FORESTALLING FORECLOSURE
THE STRATEGIC USE OF @RISK TO A HEALTH CENTER IN FINANCIAL DISTRESS

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The Problem

- Medical center in California
- Secures 30-year $5.1 million mortgage from private banks
- Two loans with average rate of 5.4%
- Loans guaranteed by U.S. Government
- Unexpected decrease in the center's net income
  - government reimbursements down; numbers of uninsured up
- Monthly P&I too burdensome
  - borrower suspends mortgage payments
  - lenders begin default process
- No one wants foreclosure; how to proceed?

The Project

- Analyze debt situation
- Goals:
  - can borrower avoid default?
  - should the center refinance?
  - how likely is it borrower can resume mortgage payments within the next 12 months?
- Focus on debt capacity from 2010 through 2040

Defining the Situation

- Debt Capacity – Total amount of debt borrower can carry; function of annual income
- Debt Service Coverage – Ratio of Debt Capacity to Annual Principal and Interest Payment
  - bank's target DSC = 1.25
- What is annual net income necessary to satisfy DSC?

$$CF\ for\ Debt\ =\ Net\ Income\ +\ Depreciation\ +\ Interest\ Expense$$

$$DSC\ =\ \frac{Net\ Income\ +\ Depreciation\ +\ Interest\ Expense}{Annual\ Principal\ Payment\ +\ Annual\ Interest\ Expense}$$

Defining the Inputs

Known Inputs

- Depreciation Expense
  - from Income Statement
  - Straight Line method
  - $343,375 per year
- Interest Expense
  - from Amortization Table
  - varies year to year
- P&I Payments
  - from Amortization Table
  - $349,530 per year
- Annual Loan Balance
  - from Amortization Table
  - Declines year to year

Unknown Inputs to Test

- Interest Rate
  - current rate: 5.423%
  - 6. 39% (maximum non-rated muni bond yield, per Delphis-Hanover, February 2010)
- Term of Debt
  - current term: 30 years
  - 35 years and 40 years
- Net Income (aka Change in Net Assets)

Defining Change in Net Assets

Change in Net Assets

- Seven Years of Audits
  - two years of losses
  - five years of gains
  - low of ($577,250)
  - high of $1,432,720
  - average of $333,430
  - σ of $610,015

From Audited Statements

Change in Net Assets	
FY2003	$339,840
FY2004	$224,338
FY2005	$(4,055)
FY2006	$1,432,720
FY2007	$322,363
FY2008	$596,053
FY2009	$(577,250)

The Debt Capacity Model

- Use Evolver to solve for net income in equation:

$$CF\ for\ Debt\ =\ Net\ Income\ +\ Depreciation\ +\ Interest\ Expense$$

- Subject to the condition:

