



**ORACLE®**

## Adding Risk Measurement to Enterprise Performance Management Analytics

A short demonstration of Oracle Crystal Ball and Hyperion Planning – Driver  
Based Forecasting

Microsoft Excel - CB Test.xlsx

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

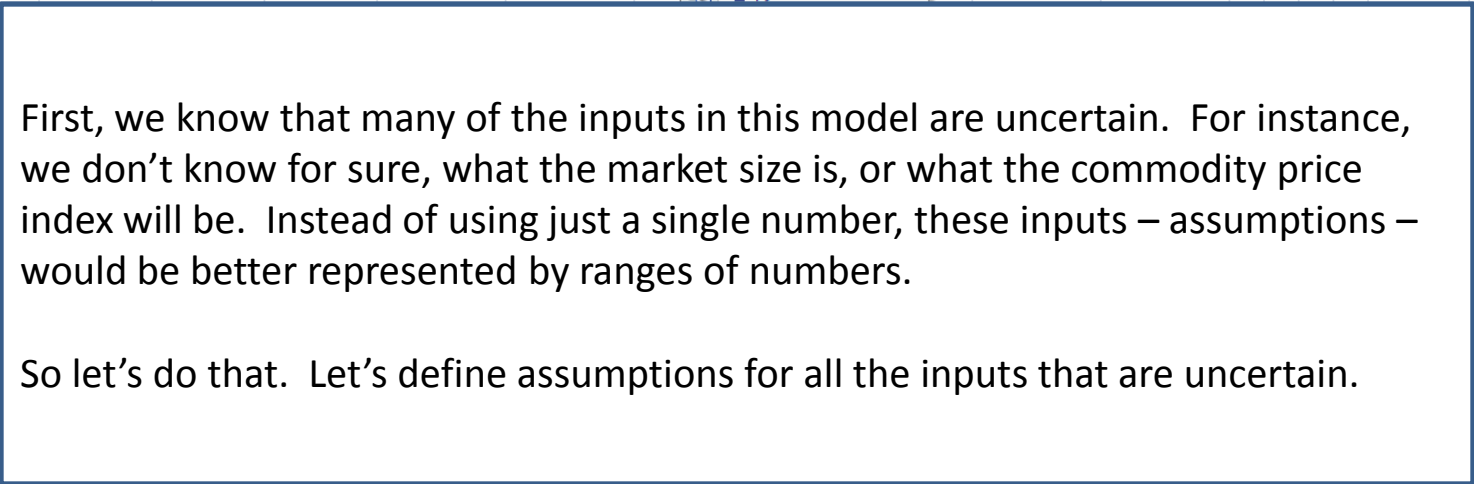
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In this example, we use Hyperion Planning to calculate our Cost of Sales for next year. We've calculated our cost of sales for FY10 at \$1,925,227,236. Presenting this to Management, we've been asked two questions:

- 1) How likely is it that cost of sales will exceed this number?
- 2) Which drivers are the most important in this model?

Let's apply two simple risk analysis techniques to answer these questions.



CB Test.xlsx - Microsoft Excel

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

Activate Reset Zoom In Zoom Out Pivot Select Form Refresh Offline Instructions Sync Back To Server Take Offline Lock Connections Ad hoc Analysis Forms

POV Manager Adjust Member Selection Cell Text Function Builder Supporting Details Task Business Rules Rules on Form Business

D3 24

	Q1	Q2	Q3	Q4	-Year
Market Size (billions)	21	22	24	33	
Market Share %	1%	1%	2%	4%	
Hardware	270,900,000	281,600,000	477,148,152	1,243,337,420	2,272
Contract Renewals	3,021	3,016	3,500	4,000	
Renewal Rate %	93%	96%	95%	95%	
New Contracts	275	302	400	500	
Support Rate	5,072	5,368	5,000	6,500	
Support	15,675,134	17,197,090	18,625,000	27,950,000	79,447
Consultants	267	295	340	350	
Working Days	62	64	64	63	
Utilization Rate %	83%	85%	95%	95%	
Consulting Rate	378	356	350	350	
Consulting	41,599,752	45,639,393	57,881,600	58,653,000	203,773
Training % of Sales	22%	24%	15%	15%	
Training	60,708,690	66,851,840	71,572,223	186,500,613	385,633
Commodity Price Index	43	53	60	62	
Change in Price Index	-57%	24%	12%	4%	
Cost of Sale % - Hardware	69%	69%	70%	70%	
Cost of Sale % - Services	45%	43%	50%	50%	
Cost of Sales	242,745,272	256,240,978	411,644,175	1,014,596,812	1,925,227

