The C.I.I.- E.S.R.I. Quarterly and Monthly Surveys of Business Attitudes: Methods and Uses

Peter Neary

Special Article

in

QUARTERLY
ECONOMIC
COMMENTARY

March 1975

J. DURKAN
F. KIRWAN

THE C.I.I.—E.S.R.I. QUARTERLY AND MONTHLY SURVEYS OF BUSINESS ATTITUDES: METHODS AND USES[1]

by
PETER NEARY

1. *Introduction*

Beginning with the fourth quarter of 1961, the Confederation of Irish Industry (C.I.I.) and the Economic and Social Research Institute (E.S.R.I.) have been jointly administering a quarterly survey of businessmen's attitudes in the Republic of Ireland. The results of this survey were circulated to C.I.I. members and since 1968 were published in the E.S.R.I.'s Quarterly Economic Commentary.

Similar monthly surveys have been carried out on a coordinated basis by the member countries of the European Economic Community since 1961. On Ireland's accession to the E.E.C. it was decided to revise the C.I.I.—E.S.R.I. survey so as to ensure comparability with those in other member countries. The process of revision has now been completed: the last quarterly survey referred to the fist quarter of 1974, while the first monthly survey was carried out in March 1974, and has been continued on a regular basis since then.

The purpose of this note is to describe the methods and coverage of the two surveys, to outline the uses to which the results may be put, and to suggest some directions for further research into both the methods and application of the surveys.

2. *Methods of the Surveys*

The methods used to obtain the data and to calculate the results of both surveys are almost identical. Questionnaires are first sent out to participating firms. When the comlpeted replies are received the information they contain is coded and transferred to punched cards. The actual processing and calculation of the results is then carried out by computer.

The first stage in the processing is to group each individual firm's replies into the appropriate industry sub-group. The number of separate sub-groups distinguished was forty-four in the quarterly survey and thirty-five in the monthly survey. (The coverage of these sub-groups is discussed in Section 3 below). This aggregation process is carried out using firm weights which are supplied by the firms themselves. As Table 1 shows, the quarterly survey used employment weights for all questions, whereas the monthly survey uses export and turnover weights, depending on the question. It should be noted that the monthly survey uses a finer classification of weights than the quarterly: as explained in the footnotes

1. The initial work on the survey viz. selection of firms, calculation of export and net output weights etc., was carried out by R. Kelleher, (now of Central Bank), J. Gracie C.I.I. and J. Durkan E.S.R.I. The computer programs to process the results were written by Peter Neary.

to table 1, firms replying to the quarterly survey were asked to specify into which of five employment categories they fell, whereas eleven categories of turnover and exports are distinguished in the monthly survey.

Appendix 1 gives a numerical example of the aggregation of individual firms replies to industry sub-group level. In the case of all but two questions, each firm can give one of three replies (e.g., higher, same or lower). The two exceptions are questions 4 and 13. The former (which

Table 1: : WEIGHTING SCHEMES USED IN QUARTERLY AND MONTHLY SURVEYS

Survey	Weights used to Aggregate Individual Firm Replies to Industry Subgroup level	Weights used to Aggregate Industry Subgroup Replies
C.I.I.—E.S.R.I. Quarterly Survey 1961-1974	Employment weights for all questions	Export weights for questions 3 and 10 Net output weights for other questions
C.I.E.—E.S.R.I. Monthly Survey, March 1974 onwards	Export weights for questions 7 and 8 Turnover weights for other questions	Export weights for questions 7 and 8 Net output weights for other questions

Sources of Weights:

Individual Firm Weights: In both surveys, firms replying to the questionnaire were asked to indicate on an ordinal scale into what range of the relevant variable they fell. In the quarterly survey five categories of employment were distinguished. In the monthly survey, eleven categories of turnover and exports are distinguished, and firms' ordinal replies are converted to cardinal weights by setting them equal to the mid-point of the relevant range; e.g., a firm which states that its turnover is between £300,000 and £500,000 is assumed to have a turnover of £400,000. Finally, exact figures for firms in the largest category (over £5m.) are obtained where possible from published data or directly from the firms themselves (otherwise a weight of £7.5m. is assigned to such firms).

