cannot be compiled by the CSO without surveying them. The table below for Manufacturing and Services illustrates this point. It shows, for example, that enterprises with fewer than 50 persons engaged, account for 28% of employment and 20% of output in manufacturing industry; 75% of employment and 68% of turnover in retailing; 57% of employment and 43 % of turnover in the wholesale sector.

Persons engaged

Sector	under 20	20 – 49	50 – 99	100+	All Enterprises-
		% Distribution			
Manufacturing					
No. Enterprises	58	22	10	10	100
Persons engaged	13	15	16	56	100
Gross Output	8	12	14	66	100
Retailers					
No. Enterprises	97	2	1		100
Persons engaged	64	11	25		100
Gross Output	55	13	32		100
Wholesalers					
No. Enterprises	80	14	6		100
Persons engaged	32	25	43		100

Gross Output	23	20	57	100	

Response rates for the quarterly surveys:-

The following table shows the response rates (in percentages) for the first quarter of 1998.

Emp.Gp. Sector	0-19	20-49	50-99	100+	Total
Industry	n/a	56	58	73	61
Cons.	44	37	31	43	41
Ret./Who	69	48	59	75	63
Service	67	42	53	61	59

Note that completion and return of the QSI form is compulsory under an Order of the Statistics Act, and non-respondents are liable to penalties prescribed in said Act. However, up to now, CSO has not, to any large degree, pursued recalcitrant parties, through the courts. While the Office may in the future prosecute certain significant non-respondents, it is still too early to say if prosecution of non-respondents will become routine.

It is evident that the response rates for the quarterly surveys (~ 60%) are significantly lower than those for the annual surveys (ASI: 95% , CIP: 85%)

Low response can be attributed to two main reasons:
(i) inquiry-form fatigue amongst respondents, compounded in the current case by the multiple-question nature of the QSI inquiry and
(ii) the fact that the accounting information sought in the QSI survey is usually not readily available to respondents (except in the case of the larger companies).
(iii) It should be noted, however, that the calculation of the response rates for the quarterly surveys may have been affected to some degree by Register issues.

Efforts to improve response:-

The above notwithstanding, the response rates at present are 5%-10% higher than those in early 1996. Factors influencing this improvement are:

(i) Selective sampling in the services sectors. As noted above, the services samples are picked, numbers permitting, from enterprises which have not been selected on the latest Annual Services Inquiry and Business Profile Inquiry. The expectation here is that enterprises are more likely to respond, the fewer the number of inquiries they receive. Furthermore, the less than 20 persons engaged component for quarter t is selected as far as possible from those enterprises responding to the QSI inquiry in at least one of the previous four quarters (rationale: those responding to an inquiry once are likely to respond to the same inquiry repeatedly), with the remainder taken from enterprises which have not been surveyed in any one of the previous four quarters (rationale: it is better to survey "virgins" than to survey non-respondents again). It may seem from this that "good" respondents suffer repeat surveying, while "naughty" respondents are let off! Roughly one-third of the less than 20

persons engaged subset, plus grossing of the remainder using register employment; and by grossing exclusively, using register employment. For both construction and **services,** the imputation and grossing method produced the more consistent results.

See Appendix VI for a description of the Imputation/Grossing procedure used for the sector Mining, Manufacturing and Energy.

COMPARABILITY OF RESULTS, FOR SECTOR MINING, MANUFACTURING AND ENERGY, WITH THE ANNUAL STRUCTURAL SURVEY; AND CONSISTENCY OF THE TIME SERIES

So far, only results for the above sector have been published. The findings are, however, relevant to the **services sectors** also.

The table compares, for selected NACE divisions, 1996 QSI annualised total stock changes and total capital acquisitions with preliminary results from the 1996 Census of Industrial Production(CIP).

