ECFS 2018

Asigurări de viață, pensii private - alternative de diversificare a beneficiilor angajaților

Finanțe personale antifragile la risc investițional: Managementul corelat al activelor și pasivelor

Antifragile personal investment finance: correlated asset and liability management

Dr. Adrian Mitroi, CFA

A. Prof., ASE Bucharest

Sufficient Return and efficient portfolios: More Risk or More Capital

stimulus induced return made up for lost principal

1995-2005

	Probability	Equity fund %	Bond fund %	50% equity + 50 % bond
Recession	1/3	- 7	17	+ 5
Normal	1/3	+ 12	+ 7	+ 9.5
Boom	1/3	+ 28	- 3	+12.5
Expected return		11	7	9
Variance		204.7	66.7	9.5
Standard deviation		14.3	8.2	3.1

If Cov(s,b)= 0,3333(-7-11)(17-7)+0.3333(12-11)(7-7)+0.3333(28-11)(-3-7) = -116.67, then ρ(s,b) = cov (s,b) / σaσb= -116.66 / [(14.3) (8,2)] = - 0.99

Insufficient Return, inefficient portfolios: both More Risk and More Capital

it takes a lot of extra interest to make up lost principal

2005-2015/20

	Probability	Equity fund %	Bond fund %	50% equity + 50 % bond
Recession	1/4	- 10	5	-2.5
Normal	1/2	+ 6	- 2	+ 2.0
Boom	1/4	+ 12	- 5	+3.5
Expected return		3.5	-1	1.25
Variance		81	9	4.5
Standard deviation		9	3	2

If Cov(s,b)= 0,25(-10-3.5)(5+1)+0.5(6-3.5)(-2+1)+0.25(12-3.5)(-5+11) = -20, then ρ(s,b) = cov (s,b) / σaσb= -20 / [(9) (3)] = - 0.75

Sharpe $_{1995-2005}$ > 5 x Sharpe $_{2005-2015/20}$

A pension that has to pay €10,000 in 50 years (@4 %) in today's money, €1,400; use of 7 % reduces that to €340 today, but €10,000 remains to fund

CALM is key for a great pension, insurance, investment, product

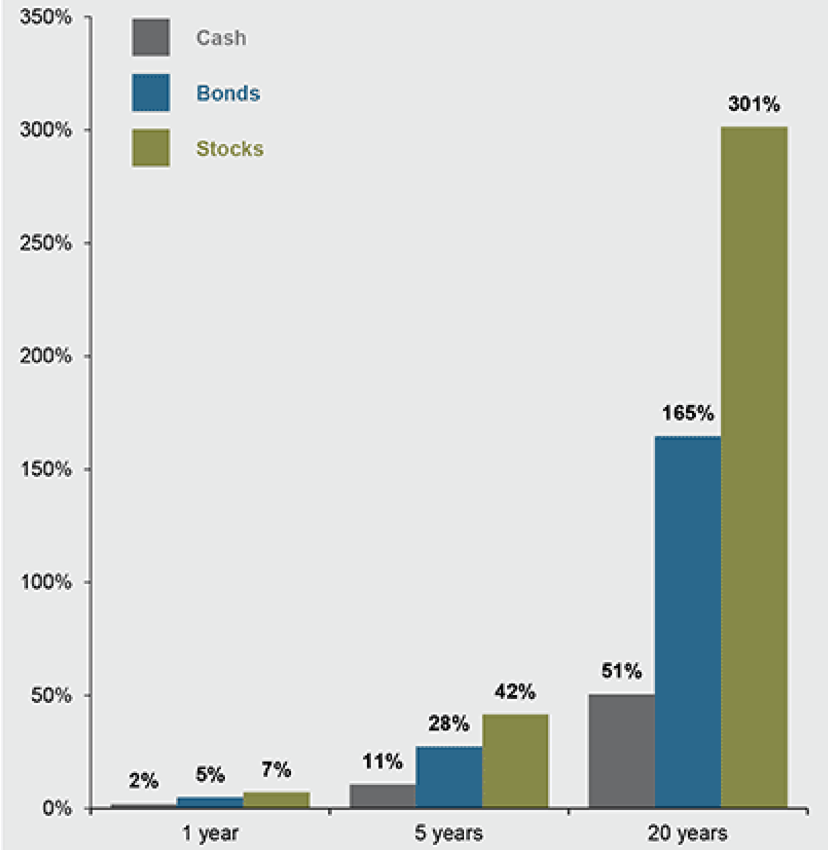
- The financial consumer promised against risk (insurance), income (pensions), increase wealth (investment)
- Family investment portfolio risk profiling, personal, professional objectives, specific to a "*modern financial citiz*en"