Define Assumption: Cell D3

Name: Q3 Market Size

Triangular Distribution

Minimum: 23 Likeliest: 24 Maximum: 26

OK Cancel Enter Gallery Correlate... Help

We've defined our first assumption (Q3 market size) as a triangular distribution with parameters as shown for minimum, likeliest and maximum.

We can define these parameters in two ways: first, if we have historical data for market size, we could use various tools in the software to automatically define the distribution and its parameters. Or, if we have no data, we can use subject matter expertise – our best estimates – to manually enter the parameters in the pop-up.

We define assumptions for:

Market size; Market share; Renewal rate; Number of new contracts; Utilization rate of consultants; Training as a % of sales and Commodity price index.

Microsoft Excel ribbon showing tabs: Home, Insert, Page Layout, Formulas, Data, Review, View, Developer, Add-Ins, Hyperion, Crystal Ball. The Hyperion tab is active, showing options like Refresh All, Submit Data, and Review. The Crystal Ball tab shows options like Undo, Paste Data, and Adjust. The Business Rules tab shows options like Business Rules and Rules on Form.

F22		=+B22+C22+D22+E22															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	FY10					FY11					FY12						
2		-YearTotal					-YearTotal					-YearTotal					
3	Market Size (billions)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
3	Market Size (billions)	21	22	24	33	100	22	23	25	35	105	-	-	-	-	-	
4	Market Share %	1%	1%	2%	4%	2%	2%	2%	2%	3%	2%	-	-	-	-	-	
5	Hardware	270,900,000	281,600,000	477,148,152	1,243,337,420	2,272,985,572	374,850,000	369,600,000	504,000,000	1,074,150,000	2,322,600,000	-	-	-	-	-	
6	Contract Renewals	3,021	3,016	3,500	4,000	13,537	3,000	3,000	4,000	5,000	15,000	-	-	-	-	-	
7	Renewal Rate %	93%	96%	95%	95%	95%	95%	95%	95%	95%	95%	-	-	-	-	-	
8	New Contracts	275	302	400	500	1,477	300	400	450	500	1,650	-	-	-	-	-	
9	Support Rate	5,072	5,368	5,000	6,500	5,485	5,000	5,000	5,000	5,000	5,000	-	-	-	-	-	
10	Support	15,675,134	17,197,090	18,625,000	27,950,000	79,447,224	15,750,000	16,250,000	21,250,000	26,250,000	79,500,000	-	-	-	-	-	
11	Consultants	267	295	340	350	350	270	300	350	375	375	-	-	-	-	-	
12	Working Days	62	64	64	63	253	63	64	64	62	253	-	-	-	-	-	
13	Utilization Rate %	83%	85%	95%	95%	90%	85%	85%	90%	90%	88%	-	-	-	-	-	
14	Consulting Rate	378	356	350	350	358	350	350	350	350	350	-	-	-	-	-	
15	Consulting	41,599,752	45,639,393	57,881,600	58,653,000	203,773,745	40,483,800	45,696,000	56,448,000	58,590,000	201,217,800	-	-	-	-	-	
16	Training % of Sales	22%	24%	15%	15%	19%	20%	20%	20%	20%	20%	-	-	-	-	-	
17	Training	60,708,690	66,851,840	71,572,223	186,500,613	385,633,366	74,970,000	73,920,000	100,800,000	214,830,000	464,520,000	-	-	-	-	-	
18	Commodity Price Index	43	53	60	62	62	74	85	65	42	42	-	-	-	-	-	
19	Change in Price Index	-57%	24%	12%	4%					74%	-35%	-	-	-	-	-	
20	Cost of Sale % - Hardware	69%	69%	70%	70%					70%	69%	-	-	-	-	-	
21	Cost of Sale % - Services	45%	43%	50%	50%					50%	50%	-	-	-	-	-	
22	Cost of Sales	242,745,272	256,240,978	411,644,175	1,014,596,812	1,925,227,236	335,834,100	337,941,542	448,487,542	890,484,000	2,012,747,183	-	-	-	-	-	
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Next, we tell the software which output – the forecast – we’re interested in tracking. In this case, we want to analyze the cost of sales. If we can compute the probability of that calculated metric, we can answer our first question – how likely is it that costs will exceed the number?