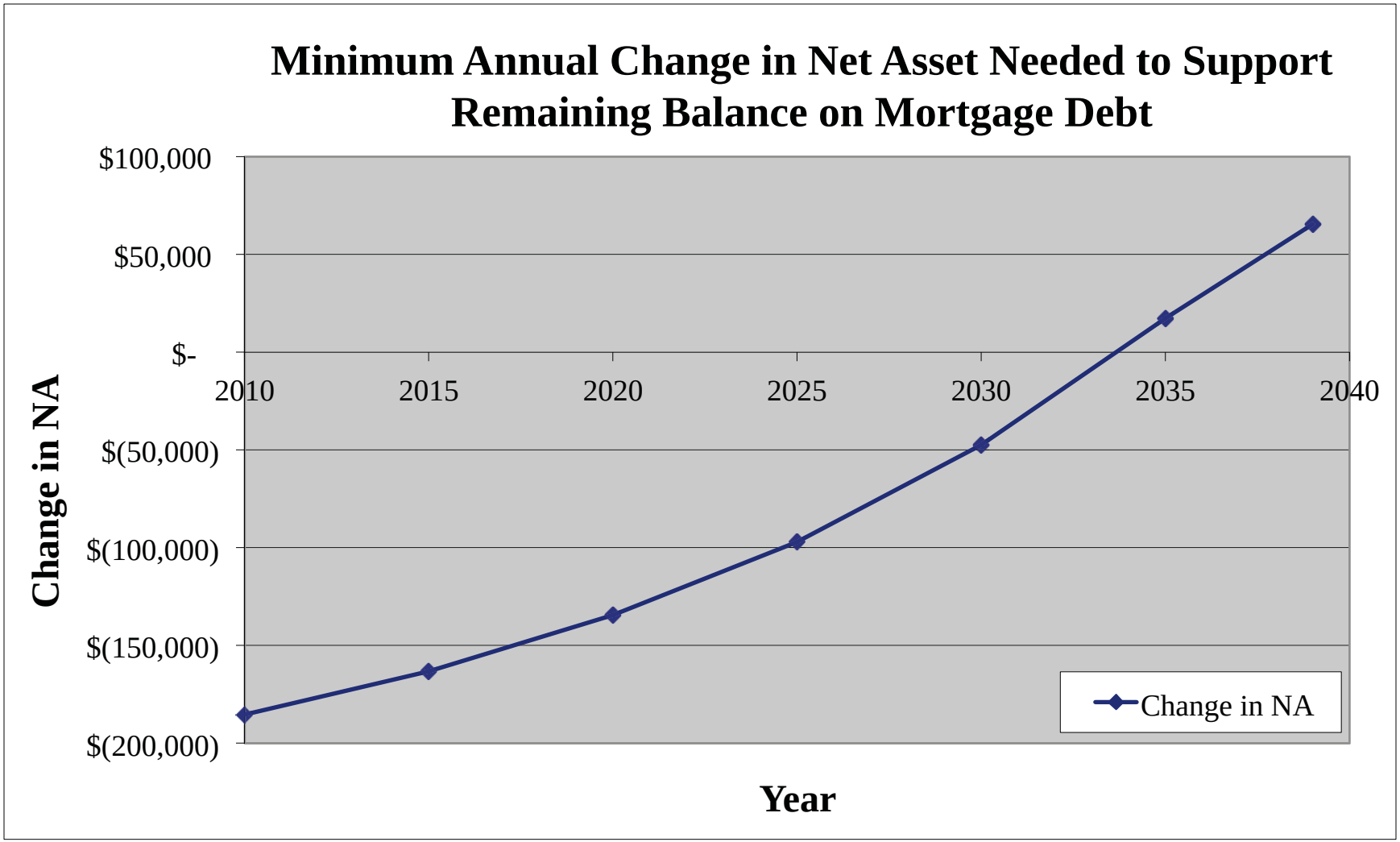
$$1.25\ =\ \frac{Net\ Income\ +\ Depreciation\ +\ Interest\ Expense}{Annual\ Principal\ Payment\ +\ Annual\ Interest\ Expense}$$

- Repeat calculation for each year of interest
- Calculating the minimum net income needed to service mortgage with DSC of 1.25 for each year

Determining Debt Capacity

FINANCIALLY STRUGGLING HEALTH CENTER				
DEBT CAPACITY ANALYSIS				
Using Financial Data for 1 January 2003 through 31 December 2009				
Debt Capacity				
Provides rough measure of total debt cash flows could support, assuming Debt Service Coverage Ratio of 1.25 times and various amortization periods at current commercial mortgage rates.				
Defined As:	Change in Net Assets Plus Depreciation Expense Plus Interest Expense			
	INPUTS for FY2010			
Change in Net Assets			$ (185,311)	Solution
Depreciation			$ 343,375	Straight Line
Interest Expense			$ 278,847	From Amortization Table
Fiscal Year				**2010**
Cash Flow Available for Debt Service				$ 436,912
Cash Flow Available for Debt Service with				
Debt Service Coverage of:		1.25		$ 349,530
Debt Supported by Adjusted Cash Flow				
Interest Rate:		5.42%		
Term in years		30		
Balance at Beginning of Year				$ 5,173,765

Debt Capacity Results



Debt Capacity Results

- Analysis results in unexpected conclusion
  - results raise their own issues
- Negative net income not sustainable economically
  - depreciation is as large as cash flow available for debt service
- Occasional losses should pose minimal threat
- Break even strategy needed
- Question: What is likelihood of minimum net income?
- What is likelihood of satisfying DSC in any given year?

