The Business of Change: 2010 and Beyond

Optimal Annuity Strategies After Retirement

Michael Goemans
Makhosi Ncube

Agenda

1. Background / Intention of Research
2. Factors Influencing Lifetime Income
3. Modelling Procedure
4. Results
5. Conclusions

Agenda

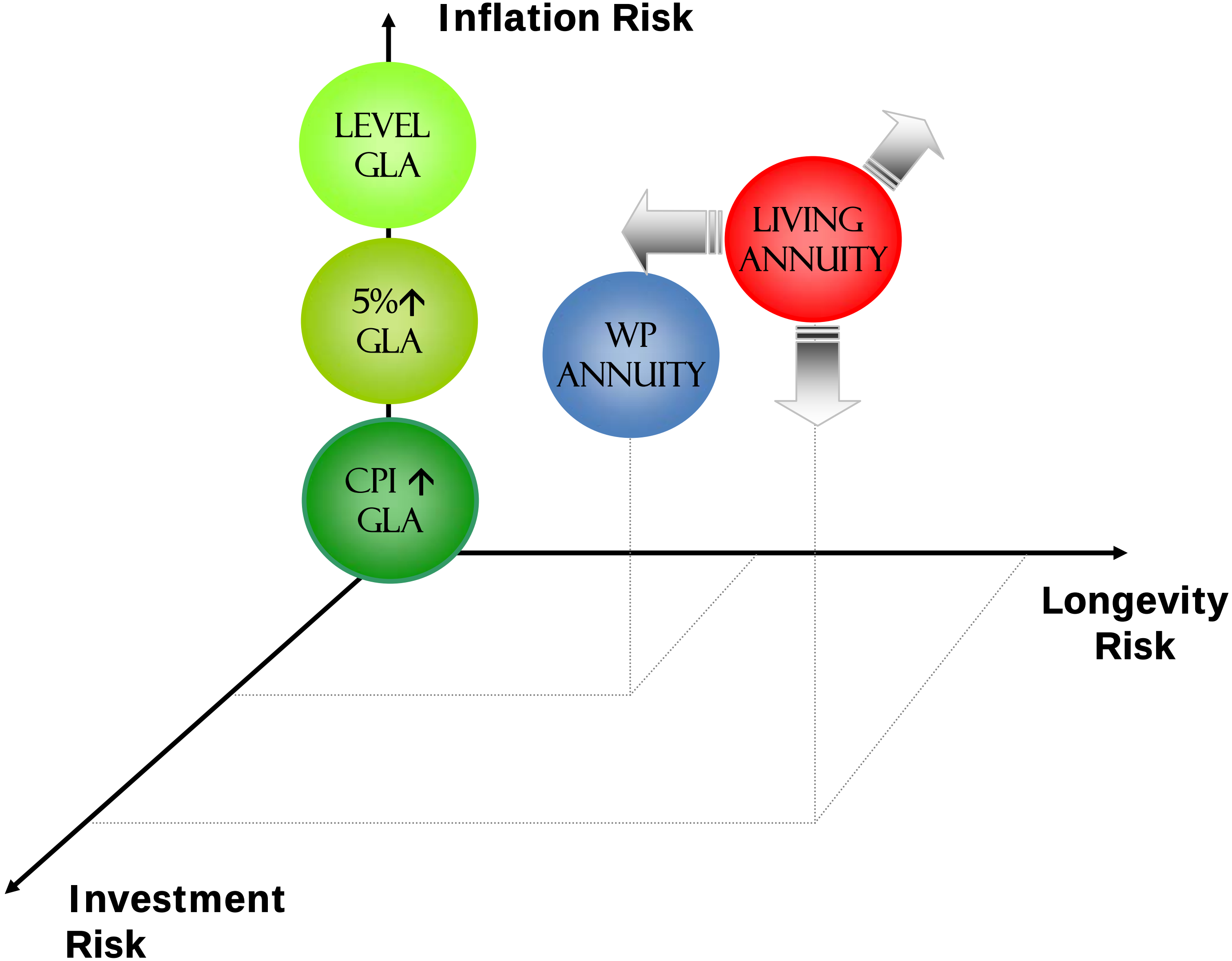
1. Background / Intention of Research
2. Factors Influencing Lifetime Income
3. Modelling Procedure
4. Results
5. Conclusions

The Business of Change: 2010 and Beyond

Background

- Compulsory purchase post-retirement income annuities
  1. Guaranteed Life Annuity
  2. Investment Linked Living Annuity
  3. With-Profits Annuity

Risk Characteristics



Background

- Choices influenced by personal circumstances and attitude to risk
- Can one get clear guidance on
  - Where is a retiree likely to get the most long-term income?
  - Does the current level of interest rates matter?
  - What equity exposure and drawdown rate in a living annuity is optimal? Should the drawdown rate be varied over time?
  - Should a retiree start off in a living annuity and move to a guaranteed annuity later in retirement?