- A,L mismatch, deficit needs higher contributions, but how value L? indexes not reflect *pensioner unique liabilities, true objective*
- Returns beat market w/ A, underfund w/ L; **investment portfolio objective L driven** not A driven: mortgage, kindergarten…
- *A great insurance product should insure event costs not amounts*

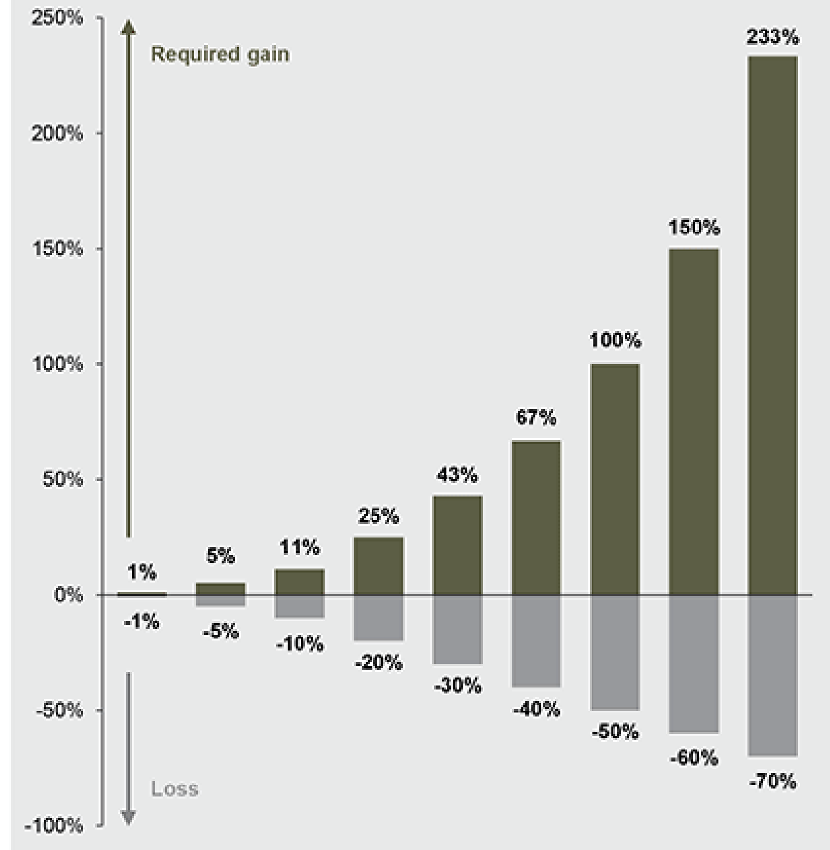
- An antifragile portfolio (individual investment bricolage, DIY) - capital protection, **wealth edification, investment risk profiling**
- financial product - a *wider context*, ***with a longer perspective: great products should address ladies not gentlemen***

The importance of staying invested and limiting losses

The power of compounding
Cumulative return by holding period



Gain required to fully recover from a loss
Loss and subsequent gain necessary for full recovery of value



Investing principles

Compounding helps high growth investments | no risk is a major risk

Higher Initial capital loss harder to recoup| risk of buying expensive investment

CALM: Managing investment A against L

Correlated A vs. L, dedication strategies specialized fixed-income strategies to accommodate specific future needs of the investor

Immunization	Cash flow matching

- either invest too much or too low
- either more capital or more risk

- "lock in" a guaranteed ROI, a particular horizon, irrespective of any parallel shifts in the yield curve
- identify portfolio for which change in price is equal to change in reinvestment income at time horizon of interest
- Set D equal to specified portfolio horizon (D matching) offsets both + and - incremental return
- (immunizing portfolio has same PV as immunized liability

CALM DEDICATION STRATEGIES: IMMUNIZATION

A portfolio of three bonds with Ron10.000 par value each had a dollar duration (price change) of Ron1.120. After a shift in the interest rate, the portfolio values, exemplified:

Bond	Price	Market Value	Duration	Ron Duration
Bond 1	Ron 99,822	Ron 10.237	4,2	Ron 434
Bond 2	98,728	10.047	0,3	30
Bond 3	99,840	10.024	3,6	360
				Ron 824

Investment decision: the rebalancing ratio required to maintain leu duration at initial level:

