

The investment intentions inquiry in manufacturing industry

This article describes the use of the results of the inquiry into intended fixed investment made by the Ministry of Technology from a panel of firms in manufacturing industry and assesses the value of the inquiry as a forward looking indicator of manufacturing industry's capital expenditure. The main part of the article describes the three main inquiries and the preliminary inquiry carried out in respect of each year. The purpose of these inquiries is to obtain some knowledge of firms' plans and intentions in the short term when important fluctuations in investment can occur. The article describes the various problems encountered in using the information collected from companies.

It also shows the results of the surveys of intentions and indicates that it is not possible to take expectations of investment provided by industry at their face value but rather that it is necessary to interpret them by reference to the relationships between expected and actual capital expenditure of manufacturing industry over the past years.

The inquiry has been reasonably successful in estimating future capital expenditure of manufacturing industry as a whole; but, nevertheless, it is perhaps inevitable that with an inquiry of this nature the results can sometimes give only broad estimates of the likely size of changes in investment.

As well as describing the quantitative inquiries, an account is given of the qualitative inquiry taken each May, in which companies indicate the direction of change to their expected capital expenditure provided in the previous quantitative inquiry (taken in the preceding November/December).

The question of estimating future investment for industry groups is briefly considered. Appendix 1 gives a description of the operation of the inquiry and Appendix 2 describes the development of some regression equations using the information from the intentions inquiry on its own or in conjunction with other data.

An inquiry is conducted three times a year by the Ministry of Technology⁽¹⁾ in which manufacturers provide returns of their intended fixed investment in the near future. This article describes these inquiries, explaining in particular how the information that is published on investment trends after each inquiry is obtained from the manufacturers' returns. The investment intentions inquiry also covers the distributive and service industries and the shipping industry and this part of the inquiry is taken by the Board of Trade.

Fixed investment is an important economic variable by virtue of its contribution to the long-term growth of the economy and its effect on short-term fluctuations in demand; forecasts of movements in it are an essential basis for the management of the economy and are needed by industry and business as a help in their forward planning. Long-term forecasts of investment are probably most appropriately made by econometric model-building, but in the short term it is desirable to have some knowledge of firms' plans and intentions. For this reason in 1955 larger companies in manufacturing industry, the distributive and service trades and the shipping industry were asked to co-operate in making this information available by providing, on a voluntary basis, regular returns of their intended investment expenditure. The

inquiry has of necessity to collect the kind of information which is available from companies. This ranges from systematically compiled expenditure budgets to rather broad estimates, based, perhaps, on financial considerations of what funds are likely to be available or on what is likely to be the sanctioned upper limit of capital expenditure.

Returns from contributors are called for in May, in August/September and in November/December and the results of the inquiry are then available in June, October and January, respectively. This timing enables the information gained by the inquiry to play a part in the three main official short-term forecasts of national income which are made through the year, geared to the annual Budget (see: Short-term Economic Forecasting in the United Kingdom, *Economic Trends* August 1964).

There are a number of other indicators becoming available throughout the year which throw light, in greater or lesser degree, on the trend of fixed investment and these may play a part, with the information about industry's plans, in arriving at the investment component in the national income forecasts. This article, however, is concerned largely with the assessment which is made, by means of the inquiry, of the likely level of future capital expenditure of manufacturing industry as envisaged by manufacturers themselves; it is this assessment which is regularly published after each inquiry.

The article describes in detail the investment intentions inquiry in manufacturing industry; the inquiry in other sectors is touched upon only briefly below. The structure

(1) Responsibility for statistics of investment by manufacturing industry was transferred from the Board of Trade to the Ministry of Technology in November 1969. Before November 1969 the Board of Trade was responsible for statistics of investment by manufacturing industry as well as statistics of investment by the distributive and service industries and the shipping industry.

of the article is as follows. The next few paragraphs give a brief description of the mechanics of the inquiry, which are explained more fully in Appendix I, and are followed by the main section of the article dealing with the use made of the results of the inquiry. Various aspects of the inquiry are then discussed before the final sections outline some ideas bearing on future lines of development and attempt some assessment of its value.

It is to be noted that the various analyses in this article cover the 10 years from 1960 when the inquiry was put on a more comprehensive and more systematic basis than in the earlier years.

Structure of the inquiry

For any one year of expenditure, information is collected on six occasions: a preliminary and three successive main inquiries are made in the form of amounts to be spent; and on two occasions, after the preliminary inquiry and after the second main inquiry, an indication is sought of the direction of any change in intended expenditure (the qualitative inquiry). The table below shows how this programme covered expenditure intentions for the year 1969 and how, with the information for 1969, returns were obtained at the same time for 1968 or for 1970:

Examples of timetable⁽¹⁾

	Year in respect of which inquiry is made		
	1968	1969	1970
Returns collected			
Nov/Dec 1967	(iv) Second main inquiry	(i) Preliminary inquiry	
May 1968	(v) Qualitative inquiry	(ii) Qualitative inquiry	
Aug/Sept 1968	(vi) Third main inquiry	(iii) First main inquiry	
Nov/Dec 1968		(iv) Second main inquiry	(i) Preliminary inquiry
May 1969		(v) Qualitative inquiry	(ii) Qualitative inquiry
Aug/Sept 1969		(vi) Third main inquiry	(iii) First main inquiry

⁽¹⁾ This is the timetable in force after the introduction of the preliminary inquiry and the qualitative inquiry in 1963 and 1964 respectively. Before that time the inquiry now taken in August/September was taken about two months earlier.