Debt Service Coverage Simulation Using @Risk

- Three variables determine DSC:
  - change in net assets
  - term of debt
  - interest rate
- Would refinancing reduce debt burden?
  - would reducing payments make a difference?
- Refinancing changes
  - mortgage rate
  - annual P&I
  - years on mortgage

Debt Service Coverage Simulation Using @Risk

- Think of problem in Time Value of Money terms
  - PV = principal balance remaining on mortgage debt
  - FV = $0 (fully amortized mortgage)
  - PMT = annual P&I
  - i = mortgage rate
  - n = term remaining on mortgage
- Refinancing affects only PMT, i, and n
- Change in net assets, depreciation, and interest expense determine mortgage debt capacity
  - discounted cash flow approach solving for PV

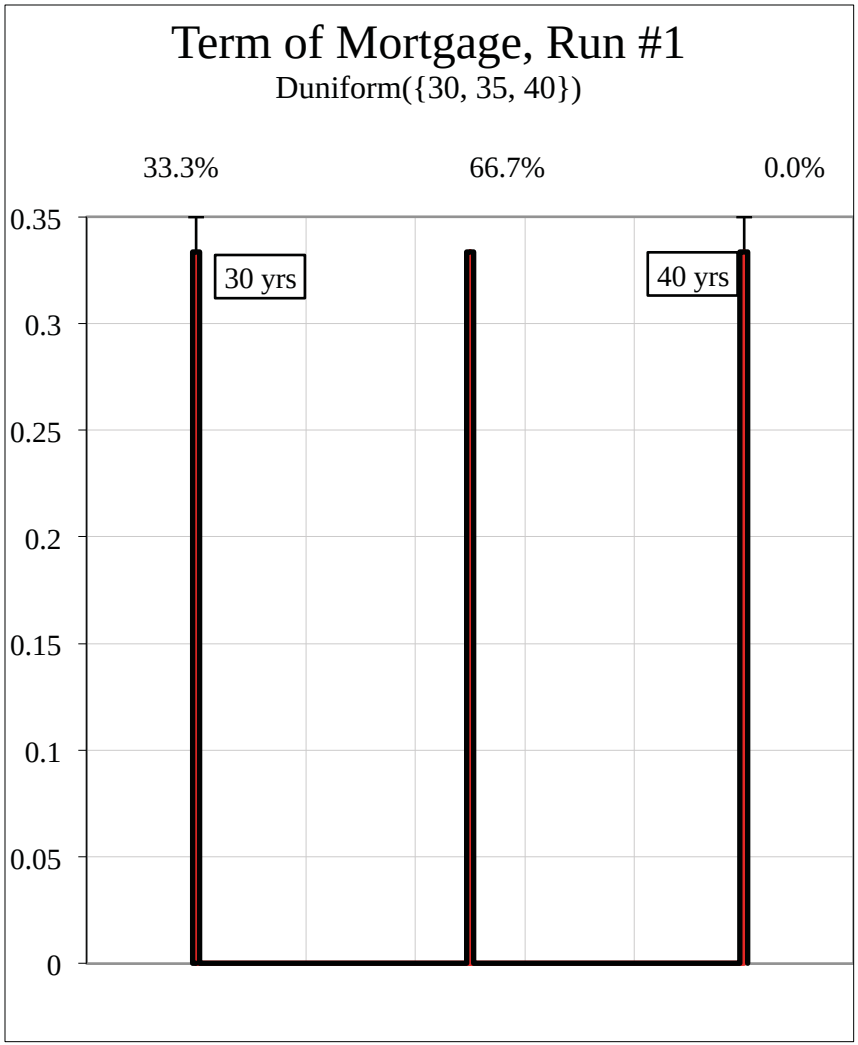
Debt Service Coverage Simulation Using @Risk

