

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Short-Term Economic Forecasting

Volume Author/Editor:

Volume Publisher: UMI

Volume ISBN: 0-870-14172-4

Volume URL: <http://www.nber.org/books/unkn55-1>

Publication Date: 1955

Chapter Title: PLANT AND EQUIPMENT PROGRAMS AND THEIR REALIZATION

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Chapter URL: <http://www.nber.org/chapters/c2901>

Chapter pages in book: (p. 53 - 112)

PLANT AND EQUIPMENT PROGRAMS AND THEIR REALIZATION

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THE OFFICE OF BUSINESS ECONOMICS in the Department of Commerce and the Securities and Exchange Commission have, since World War II, been compiling data on anticipated as well as actual capital outlays by business. Early each quarter a sample of firms is asked to report plant and equipment expenditures for the quarter just past and planned expenditures for the current and for the succeeding quarter. Annually, at the year-end, these firms are also asked to report their anticipations of both capital outlays and sales for the following year.¹

This paper makes use of these data to analyze the differences between the plant and equipment expenditures planned by business and those actually made, in order to appraise the accuracy with which businessmen anticipate their capital outlays, as well as to cast some light on the nature of investment decisions. Attention will be given not only to the aggregate discrepancies between actual and anticipated expenditures but also to the discrepancies of individual companies. The latter will be analyzed in terms of the type of company involved, the size and form of investment, and the cyclical and other characteristics of the period covered.

For 1949 a special questionnaire was sent to a sample of companies asking them to indicate the reasons for differences between

When this paper was prepared, Mr. Friend was Chief of the Business Structure Division, Office of Business Economics, Department of Commerce. Mrs. Bronfenbrenner was on leave from the University of Illinois, which made funds available to assist in certain phases of this research. However, the authors alone are responsible for this report.

¹ The sample firms regularly responding in the survey consist of close to 1,000 registered corporations in all industries reporting each quarter to the Securities and Exchange Commission and more than 1,100 nonregistered manufacturing companies, noncorporate as well as corporate, reporting to the Office of Business Economics. On the basis of these reports totals are estimated for all nonagricultural business by major industry groups and are publicly released as a regular quarterly series.

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actual and anticipated expenditures.² The results of this survey provide, for the first time, fairly comprehensive direct information on the factors which motivate changes in business investment decisions.

Much of the analysis contained in this paper was presented earlier by the authors in the December 1950 issue of the *Survey of Current Business*. The main addition to the previous material lies in a more comprehensive analysis of the quarterly data, though some further study has been made of the discrepancies between annual anticipations and expenditures.

While it is already possible to draw certain tentative conclusions as to the usefulness of anticipatory data in projecting expenditures, it should be emphasized that the analysis is exploratory in scope and that the period covered does not include even one complete cycle. Moreover, the initial questionnaire relating to businessmen's reasons for departing from their investment plans was found to have a number of deficiencies which it is hoped can be corrected in future surveys of this type.

This paper was written in the summer of 1951; and while certain basic aspects of the analysis have been brought up to date, it was not generally feasible to incorporate 1951 and 1952 data.

A. Summary

It appears from the available evidence that anticipatory data on plant and equipment expenditures provide a useful tool for short-term projections of aggregate capital outlays both in dollar and, more particularly, in real terms. The most important reasons for this are, first, that investment decisions as reflected in business programs involve commitments some time in advance, and, second, that many of the factors which modify these decisions for individual firms tend to offset each other in the aggregate. For individual firms as well as for aggregates, projections of expenditures based on investment programs give better results on the average than alternative procedures.

Apart from random influences that offset each other in their effect on investment programs of different firms, there are cyclical factors which tend to make actual expenditures somewhat higher or lower than those anticipated, depending on the direction of

² A second questionnaire, relating to the reasons for differences between actual expenditures in 1949 and anticipated expenditures for 1950, was sent to another sample of firms.

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movement in economic conditions. In addition there is some tendency toward systematic understatement in the expenditure plans reported by business, largely as a result of the omission of many small items of capital outlay and the exclusion of items whose acquisition is uncertain. By making appropriate adjustments for these factors, projections based on anticipations can be improved, but additional data for other periods will be required before the magnitude of these adjustments can be determined at different stages of the cycle. The quarterly anticipations have provided a useful adjunct to the annual data in making adjustments for sharp changes in the economic situation.

There is a wide disparity in the accuracy with which individual businessmen anticipate their capital outlays, though in the aggregate the positive and negative discrepancies tend to cancel out. The degree of accuracy is related to many different factors, including size of firm, amount of investment, and age of existing assets. The largest firms are much more accurate in their anticipations than the smallest firms. Similarly, firms planning large-scale investment (relative to existing assets) perform better than those planning minor expenditures. It is also interesting to note that where existing plant and equipment is relatively old, firms are less likely substantially to curtail their planned expenditures.

A regression analysis relating deviations from investment programs to concurrent changes in the firm's operating experience and financial position did not disclose any statistically significant relationships in the postwar years. Changes in sales and earnings, whether these were anticipated or unanticipated, seem to have had only a slight effect in this period on the realization of annual investment programs for most firms. The same thing is true of changes in the firm's liquid position and of changes in the ratio of unfilled orders to sales, which might be taken as a measure of pressure on capacity as well as an indication of future earnings.

The absence of significant overall relationships between changes in sales or earnings and the deviations from investment plans is due in part to the unusual backlog of demand for capital goods during these years, but also reflects the complexity of factors affecting investment decisions. Even within this period, however, there were a number of firms for which movements in sales and earnings did exercise a decisive influence on investment programs.

The special questionnaire sent to a sample of companies showing large percentage differences between actual and anticipated ex-

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penditures in 1949 indicates that for these firms changes in the sales and in the earnings outlook accounted for nearly half of the cases where actual expenditures in 1949 were lower than those anticipated. These two factors were also given as reasons for increasing expenditures, but in a much smaller proportion of the cases. Of the many other factors resulting in downward revisions in planned outlays, probably the single most important was a change in working capital requirements.

The most significant factors listed as tending to make expenditures exceed plans were changes in the plant and equipment supply situation, changes in plant and equipment costs, competitive conditions, new products, and the failure to report small capital outlays and items whose acquisition was regarded as uncertain. These factors were mentioned as the principal motivating forces by 73 per cent of the firms with expenditures higher than planned, but by only 28 per cent of the firms with lower expenditures.

Though there were significant changes during 1949 in the availability of external financing, the questionnaire response indicates that this was not important in altering planned outlays on plant and equipment. Technological developments were only moderately more influential.

In general it appears that a sizable proportion of the changes in planned outlays on plant and equipment are attributable to factors whose impact is determined by cyclical influences, but there are other important factors which are largely independent of the level of business activity.

B. Role of Investment

It may be worth while to consider briefly the reasons for the great interest shown in the series on actual and anticipated plant and equipment expenditures, which in the few years since its inception has been widely used in the analysis of economic trends and has become one of the best-known business barometers.

The long-term role of investment in adding to the nation's stock of capital, in raising productivity, and in contributing a major share to the secular rise in the standard of living is of fundamental importance to the economy, and the OBE-SEC series provides the only comprehensive breakdown of such investment by industry group. However, even more attention in recent years has been given to the important and partly autonomous role of investment in the

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cyclical determination of income, and it is this aspect of investment activity with which the present paper is concerned.

Since capital outlays make considerable use of external financing and since they depend on business expectations, which in turn reflect many factors not closely connected with current income, it may be argued that these outlays exercise a more independent influence upon income than does consumption, the other major type of private expenditure. Furthermore, investment is more subject than consumption to large percentage variations from year to year, because of the postponability of capital expenditures, the volatile nature of certain elements affecting profit expectations, and, again, the importance of external financing.

Empirically, the movements in fixed business investments are found to correspond closely in timing and direction with such comprehensive measures of business activity as the gross national product. This in itself lends interest to the prediction of investment, even independently of the theoretical considerations indicated above.

The series on anticipated plant and equipment expenditures should be expected to provide some advance insight into the course of capital outlays, if only because the investment decisions reflected therein ordinarily involve commitments some time in advance of expenditures. These commitments may take the form of orders actually placed or of arrangements for raising funds if the project is to be financed externally. Moreover, the time and effort expended in the mechanics of arriving at (or altering) a decision contribute a certain resistance to change. However, investment decisions are obviously not completely binding, and various factors play a part in modifying them.

Investment programs are affected not only by the factors determining a firm's demand for capital goods, but also by those determining the supply of such goods. The supply situation is, however, less subject to the control of the individual firm.

On the demand side, investment decisions are largely a reflection of discounted profit expectations, with due regard to the uncertainty with which these expectations are held and due allowance for the expected cost of financing. At times, of course, funds may not be available on virtually any terms. The expected rate of return on investment, which in turn reflects estimated sales and fixed and variable costs, depends on many different variables, including the level of and the rate of change in sales, orders, utilization of capacity, prices and costs, and technological and institutional develop-

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ments. It is affected, though not completely determined, by past experience.

An investment decision in response to a given expected rate of return and cost of financing may further depend on various aspects of the financial condition of the business, including its liquidity and debt-equity position. It will also be influenced by other noneconomic as well as economic characteristics of the firm and period, in particular those affecting the degree of confidence or certainty with which the firm is able to appraise its prospects.

When actual investment of an individual firm deviates significantly from that planned, it may reflect a divergence between actual conditions and expectations with respect to the factors mentioned above as determining demand, or it may indicate that the supply situation is different from that anticipated. For firms in the aggregate it would be expected that many, though not all, of these reasons for differences between actual and anticipated expenditures would offset each other. An indication of the extent to which there is such offsetting is presented in the next section.

C. Aggregate Expenditures—Actual versus Anticipated

1. ANNUAL COMPARISON

Actual and anticipated aggregate expenditures on new plant and equipment for the years 1947-1952 are compared in table 1 and chart 1. The table gives the data by major industry groups as well as all-industry totals. It should be noted that the fixed investment of new firms is not included in these aggregates in the period 1947-1950, although it is contained in the revised series used for 1951 and 1952.

It is evident that the degree of accuracy with which businessmen have anticipated their actual outlays in the past has varied considerably both by industries and, more importantly, by years. In 1947—the first calendar year for which planned outlays were reported—actual expenditures were 16 per cent higher than those anticipated at the beginning of the year, while in 1948 and 1949 the differences were reduced to 3 per cent and 1 per cent, respectively. In 1950 actual expenditures were again considerably above those anticipated, the difference amounting to 15 per cent. In 1951 and 1952 the deviations from program were very small, amounting to 2 per cent and 1 per cent, respectively. Some possible explana-

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TABLE 1
Business Expenditures for New Plant and Equipment, Actual and Anticipated, 1947-1952
(billions of dollars)

Industry	1947		1948		1949		1950		1951 ^a		1952 ^a	
	Actual	Anticipated	Actual	Anticipated	Actual	Anticipated	Actual	Anticipated	Actual	Anticipated	Actual	Anticipated
All industries	13.89	16.18	18.61	19.23	18.31	18.12	16.09	18.56	25.02 ^b	24.53 ^b	25.23 ^b	25.52 ^b
Manufacturing	6.17	7.46	7.76	8.34	7.24	7.25	6.74	8.22	11.12	10.85	11.92	11.99
Mining	0.61	0.69	0.69	0.80	0.82	0.74	0.65	0.68	0.93	0.93	0.99	0.88
Railroads	1.00	0.91	1.53	1.32	1.45	1.35	0.93	1.14	1.48	1.47	1.47	1.39
Other transportation Electric and gas utilities	^c	^c	0.78	0.70	0.65	0.52	0.35	0.44	0.35 ^b	0.38 ^b	0.45 ^b	0.43 ^b
Commercial and miscellaneous ^d	1.69	1.90	2.30	2.68	3.13	3.14	2.94	3.17	3.70	3.66	3.96	3.84
	4.42 ^c	5.22 ^c	5.56	5.40	5.01	5.12	4.48	4.92	7.45	7.24	6.44	6.99

^a The figures for 1951 and 1952 are based on revised series. For a description of the revision see Lawrence Bridge, "Capital Expenditures by Manufacturing Industries in the Postwar Period," *Survey of Current Business* (Department of Commerce), December 1951, and Lawrence Bridge and Vito Natrella, "Capital Expenditures by Non-manufacturing Industries," *Survey of Current Business*, August 1952. Revised anticipations were obtained by applying the anticipated relative change from the previous year to the revised figures for the previous year, for each manufacturing and each non-manufacturing industry.

^b Investment in 1951 and 1952 differs from the most recent OBE-SEC figures in the omission of expenditures in the fields of pipelines, trucking, and other motor transport, which were not reported prior to 1951 and for which 1951 and 1952 anticipations are not available.

^c Other transportation is included in the commercial and miscellaneous group in 1947.

^d Data include trade, service, communications, construction, and finance.

Sources: Office of Business Economics, Department of Commerce; Securities and Exchange Commission. Data exclude expenditures of agricultural business and outlays charged to current account. Anticipated expenditures were reported by business between mid-January and mid-March of the year to which they refer.

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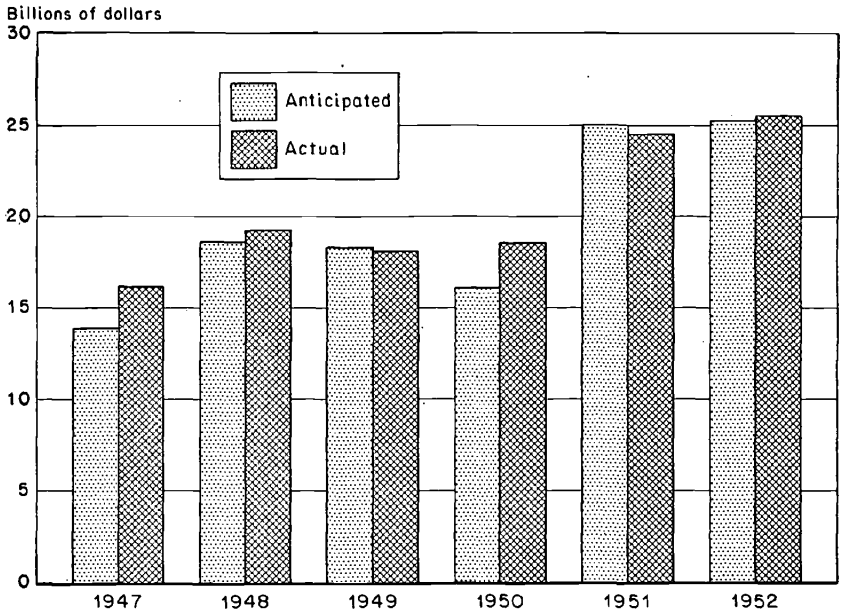


Chart 1. Business Expenditures for New Plant and Equipment, Actual and Anticipated, 1947-1952

tions for the sizable discrepancies observed in 1947 and 1950 will be considered later.

