Insurance Industry Disclosures

- IRDAI mandates quarterly publication of around 42 schedules.
- Some Examples include
  - L1 – Revenue Account
  - L2 – Profit & Loss Account
  - L5 – Commission Schedule
  - L22 – Analytical Ratios
  - L34 – Yield on Investments
  - L39 – Claim Ageing
  - L42 – Valuation Basis (Life)

Actuarial Assumptions – Form L-42

6.1. Interest Rate

The valuation discount rates for the various lines of business are set out below:

Valuation discount rate (%)	March 2017	March 2018
Par life in-force	4.96	5.08
Par life paid up	5.28	5.51
Par group life	5.65	5.43
Par pension in-force	4.91	4.97
Par pension paid up	4.94	5.14
Par group pension	5.20	5.15
Future perfect	3.49	4.66
Annuity	5.59	5.52
Non-par protection	5.18	5.44
Non-par health	5.36	5.50
Non-par group	4.41	4.66
Non-par investment (other than GSIP and ASIP)	4.97	5.31
GSIP	4.85	4.96
GSIP paid up	5.17	5.35
ASIP	6.20	6.13
Health	5.45	5.54
Non-unit life, pension and health	4.88	5.15
Non-par variable	5.61	5.35
Non-par variable pension	5.93	5.86

ICICI Pru Life

(1) Valuation Interest Rate Assumptions

(a) Individual Business	Minimum	Maximum
(a.1) Life - Participating policies	7.0%	5.8%
(a.2) Life - Non-participating policies	5.2%	5.8%
(a.3) Annuities - Participating policies	N/A	N/A
(a.4) Annuities – Non-participating policies	6.9%	6.9%
(a.5) Annuities - Individual pension plan	N/A	N/A
(a.6) Unit Linked	5.2%	5.2%
(a.7) Health insurance	5.8%	5.8%
(b) Group Business		
(b.1) Life - Non-participating policies (excludes one year term policies)	5.8%	5.8%
(b.2) Unit Linked	5.2%	5.2%

HDFC Life

Actuarial Assumptions – Form L-42

The mortality assumptions for different products expressed as a percentage of Standard table are as below.

Plan	Valuation basis at March 31, 2017	Valuation basis at March 31, 2018
Participating (Life and Pension)	90% to 125% of IALM 06-08 rated up by 1 year for males and rated down 1 year for females	90% to 125% of IALM 06-08 rated up by 1 year for males and rated down 1 year for females
Non Participating including Group Mortgage	45% to 120% of IALM 06-08 rated up by 1 year for males and rated down by 1 year for females depending on products	45% to 140% of IALM 06-08 rated up by 1 year for males and rated down by 1 year for females depending on products
Rural	200% of IALM 06-08	200% of IALM 06-08
Non Linked Health	35% to 155% of IALM 06-08 rated up by 1 year for males, rated down by 1 year for females	35% to 155% of IALM 06-08 rated up by 1 year for males, rated down by 1 year for females
Annuity	25% to 65%of LIC 96-98 for males, rated down by 4 years for females with appropriate mortality improvement	25% to 65%of LIC 96-98 for males, rated down by 4 years for females with appropriate mortality improvement
Group Term	Unearned premium basis	Unearned premium basis

ICICI Pru Life

(2) Mortality Assumptions	Expressed as a % of IALM 2006-08, unless otherwise stated		
(a) Individual Business	**Minimum**	**Maximum**	
(a.1) Participating policies	42%	264%	
(a.2) Non-participating policies	24%	960%	
(a.3) Annuities	26%	36%	Expressed as a % of LIC Annuitants (1996-98)
(a.4) Unit linked	29%	138%	
(a.5) Health insurance	120%	144%	
(b) Group Business (unit linked)	77%	480%	

HDFC Life

Actuarial Assumptions – Form L-42

6.2. Expense Inflation

The inflation assumption is 4.38% at March 31, 2018 compared to inflation assumption 4.55% at March 31, 2017.

6.4. Expense Assumptions

Type of expense (₹)	Valuation basis at March 31, 2017	Valuation basis at March 31, 2018
Renewal expense per policy		
All conventional and unit linked (includes in-force premium paying, paid up policies, lapsed/premium discontinuance state within revival period policies)	570	570
Annuity	410	570
Rural	45	50
Renewal expense per premium		
All conventional and unit linked in force, paid up and lapsed policies (% of annual premium)	0.83% to 1.65%	0.83% to 1.65%
Claim expenses per policy	175 to 13,185	190 to 14,030

ICICI Pru Life

(3) Expense Assumptions

The values of future expenses have been determined on prudent assumptions to allow for-

1) all future maintenance expenses on an on-going basis
2) the future expenses that are likely to be incurred if the company were to close to new business within 12 months of the valuation date.

The future maintenance expenses are provisioned using servicing costs per policy, claim expenses and investment expenses.
The per policy costs vary by premium frequency.
The claim expense assumption is specified as fixed amount per claim.
The per policy costs and claim expenses are increased at an inflation rate of 6.5% per annum.
In addition, investment expense of 0.036% of the fund is also reserved for.
The provision for future expenses likely to be incurred if the company were to close to new business is held as an aggregate reserve at a company level.

HDFC Life

Actuarial Assumptions – Form L-42

- There are more assumptions about ->
  - Persistency
  - Bonus Rates
  - Taxation

Valuation of Life Insurers

- Embedded Value (EV) & Value of New Business (VNB)
  - Return on Embedded Value (RoEV) & VNB Margin
- Appraisal Value
- Insurer vs. Bank

Indian Embedded Value (IEV)

- IEV = ANW + VIF where
  - ANW => Adjusted Net Worth
  - VIF => Value of In-Force Business
- ANW = RC + FS
  - RC (Required Capital)
    - IRDAI mandates Solvency Ratio of 150% of Required Solvency Margin
  - FS (Free Surplus)
    - Value of any excess assets over liabilities + RC that can be immediately distributed to shareholders
- VIF = PVFP - FCoC - TVFOG - CRNHR
  - PVFP => Present Value of Future Profits
  - FCoC => Frictional Cost of Capital
  - TVFOG => Time Value of Financial Options & Guarantees
  - CRNHR => Cost of Residual Non-hedgeable Risks

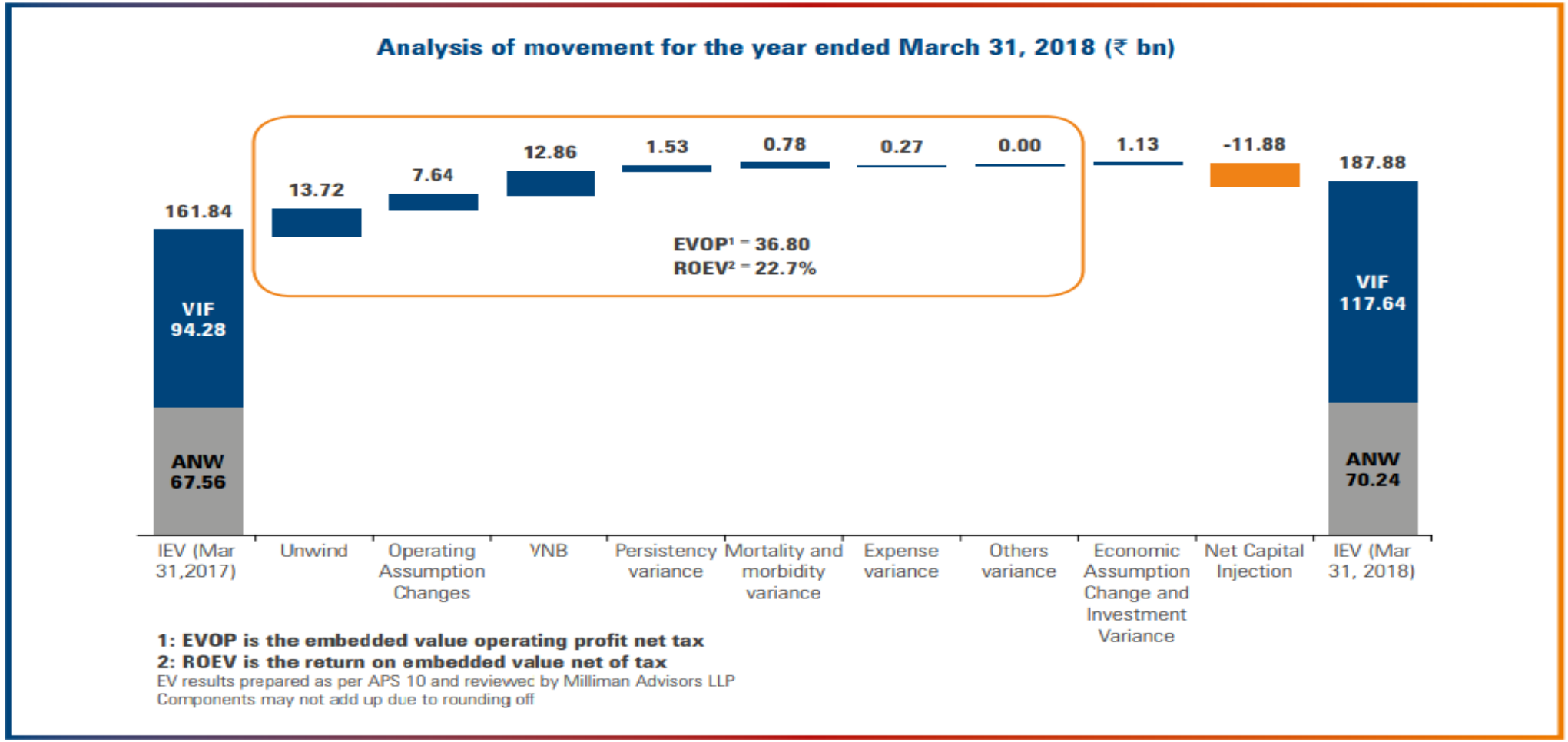
Indian Embedded Value (IEV)

