



ORACLE®

Adding Risk Measurement to Enterprise Performance Management Analytics

A short demonstration of Oracle Crystal Ball and Hyperion Essbase

Crystal Ball and Essbase simple simulation example.xls - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Developer Add-Ins Hyperion Crystal Ball

Connections: Activate, Reset, Connect, Zoom In, Zoom Out, Pivot, Keep Only, Remove Only, Ad hoc Analysis

Forms: Select Form, Refresh Offline, Expand, Instructions, Sync Back To Server, Collapse, Take Offline, Lock

Review: Refresh, Refresh All, Submit Data, Undo, Redo, Copy

A1

	A	B	C	D	E	F	G	H	I	J
1				POV [Essbase] x						
2				Market						
3				Product						
4				Accounts						
5				Scenario						
6				Refresh						
7										
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17										

Ad-Hoc Historical

Ready

Start

As a simple example of adding risk measurement to an analysis, let's assume this use case:

You manage VCR sales in New York. You have to commit to a margin number for next year and provide a Units forecast that will make you reach that number. Since there's a lot of uncertainty in future sales, you want to commit to a margin number with a reasonable amount of risk.

Two questions:

- 1- What margin number should you commit to, to be 80% confident of hitting your number
- 2- How many units should you forecast to get to that margin?

Let's show how a quick risk analysis easily answers those questions without changing your daily workflow.

Crystal Ball and Essbase simple simulation example.xls [Compatibility Mode] - Microsoft Excel

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Connections Ad hoc Analysis Forms Review

Activate Zoom In Keep Only Select Form Refresh Offline Expand
Reset Zoom Out Remove Only Instructions Sync Back To Server Collapse
Connect Pivot Take Offline Lock Refresh All Submit Data

A1

	A	B	C	D	E	F	G	H	I	J
1		Year								
2	Period	18582796.81								
3										
4										
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16										
17										

POV [Crystal] X

Market

Product

Accounts

Scenario

Refresh

Ad-Hoc Historical Forecast Results

Ready

Start Crystal Ball

To start your analysis you want to use historical data. You can get this by drilling down to the right data.

In our example, we will use Excel as our working interface.

Crystal Ball and Essbase simple simulation example.xls [Compatibility Mode] - Microsoft Excel

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Connections Ad hoc Analysis Forms Review

Activate Zoom In Keep Only Select Form Refresh Offline Expand
Reset Zoom Out Remove Only Instructions Sync Back To Server Collapse
Connect Pivot Take Offline Lock Refresh All Submit Data

A2

	A	B	C	D	E	F	G	H
1		FY08	FY08	FY08	FY08	FY08	FY08	FY08
2		Jan	Feb	Mar	Apr	May	Jun	Jul
3	Units	753	782	825	786	802	903	881
4	Price	1609.13	1591.49	1501.04	1627.8	1595.96	1487.02	1612.48
5	Sales	1211674.89	1244545.18	1238358	1270450.8	1279959.92	1342779.06	1420594.88
6	COGS_Per_Unit	875.19	908.25	859.56		935.25	850.65	870.1
7	Cost_of_Goods_Sold	659018.07	710251.5	709137		750070.5	768136.95	766558.1
8	Margin	552656.82	534293.68	529221		529889.42	574642.11	654036.78
9	Margin_%	45.61098233	42.9308384	42.73570325		39890724	42.79498595	46.0396408
10								
11								
12								
13								
14								
15								
16								
17								

POV [Crystal] x

New_York

VCR

Actual

Refresh

Ad-Hoc Historical Forecast Results Simulation Submit

Ready Average: 1132.578194 Count: 90 Cumulative: 81545.62 100%

Microsoft Excel - Crystal Ball and Essbase simple simulation example.xls [Comp

Start Crystal Ball Crystal Ball and Essbase ... Microsoft Excel - Crys... 7:11 PM

Using an ad-hoc analysis, we drill down the relevant data for our region.

