12 PD

Embedded Value Accounting

Valuation Actuary Symposium

Duncan Briggs

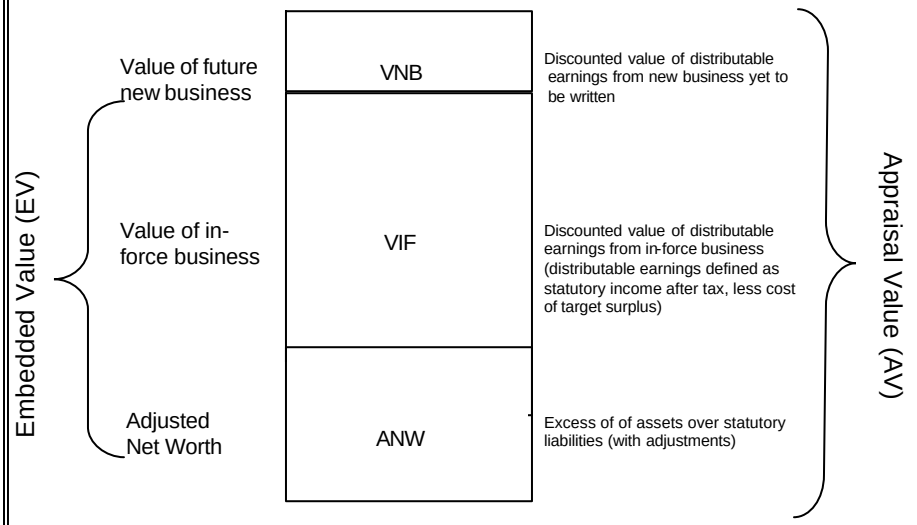
September 19, 2002

Topics

- Overview of Embedded Value Accounting and its Worldwide Use
- Mechanics of Embedded Value Accounting
- Practical Implementation Issues

Overview of Embedded Value Accounting and Its Worldwide Use

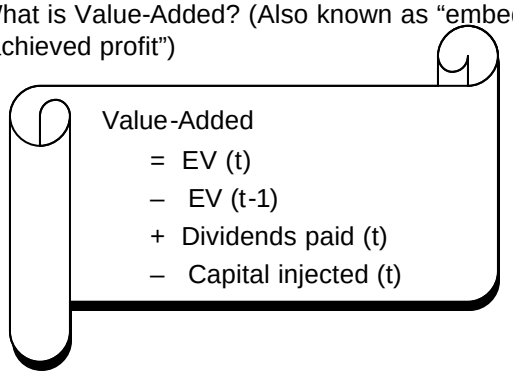
The economic value (appraisal value) of a life insurance company has three components, two of which comprise the embedded value



3

Definition of value-added

- What is Value-Added? (Also known as “embedded value profit” or “achieved profit”)



=> The growth in value (adjusted for capital inflows and outflows) must exceed the risk discount rate in order for true value to have been created.

4

Worldwide embedded value reporting

U.K. insurers and multinationals were the first companies to adopt the concept

- Widespread reporting in the U.K., Australia and South Africa
- Began as defense against unwanted acquisition
- U.K. analysts focus on embedded value results in making stock selections
- Generally adopted as performance measurement system by the multinationals
- Increasingly used in Continental Europe and Asia

5

Adoption of embedded value reporting by Canadian companies was rapid

- Large Canadian life insurers first published EVs last year
- Key driver was stock analyst pressure
  - E/S, P/B, ROE remain important. EV adds a forward looking piece to the puzzle
  - Throws light on GAAP statements
  - VNB and movement in EV more important than EV because they provide insight on future earnings trends
  - Increases investor understanding and confidence
  - Allows cross country comparisons

6

Worldwide Embedded Value reporting

There are different levels of Value-Added publications

- Publication in annual statement (e.g., CGU (U.K.), Zurich FS (CH), Mediolanum (Italy), Old Mutual (South Africa))
- Presentation to financial analysts (e.g., Aegon (NL), ING(NL), Allianz (Germany), Skandia (Sweden))
- Inclusion in IPO prospectus (e.g., Pacific Century Insurance (HK), Catalina Occidente (Spain), PZU Insurance (Poland))
- Estimation by financial analysts (e.g., Swiss Life (CH), AGF (France), various Canadian and US companies)

7

Mechanics of Embedded Value Accounting

Analysis of Value-Added

Generic Value-Added Formula

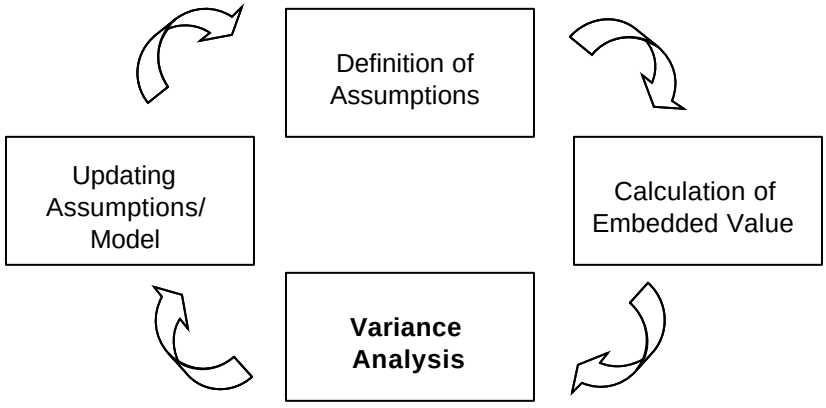
Value-Added (t)	=	EV(t) - EV(t-1)
	+	Dividends Paid
	–	Capital Injected

