Interest Rate Risk: Practical Techniques for Risk Scenario Development

ERM Symposium – Washington, DC
Session C12
April 8, 2016
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Preparing for uncertainty

- April 2015 - published
  - Drivers of low/high rates
  - Survey
  - Impact on life insurance products
- Researchers
  - Max Rudolph, Rudolph Financial Consulting, LLC
  - Dr. Randy Jorgensen, Creighton University
  - Karen Rudolph, Milliman
- https://www.soa.org/Research/Research-Projects/Life-Insurance/research-2015-rising-interest-rate.aspx

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Drivers of low rates

- Low growth
- Improved productivity
  - Late 1800s
- Monetary policy
  - Works best with balanced budget

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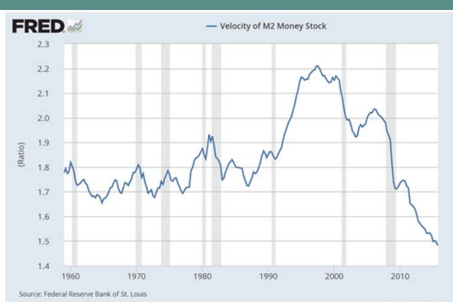
Drivers of low growth

- Velocity of money (trust)
  - Pushing on a string
  - GDP = MV = PY
    - Money supply, Velocity
    - Prices, Output (Y)
- Demographics
- Headwinds - Robert Gordon The Rise and Fall of American Growth
- http://www.cepr.org/sites/default/files/policy_insights/PolicyInsight63.pdf

Velocity of Money



Demographics

- Aging population buys services, slows growth
  - Fewer people lowers GDP
  - Role of immigration
  - Can change quickly
  - Interacts with other risks (e.g., geopolitical conflicts, rising oceans)
- Advice: watch and learn from Japan and Europe

Headwinds - Gordon

- Females entered the workforce once
- Movement to lower cost regions - outsource
- Sustainability costs – historical, future
- Government actions
  - High debt repercussions
  - Active Federal Reserve policies
- Return to pre-1700 growth rates (0.2%) as industrial revolutions wind down
  - Steam engine, trains, computers

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Rising interest rates

- Who "knows" how this will play out?
  - Can it be controlled?
- What are the drivers?
  - Debt – public/private
  - Unbalanced trade/currencies
  - Bubbles (illiquid, smart beta, Miami property)
  - Manipulated markets (e.g., Fed, GSEs)
- Advice: test your exposures qualitatively

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Books that make you think

- This Time is Different
  - Carmen Reinhart/Ken Rogoff
- Currency Wars/The New Case for Gold
  - James Rickards
- The Demographic Cliff
  - Harry Dent

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This Time is Different

- Reinhart/Rogoff
- Inflation spikes (into hyperinflation) when
  - Debt becomes large
  - Central bank monetizes the fiscal debt
  - Debt is owed to foreign sources
- Does this sound familiar?
  - Timing not predictable

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Impact on insurers

- Nominal rates matter (real guarantees?)
- Interest rate guarantees in products
  - Deferred annuities, universal life, DI, LTC
  - Participating products, whole life
  - Payout annuities (DB plans, individual, structured settlements)
- Disintermediation risk, volatile duration metric
- Industry reaching for yield and taking bets
- Advice: develop proactive scenarios

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Strategies that increase systemic risk

- Press release always touts diversification
- Alternative investment classes
  - e.g., timber, rail cars
- Silent risk (extra yield but don't know why)
- Liquidity/Credit risk
- Market timing/short assets (consistent incentive compensation?)
- Leverage
- Products you don't understand
  - Is this a core competence

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Japanese experience

- Change product mix
- Buying insurers in other markets
  - Avoid yen (see China/yuan/gold)
- Cost cutting
- Favorable experience (mortality)
- Alternative asset classes
- Regulatory changes
  - Lower interest guarantee
  - Weakened reserve adequacy requirements

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Product Mix Scenario

- Will products cycle?
- Falling rates since 1980s
  - Buy term and invest the difference
  - Universal Life
- When rates next rise
  - Return to participating products?
  - Role of accumulation products?
  - Where is insurance core competence?
- What if they don't rise?

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Survey Key Results

- Stochastic analysis
  - Most use NAIC (Academy) generator
    - Few who use it understand it
    - Appropriate in today's low interest rate environment?
- Deterministic scenarios
  - Beyond NY 7
  - Find scenarios that matter to the tested block
- Advice: don't overcomplicate, rotate scenarios

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Survey – Deterministic Scenarios

- Almost everyone has looked at increasing/decreasing rates
  - False sense of security for management/board?
  - Think outside your comfort zone
- Few model *negative* risk free rates
  - Fed now suggests doing this
- Few model risk free rates higher than 10%
  - Often cap at 10 year Treasury plus 500 bp
- Defend - how/why scenarios were built
- Advice: NY7 take off floors, rise 3%/year for 4 years

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Contrarian

- Importance of skeptical thought
- Time horizon – go longer than competitors
- What could go wrong?
- What rules of thumb are no longer appropriate?
- Risk interactions
- Where are we subsidizing? AA3, risky stocks vs. bellwether stocks
- Advice: rotate contrarian role, qualitative analysis drives quantitative analysis

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Model Office

- Deferred annuity
  - 5 years of issues (aged)
- Universal Life
  - 10 years of issues (aged)
- Universal Life with Secondary Guarantees
  - 10 years of issues (aged)
- Advice: focus on tools presented

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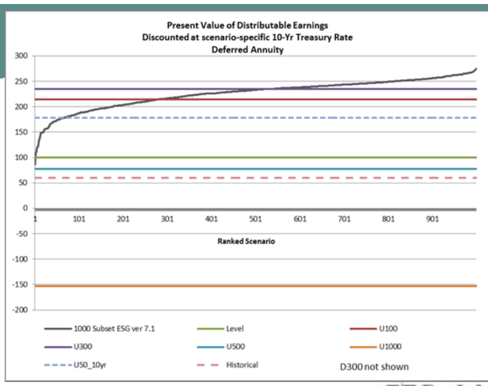

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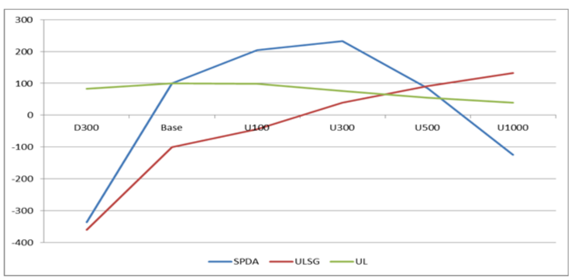
Value (normalized)



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Where do we go from here?

- Closed form solutions do not exist
- Volatility is likely
- Know your exposures
- Build benchmarks into incentive comp
- Test negative rates and spikes (above 10%)
- Timing of shocks impossible to determine
  - Driven by trust in system (VM)
  - Everything is good until it's not
- Scenario test at multiple levels of adversity

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Thank you!
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