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Titre : Embedded Value (EV) and Market Consistent Embedded
Value (MCEV) of Prevoir Viet Nam

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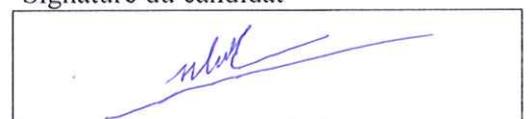
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Résumé

Les résultats financiers des sociétés d'assurance vie sont très complexes à analyser. Ils sont préparés selon des principes de comptabilité et actuariels différents d'un pays à l'autre. La communauté financière utilise souvent le ratio price-to-earnings comme outil d'analyse et de comparaison d'entreprises. Les bénéfices générés par l'entreprise en un an ne constituent aucune garantie pour l'avenir. Il est impossible de déterminer la valeur d'une entreprise en utilisant ces résultats simples. Tout ce qui entoure une compagnie d'assurance vie lié à la solvabilité et la nature des produits vendus est à long terme, ce qui rend ce type d'activité unique.

Au fil des années, les sociétés d'assurance-vie ont construit des outils pour les aider à analyser et à comprendre leurs résultats financiers. La plupart de ces outils ne reflètent pas une vision à long terme de la rentabilité de la société, ils reposent uniquement sur les résultats financiers à court terme. Il existe un outil qui a la capacité de synthétiser les informations sur la rentabilité à long terme en une seule valeur; cet outil s'appelle l'embedded value.

L'embedded value est le calcul de la valeur d'un bloc d'affaires qui prend en compte toutes les exigences qu'une compagnie d'assurance peut avoir. Il s'agit du calcul de la valeur actuelle de l'excédent distribuable aux actionnaires sur la base des hypothèses les plus probables (on best estimate).

Abstract

The financial results of life insurance companies are very complex to analyze. They are prepared according to accounting and actuarial principles varying from one country to another. The financial community often uses the price-to-earnings ratio as a tool to analyze and compare companies. The profits generated by the company in one year are no guarantee of the future. It is impossible to determine the value of a company using these simple results. Everything around a life insurance company is tied to solvency and the nature of the products sold is long term, which makes this type of business unique.

Over the years, life insurance companies have built tools to help them analyze and understand their financial results. Most of these tools do not hold a long-term vision of the profitability for the company, relying solely on the short-term financial results. One tool has the ability to synthesize the information on long-term profitability in one simple value; this tool is called the embedded value.

The embedded value is the calculation of the value of a block of business that considers all the requirements an insurance company can have. This is the calculation of the present value of surplus distributable to shareholders based on best estimate assumptions.

Key words

Embedded Value (EV), European Embedded Value (EEV), Market consistent Embedded Value (EEMV), Value of inforce (VIF), Net asset Value (NAV), Risk discount rate (RDR), Sensitive Test, Cost of Capital (COC), Time value of financial Options and Guaranteed (TVFOG), Cost of non-diversifiable risks (CNFR), CFO Forum, Appraisal Value, Present Value of Future Profit (PVFP), Required Capital (RC), Free Surplus (FS).

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Chapter 1

Traditional Embedded Value

1.1 DEFINITION OF EMBEDDED VALUE

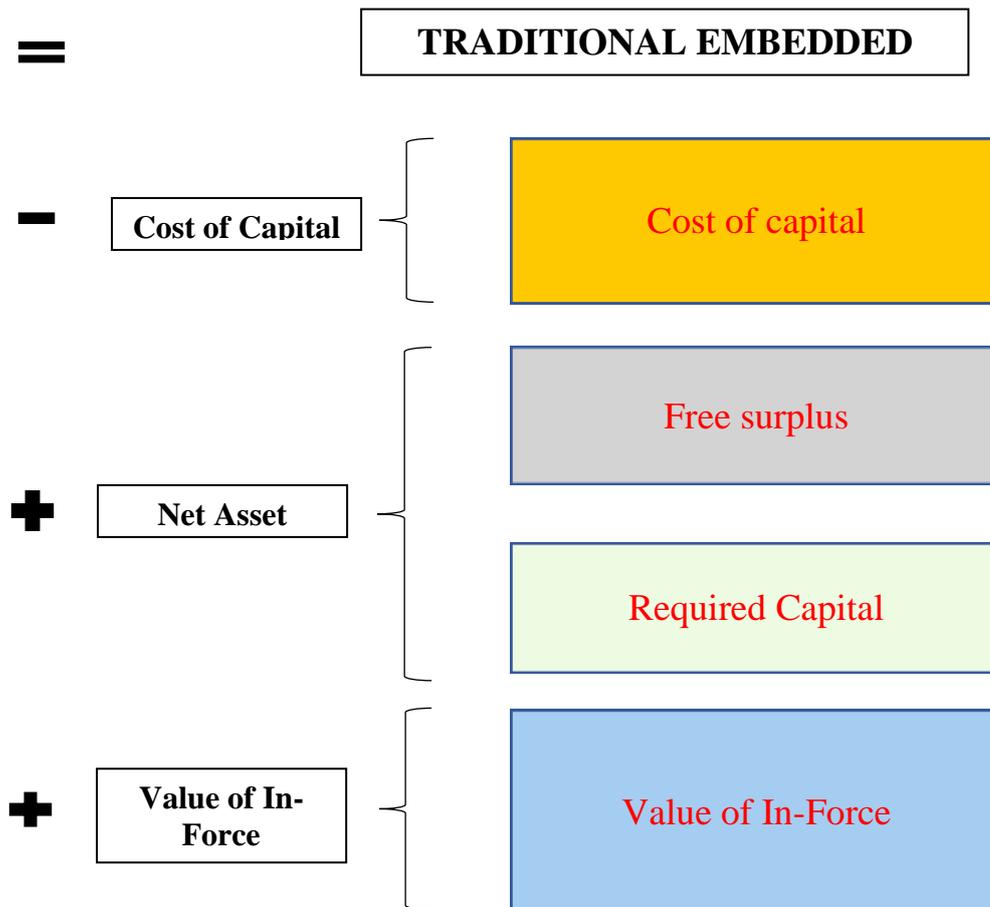
The embedded value is the valuation of a company's current in-force value without taking into account its capacity to generate new business. By definition, it is then a minimum value for the company according to the assumptions used in its calculation. The embedded value can be adjusted by adding the estimated value of future new sales to obtain the appraisal value of the company.

The embedded value is defined as the value of in-force business plus the value of the free capital. The value of in-force business is the present value of the amounts generated by the in-force that will be distributable to the shareholders in the future. Distributable amounts are discounted using the return expected by shareholders on their investment. The free capital is the capital in excess of what is currently required to meet the government's regulatory capital requirements under the assumptions of the embedded value. This amount could be immediately distributable to the shareholders.

Even though the value of future new business is not included in the embedded value, the value of one year of new business is often disclosed as a separate item that will be used externally, so the volatility of this value is clearly an important issue. According to the *Interim Draft Paper on the Considerations in the Determination of Embedded Value for Public Disclosure in Canada*, published in September 2000 by the Committee on the Role of the Appointed/Valuation Actuary of the Canadian Institute of Actuaries, new business for embedded value reporting purposes should be defined in a manner consistent with the company's current financial reporting practices. Any change to this definition should be disclosed, otherwise there could be unexplained variation in the value.

