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

PALISADE RISK CONFERENCE 201
LAS VEGAS, NEV
10 NOVEMBER 201

STEVEN SLEZAK, LECTURER, AGRIBUSINESS DEPAR
COLLEGE OF AGRICULTURE, FOOD, AND ENVIRONMENTAL SCIENCES
CAL POLY, SAN LUIS OBISPO, CALIFORNIA

The Case

- 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

- 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

- 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

- 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

- 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

- 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_{30} rate, March 25, 201
- Construction Timing: September 2011 to October 201

Building the Base Forecast Model

- 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

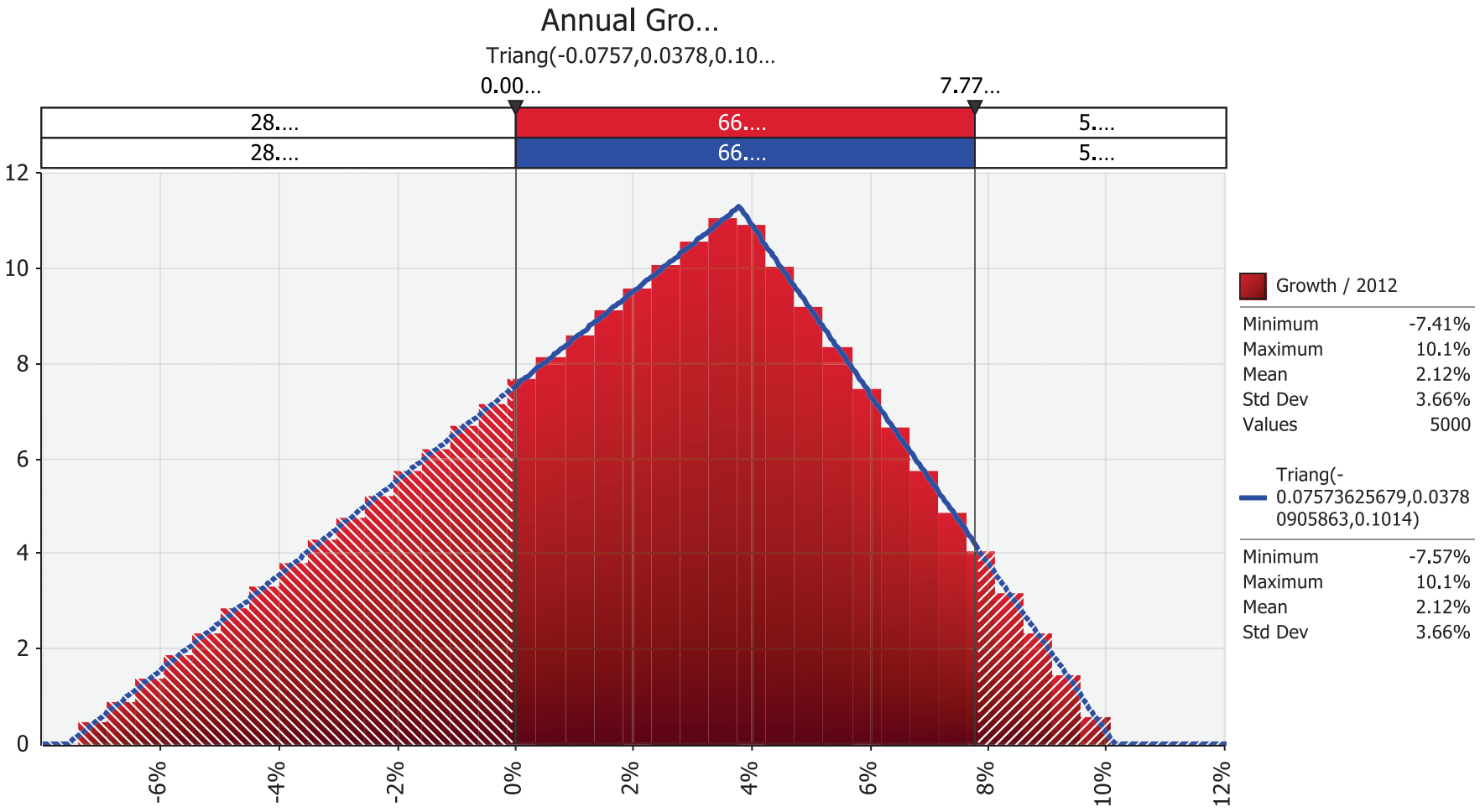
Add in New Revenue and Costs

- 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

- 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)