Background

- Use the example of
  - 60 year-old male
  - R500,000 retirement capital
  - 31 December 2007 retirement date
- Focus on which annuity strategy is expected to provide the most lifetime income, and what the risks around this are

Agenda

1. Background / Intention of Research
2. Factors Influencing Lifetime Income
3. Modelling Procedure
4. Results
5. Conclusions

The Business of Change: 2010 and Beyond

Factors Influencing Lifetime Income

- Mortality / Capital Effects
- Asset Allocation / Return Effects
- Cost / Charge Effects
- Current and Expected Future Interest Rates
- Risk Effects
- Switching During Retirement

The Business of Change: 2010 and Beyond

Agenda

1. Background / Intention of Research
2. Factors Influencing Lifetime Income
3. Modelling Procedure
4. Results
5. Conclusions

The Business of Change: 2010 and Beyond

Modelling Procedure – Key Items

- Asset Projection Model
- Mortality Basis
- Guaranteed Life Annuity Basis
- Living Annuity Basis
- With-Profits Annuity Basis

The Business of Change: 2010 and Beyond

Modelling Procedure – Key Items

- Guaranteed Life Annuity Basis
  - Single-life, 60 year-old male, 10 year guarantee term
  - Market annuity rates from Personal Finance
  - Level annuity income: **R4,221 p.m.** for life
  - 5% increasing annuity: **R2,749 p.m. + 5% p.a**
  - Derived RIY of 0.6% p.a. from bond curve

Modelling Procedure – Key Items

- Living Annuity Basis
  - Asset allocations: 0%, 25%, 50%, 75% and 100% equity
  - Drawdown rates: 2.5%, 5%, 7.5%, 10%, 12.5%, 15%, 17.5%

    R3,125 p.m. R4,167 p.m.

  - Drawdown strategies:
    - Strategy 1: Maintain same % drawdown throughout
    - Strategy 2: Adjust drawdown % to maintain Rand income
    - Strategy 3: Adjust drawdown % to grow income by 5% p.a.

The Business of Change: 2010 and Beyond

Modelling Procedure – Key Items

- Living Annuity Basis…
  - Annual charges (asset management + advice + expense):

100% equity	2.40% p.a.
75% equity, 25% bond	2.25% p.a.
50% equity, 50% bond	2.10% p.a.
25% equity, 75% bond	1.90% p.a.
100% bond	1.70% p.a.

The Business of Change: 2010 and Beyond

Modelling Procedure – Key Items

- With-Profits Annuity Basis
  - Based on traditional with-profits annuity structure
  - Initial guaranteed income using 3.5% pri
  - 50% invested in matching bonds upfront, 50% in equities
  - Initial expense charge: 2% of contribution
  - Ongoing charges: 1.75% p.a.
  - Income: **R2,898 p.m. + bonuses**

The Business of Change: 2010 and Beyond

Modelling Procedure – Key Items

- With-Profits Annuity Basis…
    - Investment returns on the equity (unmatched) portion smoothed before declaring as bonuses
    - Smoothing driven by 5-year average of past returns, adjusted depending on level of derived bonus smoothing reserve

Agenda

1. Background / Intention of Research
2. Factors Influencing Lifetime Income
3. Modelling Procedure
4. Results
5. Conclusions

Results

- Looked first at risks of each annuity type, then at expected lifetime income
- Defined two ruin measures / benchmarks:
  - Likelihood of not maintaining Rand amount of income
  - Likelihood of not growing income by 5% p.a.