- PVFP (Present Value of Future Profits)
  - Most important component of EV
  - Post-tax cash flows attributable to Shareholders from existing (in-force) business
  - Several assumptions go into calculation like -
    - Interest rate assumptions
    - Mortality assumptions
    - Persistency assumptions
    - Reverse discount rate for liabilities
    - Inflation assumptions
  - The cash flows are discounted back to present using risk free rate which is Zero Coupon Yield Curve (ZCYC) from Clearing Corp. of India
  - For Non-Par products, PVFP = Net Cash Flows from VIF + Investment Income - Taxes
  - For Par products, PVFP = Transfer to shareholders accounts - Taxes

IEV & VNB

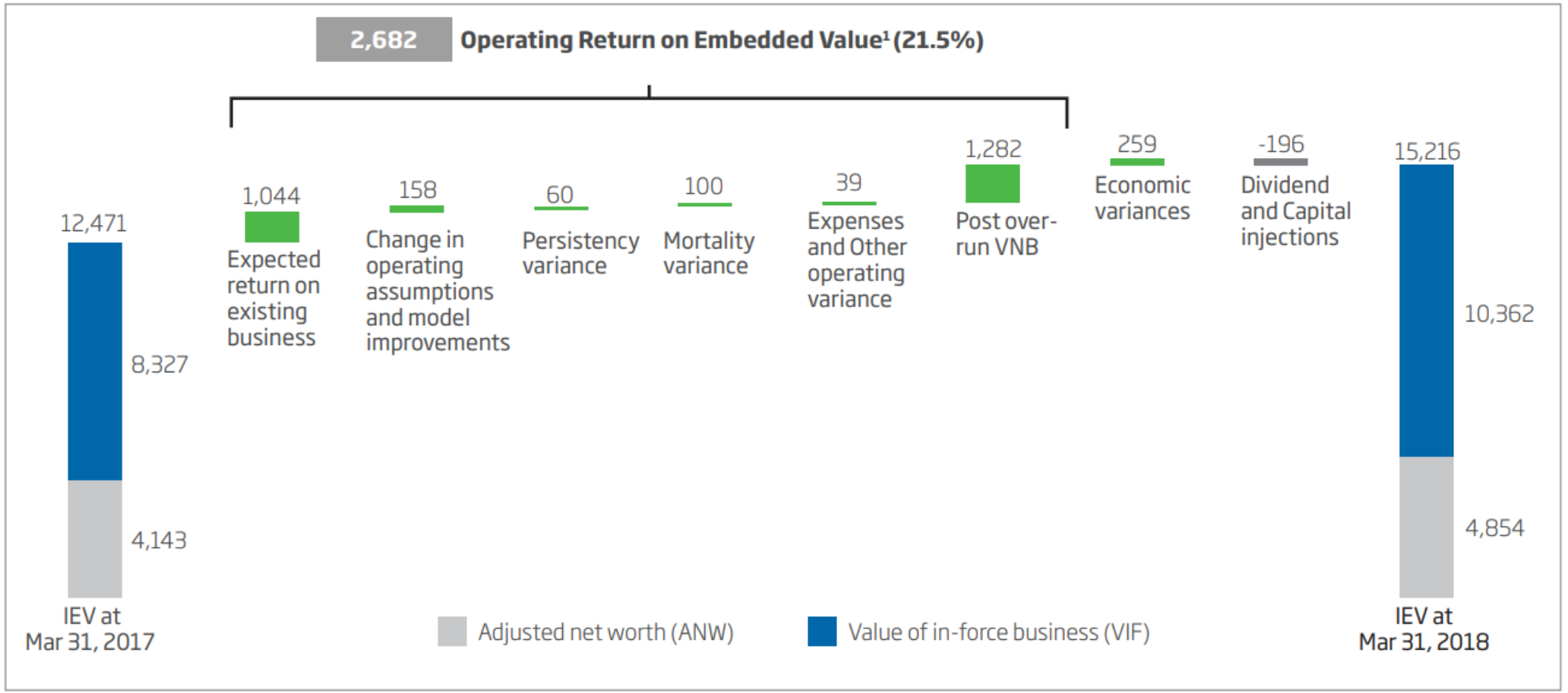
- FCoC (Frictional Cost of Capital)
  - Taxes on Investment Income
  - Investment expenses for assets backing RC + Shareholders Funds
- TVFOG (Time Value of Financial Options & Guarantees)
  - Any impact arising on shareholder value due to financial options & guarantees provided in the in-force products
  - Examples of FOG
    - Smart ULIP Series of SBI Life, Maturity Value => Highest NAV achieved during first 7 years from launch
    - Retire Smart of SBI Life => Maturity Value = 101% of Premiums Paid
- CRNHR (Cost of Residual Non-hedgeable Risks)
  - Covers for any risks which is not covered previously
- VNB is calculated using same methodology except it is for NBP

YoY IEV Movement



ICICI Pru Life EV Movement [3]

YoY IEV Movement

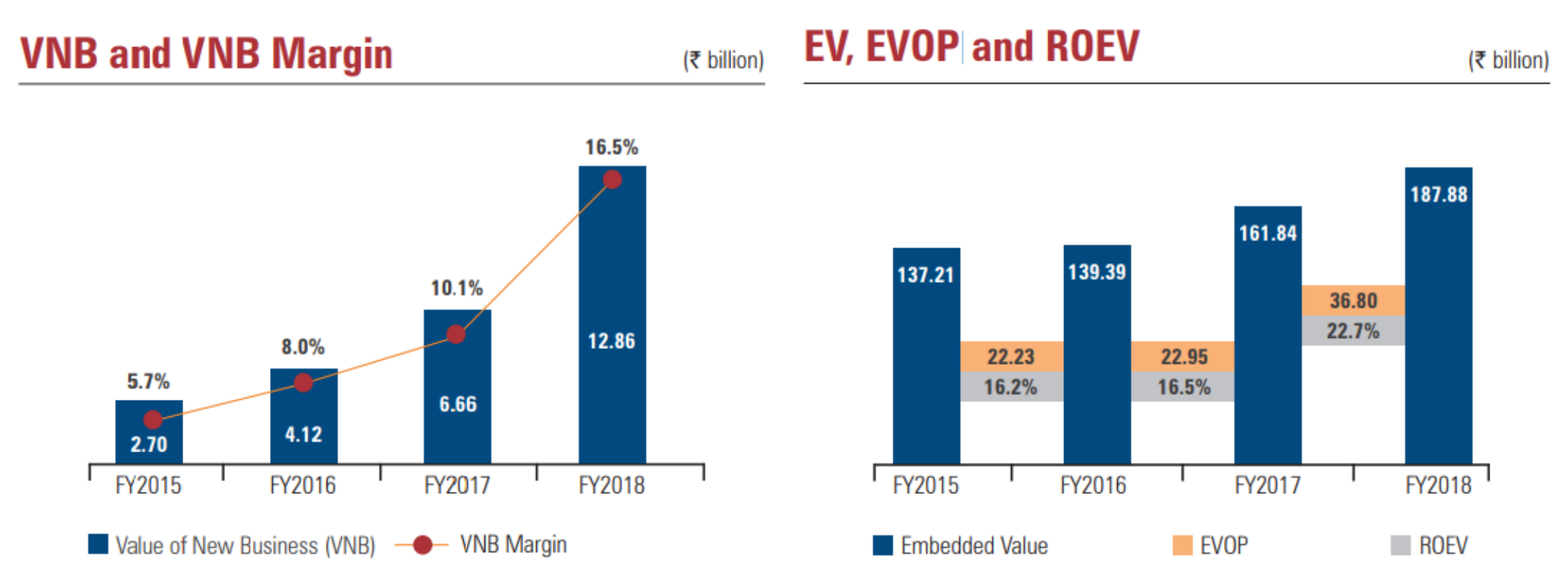


HDFC Life EV Movement [4]

How to Value Using IEV?

