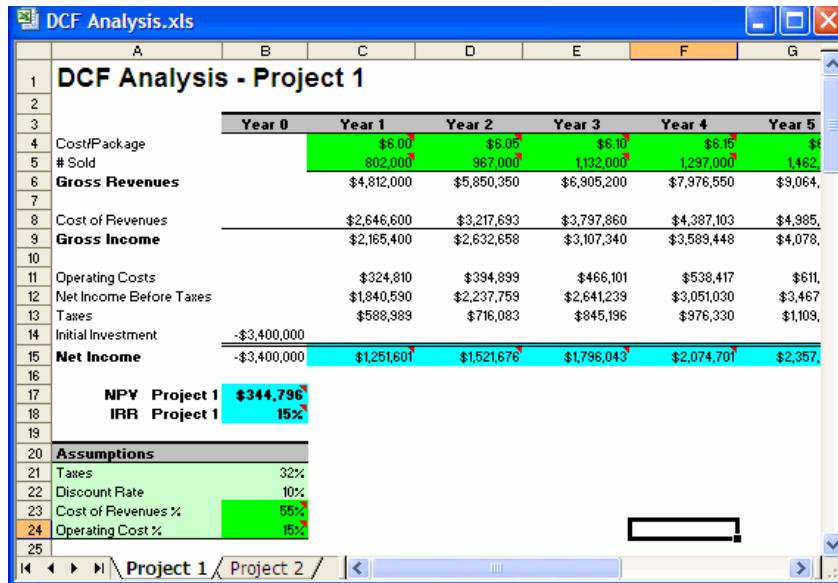


# One-Minute Spotlight

## The Crystal Ball Forecast Chart

Once you have run a simulation with Oracle's Crystal Ball, you can view several charts to help you visualize, understand, and communicate the simulation results. This Spotlight uses Crystal Ball and a simple spreadsheet (shown below) to demonstrate how you use a forecast chart.



	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Cost/Package	\$6.00	\$6.05	\$6.10	\$6.15	\$6.20	\$6.25
# Sold	802,000	967,000	1,132,000	1,297,000	1,462,000	1,627,000
<b>Gross Revenues</b>		\$4,812,000	\$5,850,350	\$6,905,200	\$7,976,550	\$9,064,000
Cost of Revenues		\$2,646,600	\$3,217,693	\$3,797,860	\$4,387,103	\$4,985,000
<b>Gross Income</b>		\$2,165,400	\$2,632,658	\$3,107,340	\$3,589,448	\$4,078,000
Operating Costs		\$324,810	\$394,899	\$466,101	\$538,417	\$611,000
Net Income Before Taxes		\$1,840,590	\$2,237,759	\$2,641,239	\$3,051,030	\$3,467,000
Taxes		\$588,989	\$716,083	\$845,196	\$976,330	\$1,109,000
Initial Investment	-\$3,400,000					
<b>Net Income</b>	-\$3,400,000	\$1,251,601	\$1,521,676	\$1,796,043	\$2,074,701	\$2,357,000
<b>NPV Project 1</b>						<b>\$344,796</b>
<b>IRR Project 1</b>						<b>15%</b>
<b>Assumptions</b>						
Taxes						32%
Discount Rate						10%
Cost of Revenues %						55%
Operating Cost %						15%

This discounted cash flow (DCF) spreadsheet model contains two projects that have different input values and Crystal Ball assumptions. Prior to simulation, you used average values to calculate a deterministic (non-probabilistic) net present value (NPV) of \$344,796 for Project 1. Your goal is to examine the probable NPV forecast for Project 1, so you run Crystal Ball for 2000 trials and begin to analyze the results.