Results of the three main inquiries are available in respect of the years from 1960 onwards and in the following sections the analyses relate very largely to these inquiries. The preliminary inquiry was added to the programme in 1963 in respect of 1965 expenditure and experience with it is outlined in a short section below. The qualitative inquiries, taken in May to provide a post-Budget view, were started in 1964 and are considered only briefly.

Firms whose capital expenditure covers rather over 60 per cent of the capital expenditure of all manufacturing industry regularly provide returns; the coverage for the

first main inquiry is slightly less than for the second which in turn has a coverage marginally below that for the third inquiry. The figures received are grossed-up to represent manufacturing industry in total; this is explained in the Appendix.

This article deals only with the analysis and interpretation of the investment intentions inquiry for manufacturing industry. Similar methods are used for both the distributive and service industries and the shipping industry, but the results have been less satisfactory than those for manufacturing industry. For the distributive and service industries part of this is due to the fact that the sample (covering about 25 per cent of investment) is smaller and less representative than that for manufacturing industry. Also, companies in these industries appear to feel less need for forward planning of investment, partly because of the nature of the capital equipment which consists, to a greater extent than in manufacturing, of vehicles and small items of plant not generally requiring the same degree of planning before purchase.

The shipping industry is virtually completely covered, but the results have still not proved to be very reliable. Companies' returns of intended investment are often weak, in part because of the irregular timing of payments which may follow unexpected changes in the actual amount of work done. There is an additional and exceptional difficulty in this industry because some companies are United Kingdom subsidiaries of international shipping companies, and the latter may decide to switch ownership of a particular vessel (existing or under construction) between one subsidiary and another or between the subsidiary and the parent.

The inquiry results

Each main inquiry provides for manufacturing industry as a whole an estimate of the amounts intended by manufacturers to be spent on capital account in the year concerned. These amounts are compared below with figures of actual capital expenditure at current prices in the year concerned. Some indications on the pricing basis of companies' expectation of future expenditure were provided by firms at the time of devaluation. This suggested that expectations, particularly from the large firms, tended to take some account of possible price changes either directly or by means of a contingency allowance. To the extent that some companies do not attempt to allow for price changes between the time of the inquiry and the time of actual expenditure or are not successful in allowing for the price change that actually takes place, there will be an element of incongruity. It is, however, unlikely that the degree of incongruity will change markedly from year to year though there is a risk of increased incongruity when prices are rising rapidly. The main analysis of the expected expenditures is therefore made on the basis of comparing that expenditure with actual expenditure at current prices in the year concerned. The estimates of actual expenditure used are, except for the latest year, those which have been available from the censuses of production; for the latest year an estimate based on the quarterly inquiry into capital expenditure is used. Table A sets out the figures from 1960 to 1969.

Aggregated contributors' expectations and actual capital expenditure

Manufacturing industry

	Main inquiry			Actual capital expenditure Current prices
	1st	2nd	3rd	
1960 ..	862	1,145	1,184	1,035
1961 ..	1,288	1,400	1,422	1,253
1962 ..	1,287	1,372	1,332	1,183
1963 ..	1,094	1,222	1,200	1,070
1964 ..	1,089	1,302	1,384	1,236
1965 ..	1,435	1,667	1,575	1,420
1966 ..	1,592	1,707	1,650	1,521
1967 ..	1,593	1,575	1,642	1,485
1968 ..	1,586	1,788	1,752	1,580 ⁽¹⁾
1969 ..	1,983	2,138	2,054	1,783 ⁽¹⁾

(¹) The ending of the higher rates of investment grants on 31st December, 1968 appeared to bring forward into 1968 expenditure which might otherwise have taken place in 1969. The amount of the expenditure so brought forward (at current prices) has been estimated at about £35 million. In relating expectations for the years 1968 and 1969 to the out-turn, therefore, one can use either the recorded figures or figures adjusted by this amount of £35 million. There are uncertainties as to which is the more appropriate comparison, though in this table and in the analyses the adjusted figures have been used throughout. This assumes that manufacturers' planned expenditure for 1968 and 1969, as returned in the inquiries, did not take into account the bringing forward of expenditure from 1969 to 1968. In some quarters there may have been, despite official statements to the contrary, a feeling that the higher rates of grant might be extended beyond the 31st December 1968. The switching of investment from 1969 to 1968 could therefore have been a last-minute change in expenditure plans when it became clear that the reduction in the grant rates was to take place: alternatively the uncertainties involved could have induced companies to make allowance for the switch as a secondary stage in their plans. If this was the basis on which returns were made, the use of the adjusted figures is appropriate, except perhaps with regard to the second and third main inquiries for 1969 supplied in November/December 1968 and August/September 1969 respectively: by this time companies could have made allowance in their plans for the short-fall of expenditure in 1969.

The most striking characteristic of firms' aggregated expectations is that generally they are significantly higher than the out-turn of expenditure. This feature of the aggregate figures conceals much variation among the individual contributors. For any one year some have expectations in large excess of their actual expenditure while others have expectations well below out-turn. In general the later the inquiry, the narrower the range of variation.

Use of the inquiry results

As the aggregated expectations exceed actual capital expenditure they cannot be used as direct estimates of this expenditure. Consideration has to be given, in using the latest inquiry, of the way in which past expectations have related to actual capital expenditure. The first approach is to examine the extent to which expectations have exceeded expenditure and Table B sets out the data.