Results – Ruin Probabilities (Maintain)

- Guaranteed Life & With-Profits Annuity: 0%
- Living Annuity:
  - Drawdown Strategy 2 (maintain Rand income) has lower ruin probabilities than Drawdown Strategy 1 (maintain % drawdown)
  - Maximum initial drawdown rate of 7.5% to keep ruin probabilities below 50%

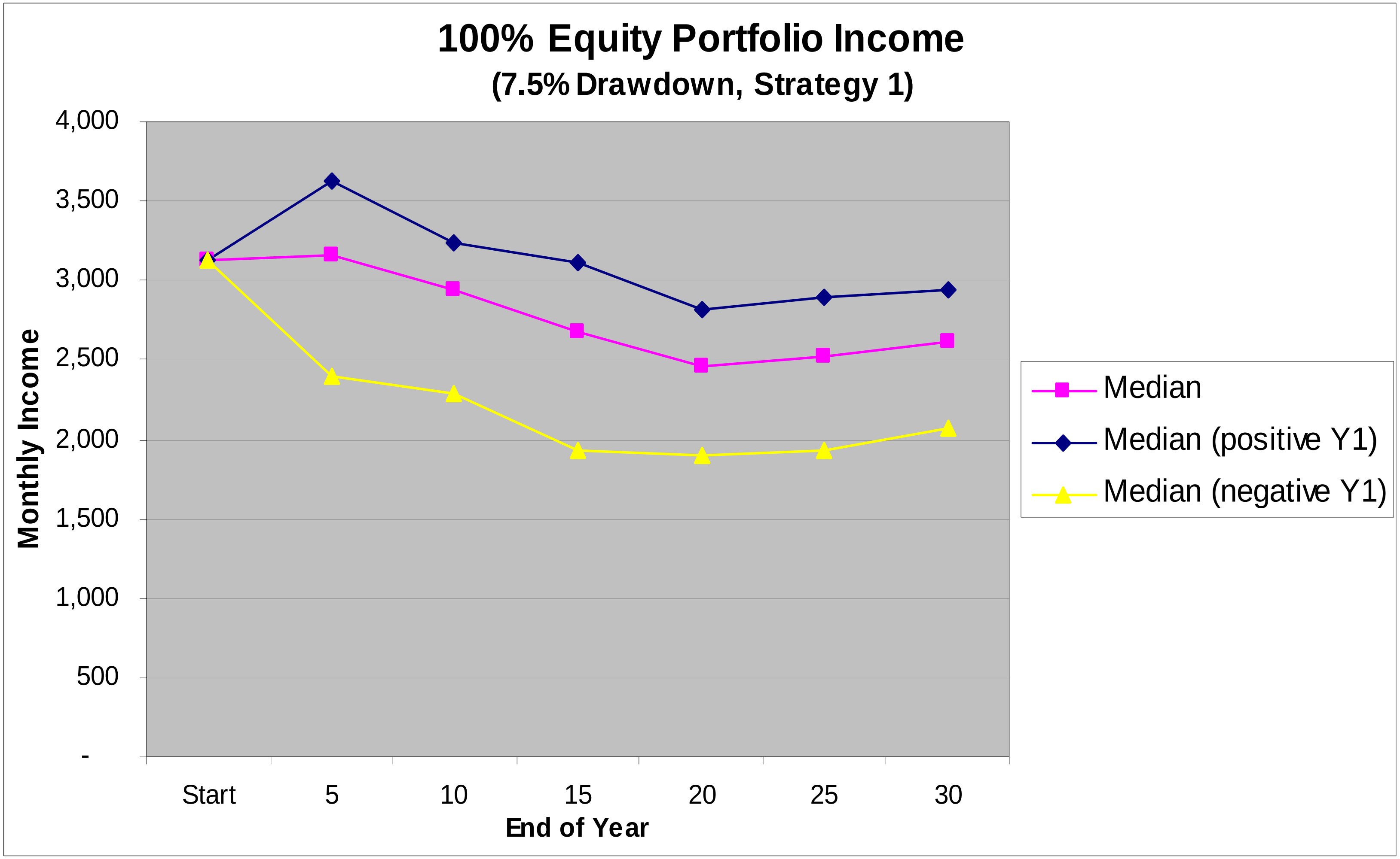
COMPARISON OF RUIN PROBABILITIES – 7.5% DRAWDOWN RATE

DRAWDOWN STRATEGY 1	END OF YEAR						
	START	5	10	15	20	25	30
100% BOND	0%	49%	69%	87%	90%	86%	85%
25% EQUITY	0%	45%	57%	66%	72%	68%	67%
50% EQUITY	0%	45%	51%	57%	60%	57%	55%
75% EQUITY	0%	47%	51%	55%	57%	55%	54%
100% EQUITY	0%	50%	55%	56%	58%	56%	56%