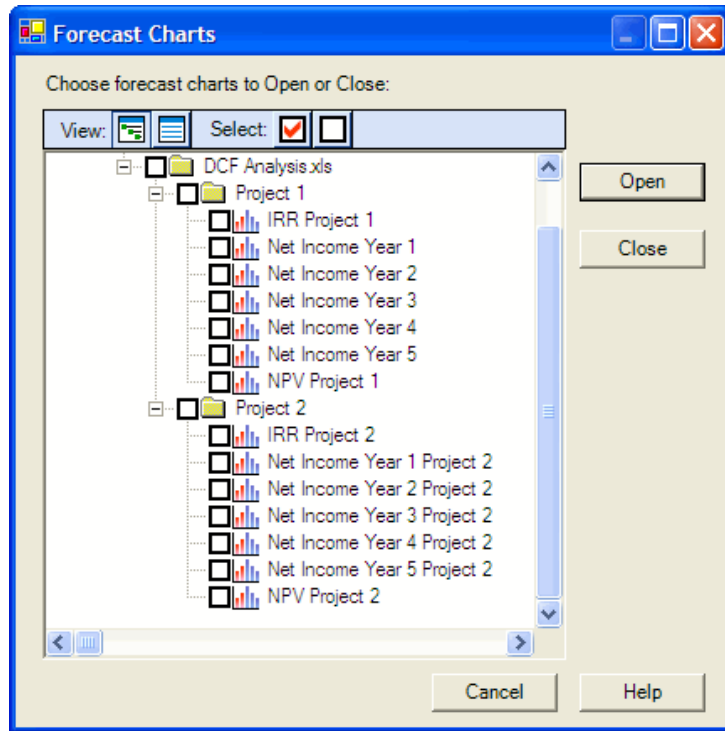
## Opening the Forecast Chart

In the Define Forecast dialog, you can set whether or not to show each forecast window during or after a simulation. If you deselect this option, then you will need to open the forecast chart or charts using the Crystal Ball toolbar button (outlined in red, below):



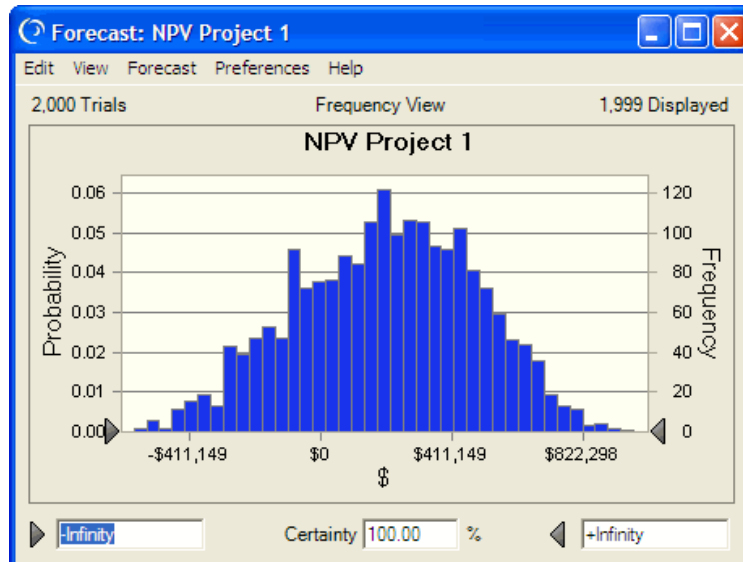
You can also select the Forecast Windows option from the Analyze menu. Both ways will open the Forecast Charts dialog, from which you can choose to view some or all of your simulation forecasts. We will look at NPV Project 1.

# One-Minute Spotlight



## The Frequency Chart View

The frequency view is a simple histogram of the values generated during the 2000 iterations.

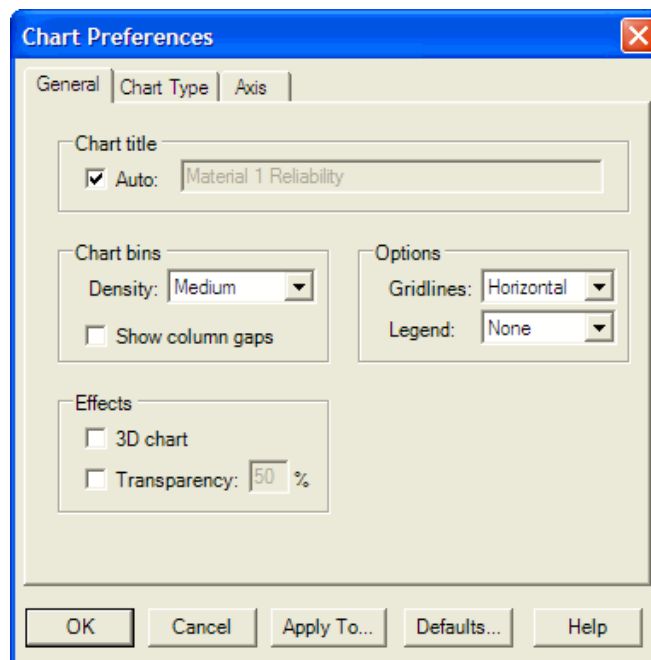


## One-Minute Spotlight

The forecast chart groups the output values into a set number of intervals so that they can be easily read. The bottom axis shows the range of output values. The highest value on the frequency scale on the right side of the chart (120) is the frequency for the group interval that contains the greatest number of forecast values—that is, the mode of the frequency distribution. The scale on the left side of the chart shows the probability of any particular interval, the greatest being .06 or 6%.