Crystal Ball and Essbase simple simulation example.xls [Compatibility Mode] - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Developer Add-Ins Hyperion Crystal Ball

Select Freeze Cell Prefs Run Preferences Trials: 5 Save or Restore View Charts Create Report Extract Data OptQuest Predictor More Tools Help Resources About

A2

	A	B	C	D	E	F	G	H
1		FY08	FY08	FY08	FY08	FY08	FY08	FY08
2		Jan	Feb	Mar	Apr	May	Jun	Jul
3	Units	753	782	825	786	802	903	881
4	Price	1609.13	1591.49	1501.04	1627.8	1595.96	1487.02	1612.48
5	Sales	1211674.89	1244545.18	1238358	1279450.8	1279959.92	1342779.06	1420594.88
6	COGS_Per_Unit	875.19	908.25	859.56	950.92	935.25	850.65	870.1
7	Cost_of_Goods_Sold	659018.07	710251.5	709137	747423.12	750070.5	768136.95	766558.1
8	Margin	552656.82	534293.68	529221	532027.68	529889.42	574642.11	654036.78
9	Margin_%	45.61098233	42.9308384	42.73570325	41.58250399	41.39890724	42.79498595	46.0396408
10								
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Ad-Hoc Historical Forecast Results Simulation Submit

Ready Average: 1132.578194 Count: 99 Sum: 81545.63 100%

Crystal Ball

Since we want to use historical data to get a sense of what the future could hold, let's run a time-series analysis on the data to forecast the next quarter. We use a tool called CB Predictor.

Crystal Ball and Essbase simple simulation example.xls [Compatibility Mode] - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Developer Add-Ins Hyperion Crystal Ball

Predictor

Welcome

Input Data

Data Attributes

Methods

Options

Select location of data series

Location of data series:

Orientation

- ☒ Data in rows
- ☐ Data in columns

Headers

- ☒ Top row has dates
- ☒ Left column has headers

3 data series
24 columns of data

	A	B	C
2		Jan	Feb
3	Units	753	782
4	Price	1609.13	1591.49
5			
6	COGS_Per_Unit	875.19	908.25

< Back Next > Run Close Help

Ready Average: 1132.578194 Count: 99 Sum: 81545.63 100%

Predictor grabs the data sets of historical data

Crystal Ball and Essbase simple simulation example.xls [Compatibility Mode] - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Developer Add-Ins Hyperion Crystal Ball

Predictor

Welcome

Input Data

Data Attributes

Methods

Options

Select data attributes and optional screening

Data is in: periods

Seasonality

AutoDetect Data contains seasonal series with cycles of 3 and 6 periods.

Confirm the seasonality of your data visually: View Seasonality...