One obvious test of the usefulness of anticipatory data lies in a comparison with the results obtained by other procedures. The table below shows the per cent deviations of actual expenditures from various types of projections:

	1947	1948	1949	1950	1951	1952
Per cent deviation of actual expenditures from:						
Anticipated expenditures	16	3	-1	15	-2	1
Actual expenditures of previous year	34	19	-6	2	25	4
Actual expenditures of first quarter of year, at seasonally adjusted annual rates	16	5	-9	13	8	-1

The projection of expenditures on the basis of anticipated outlays gives better results, in general, than are obtained by extending current outlays, the only real exception being 1950. While the antici-

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patory data do not offer an outstanding improvement over projections based on actual first-quarter expenditures, it should be remembered that they are available a full quarter earlier.

Anticipatory data were also found to be more reliable than any usual extrapolation of past data, such as adjusting current expenditures by the rate of change in such expenditures, or estimating prospective outlays from lagged profits. For example, the 1919-1941 linear regression between plant and equipment expenditures and corporate profits after taxes, lagged six months, would underestimate expenditures by more than 40 per cent on the average if applied in the postwar years. Obviously, it may be possible to stipulate some mechanical procedure for extrapolating past data which would perform better than anticipated outlays in projecting expenditures for the postwar years, but to the knowledge of the authors no procedure suggested independently of the actual expenditure figures achieves this result.

The fact remains, however, that the accuracy of investment projections based on anticipated outlays is not very satisfactory in 1947 and 1950. In 1947 this result may be explainable in part by the newness of the survey and in part by an unanticipated easing of supplies and elimination of restrictions on nonresidential construction; in 1950 the Korean war—which could not be foreseen by businessmen at the beginning of the year—played a major, though not exclusive, role in the change in the investment picture.

Probably the most encouraging aspect of the comparative data cited above is the indicated ability of the anticipated expenditures to project correctly a downward movement in actual outlays at the cyclical turning point which occurred at the beginning of 1949. A number of projection procedures give satisfactory results so long as there is no substantial change in economic trends, but the real test of a projection lies in its performance when changes do occur. Moreover, in the first quarter of 1948 businessmen correctly anticipated an increase in expenditures in spite of the weakening in prices and orders at that time.³ In 1948, 1949, and 1951 virtually every industry was able to indicate whether its outlays would rise or decline during the year—the one exception being a rather small group.

³ Similarly, a special survey early in 1945 gave evidence that businessmen planned to make large capital outlays in the first postwar year, at a time when there was considerable uncertainty about the immediate postwar trend and the extent of the expected decline in business activity. See D. Stevens Wilson, "Planned Capital Outlays by Manufacturers," *Survey of Current Business* (Department of Commerce), June 1945, pp. 5-9.

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2. QUARTERLY COMPARISON

The quarterly anticipations provide a useful adjunct to the annual data, particularly when the economic situation changes rapidly. Thus in 1950 they depicted in advance the substantial upsurge in capital outlays in the second half of the year.

Since businessmen are requested quarterly to supply their estimated outlays for the current as well as for the following quarter, there are really two series of anticipated quarterly expenditures—the first anticipations, reported, generally, somewhat more than a full quarter in advance, and the second anticipations, reported in the early weeks of the quarter to which they refer. Except when sudden changes occur in the economic situation, neither set of quarterly anticipations gives appreciably more accurate approximations of aggregate expenditures than do projections for an entire year. Moreover, when tested against the other methods of projecting outlays, the quarterly anticipations do not fare much better than do the annual anticipations. The second series of quarterly anticipations furnishes somewhat better results than the first set.

The performance of the quarterly anticipations may be considerably improved, however, by introducing a seasonal correction. It appears, for example, that businessmen fail to allow fully for the seasonal rise in plant and equipment expenditures which occurs in the fourth quarter and which apparently reflects the concentration of certain charges to capital accounts in the end-of-year statements. Thus there is a systematic tendency to underestimate expenditures in this quarter, and improved results may be obtained if anticipations are adjusted upward by a suitable seasonal factor.

Seasonal adjustments of the anticipatory data, based on systematic tendencies to under- or overestimate in particular quarters, have been carried out for manufacturing, though not for the all-industry total. When the anticipatory data are seasonally corrected, the second anticipation appears to yield significantly more accurate projections than either the first anticipation or a simple extension of seasonally adjusted current outlays.

When the performance of the seasonally adjusted anticipatory series is appraised on the basis of regression analysis, a correlation of 0.96 is obtained between actual expenditures and the second anticipation, compared with 0.85 when the seasonally adjusted actual expenditures of the previous quarter are used as the explanatory variable. The first anticipation shows a systematic tendency to un-

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derestimate by about 10 per cent, but when this is allowed for, its predictive performance is relatively good, as evidenced by a correlation of 0.92 with actual expenditures.⁴

3. REASONS FOR DISCREPANCIES

Both annual and quarterly surveys suggest that movements in capital goods prices are an important factor in departures from projected dollar expenditures on plant and equipment. Thus the price rises for capital goods might have been responsible for as much as half in 1947 and one-third in 1950 of the discrepancies between actual and anticipated expenditures for those years. In 1948 and 1949 the price movements were again in the same direction as, but proportionately even larger than, the discrepancies between actual and anticipated expenditures. On a quarterly basis, businessmen in their first anticipations tended to overestimate their outlays during the few quarters in which prices declined and to underestimate their outlays in other periods. It is quite possible, therefore, that anticipated outlays to a considerable extent reflect a planned physical volume of investment valued at prevailing prices, and hence do not sufficiently take account of price factors.

There are two other sets of factors, apart from random miscalculations, which may cause actual expenditures to diverge from expectations. First, changes in economic conditions obviously have some effect on investment plans totally aside from their influence on the prices of capital goods. Second, even if economic conditions are assumed to conform to expectations, some systematic understatement might be expected in anticipated fixed-capital outlays reported for any period well in the future, since to the extent that businessmen are uncertain about their plans they are probably more likely to omit than to include their more tentative projects. Thus the greater understatement of actual expenditures in the second half of the year than in the first half, as indicated by the quarterly and annual anticipations reported at the beginning of the year, may be due at least in part to the fact that future programs are more incomplete than near-term budgets. Further, discrepancies between actual

⁴ Letting x_1 be actual expenditures, x_2 and x_3 the seasonally adjusted second and first anticipations, and x_4 actual expenditures in the previous quarter, seasonally adjusted (all in millions of dollars), the following regressions are obtained:

$$\begin{aligned}x_1 &= -30 + 0.999 x_2 \\x_1 &= -40 + 1.100 x_3 \\x_1 &= 120 + 0.977 x_4\end{aligned}$$

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and anticipated expenditures may reflect not only modification of investment plans by individual companies but also differences in the samples used in deriving aggregate estimates, since not all firms reporting actual outlays also reported anticipated outlays.

D. Individual Company Expenditures—Actual versus Anticipated

The following sections compare actual and anticipated expenditures on an individual company basis to obtain information which cannot be derived from the aggregate figures. The analysis will be confined for the most part to data for manufacturing firms, since the sample of respondents is largest for this group.

The accuracy with which individual firms anticipate their plant and equipment expenditures is of interest from several points of view. First, it is important to determine whether the relatively close agreement between expenditures and anticipations in the aggregate is the result of accurate planning by individual firms or whether it relies heavily on offsets between large positive and negative errors. In the latter case the reliability of the predictions over time will depend on the stability of the forces which bring about a balance between positive and negative discrepancies. Second, an analysis of the individual discrepancies makes it possible to determine whether anticipations are more accurate for certain groups of firms and certain types of investment than for others, and this may lead to improvement of projection procedures. Third, any information regarding the firmness of individual companies' investment programs contributes to knowledge of the behavior of the firm and is useful in the study of investment decisions.

1. PERCENTAGE DEVIATIONS FROM ANTICIPATED INVESTMENT

Table 2 and chart 2 show the frequency distribution of per cent deviations of annual expenditures from anticipations for 941 manufacturing firms which reported both figures for 1949.⁵ Unless otherwise indicated, figures for individual firms throughout this section will include expenditures for used as well as new plant and equipment, although the aggregate figures refer to new only. In 1949, purchases of used capital goods constituted a very small proportion

⁵ This includes all of the reporting firms for which either actual or anticipated expenditures exceeded \$10,000. Where smaller amounts than this were involved it was felt that the per cent change might be a misleading measure of the accuracy of the anticipations.

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TABLE 2

Frequency Distribution of Percentage Deviations of Actual from Anticipated Expenditures for Plant and Equipment, Manufacturing Firms, 1949

<i>Per Cent Change of Actual from Anticipated Expenditures</i>	<i>Number of Firms</i>	<i>Per Cent</i>
-100 to -80	28	3.0
-79.9 to -60	33	3.5
-59.9 to -40	71	7.5
-39.9 to -20	118	12.5
-19.9 to 0	138	14.7
0 to 19.9	120	12.8
20 to 39.9	109	11.6
40 to 59.9	64	6.8
60 to 79.9	35	3.7
80 to 99.9	27	2.9
100 to 119.9	34	3.6
120 to 139.9	14	1.5
140 to 159.9	15	1.6
160 to 179.9	15	1.6
180 to 199.9	7	0.7
200 and over	113	12.0
Total	941	100.0

Sources: Office of Business Economics, Department of Commerce; Securities and Exchange Commission. Table includes all reporting firms for which either actual or anticipated expenditures exceeded \$10,000. Anticipated expenditures were reported by business between mid-January and mid-March 1949.

of the total. As elsewhere in this section, similar results have been obtained for 1948 and 1947, but only the 1949 figures are presented. The only noteworthy difference in the earlier years occurs in 1947, when the distribution is shifted to the right, indicating a stronger tendency for expenditures to exceed anticipations.

A considerable degree of dispersion is indicated by the figures in table 2. Only a little more than one-fourth of the firms came within 20 per cent of their anticipations, while over one-fifth spent more than twice, and one-tenth spent less than half, the amount planned. Thus such accuracy as the aggregate projections achieve appears to depend on offsets between underestimates and overestimates and on the fact (to be discussed later) that large firms and firms projecting major capital outlays performed substantially better than the average (see tables 4 and 7).⁶

⁶ Where asset data were available it was found that firms with total assets exceeding \$50 million constituted only 6 per cent of the firms in the extreme intervals (i.e. with expenditures less than half or more than twice the amount

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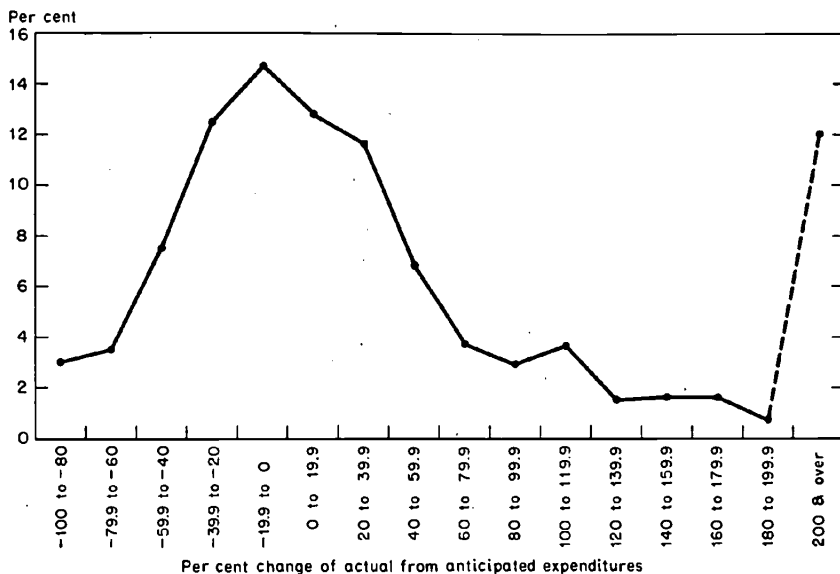


Chart 2. Frequency Distribution of Percentage Deviations of Actual from Anticipated Expenditures for Plant and Equipment, Manufacturing Firms, 1949

Even for individual firms, however, the figures in table 2 do not give a complete picture of the accuracy of anticipations. In many cases a large percentage discrepancy between actual and anticipated investment may represent an expenditure which is very minor from the point of view of the firm in question. Thus when the discrepancy is related to the firm's gross fixed assets, it is not ordinarily found to constitute a substantial percentage of this base. For the 513 reporting firms for which information on gross fixed assets was readily available almost half of the discrepancies amounted to less than 2 per cent of gross fixed assets, while over 70 per cent amounted to less than 4 per cent. In only 7 per cent of the cases did the discrepancy exceed 10 per cent of gross fixed assets.

As in the case of the aggregate figures, projections based on anticipations were found to perform better than projections based on extrapolation of past data. This is true whether dollar discrepancies or per cent discrepancies between actual expenditures and projections are considered.

planned), compared with 21 per cent of those in other intervals. Firms with planned expenditures exceeding 10 per cent of gross fixed assets constituted 17 per cent of the firms in the extreme intervals, compared with 33 per cent of those in other intervals.

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Table 3 shows a two-way frequency distribution of the percentage deviations of actual from anticipated expenditures compared with the percentage deviations for the same companies of actual expenditures from outlays in the previous year.