1.2 EMBEDDED VALUE FORMULA

$$\begin{aligned}\text{Traditional Embedded Value} &= \text{Net Asset Value} + \text{Value of In-Force} - \text{Cost of} \\ &\quad \text{capital} \\ &= \text{Required capital} + \text{Free surplus} + \text{Value of In-} \\ &\quad \text{Force} - \text{Cost of capital}\end{aligned}$$



Value of In-Force (VIF): is the present value of the net of tax shareholder cash Flow from both the in-force business and the assets backing the associated liabilities with the Risk discount rate (RDR).

Profit to shareholders (R_k) = After tax profit + After tax investment income on capital – Increase in capital

After tax profit = Premiums (P) + Investment income (I) – Benefits (B) – Expenses (E) – Increase in Statutory Reserves (ΔSR) – Tax on income (T)

Where:

Benefits: Death Benefit, Survival Benefit, Surrender Benefit, Maturity Benefit....

Expenses: Compensation paid to agents, Acquisition and maintenance expenses, premium taxes....

Tax on income = $(P + I - B - E - \Delta TR) * T_x$ with ΔTR is the increase in Tax reserve and T_x is the tax rate.

$$\text{VIF} = \text{PVFP} = \sum_{k=1}^n \frac{R_k}{(1+RDR)^k}$$

Required capital: is the market value of assets, attributed to the business over and above that required to back the liabilities for the business and whose distribution to shareholder is restricted. The level of required capital may be set by reference to regulatory capital requirements, levels of capital requirements that achieve a target credit rating, internal model capital requirements, or a combination of these.

Free surplus: is the market value of any assets allocated to, but not required to support, the in-force business at the effective date of the embedded value calculation.

Cost of capital: is a deduction from the Present value of future profit (PVFP) in respect of the additional costs from investing in assets backing the required capital via an insurance company.

1.3 Advantage and Limit of Traditional Embedded Value

1.3.1 Advantage of Traditional Embedded Value:

- 1) From the economic point of view, The Embedded Value (EV) correctly measures the value creation, in particular of sale of insurance contract results in immediate increase in value. Thus, EV focuses on notion of value and in theory, comparable from one year to the next.
- 2) The EV reflects past experience and the future changes when establishing the Best estimate assumption. In particular, the management policy is integrated. Finally, the assumptions are review each year and a poor initial assessment of them appears distinctly.
- 3) The methodology for calculating EV is also a solid framework for evaluating New Business generated by a company. On contrary of EV, the statutory standard or GAAP do not insulate the profitability of New Business.
- 4) The analysis of EV overtime, notably the movement of EV published by the company, makes it possible to measure clearly the operational performance as well as management policy.

- 5) The EV propose a rigorous framework for measuring key value of the insurance company (excluded the intangible assets, brand value or management quality). Unlike other companies, the EV includes all assets as well as the stock (In-force) which represents a large part of the insurance company's value.
- 6) The EV makes it possible to compare different companies regardless of which country they operate and are independent of local reporting standard.
- 7) The EV of a portfolio can be easily broken down.
- 8) Financial reporting will never guarantee a realistic vision, complete and perfectly faithful of a company. In spite of the very constraining GAAP standards, there are many US scandal type like Enron or more recently Fannie Mae in 2008. On the other hand, the use of common principles and non-standard, offset by the need to disclose the main assumptions as well as the publication of sensitive test allow the reader to be able to have a right opinion on the communicated figures.

1.3.2 Limit of Traditional Embedded Value:

However, in the absence of common calculation principles, several points of divergence appeared:

- 1) The major criticism of the Traditional Embedded Value is the choice of the Risk Discount Rate. Indeed, RDR is usually equal to the sum of the risk-free rate plus Risk premium and correctly quantifying this Risk premium is not easy. The choice of RDR is essential in the final value obtained. It is intended to reflect all the risks of the future flows of each company. However, the rate quickly disconnected from reality because company began to display identical rates, ranging between 7%-8%. The reason is that no company wants to appear in the eyes of the market as not profitable (a rate less than 7%) or on the contrary, taking too much risks (a rate greater than 8%). We spoke of the

“Herding effect”. Finally, The RDR was more chosen according to the market conditions and the actual risks of the company.

- 2) The publication of EV lacks of the consistency. The risks and the method of how to evaluate them could vary greatly from one company to another.
- 3) It is possible to inflate the value of EV by investing in more risky assets.
- 4) Similarly, the amount of capital required and the cost inherent to it are subject to different evaluations according to the companies. Does the required capital correspond to the Minimum regulatory capital or may it be equal to another amount?
- 5) What risks should be assessed and incorporated into the EV calculation? Certain risks are assessed by the companies are diversifiable by investors. Or the modern economic theory stipulated that all non-systematic risks shall not be the remuneration object. Should they therefore be integrated into EV calculation? Let’s take the example of the mortality risk, it is a non-systematic risk and should therefore not to be taken into account. However, some risks are specific to insurance: risk of illiquidity of absence of financial products capable to replicate the insurance contract (maturity too long).

It is therefore urgent to establish the principles to achieve the consistency of Embedded Value reporting.

1.4 Embedded Value Assumptions:

The assumptions determination is very critical in the embedded value calculation. The embedded value is very sensitive to the assumptions underlying the calculation. Therefore, for the sake of consistency in future embedded value recalculation, it is important that the methodology used to set the assumptions produces realistic assumptions and that it be objective. The objective criteria are very important because we want the

embedded value to reflect changes in the environment, not changes due to human judgment.

The assumptions used in the embedded value calculation can be mainly split into two categories: the economic and the non-economic assumptions.

1.4.1 Economic Assumptions

The economic assumptions refer to all the assumptions related to the economic market. Those are mainly future reinvestment rates on fixed income assets, future returns on variable income assets (such as stocks and real estate), currency exchange rates, default rates, inflation rates and investment expenses.

Because those assumptions have a high level of correlation, it is very important to ensure consistency in their setting. Interest rates are used to project assets and liabilities as well as to discount future profits in the embedded value (the risk discount rate). The interest rates for assets and liabilities must be consistent for each future projection year. The risk discount rate is a fixed rate consistent with the actual environment at the embedded value calculation date. The risk discount rate must not vary for the projection period because it has to reflect the current rate curve, not the expected rate curve(s) in the future. This rate should reflect the long-term, risk free rate plus an estimate of the risk premium demanded by investors. The risk discount rate may vary according to the country in which the business operates to allow for differences in the risk free rate and the risk premium (as an example, the risk premium may be increased to reflect currency exchange rates).

The future return on variable income assets should be consistent with the expected rates on fixed income assets and with the risk discount rate. Therefore, it may be appropriate to assume that the future return on stocks is not higher than the risk discount rate. Setting the future return on stocks equal to the risk discount rate has the advantage of avoiding create unusual embedded value movement in the future. If the risk discount rate changes, we automatically change our return expectation on stocks. For mortgages, a method to reflect the relationship with fixed income returns can be to set a risk premium over fixed income assets and to assume it is constant over time. Regarding the inflation rate, a method can also be developed to have it consistent with the fixed income rates.

1.4.2 Non-Economic Assumptions

The main considerations in setting the other actuarial assumptions are that they must be best estimate assumptions comparable to valuation assumptions without margins. Therefore, the assumptions should be consistent, or the same, as the assumptions presented in the Appointed Actuary's report. In the event of any regulatory restriction in the best estimate assumption set by the appointed actuary, the assumption used in the embedded value calculation should be the true best estimate, without any restriction. An example of this is the mortality improvement that should be included in the embedded value projection but cannot be reflected in the valuation of liabilities.

The assumptions relating to required capital calculations or taxation (investment income tax, premium tax, corporate tax) should only reflect future changes that are announced or confirmed by the tax authorities at the calculation date.

