

# USING @RISK TO FORECAST FEASIBILITY OF A STRATEGIC EXPANSION: A CASE

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# The Case

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- ▶ **Retail operation in California**
  - ▶ two locations – main store and downtown
  - ▶ annual sales of \$1.2 million in FY2010
- ▶ **Opportunity**
  - ▶ expand into property next door at downtown location
  - ▶ expansion to allow sales of more specialty items
- ▶ **Reconstruction of space would cost \$150,000**
  - ▶ paid entirely out of equity
  - ▶ equity would be rebuilt through revenues



# The Steps

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- ▶ Create set of historic financials
  - ▶ using percent of sales method
- ▶ Organize data on growth rates, cash flow parameters
- ▶ Create pro-forma forecast of base financials
  - ▶ following percent of sales method
- ▶ Forecast revenues and costs associated with project
- ▶ Combine base forecast with project forecast
- ▶ Perform NPV analysis
- ▶ Create @Risk overlay for key inputs and outputs
- ▶ Describe results, interpret information, recommend action



# The Feasibility Study

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- ▶ **Management needs study**
  - ▶ forecast of revenues under uncertain economic conditions
  - ▶ test management assumptions (growth, impact of expansion)
- ▶ **Expansion must pay for itself**
  - ▶ sufficient revenue to recover equity investment?
  - ▶ any surprises or unexpected results?
- ▶ **Management very confident in assumptions**
  - ▶ does not want a full-blown strategic analysis
- ▶ **Goal: persuade board to approve investment**



## Some Problems

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- ▶ Store is a division of non-profit corporation
- ▶ Management reports to board of parent
  - ▶ conservative and not focused on profitability
  - ▶ not sophisticated in terms of finance, forecasting, or investment
- ▶ Use internal data only
- ▶ Study cannot resemble a black box
  - ▶ how to employ monte carlo analysis?



## A Simple (but Effective) Solution

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- ▶ Focus on pro-forma income statements (simple model)
  - ▶ no balance sheets or statements of cash flow
- ▶ To justify investment
  - ▶ recapture initial investment through net income
  - ▶ identify appropriate growth rate and specialty sales levels
  - ▶ find conditions for minimum NPV
- ▶ Use simple distributions throughout; minimize inputs
- ▶ For assumptions:
  - ▶ growth – use current and historic data
  - ▶ forecast – use percent of sales method



## Internal Data Available

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- ▶ Five years' historic income statements (audited)
  - ▶ FY 2006 through Q3 2011
  - ▶ 75 different revenue and expense items
- ▶ Known revenues and costs:
  - ▶ annual sales and annual specialty sales per square foot
  - ▶ existing costs, additional rent, capital expenditures, depreciation, COGS as percent of sales
- ▶ Cost of Capital: 4.75% (UST<sub>30</sub> rate, March 25, 201
- ▶ Construction Timing: September 2011 to October 201



# Building the Base Forecast Model

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- ▶ Start with existing line items
- ▶ Percent of sales method used
  - ▶ calculated each line item with historic average proportion
- ▶ Choose conservative growth rate
  - ▶ management FY 2011 estimate of 10.1%
  - ▶ historic average of 7.6%
- ▶ Determine specialty sales levels





# Add in New Revenue and Costs

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- ▶ All additional revenue from one source
  - ▶ Specialty merchandise sales in new space
- ▶ Three sources for additional costs
  - ▶ COGS for new merchandise
  - ▶ new lease
  - ▶ new depreciation
- ▶ Capital Expenditures