TABLE 3

Two-Way Frequency Distribution of Percentage Deviations of Actual from Anticipated Expenditures for Plant and Equipment and from Actual Expenditures in the Previous Year, Manufacturing Firms, 1949
(number of firms)

<i>Per Cent Change of Actual Expenditures from Anticipations</i>	<i>Per Cent Change in Actual Expenditures from Previous Year</i>					<i>Total</i>
	<i>-50.0 or Under</i>	<i>-49.9 to -20.0</i>	<i>-19.9 to 19.9</i>	<i>20 to 99.9</i>	<i>100 or Over</i>	
-50.0 or under	21	6	0	0	1	28
-49.9 to -20.0	34	27	10	5	2	78
-19.9 to 19.9	30	42	41	21	9	143
20.0 to 99.9	24	25	27	30	14	120
100.0 or over	13	10	22	14	9	68
Total	122	110	100	70	35	437

Sources: Office of Business Economics, Department of Commerce; Securities and Exchange Commission.

The performance of the anticipatory data is clearly superior not only in terms of the frequency with which relatively accurate projections are obtained but also in terms of the greater symmetry of the distribution, with underestimates and overestimates tending to balance each other. The relative frequency of accurate anticipations is greatest when there was little change in actual expenditures from the previous year. The greatest symmetry occurs when actual expenditures were lower than in the previous year. In other words, when a decline in actual expenditures occurred, firms were about as likely to underestimate as to overestimate this decline in making their anticipations, but when expenditures rose, the increase was not in general foreseen and underestimates of actual expenditures were the rule.

If in the above comparison expenditures in the previous year are replaced by expenditures in the first quarter of the current year or in the fourth quarter of the previous year, at seasonally adjusted annual rates, the results are found to favor the anticipatory data even more strongly. It appears that for individual companies, out-

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lays for the entire previous year provide a definitely more satisfactory basis for projection than do current quarterly expenditures, at least so long as seasonal factors for the individual firms are not available and the overall seasonal adjustment, which is quite inappropriate in certain cases, must be applied.

When extrapolations based on current outlays are compared with anticipatory data on the basis of dollar variations from actual expenditures, the performance of the latter is again superior. For example, the anticipated expenditures came within \$20,000 of the actual outlay in one-third of the cases, while projections based on the previous year's expenditures came this close in only one-fourth of the cases. Similarly, the discrepancies from anticipations exceeded \$1 million in only 8 per cent of the cases, compared with 12 per cent when the alternative projection was used. The tendency for positive and negative discrepancies to balance out is again found to be much stronger for the projections based on anticipatory data.

The quarterly plant and equipment data were studied along the same lines as were the annual figures. This analysis was carried out primarily for the third quarter of 1949 and covers those of the firms studied in the annual analysis which reported full information for this particular quarter. In addition small sample checks were made for several other quarters in the postwar period.

The frequency distribution of quarterly per cent deviations from second anticipations is very similar to the distribution of annual per cent changes shown in table 2 and chart 2. Of the 679 firms included, slightly more than one-fourth came within 20 per cent of their second anticipation, while one-fifth spent more than twice, and one-sixth less than half, the amount planned.

When the first anticipation is considered, the distribution shows somewhat more dispersion and in particular a larger number of cases in which expenditures were very substantially underestimated. Between one-fourth and one-fifth of the companies came within 20 per cent of their first anticipation, while 27 per cent spent more than twice, and 17 per cent less than half, as much as anticipated.

The inaccuracies involved in the quarterly anticipations—particularly the second set—may be due in considerable degree to difficulties in programming the deliveries of, and consequently the outlays on, capital goods already on order. However, the attempts made to test this hypothesis proved inconclusive.

When the predictive performance of the quarterly anticipations is compared with that of projections based on the seasonally ad-

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justed actual expenditures in the previous quarter in a two-way table similar to table 3, the results are somewhat in favor of the anticipations, though the difference is not so marked as for the annual data and is less obvious for the first than for the second anticipation. The greater tendency of under- and overestimates to balance out in the case of projections based on the anticipatory data is again very evident.

2. TENDENCY TO UNDERESTIMATE EXPENDITURES

As indicated in table 2, substantially more than half (59 per cent) of the firms underestimated their annual expenditures. Since 1949 was a year of moderate decline in economic activity, in which about three-fifths of the reporting firms fell short of their sales anticipations, the understatement of expenditures by a majority of firms in this year (as well as in previous years) indicates a systematic tendency in this direction. This will be elaborated in a subsequent section dealing with the reasons given by businessmen for departures from their investment programs.

Despite the prevalence of cases in which individual firms exceeded their anticipations, actual investment for all firms was slightly smaller than the aggregate projection. This is primarily due to the fact that firms with negative discrepancies represent a larger proportion of aggregate investment than their number indicates; for example, the number of negative discrepancies exceeding \$1 million is significantly larger than the number of positive discrepancies of this size.⁷

In 1947 the tendency for individual firms to understate their investment programs was much more pronounced than in 1949 or 1948, reflecting the differential effect in these years of movements in capital-goods prices as well as in other economic variables. It is interesting to note that large firms and firms anticipating major expenditures showed no tendency to exceed their investment programs in either 1949 or 1948 and less tendency than other firms to do so in 1947.

With regard to the quarterly data it appears that the first anticipation generally understates actual expenditures, but except in

⁷ Some difficulty may also arise from the fact, mentioned earlier, that the total figure for actual investment is based on a slightly different group of firms from those on which the figure for anticipated investment is based, since some firms report actual expenditures but fail to report anticipations.

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1947 there is no evidence of systematic underestimation in the second anticipation.

3. INFLUENCE OF COMPANY CHARACTERISTICS

An attempt was made to determine which characteristics of the individual company appear to affect the accuracy with which investment is anticipated. The most obvious possibilities are size and industry, both of which were tested.

a. Breakdown by size. Table 4 and chart 3 give a breakdown by asset size of the per cent changes of annual expenditures from anticipations for those firms for which data on total assets were readily available. Firms with total assets exceeding \$50 million were

TABLE 4
Frequency Distribution of Percentage Deviations of Actual from Anticipated Expenditures for Plant and Equipment, Manufacturing Firms, by Size of Assets, 1949

Per Cent Change of Actual from Anticipated Expenditures	Total Assets					
	Under \$10,000,000		\$10,000,000 to \$50,000,000		Over \$50,000,000	
	Number of Firms	Per Cent	Number of Firms	Per Cent	Number of Firms	Per Cent
-100 to -80	1	0.5	0	0.0	0	0.0
-79.9 to -60	10	4.5	6	2.8	1	1.1
-59.9 to -40	25	11.3	14	6.6	7	7.4
-39.9 to -20	25	11.3	30	14.1	16	17.0
-19.9 to 0	27	12.2	34	16.0	30	31.9
0 to 19.9	21	9.5	37	17.4	15	16.0
20 to 39.9	25	11.3	36	16.9	9	9.6
40 to 59.9	17	7.7	18	8.5	7	7.4
60 to 79.9	9	4.1	7	3.3	2	2.1
80 to 99.9	8	3.6	5	2.3	3	3.2
100 to 119.9	11	5.0	6	2.8	1	1.1
120 to 139.9	4	1.8	2	0.9	0	0.0
140 to 159.9	3	1.4	4	1.9	0	0.0
160 to 179.9	4	1.8	0	0.0	0	0.0
180 to 199.9	4	1.8	1	0.5	1	1.1
200 and over	27	12.2	13	6.1	2	2.1
Total	221	100.0	213	100.0	94	100.0

Sources: Department of Commerce, Office of Business Economics; Securities and Exchange Commission. Includes all reporting firms for which either actual or anticipated expenditures exceeded \$10,000 and for which information on total assets at the end of 1948 was readily available. Anticipated expenditures were reported by business between mid-January and mid-March 1949.

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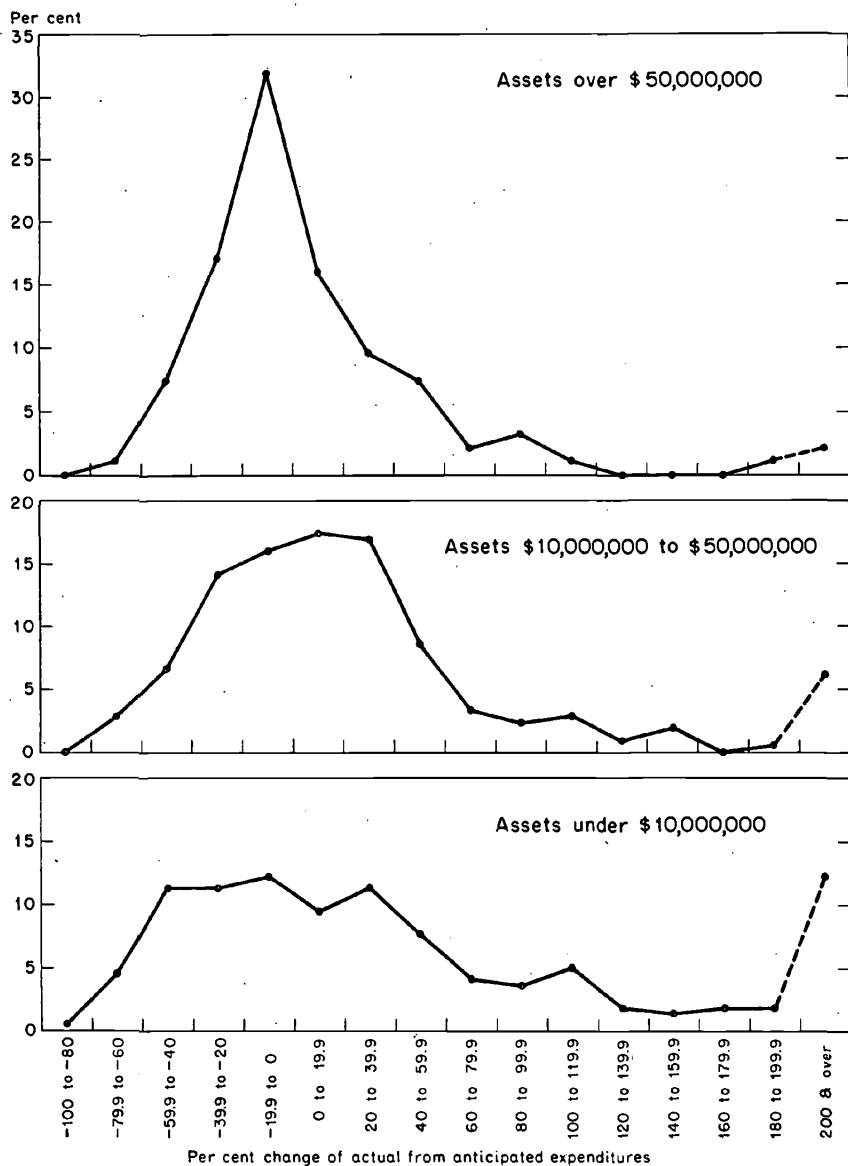


Chart 3. Frequency Distribution of Percentage Deviations of Actual from Anticipated Expenditures for Plant and Equipment, Manufacturing Firms, by Size of Assets, 1949

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considerably more accurate in their anticipations than firms with assets between \$10 million and \$50 million; and these in turn were more accurate than firms with assets less than \$10 million.

There are a number of reasons why such a result might be expected. In the first place the expenditure plans of a large firm ordinarily involve a number of separate projects. To the extent that the discrepancies between expenditures and anticipations for these individual projects are random in nature there will already be cancellation of positive against negative discrepancies within the firm.

Second, there are certain expenditures which occur from time to time but which cannot be specifically foreseen in advance—for example, the unexpected breakdown of a piece of machinery. The large firm will experience a number of such incidents in any given year and, although unable to predict the individual items of expenditure, will be in a position to make some blanket allowance for them in advance. The small firm, which has few such expenditures in a single year, frequently will not attempt to allow for them in advance, giving rise to a definite bias in the direction of underestimation. This argument as to differences in planning behavior between large and small firms derives some empirical support from the fact that the largest size group is the only one which showed no tendency to underestimate expenditures in 1949.

Third, a large organization must make its plans further in advance than a smaller firm. The decision-making process is more formalized; a capital budget is more likely to exist. The number of administrative levels which must give approval is larger. These factors contribute not only to the making of decisions well in advance of actual expenditure but also to the inflexibility of plans when made; and the effect is to reduce the likelihood of large deviations from anticipations.

In addition to influencing the accuracy of anticipations, size is also found to affect the extent to which the anticipatory data represent an improvement over projections based on past outlays. This may be seen in table 5, which shows a size breakdown of the frequency distributions of per cent deviations of actual expenditures both from anticipations and from actual investment in the previous year. The anticipatory data provide a telling improvement over extrapolation for the largest firms, substantial improvement for the medium-sized firms, and no significant improvement for the smallest firms. It may be noted that the concentration of overestimates obtained for the smallest companies in extrapolating previous-year

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TABLE 5
 Comparative Accuracy of Projections of Plant and Equipment Expenditures Based on Anticipated Expenditures
 and on Actual Outlays in the Previous Year, Manufacturing Firms, by Size of Assets, 1949
 (number of firms)

Per Cent Change from Projection	Total Assets under \$10,000,000		Total Assets, \$10,000,000 to \$50,000,000		Total Assets over \$50,000,000	
	Anticipated Expenditures	Expenditures in Previous Year	Anticipated Expenditures	Expenditures in Previous Year	Anticipated Expenditures	Expenditures in Previous Year
-50.0 or less	15	56	11	53	2	13
-49.9 to -20.0	34	40	28	45	16	25
-19.9 to 19.9	39	34	61	40	43	26
20.0 to 99.9	45	28	57	27	18	15
100.0 or more	45	20	21	13	2	2
Total	178	178	178	178	81	81

Projection Based on:

Sources: Office of Business Economics, Department of Commerce; Securities and Exchange Commission.

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expenditures reflects the cyclical movement in this period, while the concentration of underestimates obtained from anticipations reflects the systematic tendency of the smaller companies to understate expenditures.

A size breakdown of the quarterly data also shows the superior ability of the large firms to anticipate their expenditures accurately. The superiority of anticipatory data over projections based on current outlays is again significant for the large and medium-sized firms, though not for the smallest size group.

b. Breakdown by industry. A breakdown of the annual data was also made by industry groups within manufacturing. Seven such groups—food, textiles, paper, chemicals, iron and steel, electrical machinery, and machinery other than electrical—were sufficiently well represented to permit separate analysis.