An assumption is also required to determine the appropriate level of required Capital.

1.4.3 Reflecting The Risk In Embedded Value Calculation

The embedded value is only a best estimate. In the future, there may be different between the assumptions used in the calculation and the reality. This is only one vision of the future.

There are a lot of ways to reflect the risk in the embedded value (the risk that the real embedded value differs from the calculated one). The best way to help people assess the risk in the embedded value is to present the sensitivity of the number to different changes in the assumptions. As an example, one could change the risk premium. A high sensitivity of the embedded value to the risk premium indicates that most of the profits are far into the future.

Another test that could be done is to change the interest rate curve. In addition to the test of different assumptions, the value of some assumptions could be separately presented. As an example, one could disclose the value of mortality improvement in the projections. The value of a higher risk block of business could also be presented separately. Segregated funds with a guarantee are a good example of a risky business with a value changing

according to the stock market. Because this business can be very volatile, the embedded value associated with it could be isolated from the rest of the business and presented separately.

1.5 Embedded Value Versus Stock Price:

By definition, the embedded value is the present value of all future amounts that will be distributable to shareholders. Because it includes everything belonging to shareholders, it can be viewed as the price of the company, so it could easily be compared to the stock price. The only difference between the two is that embedded value excludes the value of future business and may use a different discount rate.

Any change in the environment surrounding the company will have an impact on its price. Measuring the value of those changes is a hard task; this is where the embedded value methodology becomes a useful tool. Although not giving the exact change in the stock price, the impact of the change on the embedded value can give some insights as how the market can react to the change. It is important at this point to understand that the calculation cannot give the exact impact, because there is an infinite number of factors that cannot be included in the model, such as shareholders' behavior or other companies' reactions to the change. However, the calculation can give some guidances, or it can more precisely assess the value of and the impacts of the change. As an example, the regulator can change the required capital formula. How could we get a sense of this change? Using the embedded value methodology, a projection of the required capital with the old formula and the new one can be done. The present value of the future impact, as well as the projection of the impact itself, will indicate if the change in the formula is positive or negative to the company. Without the embedded value methodology, the company can think the change is a profitable one because current solvency ratio could increase. But in fact the effect could reverse in the near future, leading to a negative impact for the company. By assessing the impact of the change, the company could react promptly and avoid future problems. Another use of the embedded value can be to test the impact of current management decisions and to know how it will affect the company's value.

1.6 Other Uses Of Embedded Value And Its Methodology:

Embedded value itself and the calculation methodology surrounding it can be used for tasks other than trying to predict the stock price. Some of the other uses are discussed below.

1.6.1) Compensation tied to Embedded Value:

The stock price variation is closely correlated to embedded value movement. According to this principle, it could be interesting to base management compensation on the embedded value movement. This is common practice in countries such as in Europe. A good way of doing this can be to base compensation on the impact of decisions for which management has control. With this type of compensation, management will have to take care of the long-term impact of its decisions and it will have the tools to do so. However, we must be very careful when using embedded value because of its sensitivity to the assumptions underlying its calculation. To base compensation on the embedded value may induce manipulation of the assumptions underlying it.

1.6.2) Actuarial Appraisal Value:

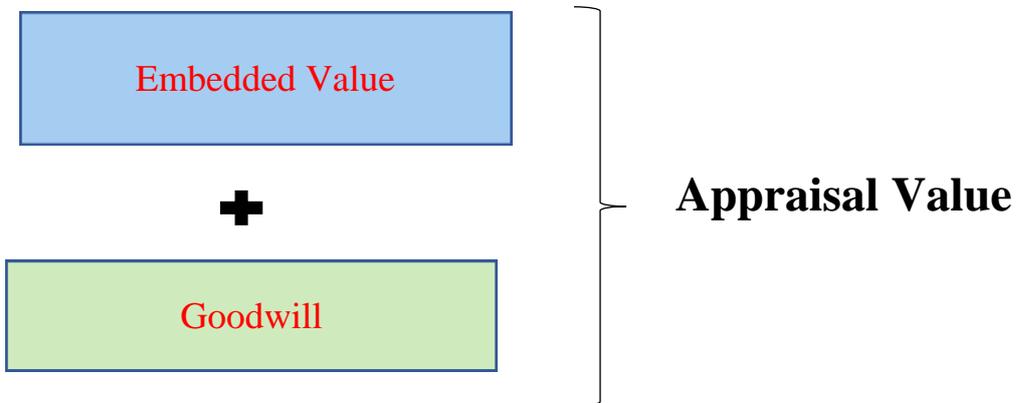
The embedded value methodology can also be used to determine the purchase price of a company or a block of business. This price is also known as the actuarial appraisal.

The actuarial appraisal represents the value of the in-force business and the value of future business that the company purchased will provide. The value of the future new sales is often expressed as a multiple of the value added by one year of sales. If the new sales return on investment is equal to the risk discount rate, then no additional value will be created by future new sales. Note that this is more likely to happen in appraisal value calculation than in embedded value calculation because the risk discount rate used for an actuarial appraisal is often higher than the risk discount used for the embedded value calculation.

1.6.3) Goodwill:

Goodwill is the difference between the total purchase price and the fair value of net assets. The new accounting rules do not assume that goodwill declines in value over time. Goodwill is not amortized. Instead, it is tested for impairment on an annual basis for applicable reporting units. The test is a comparison between the fair value of the reporting unit and its book value to determine if there is an impairment. If there is one, then the fair value of the net assets of the reporting unit must be compared to the fair value of the reporting unit to arrive at the fair value of the goodwill. The embedded value methodology, through the actuarial appraisal method, can be used to

determine the fair value of the reporting unit in purchase transactions involving insurance liabilities.



Chapter 2

Prevoir Traditional Embedded Value

2.1) Overview of business

Prevoir Vietnam (PVN) current businesses are generated from three channels: Vietnam post office channel (VNPOSTS), Bancassurance channel and agency channel. The table below summarise the in-force business as at the valuation date by channel:

Business by channel (VND millions)	Total Reserves	%
VNPOSTS	617.452	89%
Bancassurance	73.746	11%
Agency	127	0%
Total	691.325	100%

VNPOSTS was the major distribution channel of PVN, represent 89% of total reserves as at the valuation date. PVN also has entered in to agreements with different banks to sell the products. So far there are more than 20 banks selling PVN's products and the business from this channel represented 11% of PVN total reserves.

2.2) Summary of results

➤ The embedded value of the Company' business as at 30 September 2015 consisting of The adjusted net asset value, the value in-force business, together with number of adjustments. These values have been calculated on a "going concern" basis.

➤ All figures shown assume 100% ownership.

➤ The components of the embedded value are summarised in the table below under a range of risk discount rate:

Components of EV (VND Millions)	Risk discount rate		
	12%	14%	16%
Adjusted Net Asset Value	594.713	594.713	594.713
Value of in-force (VIF) before Cost of capital (CoC)	167.427	156.425	146.551
CoC	(39.097)	(46.288)	(54.945)
VIF after CoC	128.330	110.138	91.606
Unmodelled business	7.746	6.648	5.530
Cost of extra capital for Universal life (“UL”) products	(50.248)	(56.676)	(61.491)
Total VIF after CoC	85.828	60.109	35.645
Embedded value before adjustment	680.541	654.822	630.358

➤ Unmodelled business: We have use RAFM software to project the future cash flow of the company for calculating the Value of in-force of covered business. The software is modelled for the products covered 99.4% of total reserves for in-force business. For unmodelled business, we have adopted a gross-up approach, given the immaterial impact on value of such adjustment, i.e. the embedded value has been grossed-up for unmodelled business at an aggregate level by assuming the profitability of the unmodelled business is the same as for the total modelled business.