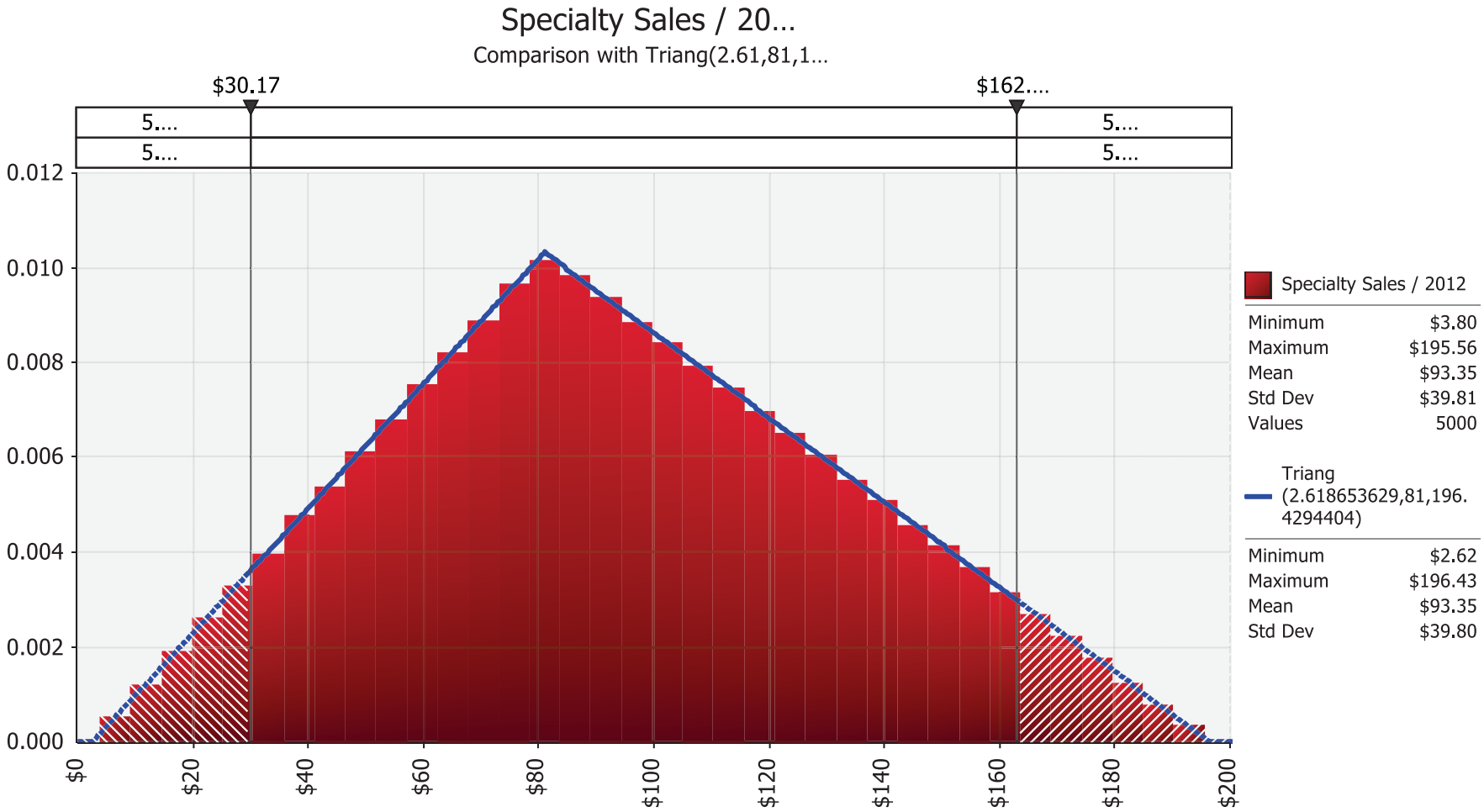
Simulation of Base Growth Rate



Defining the Inputs – Specialty Sales

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

Simulation of Specialty Sales per Square Foot



Output – Forecast Net Income