Of the industries studied, textiles (with 84 firms), paper (with 55 firms), chemicals (with 74 firms), and iron and steel (with 137 firms) gave the best performance in terms of per cent discrepancies from anticipations. Only food (with 95 firms) and machinery other than electrical (with 121 firms) showed as much dispersion as, or more dispersion than, the total distribution.

In contrast to the general pattern, chemicals, iron and steel, and machinery other than electrical indicated no tendency to exceed investment plans. In the first two cases this reflects the presence of a high proportion of the very large firms, which showed a slight tendency to spend less than anticipated. In the third case the tendency to exceed investment plans was apparently offset by the relatively sizable decline in sales and profits in 1949. Food and textiles—which were characterized by comparatively small firms and in the case of food by relatively good profit experience—showed a very large predominance of positive discrepancies.

Apart from the effect of size of firm and other factors found to be influential in their own right, there is no evidence that industry characteristics (within the manufacturing sector) were associated with differences in the accuracy with which expenditures were anticipated.

4. INFLUENCE OF TYPE OF INVESTMENT

The accuracy with which expenditure is anticipated may also depend on the nature of the intended investment. Significant differences were found in this respect between investment in plant and in equipment and between expenditures of major and of minor pro-

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portions (relative to gross fixed assets). There are probably further differences in behavior depending on whether expansion, cost-cutting, or replacement is primarily involved, but no information was available on which to make such distinctions.

a. *Plant versus equipment.* Table 6 shows the per cent deviations of actual from anticipated annual expenditures for new plant and

TABLE 6

Frequency Distribution of Percentage Deviations of Actual from Anticipated Expenditures, Plant versus Equipment, Manufacturing Firms, 1949

Per Cent Change of Actual from Anticipated Expenditures	New Plant		New Equipment	
	Number of Firms	Per Cent	Number of Firms	Per Cent
-100 to -80	46	10.8	34	4.5
-79.9 to -60	26	6.1	32	4.2
-59.9 to -40	28	6.6	59	7.8
-39.9 to -20	41	9.6	88	11.6
-19.9 to 0	37	8.7	103	13.6
0 to 19.9	33	7.8	92	12.1
20 to 39.9	39	9.2	72	9.5
40 to 59.9	15	3.5	42	5.5
60 to 79.9	12	2.8	33	4.3
80 to 99.9	12	2.8	35	4.6
100 to 119.9	10	2.4	23	3.0
120 to 139.9	6	1.4	18	2.4
140 to 159.9	9	2.1	10	1.3
160 to 179.9	5	1.2	13	1.7
180 to 199.9	5	1.2	4	0.5
200 and over	101	23.8	102	13.4
Total	425	100.0	760	100.0

Sources: Office of Business Economics, Department of Commerce; Securities and Exchange Commission. Included in the analysis of plant expenditures are all reporting firms for which either actual or anticipated expenditures on plant exceeded \$10,000. A similar rule was followed with respect to equipment. Anticipated expenditures were reported by business between mid-January and mid-March 1949.

new equipment taken separately.⁸ The distribution relating to equipment follows very closely the pattern for plant and equipment combined.

⁸ The breakdown between plant and equipment is available for new capital goods only. The number of firms is substantially smaller than for plant and equipment combined, since many firms do not report plant and equipment separately. Cases in which both anticipated and actual expenditures were less than \$10,000 are again excluded. It was not feasible to treat plant and equipment separately for any year except 1949.

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Anticipations of expenditure for plant, however, are definitely less accurate than for equipment, in spite of the fact that construction requires relatively firm commitments for a considerable period in advance of expenditure. This may be partly explained by the fact that investment in plant is normally a much more discrete process than investment in equipment. For many firms the decision is either to build some particular structure involving a substantial capital outlay, or not to build it, with no half-way measures feasible. Thus when changes in plans occur, they are likely to be big, and it is not surprising that a considerable proportion of cases fall in the extreme intervals of the frequency distribution. Almost a third of the firms spent more than twice as much on plant as anticipated, while over a fifth spent less than half the amount planned.

The large number of firms exceeding plans by more than 100 per cent may also reflect the fact that in any given year many firms plan virtually no plant expenditure. Then if minor plant repairs unexpectedly become necessary, the resulting small expenditures rank large percentagewise. It is pointed out below that plant anticipations are substantially less accurate for small programs than for large. For the quarterly data as well as the annual it was found that expenditures for new plant were much less likely to be accurately anticipated than outlays for new equipment.

b. Scale of investment. Table 7 shows a breakdown between firms which planned investment on a major scale—exceeding 10 per cent of gross fixed assets—and those which anticipated relatively minor expenditures. Anticipations are considerably more accurate in the former case: 43 per cent of the firms spent within 20 per cent of anticipations, while only 12 per cent spent less than half or more than twice as much as anticipated. When smaller expenditures were planned, 26 per cent fell in the range of high accuracy, and 26 per cent in the extreme intervals. Within the group of firms anticipating minor outlays, the least satisfactory results were obtained when the investment program amounted to less than 5 per cent of fixed assets.⁹

These results suggest that major investments may be more carefully planned than others, for longer periods in advance. There is,

⁹ It is interesting that the relevant variable appears to be the size of the program relative to the existing assets of the firm, rather than the absolute size of the program. It was found that, within a given dollar range, the major or moderate programs of small or medium-sized firms came closer to actual expenditures than did the small programs of large firms—in spite of the generally higher accuracy of the large firms.

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TABLE 7

Frequency Distribution of Percentage Changes in Investment Plans, Classified by Ratio of Anticipated Expenditures to Gross Fixed Assets, Manufacturing Firms, 1949

<i>Per Cent Change of Actual from Anticipated Expenditures</i>	<i>Anticipated Expenditure Relative to Gross Fixed Assets</i>			
	<i>Greater than 10 Per Cent</i>		<i>Less than 10 Per Cent</i>	
	<i>Number of Firms</i>	<i>Per Cent</i>	<i>Number of Firms</i>	<i>Per Cent</i>
-100 to -80	0	0.0	0	0.0
-79.9 to -60	4	2.6	12	3.3
-59.9 to -40	16	10.5	28	7.8
-39.9 to -20	24	15.7	45	12.5
-19.9 to 0	34	22.2	55	15.3
0 to 19.9	32	20.9	40	11.1
20 to 39.9	20	13.1	49	13.6
40 to 59.9	9	5.9	32	8.9
60 to 79.9	3	2.0	15	4.2
80 to 99.9	2	1.3	14	3.9
100 to 119.9	4	2.6	13	3.6
120 to 139.9	1	0.7	5	1.4
140 to 159.9	0	0.0	7	1.9
160 to 179.9	1	0.7	2	0.6
180 to 199.9	1	0.7	5	1.4
200 and over	2	1.3	38	10.6
Total	153	100.0	360	100.0

Sources: Office of Business Economics, Department of Commerce; Securities and Exchange Commission. Table includes all reporting firms for which either actual or anticipated expenditures exceeded \$10,000 and for which assets data at the end of 1948 were readily available. Anticipated expenditures were reported by business between mid-January and mid-March 1949.

of course, considerable correlation between the asset size of firms and the scale of anticipated investment relative to gross fixed assets; but even within asset-size groups anticipations were found to be more accurate when major expenditures were planned. For firms with assets over \$50 million 54 per cent of those projecting major expenditures fell within the range of high accuracy, compared with 40 per cent of those planning minor expenditures; and comparable differences occurred in the other two size groups. In all size groups a smaller proportion of firms fell in the extreme intervals when major rather than minor expenditures were projected; and for all but the largest firms the difference was substantial.

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For firms projecting minor expenditures the deviations from plan, in addition to being relatively large, are apparently nonrandom in nature. These firms showed a systematic tendency toward investing more than was planned, while firms anticipating major capital outlays showed little evidence of such a tendency, at least in 1949. The same pattern held true within asset-size groups for small and medium-sized firms, though large firms showed no tendency to exceed projected expenditures even when these were small relative to existing assets.

When plant and equipment expenditures are considered separately for firms with major and firms with minor investment programs, it appears that the accuracy of equipment anticipations increases very little when major outlays are planned, but the accuracy of plant anticipations improves strikingly. When major programs are involved, plant expenditures are almost as accurately anticipated as those for equipment, though they continue to show a significantly higher frequency of cases in which outlays were more than twice or less than half as much as planned.¹⁰

A comparison of investment anticipations with projections based on outlays in the previous year for firms planning different scales of investment shows that for firms with programs exceeding 10 per cent of gross fixed assets the anticipatory data are notably more accurate. The superiority of anticipations for firms planning investment between 5 and 10 per cent of gross fixed assets is almost as great, but there is little difference in accuracy between the two methods of projection when outlays less than 5 per cent of gross fixed assets are planned.

On a quarterly basis a somewhat different picture emerges when the performance of second anticipations is examined. Anticipations are again more accurate for firms planning investment on a major or moderate scale—that is, exceeding 2.5 per cent or in the range between 1 and 2.5 per cent of gross fixed assets, respectively—than for firms with relatively small programs. However, in this instance there is little difference between firms planning major and those planning moderate capital outlays; and, more important, the antici-

¹⁰ In studying the effect of scale of planned investment upon the accuracy of anticipated plant expenditures, it would be somewhat more relevant to classify firms by size of planned expenditure on plant (rather than by size of total investment program) relative to existing fixed assets. However, such a test would be considerably more difficult to make than the one actually carried out and should yield similar results.

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pations of firms with programs of intermediate size show greater improvement in accuracy over projections based on seasonally adjusted expenditures in the previous quarter than occurs for firms planning larger outlays. The firms planning very substantial expenditures in a single quarter showed a strong tendency to fall short of anticipations.

5. OTHER INFLUENCES

There are, of course, a large number of other classifications of companies which would be relevant in appraising the accuracy of the anticipatory data. In the above discussion, attention has been confined to those classifications of type of company and type of investment which are available at the time the capital program is prepared and which, while they do not themselves provide motivation for departures from plan, may affect the susceptibility of the firm's program to revision in response to subsequent events. Other breakdowns of this type which it was feasible to test crudely (for one year only) include pressure on productive capacity at the beginning of the period, condition of the existing stock of capital, previous profit record, liquidity at the beginning of the period, and whether or not it was planned to make use of external financing.

However, a number of bases for classification that would have been properly included in the present section have not been covered because of the unavailability of data. These include such considerations as the mechanics of the firm's decision-making process—the existence of a formal capital budget, for instance. Certain relevant classifications based on changes occurring after the formulation of investment plans are analyzed in the final section, which deals with statistical relationships between discrepancies and explanatory variables.

Three of the further breakdowns which were tested—based on pressure on productive capacity at the beginning of the period, profit history, and liquidity at the beginning of the period—did not show any significant relationship between these characteristics and accuracy of anticipations. The tests involved in the first instance the ratio of unfilled orders to sales at the beginning of the period compared with the prewar ratio, in the second instance the rate of return on invested capital in the previous three years, and in the third instance the ratio of liquid assets to sales at the beginning of the period compared with a prewar norm. These tests were not

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completely satisfactory in terms of either the measures used or the size of the sample.¹¹

The condition of the individual firm's existing stock of capital, as regards both physical repair and obsolescence, would be expected to indicate in some degree the urgency of proposed expenditures. Though direct information on this point was not available, a rough measure of the relative newness of capital assets at the beginning of 1949 was obtained by examining the size of capital outlays in the period 1946-1948 in relation to 1948 gross fixed assets. Where the proportion of recent expenditures was small, it was expected that replacement needs would be relatively urgent and that this would tend to diminish the probability of substantial curtailment of projected expenditures.

The firms for which postwar investment amounted to less than 30 per cent of gross fixed assets showed a somewhat higher accuracy in anticipating 1949 outlays than did firms with larger relative expenditures in 1946-1948. More striking is the fact that a much smaller proportion of the former than of the latter group showed negative discrepancies of more than 20 per cent.¹² The results obtained here are subject to certain limitations, first because of the smallness of the sample involved, and second because the book value of gross fixed assets is not a particularly adequate measure of a firm's existing stock of capital. More work along these lines, to correct these deficiencies, would appear to be warranted.

With regard to whether firms planned the use of external funds in financing their investment programs as formulated at the beginning of the year, it was again impossible to obtain direct information. However, this was assumed to be the case for the beginning of 1949 whenever new securities were issued for plant and equipment purposes in the last quarter of 1948 or the first three quarters of 1949. Information on the use of bank loans for this purpose was not readily available. It may be expected that the commitments involved in raising outside funds increase the rigidity of investment programs thus financed.

Since there is a close interrelation between size of firm and the

¹¹ A subsequent test, involving a small sample of firms with very high ratios of unfilled orders to sales (compared with a prewar norm), indicates that an abnormally high level of unfilled orders may have some effect in increasing the probability that programs will be exceeded and in decreasing the frequency of curtailments.

¹² The difference between the two groups is too large to be explained on the basis of size of firm.

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use of external financing, this test could be carried out only within asset-size groups and was in fact made only for the largest group (with assets exceeding \$50 million). New securities to finance plant and equipment expenditures were issued in the relevant period by 10 of the 94 largest companies. Of these 10 companies, 6 came within 15 per cent of anticipations, and the largest deviation amounted to 26 per cent. Performance within the group did not appear to be correlated with the size of the investment program relative to gross fixed assets, though in all cases fairly substantial programs were involved. The record of these 10 firms is better than the record of the remaining firms in this size group that planned investment on a comparable scale, but the nature of the sample is not such as to permit any definitive conclusions.

A final test was made to determine whether the same firms tend to anticipate accurately in successive years. Apart from the effects of size and other considerations already noted, there was no evidence of such a tendency.

E. Reasons for Changes in Investment Plans

As previously mentioned, a special follow-up questionnaire (which is reproduced in the Appendix to this paper) was sent to a sample of companies early in 1950 with a request that they indicate the reasons for differences between actual and anticipated expenditures in 1949. The questionnaire was sent to most survey firms whose actual outlays on plant and equipment during 1949 differed by more than 25 per cent from the expenditures anticipated at the beginning of the year.¹³ Replies were received from 368, or 84 per cent, of the 440 companies contacted. Of these responses, the 305 in manufacturing are analyzed below.