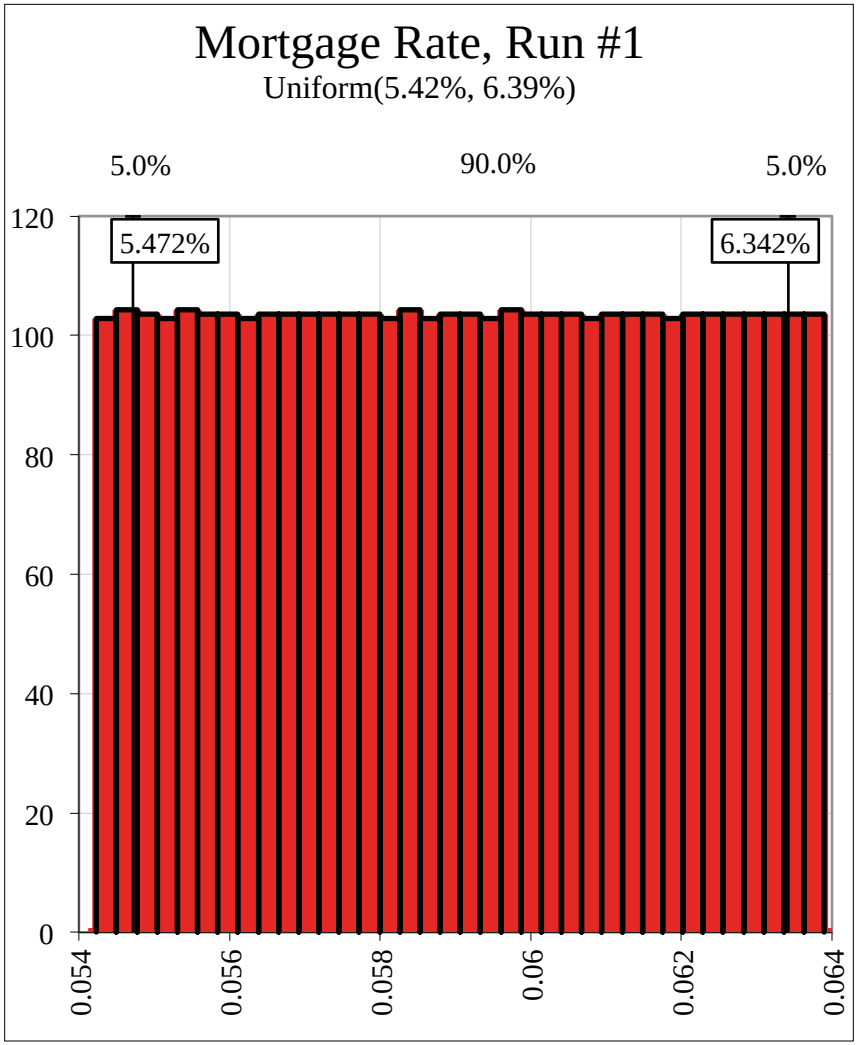
- @Risk simulation inputs:
  - change in net assets
  - term of debt
  - interest rate
- @Risk simulation outputs:
  - change in net assets
  - debt capacity
- Technical Details
  - MacBook Pro, OS X v 10.6.2
  - Parallels Desktop v 5.0.9310
  - Microsoft Windows XP HE 2002 SP3
  - @Risk 5.0

