

One-Minute Spotlight

The Crystal Ball Charts: Overlay and Trend

Once you have run a simulation, you can view several charts to help you visualize, understand, and communicate the simulation results. In this Spotlight, you will see how the overlay and trend charts can help you to compare the results from multiple forecast charts simultaneously.

You have already completed a net present value (NPV) analysis of Project 1 in the discounted cash flow (DCF) spreadsheet model. You now wish to compare the simulation results of the NPV for both projects (both are shown below), which are on separate worksheets in the same model. You run Crystal Ball for 2000 trials and begin to analyze the results.

| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|-------------------------|--------------|-------------|-------------|-------------|-------------|------------------|
| Cost/Package | | \$6.00 | \$6.05 | \$6.10 | \$6.15 | \$6.20 |
| # Sold | | 802,000 | 967,000 | 1,132,000 | 1,297,000 | 1,462,000 |
| Gross Revenues | | \$4,812,000 | \$5,850,350 | \$6,905,200 | \$7,976,550 | \$9,064,400 |
| Cost of Revenues | | \$2,646,600 | \$3,217,693 | \$3,797,860 | \$4,387,103 | \$4,985,400 |
| Gross Income | | \$2,165,400 | \$2,632,658 | \$3,107,340 | \$3,589,448 | \$4,079,000 |
| Operating Costs | | \$324,810 | \$394,899 | \$466,101 | \$538,417 | \$611,800 |
| Net Income Before Taxes | | \$1,840,590 | \$2,237,759 | \$2,641,239 | \$3,051,030 | \$3,467,200 |
| Taxes | | \$588,989 | \$716,083 | \$845,196 | \$976,330 | \$1,109,400 |
| Initial Investment | -\$3,400,000 | | | | | |
| Net Income | -\$3,400,000 | \$1,251,601 | \$1,521,676 | \$1,796,043 | \$2,074,701 | \$2,357,800 |
| NPV Project 1 | | | | | | \$344,796 |
| IRR Project 1 | | | | | | 15% |
| Assumptions | | | | | | |
| Taxes | | | | | | 32% |
| Discount Rate | | | | | | 10% |
| Cost of Revenues % | | | | | | 55% |
| Operating Cost % | | | | | | 15% |



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| | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|-------------------------|--------------|-------------|-------------|-------------|-------------|-------------|
| Cost/Package | | \$5.00 | \$5.10 | \$5.20 | \$5.30 | \$5.40 |
| # Sold | | 802,000 | 967,000 | 1,132,000 | 1,297,000 | 1,462,000 |
| Gross Revenues | | \$4,010,000 | \$4,931,700 | \$5,886,400 | \$6,874,100 | \$8,041,000 |
| Cost of Revenues | | \$2,205,500 | \$2,712,435 | \$3,237,520 | \$3,780,755 | \$4,422,500 |
| Gross Income | | \$1,804,500 | \$2,219,265 | \$2,648,880 | \$3,093,345 | \$3,618,500 |
| Operating Costs | | \$270,675 | \$332,890 | \$397,332 | \$464,002 | \$542,700 |
| Net Income Before Taxes | | \$1,533,825 | \$1,886,375 | \$2,251,548 | \$2,629,343 | \$3,075,800 |
| Taxes | | \$490,824 | \$603,640 | \$720,495 | \$841,390 | \$984,000 |
| Initial Investment | -\$3,400,000 | | | | | |
| Net Income | -\$3,400,000 | \$1,043,001 | \$1,282,735 | \$1,531,053 | \$1,787,953 | \$2,091,800 |
| NPV Project 2 | | | | | | -\$241,403 |
| IRR Project 2 | | | | | | 6% |
| Assumptions | | | | | | |
| Taxes | | 32% | | | | |
| Discount Rate | | 10% | | | | |
| Cost of Revenues % | | 55% | | | | |
| Operating Cost % | | 15% | | | | |

Creating the Overlay Chart

You can use Crystal Ball's overlay chart feature to view the relative characteristics of those forecasts on one chart. The overlay chart superimposes the frequency data from selected forecasts so you can compare differences or similarities that otherwise might not be apparent. There is no limit to the number of forecasts you can overlay.