Industry Subgroup Weights: Net output weights are taken from the annual Census of Industrial Production. Export weights are taken from the annual Trade Statistics of Ireland, with export commodities grouped to conform as closely as possible to the Census of Industrial Production classification. Both sets of weights are normally taken from the most recently available source: the net output weights used since March 1974 with the monthly survey refer to 1970, and the export weights to 1971.

was not included in the quarterly survey) asks for a numerical answer, namely the number of month's production which the firm has on its order book. The latter question, number 13, first asks whether or not the firm is facing constraints on its production. If the answer to this question is "yes", it is then asked to specify which of eight possible causes is responsible (e.g., insufficient capacity, insufficient raw material supply, etc.). The aggregation of individual firms' replies to this question is carried out in exactly the same way as that shown in Appendix 1. However two

additional points should be noted. First, the answers of firms who reply "no" to question 13 but still specify one or more causes responsible in their reply to question 13a, are ignored. Secondly, firms may indicate more than one of the eight causes as being responsible for the constraints they face, in which case their turnover weight is divided equally between the causes they specify.

After a set of answers to each question has been calculated for each industry sub-group, these are then aggregated to industry group and sector level. The weights used at this stage are obtained from published sources (see notes to Table 1 for details). Export weights are used for those questions which relate to exports (3 and 10 in the quarterly survey, 7 and 8 in the monthly survey), and net output weights for the remainder. The same weights are used, of course, in aggregating the answers of all industry groups to obtain the answers for all manufacturing industry as a whole.

An innovation which was introduced in the monthly survey, in conformity with E.E.C. practice, was to group the industry sub-group answers by sector. Five different sectors are distinguished: consumer goods, both durable and non-durable, capital goods, divided between construction and equipment, and intermediate goods. The details of which sub-groups are included in which sector follow the practice adopted in other E.E.C. countries [See Commission (1967), pp. 10-11 and Appendix 2 below], except where a sufficiently fine industry sub-group classification could not be obtained from Irish Census of Production data.

Finally, the calculation of all these different tables is repeated separately for Dublin and non-Dublin firms. Some care should be exercised in interpreting these figures, since the basis of classification used is the location of the firm's administrative offices, which does not always coincide with that of its manufacturing plant. This problem is not too serious in the case of large multi-plant firms however, since separate questionnaires are normally sent to each plant in such cases.

3. *Coverage of the Surveys*

Both surveys cover all manufacturing industries, with mining, quarrying and turf production being excluded. The major difference between the two surveys lies obviously in the frequency with which they are taken; the old survey was taken once a quarter, whereas the new one is taken every month, in conformity with the Harmonized Business Surveys in other E.E.C. countries. However there are other equally important differences, especially in relation to the degree of disaggregation by industry and to the number of firms sampled. Table 2 presents information relevant to both these aspects.

Considering first the matter of disaggregation by industry, it is apparent from Table 2 that the quarterly survey conformed exactly to

Quarterly Survey, 1961–1974						Monthly Survey, 1974 onwards					
Industry Group	Number of Sub-Groups included	Corresponding C.I.P. Industries	Average No. of Respondents 1971(iii)–1972(ii)			Industry Group	Number of Sub-Groups included	Corresponding C.I.P. Industries	Average No. of Respondents June–July 1974		
			Total	Dublin	Rest				Total	Dublin	Rest
Food	9	4–13	27	17	10	Food	1	4–13	31	14	17
Drink and Tobacco	5	14–18	6	5	1	Drink and Tobacco	1	14–18	9	4	5
Textiles	5	19–22, 25	14	3	11	Textiles	3	(19), 20, 21, 25	19	4	15
						Wearing Apparel ...	2	22, 24	30	18	12
Clothing and Footwear	5	23, 24	21	12	9	Leather and Footwear	3	23, 31, 32	10	1	9
Wood and Furniture	2	26–28	8	3	5	Wood and Cork ...	1	26	6	2	4
						Furniture	1	27	5	2	3
Paper and Printing	2	29, 30	10	6	4	Paper	1	29	9	6	3
						Printing	1	30	9	9	—
Chemicals	4	33–36	10	7	3	Plastics	1	(47)	5	4	1
Glass, Clay and Cement	2	37–39	6	5	1	Chemicals	3	33–36	15	12	3
						Petroleum Products ...	1	(47)	—	—	—
Metals and Engineering	7	40–46	15	6	9	Building Materials, etc.	2	37–39	12	6	6
						Iron and Steel ...	1	(40)	3	2	1
Other Manufacturing	3	31, 32, 47	4	1	3	Primary Products of Iron and Steel ...	1	(40)	4	2	2
						Metal Consumer Goods	2	(40), (46)	2	1	1
						General Equipment ...	1	(20), 44, (46)	10	4	6
						Non–Electrical Machinery	2	41	8	4	4
						Domestic Electrical Appliances	1	(42)	5	3	2
						Electrical Equipment	1	(42)	11	6	5
						Motor Vehicles ...	1	45	6	4	2
						Shipbuilding	1	43	2	1	1
						Precision Instruments	1	(47)	2	—	2
						Rubber Products ...	1	(47)	6	4	2
						Non-Ferrous Metals	1	(40)	2	—	1
Total	44		121	65	56		35		221	113	108

