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## THE SALES FORECAST AND FINANCIAL MANAGEMENT IN THE SMALL MANUFACTURING FIRM

Richard Burns and Joe Walker

### ABSTRACT

The importance of an accurate sales forecast to financial management in general is well documented. Although large firms' forecasting practices *as they relate to financial management* have been surveyed, this is the first such study on small (manufacturing) firms. Surprisingly, the two groups are highly similar with respect to accuracy desired, accuracy achieved, the uses of the sales forecast, and in the importance of the sales forecast. However, large and small firms do differ significantly in methods, perceived sophistication of methods, and in the commitment of resources to the sales forecasting effort.

### I. INTRODUCTION

Sales forecasting is the cornerstone of financial planning. The importance of the sales forecast permeates many financial management activities including cash flow estimation, cash budgeting, capital budgeting, capital structure analysis, financial planning and valuation. In their leading textbook Brigham and Gapenski include the sales forecast among the principal components of the corporate financial plan. Further, "If the sales forecast is off, the consequences can be serious" (Brigham & Gapenski, 1993, p. 812). Cornell, referring to the discounted cash flow model as it is applied to business valuation, comments that, "At the core of any cash flow forecast lies a sales forecast. Sales to a company are like gross national product to a country. They are a measure of overall economic activity. All other sources and uses of cash, including production costs, capital expenditures, and interest income, are related, either directly or indirectly, to sales" (Cornell, 1993, p.124).

Geurts, Lawrence, and Guerard devote an entire book to methods of improving the accuracy of the sales forecast. The authors state that "sales forecasting affects almost every area of business operations. It is the basis for every budget and for the control and evaluation of management programs. The forecast integrates all parts of the business with the market, which is the ultimate determinant of the firm's survival and success" (Geurts, Lawrence & Guerard, 1994, p.1). Finally, two well-respected researchers in the area of

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*small firm* finance provide testimony on the importance of the sales forecast to the *smaller* business: "The estimation of sales for the planning period is the single most important variable in developing the financial plan. It is the basis of almost all other projections; thus, the reliability of the profit plan, as well as other financial plans, is largely dependent upon the accuracy of the sales forecast" (Walker & Petty, 1986, p.77).

The importance of an accurate sales forecast to financial management in large firms in general is thus well documented. The focus of this research, however, is on the importance of sales forecasting and its use in financial management functions for the *small business* in particular.

In the next section, a brief review of the relevant literature is provided, followed by a section discussing the survey design, procedures, sample characteristics, and results. A summary section follows accordingly.

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## II. LITERATURE REVIEW

For sales forecasting practice, the finance literature generally refers to the seminal work of Pan, Nichols, and Joy (hereafter PNJ) in *Financial Management* (Pan, Nichols, & Joy, 1977). These authors surveyed the Fortune 500 with the intent of summarizing the current sales forecasting practices of major U.S. industrial firms. They quote, "The results of our survey were consistent with the thesis that large industrial firms recognize the importance of sales forecasting and commit resources to these efforts on a planned, regular basis." (PNJ, 1977, p. 76) Their study also revealed that large firms perceive their techniques as sophisticated and providing a high degree of accuracy, particularly with periodic revision. Furthermore, the large firms show a positive relationship between the degree of accuracy desired and the accuracy actually achieved. It bears mentioning that the PNJ study on *large* firms is cited in Walker and Petty (1986), a well-regarded text in the financial management of the *small* firm.

A significant part of the questionnaire in the current study is based upon the PNJ survey instrument. However, the area of investigation was enhanced through modifications and additions appropriate for the study at hand. The source of some of these enhancements are from the studies by Pohlman, Santiago, and Markel (1988, PSM hereafter) and McIntosh (1990); and many of their questions will also comprise a significant part of the survey instrument. These researchers investigated the *cash flow* estimation practices of large companies (Fortune 500) and real estate appraisers, respectively, practices which are based largely on forecasts of sales. In fact, when asked to rank the most important factor in estimating cash flow, 94% of these Fortune 500 respondents ranked the sales forecast as highly important. "...it is also the factor with the highest weighted average ranking among all the factors listed. The relative importance accorded to this factor is not surprising, considering that an operating cash flow forecast starts with a sales forecast" (PSM, 1988, p.75).