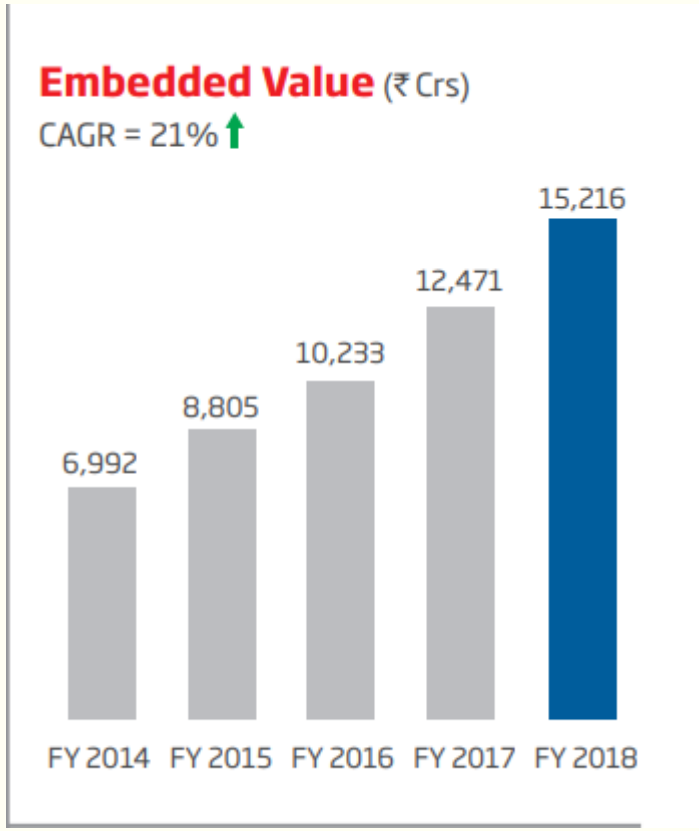
- IEV can be thought of as book value & RoEV as return on equity
- RoEV mainly depends upon following components
  - **Unwind** or expected return on existing business – largely rangebound. This is essentially moving the business one year forward and letting off the discount.
  - **Assumption changes** – better if they are conservative & don't change often.
  - **Experience Variance (Mortality/Persistency/Inflation)** – experience shall be better than assumptions & not fully in control
  - **VNB** – growth from new business
- Unwind will continue to be in the 7-10% range of IEV, it is VNB which provides higher RoEV. Hence VNB & VNB margin remains one of the most important parameter for valuation. VNB defining the growth and VNB margin defining the profitability thereof.

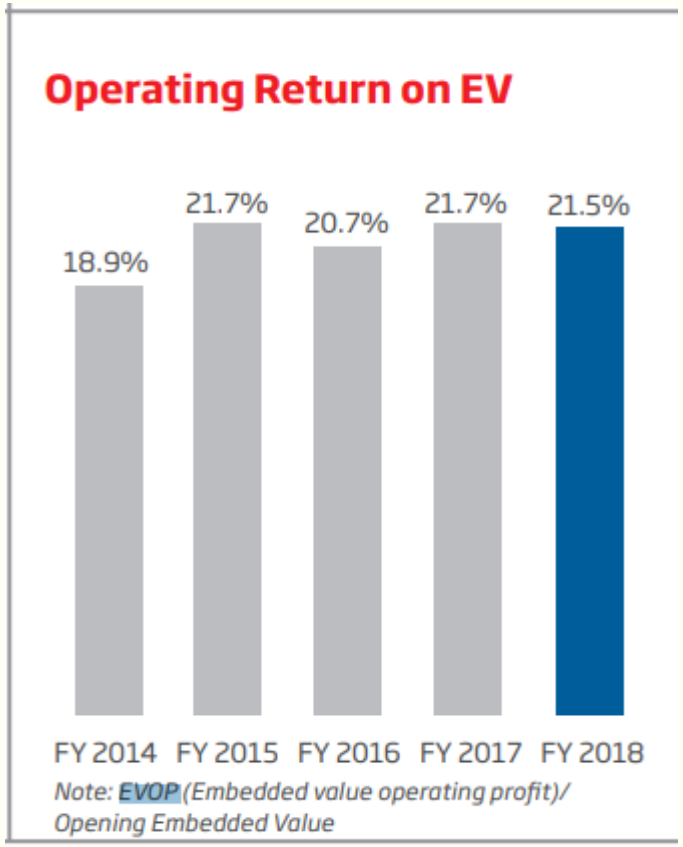
IEV, EVOP, VNB Margin – ICICI Pru Life

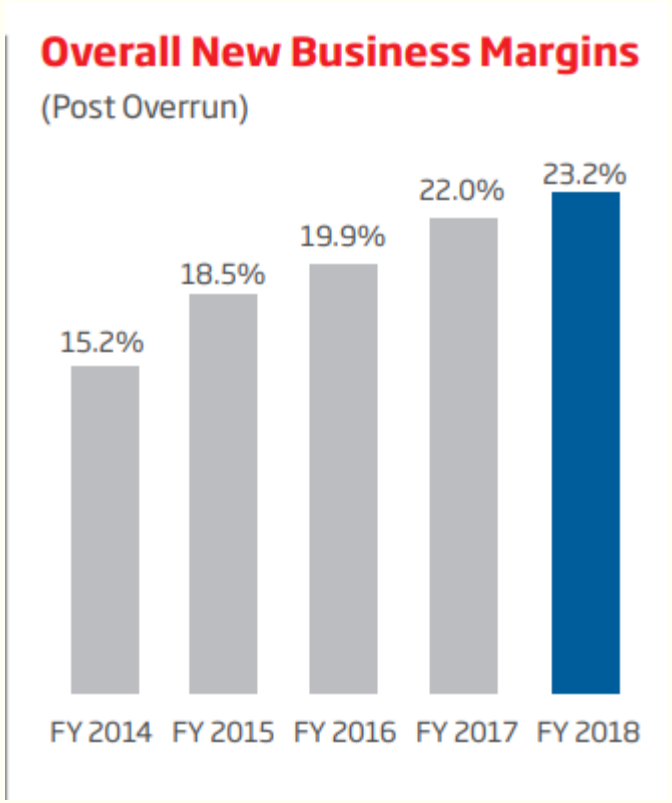


ICICI Pru Life [3]

IEV, EVOP, VNB Margin – HDFC Life







HDFC Life [4]

Appraisal Value

- One drawback of EV can be said that it does not factor in any value created through new business, it only focuses on value of in-force business.
- VNB represents value of new business & if one can do DCF kind of calculation to get value from VNB.
- Appraisal Value = EV + Multiple * VNB
  - Where multiple can be thought as similar to P/E ratio
- This explains lower valuation in terms of EV multiple in developed markets due to low contribution from VNB compared to India.

Sensitivity Analysis

Sensitivity analysis – FY18

Analysis based on key metrics[1]	Scenario	% Change in VNB[2]	Change in VNB Margin[2]	% Change in EV
Change in				
Reference rate	Increase by 1%	0.27%	0.06%	-1.80%
	Decrease by 1%	-1.71%	-0.40%	1.93%
Equity market movement[2]	Decrease by 10%	-1.24%	-0.29%	-1.84%
Persistency (Lapse rates)	Increase by 10%	-5.63%	-1.31%	-1.75%
	Decrease by 10%	6.06%	1.41%	1.87%
Maintenance expenses	Increase by 10%	-2.18%	-0.51%	-0.63%
	Decrease by 10%	2.17%	0.51%	0.63%
Acquisition Expenses	Increase by 10%	-14.16%	-3.30%	NA
	Decrease by 10%	14.16%	3.30%	NA
Mortality / Morbidity	Increase by 5%	-5.19%	-1.21%	-0.77%
	Decrease by 5%	5.20%	1.21%	0.77%
Tax rate[3]	Increased to 25%	-14.38%	-3.35%	-7.55%

HDFC Life Sensitivity Analysis [4]

Risks

- Re-insurance risk
- Reinvestment risk

Summary

- Key Insights
- Key Risks

Key Insights

- Insurance is capital intensive business in following ways
  - It has taken 10 years for most players to start reporting profit due to front ended costs
  - Tightly regulated solvency capital
  - Most insurers leave aside funds for future appropriations (FFA)
- Consolidation?
  - Top 8 players + LIC had 90% of business share in last 15 years. Smaller players have not made much of dent in the market share.
  - Insurance is capital intensive business with most players taking a decade to report profit.
  - Can non-bank promoted insurers survive despite open bancassurance architecture?
- Opex ratios continue to trend downwards
  - As AUM size grows, opex/AUM to trend downwards due to continued renewal premiums. Case in point – LIC (8-9% opex) vs. Private Leaders (12-14%)
  - Commissions are capped by regulations

Key Insights

- VNB Margin is largely a function of product mix & operating matrix & hence some players like HDFC/Max have kept lower ULIP % by design
- Insurers with strong Banca tie-ups to have advantage in distribution of ULIPs as ULIP is low margin business & Banca is low cost channel.
- The reported PAT does not grow inline with premium growth & might degrow due to higher new business strain i.e. premium < costs + actuarial liabilities. Hence persistency remains one of the most important parameter to track business quality.
- Due to various restrictions on investments from float, no competitive advantage can be built through higher investment returns. Investment performance will largely remain same across major players.

Key Risks

- Interest rate
  - Most Insurance companies have a model that assumes interest rates in the bracket of 4% to 12%. Any interest rate movement beyond that will be chartering into unknown territories.
  - Asset Liability Mismatch
- Accounting
  - Accounting remains one of the biggest risk in Life insurance companies due to multi-year nature of products
  - Companies can borrow profits from future to spice up numbers
  - There are no standard assumption on interest rates/yields or opex, since the insurance companies treat them based on their experience and the current reality. A few basis points change can make a lot of difference, case in point being HDFC Life IPO.
- Inflation & other opex assumptions
  - Inflation assumptions in operating matrix could impact profitability although the impact is not as severe as interest rate.
- Tax rate
  - Any changes in tax rate could impact future profits significantly since the modeling has been done with current tax assumption. Tax increase are not pass through.
- Reinsurance risk
  - Depending upon the concentration and the regulatory ratios some parts of insurance portfolios are reinsured. Incase of re-insurers defaulting the risk moves to primary insurer.

Valuation

- EV + VNB Growth + VNB Margin is the standard based on which a lot of valuation modeling happens.
- But a lot gets ignored
  - HDFC Life is majorly a group player. Group insurance vs Retail insurance can be compared to Corporate Lending vs Retail lending from an ops perspective. SBI reduced its group portfolio significantly.
  - ICICI Pru has a highly focused ULIP portfolio the ULIP part being maintained by ICICI AMC. The recent IPO purchase of ICICI Securities shares by ICICI AMC and the SEBI investigation casts doubts on their fiduciary responsibilities.
  - Any movement towards a non linked portfolio could change VNB margins significantly on the positive at the same time introducing higher long term risks.
  - Tax rates assumptions on dividend currently differs and impacts EV significantly.
  - Nobody cares about the underlying interest rate assumptions, a small change there could completely change the picture. ICICI appears most conservative here.