Notes.—C.I.P. industry numbers refer to the classification used in the annual Censuses of Industrial Production and the Quarterly Industrial Inquiries, the results of which are published in the Irish Statistical Bulletin. Bracketed numbers indicate that the net output of the C.I.P. industry in question has been divided between more than one

the classification adopted in the Census of Industrial Production (C.I.P.). Results were published for each of ten industry groups and these results were built up from results for forty-four industry sub-groups, which also correspond exactly to the individual industries distinguished in the C.I.P.

The situation with the monthly survey is quite different, however. Since the industry classification adopted is that which was already in use with the Harmonized Business Survey in the E.E.C., it does not conform closely to C.I.P. practice. In particular, the output of some C.I.P. industries had to be assigned to two or more different sub-groups. However, while the C.I.P. gives separate gross output figures for different types of output within an industry, separate figures for net output are not available. In order to construct net output weights using C.I.P. data, it was therefore necessary to assume that the share of net output in gross output was the same for all the products of a given industry. The resulting weights are given in Appendix 2.

An even more serious drawback of the E.E.C. industry classification from an Irish point of view is that the food manufacturing industries (including drink and tobacco) are "provsionally left out because it was impossible to obtain comparable results for them from the different countries" [Commission (1967), p. 9]. Given the importance of these industries in Ireland (accounting for 32.9 per cent of net output in manufacturing industry in 1971), such an approach was obviously unacceptable. Firms in the food, drink and tobacco industries are therefore included in the new survey as they were in the old, although the results for these sectors are built up directly from individual firms' replies, without the intermediate stage of constructing separate results for different sub-groups. Finally, to conform with E.E.C. practice, a set of results for all industries except food, drink and tobacco, is constructed and forwarded each month to the E.E.C. Commission. Irish users of the survey continue to obtain results for all industries including food, drink and tobacco.

The other major difference in coverage between the two surveys lies in the number of firms sampled. As may be seen from Table 2, the average number of respondents to date has been nearly twice as many as in the quarterly survey. Since the response rate in both surveys are very similar, this obviously indicates the increased informational content of the new survey.

4. *Uses of the Survey Results and Directions for Further Research*

The major uses of the survey results are fairly obvious. To the individual businessman they give an indication of conditions in his own industry and in industry as a whole. To the economist they provide a wealth of information on the current production and stocks position in different sectors and on businessmen's expectations about their future trends. Since they are both more frequent and more up-to-date than any

other short-term indicators of industrial production, they are therefore of considerable use in a forecasting context.

Before discussing other uses to which the results might be put, some possible improvements in the methods of the survey may be mentioned. In the first place, it would seem worthwhile to investigate the possibility of adopting a greater disaggregation of the industry sub-groups. A finer classification would make the results more accurate, and would reduce the possibility of a single large firm's replies dominating the answers of an entire industry group. This need not involve any breach of confidentiality, as only the results for the overall industry groups are usually published in full. This change is principally desirable in the case of the food, drink and tobacco industry groups, since the new survey is at present inferior to the old in this respect.