1. CHECK LIST

After a pretest of alternative procedures, the companies were given a check list of the more important conditions which might have differed from expectations and were asked to designate the principal factor and other major factors responsible for the discrepancy between actual and anticipated expenditures. The list included changes in the sales outlook, current expenses, net earnings, work-

¹³ This questionnaire was not sent to all the firms in this group since it was necessary to obtain other information from some of them and it was not desired to burden any firm unduly. Moreover, if actual expenditures were under \$5,000, a questionnaire was sent only if the discrepancy was in excess of \$1,000.

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ing capital requirements, plant and equipment supply situation, plant and equipment costs (namely, prices paid), availability and cost of debt financing, availability and cost of equity capital, and other factors (technology, competitive conditions, unfilled orders, and so on). It was realized that not all these factors were independent in their influence on investment decisions—for example, changes in the sales outlook or in expenses usually involve changes in the earnings outlook—but it was desired to determine the relative emphases placed on these factors by businessmen themselves.

In addition the respondents were requested to indicate what the reason was for the difference between actual and anticipated outlays in cases where it was not due to a divergence between actual conditions and expectations with respect to the factors enumerated in the check list. They were also asked to submit any other remarks which might help to explain the discrepancy.

The explanatory factors mentioned in the responses have been classified into fifteen categories. In addition to the eight specific factors in the check list, seven more were included to cover the supplementary comments. As will be seen from the following discussion, there may be different influences affecting plant and equipment expenditures even within the categories used. In some instances it is possible to segregate these influences on the basis of written comments or other supplementary information.

The check list requires little clarification. The “sales outlook” category has been adjusted by the removal for separate consideration of cases in which the change in sales outlook is associated with a change in competitive conditions and cases in which a new product or a change in product mix is involved.

The “current expenses” category covers two situations. In the first the effect is one of encouraging or discouraging the substitution of capital for labor, so that current expenses and plant and equipment expenditures might be expected to move in the same direction relative to anticipations. In the second situation the change in current expenses is simply the reason for a change in earnings and has the same impact as a change in earnings arising from any other source. This would lead to a change in plant and equipment expenditures in the opposite direction from the change in current expenses. The second pattern was the usual one and was characteristic of the cases where earnings or sales were checked as the principal factor and current expenses as a major factor.

The category “plant and equipment supply situation” includes

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cases in which postwar shortages of capital goods eased more rapidly than anticipated, as well as cases of routine delays and speed-ups in the delivery of capital goods on order. The category "plant and equipment costs" covers cases in which the physical volume of investment was not particularly affected but prices and hence dollar expenditures were different from those anticipated, and also cases in which purchases were induced or deferred because of price changes. The two types of factors under this category operated differently on plant and equipment expenditures, but could generally be distinguished by comments indicating the direction of the discrepancy between actual and anticipated prices of capital goods; the first type—where physical quantities are not particularly affected—was somewhat more common during the year covered.¹⁴

2. OTHER EXPLANATORY FACTORS

The seven explanatory factors which were added to those contained in the check list are as follows: change in competitive conditions, new product or change in product mix, changes in the availability of labor or raw materials, changes in technology, timing problems, routine under- or overestimates, and miscellaneous.¹⁵ In all cases the changes referred to are changes from expectations.

The category "change in competitive conditions" contains all cases in which this factor is mentioned, even though sales outlook may be the factor checked. When competitive conditions are mentioned, the pattern of behavior is a fall in sales below anticipations, accompanied by a rise in plant and equipment expenditures. This is in contrast with the parallel movement of sales and capital goods expenditures which predominates when sales are checked and competitive conditions are not mentioned.

"New product or change in product mix" covers, in about equal number, cases in which a new product is introduced or the demand for a new product exceeds expectations, and cases where, in response to shifts in demand, the production of certain products is expanded at the expense of others. However, when the unanticip-

¹⁴ This type of case was definitely more important than the other for new plant and equipment. However, as an offset there were a number of cases in which unanticipated purchases of used plant and equipment were made because bargains became available.

¹⁵ Changes in competitive conditions and in technology were the only two of these factors which were suggested in the questionnaire as possible "other" conditions which might differ from expectations.

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pated expenditure results from style changes or minor product improvements, the classification "routine underestimate" is used.

"Changes in the availability of labor or raw materials" during 1949 applied mainly to strikes. In a couple of cases material shortages were involved.

"Changes in technology" covers the cases in which developments in production techniques appear to have governed the decision to spend more or less for plant and equipment than was anticipated. Process changes and reevaluation from a technological point of view of proposed equipment purchases are included here.

Under "timing" are included situations in which a proposed investment expenditure takes more (or in a few cases less) time to consummate than was anticipated. The time lag generally is that between the original investment decision and the placing of the order or contract. No change of decision or intent by the management to postpone the project is involved. Delays or speed-ups which arise from the supply side—from supply shortages or the acceleration of deliveries of capital goods already on order—are of course included under "plant and equipment supply situation" rather than here.

"Routine under- or overestimate" is intended to apply where the discrepancy results from a number of small expenditure items rather than from the initiation or cancellation of any major projects. The typical pattern here is that the firm estimates a certain lump sum, not for expenditures specifically in mind at the time, but to cover replacement and miscellaneous needs which will arise during the year in the ordinary course of operations. This estimate may be either too small or too large to take care of the needs which actually arise.

The miscellaneous category includes a number of subgroups. The largest of these (the principal factor in 15 cases and a major factor in 5 cases) contains the firms which simply state that certain projects were initiated or deferred or canceled without any clear indication why this decision was made, except for an apparent tendency to exclude from reported investment programs items whose acquisition is uncertain. The projects here are too large and too specific for the concept of a routine under- or overestimate to be appropriate. A second subgroup (6 cases, all principal) consists of instances in which the discrepancy is purely a matter of accounting procedure—a decision as to what items of expenditure should be capitalized and when. In other subgroups the discrepancy is re-

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lated to the sale or dissolution of the business (2 cases), the replacement of a major fire loss (2 cases), the decision to buy rather than lease the needed capital good (4 cases), and clerical errors in the reporting of actual or anticipated expenditures (6 cases, including 5 principal and 1 major). A final subgroup contains one-of-a-kind cases not otherwise classified (5 cases).

3. IMPORTANCE OF DIFFERENT FACTORS

Chart 4 and table 8 indicate the number of firms giving designated reasons for discrepancies between actual and anticipated expenditures in 1949, segregating firms which exceeded investment plans by at least 25 per cent from those which curtailed plans by this amount. The table shows the frequency with which each factor was indicated as being the principal influence, and also the frequency with which it was mentioned as a major influence. For principal factors the table shows separately the firms which gave one reason only and those which indicated major influences in addition to the principal factor.

A change in the sales outlook was by far the most commonly mentioned as the reason for a decrease in expenditures below the level anticipated at the beginning of the year. Unlike the other reasons given for discrepancies between actual and anticipated expenditures, information does exist on the level of actual and anticipated sales for a high proportion of the firms in the survey so that a quantitative comparison can be made between the discrepancies in expenditures and the extent to which conditions differed from expectations with respect to sales.

For the firms mentioning a change in sales outlook as the principal reason for discrepancies between actual and anticipated expenditures, there was a strong positive correlation between changes in expenditures and in sales; that is, the larger the discrepancy between actual and anticipated sales, the larger the corresponding discrepancy in expenditures. In contrast, there was no such correlation between discrepancies in expenditures and sales for the firms specifying other reasons for a divergence between actual and anticipated outlays. For the firms not receiving the special follow-up questionnaire, there was only a slight positive correlation between discrepancies in expenditures and sales.

A second factor of some importance in reducing planned outlays was a change in the earnings outlook. Changes in the sales and earnings outlooks, which are obviously closely related, together ac-

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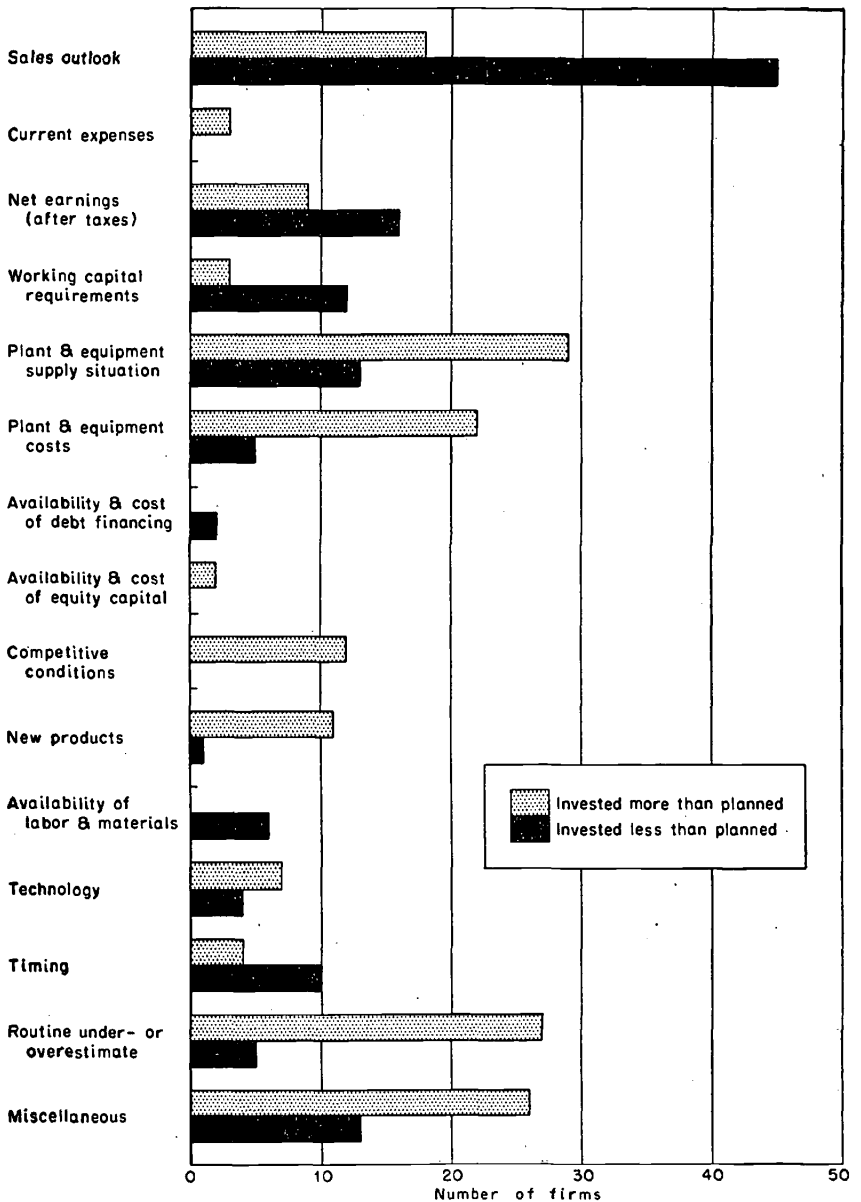


Chart 4. Frequency Distribution of Explanatory Factors for Changes in Investment Plans, 305 Manufacturing Firms, 1949

Frequency Distribution of Explanatory Factors for Changes in Investment Plans, 305 Manufacturing Firms, 1949

Distribution of Firms Designating Factor as:

Principal Reason for Change

Firms

Firms Mentioning Principal Factor

Firms Mentioning Both Principal and Major Factor

Major Reason for Change

Factor	All Firms		Per Cent		Firms Mentioning Principal Factor Only		Firms Mentioning Both Principal and Major Factor		Major Reason for Change			
	Number	Increased Outlays ^a	Decreased Outlays ^a	Increased Outlays ^a	Decreased Outlays ^a	Number	Increased Outlays ^a	Decreased Outlays ^a	Number	Increased Outlays ^a	Decreased Outlays ^a	Number
Changes from expectations in:												
Sales outlook	18	45	10.4	34.1	6	22	12	23	8	15		
Current expenses	3	0	1.7	0.0	2	0	1	0	1	11		
Net earnings (after taxes)	9	16	5.2	12.1	2	2	7	14	5	16		
Working capital requirements	3	12	1.7	9.1	1	4	2	8	3	12		
Plant and equipment supply situation	29	13	16.8	9.8	21	7	8	6	9	2		
Plant and equipment costs	22	5	12.7	3.8	13	4	9	1	10	11		
Availability and cost of debt financing	0	2	0.0	1.5	0	1	0	1	0	1		
Availability and cost of equity capital	2	0	1.2	0.0	1	0	1	0	2	0		
Competitive conditions	12	0	6.9	0.0	9	0	3	0	4	0		
New products	11	1	6.4	0.8	7	1	4	0	3	0		
Availability of labor and materials	0	6	0.0	4.5	0	5	0	1	0	1		
Technology	7	4	4.0	3.0	5	3	2	1	2	3		
Timing ^b	4	10	2.3	7.6	3	8	1	2	3	6		
Routine under- or overestimate	27	5	15.6	3.8	26	4	1	1	8	5		
Miscellaneous ^c	26	13	15.0	9.8	24	11	2	2	5	1		
All factors	173	132	100.0	100.0	120	72	53	60	63	84		

^a Increased (decreased) outlays refer to 1949 expenditures higher (lower) than anticipated by the firm at the beginning of 1949.

^b Time lag in placing of order or contract.

^c See text for breakdown of these factors.

Sources: Office of Business Economics, Department of Commerce; Securities and Exchange Commission. Survey included only those firms whose actual plant and equipment expenditures in 1949 differed by more than 25 per cent from anticipated outlays reported by business between mid-January and mid-March 1949.

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counted for nearly half of the cases in which actual expenditures in 1949 were lower than those anticipated.¹⁶ These two factors were also given as reasons for increasing expenditures, but in a much smaller proportion of the cases. Of the other factors resulting in revisions in planned outlays, only three—working capital requirements, timing, and availability of labor and materials—were clearly more important on the down than on the up side.

The most significant factors tending to increase planned outlays were changes in the plant and equipment supply situation, in plant and equipment costs, in competitive conditions, in new products, in routine underestimates, and in miscellaneous influences resulting in the initiation of substantial new projects. These factors were mentioned as the principal motivating forces by 73 per cent of the firms with expenditures higher than planned, but by only 28 per cent of the firms with lower expenditures. It is interesting to note that small routine discrepancies showed a higher relative frequency of increases (compared with decreases) in expenditures than did the larger discrepancies listed under "miscellaneous."