Division	Stock	Change(£m.)	Capital	Acquisitions(£m
	QSI	CIP	QSI	CIP
15	125	51	315	295
22	6	-3	125	105
24	20	40	384	404
30	-273	-247	210	287
31	12	17	81	81
32	-38	-18	69	74
33	6	23	80	113
34	-5	0	59	15
40	35	20	192	199
Total	-93	-93	1,895	1,959

There are a number of factors contributing to discrepancies between the two surveys:

(a) Much lower response rates for QSI surveys than for the CIP survey, resulting in greater use of imputation in the former.
(b) Only 42% of enterprises in the 1996 CIP survey had calendar (i.e. January to December) accounting years, and thus the results of the two surveys are not directly comparable at any aggregate level.
(c) CIP returns are based on audited accounts, which every company is statutorily required to produce each year. QSI returns, on the other hand, are based on management accounts; or, where such accounting is not carried out, as is the case with many smaller companies, merely on best estimates. Thus, the accounting procedure carried out for the CIP is generally much more rigorous.
(d) External auditors and companies' financial management have different orientations. For instance, stocks may be valued for the CIP and QSI surveys using different valuation methods; or companies may consider certain items to be part of stocks for the purpose of QSI surveys, but decide at audit time to treat these as capital acquisitions; or companies may return zero capital disposals in QSI surveys during the year, but sell or write off large amounts of assets at the end of the accounting year in the CIP return.
(e) Due to evolution of the Industry Register, there are necessarily differences in coverage between the QSI (quarterly) surveys and the CIP (once a year) survey.

There were also inconsistencies within the QSI time series:

In stocks, these manifested at enterprises level as discrepancies in stock levels between closing quarter t and opening quarter t+1. (These figures, of course, should be the same.) This was due to the widespread incidence of companies changing accounting procedures from one quarter to the next. Moreover, evolution of the survey population produces quarter-on-quarter stock level discrepancies at aggregate level. For these reasons, it was decided that stock **change** figures would be published, rather than the **absolute level** of stocks in each quarter.

A related problem arose in trade creditors/debtors, with the special dimension in this case that subsidiaries of foreign-owned multi-national companies were often inconsistent in how they treated amounts owed to/from the foreign parent (which amounts, correctly, should always be included as creditors/debtors).

BENCHMARKING OF INDUSTRY RESULTS WITH THE STRUCTURAL SURVEY

Due to the long-established use of the CIP survey as the primary source of annual Industrial data for CSO's National Accounts Division, and acknowledging the accounting deficiencies in data returned in the QSI surveys, it was decided that the QSI results should be benchmarked against the CIP results. This would allow quarterly National Accounts estimates of stocks and capital assets to be consistent with the annual results.

Since National Accounts Division uses the CIP results without any calendar-year conversion, it was decided that the totality of QSI quarterly data should be adjusted to fit with the totality of CIP data i.e. it was decided that the adjustment would not be purely for observations with the same accounting year. In other words, the adjustment would make the annualised QSI results equal to the 1996 CIP results, but keep the QSI quarterly proportions. This was attempted, in the first place, at enterprise level. However, as coverage of the QSI and CIP surveys differed, and indeed coverage of the QSI surveys changed across the year, this did not prove possible. At present, benchmarking is being investigated at 4-digit NACE level: if this does not prove feasible, the procedure will be carried out at a more aggregated level.

Appendix 1

I Sample Design

The 'enterprise' was the unit used for survey purposes i.e. one return was sought in respect of each enterprise covering all its branches. A stratified random sample was selected. In the case of the Retail and Wholesale sectors, turnover (from the 1988 Census of Services) was used as the stratification factor. In the Business Services sector, stratification was on the basis of total persons engaged since turnover was not sought in the 1988 Census for this sector. All enterprises with a turnover in excess of £1 million were selected in the Retail sector, while decreasing sampling proportions were taken in the following lower turnover ranges: £250,000 - £1 million; £ 50,000 - £250,000; under £50,000. In the Wholesale trade all enterprises with turnover in excess of £5 million were selected. A sample of 2 in 3 was taken for enterprises with turnover in the range £1 million to £5 million while decreasing sampling ratios were used in lower turnover groups. In the case of the Business Services sector all enterprises with more than 10 persons engaged were selected. A sample of 1 in 2 was taken for enterprises with 6 - 10 persons engaged and decreasing proportions were selected in the lower persons engaged ranges.