Debt Service Coverage Simulation Using @Risk

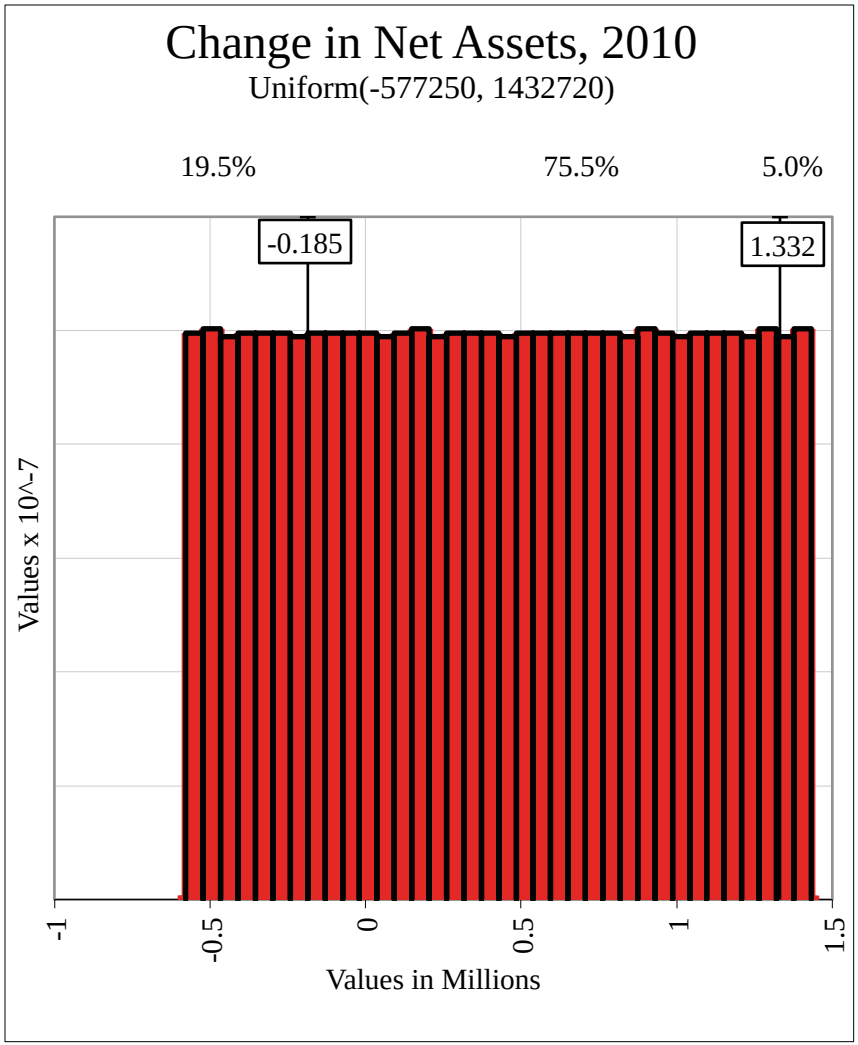
- Simulation for 2010 only
- Make two runs to refine model
  - small data sample for net income with large σ value
- Start with uniform distributions for two variables
  - net income (−$577,250 to $1,432,720)
  - interest rate (5.42% to 6.39%)
- Term variable uses discrete uniform distribution
  - values (30, 35, 40)
- Run 1000 iterations to start first simulation