Data screening

☒ Fill-in missing values

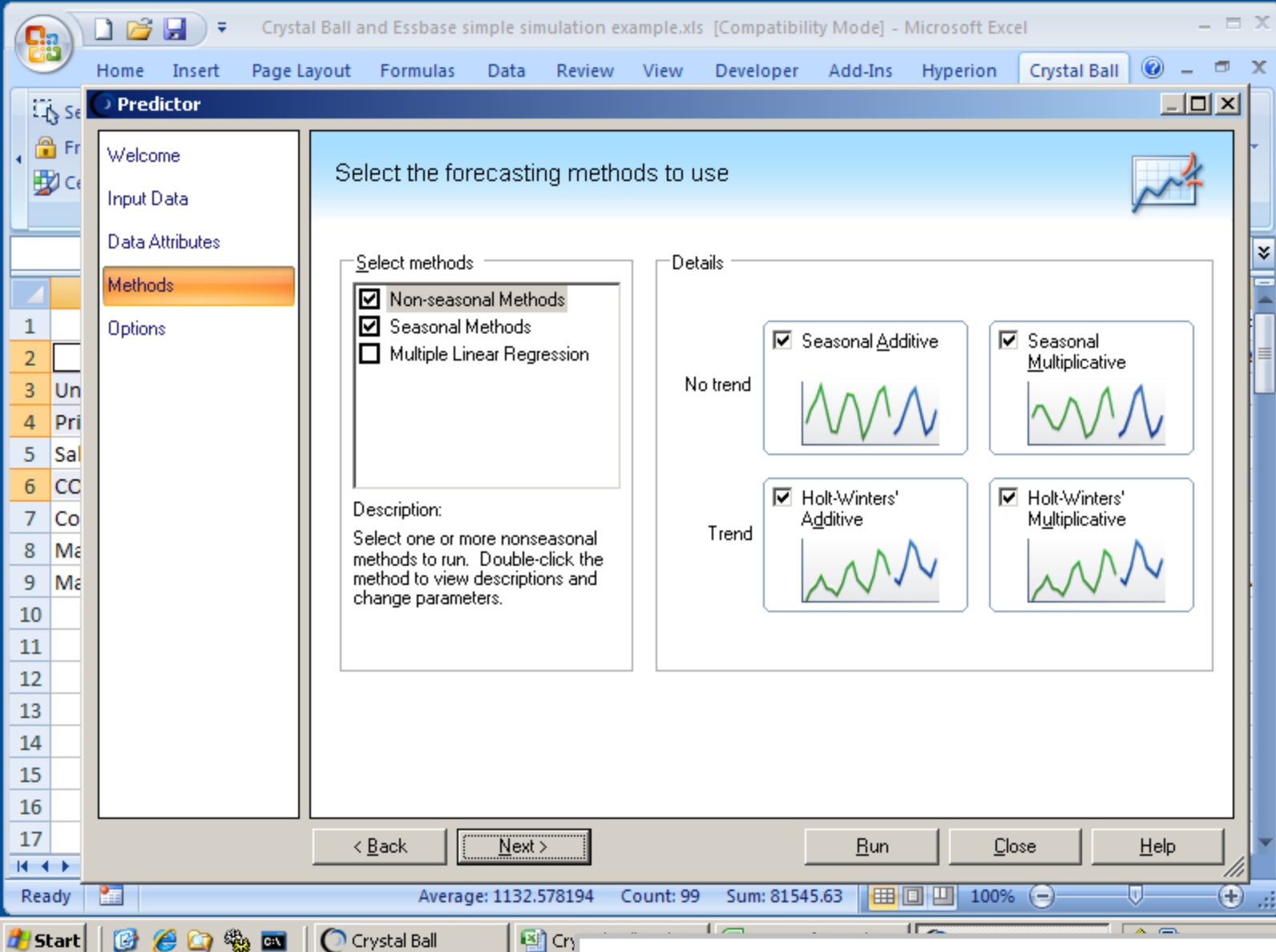
☐ Adjust outliers

View Screened Data...