ll Grossing

In the Retail and Wholesale trade, total persons engaged was used as the grossing factor for wages and salaries, persons engaged and the various components of persons engaged, while total turnover (excluding VAT) was used to gross all other items. The sample was divided into strata. Strata were as follows, based on the 1987 reported turnover (excluding VAT):- Sample Strata Under £50,000; £ 50,000 - £250,000; £250,000 - £1 million; £1 million and over. The turnover grossing factor in each of the four cells was then the total 1987 turnover of all enterprises in the cell divided by the 1987 turnover of the 1992 sample enterprises in that cell. The persons engaged grossing factor was similarly calculated for each cell as the sum of persons engaged in March 1988 in each cell divided by the sum of persons engaged in March 1988 of the 1992 sample enterprises in each cell. In the Business Services sector only one grossing factor, viz. persons engaged, was used for all items. Here again, the sample was stratified by total persons engaged, based on the total persons engaged in March 1988, with the following categories:- Persons Engaged 1 - 4 persons 5 - 9 persons 10 - 19 persons 20 + persons Grossing factors were calculated for each cell using the same method as for the Retail and Wholesale trades. In general, businesses which had gone out of business between 1988 and 1992 were not included. However, where an enterprise was taken over by another enterprise in the sample, the combined return was included and the base year turnovers in1987 and persons engaged in March 1988 were combined to cover the two enterprises.

RETAIL SALES INDEX

Scope and Coverage

The Retail Sales Index covers, on a sample basis, the retail sales of retail businesses, wholesale businesses with sizeable retailing activity and the separate sales establishments of non-distribution enterprises. Excluded from the index coverage are the direct retail sales from non-distribution establishments together with the incidental retail sales of wholesale businesses. Also excluded are sales by hawkers, street stalls and other retailing activities not conducted from permanent business premises. The statistical unit used for reporting sales figures in this inquiry is the enterprise (i.e. complete business covering all branches).

Methodology

The business categories and the underlying structural weighting of the current Retail Sales Index is based mainly on the classification of enterprises identified in the 1988 Census of Services. The index system is structured on the retailing enterprises covered in the Census classified by 14 retail business categories and four turnover (excluding VAT) ranges.

The Retail Sales Index is compiled by collecting turnover figures from a panel of
c. 2,500 respondents on a monthly basis; however, these 2,500 businesses only represent less than 40% of the estimated total current retail sales of all enterprises. Therefore, it is necessary to relate the turnover of the respondent panel to the overall turnover of the retail sector of the State in order to produce national results. The Census of Services in 1988 surveyed all retailers operating in Ireland and therefore gives a complete picture for the sector. The results of the Census were used to 'revise' the way in which the R.S.I. was compiled in order to make it a more up-to-date estimator of consumer expenditure; this revision exercise had previously been carried out in 1982.

HISTORY OF THE RETAIL SALES INDEX.

First production of results	- 1962
Revisions of the R.S.I	- 1968,1976
First production of volume index (including a further revision)	- 1982
Final revision of the R.S.I.	- 1993

A detailed methodological description of the Retail Sales Index is provided in the March 1994 issue of the *Statistical Bulletin* published by the CSO.

Appendix III
Comparison of Turnover and Retail
Sales results 1971 - 1996

	1971	1977	1987	1991	1992	1993	1994 ~	1995 ~	1996
All Retail Turnover incl. VAT * (1)	758,506	2,557,125	8,175,717	10,610,419	11,393,810	11,854,245	13,070,658	16,219,975	18,210,459
(1) Excl. Garages	620,750	1,931,550	6,408,821	8,167,083	8,849,268	9,309,154	10,132,026	11,093,382	11,917,327
Index (1) 1987 = 100	9.3	31.3	100.0	129.8	139.4	145.0	159.9	198.4	222.7
Index (2) 1987 = 100	9.7	30.1	100.0	127.4	138.1	145.3	158.1	173.1	186.0
Retail Sales Index 1990 = 100 (3)	12.9 #	32.7 #	83.4 #	101.8	106.2	109.4	118	123.7	134
Retail Sales Index 1987 = 100 (4)	15.5	39.2	100	122.1	127.3	131.2	141.5	148.3	160.7
(4) Excl. Garages 1987 = 100	14.9	36.1	100	121.6	127.5	131.8	140.1	146.8	156.3

linked indices

~ Not strictly comparable because of the introduction of Nace Rev. 1 in 1995. The grossing   methodology and sampling register used from 1995 differs from that used in earlier years.