DRAWDOWN STRATEGY 2	END OF YEAR						
	START	5	10	15	20	25	30
100% BOND	0%	0%	1%	7%	34%	79%	97%
25% EQUITY	0%	0%	1%	11%	26%	42%	51%
50% EQUITY	0%	0%	9%	22%	35%	44%	47%
75% EQUITY	0%	3%	18%	32%	41%	47%	50%
100% EQUITY	0%	9%	26%	39%	48%	52%	54%

The Business of Change: 2010 and Beyond

Path Dependence of Income



The Business of Change: 2010 and Beyond

Results – Ruin Probabilities (Grow)

ACTUARIAL SOCIETY OF SOUTH AFRICA

- 5% Increasing Life Annuity: 0%
- With-Profits Annuity:

WITH-PROFITS ANNUITY	END OF YEAR						
	START	5	10	15	20	25	30
	0%	50%	55%	57%	61%	63%	66%

- Living Annuity
  - Customised strategy (3) again minimises risk
  - Drawdown: 2.5% (any allocation) // possibly 5% (25% / 50% equity)

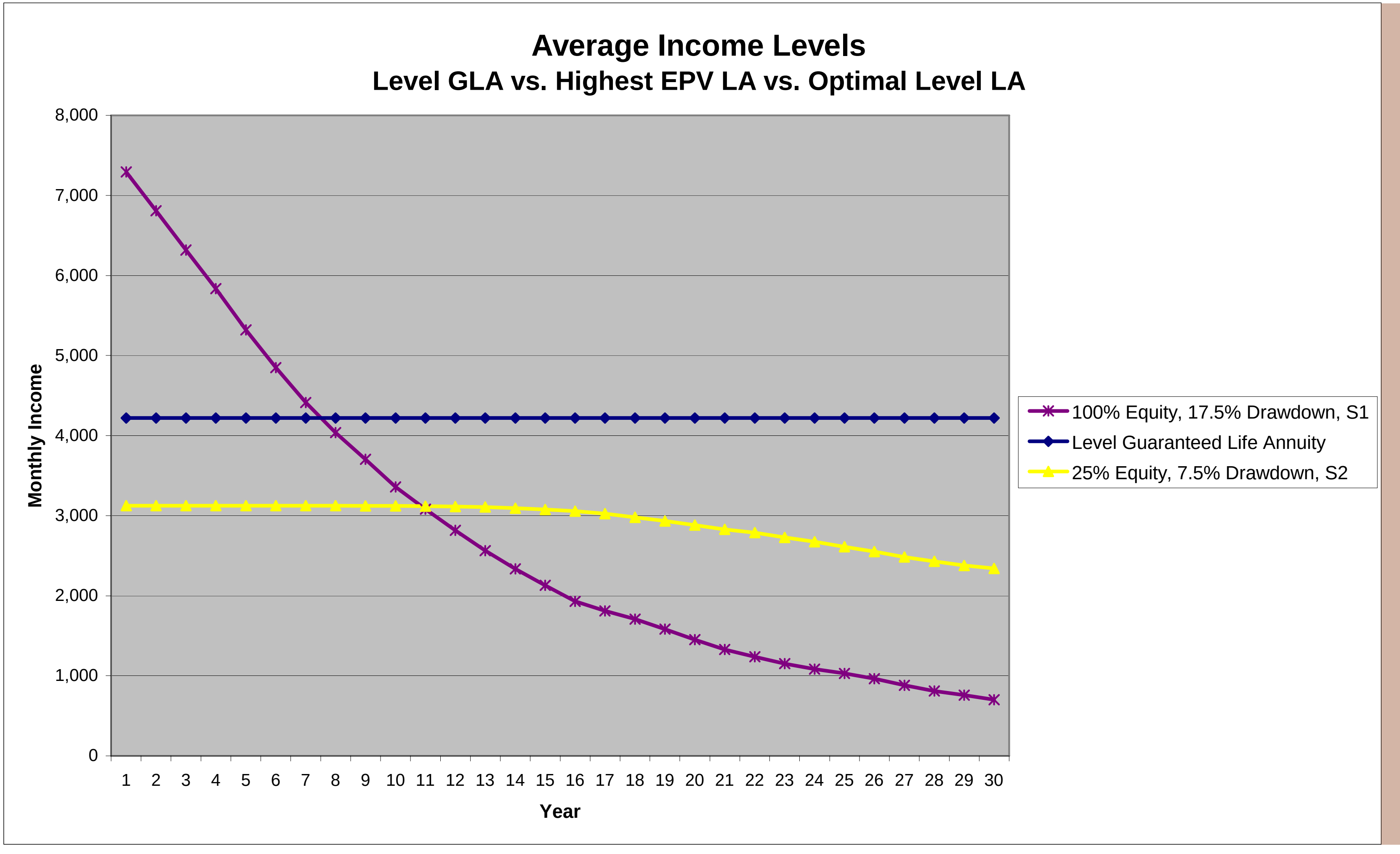
The Business of Change: 2010 and Beyond

Results – Expected Lifetime Income

STRATEGIES RANKED BY EPV OF INCOME	20%	EPV	80%
WITH-PROFITS ANNUITY	386,736	528,652	630,483
100% EQUITY, 17.5% DRAWDOWN RATE, STRATEGY 1	341,444	492,547	616,667
…	…	…	…
100% EQUITY, 15% DRAWDOWN RATE, STRATEGY 3	337,035	480,621	602,585
75% EQUITY, 17.5% DRAWDOWN RATE, STRATEGY 1	366,789	475,371	573,691
…	…	…	…
LEVEL GUARANTEED LIFE ANNUITY	467,968	467,968	467,968
5% INCREASING GUARANTEED ANNUITY	464,230	464,230	464,230
…	…	…	…
25% EQUITY, 7.5% DRAWDOWN RATE, STRATEGY 2	335,925	341,247	346,474
…	…	…	…
50% EQUITY, 5% DRAWDOWN RATE, STRATEGY 3	299,742	327,448	351,846
…	…	…	…
50% EQUITY, 2.5% DRAWDOWN RATE, STRATEGY 3	177,531	209,340	233,025