Changes in the availability of debt and equity financing were unimportant in altering planned outlays on plant and equipment. Though stock prices rose considerably during 1949 and equity financing was more attractive to business concerns, very few firms were thereby induced to step up their expenditure programs.

The other two factors listed in the table—changes in current expenses and in technology—also had only a small influence on revisions of planned outlays. Only a few firms were induced to substitute capital for labor to a significantly greater extent than planned at the beginning of the year. A somewhat higher proportion of firms increased their plant and equipment expenditures as a result of technological developments, but these were offset in large part by firms which decreased their planned outlays for the same reason.

4. CYCLICAL VERSUS NONCYCLICAL INFLUENCES

The period covered by these questionnaire replies obviously affects both the relative frequency with which a specific factor is

¹⁶ When more than one factor was mentioned by the same firm, a change in the sales outlook was more frequently associated with a change in the earnings outlook than with any other factor. Both were, in a number of instances, either separately or jointly mentioned together with a change in working capital requirements. It may be noted that changes in the sales and earnings outlooks accounted for a higher proportion of downward revisions in equipment than in plant.

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mentioned and, for many of the factors, the relative frequency of increases compared with decreases in expenditures. The importance of a number of these factors, as well as the direction of their effect on expenditures, will vary widely in different stages of the business cycle.

The effect of changes in the sales and earnings outlooks would be expected to be completely different in a period of strong inflationary conditions or at other points of the business cycle from what it was in the very moderate downturn in 1949. Whereas in a downturn, or at least in its initial stages, the apparent effect of changes in these factors for most firms is to lower planned outlays, the reverse effect is likely in a recovery.

It is more difficult to tell whether the other significant factors resulting in downward revisions in planned outlays—working capital requirements, timing, and availability of labor and materials—are strongly influenced by cyclical movements. Thus to the extent that the depressing influence of changes in working capital requirements in 1949 on plant and equipment expenditures was a reflection of smaller sources of funds from internal operations than had been anticipated, without a corresponding reduction in needs for funds, the effect might be assumed to be cyclical and related to sales and earnings.¹⁷ However, it is not easy to determine how the effects of changes in the availability of funds and changes in needs for funds net out at cyclical turning points.

Changes in the availability of labor and materials, which tended to reduce capital expenditures in 1949, presumably have their greatest effect in a boom period and much less effect in a depression. Of the important factors depressing investment, only timing difficulties seem to be largely noncyclical in character.

A number of the factors resulting in upward revisions in programmed expenditures during 1949 were affected to some extent by cyclical influences. The plant and equipment supply situation is one such factor, but as a result of the special wartime and postwar developments the easing of supply conditions for capital goods probably had a more important impact on expenditures in 1949 than might normally be expected from purely cyclical influences.

Plant and equipment costs also reflect cyclical influences, but

¹⁷ It might be noted that where working capital requirements were mentioned as the principal factor inducing a reduction in plant and equipment expenditures, actual sales during 1949 were lower than those anticipated at the beginning of the year in half the cases and higher in the other half.

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again it is difficult to infer from the 1949 experience any normal cyclical behavior. It is easy enough to describe the behavior of the two component parts, the first composed of cases in which the anticipated purchase is made but at different cost, the second of cases in which a purchase is induced or deferred because of change in costs. However, each of these operates differently on plant and equipment expenditures, and it is not possible to determine the relative importance of these two types of cases in various stages of the cycle. In 1949 the cases in which changed costs did not greatly affect the physical quantities of purchases were somewhat more important than cases of the other type in stimulating upward revisions in programmed expenditures, particularly for new plant and equipment. Apparently, in spite of the slight decline in average costs during the year, a sizable number of companies anticipated lower costs than actually prevailed.¹⁸

Neither the plant and equipment supply situation nor plant and equipment costs appear to be as strongly dependent on cyclical considerations as the more important factors responsible in 1949 for downward revisions in programmed expenditures—namely, changes in the sales and earnings outlooks. Moreover, the other key factors on the up side—competitive conditions, new products, routine underestimates, and miscellaneous influences resulting in the initiation of substantial new projects—appear to be even less dependent on cyclical influences. This is especially true for the last two of these categories.

The foregoing discussion suggests that while a sizable proportion of the changes in planned outlays on plant and equipment are attributable to factors whose impact is cyclically determined, there are other important factors which are largely independent of the level of business activity. It is not possible without similar data for a number of periods to appraise the relative importance of the different factors in various stages of the business cycle.

However, in addition to the cyclical influences there is evidence once again of a systematic tendency on the part of businessmen to underestimate their plant and equipment expenditures in their programs for the following year. Among the factors responsible for this systematic understatement are the omission of many small items of capital outlay and a tendency to exclude items whose acquisition is

¹⁸ The aggregate expenditure figures and data on costs suggest that this factor may have been much more significant in 1947 and probably was somewhat more significant in 1948 and 1950.

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uncertain. These factors help to explain the earlier finding that nearly three-fifths of all firms included in the OBE-SEC survey underestimated their plant and equipment expenditures in 1949, even though about the same proportion overestimated their sales.

5. EXPLANATORY FACTORS BY SIZE OF FIRM

Though the data are rather scanty, table 9 suggests that the relative importance of the various factors in explaining discrepancies between actual and anticipated expenditures varies by size of firm. The table presents, for three different size groups of firms, a distribution of the principal factors which resulted in higher outlays than anticipated and of those which resulted in lower outlays.¹⁹

The table indicates that in 1949 changes in the plant and equipment supply situation and in competitive conditions were relatively much more important in raising expenditures of the smallest firms than in raising those of the largest firms. Only the smallest firms mentioned changes in the earnings outlook as a significant factor in reducing planned outlays.²⁰ The few firms in the total sample which gave changes in the availability and cost of debt and equity financing as the primary factor in explaining discrepancies between actual and anticipated outlays were all relatively small; each had assets of less than \$1 million. There were also minor differences among the three size groups in the apparent effect of technology and new products.

However, possibly the most interesting difference is the much greater importance of routine and miscellaneous miscalculations for medium-sized and small firms than for large firms. For the latter there is no indication of any net tendency to underestimate plant and equipment expenditures for these reasons. Of the other factors, changes in the sales outlook, in working capital requirements, and in plant and equipment costs had about equal impact on expenditures in all of the size groups.

6. EXPLANATORY FACTORS BY SIZE OF DISCREPANCY

As might be expected, a distribution of the various explanatory

¹⁹ The firms are classified by sales size since this was available in virtually every case, whereas assets size was available only in a much smaller proportion of the cases. However, a distribution by size of assets seems to show approximately the same size differences as those depicted in table 9. The data are inadequate for an industry breakdown.

²⁰ It may be noted that though most firms in all size groups experienced declines in earnings from 1948 to 1949, this trend was most pronounced for the smallest firms.

TABLE 9

Frequency Distribution of Principal Explanatory Factors for Changes in Investment Plans, 305 Manufacturing Firms, 1949, by Size of Sales

Factor	\$20,000,000 to \$20,000,000 and Over						\$2,000,000 to \$20,000,000																																																																																																																																																																																									
	Under \$2,000,000		In-De-		In-De-		Under \$2,000,000		In-De-		In-De-																																																																																																																																																																																					
	creased Outlays ^a	creased Outlays ^a	creased Outlays ^a	creased Outlays ^a	creased Outlays ^a	creased Outlays ^a	creased Outlays ^a	creased Outlays ^a	creased Outlays ^a	creased Outlays ^a	creased Outlays ^a	creased Outlays ^a																																																																																																																																																																																				
Changes from expectations in:	Number of Firms												Per Cent																																																																																																																																																																																			
Sales outlook	6	16	9	18	3	11	9.0	37.2	11.4	32.7	11.1	32.4	2	0	1	0	0	0	3.0	0.0	1.3	0.0	0.0	0.0	1	1	9	4	3	4	1.5	20.9	5.1	5.5	14.8	11.8	1	4	1	4	1	4	1.5	9.3	1.3	7.3	3.7	11.8	12	0	14	9	3	4	17.9	0.0	17.7	16.4	11.1	11.8	9	2	7	1	6	2	13.4	4.7	8.8	1.8	22.2	5.9	0	1	0	1	0	0	0.0	2.3	0.0	1.8	0.0	0.0	0	0	2	0	0	0	0.0	0.0	2.5	0.0	0.0	0.0	8	0	3	0	1	0	11.9	0.0	3.8	0.0	3.7	0.0	4	1	6	0	1	0	6.0	2.3	7.6	0.0	3.7	0.0	0	2	0	1	0	3	0.0	4.7	0.0	1.8	0.0	8.8	1	2	4	2	2	0	1.5	4.7	5.1	3.6	7.4	0.0	1	1	2	8	1	1	1.5	2.3	2.5	14.5	3.7	2.9	10	2	15	2	2	1	14.9	4.7	19.0	3.6	7.4	2.9	12	3	11	6	3	4	17.9	7.0	13.9	10.9	11.1	11.8	67	43	79	55	27	34	100.0	100.0	100.0	100.0	100.0	100.0

^a Increased (decreased) outlays refer to 1949 expenditures higher (lower) than planned by the firm at the beginning of 1949.^b Time lag in placing of order or contract.

Sources: Office of Business Economics, Department of Commerce; Securities and Exchange Commission. Survey included only those firms whose actual plant and equipment expenditures in 1949 differed by more than 25 per cent from anticipated outlays reported by business between mid-January and mid-March 1949. Factors include only those indicated as "principal" by respondents. Size is based on 1948 sales.

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factors by the absolute size of discrepancies in plant and equipment expenditures shows about the same picture as the distribution by size of firm. For the large absolute discrepancies, routine under- and overestimates are very unimportant on both sides, and miscellaneous miscalculations, though somewhat more important, cancel out in their net impact on plant and equipment expenditures.²¹

7. NONMANUFACTURING FIRMS

Though follow-up questionnaires relating to the reasons for differences between actual and anticipated expenditures in 1949 were sent to nonmanufacturing as well as to manufacturing firms when actual outlays were more than 25 per cent higher or lower than anticipated, it was only for the railroad group that the sample response was sufficient to justify separate treatment. For this group, understatement and overstatement of outlays were equally common.

Changes in the sales and earnings outlooks, changes in working capital requirements, and timing difficulties tended to reduce planned investment for railroads as they did for manufacturing firms. However, changes in the sales outlook were much less important for the railroads. On the other hand, routine under- or overestimates were much more important on the up side, accounting for well over half of the revisions in planned outlays, but for only a negligible proportion of decreases. Most other factors were relatively insignificant.

F. Statistical Relationships between Discrepancies and Explanatory Variables

Four major groups of factors were indicated in the follow-up responses as reasons for deviations from investment plans: changes in the sales and profitability picture; changes in the availability of funds either from internal or from external sources; changes arising from a variety of reasons not connected with the firm's economic position, e.g. technological considerations, misjudgments as to timing, or necessity for unexpected replacement; and changes arising from the supply side, in the cost and availability of capital goods. The influence of factors in the first two groups may be investigated further by comparing the observed discrepancies between

²¹ The situation is different, however, for the large relative discrepancies—that is, the ratios of absolute discrepancies to anticipated investment—which represent for the most part small and medium-sized firms and for which the distribution of explanatory factors is very close to that for all firms.

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actual and anticipated expenditures with the movements in such variables as sales, profit rates, and various measures of liquidity and availability of funds.

It should be pointed out that the analysis of deviations from investment plans in a particular year is a somewhat different problem from the analysis of investment decisions themselves. For example, the timing of orders and deliveries and the availability of capital goods are factors which may have considerable effect in explaining differences between actual and anticipated expenditures in a given year, but no substantial impact on the total of investment over somewhat longer periods. Conversely, the record of sales and profit experience previous to the formulation of the investment program will be an important determinant of the investment decision, but subsequent changes in these variables may not contribute as greatly to the explanation of deviations from the original plan.

1. EFFECT OF CHANGES IN SALES AND EARNINGS

The evidence supplied by the follow-up responses indicates that changes in sales and earnings subsequent to the formation of the investment plan influence the extent to which the plan is realized. However, the correlation between per cent deviations from anticipated expenditures in 1949 and per cent changes in sales either from expectations or from sales in the previous year was found to be low.²² The same result holds in 1948 and in 1947.²³

A rather large proportion of firms show an increase in capital outlays above anticipations in spite of a fairly substantial decline in sales. This recalls the pattern of behavior found in the follow-up responses in those cases where a decline in sales was associated with a change in competitive conditions. It appears that when the competitive situation is an important factor, the investment response to a decline in sales is opposite in direction to that which ordinarily occurs. The fact that a negative relationship between these variables is superimposed upon the predominantly positive one is partly responsible for the unsatisfactory nature of the results obtained.

²² Discrepancies between actual and anticipated investment were measured relative to gross fixed assets, as well as to anticipations, in studying the influence of sales movements and other variables which will be considered later. However, correlations were not substantially improved when discrepancies were measured in terms of gross fixed assets.

²³ On a quarterly basis the correlation between per cent deviations from first anticipations and per cent changes in sales from the previous quarter was also tested and found to be completely insignificant.

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In addition to influencing profit expectations, movements in sales may reflect changes in the pressure on productive capacity. An attempt was made, however, to find a variable which would be more adequate than sales for this purpose. The variable used was the ratio of unfilled orders to sales, but no significant correlation was found when the changes in this ratio were compared with the per cent deviations from investment plans.

Movements in earnings, also, were found to contribute little toward the explanation of discrepancies between actual and anticipated expenditures. The two income variables tested were the change in profit rates from the previous year and the difference between the actual profit rate and an estimate of the expected rate, obtained by multiplying sales anticipations and the ratio of income to sales in the previous year. The correlation in both cases was small.

In evaluating these results it should be recalled that the period studied was unusual in that a large backlog of demand for plant and equipment existed, and this may have diminished the influence on investment of changes in sales and earnings. On the other hand, changes in earnings cannot be expected to exert a direct influence on the realization of investment plans except insofar as the current profit movements influence fairly long-run profit expectations.²⁴ Even when the investment under consideration represents expansion, the current fluctuations in sales and profits may not have a predominant influence on the expected rate of return. When cost-cutting or the replacement of obsolescent machinery is involved, or in the case of a new product, the influence will be even less, since the expected rate of return is likely to be quite unrelated to overall profit rates on existing investment.