However, the published works on the sales forecasting practices of *small* businesses are somewhat limited. Dalrymple's (1975) study was used in part to organize the study herein, and he references an earlier Conference Board survey (1970). The only other work the present authors are aware of is by Peterson (1996), although his work was not geared specifically to analyzing the financial function of the forecast.

To summarize, the purposes of the present study are: (1) to survey *small* business manufacturers<sup>1</sup> in order to estimate the importance they attach to forecasting and its financial applications, (2) to inquire about the methods they use and the specific operational procedures they employ, and (3) to search for relationships among the answers particularly in regard to firm size both within the sample of this study and also in comparison to the PNJ and PSM studies.

## III. SAMPLE DESIGN, PROCEDURES AND RESULTS

### *Who responded to the survey?*

A survey cover letter and a survey instrument<sup>2</sup> were first tested in the local area. The revised survey was then mailed to a random sample of small (under 500 employees according to the official SBA definition) manufacturing firms across the U.S. provided by Zeller & Leticia<sup>3</sup> over a four-month period in early 1998. However, based upon previous surveys of the authors, the lower cutoff for the mailing was set at 50 employees not only to increase the response rate but to increase the percent of usable returns. Four thousand questionnaires were sent out, and 231 usable responses were obtained for a usable response rate of 5.3% which is comparable with past surveys of small businesses. Ten of the returned questionnaires were from firms indicating under 50 employees, but these were kept in the sample since there were no significant outlier effects. Firms indicating over 500 employees in the return sample were excluded due to the severe outlier effects they represented. No attempt was made to determine non-respondent bias based on cost/benefit measures and also because the authors have not encountered such bias in past surveys of this group wherein heroic attempts to measure such bias were attempted.

In this study, two measures for size were used: number of employees and sales. By sales

(see Table I), a very popular measure in the research literature, the average firm herein surveyed had a mean of about \$22 million in sales per year with a median of only \$14 million, suggesting a skewed distribution.

The mean number of employees (also see Table 1) was about 152 and the median was only 115, again evidencing a very skewed distribution. The advantage of the number of employees is that it is basically invariant to inflation, and it is used by the Small Business Administration as their primary size measure. However, the very title of this paper suggests that "sales" is the focus of the forecast. Since the two measures of size correlate moderately ( $r = 0.49$ ) but significantly ( $p = 0.0001$ ), this study used both variables in various tests and found some, but very little, difference between the results.

***What did the respondents say generally about sales forecasting and its importance and uses and applications in their company?***

About 79% of the respondents *formally* forecast sales, strongly indicating the importance of the forecasting process by the small firms. Since the "no" answers may still forecast, though not formally, this most likely is a very conservative measure of the importance of the sales forecast.

At this point, the total sample was broken up into thirds based on (1) number of employees and (2) dollar sales, and the smallest one-third and largest one-third of the firms (using each size measure separately) were each tested against other variables to determine if size effects existed within the small manufacturing firm sample. To economize on space, only the statistically significant results (less than 5%) will be reported.

A size effect (measured by both number of employees and sales) was found for the presence of formal testing. The difference was significant at the 0.001 level for both measures of size with the "larger" small firms having a formal forecasting process more often than the "smaller" small firms.

For those sample firms that do such formal forecasting, 95% have a person in the company responsible for coordinating or supervising the sales forecasting process. This compares favorably with the 67% of *large* firms that have persons responsible for forecasting *cash flows* as shown in the PSM study. Furthermore, there is a strong positive relationship at the 0.001 level of significance for firms that formally forecast and that have a person responsible for the forecast.

But who actually does the forecasting in these small firms, and does the answer to that question impact on, say, the forecast accuracy as claimed in PSM? The many titles of those responsible for sales forecasting were grouped into 7 basic categories plus a miscellaneous category (Table II).