A second issue which merits investigation is the sensitivity of the results to the weights used, both at firm and at industry sub-group level. Although new sets of weights are calculated as frequently as possible, the weights actually used are of necessity relatively out-of-date. For example, at the time of writing, the results of the 1971 C.I.P. have only recently appeared; the net output weights used to date are taken from the 1970 C.I.P. When more up-to-date weights become available it would be of interest to recalculate previous surveys to see whether the results are seriously biased by the unavailability of truly contemporaneous weights. As for the individual firm weights, these do not suffer to the same extent from the problem of being out-of-date. However another difficulty which arises with them is that for most questions the weights are based on turnover rather than on net output. This seems to be the practical procedure, since in a direct questionnaire it would not be feasible to ask each firm to specify its net output. However unless the ratio of net output to turnover is identical for each firm in a given industry sub-group, this problem will lead to a bias in the results. A related problem is that a single firm with a very large turnover may swamp the replies of other smaller firms in the same industry sub-group. While this does not matter if the firm is in fact dominant in that sub-group (except insofar as the object of the survey is to reflect business opinion rather than actual business conditions), it raises a serious difficulty if the large firm fails to complete the questionnaire every month. Such a failure might appear to indicate a change in business conditions, when in fact no actual change need have occurred. One way of overcoming this difficulty would be to attach relatively less weight to the replies of the larger firms. The simplest way of doing this, would be to weight each firm's reply by the logarithm of its turnover, rather than by its actual value. There are of course other approaches to the problem of non-response.

A third and final improvement which could be made would be to improve the regional classification of replies. It is arguable that the

present distinction between Dublin and non-Dublin firms is of little economic importance. A more meaningful breakdown, distinguishing four or more different regions, might be of greater value (though as Table 2 suggests, it is likely that some regions might have insufficient firms in a number of industry groups to permit meaningful conclusions to be drawn from the results).

Turning from improvements in the methods of the survey, to possible applications of its results, its use in deriving short-term indicators has already been mentioned. One problem in this area is that it is necessary to have some idea of the correlation between survey results and the actual outcome as measured by published official statistics. A study by Baker (1968) investigated this problem for the results of the first six to seven years' operation of the quarterly survey. Its findings suggested that the survey results could be a useful leading indicator of trends in the levels of industrial production and other macro-variables. With a much larger set of results now available, it would be of interest to repeat this exercise for a number of different series.

In addition to providing information on businessmen's assessments of the current state of their industry, the survey also indicates their expectations about future trends. These data could obviously be applied both to the development of short-term indicators, and to the construction of expectational variables for inclusion in (e.g.) estimated investment functions. For the latter purpose, it would be desirable to have a cardinal, rather than a merely ordinal measure of expectations; such measures could be derived using the methods which have been developed in Britain in connection with similar data on price expectations [see Carlson and Parkin (1973)].

Even without adjusting the published survey results, they may still be incorporated directly into econometric work. One area where this might prove fruitful would be to use the results of question 13 (question 7 in the old survey), to derive measures of capacity utilization. Going even further, it is possible to estimate relationships which are specified solely in terms of survey data, using methods developed by Theil (1963). It is obvious that the range of potential application of the survey results is extremely wide.

5. *Conclusion*

It is apparent that the new survey is in almost all respects a major improvement over the old. In particular, its greater frequency, expanded coverage, and more detailed industry classification ensure that it will give a much clearer and more reliable picture of the state of businessmen's views about the current and future position of their industries. Moreover since the new survey conforms exactly to the Harmonized Business

Surveys in the E.E.C., its results are directly comparable with those from other European countries.

The disadvantage of these improvements in accuracy and international comparability is that the results of the new survey cannot be compared exactly with those of the old survey which it replaces. This discontinuity is an inevitable consequence of improvements in statistical methods. However, insofar as it is desired to link the results of the two surveys at industry level, it is hoped that the details given in section 3 and Appendix 2 will facilitate this task.

Appendix 1: *Example of Aggregation of Individual Firm Replies to Industry Sub-Group Level*

Assume that the following replies to questions 1 and 4 are obtained from three firms in a given industry sub-group. Two alternative sets of hypothetical turnover weights for the firms are also given.

		Firm 1	Firm 2	Firm 3
Q. 1: For the time of year, the value of production by your firm in the past month compared with the previous month was:		Same	Higher	Lower
Q. 4: At your present rate of output, and assuming normal conditions, approximately how many months' production is accounted for by your order book or your production schedule?		1	8	4
Hypothetical Turnover Weights (£'000)	A	400	875	150
	B	250	35	625

These individual firm replies are then aggregated, using a set of weights, to obtain a composite reply for the industry sub-group as a whole. For the two sets of weights shown, the resulting replies would be as follows. (It is apparent that the application of different sets of weights has a considerable effect on the results.)