Note that, at the top of the chart, Crystal Ball does not display some of the output values. While these extreme values are included in all statistical calculations, Crystal Ball excludes them from the chart view for the sake of readability. You can change the view settings to show these outliers using the Display Range option in the Preferences menu at the top of the forecast chart.

### Changing the Appearance of the Chart



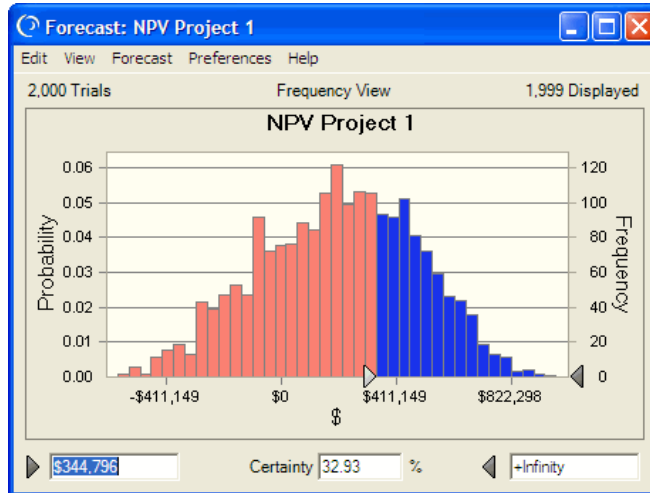
You can also organize the same data as cumulative (S-curve) or reverse cumulative charts through the View menu.

### Determining the Certainty of a Result

The interactive forecast chart lets you view the forecast data in many revealing ways. The simplest way is to enter a value in either of the lower left or right input boxes. To see the certainty of

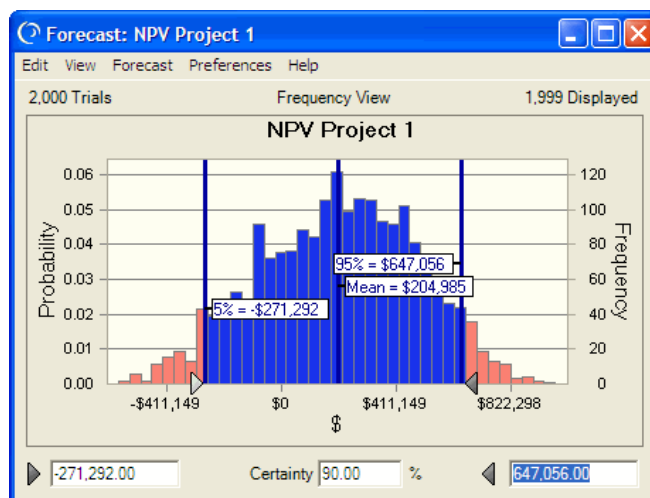
# One-Minute Spotlight

achieving your estimated \$344,796 NPV, you enter that value in the lower left box and press the Enter key.



The chart moves the left certainty grabber (the triangle at the base of the graphic view) to the \$344,796 point, and tells you that you achieved that goal in 32.93% of the trials. You can run the same analysis on any outcome you want to view. You can also move the certainty grabbers manually by clicking on them, holding down your left mouse button, and sliding them horizontally.

