

Product Demand Forecast

Multivariate Solutions

Monte Carlo Simulation

- In a Monte Carlo simulation, a model in an excel spreadsheet format is set up and the cells whose values come from the survey results or other sources are identified.
- For each of these cells, a distribution of possible values using the appropriate statistics is specified.
 - That is, each cell moves differently according to how it is set up.
- Once all cells are set up, random trials can run, say, 100,000 times.
- What results is a distribution of all possible outcomes, and the chances of an particular outcome (or better) happening.
- Monte Carlo analysis can be used for:
 - Market size estimation
 - Market potential for a product
 - Sales estimation
 - Find the most lucrative price point

Monte Carlo

Market Potential Application

- This Montgomery Patton market size forecast model is used primarily to determine the approximate size of Montgomery Patton markets in various markets worldwide.
- While it is a relatively straightforward matter to develop confidence intervals for each of the market sizes taken alone, what is really at issue is the confidence interval of all the market sizes taken together to get a wide ranging *guestimate* of the actual size of the Montgomery Patton market.
- The following Monte Carlo simulation is an example of how this is done.

Monte Carlo

Market Potential Application

- North American demand for Montgomery Patton products and Montgomery Patton sales and market share are reported, when in the real world:
 - North American sales are said to be \$6.3 million, when they could actually be between \$6 million and \$6.6 million.
 - The percentage of Montgomery Patton market share for this product is reported to be 40%, when it could be between 36% and 43%.
 - The market share that Montgomery Patton captures in North America for this product products was reported in the survey at 11%, when it may actually be between 8% and 14%.

Monte Carlo

Market Potential Application

- Questions Included in the Survey
 - Percentage of Projects Would Use Product
 - Average Job in Units Using This Product
 - How Many Projects Complete in a Typical Month
- Montgomery Patton (our fictional client) provides data to input
 - # Agents in each of the target markets
- The output not only summarizes potential market size for the US Montgomery Patton market, but also for each individual Montgomery Patton market.

Monte Carlo

Market Potential Application

- Example North American Spreadsheet
 - Distribution values are built into the bright green cels
 - The light blue indicate forecast values

Montgomery Patton Market Size Monto Carlo Analysis

South	# Agents	Percentage of Projects Would Use Product	Average Job in Units Using This Product	How Many Projects Complete in a Typical Month		Projected Units For New Product
Total Wholesale	9,079	65	165	6.4	Wholesale	6,778,779
Total Retail	44,889	71	51	12.0	Retail	19,325,876
					Total	26,104,655

Central	# Agents	Percentage of Projects Would Use Product	Average Job in Units Using This Product	How Many Projects Complete in a Typical Month		Projected Units For New Product
Total Wholesale	7,136	76	460	8.8	Wholesale	21,901,244
Total Retail	23,975	83	298	12.6	Retail	74,432,185
					Total	96,333,429

West	# Agents	Percentage of Projects Would Use Product	Average Job in Units Using This Product	How Many Projects Complete in a Typical Month		Projected Units For New Product
Total Wholesale	9,174	55	298	4.5	Wholesale	6,717,475
Total Retail	39,398	71	85	14.4	Retail	34,230,182
					Total	40,947,657

	Projected Units For New Product
Total Wholesale	35,397,498
Total Retail	127,988,243
Total Market	163,385,741

Monte Carlo

Market Potential Application

- Forecasts for the Southern market
 - The percents are 80%, 50% and 20% are highlighted.
 - The results are analyzed as follows:
 - There is an 80% chance wholesale product usage in the South is 273,500 units or greater (red box).
 - There a 50% chance that total product unit usage in the South is 12,650,000 or greater (blue box).

Percentiles	Projected Units For New Product - South - Wholesale	Projected Units For New Product - South - Retail	Projected Units For New Product - South - Total
100%	7	2	10,504
90%	77,456	553,289	1,684,696
80%	273,404	1,386,439	3,499,380
70%	604,259	2,582,116	5,854,545
60%	1,137,123	4,299,374	8,821,122
50%	1,968,488	6,719,051	12,657,452
40%	3,304,879	10,052,945	17,873,064
30%	5,604,221	15,267,238	24,976,687
20%	9,778,149	24,560,428	36,906,016
10%	19,805,047	46,775,249	63,859,796
0%	314,971,117	1,027,871,663	1,031,810,769

Monte Carlo

Market Potential Application

- Summary Forecasts for the Total US Market
 - The middle point (50%) size of unit retail market is around 48,000,000 units (red box).
 - Montgomery Patton wants to know the if total product units sales can be above 140,000,000 units. We report the likelihood to be less than 30% (blue box).

Percentiles	Projected Units For New Product - Total Wholesale	Projected Units For New Product - Total Retail	Projected Units For New Product - Total Market
100%	79	42,877	16,075
90%	1,898,652	9,417,126	20,690,287
80%	3,671,838	16,140,846	32,198,759
70%	6,161,731	24,601,800	45,144,490
60%	9,274,197	34,417,355	59,766,915
50%	13,305,500	47,633,588	78,274,882
40%	19,088,033	65,480,969	102,367,981
30%	27,468,228	95,301,886	137,057,503
20%	42,430,587	142,471,885	197,099,807
10%	77,019,781	265,569,843	331,214,299
0%	5,979,505,575	10,665,148,983	10,677,615,956