In our example, we’re forecasting the FY10 year total cost of sales.

F22		=+B22+C22+D22+E22																	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q		
1	FY10					FY11					FY12								
	-YearTotal					-YearTotal					-YearTotal								
2	Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4		Q1	Q2	Q3	Q4					
3	Market Size (billions)	21	22	24	33	100	22	23	25	35	105	-	-	-	-				
4	Market Share %	1%	1%	2%	4%	2%	2%	2%	2%	3%	2%	-	-	-	-				
5	Hardware	270,900,000	281,600,000																
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15	Consulting	41,599,752	45,639,393	57,881,600	58,653,000	203,773,745	40,483,800	45,696,000	56,448,000	58,590,000	201,217,800	-	-	-	-				
16	Training % of Sales	22%	24%	15%	15%	19%	20%	20%	20%	20%	20%	-	-	-	-				
17	Training	60,708,690	66,851,840	71,572,223	186,500,613	385,633,366	74,970,000	73,920,000	100,800,000	214,830,000	464,520,000	-	-	-	-				
18	Commodity Price Index	43	53	60	62	62	74	85	65	42	42	-	-	-	-				
19	Change in Price Index	-57%	24%	12%	4%	-39%	20%	14%	-24%	-35%	-32%	-	-	-	-				
20	Cost of Sale % - Hardware	69%	69%	70%	70%	70%	71%	72%	70%	69%	69%	-	-	-	-				
21	Cost of Sale % - Services	45%	43%	50%	50%	47%	50%	50%	50%	50%	50%	-	-	-	-				
22	Cost of Sales	242,745,272	256,240,978	411,644,175	1,014,596,812	1,925,227,236	335,834,100	337,941,542	448,487,542	890,484,000	2,012,747,183	-	-	-	-				
23																			

### Define Forecast: Cell F22

Name: Year Total Cost of Sales

Units:

LSL: USL:

Target:

OK

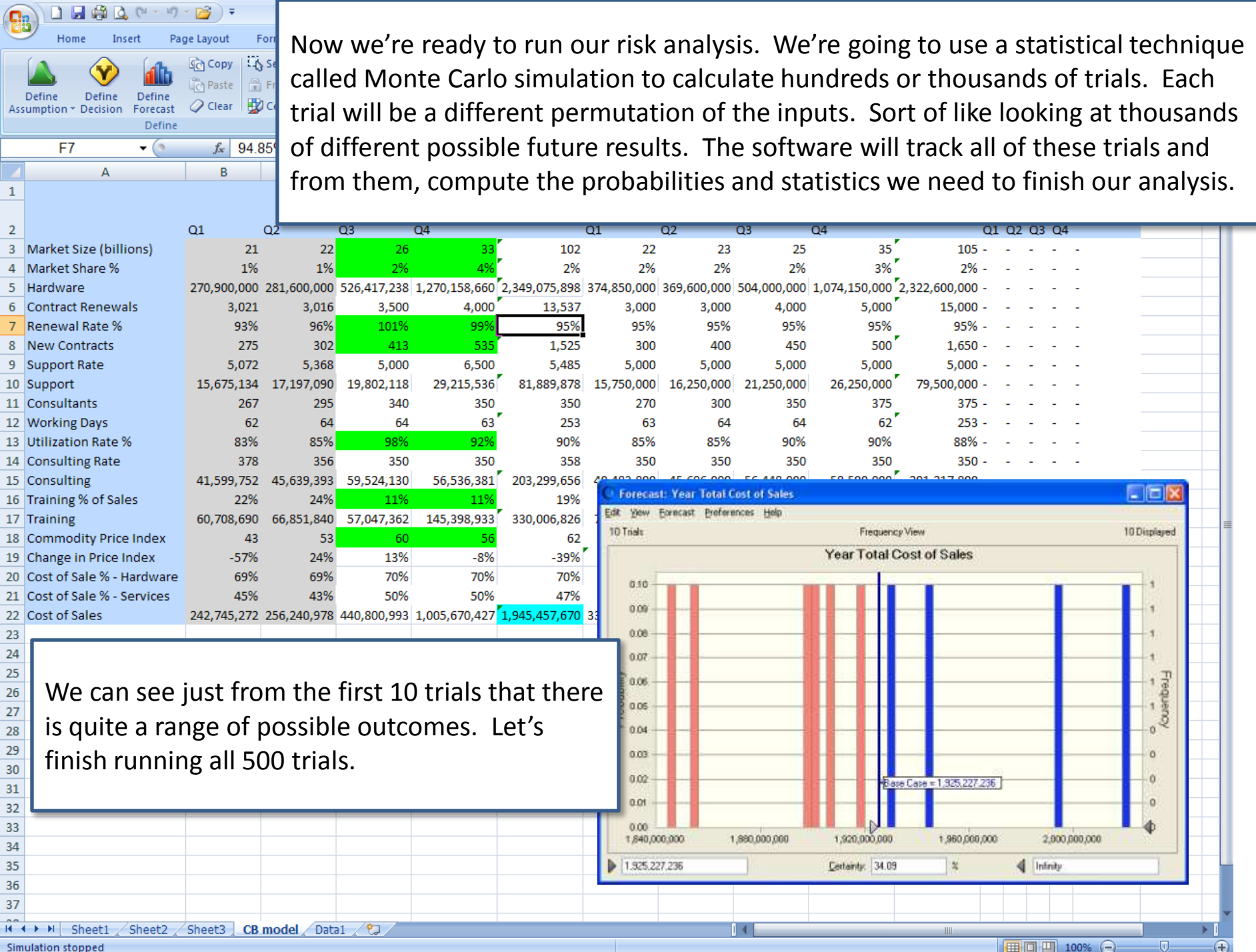
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