➤ Cost of Extra capital for UL product: Insurance companies conducting UL product in Vietnam must hold an additional solvency margin of VND 100 billion in addition to the minimum statutory level. In this valuation, we have included this additional capital of VND 100 billion at valuation date and allowed it to be released at the time that the last UL policy is off book.

➤ The method to derive the values is based on a traditional deterministic discounted cash flow methodology. This methodology makes implicit allowance for all risks including the cost of investment return guarantees and policyholder options, asset/liability mismatch risk, credit risk and the economic cost of capital through the use of a risk adjusted discount rate. Alternative approaches, such as “market consistent value”, have been developed where these risks are explicitly valued.

➤ The adjusted net asset value is based on the unaudited balance sheet account of the company as measured on the local statutory basis. The net asset value has been adjusted to reflect the market value of the non Universal Life fund assets based on the asset valuations of the company. For UL fund assets, no market value has been adjusted.

2.3) Sensitivity Test

In addition to the results shown above, we have calculated results to illustrate the sensitivity of the value of in-force business, to a range of alternative assumptions as at 30 September 2015. The sensitivities calculated were:

- Investment return increases by 50bp;
- Investment return decreases by 50bp;
- Lapse rates increase by 10%;
- Lapse rates decrease by 10%;
- Expense per policy increases by 10% and expense per premium increases by 10%;
- Expense per policy decreases by 10% and expense per premium decreases by 10%;
- Mortality/morbidity rates increase proportionally by 10%;
- Mortality/morbidity rates decrease proportionally by 10%;

- Adopt 100% of statutory minimum solvency margin;

The following table summarises the results of the sensitivity tests on the embedded value of the company as at 30 September 2015. For each sensitivity test, only the relevant parameter has been change and no consideration has been given to how other assumptions and tax payments might change in the scenario considered. The results are shown using a risk discount rate of 14% per annum.

Sensitivity of VIF (VND millions)	VIF before CoC	CoC	VIF after CoC	% Change
Base case	156.425	(46.288)	110.138	
Investment return increases by 50bp	159.062	(44.688)	114.374	4%
Investment return decreases by 50bp	153.869	(47.861)	106.008	(4%)
Lapse rate increase by 10%	154.502	(44.577)	109.924	0%
Lapse rate decrease by 10%	158.611	(48.118)	110.493	0%
Expenses increase by 10%	147.049	(46.288)	100.762	(9%)
Expenses decrease by 10%	165.797	(46.288)	119.509	9%
Mortality/morbidity rates increase by 10%	152.199	(46.245)	105.954	(4%)
Mortality/morbidity rates decrease by 10%	160.659	(46.331)	114.328	4%
Adopt 100% of statutory minimum solvency margin	156.425	(30.858)	125.567	14%

2.4) Methodology

➤ The components of embedded value of the company as at 30 September 2015 include:

- the adjusted net asset value, and
- the value of in-force business after the cost of capital

➤ The adjusted net asset value comprises required capital representing assets required to support the written business, and free surplus, representing excess assets potentially distributable to shareholders immediately.

➤ The net worth of a company can be defined as the excess of the market value of assets over liabilities (policyholder and other reserves). For the purposes of embedded value calculation, the net asset value has been taken from balance sheet as at 30 September 2015 of the company with certain adjustment to reflect the market value of the assets.

➤ The value of in-force business has been taken to the present value of the future statutory earnings arising after tax, which will be available for distribution to the shareholders of the company. The choice of risk discount rates used to value the stream of future profits should be commensurate with the yield obtainable by placing the capital in alternative investment of similar risk.

➤ In order to derive the distributable earnings expected to emerge in future years, we performed a projection of the following revenue items for its main product lines:

	Premium income received
Plus	Investment income
Less	Death claims, surrenders and maturities
	Other claims payments
	Commissions and other agency compensation

Operating expenses
 Policyholder dividends
 Increase in statutory reserves
 Tax payment
 Change in solvency margin

➤ Cost of holding required capital: to the extent that part of the company's assets are required to support its solvency margin and will earn interest at a rate below the rate of discount being assumed, there will be an economic cost involved. This cost is reflected by a cost of capital adjustment to the value of in-force business.

2.5) Assumptions

➤ The economic and operating assumptions used to determine the results take the company's recent operating experience into account. These assumptions have been made on a "going concern" basis, assuming continuation of the economic and legal environment currently prevailing in Vietnam.

Mortality/Morbidity

The mortality assumptions were set up based on the company's pricing assumptions and their recent actual experience. A summary of mortality assumptions used in this valuation is shown in the following table:

Mortality assumptions	EDU 2	AVP/ AVP 2	AVL/ AVL 2	EDU 3	CRL /CR L2	CRL 3	EDV2	TL2	RT L2	ST L
Mortality	55% of CSO1980 (Male)				56% of CSO1980		56% of CSO1980	Death: 55% of CSO1980 (Male) TPD: 15% of mortality	55% of CSO1980 (Male)	
Accidental Death	n/a	0,03%	n/a	n/a	n/a	0,0675%	0,1%	n/a		

Lapse

The lapse assumptions below has been set based on typical lapse levels in Vietnam insurance market

Lapse assumptions									
Policy year	EDU2	AVP/AVP2	AVL	E_AV L	EDU3	CRL/CRL2	CRL3	EDV2	Term life series
1	5% all years	4%	0%	0%	5% during premium payment period and 0% for the rest policy term	15% all year	10% all year	2,5% during premium payment period and 5% for the rest policy term	0%
2		7,5%	10,5%	11,5%					
3		7%	17,5%	16%					
4		6%	12%	10,5%					
5		8%	10%	7%					
6		14%	9%	6%					
7		12%	9%	6%					
8		11%	9%	6%					
9		10%	8%	6%					
10		9%	7%	6%					
11		8%	6%	6%					
12		7%	6%	6%					
13+		6%	6%	6%					

Expenses

Unit expenses: As the company is in an expense overrun position, we have adopted the unit expense assumptions in line with the industry experience and the company's own operation features. The expenses overrun has been investigated at company level based on adopted unit expense assumptions and taking into account the company's future new business growth plans.

Expense assumptions						
	First year expenses			All year expenses		
Product	Per policy (VND)	% Premium for acquisition	% Premium for marketing fee	Per policy (VND)	% Premium for maintenance	% Premium for marketing fee
Ordinary Par	350.000	15%		100.000	5%	0%
Universal Life (except AVP2)	350.000	15%		150.000	5%	0%
AVP2	350.000	15%	15%	150.000	5%	0%
CRL1	45.000	5%		20.000	2%	33%
CRL2	45.000	5%		20.000	2%	20%
CRL3	45.000	5%		20.000	2%	3.6%
STL	45.000	5%		20.000	2%	5%
TL2	45.000	5%		20.000	2%	2%
RTL2	45.000	5%		20.000	2%	0%

Commission rates and other agency compensation

The assumptions for commission and other sales remuneration include both initial and renewal commissions, bonuses and overrides paid directly to the distributors.