Aggregated contributors' expectations in relation to actual capital expenditure

Manufacturing industry

	Main inquiry		
	1st	2nd	3rd
Year of expenditure			
1960	-17	11	14
1961	3	12	13
1962	9	16	13
1963	2	14	12
1964	-12	5	12
1965	1	17	11
1966	5	12	8
1967	7	6	11
1968	0	13	11
1969	11	20	15
Mean	1	13	12

The experience of the ten years indicates that the results of the third main inquiry—based on returns received in August or September of the year of expenditure—were considerably higher than the actual expenditure in the year, by 12 per cent on average. The second main inquiry—taken just before the beginning of the year of expenditure—gave results which were also significantly higher by virtually the same proportion. The first main inquiry—taken in August or September of the year previous to the year of expenditure—gave results which on the average experience of the years shown were slightly above the out-turn. However, the variation of this excess over the years casts some doubt on whether the mean is the appropriate average from which to measure variations.

In the earliest years of the inquiry, it was assumed in handling the results that the excess of expectations to out-turn for each of the three main inquiries (first, second or third) remained reasonably constant. At that time it was, in consequence, the practice to compare the latest inquiry results with the corresponding inquiry result in respect of the previous year and take the change between these two as indicating the proportionate increase or decrease of expenditure in the year concerned compared with expenditure in the previous year.

When experience of the relationship between expectations and out-turn began to accumulate, however, it became clear that the excess of expectations to out-turn was liable to vary more than had been originally assumed, the variation being dependent on factors affecting investment between the time of the inquiry and the period of actual expenditure. Table C shows the variations of each inquiry around the mean and, for the year concerned, the increase in actual capital expenditure at current prices compared with the previous year, changes which, as explained below, appear to have some relation with the variation in the percentage excess.

Variation of percentage excess from mean

Table C

Year of expenditure	Main Inquiry			Actual capital expenditure (Current prices) Change on previous year Percentages
	1st	2nd	3rd	
	1960 ..	-18	-2	
1961 ..	+2	-1	+1	+21
1962 ..	+8	+3	+1	-6
1963 ..	+1	+1	0	-10
1964 ..	-13	-8	0	+16
1965 ..	0	+4	-1	+15
1966 ..	+4	-1	-4	+7
1967 ..	+6	-7	-1	-2
1968 ..	-1	0	-1	+6 ⁽¹⁾
1969 ..	+10	+7	+3	+13 ⁽¹⁾

⁽¹⁾ Adjusted for the distortion at the end of 1968 associated with the reduction in the investment grant rates.

As one might expect the relationship of the third main inquiry to out-turn has varied least. A slight downward trend—possibly due to improving forecasting techniques—can be seen until 1966 or 1967; it appears to have been reversed in the last two or three years. In only two years, 1966 and 1969, is the excess of expected expenditure over actual somewhat out of line. The relative lowness of the 1966 inquiry may reflect a loss of confidence following the July measures of that year—the inquiry was taken in August/September—which in the upshot did not affect actual spending to the extent foreseen. For 1969 the tight credit situation may have resulted in some expenditure being postponed or cancelled (though the present figures for actual expenditure in 1969 are based on the quarterly sample and the census revision has tended in recent years to be upwards: if the revision for 1969 is upwards the high excesses may well be lowered).

The variation in the relationship between expected and actual expenditure is much greater for the second and particularly so for the first main inquiries. A strong factor affecting the first inquiry appears to be the stage in the investment cycle at the time the inquiry was taken. Thus, for example, the first inquiry for 1960, which was made at a time, in August/September 1959, when investment was sluggish, did not foreshadow the increase in investment in 1960 and was markedly below the average relationship to out-turn of the first inquiry. Results of the second inquiry for 1960 were only two percentage points below the average excess, so by that time manufacturers had a fairly close idea of the strength of the upward movement. On the other hand the first inquiry for 1961, another year of strong increase, which was taken in 1960 when investment was already rising, had a normal relation to the out-turn. In 1962 the reverse situation to 1960 can be seen when the first inquiry made during the peak year of 1961, was more than usual in excess of the out-turn. The second inquiry was reasonably close to average experience with only a slight trace of over-optimism. 1963 was the second year of the decrease and all three inquiries showed a normal relationship to

out-turn. For 1964 a repeat of the 1960 situation can be seen, with the exception that the strength of the increase was not realised even by the time of the second inquiry. 1965 was a fairly good year slightly marred by a higher than normal excess relationship for the second inquiry. 1966 was spoiled as has been seen, only by the third inquiry. 1967 was an unusual year: as expected in a year of decreasing expenditure the first inquiry overshot the mark; but the second inquiry, on the other hand, was markedly too pessimistic. It is possible that manufacturers were expecting at this stage a decline in investment comparable to the previous cyclical declines whereas in practice the 1967 fall was comparatively mild. The higher rates of investment grant payable in respect of expenditure during that year and 1968 may also have played some part. The upward movement in 1968 was gradual until half-way through the year, and this coupled with the mildness of the downward and upward movements in recent years compared with previous movements, probably explains why the first inquiry did not greatly understate the level of investment. It is, however, more difficult to explain the pattern for 1969. While the situation is confused somewhat by the bringing forward of expenditure that occurred at the end of 1968 before the reduction in the investment grant rates, the results of the inquiries for the year and the out-turn as at present estimated suggest that expectations have been revised downwards.

Leaving aside 1969 one can conclude that a weakness in the series of main inquiries is that the first is not always a good indicator of turning points, which may first be suggested by the second main inquiry. For the second or third year of any upward or downward movement the inquiries give a good indication of the rate of investment.

Another form of presentation of the data which has been found useful for study in regard to the use of the latest inquiry is set out in Table D. Again there are variations each year round the average change—variations which in some cases can be attributed to the first and second main inquiries not appearing to anticipate fully the strong cyclical changes in manufacturing industry's investment.