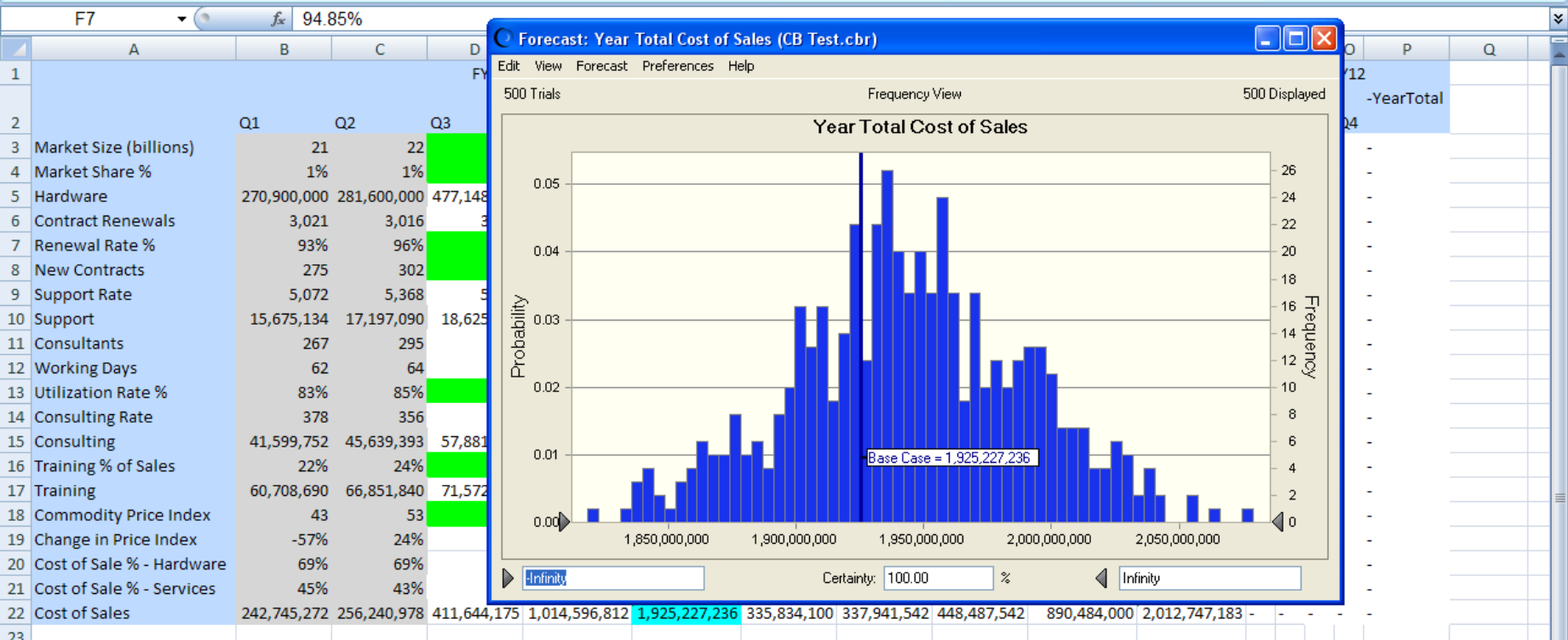
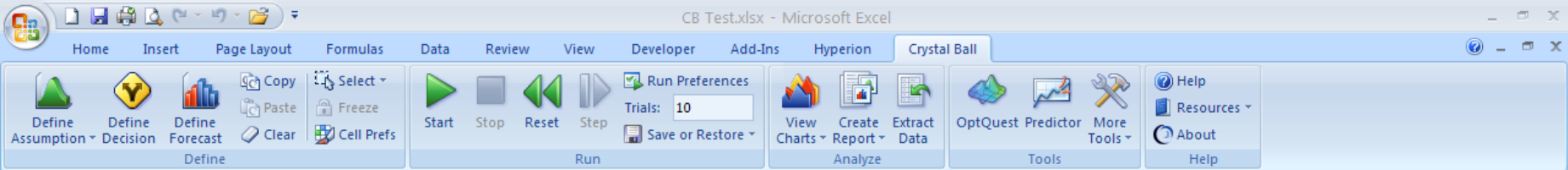
We define this cell as the Forecast.