Commission assumptions							
Product	Type	Premium term	Channel	1 Yr	2 Yr	3 Yr	4 Yr+
EDU2	Premium	All	VNPOSTS	40%	5%	5%	5%
AVP/AVP2	Premium	All	VNPOSTS	20,3%	4%	4%	4%
AVP/AVP2	Extra Premium	All	VNPOSTS	1,8%	1,8%	1,8%	1,8%
AVL	Saving contribution	All	VNPOSTS	5,3%	4,3%	4,3%	4,3%
AVL	COI	All	VNPOSTS	10%	10%	10%	10%
AVL	Fund Value	All	VNPOSTS	0,1%	0,1%	0,1%	0,1%
AVL	Extra contribution	All	VNPOSTS	4,3%	4,3%	4,3%	4,3%
E_AVL	Saving contribution	All	VNPOSTS	7,3%	2,8%	2,8%	2,8%
E_AVL	COI	All	VNPOSTS	10%	10%	10%	10%
E_AVL	Fund Value	All	VNPOSTS	0,1%	0,1%	0,1%	0,1%
E_AVL	Extra contribution	All	VNPOSTS	2,8%	2,8%	2,8%	2,8%
EDU3	Premium	5	Agency	20%	4%	4%	0%
EDU3	Premium	8	Agency	26%	6,4%	6,4%	0%
EDU3	Premium	9	Agency	28%	7,2%	7,2%	0%
EDU3	Premium	10+	Agency	30%	8%	8%	0%
EDV2	Premium	5	Agency	25%	6%	6%	0%
EDV2	Premium	10	Agency	40%	10%	10%	0%
EDV2	Premium	15	Agency	40%	10%	10%	0%
RTL2	Premium	All	Banca	0%	0%	0%	0%

STL	Premium	All	Banca	0 – 15%	0 – 15%	0 – 15%	0 – 15%
TL2	Premium	All	Banca	0 – 40%	0 – 40%	0 – 40%	0 – 40%
CRL/CRL2/CRL3	Premium	All	Banca	0 – 15%	0 – 15%	0 – 15%	0 – 15%

Commission override (based on premium)		
Product	Prem_term	1 Yr
EDU3	5	29,44%
EDU3	8	31,06%
EDU3	9	31,60%
EDU3	10+	32,14%
EDV2	5	28,14%
EDV2	10/15	32,94%

Investment return

We have assume the following investment returns for each product type as at 30 September 2015, taking into account prevailing market conditions and the company's current liability features

Investment return assumption					
	EDU2	AVP/AVP2/AVL/ E-AVL	EDU3/EDV2	CRL series	Term life series
Investment return on non-unit reserve	6,5%	6,5%	6,5%	6,5%	6,5%

and required capital					
Gross interest rate on UL fund	n/a	6,7%	n/a	n/a	n/a
Net interest rate on UL fund	n/a	4,4%	n/a	n/a	n/a

Expense inflation

An expense inflation assumption of 5% p.a has been applied in this valuation.

Taxation

The enterprise income tax is essentially a tax on profits. The current tax rate is 22% for 2015 and 20% for future years.

Reserving basis

The mathematics reserves as at valuation date and projected into the future were calculated on the statutory reserving methods and bases of the company and have been assumed to continue unaltered.

Required capital

The required capital and statutory reserves assumed in the EV reflect any amount of assets allocated to the business whose distribution to shareholders is restricted. The minimum solvency margin requirement is defined as the sum of 4% of statutory reserves and 0,1% of sum at risk (if the contract term is less than or equal to 5 years) or 0,3% of sum at risk (if the contract term is greater than 5 years).

For this valuation, we have adopted required capital as 150% of the statutory minimum solvency margin defined by the Ministry of Finance. A sensitivity test under 100% of minimum solvency margin is also shown above.

Insurance company conducting universal life business in Vietnam must hold an additional solvency margin of VND 100 billion in addition to the minimum statutory level as defined above. In this valuation we have included this additional solvency margin of VND 100 billion at the valuation date and allowed it to be released at the time that the last universal life policy is off book.

In addition, life insurance companies must make annual contributions of 5% of after-tax profits to establish a compulsory reserve fund (“Compulsory Reserves”) which is maintained at a maximum level of 10% of their Charter Capital. The compulsory reserve fund acts as an extra cushion ensuring the solvency of the insurance business operation. As at the valuation date PVN held 496 million VND Compulsory Reserves in the balance sheet.

Life insurance companies also need to make annual contributions of 1% of before-tax profits to establish a Contingency Reserves which is maintained at a maximum level of 5% of the premium collected in current fiscal year. As at valuation date PVN held 100 million VND Contingency reserves in the balance sheet.

Policyholder dividend

In this valuation, we have assumed that 70% of the total surplus will be distributed to policyholders based on long term unit expense assumptions.

Risk discount rate

The risk discount rate chosen required considerable judgement, but in general should reflect the investors’ required return on investment and the risk associated with realising future expected earnings.

In this valuation we have adopted 14% as the central RDR, which is a combination of the risk free rate to reflect the time value of money plus risk margin to make allowance for the risk that actual experience in future years differs from that assumed in the projections underlying the results.

2.6) Model Summary

The cash flow projections for individual products were performed at model point level by using RAFM software from Towers Watson. Product lines modelled in RAFM include Universal Life, Participating, Credit Life and Term Life.

We have modelled 13 major in-force products which represent 99.4% of the in-force statutory reserves as at valuation date.

2.7) Results

Net asset value

The balance sheet and the net asset value of the company under statutory basis as at the valuation date is shown in the following table:

Statutory balance sheet as at 30 Sep 2015 (VND millions)	
Cash and cash equivalent	38.783
Short-term investments	316.449
Account receivable	154.969
Other current assets	3.046
Fixed assets	14.046
Long-term investment	806.531
Construction in progress	200
Long-term deposits	14.305
Other long-term assets	3.901
Total assets	1.352.229
Current liabilities	56.918

Technical reserves	712.508
Other liabilities	16.127
Total liabilities	785.553
Paid-in capital	800.000
Compulsory reserves	496
Undistributed earnings	(233.820)
Total shareholder's equity	566.676

All the assets on the balance sheet are classified as Held-to-maturity and valued on a book value basis. An adjustment has been made on shareholder equity to reflect the difference between the market value and book value of non-UL fund assets. The adjustment and the final adjusted net asset value is summarised as in the table below:

Adjusted net asset value as at 30 September 2015 (VND millions)	
Shareholders' equity	566.676
Adjusted for revised total reserves by PVN	14.142
Revaluation of assets to market value	13.895
Adjusted net asset value	594.713

Value of in-force business

The table below shows the value of the in-force business for life insurance business after tax and the cost of holding required capital as a risk discount rate of 14%:

Product	Number of policies	Reserves (VND millions)	VIF @ 14%
Universal life	100.880	616.254	141.416
Participating	604	5.277	899
Credit life	220.250	22.566	13.804

Term life	19.863	29.079	306
Total	341.597	673.176	156.425

The following tables summarize the results at risk discount rate of 12%, 14% and 16% respectively:

Product	Risk discount rate (VND million)		
	12%	14%	16%
Adjusted net asset value	594.713	594.713	594.713
Modelled business			
- Universal Life	152.045	141.416	132.600
- Participating	981	899	825
- Credit Life	14.086	13.804	12.845
- Term Life	315	306	280
Value of in-force before Cost of capital	167.427	156.425	146.551
Cost of required capital	(39.907)	(46.288)	(54.945)
Value of in-force after Cost of capital	128.330	110.138	91.606
Unmodelled business	7.746	6.648	5.530
Cost of extra capital for UL products	(50.248)	(56.676)	(61.491)
Total value of in-force business	85.828	60.109	35.645
Embedded value before adjustments	680.541	654.822	630.358

2.8) Limitations

The method to derive the value is based on a deterministic approach to value the cash flow. This method implicit values the cost of the policyholder options, investment guarantees, asset/liability mismatch risk, credit risk and the economic cost of capital through a discount rate which is loaded for these risks. Recently alternative approaches such as a “market consistent value”, have been developed where the risk are explicitly valued. The company has not examined the value which could be obtained using these alternative approaches.