The Business of Change: 2010 and Beyond

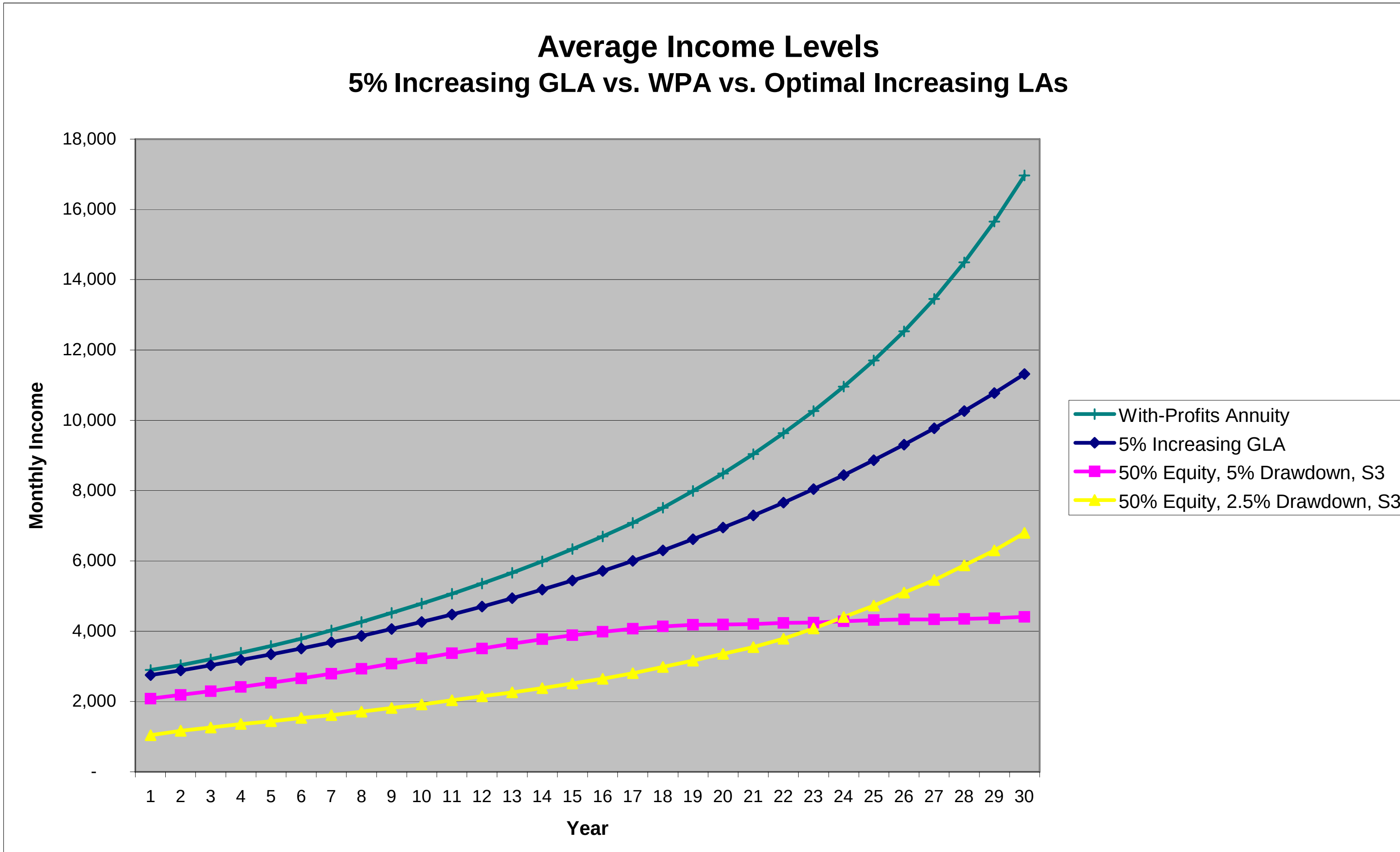
Results – Expected Lifetime Income



Results – Expected Lifetime Income

Strategies ranked by EPV of income	20%	EPV	80%
WITH-PROFITS ANNUITY	386,736	528,652	630,483
100% EQUITY, 17.5% DRAWDOWN RATE, STRATEGY 1	341,444	492,547	616,667
…	…	…	…
100% EQUITY, 15% DRAWDOWN RATE, STRATEGY 3	337,035	480,621	602,585
75% EQUITY, 17.5% DRAWDOWN RATE, STRATEGY 1	366,789	475,371	573,691
…	…	…	…
LEVEL GUARANTEED LIFE ANNUITY	467,968	467,968	467,968
5% INCREASING GUARANTEED ANNUITY	464,230	464,230	464,230
…	…	…	…
25% EQUITY, 7.5% DRAWDOWN RATE, STRATEGY 2	335,925	341,247	346,474
…	…	…	…
50% EQUITY, 5% DRAWDOWN RATE, STRATEGY 3	299,742	327,448	351,846
…	…	…	…
50% EQUITY, 2.5% DRAWDOWN RATE, STRATEGY 3	177,531	209,340	233,025

Results – Expected Lifetime Income



The Business of Change: 2010 and Beyond

Results – Switching

ACTUARIAL SOCIETY OF SOUTH AFRICA

- Due to mortality credits, switching was found to add value to retirees with living annuities
  - Increase in expected lifetime income, reduction in risk
- But, found that switching should occur as early as possible
  - Downward sloping yield curve
  - Relatively high LA charges relative to expected returns

The Business of Change: 2010 and Beyond

Agenda

ACTUARIAL SOCIETY OF SOUTH AFRICA

1. Background / Intention of Research
2. Factors Influencing Lifetime Income