The largest category contains the word "sales" in the person's title, such as sales manager or vice-president of sales, or even manager of sales and marketing. Thus, the category will overlap with some of the other categories. Therefore, although percentage calculations will be somewhat misleading, that group would represent approximately 37%. The next largest group had the words "president" or "CEO" or even "owner" in the title. The next largest group had the word "marketing" in the responsible person's title (again, this process therefore overlaps with the first group since several titles were sales and marketing managers). Only 39 titles (about 14% allowing for overlapping titles) had a finance title such as CFO, VP Finance, or controller, which by itself does not clearly support the importance of sales forecasting to the financial function, yet perhaps at this size level that function is not yet highly specialized. Clearly, at this level, the sales managers for these small firms are primarily responsible for the sales forecast. In yet another breakdown of the data into titles with *only* sales, *only* marketing, sales *and* marketing, controllers, CFO's *or* financial VP's, presidents *or* owners, and miscellaneous, none of the groups correlated significantly with forecast accuracy in contrast to the PSM study wherein top management had an influence on obtaining better forecast accuracy.

If company standard forecasting practices exist, it would be another positive indication that small firms attach importance to the sales forecast. For those firms that did *formally* forecast sales, about 71% of them had company standard practices for generating such sales forecasts. This small firm percentage

compares favorably with the 65.5% of large firms in the PSM study that followed company standard practices for forecasting cash flows. The intrasample test based on (employee and sales) size differences did show a significant difference at the 0.01 level for "larger" small firms having company standard practices

	N	MEAN	MEDIAN	STD DEV	RANGE
SALES (IN MILLIONS)	223	22.4	13.5	31.9	3.8 - 300
EMPLOYEES	231	152.1	115	99.7	50-500

more often than "smaller" small firms.

Again, to address the importance of the sales forecast, survey respondents were asked to rank the priority of the sales forecast at their company. As shown in Table III, about 63% of the respondents ranked it 1 or 2 on a 5-point scale. Only 8% ranked it 5, the lowest priority. The importance of forecasting, therefore, is indicated by the approximately two-thirds who ranked it above average in importance. This is comparable to the Dalrymple (1975) results wherein 64% of the respondents reported forecasting being "very important." In addition, in the intrasample test, there is a significant difference (at the 0.02 level) in that the "bigger" firms (based on employee size) do rank forecasting more highly than the "small" firms. However, based on sales, there is no statistical significance, one of the few differences in testing that emerged from differing definitions of firm size.

One of the most difficult questions to answer in this survey asked how much the company spent on forecasting sales annually. It was difficult for the respondents to answer this question because of how integrated the forecasting function was among so many units and their jobs — that is, the forecasting function was part of a general budget process and not just a standalone procedure. Therefore, the reported spending probably likely understates the true amount spent. Only half of the respondents answered this question, and of those the mean was about \$19,000 (median of \$5,000) with a minimum of zero and a maximum of \$550,000. Taking the median dollars spent on forecasting (\$5,000) and the median sales (\$13.5 million) would give a median percentage of about 0.037%. This compares poorly with Wheelwright and Clarke (1976, p. 64) who report a forecasting budget for *large* companies in the range of \$10,000 to \$50,000 in 1976 for companies with sales up to a million dollars (ratio of 3% for the midrange). Adjusting for inflation, that would be approximately \$28,700 to \$143,500 spent on forecasting for companies with sales up to \$2.87 million in today's dollars. The within sample difference, however, was statistically significant at the 0.02 level for both employee and sales definitions and showed that the "larger" small firms spent more than the "smaller" small firms. In the same vein, however, the *ratio* of forecast spending to sales in the "larger" small firms did not significantly differ from that of the "smaller" small firms based on either employee or sales size. So while the total sample of forecast spending for small firms might not compare with the larger firms such as studied in PNJ, within the small firm sample there is evidence of a proportional progression in the dollar amount of resources devoted to forecasting as the size of the firm increases although the ratio of spending to sales apparently does not change.