The values attributable to the life insurance business are highly dependent on the results of financial projections. In developing the projections, assumptions are made about future experience, including economic and investment experience, tax, expenses, lapse rates, mortality and legislation. These assumptions have been made on the basis of reasonable estimates. However, actual future experience is likely to differ from these assumptions, due to random fluctuations, changes in the operating environment and other factors. Such variations in experience could have a significant effect on the results.

The projections and values developed have been prepared on a “going concern” basis and assume a continuation of the current economic/political/social environment prevailing in Vietnam. These projections, and values, therefore rely on the inherent assumption that the environment in Vietnam will remain stable.

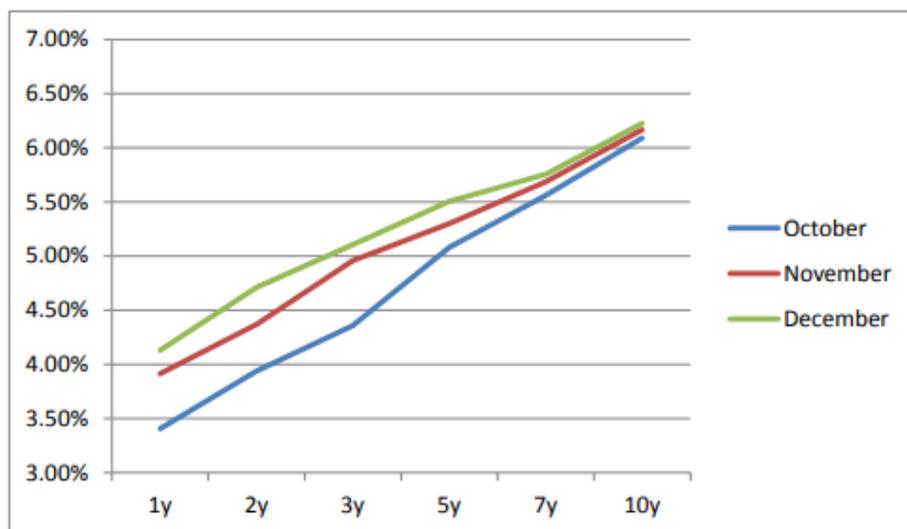
2.9) The difficulty in applying the Embedded Value concept in Vietnam

There are many difficulties in applying the Embedded value concept in practice:

✓ In practice, we usually use the software to calculate the embedded value. In life insurance company, there are many products to sell in the market. We need to model all products in the software. This task may take a lot of effort. In reality, we may model only the key products (has large sale in the portfolio). The un-modelled products will be gross up to calculate the embedded value of total company.

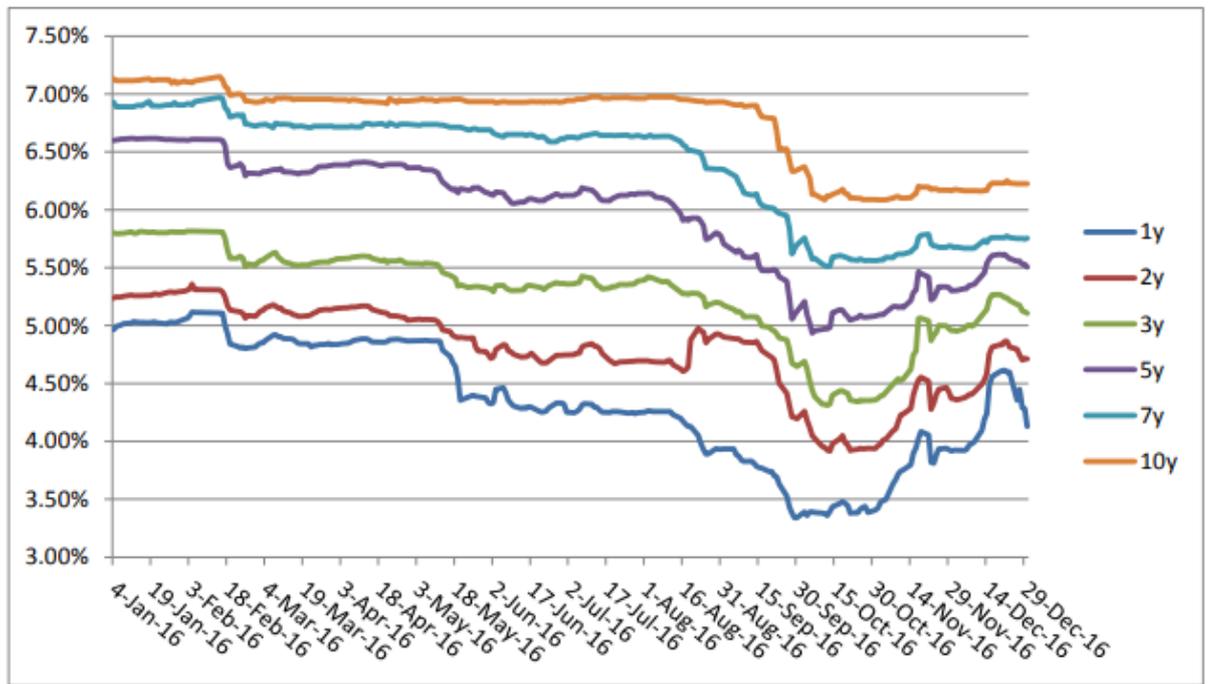
✓ The Risk discount rate (RDR) has a large impact in the result of embedded value calculation. Low RDR will create a large Value of inforce (VIF) and the embedded value of the company. The choice of RDR may be subjective to the management of the company. In Vietnam, RDR = Risk free rate + Equity risk premium where Risk free rate is the yield of 10 years government bond (around 6% per annum at end year 2016) and the equity risk premium is around 4% per annum. So the central RDR is 10% per annum and the other RDR scenarios are 8% and 12% respectively.

Figure 5: VBMA Gov' Bond Yield Fixing Curve at the end of October, November and December 2016