Some key questions

- Is life insurance a great business to own?
  - Life insurance like any financial institution deals with unforeseen risks and investments. If executed conservatively in terms the business can compound over long periods of time at rates above nominal GDP in a growing economy. With maturity and scale there is significant operating leverage. It is a commodity business like banking with limited entry barriers.
- How do you measure the underwriting discipline and investment credentials of an insurance company?
  - It is difficult to measure underwriting credentials in absolute sense but one can look at the underlying assumptions in terms of interest rates/inflation and other operating parameters to compare who is being more conservative. The real test of strength will come when the interest rates go below/above comfort levels.
  - Investment returns (float returns) are pretty much confined to government defined limits on how funds can be used. Unwind in EV change gives an idea about the returns.
- Are there example of large wealth creation in insurance companies?
  - Prudential is a very good example of long term wealth creation. AIG's fall was not because of insurance underwriting but because of speculative investments.
- Does it make sense to investment in Insurance companies in India?
  - Indian insurance companies trade at 3-5 times EV where as most insurance companies in developed world trades at 1-1.5 time EV. There is a lot of growth being factored in the current valuations. So in some ways the question boils down to what growth do you see and what is your estimate of other risks playing out as mentioned in this presentation.

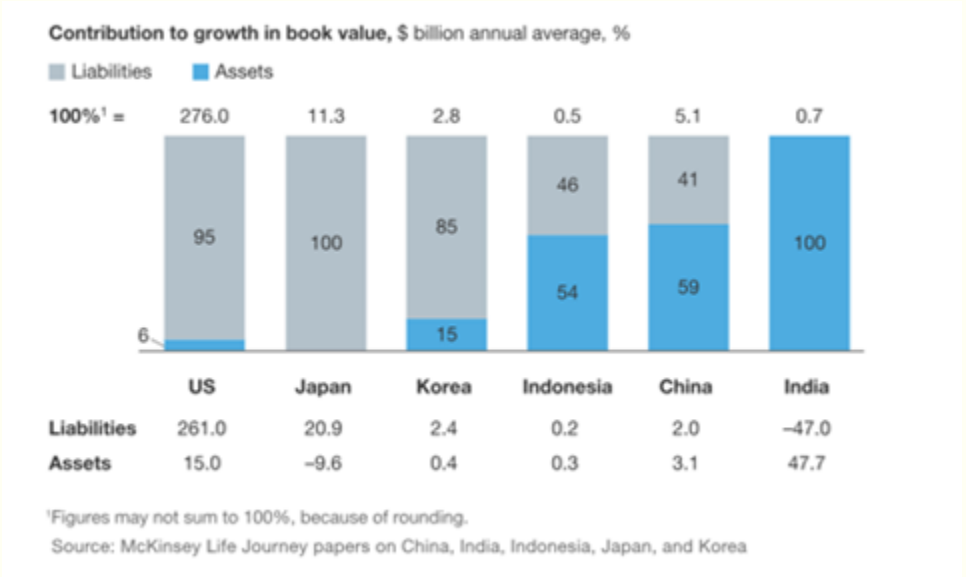
INTERNATIONAL EXPERIENCE

Life Insurance : International Experience

- In US and Japan, higher-performing life insurers generate value through superior liability management; those in emerging economies such as India, meanwhile, rely heavily on asset management. As markets matures, the basis of value creation shifts from assets to liabilities
- Industry performance gets severely impacted in poor economic cycles
- Short term products have done relatively well from ALM perspective

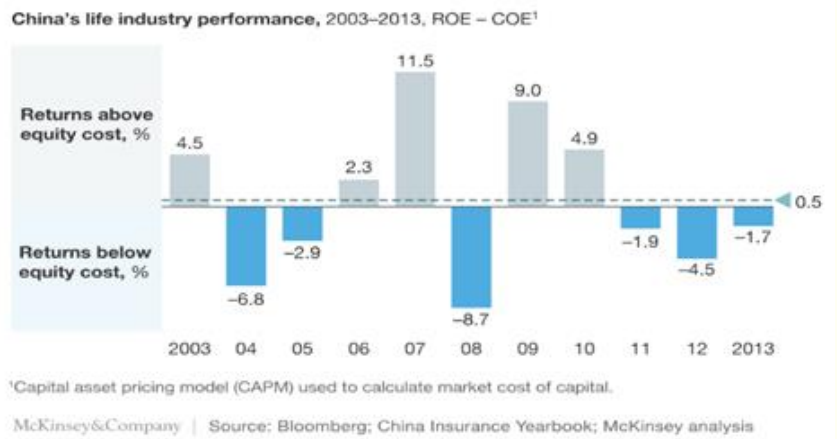
Key risks have been:

- Asset Liability Management
- Short Term vs Long Term Interest Rate movement
- Policy guarantees
- Investment issues e.g. Asset allocation and concentration
- Frauds
- The failures often tend to recur after some time has elapsed since the last occurrence and institutional memories have faded



Life Insurance : China Experience

- Industry returns far below its cost of capital. While some carriers created significant value, others dragged industry returns down to below 0
- 1st phase (Till late 90's): Guarantees and large sales forces with low productivity/high fixed costs drove returns down
- 2nd phase (Early 2000s) : Shift attention to profit and value creation. Consolidated sales forces and volume cut to improve profit
- 3rd phase : With economic growth, focus again shifted to build distribution, expand product offerings. Bancassurance popular but not much value margin share is high. 2008 recession led to huge profitability destruction
- Even with a normalized view, the best performers have still delivered annual growth rates in value that are 34 percentage points more than the worst performers
- Top-tertile Chinese companies showed above-average insurance margins of over 1.0 percentage point while insurers in bottom tertile returned below-average results of –4.8 percentage points. Differentiating factor was strong liability management

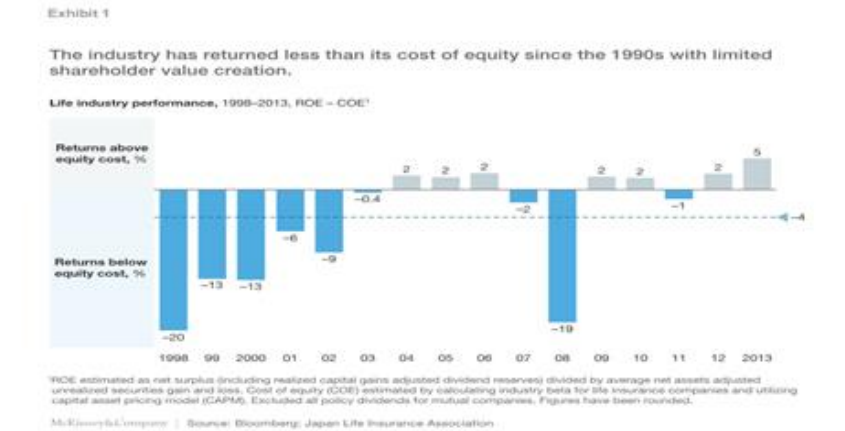


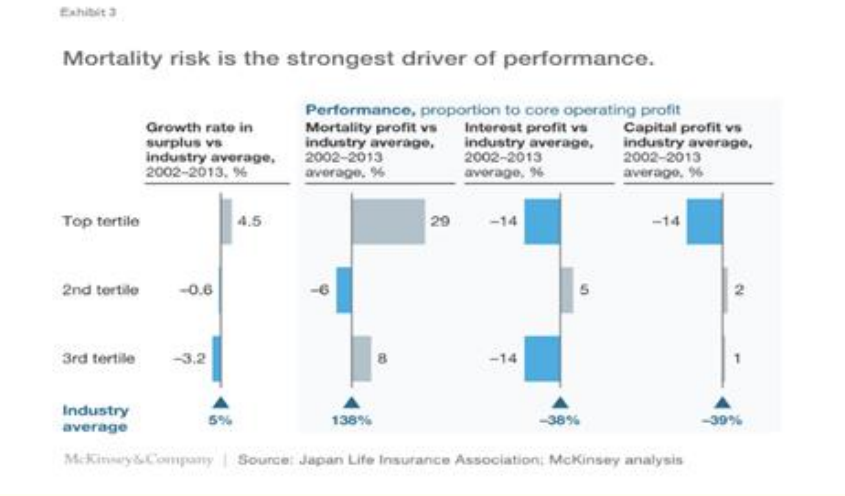
Life Insurance : Japan Experience

1980s, The boom period: Asset growth in excess of 20% CAGR. >90 % households penetration with > 50% premium compared to USA led by saving vehicles reputation due to tax deductibility, high guaranteed rate of return, low women employment rate

1990s, interest rates haunt : Rate guaranteed and the rate of investment return skewed when spread turned negative in 90s. 7 bankruptcies b/w 1996-2005 led to consolidation. Minor fortune change got wiped off in 2008 and selective value creation

Overall Experience
between 2002 and 2013, the top-performing insurers in terms of surplus growth were 14 percent below the industry
average in returns on asset-based investments, while bottom performers were 1 percent above the industry average.
Accident and health products have disproportionately created more value than individual life and annuities.