Changes between successive main inquiries

Table D

Year of expenditure	Percentages		
	Between 1st and 2nd	Between 2nd and 3rd	Actual capital expenditure (current prices) Change on previous year
1960 ..	+33	+3	+18
1961 ..	+9	+2	+21
1962 ..	+7	-3	-6
1963 ..	+12	-2	-10
1964 ..	+20	+6	+16
1965 ..	+16	-6	+15
1966 ..	+7	-3	+7
1967 ..	-1	+4	-2
1968 ..	+13	-2	+6
1969 ..	+8	-4	+13
Mean	+12	-1	

In essence the use of the latest inquiry results rests upon their appropriate adjustment on the basis of past experience. This adjustment cannot be made with great certainty as the experience of the past is variable and may not be repeated for the year concerned. The stages in arriving at an appropriate adjustment factor may be put as follows: consider for the inquiry concerned the excesses over the past years that are shown in Table B; consider whether the circumstances of the year under review (e.g. position of the cycle) are appropriate for the average excess; consider whether the excesses of the immediately preceding years are appropriate (there may be changes which make the immediate past a better guide than the earlier years of the decade); and with the second and third inquiries also consider the changes from the previous inquiries for the same year.

Careful consideration of all these aspects leads to a view that the current inquiry can be regarded as having a certain excess to the out-turn. This assumed excess is used to adjust the figures supplied by manufacturers, grossed-up for manufacturing industry as a whole. It will be appreciated that the choice of adjustment is not wholly objective but inevitably, in view of the variability of past experience, includes some subjective elements. There are, in consequence, margins of uncertainty in the result, which cannot be exactly specified.

The results of the inquiry are published in the form of the expected change in investment as a percentage of the previous year's investment. Earlier the percentage change was presented in current prices but lately the change estimated at constant prices has been given. The use of constant prices makes it necessary to forecast price movements, and the lack of systematic information on probable price changes contributes to the margin of uncertainty; but there are advantages in this presentation, e.g. in comparing with previous changes in investment in real terms. The paragraphs titled 'Assessment of the value of the inquiry' at the end of the main part of this article show the published estimates of changes in investment obtained from each main inquiry from 1960 onwards and compare these with the out-turns.

The preliminary inquiry

The three main inquiries discussed above have been taken for a longer run of years than the preliminary inquiry which was not introduced until 1963. The value of earlier information on investment trends made it desirable to attempt to collect expectations at an earlier stage and accordingly contributors were asked to provide an estimate of their intended expenditure in 1965 in November/December 1963, i.e. at the time when the second main inquiry for 1964 was being collected; this exercise has been repeated each year.

A number of contributors have not been able to provide this earlier estimate, and the coverage, in terms of capital expenditure, is about 50 per cent compared with rather over 60 per cent for the main inquiries. The returns received from the contributing companies are grossed up to represent the whole of manufacturing industry and the table below compares these figures with the actual capital expenditure in the year concerned.

Aggregated contributors' expectations and actual capital expenditure

Manufacturing industry

Table E

Year of expenditure	Preliminary inquiry	Actual capital expenditure	Inquiry results in relation to actual expenditure
	£ million	£ million current prices	Percentage excess
1965 ..	1,057	1,420	-26
1966 ..	1,367	1,521	-10
1967 ..	1,577	1,485	+ 6
1968 ..	1,468	1,580	- 7
1969 ..	1,605	1,783	-10

In contrast to the three main inquiries (Table A above) the preliminary inquiry results have usually been significantly below the out-turn of expenditure, a feature in which technical factors affecting companies' budgeting probably play a major part. At an early stage companies' plans are more uncertain and may not include allowance for projects whose incorporation in the capital budget is as yet somewhat doubtful nor for smaller items which may form part of replacement expenditure. During the course of the year before the year of expenditure the capital budget is more closely defined and greater allowance is made for coming projects. For the 5 years concerned the first main inquiry has increased the preliminary inquiry results by, on average, 17 per cent.

Change between preliminary and first main inquiry results

Table F

Year of expenditure	Percentages
1965 ..	+36
1966 ..	+16
1967 ..	+ 1
1968 ..	+ 8
1969 ..	+24

The variation in the relationship shown in Tables E and F indicates that the preliminary inquiry is strongly influenced, even more than the first main inquiry, by the stage in the investment cycle at the time when the inquiry is taken. The large upward revisions to the preliminary inquiry results for 1965 and 1969—years when actual expenditure rose markedly—suggest that these inquiries taken in 1963 and 1967 respectively—years when expenditure was in cyclical troughs—did not allow for the coming increase in investment. On the other hand, the preliminary inquiry for 1967—a trough year—was made under the influence of the upswing in investment in 1965 and does not appear to have anticipated the downturn.

It will be appreciated that, with the short run of figures and the variability in experience of the period, there are wide margins of uncertainty in adjusting the preliminary inquiry results to arrive at an estimate of what actual capital expenditure is likely to be in the year concerned. This is, of course, not unexpected; capital expenditure is volatile and the expenditure plans of companies can, and do, change substantially in the period between the taking of the inquiry and actual expenditure. Changes of this

nature, whether stemming from factors affecting particular industry groups or individual companies or from changes in economic factors affecting investment more generally, will always be important in the time between the taking of the preliminary inquiry and the period of expenditure and the possibility of these changes must always be borne in mind in considering the current preliminary inquiry. This does not, however, diminish the usefulness of the information as providing an expression of manufacturers' investment outlook at the time concerned. Moreover, with a longer run of data for interpretation and with the continuing development by companies of forward capital budgeting, the area of uncertainty in handling the inquiry results may well be reduced.