Now we're ready to run our risk analysis. We're going to use a statistical technique called Monte Carlo simulation to calculate hundreds or thousands of trials. Each trial will be a different permutation of the inputs. Sort of like looking at thousands of different possible future results. The software will track all of these trials and from them, compute the probabilities and statistics we need to finish our analysis.



We can see just from the first 10 trials that there is quite a range of possible outcomes. Let's finish running all 500 trials.

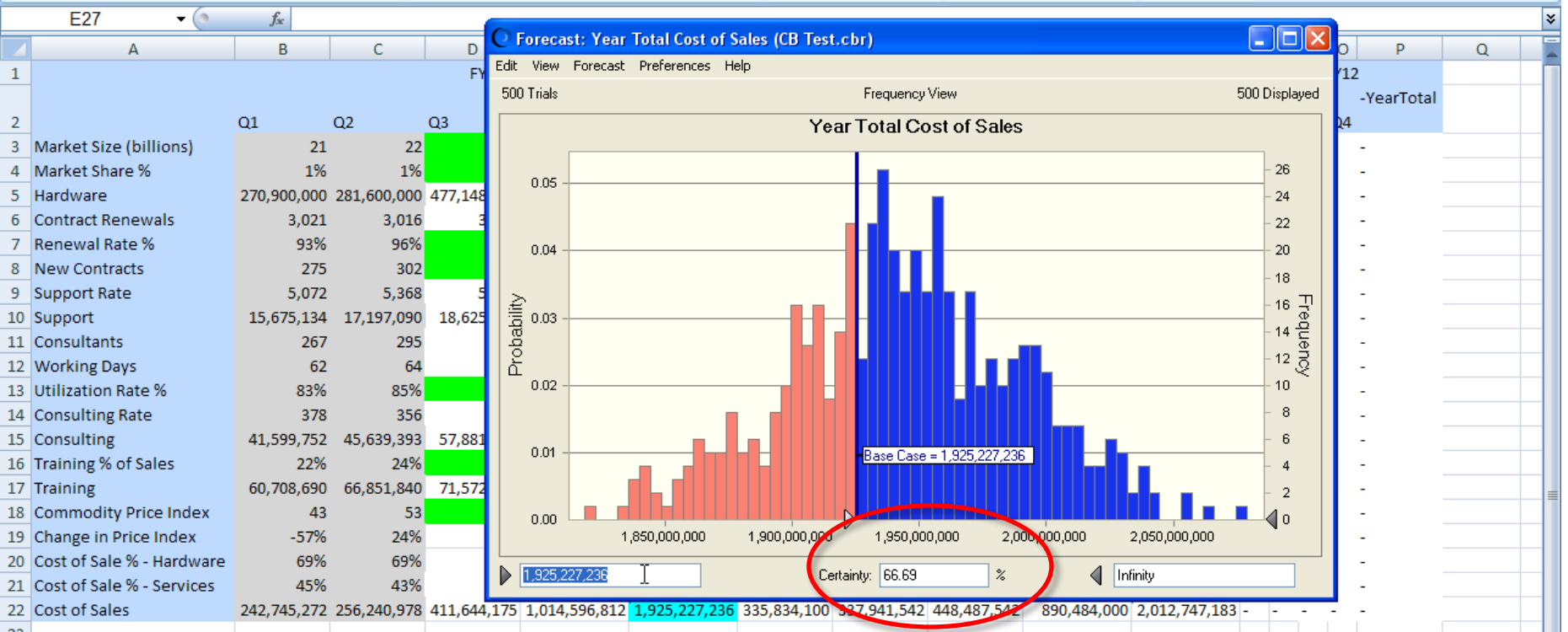
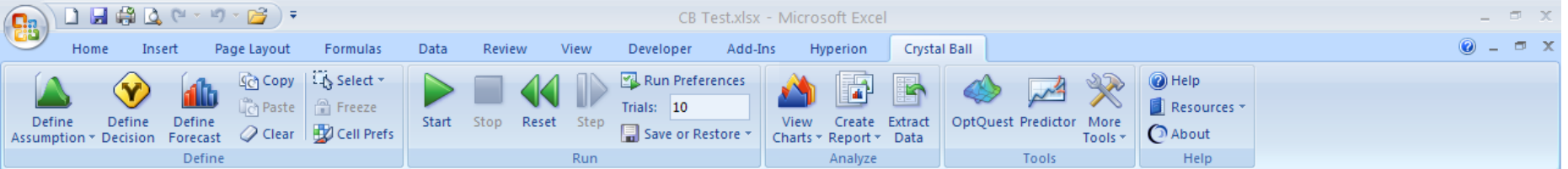


The forecast chart shows the results of all the 500 trials. This is the full range of possible outcomes for Cost of Sales, given the uncertainty inherent in our model inputs.

Now let's answer that first question:

How likely is it that cost of sales will exceed this \$1.925B?