To see in more detail how important the forecast was to the financial function, the respondents were asked to assign points (out of 100) to various *uses* of the sales forecast. Financial planning was in first place (26%) closely followed by production scheduling (24%). Next were cash budgeting and inventory decisions with respective percentages of approximately 14%, followed by capital expenditure analysis with about 11%. Financing decisions (loans) had a mean/median of about 7/0, and "other uses" had a mean/median of 3/0

TABLE II. TITLE OF FORECASTER	
SALES MANAGER (103)	MARKETING (41)
PRESIDENT OR CEO (46)	GENERAL MANAGER (6)
CONTROLLER (17)	PRODUCT MANAGER (6)
CFO or VP FINANCE (22)	MISCELLANEOUS* (17)

\* = MATERIALS MANAGER (2) , ACCOUNTING (2), CUSTOMER SERVICE, VP PROGRAM AND CONTRACT MANAGEMENT, VP ADMINISTRATION, BUSINESS DEVELOPMENT MANAGER (3), OPERATIONS PLANNING MANAGER (1), DEMAND MANAGER (1), CCO (3), BUDGET DIRECTOR (2).

(Table IV). The first place position of financial planning is not too surprising given that financial planning is often based on the percent of sales technique. None of the other studies asked this question. Within the small firm sample, there was only one statistically significant difference – based on the sales size definition, the “larger” small firms used financial planning *less* than the “smaller” small firms at the 0.01 level of significance.

“Other” reported uses of the sales forecast included: marketing and sales growth, EOQ based on setup times, customer action, sponsorships, performance analysis and strategy, the operating budget, sales goals, production and staffing requirements, sales comparisons, budget analyses, and tax planning.

***What methods of sales forecasting do the respondents use, and how do they assess those methods?***

The forecasting methods used to generate the sales forecasts were ranked by the respondents by having them assign points out of 100 to the various methods (Table V). Although the companies used several methods, the sales force composite method ranked first with a mean/median of 35/30.

The use of owner/manager subjective estimates placed second with a mean/median of 34/25. The use of customer expectations was third with a mean/median of 19/10, followed by consensus of expert opinion with mean/median of 5/0, time-series analysis with mean/median of 3/0, regression analysis with mean/median 1.5/0, and “other” with mean/median of 4/0. Some of the “other” forecasting methods mentioned in the comments section involved bidding activity, looking at historical sales patterns, the use of long-term contracts (3-5 years), computer modeling, the use of management team analysis, the use of *informal* (non-statistical) historical patterns, looking at market publications, using the futures market, and looking at the order backlog. The only statistically significant size effect within the sample was that at the 0.03 level of significance “smaller” small firms relied more on using a consensus of experts’ opinions than did the “larger” small firms.

When the respondents were asked to rank the relative sophistication of their company’s forecasting techniques compared to other companies their size and in the same industry, only 4% ranked the highest sophistication (5), 25% ranked next to highest (4), 36% ranked average sophistication (3), 23% ranked lower than average sophistication (2), and 13% ranked the lowest sophistication (Table VI). This result is markedly different from the large firms studied by PNJ who reported much higher levels of sophistication. In short, about two-thirds of the small manufacturing firm respondents rated themselves as average or above-average in terms of the sophistication of their forecasting methods. However, if sophistication is measured by the use of time-series, regression methods or the use of sensitivity analysis, then only about 22% of the respondent firms fit that definition. No statistically significant relationship was found between the method-use

**TABLE III. IS THE SALES FORECAST A HIGH PRIORITY IN YOUR COMPANY? (1=HIGHEST)**

PRIORITY	NO.	PERCENT
1	71	31.6%
2	70	31.1%
3	39	17.3%
4	27	12.0%
5	18	8.0%

measure of sophistication or the self-reported measure of forecasting sophistication and achieved forecasting accuracy. This result also does not correlate with that of the PNJ study

wherein it was found that the use of more sophisticated methods resulted in improved forecasting. One interesting result, however, was that within the small firm sample, the “larger” small firms reported more sophistication of forecasting techniques than the “smaller” small firms at less than the 1% level of significance based on both employee or sales size definitions. This result seems to provide a link to the much larger firms whereby, as firms grow, their sophistication grows too.