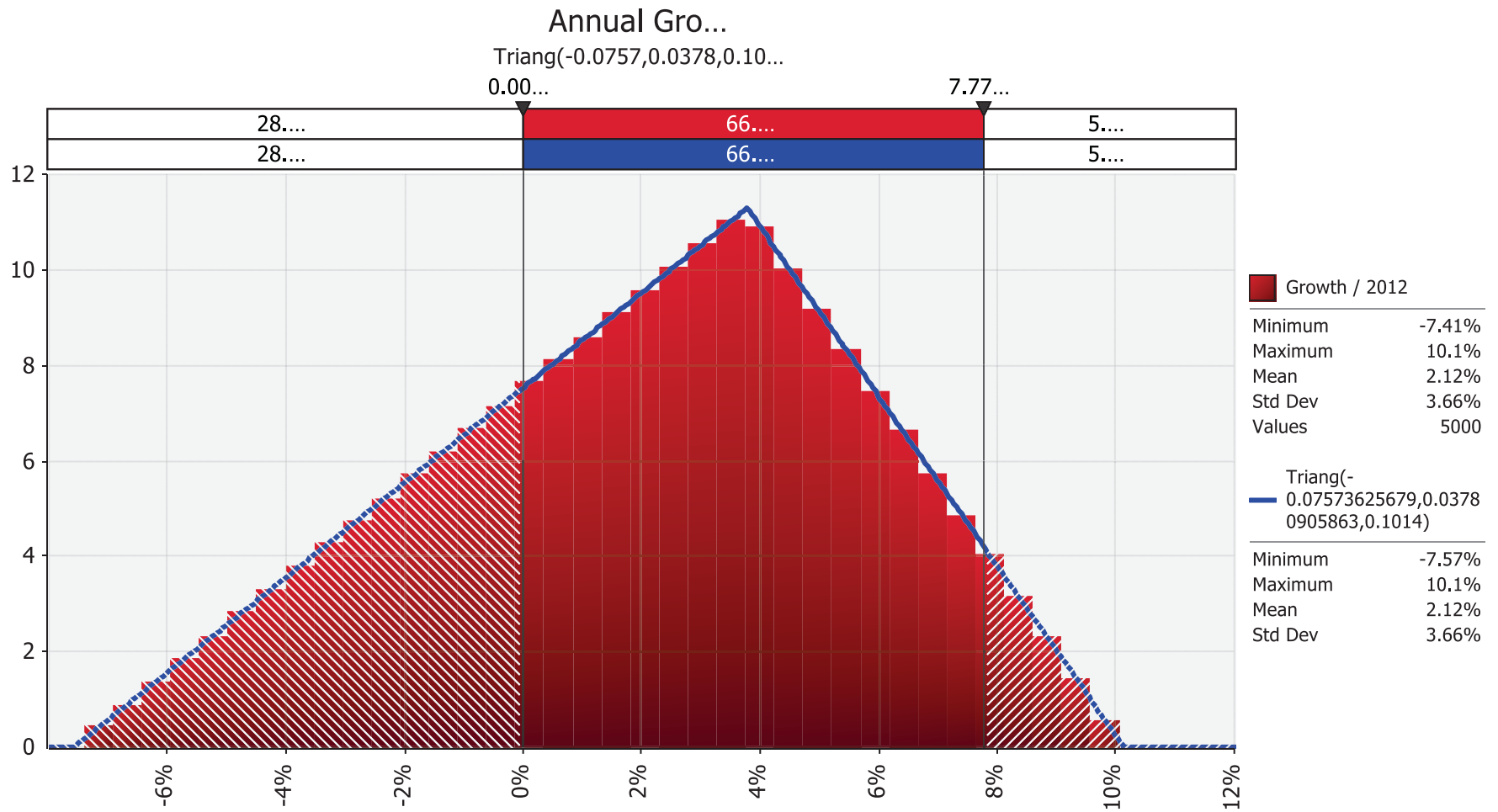
# Defining the Inputs – Base Growth Rate

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- ▶ **Growth Rate for Base Forecast**
  - ▶ management expects 10.1%
  - ▶ used RiskTriang(-7.6%, 3.8%, 10.1%)
    - ▶ historic low, half historic average, management rate
- ▶ **Resulting expected growth rate of 2.1%**
  - ▶ applies to revenues and costs
  - ▶ inflation at 2.7% in March 2011 (US DoL CPI)