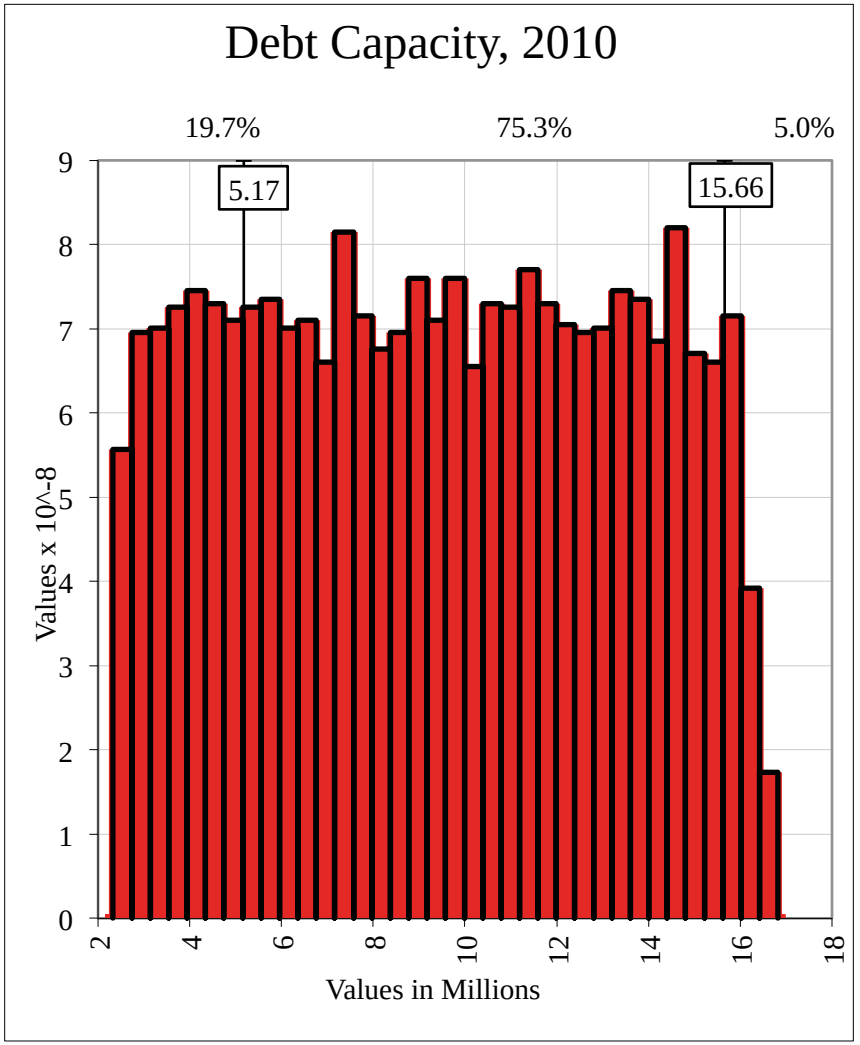
Simulation Results, First Run





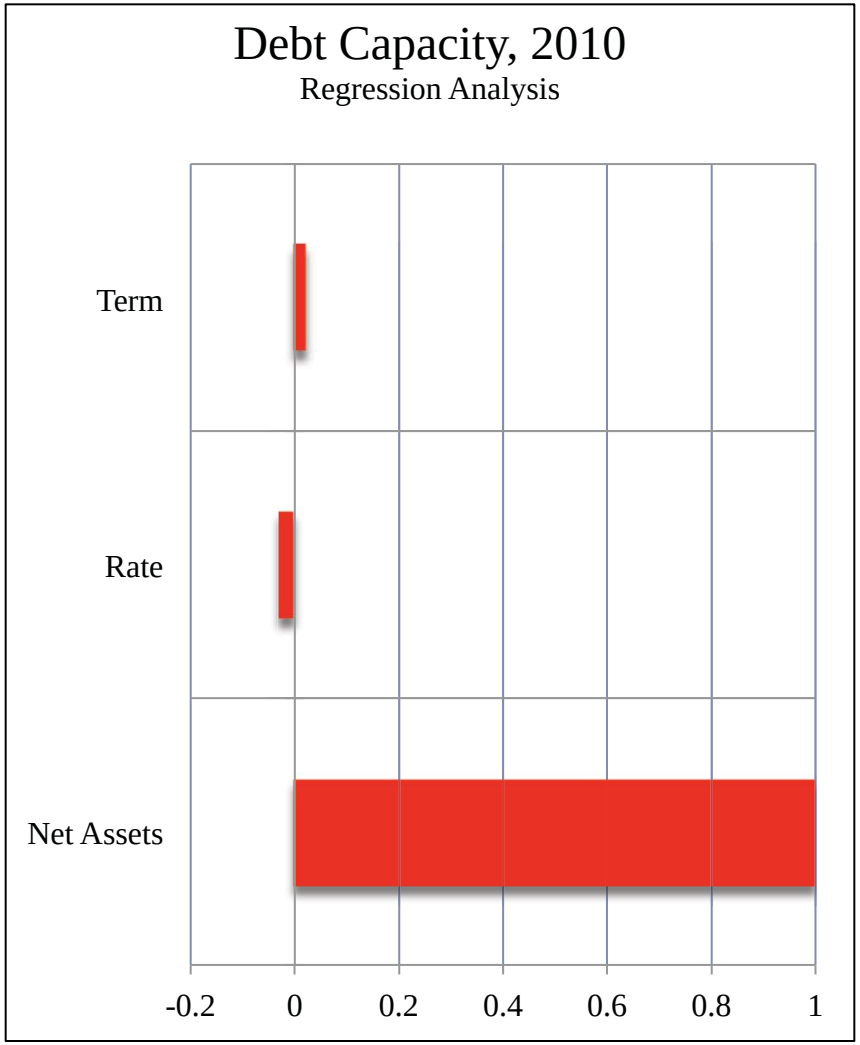
Simulation Results, First Run





Simulation Results, First Run

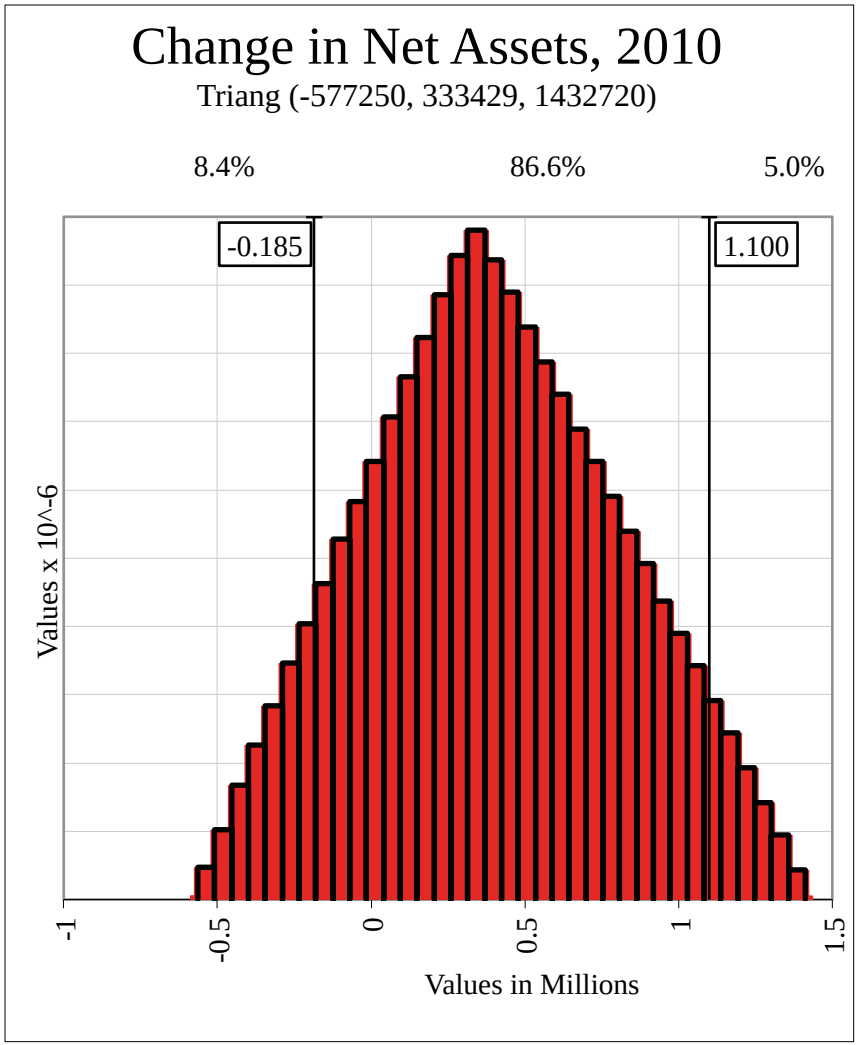
- Term and rate results as expected
- Net Income results exceed −$185,000 roughly 80% of trials
- Debt Capacity results exceed $5.17 million roughly 80% of trials
- Regression shows net income drives results
- Refinancing not useful
- Service existing debt

