

## Benchmarks for New Product Forecast Errors

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Three studies are summarized here.

- Tull, Donald S. (1967), "The Relationship of Actual and Predicted Sales and Profits in New Product Introductions," *Journal of Business*, 40, 233-250.
- Beardsley, George & Edwin Mansfield (1978), "A Note on the Accuracy of Industrial Forecasts of the Profitability of New Products and Processes," *Journal of Business*, 51, 127-135.
- Kahn, Kenneth B. (2002), "An Exploratory Investigation of New Product Forecasting Practices," *Journal of Product Innovation Management*, 19, 133-143.

### 1. Tull's Study

Tull (1967)<sup>1</sup> conducted a survey that obtained information from 16 companies. These firms tended to be larger and more profitable than typical firms in the categories examined. The products were first introduced from 1955-1963. The range of products reported by companies was from one to six. In all cases they represent the final forecast on which the decision was made to introduce the product. The biggest problem with the data is that the forecast horizon ranged from one to ten years. The error was as calculated over the whole forecast horizon.

I have simplified the tables and corrected what seemed to be typographical errors.

#### Sales Forecasts for New Products: Amount and Direction of Error by Type of Product and Information Used

	Number of Products	MAPE Mean Absolute Percentage Error	MdAPE Median Absolute Percentage Error	Products F > A Percent
Innovative products	17	61	26.0	59
Adaptive products	46	66*	26.5	69
Consumer products	35	49	23.0	63
Industrial products	28	85	36.5	68
Secondary information	28	56	24.0	57
Primary information	35	72*	35.0	71
All products	63	65*	26.0	65

\* Excludes product that failed with error of 10,200 percent.

As might be expected, the errors in profit forecasts are much higher.

#### Profit Forecasts for New Products: Error by Type of Product and Information Used

	MAPE	MdAPE	Optimism bias
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<sup>1</sup> Tull, Donald S. (1967), "The Relationship of Actual and Predicted Sales and Profits in New Product Introductions," *Journal of Business*, 40, 233-250.

	Number of Products	Mean Absolute Percentage Error	Median Absolute Percentage Error	(Products F > A) Percent
Innovative products	15	118	23.5	80
Adaptive products	38	131	42.5	70
Consumer products	35	78	25.3	66
Industrial products	18	225	73.0	89
Secondary information	22	135	33.5	55
Primary information	31	122	57.0	84
All products	53	128	46.0	72

Interestingly, only 25% (four) of the companies examined uncertainty. The rest were point forecasts. These four companies assessed risk only by assigning subjective forecasts: “pessimistic,” “most probable,” and “optimistic,” but without probabilities. No companies calculated prediction intervals.

## 2. Beardsley & Mansfield’s Study

For 57 new products developed in the years 1960 through 1964, the correlation was .37 between the initial forecasts of profits and the actual profits over a nine-year horizon (expressed in present worth as of the time of the forecast) The distribution of ratio of the Forecast Discounted Profits divided by the Actual Discounted Profits was:

**New Product Forecast Earnings Forecast Errors: 9-year horizon** for “one of the [U.S.’s] largest firms in 1960-64”

Error Ratio	Number of New Products
Less than 0.3	6
0.3-.59	5
0.6--.89	4
0.9—1.09	4
1.1—1.49	3
1.5—1.99	5
2.0—2.99	3
More than 3.0	9

## 3. Kahn’s Study

Kahn (2002)<sup>2</sup> used three sampling methods to obtain replies on new product forecasting from 168 firms. The forecasts were made at the point of the launch and were evaluated one year later. Unfortunately, it is difficult to understand what the “forecast accuracy” question was measuring. Subjects were asked to “indicate the degree of forecast accuracy one year post-launch.

<sup>2</sup> Kahn, Kenneth B. (2002), “An Exploratory Investigation of New Product Forecasting Practices,” *Journal of Product Innovation Management*, 19, 133-143.

Forecasts were less accurate, the newer the product.

Extent of Newness	Number of Products	Accuracy Index
Product improvements	45	65
Line extensions	45	63
Market extensions	42	54
New category entries	30	47
New-to-the-world	39	40

Forecast accuracy was not related to the method used nor to the number of methods used.

From the replies to Kahn's survey, it appears that formal structured methods are seldom used. For example, 30% of the sample reported using the "looks-alike" method, which must refer to the use of analogies. My expectation is that an informal use of analogies harms accuracy and, in fact, it was negatively correlated to accuracy in Kahn's study. In contrast, I would expect that a formal use of analogies would improve accuracy.

Surveys of new product forecast errors are hard to conduct. One gets the impression that firms are not careful in the way that they track forecasts. In addition, the respondents seem to have a poor understanding of forecasting methods. For example, some of the methods that they reported using seem to be impossible to apply prior to introduction