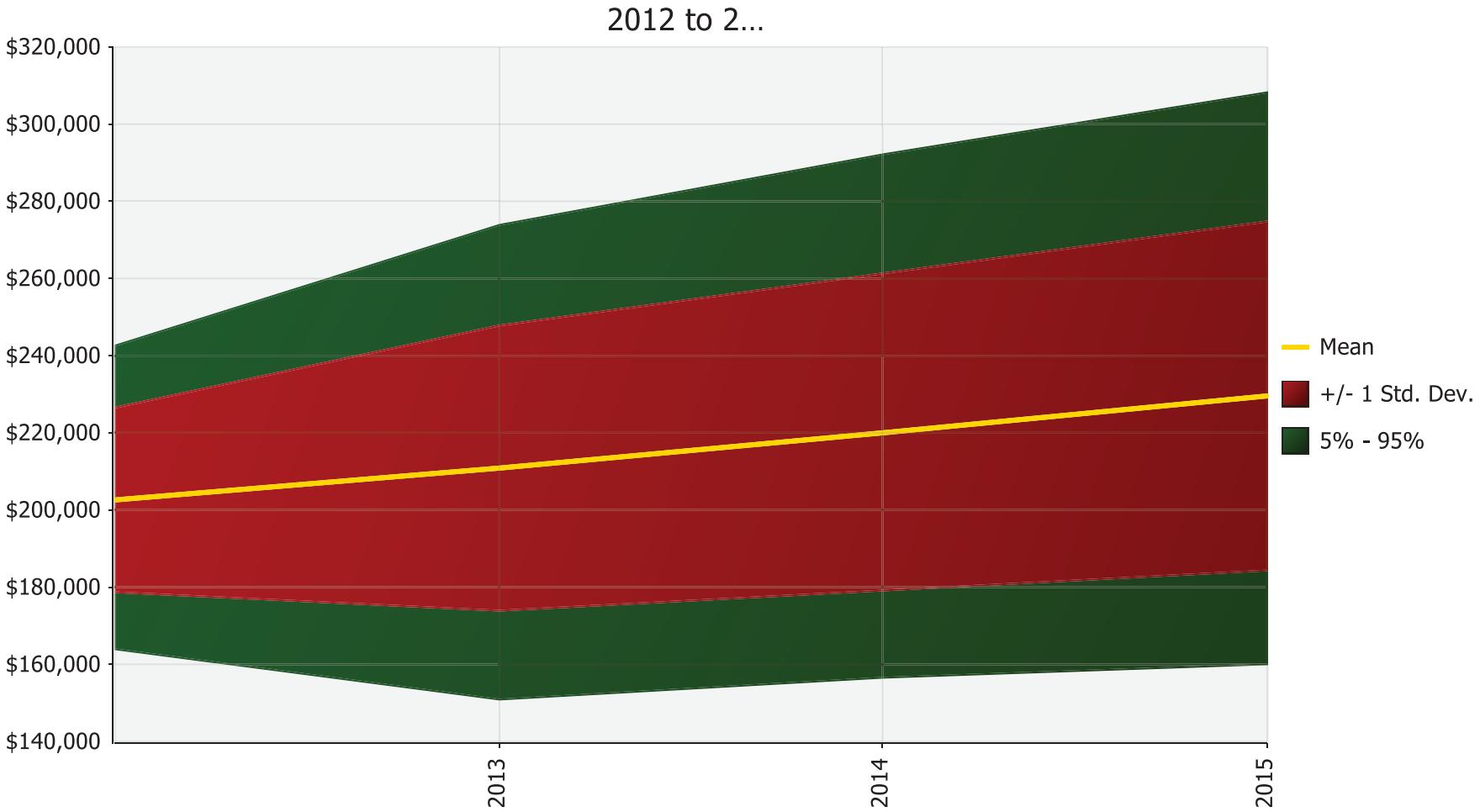
Forecast Change in Net Assets

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

Forecast Net Income Summary



Using Net Present Value to Determine Feasibility

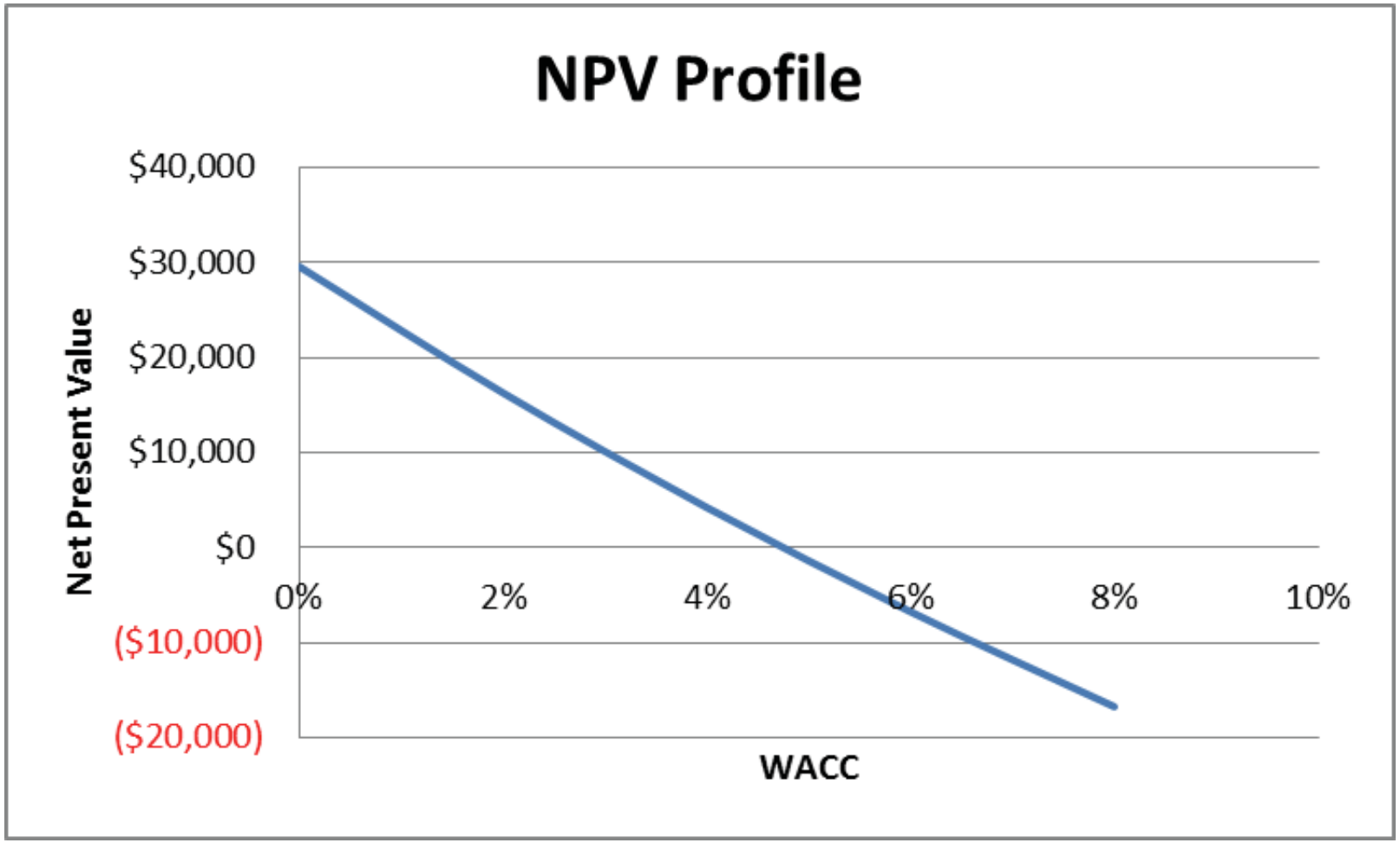
- Think of problem in Time Value of Money terms
  - PV = project initial investment ($150,000)
  - FV = terminal value ($160,084 = $7604 ÷ 4.75%)
  - PMTs = annual net income levels (project only)
  - i = Weighted Average Cost of Capital (WACC = 4.75%)
  - n = years in forecast