For the sample of small firms, the degree of accuracy their companies realistically *desired* to achieve in the sales forecast had a mean/median of about 9/10% with a standard deviation of 5.6% and a range from 0% to 25%, which is close to the PNJ results at first glance, with both groups having about 30% who want-

**TABLE IV. POINTS (OUT OF 100) ASSIGNED TO SALES FORECAST USES**

USES	N	MEAN	MEDIAN	STD DEV	RANGE
FINANCIAL PLANNING	222	25.8	20	22.7	0-95
PRODUCTION SCHEDULING	222	23.8	20	20.5	0-99
INVENTORY DECISIONS	222	14.7	10	16.0	0-75
CASH BUDGETING	222	14.0	10	16.2	0-99
CAPITAL BUDGETING	222	12.3	10	13.6	0 - 80
OBTAINING LOANS	222	6.6	0	10.3	0 - 60
OTHER	222	2.5	0	11.2	0 - 100

ed about 10% forecasting error (see Table VII). Upon closer analysis, however, this differs in the details from the PNJ results in that a lower percentage of small firms desired the highest accuracy (< 5%) than did the large firms. At the other extreme, twice as many of the small firms desired *greater* than 10% error. Although the medians seemed to center around the same 10% accuracy figure, the difference was made up in the higher percent of large firms that desired “high” but not “very high” accuracy. Almost all (97%) of the PNJ firms desired accuracy better than 10% whereas the figure was 81% for the small firms.

There was a similarity between the small firms and the larger PNJ firms on the question of the approximate percentage error between actual sales results and the forecasted sales amounts in their annual forecast of the previous year (see Table VIII). The small firm sample had a mean forecast error of 9% (median of 7%), standard deviation of 8% and a range from 0% to 50%. However, unlike the PSM study on *cash flow* forecast error, there was no statistically significant relationship between the error rate and whether or not there was a company person responsible for the forecasts. Who did the forecasting did matter at the 5% level, with the marketing people (vs. sales managers, finance executives, or owner/presidents, etc.) being the better forecasters.

It is noteworthy that two-thirds of the small firm respondents achieved or exceeded their desired forecasting accuracy. Unfortunately, the survey was not able to determine if their forecasts were biased in one direction or the other. Perhaps most important, though, is the finding of positive correlation at the 0.002 level between desired forecast accuracy and achieved forecast accuracy which PNJ say, “...implies that

TABLE V. POINTS (OUT OF 100) ASSIGNED TO FORECAST METHODS	N	MEAN	MEDIAN	STD DEV	RANGE
OWNER/MGR SUBJECTIVE ESTIMATES	221	33.6	25	26.1	0 - 100
SALES FORECAST COMPOSITE	221	34.8	30	24.9	0 - 100
CONSENSUS OF EXPERTS' OPINION	221	4.6	0	10.6	0 - 75
CUSTOMER EXPECTATIONS	221	18.5	10	21.7	0 - 100
TIME- SERIES ANALYSIS	221	2.8	0	10.9	0 - 100
REGRESSION ANALYSIS	221	1.5	0	7.1	0 - 75
OTHER	221	4.1	0	13.7	0 - 90

forecasting success is indeed related to forecasting aspirations.” (PNJ, p. 76)

***What specific operational procedures do the respondents use in sales forecasting?***

For the small firms, the longest time period covered by the sales forecast had a mean/median of 19/12 months, standard deviation of 16 months, and range from 0 to 60 months. As shown in Table IX,



TABLE VI. RELATIVE (SELF-REPORTED) SOPHISTICATION VS. OTHER COMPANIES (1 = LOWEST): THIS STUDY VS. THE PNJ SAMPLE			
RANK	NUMBER	PERCENT IN SMALL FIRMS	PERCENT IN PNJ FIRMS
1 (lowest)	38	13%	11%
2	50	24%	
3	80	35%	30%
4	55	25%	41%
5 (highest)	8	4%	18%

the small firms were much more focused on the short run than were the PNJ firms, and none of the small firms would forecast over 5 years.

The shortest time period included in the sales forecast for the small firms had a mean/median of 4/1 months, standard deviation of 5.5 months, and a range from 0 to 60 months. As shown in Table X, the small firms were more similar to the large PNJ firms in this respect; still, the small firms short-term forecasts were more concentrated towards the shorter periods. In looking at the intrasample differences, there was a statistically significant difference (whether measured by employees or sales) in that the “larger” small firms used longer (short) forecast periods than did the “smaller” small firms.