3. Modelling Procedure
4. Results
5. Conclusions

The Business of Change: 2010 and Beyond

Conclusions

ACTUARIAL SOCIETY OF SOUTH AFRICA

- Tried to analyse risk and expected return for annuity types
- Relies on assumptions - further research / scenario testing
- Most obvious conclusions are about living annuities
  - Options providing maximum income also provide little or no chance of maintaining or growing the income over time
  - To maintain income should limit the drawdown to 7.5%, to grow it limit drawdown to 5%

The Business of Change: 2010 and Beyond

Conclusions

ACTUARIAL SOCIETY OF SOUTH AFRICA

- Conclusions are about living annuities…
  - More conservative asset portfolios (25% equity) seem optimal
  - Path dependence of more risky portfolios
  - Guaranteed and with-profits annuities provide better risk-adjusted returns
- Not obvious whether to choose guaranteed or with-profits
  - Risk preference

The Business of Change: 2010 and Beyond

Conclusions

- An optimal annuity strategy cannot be determined without looking at the personal circumstances of the retiring individual
- No annuity strategy can solve the problem of insufficient retirement income

The Business of Change: 2010 and Beyond

"The secret to living well is to die without a cent in your pocket. But I miscalculated, and the money ran out too early."

Jorge Guinle, Brazilian Playboy