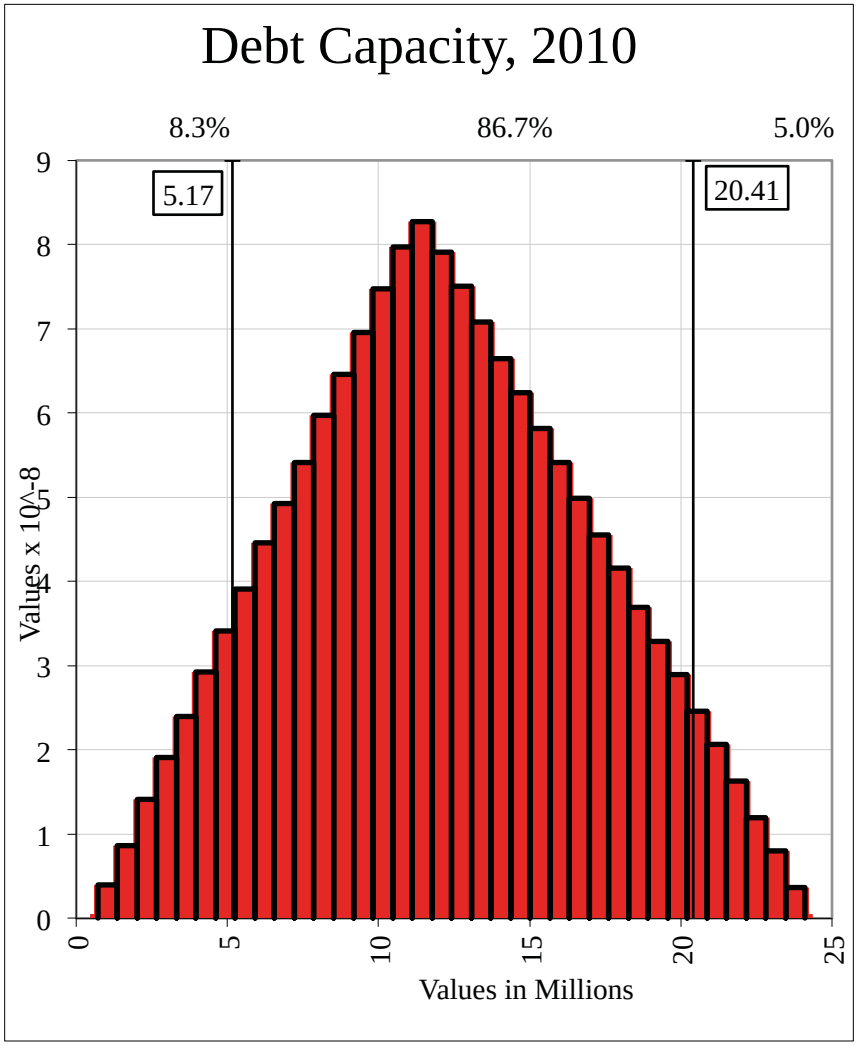


Debt Service Coverage Simulation Using @Risk

- Fix rate and term at existing values (5.42% and 30 years)
- Use triangular distribution for simulating net income
  - values (−$577,250; $333,429; and $1,432,720)
  - fixes minimum and maximum values
- Run 5000 iterations

Simulation Results, Second Run





Simulation Results, Second Run

Findings

- Net Income results exceed −$185,000 roughly 92% of trials
- Debt Capacity results exceed $5.17 million roughly 92% of trials
- Good (not great) likelihood of that occurring in FY2010
  - situation dire but not hopeless
  - better than foreclosure?
- Refinancing not a practical solution
- Best strategy to service existing debt

Analysis Leads to Strategic Conclusions

- Best solution to continue servicing existing debt
- Negotiate timetable to restart debt service payments with lenders and US government
- Create benchmarks for measuring progress
- Develop comprehensive strategic business plan to:
  - Deliver minimum (breakeven) net income in FY2010 and subsequent years
  - identify new sources of growth and minimal revenue targets
  - identify areas for budget cuts and maximum expense targets
  - create and fund debt service reserve account

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