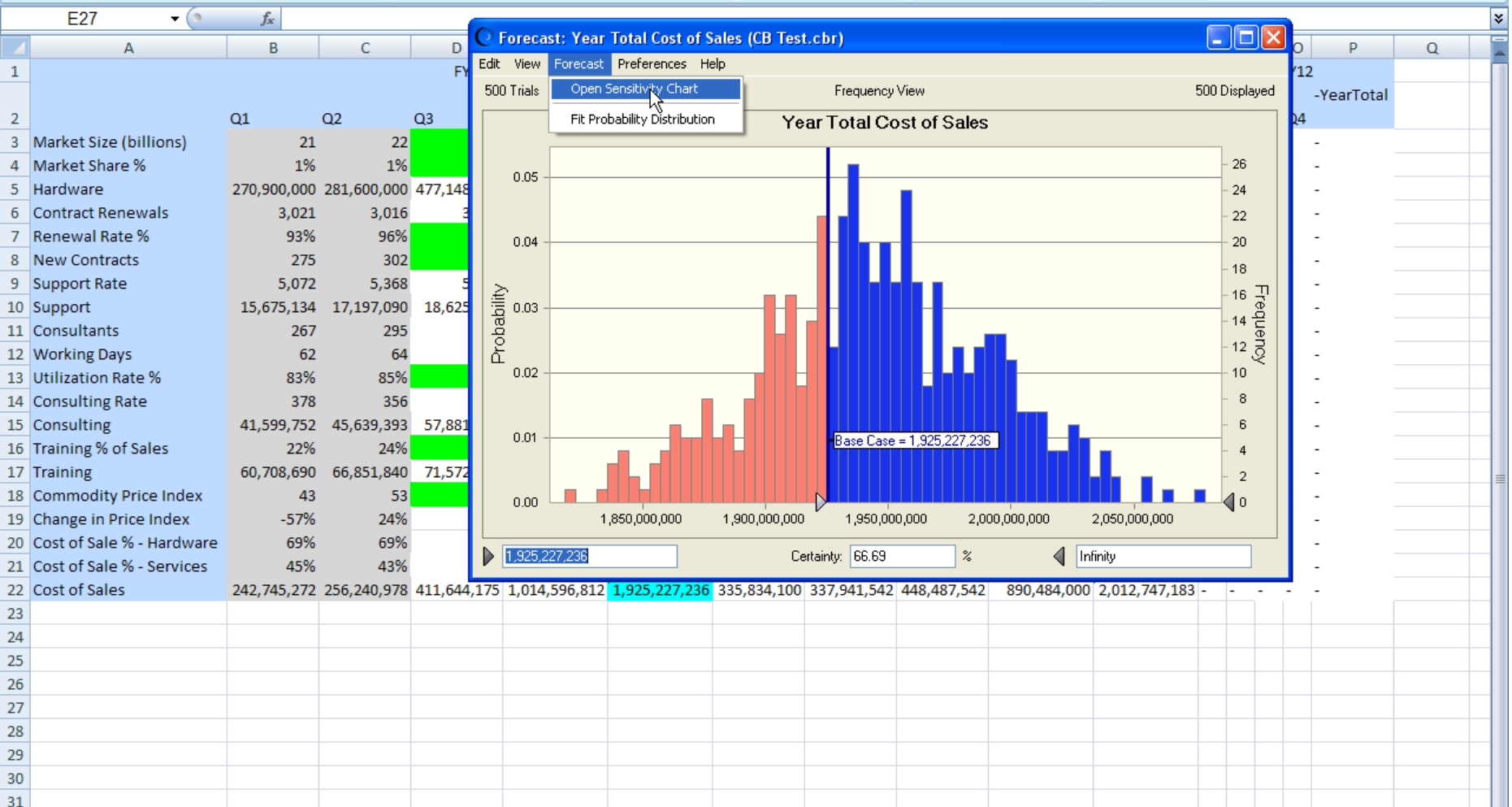
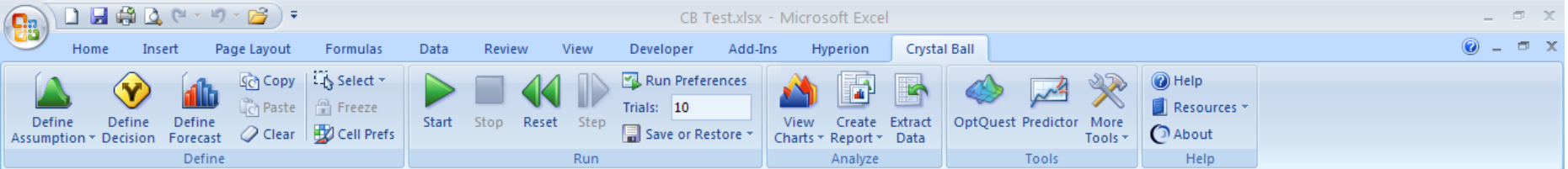