# Simulation of Base Growth Rate



# Defining the Inputs – Specialty Sales

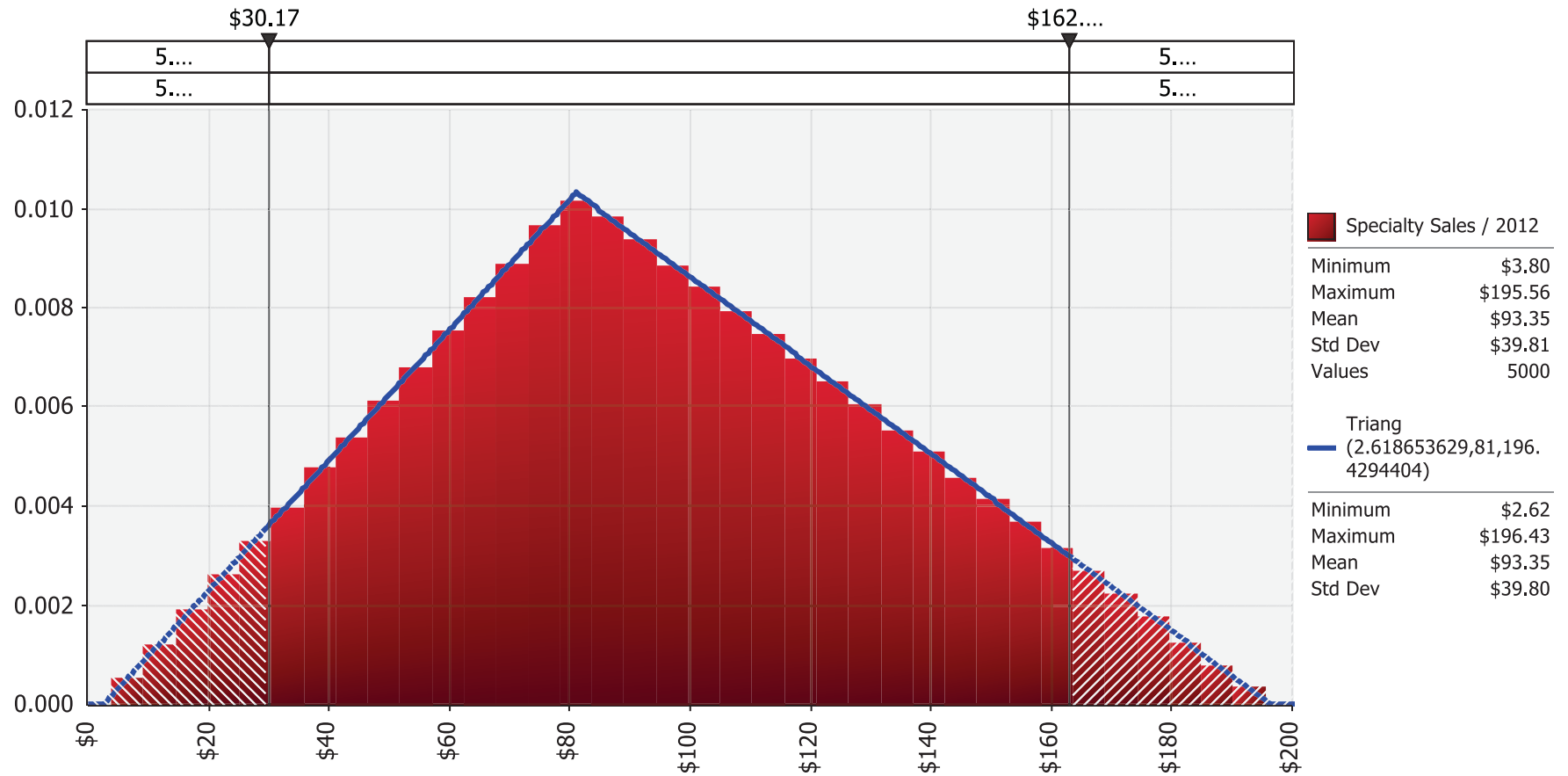
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- ▶ Annual specialty sales per Ft<sup>2</sup>
  - ▶ management expects \$162 per year
  - ▶ average annual total sales of \$400 per ft<sup>2</sup>
  - ▶ used RiskTriang(\$2.62, \$81, \$196)
    - ▶ historic low, 50% expected
    - ▶ used Goal Seek to set upper bound
- ▶ Resulting expected sales of \$93 per Ft<sup>2</sup>