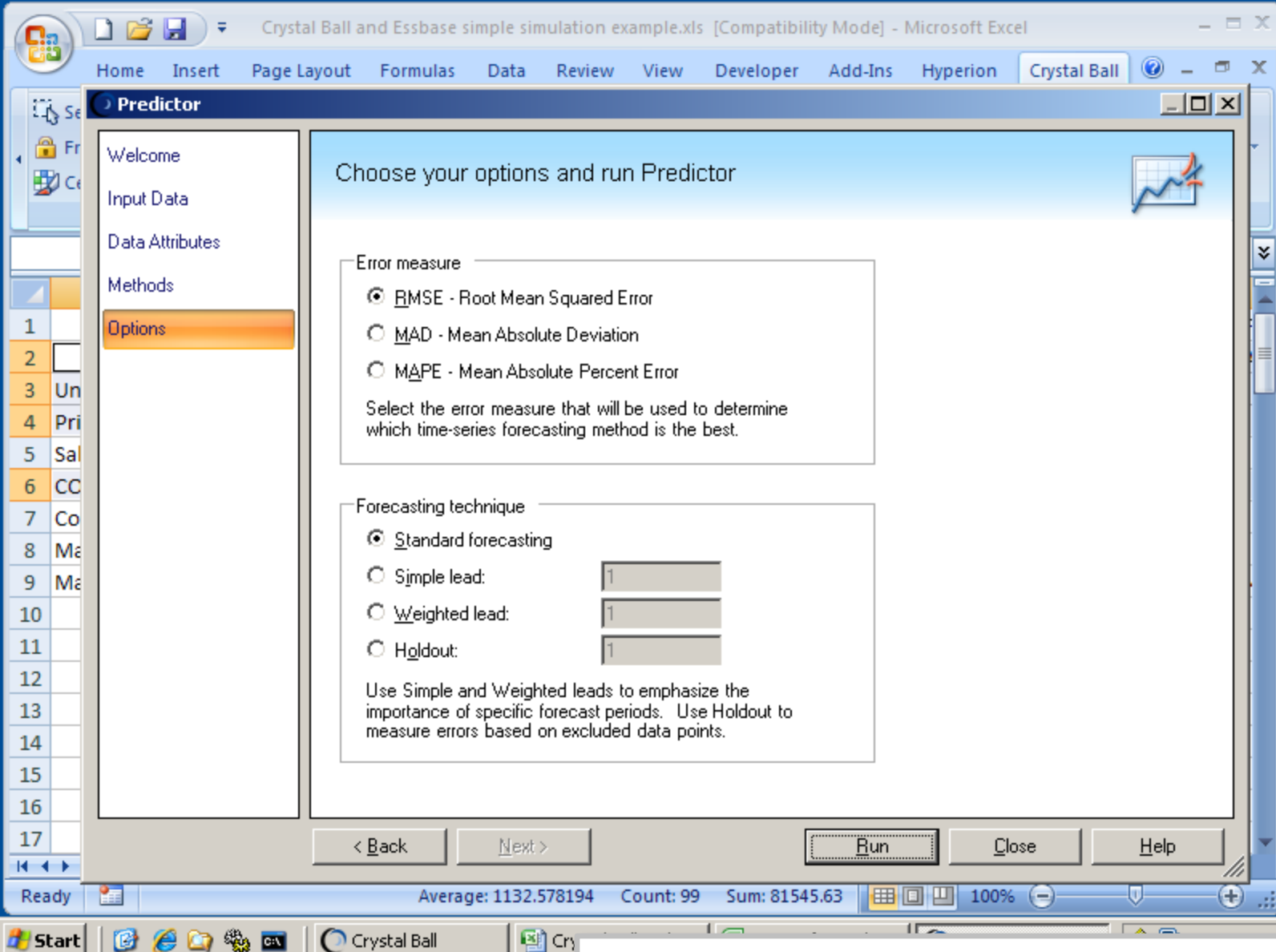
< Back Next > Run Close Help

Ready Average: 1132.578194 Count: 99 Sum: 81545.63 100%

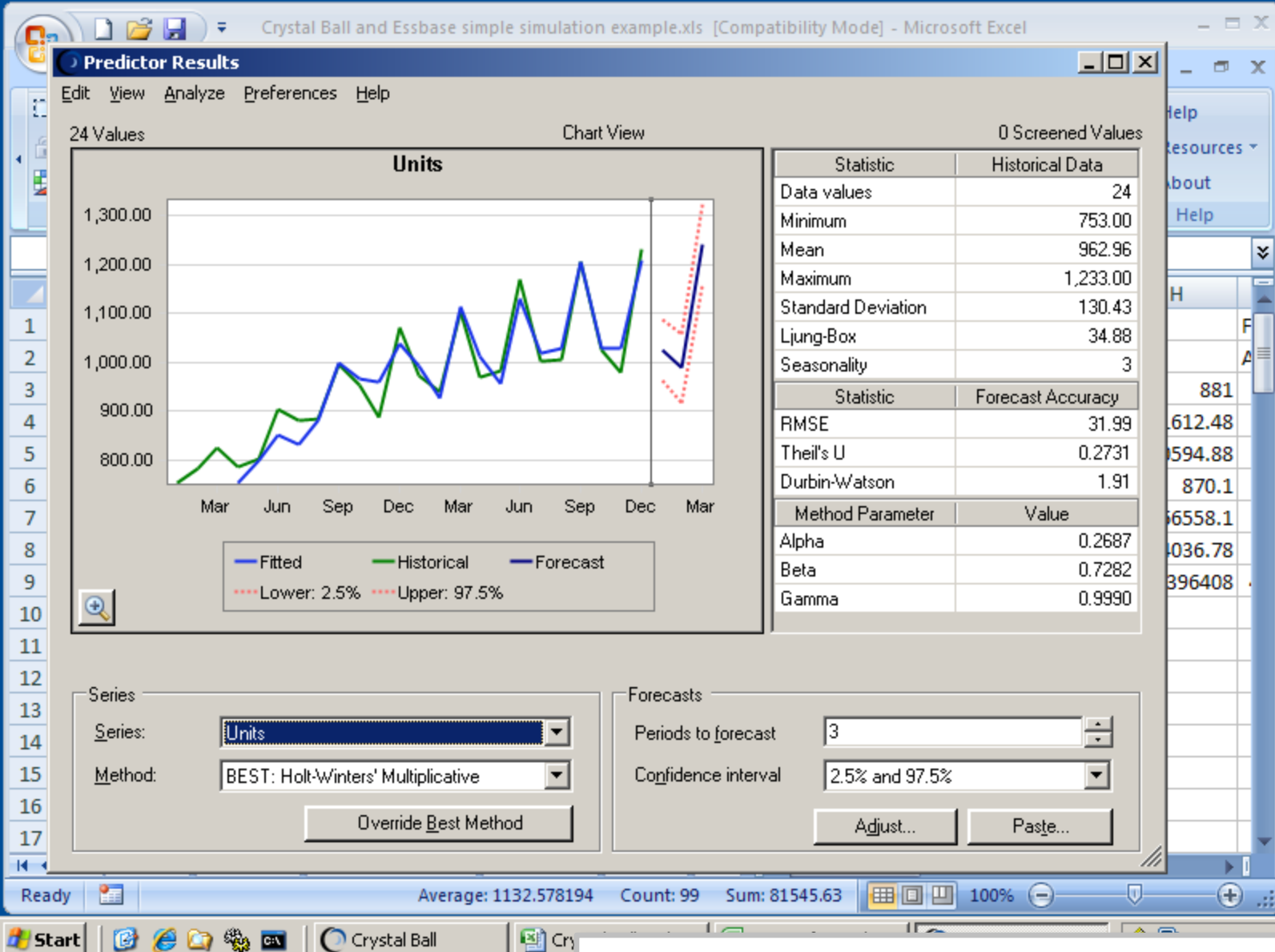
It will auto-detect seasonality (i.e. regular ups and downs)