Life Insurance : Overall History of failures

- ·Associated with random catastrophic events, prolonged investment market downturns and/or long-term risks in matching current premium revenues with future liabilities.

- ·Long term guarantees based on short term and current conditions e.g. Declaring high guaranteed bonus rates even though interest rates are declining: Selling annuity products with implied mortality improvement rates based on historical improvement rather than current conditions. These lead to ALM and negative spread problems

- ·Lack of understanding of industry e.g. Non insurance companies purchasing insurance companies:

.

- ·Domestic insurance companies acquiring off shore businesses

- ·Entering new segment of market and offering products they didn't understand risks of: Outsource part of business to provider who didn't understand insurance

1990	Australia	Regal Life and Occidental Life	Fraud
1991	USA	Guarantee Security Life Insurance	Fraud
1988-94	USA	42 companies entered liquidation including Executive Benefit, Mutual Benefit, Equitable US	Investments/product guarantees
1994	USA	National Heritage Life Insurance	Fraud
1992-1994	Canada	Les Cooperants , Sovereign Life, Confederation Life	Investments
1996-99	JAMAICA	Life of Jamaica, Island Life, Jamaica Mutual Life Assurance, Dyoll Life, Crown Eagle Life,	Investments/product guarantees
1997-2000	Japan	Nissan Mutual, Toho Life, Kyoei Life, Daihyaku Life, Tokyo Life, Chiyoda Life, Nippon Dantai	Investments/product guarantees
1998-2002	Korea	First Life, Korea Life, Handuk Life, Kookmin Life, Dongah Life,Chosun Life, Pacific Life, Doowon Life, Kukje Life, BYC Life, Taeyang Life, Coryo Life	Bad loans/Liquidity
2000	UK	Equitable Life	Negative Spread
2001	USA	companies of Metropolitan Mortgage & Securities and Summit Securities Inc. Old Standard Life Insurance, Old West Life & Annuity and Western United Life Assurance	Annuities
2002	Germany	Mannheimer	Investments
2003-04	USA	7 life insurance failures including London Pacific Life & Annuity Company	
2007	Japan	Yamato Life	Investments
2008	USA	AIG	GFC/Investments
		Federal capital infusions were required for Prudential, Principal Life, Hartford, and Lincoln,	GFC/Investments
	Netherland	Aegon, Fortis, ING	GFC/Investments
	Belgium	Ethias	GFC/Investments
	USA	Standard Life Insurance of Indiana	
2009	Greece	Aspis Pronia	Fraud
	USA	Shenandoah Life Insurance Company	
	USA	Golden State Mutual Life Insurance	
2012	Taiwan	Kuo Hua Life	Investments
	USA	InterAmerican Insurance	Fraud/Investments

	Products' characteristics	Investments characteristics	Regulatory actions	Lessons learned for resolution
U.S. life insurance insolvencies	1. Aggressive contract promises relative to peers 2. Light surrender charges	1. To fund high contract promises, excessive investment concentration in high-yield bonds 2. Real estate investments—too much concentration and inability to liquidate during economic downturn	1. Freezes on surrenders 2. Seeking buyers with success or partial success—avoiding fire sell of investments 3. Changes in contracts	1. Post insolvency: *ex post* changes in contracts by laws and regulation 2. Creating incentives by policyholders to buy prudently (market conduct regulation as well as education) 3. Pre insolvency: *ex ante* changes in contracts with approval by policyholders to avoid insolvency 4. After insolvency: retrospective policy and reserves modifications 5. Pre insolvency: oversight over diversification of investments (national regulation and education)
Japanese life insurance insolvencies	Interest rate guarantees in an era of low interest rates in Japan	Falling values of assets and aggressive pursuit of foreign investments to 'feed' the guarantees on the products		

Life Insurance : Overall History of failures

- Investment issues e.g. Asset allocation and concentration: Investment in related group assets / loans to related parties and/or in lower credit grade assets to increase yield to maturity: Unit pricing allowed retrospectively. Distressed insurers carried significantly larger holdings of their assets in real estate than non-distressed insurers.

- ·Deregulation and Dysfunctional regulatory systems Regulations in Japan, Korea and Taiwan:
.
- ·Insolvencies of life insurers in Europe have been virtually nonexistent before 2000. The deregulation of the European insurance market altered that situation

- ·Irrational competition e.g. competitive pressures leading to focus on sales and growth at the expense of financial condition (short term measures such as profit and long term measures such as capital adequacy)

- ·Misalignment of incentives for different stakeholders (shareholders, advisers, customers) e.g. commissions greater than 100% of first year premium, vanishing premium products

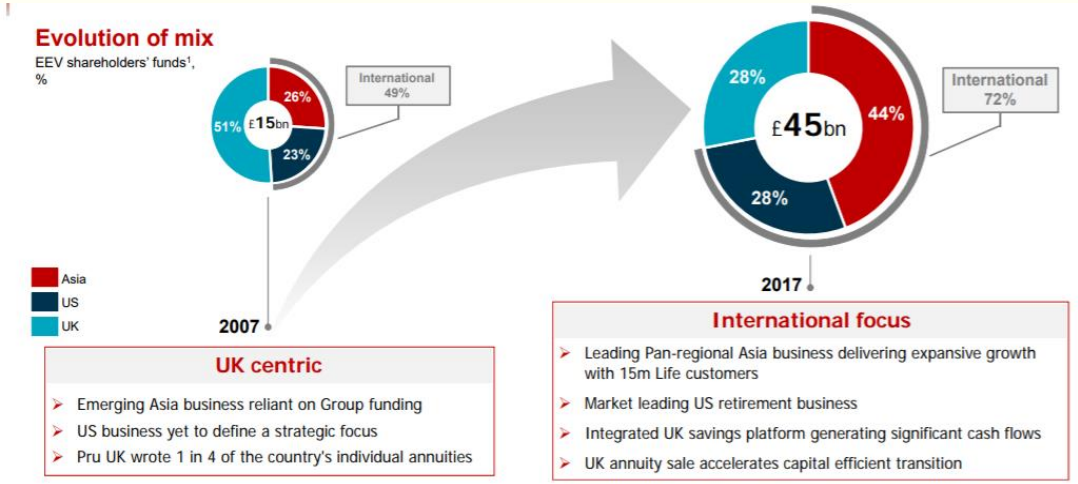
- ·Cross border management e.g. Insurers that are more geographically diversified are more likely to fail due to incapacity to deal with the increased complexity

Success Case Study : Prudential UK

Date	Adjusted Close Price	CAGR
31-Jul-04	255	
31-Jul-05	342	34%
31-Jul-06	408	27%
31-Jul-07	499	25%
31-Jul-08	400	12%
31-Jul-09	411	10%
31-Jul-10	449	10%
31-Jul-11	510	10%
31-Jul-12	670	13%
31-Jul-13	946	16%
31-Jul-14	1307	18%
31-Jul-15	1307	16%
31-Jul-16	1293	14%
31-Jul-17	1769	16%
30-Jun-18	1777	15%
24-Jul-18	1797	14%

Share information

London Stock Exchange:	PRU.L
Hong Kong Stock Exchange:	2378
New York Stock Exchange –(ADR)	PUK.N
Singapore Stock Exchange:	K6S

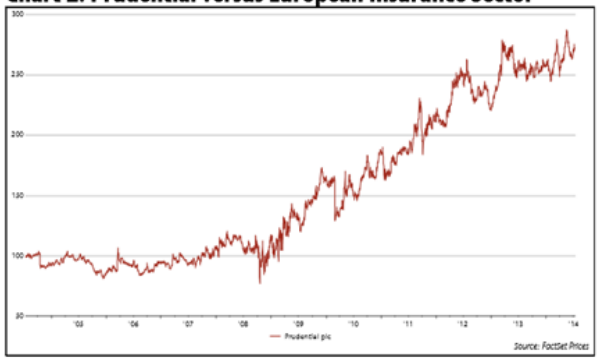


In Europe, returns have recovered to the same levels after 15 years though despite capital requirements 30% higher and yield potential considerably lower.