The qualitative inquiry

The qualitative inquiry, like the preliminary inquiry, was a late addition to the programme, being introduced in 1964 to provide information on manufacturers' investment intentions after the Budget. The need to wait a little time after the Budget for its effect, if any, on investment plans to be assessed and the timing of the programme for the early summer national income forecasting round meant that only a short period was available for collecting returns compared with that allowed for the main inquiries. Additionally, it was thought that, although companies would be able to assess the direction of any change in their plans fairly quickly after the Budget, they might not necessarily embark at that stage on revising their expectations in quantitative terms. For these reasons this particular inquiry was introduced only on a qualitative basis asking contributing companies to indicate whether they intended to spend more than, the same as, or less than they had stated in the previous (November/December) inquiry. Separate answers are requested in respect of the second main inquiry for the current year and for the preliminary inquiry for the following year.

The answers given in the inquiry are weighted together by the return given in the preceding inquiry and the balance of 'mores' minus 'lesses' is used in assessing the results. A description of this inquiry and the method of handling the information collected has been published each year along with the results of the inquiry. Details can be found with the results of the 1970 inquiry in the *Board of Trade Journal* of 17 June 1970.

An addition to this inquiry in recent years has been to ask larger firms for the latest figures of their investment intentions. In 1968 a few contributors were individually approached in order to help the interpretation of the results. As this addition proved successful a more systematic approach to some 200 larger companies, accounting for about half of all manufacturing industry's capital expenditure, was made in 1969 and repeated in 1970. Most companies were able to supply up-to-date figures and it is intended to continue asking for returns on a quantitative basis in future May inquiries.

Industry group estimates

The analyses above have related to manufacturing industry as a whole. The returns provided by contributors are, however, aggregated by industry groups within manufacturing industry and separate figures, of expecta-

tions and out-turn, are available for some 16 separate groups forming material for the development of separate estimates of future investment for these groups.

As the inquiry obtains returns mainly from larger companies the coverage of contributors varies in the different groups. In industries where the typical firm is large the coverage is good; but where smaller firms are important in the aggregate, the coverage of returns is smaller. Industry groups for which coverage is higher than average include mineral oil refining, chemicals, metal manufacture and vehicles, while coverage is comparatively low for the textiles, leather and clothing group. It may, however, be observed that full coverage of a particular industry group does not necessarily lead to reliable estimates of future expenditure; changes in plans by individual large firms are likely to have a more significant effect than for manufacturing industry as a whole. The problems of this inquiry are much more than sampling.

As might be expected the analyses show that the relationships developed above for all manufacturing industry are generally more volatile in each separate industry group. This is illustrated in the table below which sets out the results of the three main inquiries and the actual capital expenditure of the chemicals industry. This industry group accounts for a sizeable proportion of total manufacturing industry's capital expenditure (a seventh in 1969) and includes a number of large firms whose capital budgeting is well developed.

Aggregated contributors' expectations and actual capital expenditure

Chemicals industry

(Order V—Standard Industrial Classification, 1968 revision)

	Main inquiry			Actual capital expenditure current prices
	1st	2nd	3rd	
1960 ..	136 (5)	164 (26)	161 (24)	130
1961 ..	191 (16)	211 (29)	192 (17)	164
1962 ..	227 (34)	214 (27)	190 (12)	169
1963 ..	155 (16)	160 (19)	160 (19)	134
1964 ..	179 (7)	199 (18)	197 (17)	168
1965 ..	216 (-4)	274 (22)	263 (17)	224
1966 ..	251 (-3)	301 (16)	274 (6)	259
1967 ..	228 (5)	214 (-1)	228 (5)	217
1968 ..	242 (12)	264 (22)	248 (14)	217 ⁽¹⁾
1969 ..	312 (19)	319 (21)	299 (14)	263 ⁽¹⁾

Figures in brackets show the percentage excess of expectations to actual expenditure

⁽¹⁾ Adjusted for the distortion at the end of 1968 associated with the reduction in the investment grant rates.

The mean percentage excesses over the 10 years were 11, 20 and 15 respectively as compared with 1, 13 and 12 for all manufacturing industry. Thus each of the main inquiries had, on average, a greater excess than for all manufacturing industry and there appears also to be a greater variation around the average. In general the experience of the 10 years is similar to that for all manufacturing industry but somewhat more volatile.

Future developments

The analyses above have shown some aspects of the material that has emerged from the investment intentions inquiry and point to several possible ways in which future work on the intentions inquiry may be developed. There is, for example, a growing need for forecasts for separate industry groups, but, as has been shown in the section above, there are particular difficulties in this field. Nevertheless, with the growth in the number of years' experience and the exploration in greater depth of the relationship between expectations and out-turn, a sounder basis for using the returns provided by companies may emerge. Work on industry groups may well increase the understanding of the factors affecting the overall estimates of manufacturing industry's future investment. Hitherto these overall forecasts have been obtained by considering relationships between expected and actual expenditures in total; disaggregation by industry groups, even if it does not yield accurate forecasts for some industry groups, may well improve the estimate for all manufacturing industry. This and other aspects are being explored.

In carrying out the investment intentions inquiry no systematic attempt has yet been made to examine with contributing companies the relationships between their various estimates for a given year and the out-turn for that year. Ad hoc discussions with contributors have indicated that large changes between expectations, or between expectations and out-turn, have usually been the result of special factors affecting a company's capital projects. It is intended to initiate in the near future a more systematic discussion with contributors about the basis of their returns, the reasons for the changes as the year of expenditure comes nearer and the differences between expected and actual expenditure, information which would be valuable as a background in the use of these returns and might contribute towards an improvement in the inquiry's results.