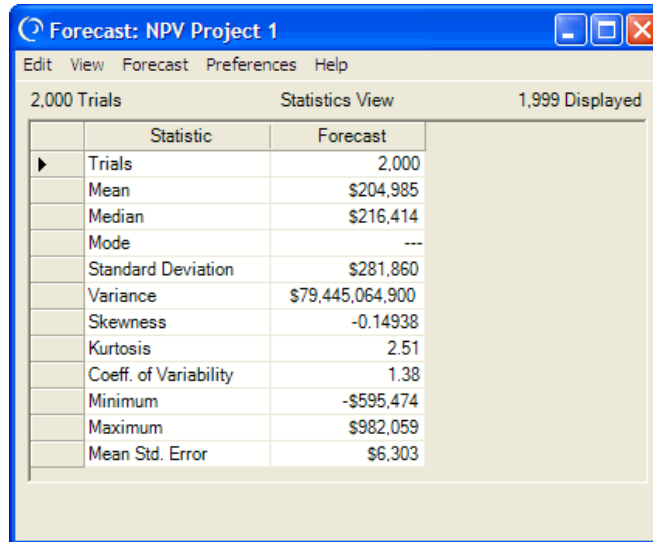
You could also look at certainty around the mean value by entering a percentile value in the Certainty field. The view below shows 90% of the values around the median (or 50%-percentile), which fall between (\$271,292) and \$647,056.



# One-Minute Spotlight

## The Statistics and Percentile Views

You can display a full set of descriptive statistics for a simulation in the forecast window by selecting View > Statistics or pressing the spacebar once. These statistics (shown below) are calculated by Crystal Ball and not by Excel.



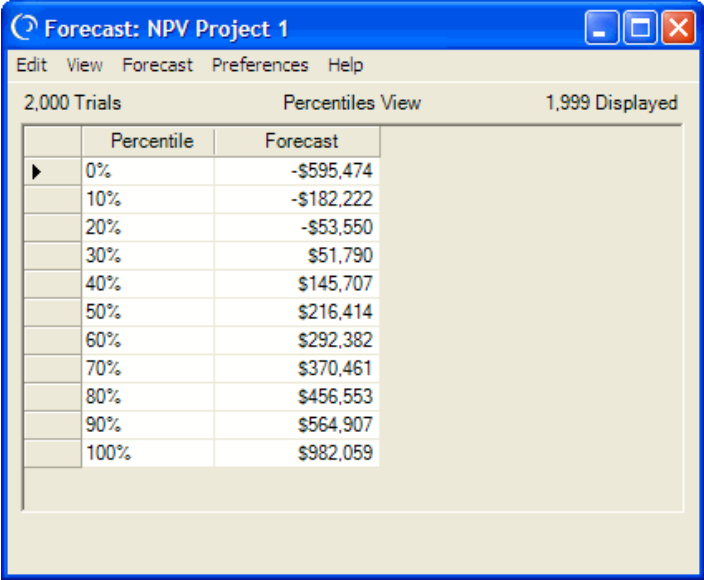
The screenshot shows a window titled "Forecast: NPV Project 1" with a menu bar (Edit, View, Forecast, Preferences, Help) and a status bar (2,000 Trials, Statistics View, 1,999 Displayed). The main content is a table with two columns: "Statistic" and "Forecast".

Statistic	Forecast
Trials	2,000
Mean	\$204,985
Median	\$216,414
Mode	---
Standard Deviation	\$281,860
Variance	\$79,445,064,900
Skewness	-0.14938
Kurtosis	2.51
Coeff. of Variability	1.38
Minimum	-\$595,474
Maximum	\$982,059
Mean Std. Error	\$6,303

You can display percentile information in 10% increments in the forecast chart by selecting the View > Percentiles or pressing the spacebar a second time. A percentile is the percent chance, or probability, of a forecast value being less than or equal to the value that corresponds to the percentile.

For example, the chart below tells you that the 90th percentile for the NPV of Project 1 corresponds to \$564,907, meaning that there is a 90% chance of a forecast value being equal to or less than \$564,907.

# One-Minute Spotlight



The screenshot shows a software window titled "Forecast: NPV Project 1". The window has a menu bar with "Edit", "View", "Forecast", "Preferences", and "Help". Below the menu bar, it displays "2,000 Trials", "Percentiles View", and "1,999 Displayed". The main content is a table with two columns: "Percentile" and "Forecast". The table lists percentiles from 0% to 100% in 10% increments, with corresponding forecast values ranging from -\$595,474 to \$982,059.

Percentile	Forecast
0%	-\$595,474
10%	-\$182,222
20%	-\$53,550
30%	\$51,790
40%	\$145,707
50%	\$216,414
60%	\$292,382
70%	\$370,461
80%	\$456,553
90%	\$564,907
100%	\$982,059

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