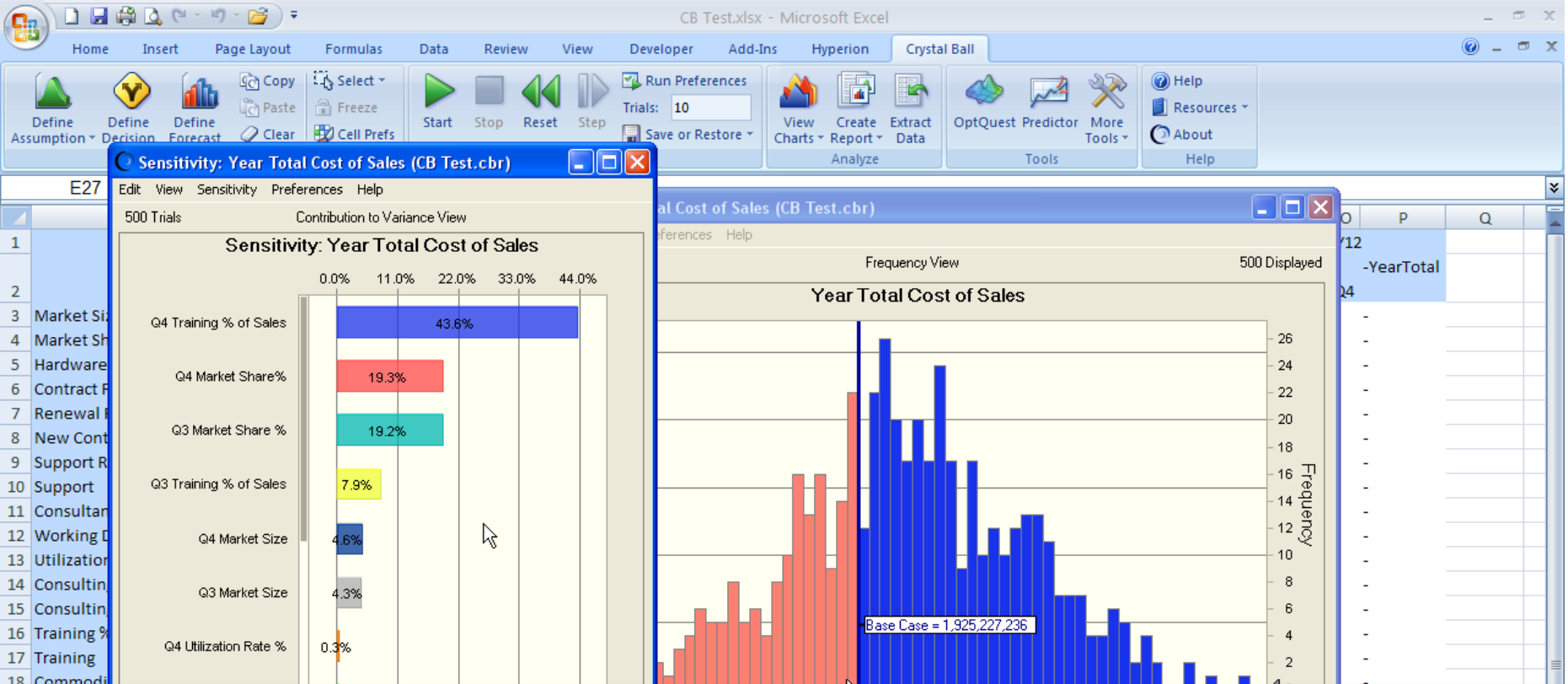
The answer:

There's a 66% likelihood that our costs will in fact exceed our estimate. This could have a serious impact on the business. We need to understand more.

It's time to answer the second question: Which drivers are the most important in this model? If we can get a better handle on those, we would know where to focus our efforts to reduce the risk.



Let's open another chart, called a sensitivity chart.





We see that of all our variable assumptions, training and market share account for 90% of the variability – the risk – in the cost of sales.

Now we know that if we can reduce the uncertainty around those factors, we will reduce the risk of exceeding our planned costs.

So in a few short minutes we've substantially enhanced our planning capabilities by adding a measure of risk as well as using the results of the simulation to gain insight into the most important drivers.

Additional elements of the risk analysis software, which we are not showing in this particular demo, can help us optimally choose scenarios – such as exactly how much to spend on advertising to customers to boost those training classes.

- 
- 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, as well as give insight into which drivers are truly important.
- 



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