# Simulation of Specialty Sales per Square Foot

Specialty Sales / 20...  
Comparison with Triang(2.61,81,1...



# Output – Forecast Net Income

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## Forecast Change in Net Assets

FYE 2012	FYE 2013	FYE 2014	FYE 2015
\$203,784	\$212,602	\$221,903	\$231,402

## Historic Change in Net Assets

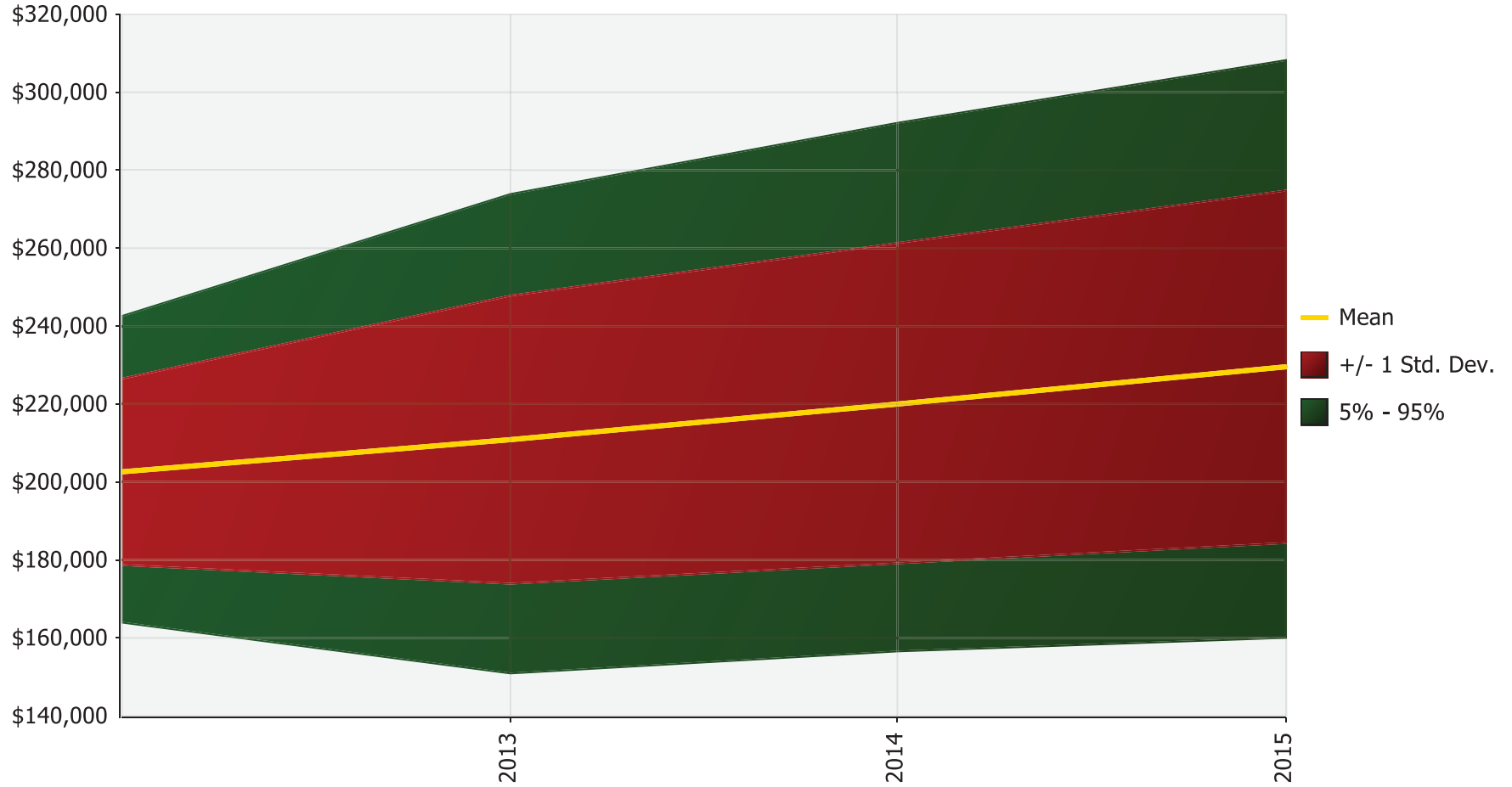
FYE 2007	FYE 2008	FYE 2009	FYE 2010	FYE 2011
\$110,376	\$174,757	\$189,399	\$162,976	\$206,751