To create an overlay chart, select the Overlay Charts option from the Analyze menu or select the overlay chart toolbar button (outlined in red, below):



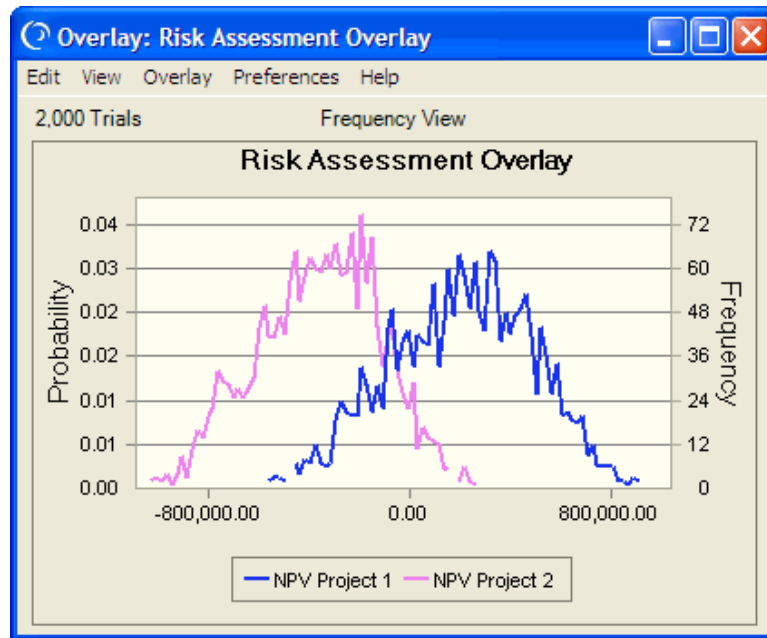
When you first open the overlay chart, you see a blank view. Click New to create a new overlay chart.

Formatting the Overlay Chart

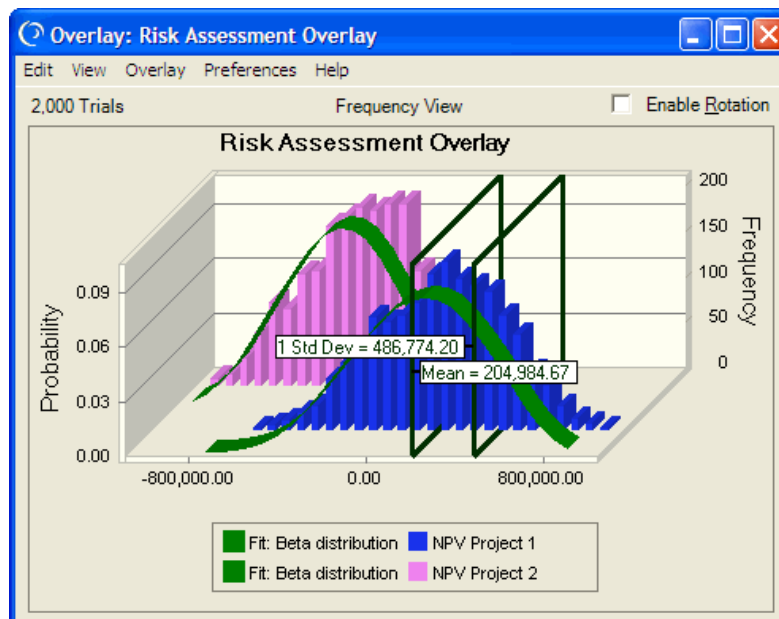
The forecast chooser shows a tree view of all the forecasts. Select the NPV forecasts for Project 1 and Project 2. Click Ok to finish. The chart appears as shown below (when set to show the forecasts as outlines).



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Customize the look and style of the overlay chart by making selections on the Chart Preferences dialog. You can also fit a continuous distribution to the results of both forecasts, add marker lines and include a 3-dimensional view. The best fit for the NPV Project 1 forecast is a beta distribution with a mean of \$204,984 and a standard deviation of \$281,789 (shown below in green).



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Creating the Trend Chart

A trend chart summarizes and displays information from multiple forecasts, making it easy to discover and analyze trends that might exist between related forecasts. You can customize your trend chart to display the probability that given forecasts will fall in a particular range.