It will apply multiple methods to find the best fit for the data and then use that method to forecast the next quarter



You can choose which forecasting technique to use and error measure



The chart shows the historical data in green on the left, with the blue line representing the best fit method. The darker blue link on the right shows the forecast for the next quarter based on that method, bounded by a confidence interval.

Crystal Ball and Essbase simple simulation example.xls [Compatibility Mode] - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Developer Add-Ins Hyperion Crystal Ball

Select Freeze Cell Prefs Run Preferences Trials: 5 Save or Restore View Charts Create Report Extract Data OptQuest Predictor More Tools Help Resources About

A2 1025.19192931453

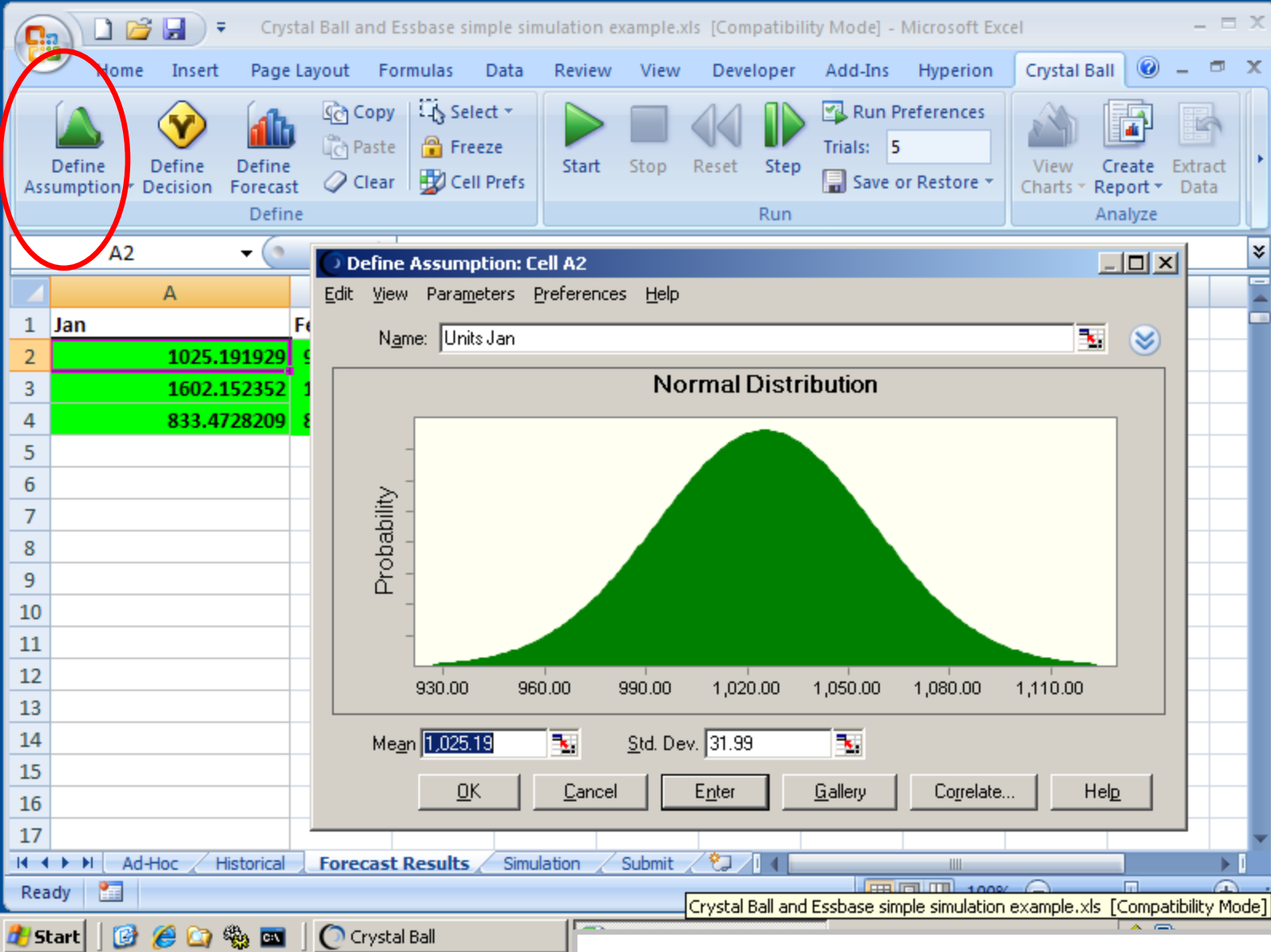
	A	B	C	D	E	F	G	H	I	J
1	Jan	Feb	Mar							
2	1025.191929	987.6242	1241.953							
3	1602.152352	1610.068	1494.827							
4	833.4728209	852.8483	807.6294							
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Ad-Hoc Historical Forecast Results Simulation Submit