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# Forecast Net Income Summary

2012 to 2...



# Using Net Present Value to Determine Feasibility

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- ▶ Think of problem in Time Value of Money terms
  - ▶ PV = project initial investment (\$150,000)
  - ▶ FV = terminal value (\$160,084 = \$7604 ÷ 4.75%)
  - ▶ PMTs = annual net income levels (project only)
  - ▶ i = Weighted Average Cost of Capital (WACC = 4.75%)
  - ▶ n = years in forecast





# Using Net Present Value to Determine Feasibility

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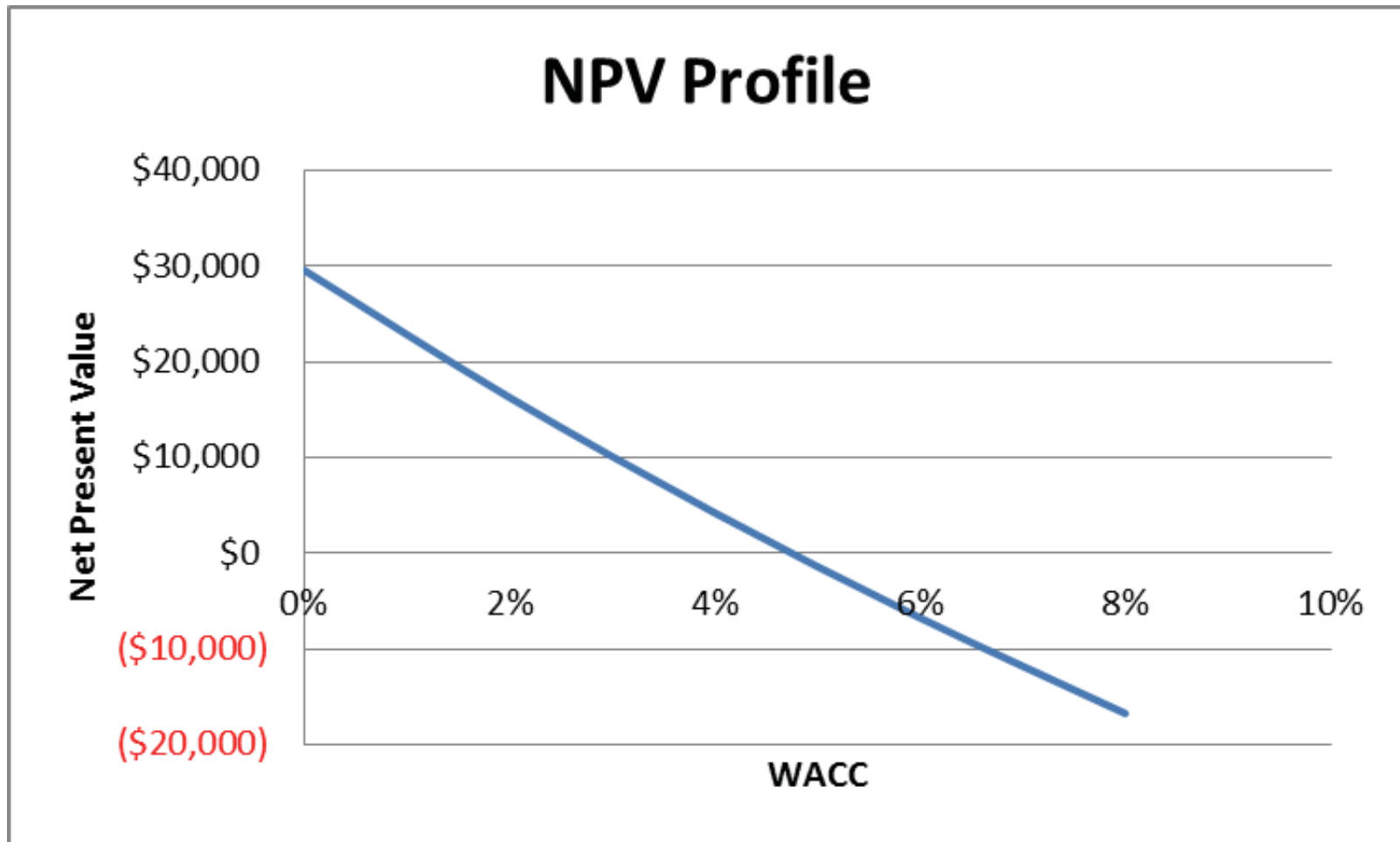
- ▶ All variables known except future cash flows
  - ▶ minimum acceptance condition is  $NPV = \$0$
  - ▶ under that condition,  $WACC = IRR$
  - ▶ find minimum cash flows necessary to justify project
- ▶ Use Goal Seek
  - ▶ define upper estimate for specialty sales; set NPV to \$0
- ▶ Project Cash Flows (Minimum Necessary)

	FYE 2011	FYE 2012	FYE 2013	FYE 2014	FYE 2015	
Net Income		\$1,881	\$4,331	\$5,872	\$7,446	
TV					\$160,084	
Cash Flows	(\$150,000)	\$1,881	\$4,331	\$5,872	\$167,530	