A further topic which could usefully be discussed with contributors at the same time is the distance ahead covered by their capital budgets and the content, etc., of these budgets. As has been shown, the preliminary inquiries have not, so far, proved so useful as the three main inquiries. The nature of the information that could be collected for periods further ahead would necessarily depend on what was available in contributors' forward budgets. These might, as the preliminary inquiries appear to suggest, be concerned more with major projects, suggesting, if an inquiry did prove viable, some difference in its structure and interpretation from the present inquiry which attempts to cover estimates of all items likely to be charged to capital account. It is by no means clear whether there exists information which, if collected, could be interpreted with sufficient precision to justify the extension of the inquiry. The value, however, for medium term economic forecasting of having the views of manufacturers on their investment plans in the years

beyond the inquiry's present horizon indicates the need to explore the practicability of this extension.

Assessment of the value of the inquiry

Table H below shows the information on investment trends in manufacturing industry that has been published after each inquiry. The results are usually expressed in the form of the change in capital expenditure, as indicated by manufacturers' intentions between the year preceding the forecast year and the year of the forecast itself. On occasions when the margin of uncertainty has seemed greater than usual the percentage changes were expressed as a range or in some less precise form.

Year to year changes in capital expenditure⁽¹⁾ as published from the results of each inquiry and as actually estimated in the out-turn

Table H

	1st main inquiry	2nd main inquiry	3rd main inquiry	Out-turn
1960	- 5%	+ 14%	+ 25%	+ 18%
1961	+ 20%	+ 30%	+ 21%	+ 21%
1962	- 2%	- 1%	a little more than 5% lower	- 6%
1963	rather more than a tenth lower	- 14%	- 10%	- 10%
1964	No great change	+ 8%	+ 14%	+ 16%
1965	Increase of about a tenth	+ 10%	+ 10%	+ 15%
1966	Increase of up to 5%	Increase of up to 2½%	- 1% ⁽²⁾	+ 7%
1967	- 7 to 8%	- 10%	- 6%	- 3%
1968 ⁽³⁾	Probably some increase	+ 5%	About the same	+ 2% ⁽³⁾
1969 ⁽³⁾	+ 10 to 15%	+ 10 to 15%	+ 10%	+ 9% ⁽³⁾

⁽¹⁾ Prior to 1967 changes at current prices. 1967 onwards changes at constant prices.

⁽²⁾ Published as '-4%' at constant prices. (Out-turn '+3%' at constant prices.)

⁽³⁾ Adjusted for the distortion at the end of 1968 associated with the reduction in the investment grant rates.

The results given in Table H are those published at the time and in consequence are based on the information available and the methods of adjustment adopted at that time. In view of certain changes in handling the inquiry (for example, the method of grossing up was recently improved) and in the methods adopted for interpreting the results (the experience of each inquiry allows the historical analyses to be improved continually) the interpretation first made (as shown in the table) may not be in precise agreement with the interpretation which could now be made in the light of up-to-date views on the most appropriate methods.

These comparisons give an incomplete view of the quality and value of the inquiry for, in attempting an assessment, a number of factors which influence the comparison need to be taken into account. The intentions inquiry is not, in itself, a direct predictor of capital expenditure in the year concerned. What it sets out to measure at the time of each inquiry is manufacturers' expectations at that time of what they will spend in a

future year. These expectations change with the passage of time not merely because firms improve the basis of their budget but because there may be changes of plans to take account of changes in the circumstances affecting capital projects both inside and outside the firm.

Changes in circumstances affecting investment plans encompass a wide range of possibilities. General factors include changes in government policy which may bear directly or indirectly on investment; changes in taxation systems and rates; changes in investment incentive schemes; and so on. On the other hand major changes in returns made by companies are often attributable to special circumstances affecting the company itself: changes in demand for its products; the influence for or against a particular project of technological innovation; and, what seems at times an important factor, the inability of suppliers to keep up with the phasing of expenditure that underlies a company's budget and its forecasts. The further ahead the forecast period the greater the likelihood of a firm's plans being changed, both because a firm's plans for a longer period ahead are in a greater state of flux and can therefore more readily be adapted to changing circumstances, and because there is simply more time for circumstances to change.

In judging the predictive value of the inquiry the simple comparison implied by Table H may in consequence not bring out the full usefulness of the inquiry. What it does show is that broadly, in most years, estimated changes in capital expenditure have been reasonable in relation to out-turn. For example, the estimated year to year changes in capital expenditure from the first main inquiry have been within about 5 percentage points of out-turn in eight years out of ten; the changes from the second main inquiry have not always been quite so close to out-turn. The year to year changes in capital expenditure from the third main forecast have in seven years out of ten been within about 3 percentage points of out-turn.

While it is not easy to estimate year to year changes of capital expenditure in the near future because of the various uncertainties which have been described above, it is clear that the investment intentions inquiry has played an important part in contributing to short-term forecasts of year to year changes in capital expenditure of manufacturing industry. Now that a fair run of past data is available it seems likely that in some areas the uses of the inquiry can be enlarged and improved.

The investment intentions inquiry

Description of the operation of the inquiry in manufacturing industry

Coverage

The contributors to the investment intentions inquiry in manufacturing industry comprise virtually all firms which make, on a voluntary basis, quarterly returns of their actual capital expenditure. The intentions inquiry, which is also conducted on a voluntary basis, consequently uses returns from a panel mainly of the larger businesses. This method of approach was adopted in place of using a random probability sample because it is the larger companies which tend, for their own internal management, to compile quarterly records of their actual capital expenditure and to make systematic forecasts of their investment. At the outset the panel consisted of about 600 companies but over the years has been considerably extended, to bring in smaller units and to secure a reasonably balanced industry coverage; currently contributors account for rather over 60 per cent of manufacturing industry's capital expenditure. The panel is still dominated by larger companies though many smaller companies contribute.