Ready 100%

Crystal Ball

The software automatically outputs our next 3-month forecast and creates input assumptions for our risk modeling. The assumptions are defined as ranges of values, instead of single point estimates. This will be useful in a moment when we run our risk analysis.



This shows that for January, we expect to sell about 1025 units, but there's a range around that forecast. Could be as little as 930 or as much as 1110

Crystal Ball and Essbase simple simulation example.xls [Compatibility Mode] - Microsoft Excel

Home Insert Page Layout Formulas Data **Review** View Developer Add-Ins Hyperion Crystal Ball

Define Assumption Define Decision Define Forecast Copy Paste Clear Select Freeze Cell Prefs Start Stop Reset Step Run Preferences Trials: 5 Save or Restore View Charts Create Report Extract Data Analyze

C2 f_x ='Forecast Results'!A2

	A	B	C	D	E	F	G	H	I
1			Jan	Feb	Mar	Qtr1			
2	What-If	Units	1025.191929	987.6241846	1241.952784	3254.768898			
3	What-If	Price	1602.152352	1610.067534	1494.826982	4707.046868			
4	What-If	Sales	1642513.66	1590141.635	1856504.532	5089159.828			
5	What-If	COGS_Per_Unit	833.4728209	852.8483303	807.6294068	2493.950558			
6	What-If	Cost_of_Goods_Sold	854469.6093	842293.6368	1003037.59	2699800.836			
7	What-If	Margin	788044.0512	747847.9986	853466.9421	2389358.992			
8	What-If	Margin_%	47.97792981	47.03027592	45.97171336	46.94996959			
9									
10									
11									
12									