Scheduled revisions of the sales forecast for the small firms occurred on average 6 times a year (median of 4) with standard deviation of 10 times and range from 0 to 104. The results were fairly comparable to the PNJ firms, but overall the small firms tended to revise their forecasts less often as shown in Table XI.

The actual sales results were compared with the forecasted sales amounts on average 24 times per year (median of 12 times per year) with standard deviation 64 and range from 0 to 365 (Table XII). Again, though somewhat similar to the PNJ firms, the small firms tended to make fewer comparisons per year even though a bigger percent of the small firms (8%) than the large firms (4%) compared more than 12 times a year as shown in Table XII. The intrasample tests showed that the “larger” small firms compared much more often than the “smaller” small firms at the 0.0001 level whether measured by employee or sales size.

Only about 16% of the respondents used a sensitivity analysis to isolate factors with the largest impact on forecasted sales versus the 69% of the PSM firms. The “larger” small firms, based on employee or sales size, use it more (86%) than the “smaller” small firms (14%) significantly at the 0.01 level. However, the use of sensitivity analysis did not correlate with actual forecasting accuracy. On the other hand, sensitivity analysis could be another measure of “sophistication.” As such, it would indicate that size and “sophistication” do go hand in hand.

In auditing past forecasts, the most common sources or types of errors reported (Table XIII) were due

overwhelmingly to customer variation (35%). The next major category of error was estimating market changes (14%). This was followed by the respondents who reported an inherent optimistic bias (11%), although only (3%) reported a conservative bias. Errors due to predicting economic factors constituted the

	< 5%	5-9%	10%	> 10%
SMALL FIRMS	15%	36%	30%	19%
PNJ FIRMS	20%	46%	32%	3%

next largest category (9.9%). Competition, weather factors, various “constraints”, lack of data, changing product mix, exchange rates, government regulation, industry trends, and other miscellaneous reasons comprised a mixture of reported forecasting errors.

About 79% of the small firm sample respondents said they made an effort to compare their sales forecast to their company’s historical performance if and when it deviated significantly from that past performance. One of the most common comments on the survey was that company historical performance for prediction purposes was useless because of the expected volatility. Yet many of the respondents did look carefully at historical performance, and not just in a general manner — they looked at past sales records by product line and even by individual customer. One respondent said they ran a 10-year company historical analysis by month and quarter.

Yet, for many of the same reasons, only 28% said that they made a similar comparison of their sales forecast to the historical performance of the *industry*. Based on comments by survey respondents, many thought that their firms’ correlations with the industry were not very strong, and so industry data was not as relevant to their experiences. Some respondents said their industry was fragmented, so industry growth patterns were not reliable. Others mentioned the non-availability or even irrelevance of industry data due to changed circumstances.

About 50% of the respondents reflected inflationary expectations in their sales forecasts versus the 70% of the PSM firms that did (and the 97% of PSM firms that at least *mentioned* it). This would seem appropriate based on the small firms having much shorter forecasting periods, while the larger PSM firms perform capital budgeting over longer periods where inflation compounds significantly. Furthermore, the

ERROR RATE	< 5%	5-9%	10%	> 10%
SMALL FIRMS	45%	12%	17%	26%
PNJ FIRMS	32%	38%	28%	2%

TABLE IX: LONGEST PERIOD FORECAST				
	> 5 YEARS	> 3 TO 5 YEARS	> 1 TO 3 YEARS	1 YEAR
SMALL FIRMS	0%	11%	20%	69%
PNJ FIRMS	4%	43%	18%	35%

PSM study was done 20 years ago when inflation rates were much higher than today; so that fact too would make inflation less important as an issue to small firm (or even large firm) forecasting today. Inflation was not significantly related to the small firms in terms of perceived sophistication of forecasting techniques nor in relation to desired or actual accuracy. Again, though, that could well be a function of today's much lower inflation rate.