Using Net Present Value to Determine Feasibility

- 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)

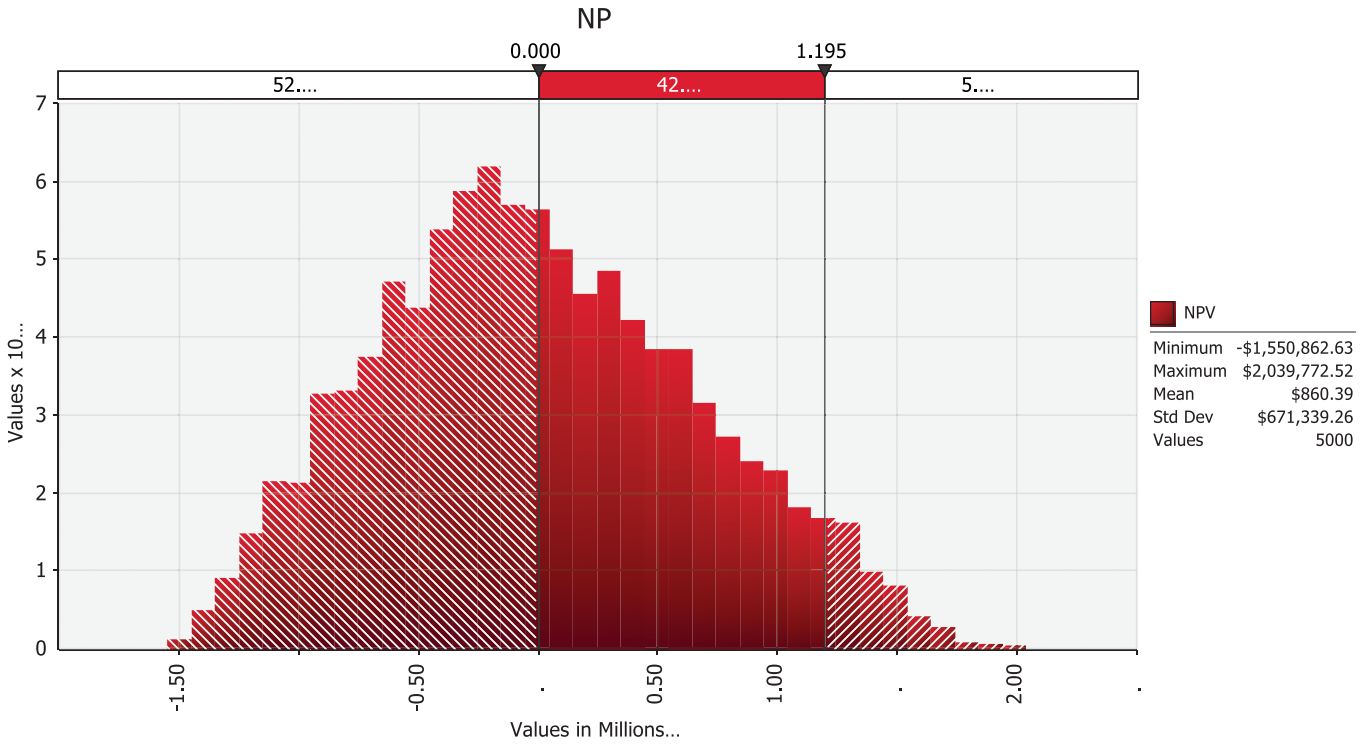
	FYE 2011	FYE 2012	FYE 2013	FYE 2014	FYE 2015	
Net Income		$1,881	$4,331	$5,872	$7,446	
TV					$160,084	
Cash Flows	($150,000)	$1,881	$4,331	$5,872	$167,530	

Output Results: Project NPV Profile



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

- 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

- Go ahead with investment
  - average sales per ft^2 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

- 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

Cal Poly, San Luis Obispo

Steven Slezak, Lecturer
Agribusiness Department
Room 22-310
College of Agriculture, Food, and Environmental Sciences
Cal Poly
San Luis Obispo, California 93407
Phone: 805-756-5008
sslezak@calpoly.edu