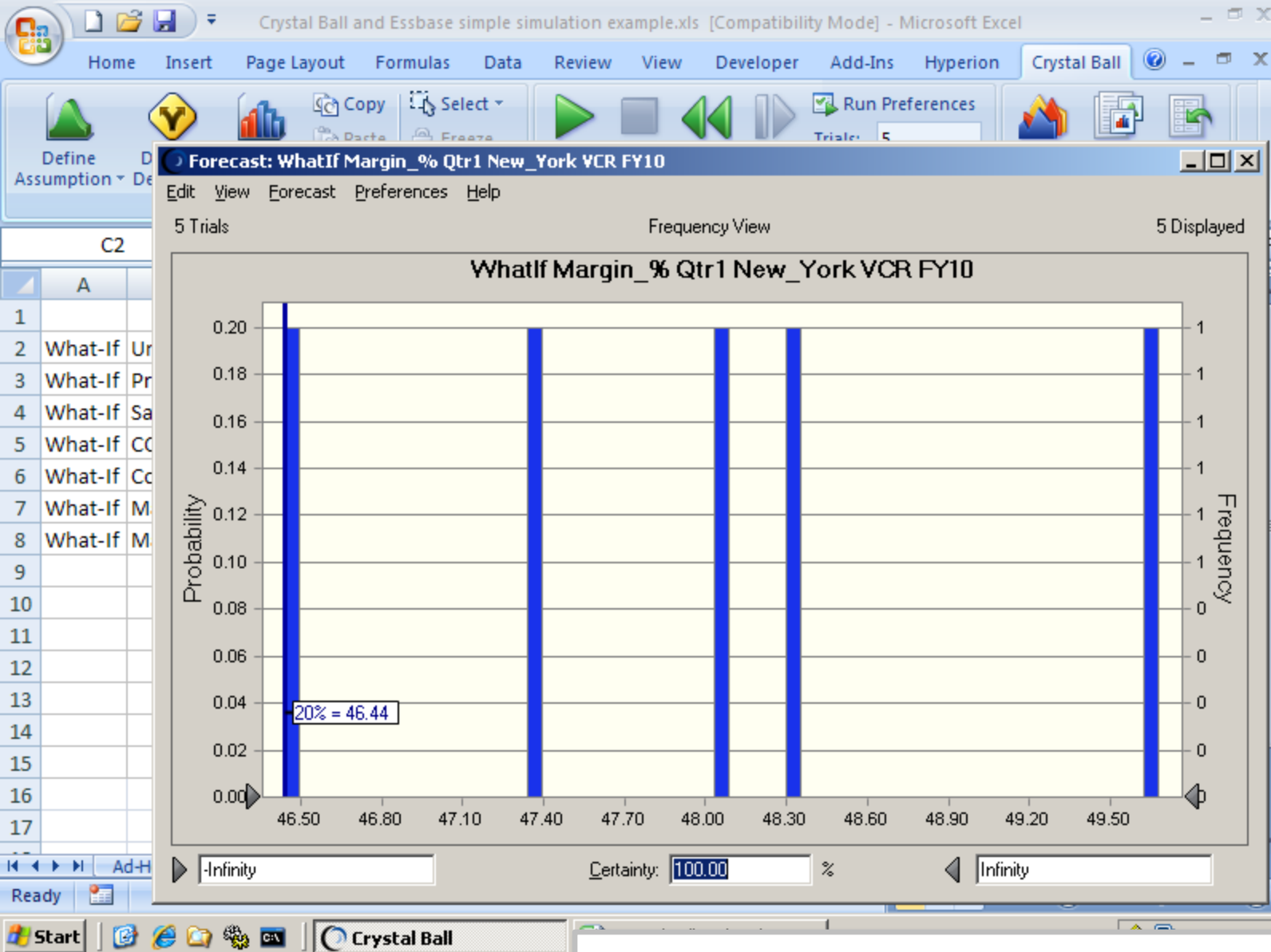
POV [Crystal] x
New_York

Here we've created a "what if" scenario in our Essbase application. We'll use this to run our analysis before committing to a margin number.