2. EFFECT OF LIQUIDITY

A number of variables relating to liquidity were also tested to determine their effect on the discrepancies between actual and anticipated investment. It was believed that unexpected decreases in the liquid funds internally available might contribute to the curtailment of planned investment, since many firms either do not find external financing available or prefer not to make use of it. To a lesser extent unexpected increases in liquid assets might lead to an expansion of investment plans, especially in cases where a desirable expenditure is being postponed because of a shortage of working capital.

²⁴ There may also be an indirect effect through resulting changes in liquidity.

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Changes in the ordinary liquidity ratios did not yield satisfactory results, because unanticipated investment in itself operates to make the year-end position less liquid than otherwise.²⁵ The resulting tendency toward a negative correlation between divergences from planned investment and movements in liquidity ratios apparently outweighed any influence which increases (or decreases) in liquidity might exercise toward encouraging (or discouraging) investment expenditures. Only slightly better results were secured by utilizing an estimate of the unexpected change in liquid funds available from internal operations. This estimate was obtained by adjusting the difference between actual profits and the previously discussed estimate of expected profits for changes in liquidity requirements associated with a level of sales and profits different from expectations. A number of multivariate tests, involving movements in sales or earnings as well as changes in various liquidity ratios, also proved inconclusive.

Quite apart from any changes in liquidity, the level of surplus liquid assets—that is, liquid assets not required for current operations—might influence the extent to which it is possible to carry out additional investment expenditures that become desirable during the year. The degree of excess liquidity in 1949 was measured by comparing the ratio of liquid assets to sales with an average of the corresponding ratios for 1948 and 1941—two years in which business enterprises as a whole held relatively little in the way of surplus liquid assets. The correlation between this measure of surplus liquidity and the discrepancy between actual and anticipated investment was small for the reporting sample as a whole, but larger for those firms which experienced sizable increases in sales over anticipations. Such firms presumably had a strong motive for exceeding their projected investment, and the existence of excess liquidity apparently had an appreciable effect in encouraging investment under these circumstances.

²⁵ Among the liquidity variables tested without significant results were changes in the following ratios: liquid assets to sales, liquid assets to current liabilities, current assets to current liabilities, long-term debt to net worth, long-term debt to common plus preferred stock, interest charges to net income before interest and taxes, and net current assets to long-term debt. Changes in the cost of equity capital, as measured by the earnings-price and dividends-price ratios, were also tested.

Appendix

Department of Commerce Questionnaires

QUESTIONNAIRE ON REASONS FOR CHANGE IN INVESTMENT PLANS

Please indicate below the factors which resulted in a difference between your actual and anticipated plant and equipment expenditures in 1949:

A. If difference was primarily due to a divergence between actual conditions and expectations with respect to the factors listed below, please indicate the relative importance of the factors:

CHECKLIST	PRINCIPAL FACTOR <i>(Check one)</i>	OTHER MAJOR FACTORS <i>(Check if applicable)</i>
Conditions differed from expectations with respect to:		
Sales outlook		
Current expenses		
Net earnings		
Working capital requirements		
Plant and equipment supply situation		
Plant and equipment costs (viz., prices paid).		
Availability and cost of debt financing.		
Availability and cost of equity capital.		
Other (technology, competitive conditions, unfilled orders, etc.) <i>(Specify)</i>		

If difference was not primarily due to a divergence between actual conditions and expectations, please indicate the reason (or reasons):

Other remarks

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REPORT FORM FOR PLANT AND EQUIPMENT EXPENDITURES SURVEY

GENERAL INSTRUCTIONS

Please mail this schedule as promptly as possible since the timeliness of the summary we will send to you each quarter is dependent upon the date we receive reports from cooperating companies. Your replies to these questions are strictly confidential. They will be seen by no one except the sworn Bureau personnel working on the survey who are prohibited by law from revealing the information which you furnish.

Your company name does not appear on this form as the confidential code number is sufficient identification for purpose of classification and tabulation.

SPECIFIC INSTRUCTIONS

Show as much of the indicated breakdown as is practicable. In all cases give total plant and equipment expenditures. Estimated amounts may be used if desired.

"Plant and equipment expenditures" for the reporting period consist of additions completed during the period plus construction in progress at the end of the period, minus construction in progress at the beginning of the period.

Exclude (1) all expenditures for land, (2) costs incurred for maintenance and repairs, and (3) expenditures on plant and equipment for use outside the continental United States. If it is not feasible to exclude actual expenditures for these items, please estimate, or indicate that they are included.

Report data on a consolidated basis for the corporation and its subsidiaries wherever possible.

Expenditures refer to all costs during the specified periods (whether on contract or by your own forces) chargeable to fixed asset accounts and for which depreciation accounts are ordinarily maintained. For "anticipated expenditures" show estimates of costs which according to present planning will be incurred during the specified period. If expenditures are not given below, indicate whether reply is "None" or whether estimates are "Not available".

ITEM	QUARTERLY SURVEY			ANNUAL SURVEY ¹	
	Actual	Anticipated		Actual	Anticipated
	Quarter ending Dec. 31, 1952 (a)	Quarter ending March 31, 1953 (b)	Quarter ending June 30, 1953 (c)	1952 (d)	1953 (e)
Expenditures for plant	\$	\$	\$	\$	\$
Expenditures for machinery and equipment	\$	\$	\$	\$	\$
TOTAL	\$	\$	\$	\$	\$

SALES - GIVE THE DOLLAR AMOUNTS OF SALES AND RECEIPTS FROM OPERATIONS FOR 1952 (actual) AND 1953 (anticipated)

ITEM	Actual 1952	Anticipated 1953
Net sales and receipts from operations	\$	\$

¹ Wherever feasible, report data on a calendar year basis. Figures for 1952 are requested here in order to insure comparability with your 1953 anticipations.

C O M M E N T

E. M. HOOVER, *Washington, D.C.*

I am confident that the analysis pursued in this paper will eventually make possible important improvements in forecasts of business investment, both by survey and by other methods. The measurement of systematic biases in investment anticipations—biases related to size of firm or program, seasonal factors, accounting conventions, conservatism in gauging the future, or anything else about

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which we can hope to know something in advance—is an obviously fruitful line of approach to refinement of the aggregate investment forecasts.

In addition to making an important contribution along these lines, the authors seek to relate businessmen's revisions of investment programs to errors in anticipating sales, prices, profits, and other presumably relevant causal factors that vary in cyclical or irregular fashion and are thus relatively unpredictable. In discussing the limitations on the direct applicability of this second set of findings, I am merely reinforcing the authors' own expression of caution.

Let us suppose that a number of relationships of the cyclically irregular type were developed still further by additional studies, till at last we could be pretty confident of the effect of unanticipated sales changes, and so on, on revision of investment programs. In order to use this information to derive an improved forecast of business investment outlays, we should still need two other kinds of data:

1. Reports on businessmen's anticipations of sales, prices, profits, and so on. The OBE-SEC surveys have in fact gathered such information in respect to sales. Perhaps further use can be made of corresponding reports on businessmen's anticipations of prices, profits, and so on, from other surveys such as those that have been made by *Fortune* and Dun & Bradstreet.

2. An estimate of the prospective errors in the aforesaid anticipations (based on our own presumably superior forecast of what sales, prices, profits, and so on, will actually do).

With the above information we could then proceed to derive an improved investment forecast. The steps involved may be illustrated, as follows, taking just one causal factor (profits) for simplicity's sake:

1. The automobile manufacturers, say, report that they expect to spend \$1 billion next year on plant and equipment (basis: present type of investment-anticipations survey).

2. At the same time the automobile manufacturers report that they expect their profits next year to be 10 per cent above this year's (basis: survey of profit anticipations).

3. We expect that automobile manufacturers' profits will in fact go up 12 per cent rather than 10 (basis: a forecast of profits regarded as more reliable than 2).

4. When profits exceed anticipations by 2 per cent, investment

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outlays tend to exceed anticipations by 5 per cent (basis: analysis of association of anticipation errors in profits and investment).

5. On the basis of 1 and 4, our improved estimate of automobile industry investment outlays for next year is \$1.05 billion.

The above would obviously be a rather indirect, not to say tortuous way of getting refined investment forecasts; and if I correctly understand the paper under discussion the authors do not suggest that we can ever expect much from such a procedure applied to cyclically irregular variables. The utility of their findings on cyclically irregular factors underlying investment revisions lies perhaps more in the progressive improvement of our understanding of the investment process and its determinants.

Here too, however, it may be worth while to underline an essential point that the authors make. When any given variable—such as “earnings”—appears prominently in their tabulations of reasons for changes in investment programs, that prominence reflects both the *importance* of the variable as an investment determinant and the *relative difficulty of correctly anticipating* the variable. Thus even if a particular variable were extremely influential with regard to investment decisions, it would not figure prominently in these tabulations if it happened to be susceptible of accurate anticipation by businessmen for a year ahead. I should judge that costs of security financing and technology, for example, would ordinarily be firm enough at the outset of a year to exclude unforeseen changes in these variables as important causes of revision of investment programs during the year.

Much depends, of course, on the length of the period of anticipations—which in the investigation under discussion was a year. For anticipations covering a period of several years, one might expect a quite different pattern of factors responsible for revisions. Factors like “timing” and “plant and equipment supply situation” would presumably be much less important in terms of a longer period such as this, while unforeseen changes in financing costs and in technological possibilities would bulk larger.

Let me say again that nothing I have said so far implies any disagreement with what I understand to be the authors' views. I have merely tried to underscore some points essential to an evaluation of their findings.

In my remaining comments I want to raise some queries which the authors may feel it worth while to answer or discuss:

1. The investigation shows that large investment plans, and in-

vestment plans of large firms, are anticipated with superior accuracy. In view of this finding, would it be desirable to weight the size strata of the sample in such a way as to give still greater emphasis to bigger firms and/or bigger programs; or perhaps to cut off the smaller firms and/or projects altogether?

2. "Working capital needs" are shown as an important reason for downward revision of plant and equipment investment programs in 1949. Since corporations as a whole needed no funds in 1949 for working capital expansion—indeed, there seems to have been a net release of funds—I am surprised to see the working capital requirements factor listed as impeding rather than encouraging the fulfillment of 1949 investment plans.

3. As a final suggestion for further discussion, I, for one, should welcome more specific indication by the authors of some of the improvements they contemplate in future surveys.

REPLY BY THE AUTHORS

In connection with Hoover's comments, we feel that several observations may be in order. As he points out, we are in agreement that our findings on systematic factors underlying investment revisions are much more immediately useful in refining aggregate investment forecasts than our findings on the relationships of cyclically irregular variables to such revisions. We are also in agreement that the immediate utility of our investigation into the latter relationships lies more in the improved understanding of the investment process and its determinants.

However, if eventually we are able to develop on the basis of this type of analysis a fairly stable relationship between actual investment and both planned investment and such other variables as the difference between actual and expected profits, it would appear to us that this information would play a necessary part in the construction of future economic models in which the levels of investment and profits (and other relevant variables including total economic activity) would be mutually determined. The resulting revision in the *aggregate* investment forecast is quite different from the procedure outlined by Hoover. We are not, of course, prejudging whether either a satisfactory investment relationship of the type described can be derived, or, if so, whether it can be used together with such other relationships as a consumption function and a profits function to construct a complete model depicting realistically the workings of the economy.

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We are also in agreement—again as Hoover points out—that even if a particular variable were extremely influential with regard to investment decisions, it might not show up prominently in the tabulations of reasons for investment revisions if it were susceptible of accurate anticipation by businessmen for a year ahead. However, it does not seem obvious to us that “costs of security financing . . . , for example, would ordinarily be firm enough at the outset of a year to exclude unforeseen changes in these variables as important causes of revision of investment programs during the year.” Costs of financing—particularly in the equity markets—can change fairly rapidly, as historical experience amply demonstrates. Whether the entire normal range in costs of financing is likely to have much effect on investment decisions is another question, but one which can be answered only by such empirical investigations. Similar questions can be raised with respect to the expected effect on investment decisions of the many minor as well as major technological developments.

In connection with the three questions that Hoover raises:

1. We are exploring the desirability of reweighting the sample of companies reporting anticipated expenditures to give greater weight to firms (and programs) which have been able in the past to forecast with relative accuracy. Obviously, however, the fact that one sector of the business population has been able to project its expenditures much more accurately than another does not necessarily mean that it can be used to project better the expenditures of the second sector.

2. The tentative explanation we gave for the finding that “working capital needs” were shown as a fairly important reason for downward revision of plant and equipment investment programs in 1949 was the smaller inflow or availability of funds than had been anticipated without a corresponding reduction in working capital requirements. It is quite plausible, moreover, that while an unanticipated easing in the working capital position in a year like 1949 would not constitute a strong inducement to increased expenditures for the firm involved, an unanticipated tightening in this position for other firms would lead to a downward revision in expenditures.

3. The improvements we contemplate in future follow-up questionnaires, apart from coverage of additional periods and more firms, consist of introduction of items which turned out to be important factors in investment revisions even though not segregated in the original follow-up questionnaire, clarification of some of the

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original items, and experimentation with questionnaires which re-order the check list and which omit the check list. In addition we plan to obtain additional material on the nature of assumptions made at the time anticipated expenditures are submitted with respect to prices and other variables not now covered in the regular annual reporting form, and on the mechanics of investment programming.

GEORGE KATONA, *University of Michigan*

I hardly need to say that I fully approve of the principles underlying the OBE-SEC surveys, since the approach to economic research I have used during the past ten years is based on the same principles. If I may try to formulate the principles of an analysis of decision formation and of predicting forthcoming trends from survey data, I would say:

1. Data obtained through questioning the economic agents whose actions and decisions influence the national economy represent a necessary supplementation of data that reflect the results of the past behavior of these agents.
2. Findings obtained through interrogating the economic agents should be analyzed in two ways. One should compile aggregate data by weighting the responses and also present microeconomic distributions grouping individual answers. Both methods should be applied to past as well as to forthcoming behavior.
3. The study of the probable causes of economic behavior should be conducted both by correlation analysis—discovering, for instance, the relations between expectations and size of firms, size of expenditures, sales, or income—and by asking the direct question, "Why?"