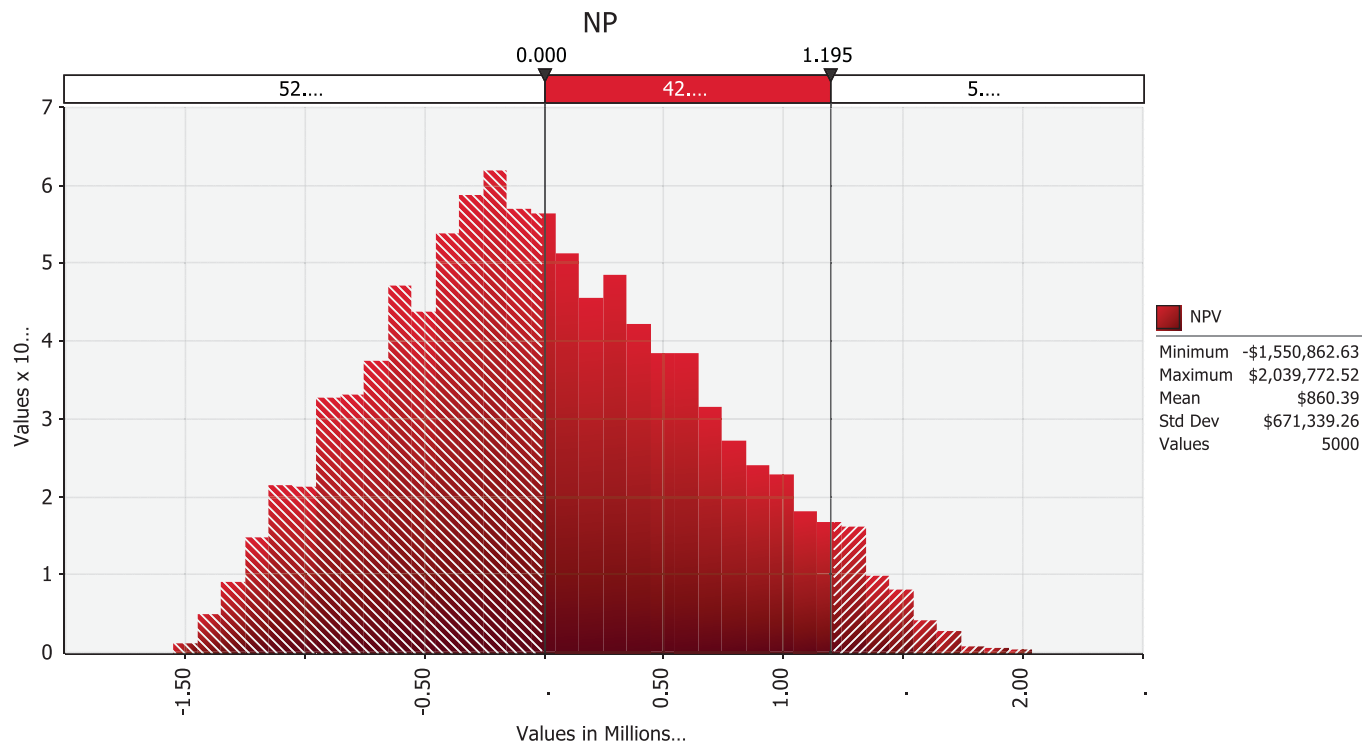
# Output Results: Project NPV Profile

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# Output Results

- ▶ Given minimum cash flow estimates
  - ▶ Net Present Value = \$0 when WACC = 4.75%
- ▶ Of 5000 iterations, 47.2% (2360) result in positive NPV



# Interpretation of Results

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- ▶ Specialty sales are the key to making this work
  - ▶ broad range of concern; \$93 is good target
- ▶ Low growth rate (less than inflation) needed
  - ▶ plenty of room for more aggressive growth
- ▶ Sufficient net income available to recapture capex
- ▶ NPV shows project should work
  - ▶ provided specialty sales target can be met
  - ▶ fewer than half of iterations met target



# Analysis Leads to Strategic Conclusions

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- ▶ Go ahead with investment
  - ▶ average sales per ft<sup>2</sup> are \$400
- ▶ Create comprehensive strategic business plan to:
  - ▶ improve likelihood of success
  - ▶ thoroughly analyze risks; minimize downside and losses
  - ▶ develop marketing strategy for specialty items
  - ▶ deliver minimum growth (2.1%) in FY12 and subsequent years
  - ▶ develop alternate scenarios and plans for extended recession
  - ▶ better analyze and understand competitive environment
  - ▶ create and fund reserve account for recaptured capex



## Some Useful References

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- ▶ For building pro-forma forecasts
  - ▶ Financial Modeling by Simon Benninga, MIT Press, 2008
  - ▶ Financial Models Using Simulation and Optimization  
Wayne Winston, Palisade Corporation, 1998
- ▶ For dealing with political issues
  - ▶ “Valuing Life Science Investments Using Simulation,  
Robert Ameo, Palisade Health Risk Analysis Forum,  
2010
- ▶ Tech Specs
  - ▶ iMac, OS X Lion v 10.7.2
  - ▶ MS Excel 2010, Windows 7, VirtualBox v 4.1.6
  - ▶ @Risk v 5.1.7 Industrial Version



# Contact Information

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