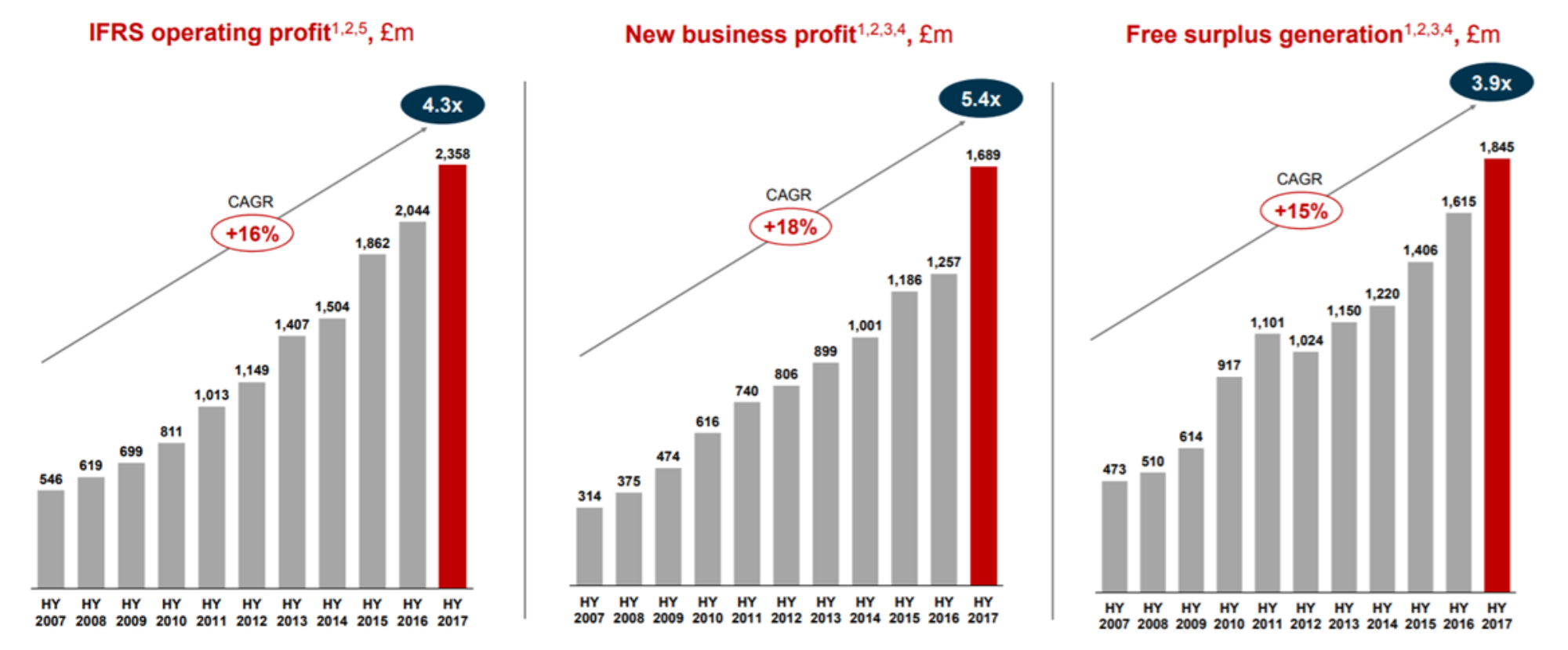
Prudential was one of the first to restructure a decade ago, and has outperformed since, focusing on life products designed for faster cash release to fund growth and fuel higher dividends

Chart 1: European Insurance Sector versus Market

Chart 2: Prudential versus European Insurance Sector

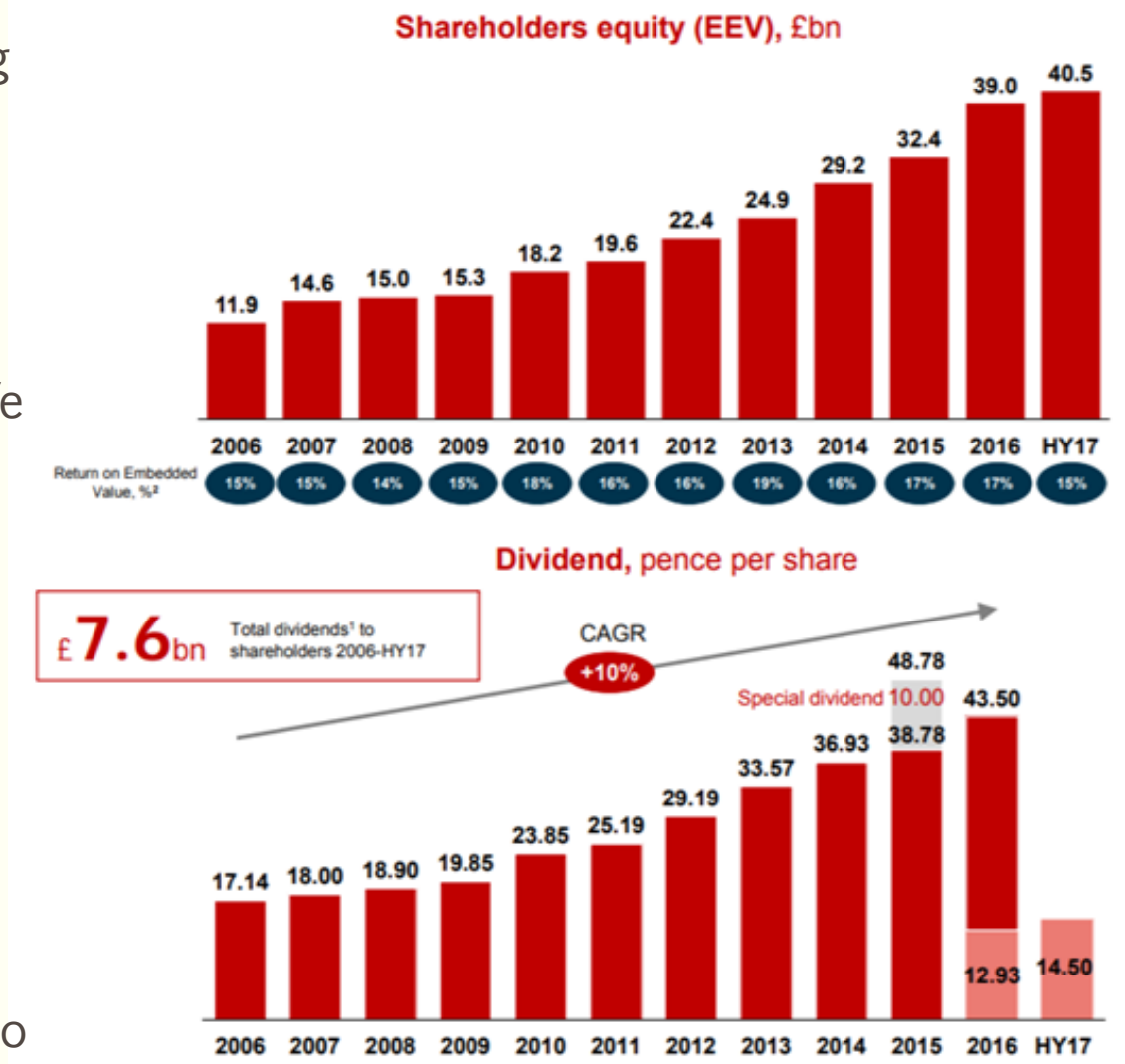


Success Case Study : Prudential UK



Success Case Study : Prudential UK

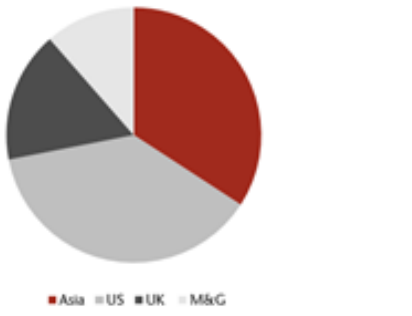
- ·One of the first to restructure a decade ago, focusing on markets with profitable growth (APJ)
- Focusing on life products designed for faster cash release to fund growth and fuel higher dividends
- ·Early to recognize the value of ‘cash’, restructuring life products to ensure distribution costs were quickly covered with profits in the form of cash
- ·The cash and growth strategies pursued in the UK (repositioning towards cash)
- Asia (growth focus on medical expenses to emerging middle class) and
- US (counter-cyclical US VA growth driven by conservative pricing and hedging strategy)
- Capital freedom in 2007 means free cash generated no longer required to shore up capital or pay down debt



Success Case Study : Prudential UK

- US (counter-cyclical US VA growth driven by conservative pricing and hedging strategy)
- Capital freedom in 2007 means free cash generated no longer required to shore up capital or pay down debt
- In USA, Cost of operations was 50% lesser than peers leveraging technology (2005-07 ARs)
- Product Diversification and balancing at various economic cycles

Chart 93: Prudential Capital Allocation



Source: Jefferies estimates, company data

Chart 96: Prudential Earnings by Division

Source: Factset

Chart 94: Prudential Rankings

	Market share (%), rankings
Asia	1st Malaysia, Philippines, Singapore, Vietnam, India , 3rd China, 4th HK; Standard Chartered distribution.
US	I variable annuities, 1 wholesale distributor
UK	5% market share: annuities, corporate pensions, with profits savings
M&G	1 UK