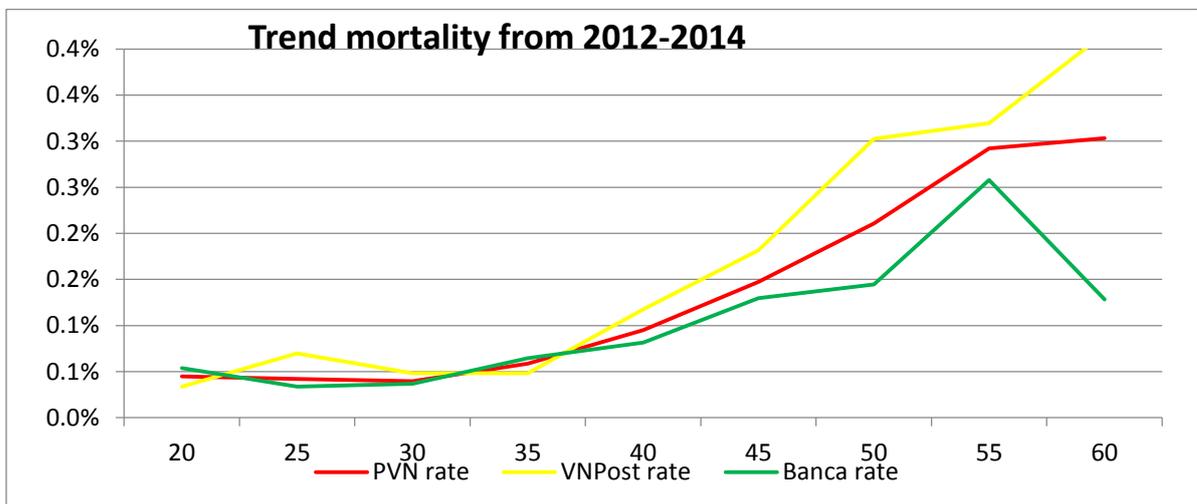
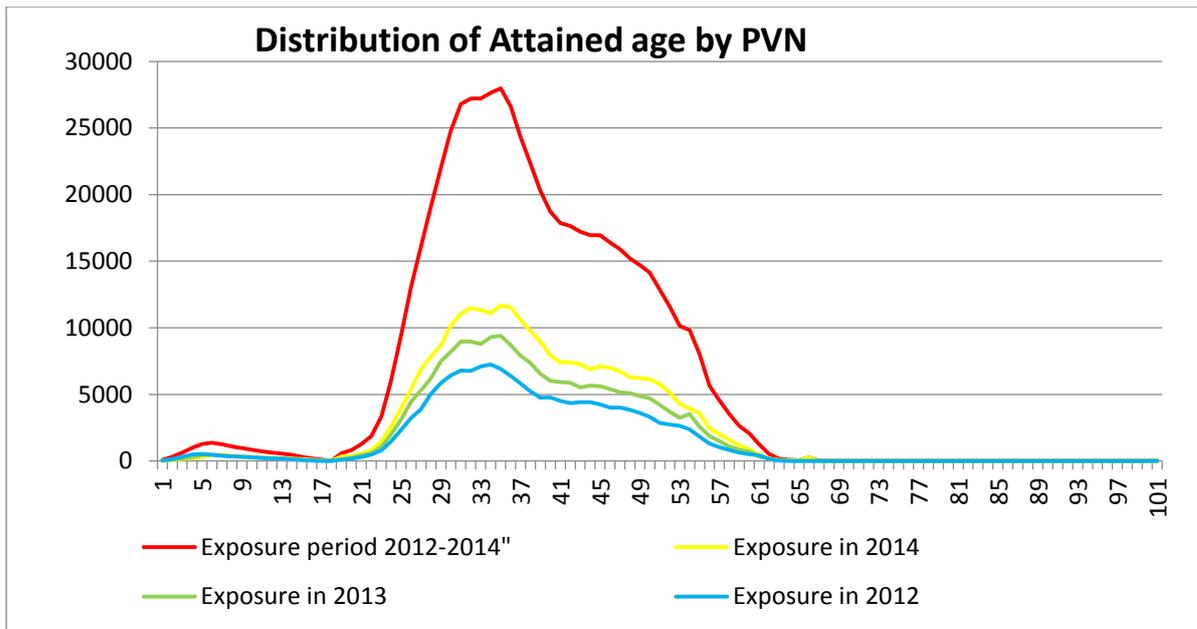
Source: VBMA

Figure 6: Movement of VBMA Gov' Bond yield fixing in 2016.



Source: VBMA

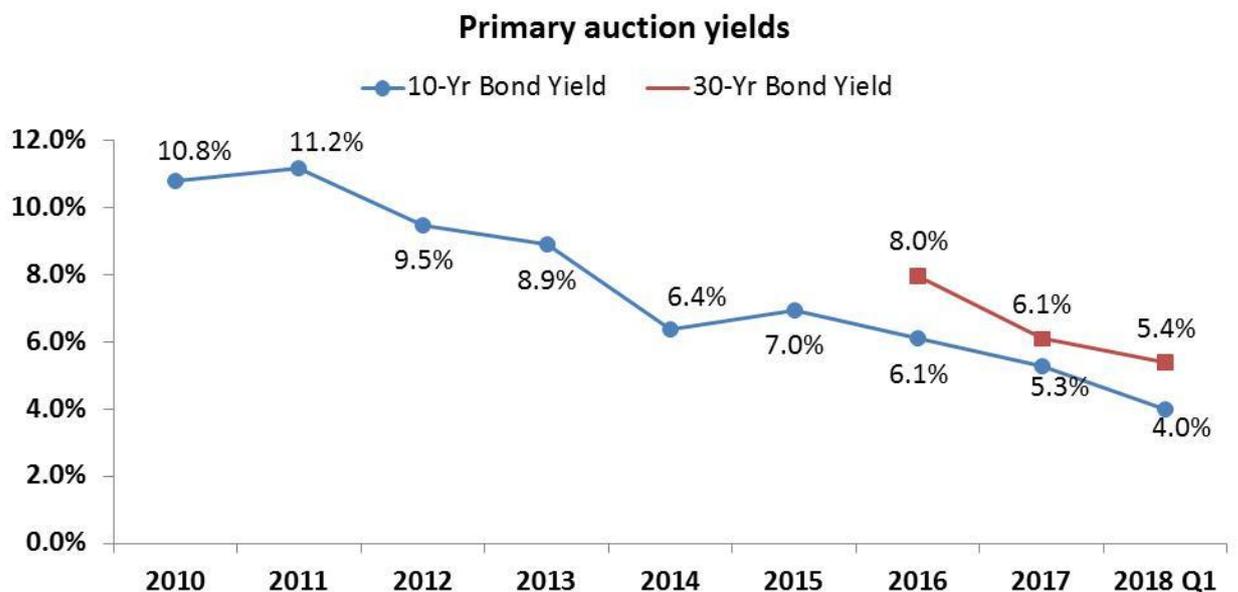
✓ For life insurance products, there are many economic and non-economic assumptions when we project the future financial cash flows to calculate the Value of inforce (VIF). The first assumption is the best estimate mortality/morbidity rate to project the future benefit cash flows. In Prevoir, we use 55% - 60% of CSO 1980 table to be the best estimate mortality assumption. The actual mortality rate of Prevoir is around 30% of CSO 1980 as statistic of Actuary department. But this figure may not be reliable because of the limit of small amount of claim data and the methodology when we apply the mortality study. In Vietnam market, there are not enough claim data for mortality study. The Society of Actuary (SOA) has collected the claim data for Vietnamese market with the contribution of life insurance companies in Vietnam in recent years. The average mortality rate of Vietnam market is around 55% - 60% of CSO 1980 table. So we use the average mortality rate of the market to project the future cash flows. The high mortality rate assumption may decrease the profit after tax and lower the VIF and the embedded value.