	Answer to Q.1 (%)			Answer to Q.4
	Higher	Same	Lower	(months)
A Weights	61	28	11	5.6
B Weights	4	27	69	3.3

The answers for different industry sub-groups are then combined using export and net output weights obtained from published sources, as explained in Table 1 and accompanying text above.

Appendix 2: Sector Codes and Weights for Industry Sub-Groups in Monthly Survey

E.E.C. No.	Industry Group	Industry Sub-Group	Corresponding C.I.P. Industry	Sector Code	Weights	
					Net Output 1970 £'000	Exports 1971 £
	Food		4-13	6	84,656	82,287
	Drink and Tobacco		16-20	6	39,365	11,324
1	Textiles	Wool	(19)	5	10,249	7,085
		Cotton	20	5	5,060	3,025
		Other Manufactures	(19), 21, 25	5	13,951	16,893
2	Wearing Apparel, etc.	Knitting Mills	22	1	15,355	4,596
		Wearing Apparel	24	1	18,951	19,470
3	Leather and Footwear	Leather	31	5	3,227	6,546
		Footwear	23	1	8,326	5,369
		Other Leather Manufactures	32	1	953	696
4	Wood and Cork		26	5	6,625	3,282
5	Furniture		27	2	4,514	751
6	Paper		29	5	10,880	5,837
7	Printing		30	5	23,853	3,348
8	Plastics		(47)	5	7,230	4,480
9	Chemicals	Basic Chemicals	(35)	5	5,064	5,327
		Industrial and Agricultural Chemicals	33, (35)	5	13,655	7,805
		Consumer Chemicals	34, (35), 36	1	11,424	11,925
10	Petroleum Products		(47)	5	10,000	4,450
11	Building Materials etc.	Building Materials	(37), 38, 39	3	17,060	4,513
		Other Ceramics, Hollow Glass	(37)	2	3,924	4,607
12	Iron and Steel		(40)	5	2,426	850
13	Primary Processing of Iron and Steel		(40)	5	6,355	1,891
14	Metal Consumer Goods	Bicycles	(46)	2	136	216
		Other	(40)	2	392	1,489
15	General Equipment		(40), 44, (46)	4	7,774	2,045
16	Non-Electrical Machinery	Agricultural	(41)	4	946	580
		Other	(41)	4	5,030	5,902
17	Domestic Electrical Appliances		(42)	2	10,291	8,414
18	Other Electrical		(42)	4	10,006	7,239
19	Motor Vehicles		45	2	16,109	2,401
20	Shipbuilding		29	4	4,058	3,389
21	Precision Instruments, etc.		30	4	7,933	15,705
B	Rubber Products		(47)	5	6,812	7,334
C	Non-Ferrous Metals		(40)	5	7,623	1,887

Notes:

E.E.C. No.: This refers to the industry group classification adopted in the Harmonized Business Surveys. See Commission (1967), pp. 9-10.

Corresponding C.I.P. Industry: This refers to the industries listed in the Census of Industrial Production and Quarterly Industrial Inquiry. Bracketed numbers indicate that the relevant C.I.P. Industry corresponds to two or more industry sub-groups in the survey. In such cases the net output weights are estimated

indirectly, usually by distributing the net output for the C.I.P. industry among the industry sub-groups on the assumption that the net to gross output ratio is constant for all sub-groups within a given C.I.P. industry.

Sector Code: Following E.E.C. practice, the results for the industry sub-groups are grouped by sector as follows:

1. Consumer goods: non-durable
2. Consumer goods: durable
3. Capital goods: construction
4. Capital goods: equipment
5. Intermediate goods
6. Food, drink and tobacco (not included in E.E.C. Harmonized Business Surveys).

REFERENCES

Baker, T. J. (1968): 'The F.I.I.-E.S.R.I. Joint Industrial Survey: a preliminary appraisal', in *Quarterly Economic Commentary*, Dublin: E.S.R.I., September, pp. 25-32.

Carlson, J. A., and M. Parkin (1973): "Inflation Expectations", University of Manchester, Department of Economics, Discussion Paper, June.

Commission of the European Communities (1967): *The Harmonized Business Surveys in the Community: Principles and Methods*, Brussels, November.

Theil, H. (1963): 'On the specification of multivariate relations among survey data', in C. Christ et al: *Measurement in Economics*, Stanford University Press, pp. 293-313.