Appendix IV

COMPARISON OF COMMON R.S.I. AND A.S.I. RETURNS 1995 and 1996

1. A total of 931 retail enterprises included in the 1995 and 1996 Annual Services inquiries were manually matched against the R.S.I. panel.

2. Of these 931 enterprises, 194 were found in the R.S.I. panel and turnover (excluding VAT) for the 95/96 A.S.I. was compared with turnover (INCLUDING VAT) for the R.S.I. 12 months ending 1995 and 1996 -

Business Category	Firms	RSI Change 1996/95 %	ASI Change 1996/95 %
Grocery	29	7.3	9.3
Grocery/Pub	2	3.1	7.8
Pub/O-L	15	14.1	8.0
T.S.N.	7	5.0	5.2
Fresh Meat	9	-1.4	-7.4
Other food,etc.*	3	5.1	-29.3
Garages/F.S.	27	19.3	13.8
Chemists	14	3.8	10.5
Hardware	12	-7.6	-5.7
Electrical goods	6	2.7	-4.5
Drapery & app	24	9.3	5.0
Footwear	11	15.6	17.4
Dept. stores	5	14.7	13.2
Other non-food	30	8.0	10.1
TOTAL	194	8.8	9.4

* Figures for ASI affected by changes in wholesale element of T.O. for one business.

Other CSO surveys, annual and short-term, to the same sectors:-

Name of Inquiry	Target	Frequency
Census of Industrial Production	Industrial firms with 3 or more persons engaged	Annual
Industrial Employment Inquiry	Industrial firms with 3 to 9 persons engaged	Annual
Industrial Employment and Earnings Inquiry	Industrial firms with 10 or more persons engaged	Quarterly
Census of Building and Construction	Building firms with 20 or more persons engaged	Annual
Building and Construction Earnings Inquiry	Building firms with 10 or more persons engaged	Quarterly
Building and Construction Employment Inquiry	Building firms with 5 or more persons engaged	Monthly
Building and Construction Register Inquiry	Building firm start-ups	Annual
Monthly Production Inquiry	Industrial firms with 20 or more persons engaged	Monthly
PRODCOM Inquiry	Manufacturing firms with 3 or more persons engaged	Annual
Annual Services Inquiry	Enterprises in the Distributive Trade and certain other sectors	Annual
Retail Sales Inquiry	Retail firms	Monthly
Business Register Inquiry	Start-up enterprises	Annual
Business Profile Inquiry	Firms already on register	Annual
Business of Advertising Agencies	Advertising Agencies	Annual
Financial Services Banks, Employment and Earnings Inquiry	Insurance cos., and Building Societies	Quarterly

Other CSO surveys to the same sectors (cont'd):-

Name of Inquiry	Target	Frequency
Foreign Affiliate Trade Survey	Services enterprises	Annual
Public Sector Employment Earnings Inquiry	Public Sector	Quarterly
Road Freight Survey	Haulage vehicle owners	Weekly
Accommodation Survey	Hotels, guesthouses, Bed & Breakfasts	Monthly

Imputation process for stocks and capital assets (for Mining, Manufacturing, and Energy):-

In determining the reliability of results according to the various methods tried, the overriding criterion was considered to be consistency with the annual Census of Industrial Production (CIP). With this in mind: the Opening Stocks figures for Quarter 1 1996 should be similar to the Closing Stocks figures from the 1995 CIP; the ratio of Closing Stocks for Quarter 4, 1996 to Opening Stocks for Quarter 1, 1996 should be consistent with the ratio Closing Stocks:Opening Stocks in the 1996 CIP returns to date; the quarterly Capital Acquisitions/Disposals should be reasonably consistent with the 1995 CIP Acquisitions/Disposals figures, when the latter are divided by 4.
Other criteria were:
(i) Consistency between the results and the matched sample factors derived from the raw data.
(ii) Minimal discrepancies between Closing Stocks figures for quarter t and Opening Stocks figures for quarter t+1.
(iii) Comparability with methodologies employed elsewhere.