Within the above overall estimate of coverage, the proportion of investment in different industry groups accounted for by members of the panel varies widely. Coverage ranges from being virtually complete in mineral oil refining and tobacco industries, well above the average for iron and steel and chemicals industries to being comparatively poor in textiles, leather and clothing industries.

In practice, the number of returns used in a particular inquiry sometimes falls markedly below the full count of contributing businesses; non-response particularly from smaller companies is sometimes high. However, this does not significantly affect the proportion of investment accounted for by respondents.

The reporting unit

The unit for which returns are made in the inquiry, as in the inquiries into actual capital expenditure, is the business unit, i.e. the whole of a business, a firm, a company or a group of companies in associated activities (excluding any subsidiary companies operating mainly overseas). If a company or group has substantial activities in two or more industry groups for which separate accounts are kept so that two or more 'business units' exist, a separate return is required for each such unit. Over 2,000 returns are received in respect of separate business units within manufacturing industry.

Information collected

Contributors are asked to record their expected expenditure, chargeable to capital account under each of the following headings: new building work (including improvements and alterations to old buildings); acquisitions of new and second hand vehicles and acquisitions of new and secondhand plant and machinery and all other capital equipment (including mobile powered equipment, office furniture etc.). Firms are however not asked to

forecast proceeds from the sale of capital goods in respect of vehicles, plant, machinery etc., information which is asked for in the quarterly capital expenditure inquiry, in view, in some cases, of the lack of this information. The value of disposals is however small (about 6 per cent of the total value of acquisitions) and the method of calculation (see paragraph 8) produces total forecasts for all manufacturing industry which, like the figures of total actual capital expenditure, are on a basis net of disposals.

As the information sought is that to be charged by businesses to their capital account there are likely to be some slight differences of treatment of particular items from firm to firm, despite the definition given. Moreover, the degree of detail in which firms draw up their plans for future expenditure varies; although in general, returns will have a similar coverage to past expenditure, in some cases they may omit smaller items, such as minor equipment ancillary to a large project on travellers' motor cars. Unless, however, firms' practices change rapidly, these variations and omissions are not likely to have a significant effect.

Method of calculation

From the returns supplied by individual contributors estimates are made for manufacturing industry as a whole. The current method of calculation, the results of which are used in the tables in the main text, has recently been introduced. Estimates for earlier years have been reworked on this basis and supersede the estimates made by an earlier method, the use of which gave rise to the results of the inquiries published up to October 1969.

The calculation is performed separately in 16 industry groups, in some groups for two separate size strata and in two asset categories (the separate forecasts supplied by contributors for vehicles and for plant, machinery etc. are amalgamated): in all there are 46 separate cells. With the current calculation method, expected capital expenditure in the third main inquiry for year $t+1$, provided in August/September of year $t+1$, is related to actual capital expenditure of year t . (This is the first main inquiry which is taken after the first estimates of actual expenditure in year t become available). In each of the cells for which estimates are separately calculated it is assumed that the relationship between actual and expected capital expenditure for the business units in the reporting panel is representative of all business units concerned. The third main aggregated inquiry result for year $t+1$ is obtained for each cell by multiplying the sum of contributors' expected capital expenditure for year $t+1$ by the ratio of the total actual capital expenditure in year t to the sum of contributors' actual expenditure in year t . In those cells involving expenditure on plant, machinery and vehicles the figures from contributors (both expected and actual) relate to acquisitions alone while the figure of total actual expenditure relates to acquisitions less disposals; this ensures that contributors' expected capital expenditure which is provided gross of disposals is scaled down to a net of disposals basis.

The subsequent first and second main inquiry results for the following year and the preliminary inquiry result for the year further ahead are obtained for manufacturing

industry as a whole by calculations in the same cell detail described above using the ratio between the expected capital expenditure from these inquiries and from the third main inquiry for the previous year for the panel of reporting units and applying this ratio to the estimated total third main aggregated inquiry result as obtained above.

Thus expected capital expenditure from the main inquiries and the preliminary inquiries are related back to a fairly recent year for which actual capital expenditure figures are available. The method of associating third main inquiry results for year $t+1$, first and second main inquiry results for year $t+2$ and preliminary inquiry result for year $t+3$ with actual capital expenditure for year t fits in with the way in which contributors are asked to take account of changes in the structure of their group, arising from mergers, disposals, etc.

In the previous method of calculation the estimated total third main inquiry result for 1960 was obtained in

a similar fashion to that described above using the actual capital expenditure in 1959 (the first year for which a census of production was conducted on a business unit basis). The results of all subsequent main inquiries, and the preliminary inquiries when introduced, were obtained by linking from inquiry to inquiry over the years and not, as in the revised method, re-basing when each year's actual expenditure becomes available. The disadvantages of this method were that the effective weighting pattern between industries and strata was that of 1959 and that errors which crept into the system, particularly in the later years, remained. Expected capital expenditure was not related to actual expenditure except by a long chain going back to 1959. Under the new method the weighting pattern is that of most recent years for which figures of actual expenditure are available and the break in the series at the time of each third main inquiry by directly relating estimated to actual capital expenditure ensures that the influence of any errors is minimal.

