

Magazine Checkout Sales Forecasting Model

Multivariate Solutions

Applications and Goals

- In a Monte Carlo simulation, a model in spreadsheet format is set up and the cells whose values come from the survey results are identified (and which are therefore subject to sampling error).
- For each of these cells, a distribution of possible values using the appropriate means and Bias Ply errors is specified. A series of trials is then generated, each one of which represents a possible outcome of the process.

First Step – Fit Distribution of Sales

Sales Volume A	Sales Volume B	Sales Volume C	Sales Volume D
562	362	646	508
494	373	634	528
387	351	672	515
302	358	646	503
630	356	586	404
257	343	601	525
690	344	669	524
510	369	704	503
695	363	613	540
865	368	667	465
545	366	626	429
493	353	610	555
463	367	637	632
512	347	620	422
182	366	687	480

- This spreadsheet model shows a portion of the historical data of the four magazines, each data point represents one sales period. In all, there are 400 data points.
- Because you have historic sales data for all of these magazines, you can use Crystal Ball's® distribution fitting feature to create assumptions for each of the magazines.

Magazine Checkout Sales

Magazine Checkout Sales

	<i>Magazine A</i>	<i>Magazine B</i>	<i>Magazine C</i>	<i>Magazine D</i>
<i>Sales Volume</i>	499	354	639	480
<i>Retail Price</i>	\$4.95	\$7.95	\$3.95	\$5.95
<i>Cost of Goods</i>	\$2.20	\$3.80	\$1.95	\$2.40
Gross Profit	\$1,373	\$1,471	\$1,278	\$1,706

Total Gross Profit: \$5,828

- This spreadsheet model shows the estimated Total Gross Profit resulting from newsstand sales of four of the company's most popular magazines. It is one example of Crystal Ball's®.
- This spreadsheet will then be run with the assumptions, in yellow, moving around within their boundaries—their distributions determined on the previous slide.
- The forecast will be run 1,000,000 times.

The Monte Carlo Method Explained

- Expected Total Gross Profit for magazine sales represents a mid-point value (mean) outcome given the survey results. This might be the value shown in a simple spreadsheet.
- If the simulation is performed, say, 1,000,000 times, such a mid-point value (mean) outcome would represent only a small fraction of the total trials.
- When the confidence intervals are accounted for, the 1,000,000 outcomes of these trials can be arrayed in a cumulative distribution. The probability of percentage growth falling into any given interval can be read off as the number of trials with outcomes in that interval.
- The following distribution (next slide) explains how to interpret the cumulative charts.

Monte Carlo

Market Potential Application

- Summary Forecasts for the Total US Market
 - The middle point (**50%**) of expected **Total Gross Profit**, in blue, is \$5,762.
 - There is an **80%** chance, in yellow, that **Total Gross Profit** will be \$5,395 or higher.
 - There is a **20%** chance, in red, that **Total Gross Profit** will be \$6,218 or higher.

Percentiles	Total Gross Profit
100%	\$4,157
90%	\$5,228
80%	\$5,395
70%	\$5,525
60%	\$5,643
50%	\$5,762
40%	\$5,888
30%	\$6,033
20%	\$6,218
10%	\$6,504
0%	\$11,193

Monte Carlo

Market Potential Application

- Specific Goals – Decision Making
 - Executives at the magazine firm want to know the chances of making **\$5,500 or more** on **Total Gross Profit** for the given period.
 - The chart below shows that there is a **72%** chance of that occurring.