Source: Jefferies, company data

Success Case Study : Prudential UK

Parameter	Region	Type	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Risk Discount Rates																
UK		New	7.1%	7.6%	7.3%	7.8%	9.6%	8.7%	7.3%	7.7%	6.9%	6.8%	6.5%	5.6%	4.7%	4.7%
		In force	7.1%	7.7%	7.9%	8.0%	12.0%	10.2%	9.9%	8.6%	8.0%	8.3%	6.9%	5.7%	4.9%	4.8%
US		New	6.1%	7.9%	7.6%	7.0%	4.6%	7.8%	7.6%	6.5%	6.3%	6.9%	6.2%	6.7%	6.8%	6.7%
		In force	5.8%	6.1%	6.7%	6.0%	3.9%	7.2%	6.9%	6.0%	5.6%	6.9%	6.2%	6.2%	6.5%	6.5%
ASIA	ASIA	New	8.0%	9.8%	9.8%	9.5%	8.8%	9.1%	8.4%	7.4%	6.8%	8.1%	6.9%	5.9%	5.3%	5.3%
	ASIA	In force	7.9%	8.4%	8.8%	8.7%	7.8%	8.8%	8.1%	6.9%	6.1%	7.2%	6.6%	6.4%	6.1%	5.7%
	India	New	16.0%	16.5%	16.5%	15.8%	14.3%	14.3%	13.1%	13.8%	13.2%	14.0%	13.0%			
	India	In force	16.0%	16.5%	16.5%	15.8%	14.3%	14.3%	13.1%	13.8%	13.2%	14.0%	13.0%			
	China	New	10.0%	12.0%	12.0%	11.8%	11.8%	11.8%	10.5%	10.0%	10.1%	11.2%	10.2%	9.4%	9.6%	9.7%
	China	In force	10.0%	12.0%	12.0%	11.8%	11.8%	11.8%	10.5%	10.0%	10.1%	11.2%	10.2%	9.4%	9.6%	9.7%
	Japan	New	5.0%	5.0%	5.3%	5.1%	4.8%	5.1%	4.9%	4.7%	4.5%					
	Japan	In force	5.0%	5.0%	5.3%	5.1%	4.8%	5.1%	4.9%	4.7%	4.5%					
US 10 year treasury bond rate			4.3%	4.4%	4.8%	4.1%	2.3%	3.9%	3.3%	1.9%	1.8%	3.1%	2.2%	2.3%	2.5%	2.4%
Weighted expected long-term rate of inflation																
ASIA	China		3.0%	4.0%	4.0%	4.0%	4.0%	4.0%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	3.00%
ASIA	India		5.3%	5.5%	5.5%	5.0%	5.0%	5.0%	4.0%	4.0%	4.0%	4.0%	4.0%			
ASIA	Japan		0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%					
US			2.6%	2.4%	2.4%	2.5%	1.5%	2.4%	2.3%	2.0%	2.5%	2.6%	2.8%	2.8%	3.0%	3.00%
UK			2.9%	2.9%	3.2%	3.1%	3.0%	3.7%	3.6%	3.0%	2.9%	3.4%	3.0%	3.1%	3.60%	3.50%
Govt Bond Yield																
China			7.25%	9%	9%	8.25%	8.25%	8.25%	3.95%	3.50%	3.60%	4.70%	3.70%	2.90%	3.10%	3.90%
India			10.25%	10.50%	10.50%	9.25%	9.25%	9.25%	8.10%	8.75%	8.20%	9.00%	8.00%			
Japan			1.90%	1.80%	2.10%	2.00%	1.60%	1.90%	1.90%	1.00%	0.80%					

Success Case Study : Prudential UK

Parameter	Region	Type	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
APE Sales																
UK			817	900	900	897	947	723	820	746	836	726	857	874	1160	1491
US			456	515	565	671	716	912	1164	1275	1462	1496	1556	1729	1561	1662
ASIA			594	731	909	1306	1362	1261	1501 (1209)	1660	1897	1945	2237	2712	3599	3805
EEV OP (Based on long term average return)																
UK			486	426	686	859	1081	921	982	893	899	832	746	857	643	1015
US			370	755	652	627	586	1233	1458	1431	1610	1526	1528	1808	1971	2143
ASIA			473	526	779	1046	1309	1105	1450	1764	1960	1891	1900	2277	3074	3705
IFRS OP																
UK			296	400	500	528	589	657	719	723	736	735	776	1167	799	861
US			284	362	367	444	406	459	833 (618)	651	964	1233	1443	1696	2052	2214
ASIA			119	195	177	189	321	416	536	709	920	1075	1140	1174	1503	1799

Success Case Study : Prudential UK - USA

Country	Year	Inflation	% Change Inflation	Risk discount Rate - New	% Change RDR- New	Risk discount Rate - Inforce	% Change RDR- Inforce	1 Year Bond Yield	10 Year Bondyield	1 yr vs 10 yr Bonnd Yield	APE Sales	% APE Sales	EEV OP	% EEV OP	IFRS OP	% IFRS OP
USA	2004	2.6%		6.1%		5.8%		2.75%	4.3%	-1.6%	456		370		284	
USA	2005	2.4%	-7.7%	7.9%	29.5%	6.1%	5.2%	4.38%	4.4%	0.0%	515	12.9%	755	104.1%	362	27.5%
USA	2006	2.4%	0.0%	7.6%	-3.8%	6.7%	9.8%	5.00%	4.8%	0.2%	565	9.7%	652	-13.6%	367	1.4%
USA	2007	2.5%	4.2%	7.0%	-7.9%	6.0%	-10.4%	3.34%	4.1%	-0.8%	671	18.8%	627	-3.8%	444	21.0%
USA	2008	1.5%	-40.0%	4.6%	-34.3%	3.9%	-35.0%	0.37%	2.3%	-1.9%	716	6.7%	586	-6.5%	406	-8.6%
USA	2009	2.4%	60.0%	7.8%	69.6%	7.2%	84.6%	0.47%	3.9%	-3.4%	912	27.4%	1233	110.4%	459	13.1%
USA	2010	2.3%	-4.2%	7.6%	-2.6%	6.9%	-4.2%	0.29%	3.3%	-3.0%	1164	27.6%	1458	18.2%	833	81.5%
USA	2011	2.0%	-13.0%	6.5%	-14.5%	6.0%	-13.0%	0.12%	1.9%	-1.8%	1275	9.5%	1431	-1.9%	651	-21.8%
USA	2012	2.5%	25.0%	6.3%	-3.1%	5.6%	-6.7%	0.16%	1.8%	-1.6%	1462	14.7%	1610	12.5%	964	48.1%
USA	2013	2.6%	4.0%	6.9%	9.5%	6.9%	23.2%	0.13%	3.1%	-3.0%	1496	2.3%	1526	-5.2%	1233	27.9%
USA	2014	2.8%	7.7%	6.2%	-10.1%	6.2%	-10.1%	0.25%	2.2%	-2.0%	1556	4.0%	1528	0.1%	1443	17.0%
USA	2015	2.8%	0.0%	6.7%	8.1%	6.2%	0.0%	0.65%	2.3%	-1.7%	1729	11.1%	1808	18.3%	1696	17.5%
USA	2016	3.0%	7.1%	6.8%	1.5%	6.5%	4.8%	0.85%	2.5%	-1.7%	1561	-9.7%	1971	9.0%	2052	21.0%
USA	2017	3.0%	0.0%	6.7%	-1.5%	6.5%	0.0%	1.76%	2.4%	-0.6%	1662	6.5%	2143	8.7%	2214	7.9%

The US annuity business in the mean-time has benefited from above-market growth in variable annuities thanks to its conservative hedging programme ahead of the financial crisis.

Jackson growth has, to an extent, been contra-cyclical, where recent changes to commission structures to the agents and product charges to protect margins (where additional hedging costs have been incurred due to falling interest rates) could possibly mark the end of the recent growth surge.

Success Case Study : Prudential UK

Solvency II is the strongest in the sector at 253% (2013 FY)

Above all, Prudential's customer base, the middle class, is expected to grow to 135m by 2030 vs 45m 2012 (vs Prudential's 2m customers). And beyond Asia, the African continent now appears to be in Prudential's sights.

Asian focus on unit-linked investment policies with health and protection riders has successfully located the core insurance need of the growing middle classes, driving substantial growth

ROC 2015 23%, reflecting >20% IRRs in all life business (short paybacks, medical expense bias in Asia, with-profit support in the UK).

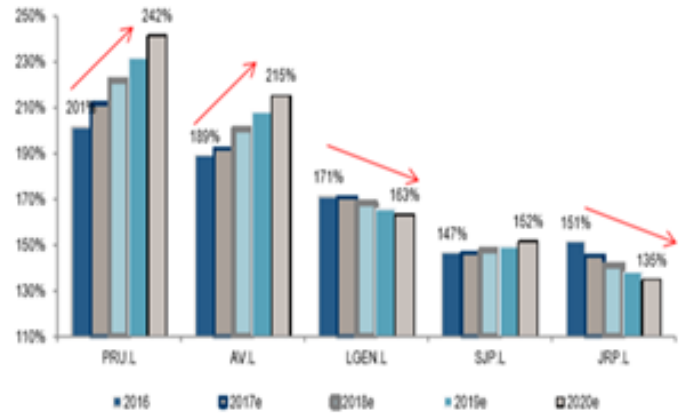
Chart 3: Capital Strength

2016	Economic Solvency*	Leverage**	Interest cover	Dividend Pay-out	Dividend cover	Capital Freedom
AEGON	185%	26%	10.0	34%	187%	2015
Allianz	215%	22%	13.4	50%	197%	2013
AXA	214%	24%	12.7	45%	148%	2015
Aviva	192%	39%	6.6	39%	152%	2016
Generali	202%	30%	8.0	45%	156%	2015
Prudential	290%	25%	14.2	35%	133%	2007
Zurich	140%	28%	7.1	65%	117%	2006

* For Zurich Z-ECM not comparable

** Tangible net of unrealised gains on bonds

Figure 2: Solvency II ratios deteriorate for annuity-focused players



Success Case Study : Prudential UK

Life					**2013 IRRs**	**10 bps life margin**
AEGON	*7.8%*	*7.7%*	*8.0%*	*7.9%*		*1.0%*
Allianz	*7.3%*	*7.9%*	*7.7%*	*7.6%*	*11.9%*	*1.4%*
Aviva	*14.2%*	*15.2%*	*15.4%*	*15.8%*	*15.9%*	*1.9%*
AXA	*10.6%*	*11.7%*	*11.8%*	*11.9%*	*14.2%*	*1.3%*
Generali	*9.5%*	*9.4%*	*9.2%*	*9.6%*	*11.9%*	*1.1%*
Prudential	21.0%	20.8%	21.6%	21.9%	>20%	*1.6%*
Zurich	*11.1%*	*12.7%*	*12.1%*	*12.2%*	*12.0%*	*1.7%*

Non-life					**1 point combined ratio**
Allianz	*13.8%*	*14.6%*	*14.5%*	*14.7%*	*1.2%*
Aviva	*11.4%*	*11.9%*	*14.3%*	*14.5%*	*1.2%*
AXA	*13.1%*	*14.0%*	*15.4%*	*15.4%*	*1.3%*
Generali	*12.5%*	*14.7%*	*15.8%*	*16.1%*	*1.5%*
Zurich	*14.6%*	*14.8%*	*14.7%*	*14.7%*	*1.3%*