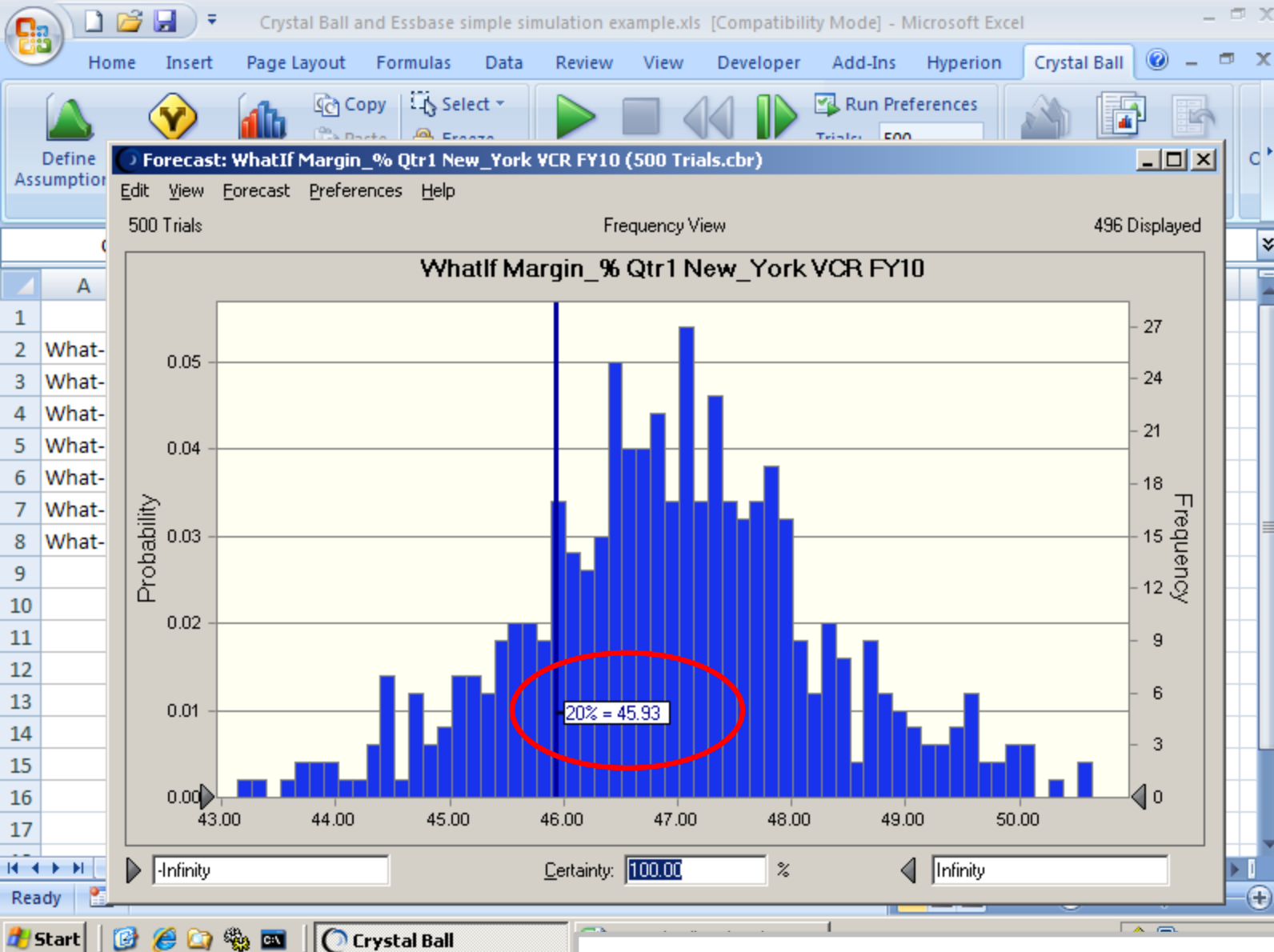
What we're going to do now is run 500 different trials, each using a different input from our variable assumptions. What this will give us is a complete range of all the possible outcomes – the forecast – from which we can compute our statistics and answer our questions:

- 1- What margin should I commit to, to be 80% confident of achieving it
- 2- How many units should I then forecast

Let's run what's called a Monte Carlo simulation to automatically calculate all those trials.



The first 5 trials show that there is indeed a broad range of outcomes. Let's finish running the 500 trials.



Once the simulation completes, we can answer our first question:

What margin should I commit to, to be 80% confident of achieving it? The answer: 45.93%

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Review: Refresh, Refresh All, Submit Data, Undo, Redo, Copy



	A	B	C	D	E	F	G	H	I
1			Jan	Feb	Mar	Qtr1			
2	Budget	Units	992.9886332	956.6293972	1208.803439	3201.978477			
3	Budget	Price	1587.16954	1594.933831	1481.406883	4681.113779			
4	Budget	Sales	1587209.995	1540416.945	1804795.808	4999384.557			
5	Budget	COGS_Per_Unit	806.5891953	824.5838743	784.1835892	2438.626879			
6	Budget	Cost_of_Goods_Sold	815467.3606	802084.2042	957650.0886	2631714.889			
7	Budget	Margin	743552.1804	711006.9105	807345.4293	2313774.144			
8	Budget	Margin_%	46.10977909	45.07764448	44.14241637	45.73375527			
9									
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14									
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16									
17									

Ready | Ad-Hoc | Historical | Forecast Results | Simulation | Submit

Crystal Ball

And finally, what units should I forecast to achieve this number?

To answer that, we preset the software to automatically extract the 20% numbers for the units, price and COGS, so these now get submitted to our “budget” scenario.

- 
- In our demonstration, we've just seen that adding the ability to measure the uncertainty – the risk – around forecasting numbers will improve the accuracy and confidence around those numbers.
- 



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