The paper by Friend and Bronfenbrenner in the December 1950 *Survey of Current Business* represents great progress, since it adds to previously published aggregates some microeconomic distributions, some results of correlation analysis, and some findings about why expectations were not fulfilled. In the current paper I especially welcome the evidence that the method of questioning the economic actors has proved to be a better predictive instrument than mechanical extrapolations from past data.

The authors do not deal explicitly with the basic question of the meaning of expressed intentions. In this respect I can be very brief, not only because I discussed the problem extensively in a book recently published but also because Firestone states the same position

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very clearly in his paper.¹ What businessmen say they intend to do should not be viewed in itself as a forecast of things to come. Expectations, intentions, and plans are attitudes, the knowledge of which is important because they shape behavior. By determining what people expect and plan and why, we can improve our diagnosis, and good diagnosis helps to improve predictions. The most important prediction we are called to make concerns the question whether or not there will be a change in trends. To predict, for example, whether business capital expenditures in the next period will be much higher, somewhat higher, or somewhat lower than in the last period is of great importance, of greater importance than to predict the exact amount of such expenditures. In this respect the record of the Commerce Department surveys—as shown, for instance, in Firestone's paper—is most impressive.

But I believe that the authors have not yet made use of all possibilities inherent in the survey approach. Just because the method is new and important, we need to explore it fully. Furthermore, we must make use of the best possible techniques and must publish the data in a way which permits full analysis and criticism by others. In these respects, in my opinion, much remains to be done, and I wish to raise a few specific questions.

My first set of questions refers to the form in which the quarterly and annual surveys have been published during the past few years. Table 1 of this paper may serve as an illustration: only extrapolated aggregates—"blow-ups" is the technical term—are published. This is not sufficient, and the survey method should give us more. Regarding actual capital outlays, we find, for instance, that manufacturers spent \$8,220 million in 1950. We should also like to know the size distribution of the outlays. How many firms spent over \$1 million, for instance? Furthermore, a Lorenz curve showing the concentration of outlays would be most useful. Finally, it is not enough to know the aggregate changes (that capital outlays of manufacturers were \$1 billion higher in 1950 than in 1949); we should also like to know how many firms have increased their capital outlays and by how much, and how many have decreased them and by how much.

Concerning anticipated expenditures, such distributions assume a still greater importance. We need to know more than that the 1951 anticipations are x per cent higher than the 1950 expenditures. What

¹ See George Katona, *Psychological Analysis of Economic Behavior* (McGraw-Hill, 1951), pp. 174ff. and, concerning the capital-outlay surveys, pp. 323ff. See also O. J. Firestone's paper in this volume, pp. 140-141.

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is the number of firms whose 1951 plans exceed their 1950 expenditures, and what is the number of firms whose plans are smaller? And what are the amounts of changes? Trend data of this kind may be helpful in predicting changes. Furthermore, from the point of view of economic theory the relation of such data to other variables, such as the trend of sales, is of great interest.

Naturally, such distributions can be presented only if the sample is representative. Unfortunately, the information given about the sample is far from complete.² We need to know what part of the extrapolated aggregates is derived from the survey and how the rest is estimated. Furthermore, we need information about the rate of nonresponse and its treatment.

The second type of question I want to raise refers to the form of inquiry about anticipated capital outlays. The questionnaire mailed to the respondents has not been published. The title of one blank reads: "Survey of 1949 Business Budgets." The instruction says: "Give the amounts which you plan at this time to spend for construction and equipment during the calendar year 1949. If exact amount has not been determined, please estimate." The question is how the people who fill out these blanks understand these words. Suppose a firm has no capital budget, or its budget has not yet been approved by the board of directors; what does it do? Projects under way and contracts already awarded will undoubtedly be included, but what is the treatment of needs, hopes, and desires?

It is well known that the greatest drawback of mail questionnaires is that they must be brief and simple. From a recent survey consisting of detailed personal interviews with top executives of manufacturing firms, we know that some capital expenditure plans are discussed in terms of contingencies and uncertainties.³ The words "depends on" occur frequently. "If such and such occurs, we shall build a new plant" is the type of answer received in some personal interviews. The fate of such answers when used in filling out the Commerce Department blank is something we ought to know. Also, the frequency of contingent answers in itself is an important trend indicator. What follows is, I think, that the simple mail questionnaires need to be supplemented by personal interviews. These could also clarify another crucial question: Who fills out the blanks in

² It consists of information that 1,000 corporations registered with the SEC and more than 1,000 unregistered manufacturing concerns are canvassed.

³ See George Katona and J. N. Morgan, "The Quantitative Study of Factors Determining Business Decisions," *Quarterly Journal of Economics*, Vol. LXXVI (1952), pp. 67ff.

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large and small plants—the president, the chief accountant, or who else?

Now I turn to my third and last set of questions referring to the form of inquiry about divergences between expressed expectations and their fulfillment. Much of the paper before us is based on answers received from 305 firms to a check list mailed out. The blank as formulated puts the respondents on the defensive. They are told that their anticipations were wrong and are asked to explain why. On top of the check list the following phrase is printed: "Conditions differed from expectations with respect to."⁴ This formulation is based on the assumption, which I believe to be incorrect, that all firms have definite expectations with regard to each of the factors mentioned: sales outlook, current expenses, net earnings, and so on. Furthermore, one would expect that at least some firms would choose the easiest way out and explain their failure to fulfill their anticipations by factors which do not put them in a bad light. Thus we find in table 8 that not a single firm explained spending less than anticipated by unavailability of capital. Naturally, we have no record of anybody saying, "We wanted to spend \$100,000 more, but the directors forbade it," or, "We never really planned to spend so much; our estimate was a mistake."

The findings concerning spending more than anticipated are somewhat unexpected. The two most frequent specific causes of spending more than anticipated are changes "in plant and equipment supply situation" and "in plant and equipment costs." As far as we know from other sources, the changes in these respects could not have been radical in 1949. Already at the beginning of 1949 the supply situation in building materials and machine tools was rather good. On the other hand, we have evidence from our surveys that in the summer and fall of 1949 businessmen were much more optimistic regarding future sales and profits than at the beginning of the year. But it is not to be expected that presidents of large corporations would put down in writing, "At the beginning of 1949 we expected a depression; when consumer expenditures held up very well, we were proved to be wrong." Although I advocate personal interviewing in place of the check list method for studying

⁴ The blanks also contain two phrases under the check list, namely, "If difference was not primarily due to divergence between actual conditions and expectations, please indicate the reason (or reasons)" and "Other remarks." This does not detract much from the suggestive influence of the check list.

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motivational factors, I want to say that even in personal interviews you hardly ever get such admissions. People remember their predictions which came true and forget very fast those which proved to be erroneous. What other method of analyzing changes in motivation is available? We may ask people, when they express their intentions, about the reasons they have for making their plans. And we may ask them a year later, without reference to what they said before, why they did what they did.

Another surprising finding is that anticipations regarding plant expenditures proved to be less accurate than anticipations regarding expenditures on new equipment. It is explained on pages 76 and 77 that when changes in plans to build plants occur, they are likely to be substantial. But why do such changes occur more frequently than changes regarding new equipment? This again is a point on which personal interviewing may shed light.

I have stressed points of methodology in my remarks because of our very great need for further research in this field. But the points I raised are related to basic theoretical questions. Two of these unsolved questions may be mentioned briefly. We read in the introductory statements by Friend and Bronfenbrenner that "capital outlays . . . depend on business expectations" (page 57). That capital outlays depend on expected profits, sales, interest rates, and so on is a generalization frequently found in textbooks. Yet it is possible, and is confirmed by our studies, that only some capital outlays depend on expectations while others do not. We need further studies on this point.⁵

It is also implied by Friend and Bronfenbrenner and frequently stated in textbooks that capital outlays are less tied down to current income than is consumption, the other major type of private expenditure. But suppose we list four major types of private expenditures instead of two (investment and consumption), namely, business capital outlays, business outlays for material and labor, consumer purchases of durable goods, and consumer expenditures for nondurables and services. Then the results may be different. We do not know which, business capital outlays or consumer spending

⁵ The role of expectations in economic behavior has been discussed in George Katona, "Expectations and Decisions in Economic Behavior," in Lerner and Lasswell, eds., *The Policy Sciences* (Stanford University Press, 1951). Regarding habitual capital expenditures, not based on definite expectations and on careful weighing of alternatives, see the article in the *Quarterly Journal of Economics* mentioned above, especially p. 90.

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on durables, is less tied down to current income. In this respect again we need empirically verified generalizations.

The Commerce Department and the SEC in their capital-outlay surveys are pioneering in an important field and have been very successful. I may summarize my emphasis on the need for further methodological research and additional analysis by saying that pioneers have responsibilities and that success imposes certain obligations.

REPLY BY THE AUTHORS

Katona raises three sets of questions, which we shall attempt to answer briefly.

The first set relates mainly to the desirability of additional distributional data and secondarily to a more complete discussion of the nature of the sample. The additional distributions suggested by Katona are somewhat outside the orientation of this paper insofar as they deal with trend patterns in investment rather than with the relation of business programs for a given period to actual investment in that period. This is, of course, no argument against the importance and relevance of such distributions for economic analysis, though questions of cost must certainly be balanced against the potential usefulness of any proliferation of distributional data. Some information on the specific points Katona raises may be obtained from table 3, where the marginal totals give a frequency distribution of per cent changes in capital outlays from 1948 to 1949, and from the discussion on page 68 of dollar variations of 1949 investment both from anticipations and from 1948 expenditures.

So far as the sample is concerned, considerably more elaborate descriptions are available than that quoted in Katona's footnote. The extent of coverage has varied over the postwar period, with the latest discussion appearing in the December 1951 *Survey of Current Business*. An earlier description of the sample appeared in the January 1946 *Survey*. The sample has no claim to randomness in view of its partial dependence on the willingness of firms to cooperate. However, the coverage in terms of assets is large, and for actual investment, where independent estimates are available, the agreement with these external data seems to be close, particularly in movement. (For manufacturing see the December 1951 *Survey*.) A complete reconciliation of the plant and equipment series with related construction and producers' durable equipment com-

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ponents of the gross national product, as adjusted to the new Census bench mark, has not yet been published.

The second set of questions refers to the form of the questionnaires on anticipated capital outlays. Katona makes the point that there is no way of knowing to what extent the reported anticipations include "needs, hopes, and desires" in addition to "projects under way and contracts already awarded." Ideally, we wish to know the probability of each contingent expenditure and the factors upon which it depends. One step in this direction has been the inclusion of anticipated sales in the regular annual questionnaires, since the level of sales is one of the major factors likely to affect contingent investments and also one regarding which businessmen generally are willing to quantify their expectations. An attempt was also made on the basis of small samples of personal interviews to determine the availability of such information as a three-way break separating from other projects, first, those already contracted for and, second, those not contracted for but to which a very high probability is attached in the absence of sharp deviations from present expectations. The results of these small sample tests were very unsatisfactory, though further study is certainly indicated.

The third set of questions relates to the form of the inquiry about divergences between programmed and realized investment. We feel, first of all, that an examination of the letter accompanying the questionnaires as well as the questionnaire itself casts doubt on the argument that the firms were placed on the defensive. We further disagree with the suggestion that the wording of the check list implies an assumption that all firms have definite expectations with regard to each of the factors. The assumption is merely that some firms have definite expectations about some of the factors; and even here "definite expectation" should be understood to imply a range, perhaps not very precisely defined, rather than a single number.

As regards the possible unwillingness of firms to give certain types of reasons for deviations from plan, such as the unavailability of capital or a mistake in the estimation of requirements, we should like to make two points. First, the fact that the unavailability of equity capital was not mentioned as a reason for curtailing programs¹ constitutes no clear evidence of the kind of bias Katona suggests, in view of the very small proportion of firms depending on

¹ We presume that Katona's remark refers to equity capital only, since some firms did indicate that the unavailability or cost of debt financing was the cause of decreased outlays.

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external equity financing and the improbability of short-term changes in the *availability* of capital to particular firms. This is not to deny that under certain conditions there may be *cost* fluctuations in the capital market which discourage some marginal projects, but in this case it is hard to see why the firms affected should be reluctant to state the facts frankly. Second, we should like to point out that, in spite of Katona's presumption to the contrary, several firms were in fact willing to indicate that the figures they reported had simply been bad estimates.

Katona also comments on the fact that changes in the supply situation and in plant and equipment costs were frequently mentioned as reasons for increased expenditures, even though evidence from other sources indicates that the changes in these respects could not have been radical in 1949. In this connection it is important to remember that the supply situation eased more slowly for small firms than for large ones and that it was primarily small firms which mentioned the supply situation as a factor inducing increased expenditures in 1949. As regards the effect of plant and equipment costs, it appears from the written comments that even though the general trend showed little upward movement, still there were substantial price rises for some equipment items, resulting in increased dollar outlays, as well as cases in which lower prices encouraged additional expenditures. We fail to understand Katona's suggestion that the increases in expenditures attributed to these causes may actually have been due to greater optimism regarding sales in the summer and fall of 1949 than prevailed at the beginning of the year. First, as mentioned in the paper, in three-fifths of the cases sales in 1949 actually fell below anticipations as reported at the beginning of the year. Second, a considerable percentage of firms did attribute an increase in expenditures to the fact that their sales held up better than expected. And third, a very substantial number of firms attributed curtailments of program to the fact that sales fell short of anticipations, though it might be expected that businessmen would be even less willing to admit an error in this direction.

In connection with Katona's general theoretical point that "only some capital outlays depend on expectations while others do not," it appears to us that any capital expenditure, even for replacement, must depend to some extent on expectations regarding the future, though these expectations need not, of course, involve any change from the present situation. Katona may mean that there are some

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capital outlays which are insensitive to wide variations in expectations, but this is in no way inconsistent with our discussion.

Regarding the relative impacts of income on private investment and consumers' durables, we do not care to make a judgment. The statement contained in our paper referred to consumption as a whole in comparison with investment.