APPENDIX 2

Regression methods

The main article described the standard methods used in the interpretation of the inquiry. In addition some regression equations using the intentions inquiry results are being developed. The number of observations, however, is, as yet, small for this or any other mechanical type of approach. This has two consequences. First, it forestalls the use of any other than comparatively simple statistical techniques and second, it means that any equations developed should be regarded as experimental and used only with caution.

All equations quoted in this appendix have been fitted over the period 1961 to 1969 (1960 to 1969 for equations using the third main inquiry results). It was, however, shown in the main article that the inquiry results for 1969 were noticeably higher in relation to the out-turn (as at present measured) than earlier forecasts. If 1969 proves to be abnormal there is a case for using equations fitted only over the years to 1968—a procedure which tends to give better fitting equations. 1969, is however, included here because of the small number of observations.

Changes in the state of the economy or in manufacturers' impressions of it could, in concept, be one source of variation between expectations and out-turn. One possible approach therefore is to correct manufacturers' aggregated expectations by some measure of the growth in the economy between the time of making the return and the time of actual expenditure. The following table shows both the simple regression equations obtained using solely the expectations as independent variables and those using growth in GDP as an additional variable:

Equation	R ²	Std. Error (£ million)
1. $I_t = 255.6 + 0.789 F_{1,t}$ (0.078)	.936	62
2. $I_t = 82.1 + 0.847 F_{1,t} + 33.19X_{3,t}$ (0.034) (5.6)	.991	26
3. $I_t = 148.8 + 0.791 F_{2,t}$ (0.068)	.951	54
4. $I_t = 109.7 + 0.803 F_{2,t} + 7.63X_{4,t}$ (0.075) (14.0)	.953	58
5. $I_t = 0.53 + 0.893 F_{3,t}$ (0.032)	.990	26

I_t is actual investment in year G ; $F_{1,t}$, $F_{2,t}$ and $F_{3,t}$ are the results of the first, second and third main inquiries for year t . $X_{3,t}$ is the percentage growth in real GDP measured at factor cost between the year ending in the third quarter of year t and that ending in the third quarter of $t-1$; $X_{4,t}$ is a similar variable but with years ending at the fourth quarters.

R^2 is the usual correlation coefficient and the bracketed figures are the standard errors of the coefficients.

The introduction of a 'growth' variable adds only to equations using the first inquiry result. (There is no absolute theoretical reason why $X_{3,t}$ should be preferred to, say, $X_{2,t}$ or $X_{4,t}$; it is used here simply as it gives the

best fitting equation.) The good fit and relatively low standard error of equation 2 perhaps looks slightly suspicious in the light of the disappointing results obtained for equations using the second inquiry result. However the analysis described in the preceding section (where $F_{1,t}$ was found to be strongly influenced by the stage in the investment cycle at the time of taking the inquiry) would suggest, given that some relationship must exist between GDP and investment, that the theory implicit in the equation is not implausible. A disadvantage of these equations is that a forecast of gross domestic product is necessary and thus the value of the equations is dependent upon its quality.

The theory does not appear to work for $F_{2,t}$ and as yet no satisfactory explanation has been found for this. A number of different growth variables have also been tried in conjunction with the third main inquiry result but without success. This is perhaps not surprising: by the time of the third inquiry, which is rather over halfway through the forecast year, it would probably be difficult for plans to change to any great extent; further by that time manufacturers should have a reasonably clear picture of the relevant economic conditions as they affect their firms.

A second type of approach, developed by Messrs. Flemming, of Nuffield College, Oxford, and Van Noorden, of Hertford College, Oxford, sidesteps the need for a forecast of GDP. This approach provides a means of combining the intentions inquiry results with data concerning the development of investment that has become available since the last intentions survey was taken. Two such types of data are the figures of actual investment and the results from the question in the CBI Industrial Trends survey, 'Do you intend to authorise more or less capital expenditure in the next twelve months than you authorised in the last twelve months on plant and machinery?' The addition of these two variables is particularly useful at the times, i.e. February and June of the forecast year, when the latest CBI survey is more up-to-date than the most recent quantitative intentions inquiry.

The following are examples of equations which 'improve' on equation 3 (repeated for convenience as equation 6).

Equations	R ²	Std. Error (£ million)
6. $I_t = 148.8 + 0.791 F_{2,t}$ (0.068)	.951	54
7. $I_t = 103.7 + 0.808 F_{2,t} + 5.27 (B_{1,t} - B_{3,t-1})$ (0.051) (2.05)	.977	41
8. $I_t = 34.08 + 0.513 F_{2,t} + 3.348 B_{2,t}$ (0.120) (1.511) $-1.272 B_{1,t} + 1.726 I_{1,t}$ (1.464) (0.648)	.989	35

In addition to the notation used in the last table $B_{3,t-1}$ is the balance of 'mores' minus 'lesses' from the plant

and machinery authorisations question in the CBI survey of October of year $t-1$, $B_{1,t}$ relates to the February survey in year t and $B_{2,t}$ to the June survey in year t . $I_{1,t}$ is investment in the first quarter of year t .

The most apparently significant CBI variable in February is the change between the October and February balances (equation 7); for June the best fitting equation uses the June and February balances separately, and introduces actual manufacturing investment in the first quarter of year t (the latest period for which an actual figure is available). Using data on the path of actual

investment adds little to equations for other times of the year.

No conclusions as to the precise value of any regression method on the intentions survey can as yet be drawn. Certain approaches look promising and may prove useful when a few more observations are available though their use, at the moment, is very limited. Similar approaches to those described in this section are being developed for the separate industry groups. The Flemming and Van Noorden equations have also been extended to provide quarter by quarter forecasts of investment.

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