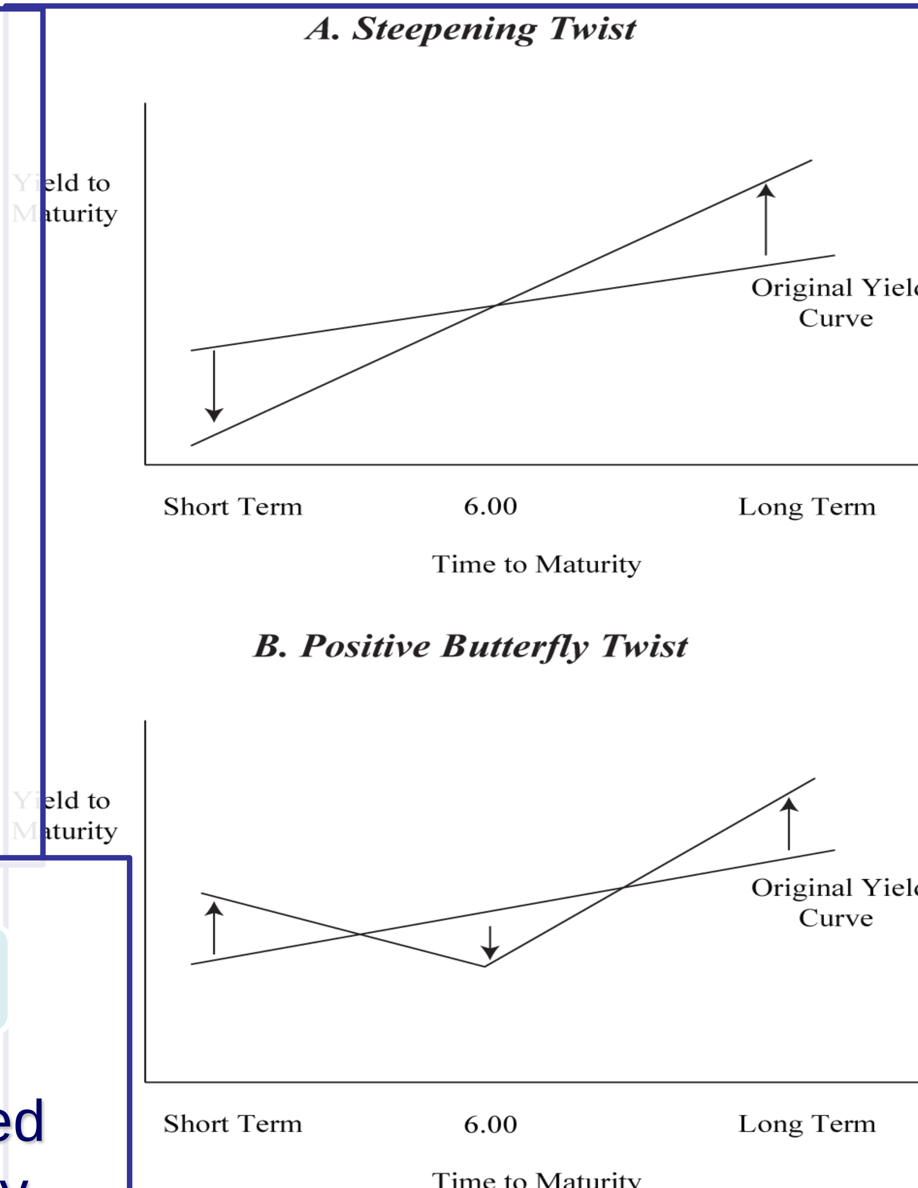
$\frac{\text{Ron } 1.120}{\text{Ron } 824} = 1{,}356$; rebalancing requires each position to increase by **35,6%**

Investment requirement: cash required for this rebalancing:

$$0{,}356 \times (\text{Ron } 10.237 + 10.047 + 10.024) = \mathbf{Ron\ 10.790}$$

Bond immunization

- single L immunization - match avg. d of A w/ time horizon of L
- matching not sufficient to immunize portfolio, twists and nonparallel changes in % curve
- ensure portfolio immunized @ scenarios



rebalancing a portfolio

•investing new Ron, if needed
- changing weight of a security to adjust dollar duration

Yield curve shifts

Option A: Single immunization, cash flow matching

- A bond w/ maturity that matches liability, an amount of principal equal to amount of last liability minus final coupon
- Liabilities reduced by coupons on bond, another bond is chosen for next-to-last liability, adjusted for coupons on first bond
- Sequence continued until all liabilities are matched

Parallel shifts:

- portfolio payments decomposed
- each liability is separately immunized by one of component streams

Option B: Multiple immunizations

- The PV of A equals the present value of the liabilities
- D of portfolio equals D of liabilities | composite D of portfolio equals composite D of liabilities
- distribution of durations of individual portfolio assets must have a wider range than distribution of liabilities.

Antifragile personal investment finances: CALM - correlated asset and liability. Conclusions

- Uncertain political economic context, CBs, similarly to their governments, in tacit co-opetition: preserving growth, price stability, accommodative policies withdrawn simultaneously
- Pressure of higher % reduce returns, institutional, individual, with bond allocations
- Lower expected % rates lower bond prices, lowers total expected returns, **underfunding future liabilities**
- This investment fragility can also be managed through CALM (correlated asset and liabilities management)

- Capital protection w/ anti-fragile management techniques of CALM in expected dynamics of low interest rates now (high prices) and large future futures (low prices)