For example, in Project 2, you have defined the five Net income calculations as forecasts. Because these forecasts are related through time, you can use the trend chart to compare at a glance the certainty ranges (probability bands) for an earlier time period and a later time period.

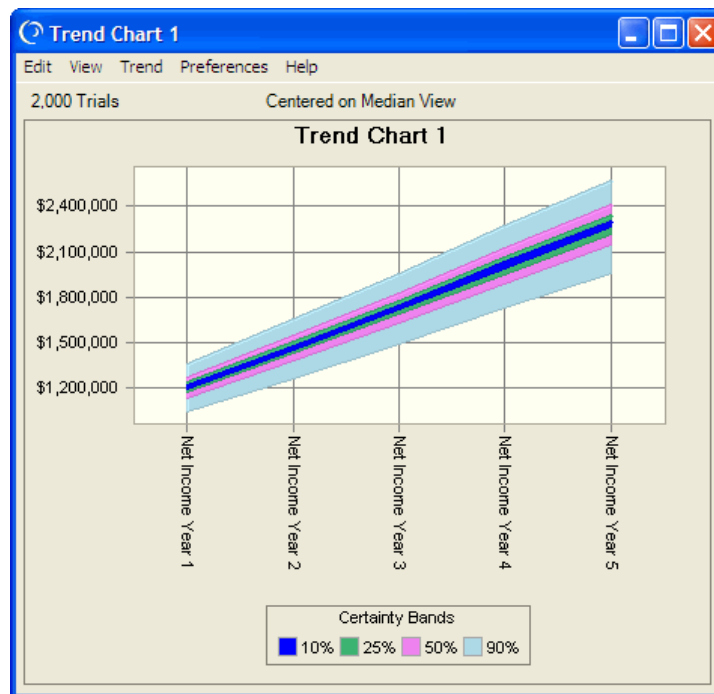
To create a trend chart, you can select the Trend Charts option from the Analyze menu or select the Crystal Ball trend chart toolbar button (outlined in red, below):



When you first open the chart, you see a blank view.

Formatting the Trend Chart

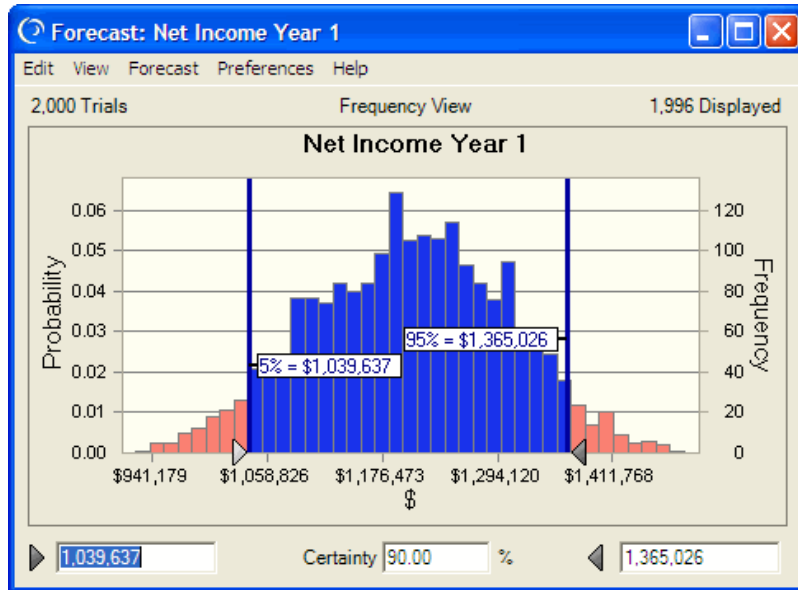
The forecast chooser shows a tree view of all the forecasts. To compare the Net Income forecasts, select the five forecasts in the order you wish them to appear.



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The trend chart displays certainty ranges in a series of probability bands, each of which represents the likelihood of where values of your forecasts fall.

For example, the light blue band that represents the 90% certainty range for Year 1 shows the range of values into which your forecast has a 90% chance of falling (\$1.04 million to \$1.36 million). You can use the forecast chart to show you the same information (shown below).



For more information or to contact us, browse to <http://www.oracle.com/crystalball>.