OR

Value-Added (t)	=	Interest on free surplus
	+	Unwinding of risk discount rate on in-force
	+	Value of current year's new business
	±	Deviations from assumptions during current year
	±	Present value of changes in assumptions for future years
	±	Changes in underlying models

9

The Control Cycle



Key discipline associated with embedded value reporting is analyzing variances between actual and expected return

10

There are some differences in presentation format being used

PV Book Profits =	100
Total Surplus =	70
Target Surplus =	50
PV (TS + interest) =	35
Asset MV/BV =	1.10

~~VIF~~	~~100 + 35 =~~	~~135~~	~~100 – (50 – 35) – .10 (50) =~~	~~80~~
~~ANW~~	~~1.10 (70 – 50) =~~	~~22~~	~~1.10 (70) =~~	~~77~~
Total		157		157

11

Embedded Value Movement Analysis

	Value of In-force		Cost of Capital	Adjusted net worth	Embedded Value
	Regulatory earn.	Change in value	Change in value	Regulatory earn.	
VIF @ 12/31/1999 - before model adjustments		**140**	**-19**	**200**	**321**
Model adjustments and restatements					
- Foreign Exchange rate earnings		0	0	0	0
- Model Changes					
- Modelling changes					0
- Errors, corrections					0
- Other					0
- Transfers		14	-2	-10	2
VIF @ 12/31/1999 - after model changes		**154**	**-20**	**190**	**323**

12

Embedded Value Movement Analysis

	Value of In-force		Cost of Capital	Adjusted net worth	Embedded Value
	Regulatory earn.	Change in value	Change in value	Regulatory earn.	
VIF @ 12/31/1999 - after model changes		**154**	**-20**	**190**	**323**
Assumption Changes					
- Economic assumption changes		-4	1		-4
- Operating assumption changes					
- Mortality/morbidity		37	0		37
- Lapses					0
- Expenses					0
- Taxation					0
- Other					0
VIF @ 12/31/1999 - after assumption changes		**187**	**-20**	**190**	**357**

13

Embedded Value Movement Analysis

	Value of In-force		Cost of Capital	Adjusted net worth	Embedded Value
	Regulatory earn.	Change in value	Change in value	Regulatory earn.	
VIF @ 12/31/1999 - after assumption changes		187	-20	190	357
Expected return		19	3	13	35
Expected regulatory profits from in-force	50	-50			0
VA by NB in 2000 @ eoy - after assumption changes	-5	15	-2	0	9
VIF @ 12/31/2000 - after new business and unwinding o	45	171	-18	203	401

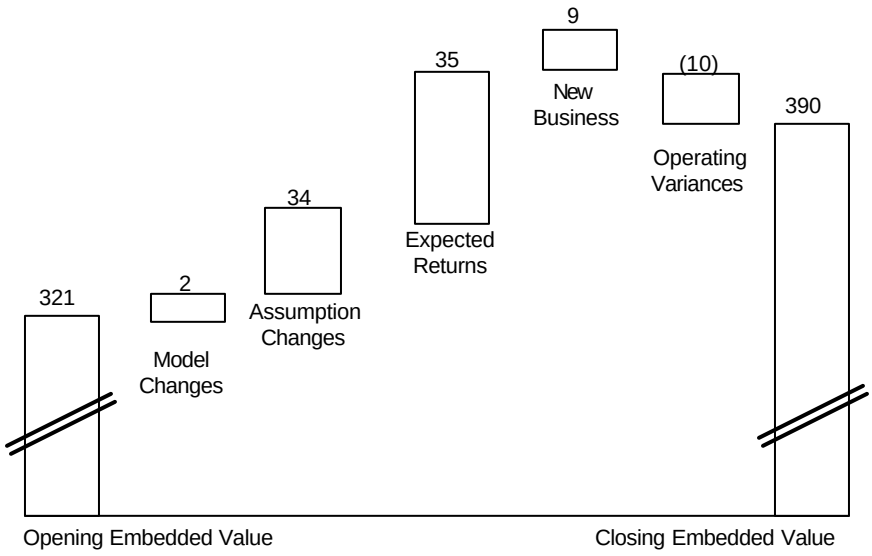
14

Embedded Value Movement Analysis

	Value of In-force		Cost of Capital	Adjusted net worth	Embedded Value
	Regulatory earn.	Change in value	Change in value	Regulatory earn.	
VIF @ 12/31/2000 - after new business and unwinding of RDR	45	171	-18	203	401
Deviation due to experience variances on in-force in 2000					
- Operating variances					
- Mortality/morbidity					0
- Lapses	-3	-9	1		-10
- Expenses					0
- Taxation					0
- Other					0
- Investment return variance					
VIF @ 12/31/2000 after experience variances in 2000	42	162	-17	203	390

15

An analysis of embedded value earnings reveals the underlying drivers of value



16

Practical Implementation Issues

Implementing an embedded value reporting system is a significant undertaking

- Typically requires regular input from actuaries in different areas of company
- Defining and managing the reporting process is critical
- Companies often implement internally before publishing externally
- Quarterly or half-yearly publication typical, with results required within weeks of close

18

The methodology must be agreed on

- Reporting units
- Assumption basis
- Cost of capital
- Level of required capital
- Use of anticipated actions
- Treatment of expense overrun, if any
- Treatment of start-up costs/goodwill
- Designation of performance within and outside management's control
- Treatment of "options"

Developing a guiding principles document at the outset is advised

19

The inputs of an embedded value system should already exist

The main components of an embedded value calculation are:

- Computer model capturing product features (e.g., charging structure, valuation basis)
- Development of “best estimate” assumptions
  - Actuarial
    - — Mortality
    - — Lapse rates
    - — Expenses
  - Economic
    - — Investment return
    - — Inflation
    - — Risk discount rate

20