About 50% of the small firms used economic forecasts as a source of inflation forecasts, and about 40% used industry forecasts to get their inflation forecasts. 16% used "other" sources such as noticing internal wages and supply pressures, sales input and market trends, input from accountants and bankers, follow-

TABLE X : SHORTEST PERIOD FORECAST				
	< 1 MONTH	1 MONTH	> 1- 3 MONTHS	>3 TO 12 MONTHS
SMALL FIRMS	9%	45%	24%	23%
PNJ FIRMS	2%	66%	17%	15%

ing commodity prices, looking at raw materials forecasts, using headquarters requirements, noting historical performance figures, using the implicit price deflator, estimating by themselves, going by union labor contracts and key vendors, and looking at the order backlog, and even checking with customers.

#### IV. SUMMARY

As stated previously, the purposes of the present study were : (1) to survey small business manufacturers in order to estimate the importance they attach to sales forecasting and its financial management applications, (2) to inquire about the sales forecasting methods they use and the specific operational procedures employed, and (3) to search for relationships among the survey responses, particularly in regard to firm size

TABLE XI: FORECAST REVISIONS PER YEAR				
	> 12	11 OR 12	3 TO < 11	< 3
SMALL FIRMS	4%	20%	35%	41%
PNJ FIRMS	2%	31%	43%	23%

both within the sample of this study and also in comparison with the PNJ and PSM studies of larger firms.

The evidence from this study clearly indicates that small manufacturing firms consider the sales forecast highly important to financial management. Most of the respondents consider the sales forecast above average in priority, and a large part consider it of highest priority. Further, most of the sample firms formally

	> 12	12	3 TO < 12	< 3
SMALL FIRMS	8%	66%	11%	15%
PNJ FIRMS	4%	87%	7%	2%

forecast sales and also have a person (generally with “sales” in the job title) responsible for coordinating and supervising the sales forecasting process according to company standard practices. A predominant use indicated for the sales forecast was financial planning. Other uses included production scheduling, cash budgeting, inventory management, and the analysis of capital expenditures, among others.

The sample firms predominantly relied on a sales force composite and on owner/manager subjective estimates to forecast sales rather than using more sophisticated techniques such as time-series and regression analysis. Procedurally, a large part of the sample firms considered historical sales levels, gathered inflation forecasts, and made both short and long-range sales forecasts. In the interests of forecasting accuracy and improved forecasting, results comparisons and forecast revisions were made.

Within the study’s sample, the “larger” small firms considered the sales forecast to be a higher priority, had a more formal process with company standard practices, and committed more company resources

ERROR	N	%
CUSTOMER FORECAST VARIANCE	75	35%
MARKET CHANGES	30	14%
OPTIMISTIC BIAS	23	10.7%
ECONOMY AND INTEREST RATES	21	9.8%
COMPETITION, WEATHER, CONSTRAINTS, LACK OF DATA, CONSERVATIVE BIAS, PRODUCT MIX, EXCHANGE RATES, GOVT REGULATIONS, INDUSTRY TRENDS, MISCELLANEOUS (ALL LESS THAN 6% INDIVIDUALLY)	65	30.4%

to the forecasting effort. Furthermore, these “larger” small firms used more sophisticated forecasting methods. These within-sample size relationships are consistent with findings in previous studies on the sales

and cash flow estimation practices of larger Fortune 500 firms.

On an inter-study basis, the small manufacturing firms in this study were highly similar to the larger Fortune 500 firms with respect to accuracy desired, accuracy achieved, the uses of the sales forecast, and the importance of the forecast. However, the smaller firms differed significantly in sophistication of methods used, the level of resource commitment, and some procedural aspects of the sales forecasting process. In particular, the small firms did not refine their forecasts with inflation concerns or perform sensitivity analysis as much as did the larger firms. Unlike large firms, the small firms aimed at shorter forecast periods and revised and compared less often. Still, the small firms aimed at and achieved roughly similar accuracy in error rates. Possibly this is not surprising precisely because of the role of the sales forecast and its importance to subsequent financial management applications and decisions by the firm regardless of size.

## NOTES

1. Small manufacturers alone were chosen for several reasons: (1) they are a more homogeneous group, thus reducing industry effects on the results; (2) manufacturers generally have more durable products and thus have a longer forecast period involved with their products; (3) it is generally known that small retail, service, and distribution firms seldom make use of explicit forecasts.
2. Available on request from the authors.
3. Zeller and Letica, Inc. (now renamed American Business Information), 15 East 26th Street, New York, New York, 10010.

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