Figure 31: Aviva valuation scenarios

AV.L	Grey Sky assumptions	Impact	Base Case assumptions	Blue Sky assumptions	Impact
Combined ratio	97.5%	-11%	95.0%	94.0%	5%
P&C investment yield	1.70%	-4%	2.20%	2.45%	2%
Life margin on reserves	0.80%	-13%	0.90%	0.95%	7%
Life AUM growth	2.00%		2.50%	2.75%	
Asset mgmt C/I ratio	67.0%	-4%	62.0%	59.0%	3%
Asset mgmt growth	0.0%		2.0%	3.0%	
Valuation	**4.46**	**-30%**	**6.40**	**7.42**	**16%**

Source: Credit Suisse estimates

Figure 32: Prudential valuation scenarios

PRU.L	Grey Sky assumptions	Impact	Base Case assumptions	Blue Sky assumptions	Impact
Asia Life margin on reserves	2.45%	-16%	2.65%	2.85%	16%
Asia Life AuM growth	7.0%		8.0%	8.5%	
US Life margin on reserves	1.03%	-9%	1.28%	1.38%	3%
US Life AuM growth	0.70%		2.70%	2.70%	
UK Life margin on reserves	0.27%	-3%	0.42%	0.47%	1%
UK Life AuM growth	-2.0%		-1.0%	-1.0%	
M&G Cost income ratio	58.0%	-2%	55.0%	52.0%	1%
M&G AUM growth	1.0%		3.0%	3.0%	
East Spring Cost income ratio	59.0%	-3%	56.0%	54.0%	2%
East Spring AUM growth	3.0%		6.0%	7.0%	
Valuation	**14.04**	**-31%**	**20.45**	**25.00**	**22%**

Source: Credit Suisse estimates

Figure 33: Legal & General valuation scenarios

LGEN.L	Grey Sky assumptions	Impact	Base Case assumptions	Blue Sky assumptions	Impact
UK Life revenue margin	0.87%	-17%	1.07%	1.22%	15%
UK Life AUM growth	2.50%		3.50%	4.00%	
LGIM Cost income ratio	52.0%	-6%	49.0%	46.0%	20%
LGIM AUM growth	2.50%		3.50%	5.50%	
US Life revenue margin	6.00%	-1%	7.00%	8.00%	1%
US Life AUM growth	1.50%		2.50%	3.50%	
P&C Combined ratio	93.0%	-1%	90.0%	88.0%	1%
P&C investment yield	1.80%		2.00%	2.20%	
LGC revenue margin	3.77%	-2%	4.27%	5.02%	3%
LGC AUM growth	1.0%		1.0%	1.0%	
Valuation	**1.60**	**-25%**	**2.15**	**2.94**	**37%**

Source: Credit Suisse estimates

BACKUP

Difference in EV Methods

	Traditional EV	European EV	Market Consistenct EV
Dicount Rate	A single discount rate - Risk free rate + premium	Typically one discount curve for all cash flows " Top down approach"	Different discount curve for each cash flows " Bottoms up approach"
Investment returns	Risk free rate plus risk premium (depending on class of asset)	Risk neutral or risk free plus risk premium approach	Risk neutral approach is used
PVIF	Furture profit projected using real world investment return, discounted using subjective risk discount rate (RDR)	Furture profit projected using real world investment return, discounted using a curve based risk free rates adjusted using a risk margin	Future profit projected using market consistent risk neutral investment returns , discounted using a curve based risk free rates adjusted for illiquidity premium
TVOG	Not necessary to calculate	Can use both risk -neutral andreal world model	Market consistent risk neutral approch using stocastic mode
Cost of Capital	No standadisation	Mandatory, disclosed as part of required capital	Mandatory split into Frictional cost of capital and Cost of non-hedgeable risk

Source: Company, Milleman

Difference in EV Methods [1]

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Insurer Vs. Bank

- We made an attempt to reformat insurance company numbers such that we can compute some ratios similar to Bank.
- Ratios include – cost of float, yield on investments, spread on float etc.
- No float gets generated from linked side of the business. Linked investment portion can be thought of as asset management business & return on assets seemed like appropriate measure for this business.
- Bank is essentially a cost plus business where yield on loans = cost of funds + margin & rather simple business.
- Life insurance is essentially a business where cost of float varies from year on year due to fixed return guaranteed to policyholders & changing interest rates.

Insurer Vs. Bank

FLOAT													
ICICI Pru Life	Non-linked Float	33707	27732	24715	19792	16196	12580	9193	5742	4093	3660	2499	1699
	Growth of Float	22%	12%	25%	22%	29%	37%	60%	40%	12%	46%	47%	
	Cost of Float	-3.90%	-2.20%	-7.40%	-3.70%	-8.10%	-6.50%	-5.40%	-4.50%	-5.80%	-7.60%	-7.10%	-3.50%
	Yield on Float	7.70%	7.40%	7.30%	6.70%	7.40%	6.10%	5.80%	5.50%	6.50%	6.00%	6.90%	5.10%
	Spread on Float	3.80%	5.20%	-0.10%	3.00%	-0.70%	-0.40%	0.40%	1.00%	0.70%	-1.60%	-0.20%	1.60%
HDFC Life	Non-linked Float	37937	28503	22104	16322	11561	8579	6035	4972	3434	2751	1931	1308
	Growth of Float	33%	29%	35%	41%	35%	42%	21%	45%	25%	42%	48%	
	Cost of Float	-5.10%	-2.60%	-7.30%	-8.30%	-4.20%	-6.80%	-6.00%	-3.70%	-3.70%	-4.70%	-7.40%	-8.90%
	Yield on Float	7.20%	5.70%	9.90%	7.10%	7.20%	6.60%	7.10%	6.70%	6.90%	7.20%	4.10%	7.90%
	Spread on Float	2.10%	3.10%	2.60%	-1.20%	3.00%	-0.20%	1.10%	3.00%	3.20%	2.50%	-3.30%	-1.00%
SBI Life	Non-linked Float	51258	41821	34574	27677	30409	18310	15634	11464	7763	4864	2819	1802
	Growth of Float	23.74%	3.48%	21.73%	7.72%	0.30%	7.90%	43.55%	151.98%	28.31%	202.00%	617.21%	
	Cost of Float	-6.40%	-6.30%	-7.30%	-7.70%	-6.10%	-7.00%	-6.10%	-5.30%	-6.00%	-7.70%	-5.90%	-7.00%
	Yield on Float	8.10%	8.00%	8.40%	8.10%	6.20%	7.70%	7.20%	6.00%	5.40%	7.80%	6.90%	8.40%
	Spread on Float	1.70%	1.70%	1.10%	0.40%	0.10%	0.70%	1.10%	0.70%	-0.60%	0.10%	1.00%	1.40%

RETURN on LINKED ASSETS													
ICICI Pru Life	Growth in Linked Premium	16%	29%	34%	-14%	-12%	-30%	-1%	9%	14%	79%	86%	
	Linked AUM	87878	75296	74778	60310	57521	57817	58827	51469	28614	24866	13252	7079
	Growth in Linked AUM	17%	1%	24%	5%	-1%	-2%	14%	80%	15%	88%	87%	
	Gross Profit/AUM	0.63%	0.72%	2.31%	1.62%	2.52%	2.23%	1.00%	2.44%	0.53%	0.93%	0.73%	0.04%
HDFC Life	Growth in Linked Premium	6%	3%	21%	-6%	3%	-4%	28%	22%	10%	85%	122%	
	Linked AUM	53800	45727	44920	34207	28333	23610	20523	15522	6878	5945	2852	1194
	Growth in Linked AUM	18%	2%	31%	21%	20%	15%	32%	126%	16%	108%	139%	
	Gross Profit/AUM	0.58%	0.43%	0.81%	1.46%	1.20%	1.73%	0.00%	0.37%	0.96%	0.35%	0.11%	0.25%
SBI Life	Growth in Linked Premium	46%	30%	23%	-13%	-36%	-15%	33%	51%	10%	138%	565%	
	Linked AUM	44573	36022	34810	28597	26548	26468	24529	17087	6781	5285	1750	244
	Growth in Linked AUM	24%	3%	22%	8%	0%	8%	44%	152%	28%	202%	617%	
	Gross Profit/AUM	0.13%	0.39%	1.20%	1.99%	2.15%	1.54%	0.91%	0.95%	0.72%	0.98%	0.06%	0.00%

Insurer Vs. Bank

- It is very good performance if insurer can do 2-2.5% RoA (4% NIM) on non-linked side of business & 1% RoA on linked side of business.
- Other Comparison with Bank
  - Banks need to raise capital from time to time as capital adequacy ratio falls to fund future growth.
  - Solvency margin of insurers tend to fall during fast growing years due to new business years. Insurers also might need to raise capital to satisfy solvency ratio but no example of capital raising in India yet.

GENERAL INSURANCE SECTOR

Ratios

- Combined Ratio
  - Equals (Net Claims + Commissions + Operating Expenses)/Net Premium
  - A value < 100% means underwriting profit & > 100% means underwriting loss.
- Loss ratio
  - Equals Net Claims/Net Premium
  - Lower loss ratio means insurer is rejecting too many claims or quality of underwriting is very good.
  - Loss ratio can widely fluctuate year on year basis due to various events like disease outbreaks, floods etc.