Imputation produced the most consistent results (both quarter to quarter, and by comparison with CIP results). The two grossing methods produced very erratic results for persons engaged, capital disposals, creditors, debtors, and particularly stocks (where there were discrepancies between closing quarter t and opening quarter t+1 of the order of hundreds of millions of £s). Grossing by turnover was even less appropriate. For only one variable, capital acquisitions, were the grossed results comparable with the imputed ones.

Numerous imputation variations were tried for the variables stocks and capital assets. The best imputation method appeared to be the following:

In the imputation process for capital acquisitions and disposals, missing data for an enterprise in any quarter are derived from the average returns for that enterprise in the four immediately-preceding quarters; or, where no historical QSI data are available, as one-quarter of the latest available structural survey (i.e. annual) data for that enterprise; or, failing this, by applying the ratio of acquisitions or disposals to employment, for the enterprise's cell in the current quarter, to the enterprise's employment.
No imputation is made for zero/blank capital assets returns i.e. imputation is restricted to observations which do not make a return. (Note that 25%-30% of respondents report zero/blank capital acquisition/disposals.)
Imputation is carried out at the sub-component level i.e. separately for vehicles, computers, computer software, machinery and equipment, land and buildings, and "other" assets, in the case of both capital acquisitions and capital disposals.

In the case of stocks, missing opening levels for an enterprise are derived as the closing levels of the preceding quarter (where available and non-trivial); or, failing this, from the average returns for that enterprise in the four immediately-preceding quarters; or, where no historical QSI data are available, as the closing stocks figure from the latest available structural survey data for that enterprise; or, failing this, by applying the ratio of stocks to employment, for the enterprise's cell in the current quarter, to the enterprise's employment. Missing closing levels are derived as the imputed opening levels of the current quarter (as returns for the subsequent quarter are usually not available). Imputation is carried out at the sub-component level i.e. separately for materials, fuel, work-in-progress, finished goods, and goods purchased for resale.

Imputation is carried out on both trivial stocks returns and on non-responses. No imputation is made for components with zero returns if the total stocks figure returned is non-zero. If the total stocks figure returned is zero, then the return is deemed to be trivial, and all components are imputed for.

Grossing procedure for the less than 20 persons engaged component (Mining, Manufacturing, and Energy):-

At the end of 1997, there were almost 2,900 enterprises with less than 20 persons engaged, and over 1,900 enterprises with 20 or more persons engaged, on the Industry Register. In the 1995 CIP results, Capital Acquisitions(total) for those companies with 20 or more persons engaged accounted for 96.3% of Capital Acquisitions of the population (i.e. all enterprises with >= 3 persons engaged); while the corresponding proportion for Capital Disposals(total) was 92.8%. Also, the proportion of population 1995 Closing Stocks(total) represented by companies with 20 or more persons engaged was 94.1% . Considering the high level of representativity of the 20 or more persons engaged subset, therefore, it was considered appropriate to gross the QSI 20 or more persons engaged subset using the 1995 CIP results.

This grossing was done as follows:

First, all pertinent variables (i.e. the stocks and assets sub-components) in the 1995 CIP enterprise data-set were summed at divisional level. Then the variables in the CIP 20 or more engaged subset were summed, also at divisional level. Next the (population sum : subset sum) ratios for these variables were merged with the QSI results data-set, and multiplied by the variable to which each ratio corresponded. Total (grossed) stocks, acquisitions and disposals were then derived as the sum of the grossed sub-components.