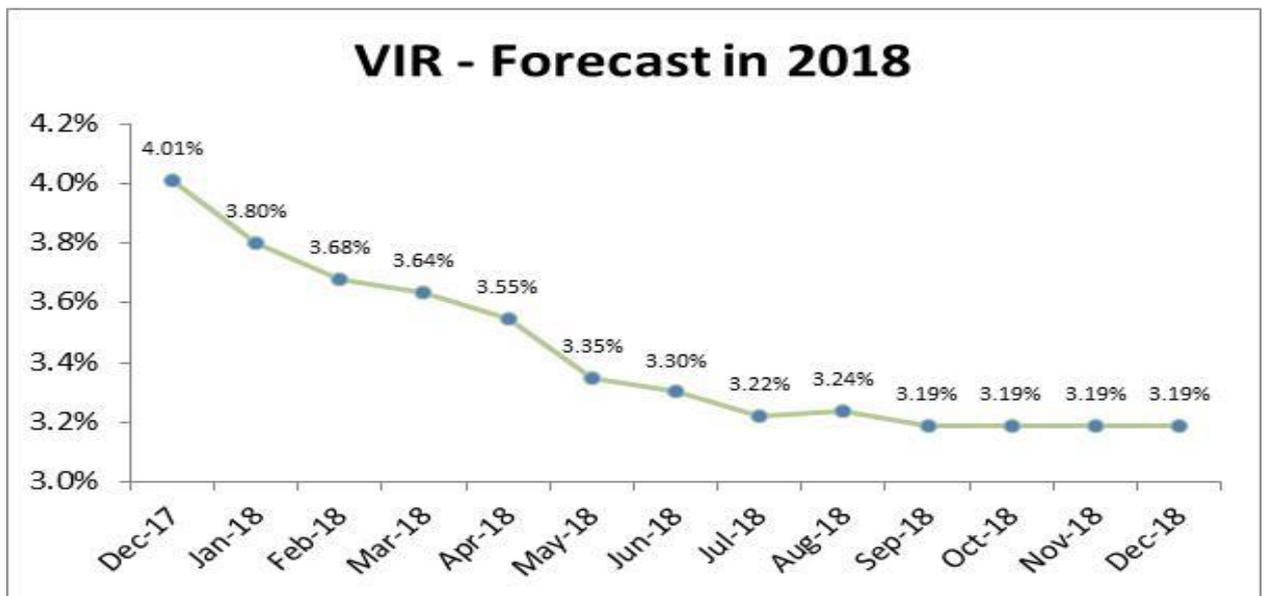


✓ The another significant assumption is the lapse assumption. Normally, we use the best estimate lapse rate assumption to project future cash flows. And the lapse assumption has a quite large impact in the future profit of life insurance company. If the actual lapse rate is higher than the best estimate lapse rate, the future profit will decrease very rapidly in the future. The life insurance company business will not create value for their shareholder. So we must be very careful to use the lapse assumption to calculate the embedded value.

✓ The remaining important assumption is the investment return assumption. The investment return has important impact on the profit of life insurance company. High investment return, high profit and vice versa.

The life insurance companies in Vietnam mainly invest their assets in term deposit and government bond. The current yield of Vietnam government bonds decrease so fast in year 2016 and 2017 (5% per annum). The decrease in government bond yield creates many problems for life insurance company in Vietnam. The profit of life insurance companies in Vietnam decrease so much at the end of year 2017. Another problem is the decrease of valuation interest rate (from 6% to 4%) due to the large decrease in yield of government bond. The large companies in Vietnam mainly sell the Endowment products (90% of portfolio). The large decrease in the valuation interest rate will increase the mathematical reserve the huge amount (estimate around 9.000 Bil VND or 450 mil USD). The huge amount increase in reserves will destroy the profit and also the embedded value of life insurance company in Vietnam. The life insurance companies in Vietnam need a large capital injection to keep the solvency ability. The dividend and bonus to the customer will decrease a significant amount.





Impact to the industry - 2017

- Total reserves increased by c. 9,000 bn due to decrease in VIR
- 12/18 life insurers reported total statutory loss of c. -4,600 bn.
- Additional capital injection to the industry of c. 13,300 bn

✓ In summary, The VIF will depend on the projected future cash flows which based on many assumptions about mortality/morbidity, lapse, investment return....So actuary need a care judgment when they define the assumption the embedded value exercise. A wrong assumption will mislead the embedded value calculation. Applying the embedded value concept in practice faces many difficulties in their assumptions and methodology. The traditional embedded value concept also depends on the Risk discount rate (RDR) choice. In practice, we use the CAPM model to calculate the RDR. To define the β coefficient and Equity risk premium is also the challenge. The used data will impact the result a lot and create the different in RDR of life companies. Current, the life companies in Vietnam use RDR range from 8% to 14%.

✓ Another challenge in calculating the embedded value in practice is the calculation of Net Asset Value. Because many assets in the balance sheet are only the book value. It may not reflect the market value of the assets. So we need to mark to market the value of assets. This task may take a lot

of effort. We may have not enough market data to mark to market all the assets. The accountant needs a careful judgment to assess the fair value of assets of the company. When we calculate the embedded value of Prevoir Vietnam, we only use the book value of assets from the accounting for the Net Asset Value because we have not enough market data to mark to market all assets of the company. We only use the market value for bond assets. This limit also creates the difficulty when we present the value of the Prevoir Vietnam with the potential investors.

✓ The embedded value concept excludes the Value of new business (VNB). We just present the 1 year new business for the reference information. We will define the Appraisal value of the company as the multiplicative factor of the embedded value (around 1,2 of the embedded value for Prevoir Vietnam). For the large insurance company, the VNB will be the important part of the total value of the company because of their ability to realize the future new sale and create the value for their shareholders. So to define the reasonable multiplicative factor of embedded value is quite a challenging task for the actuary.

Chapter 3

European Embedded Value

3.1) Presentation

The CFO (Chief Financial Officers) Forum was created in 2002. This is a working group of CFO of the large European insurance companies. The goal of this organization is to be at the heart of new standard to improve the transparency of financial market. It also seeks to ensure that the transition to new standards which are carried out as easily as possible. The two major projects of the CFO Forum are Embedded Value and the new IFRS standards. It has been chaired since 2010 by Dieter Wemmer, CFO of Zurich Financial Services Group. The working group on Market Consistent Embedded Value is currently led by Hans Wagner, Chief Risk Officer for the Life segment of AXA. From a practical point of view, the CFO Forum meets several times a year to study the documents of one of its members.

Below is the list of different companies which are its members:

AEGON N.V.
Allianz SE
Assicurazioni Generali S.P.A.
AXA SA
Aviva plc
BNP Paribas Assurance
CNP Assurances
Fortis B.V.
Hannover Rueckversicherung AG
IF P&C Insurance
ING Groep N.V.
Legal & General Group plc
Mapfre S.A.
Münchener Rückversicherungs-Gesellschaft
Old Mutual plc
Prudential Assurance Company plc
Scottish Widows Group
The Standard Life Assurance Company

Swiss Reinsurance Company
Zurich Financial Services Group

The major members of this organization are the large insurance and reinsurance group.

3.2) European Embedded Value Principles

Below are the principles of European Embedded Value:

Principle 1: Embedded Value (EV) is a measure of the consolidated value of shareholders' interests in the covered business.

Principle 2: The business covered by the EVM should be clearly identified and disclosed.

Principle 3: EV is the present value of shareholders' interests in the earnings distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business. The EV consists of the following components:

- Free surplus allocated to the covered business
- required capital, less the cost of holding required capital
- Present value of future shareholder cash flows from in-force covered business (PVIF).

The value of future new business is excluded from the EV.

Principle 4: The free surplus is the market value of any capital and surplus allocated to, but not required to support, the in-force covered business at the valuation date.

Principle 5: Required capital should include any amount of assets attributed to the covered business over and above that required to back liabilities for covered business whose distribution to shareholders is restricted. The EV should allow for the cost of holding the required capital.

Principle 6: The value of future cash flows from in-force covered business is the present value of future shareholder cash flows projected to emerge from the assets backing liabilities of the in-force covered business ("PVIF"). This value is reduced by the value of financial options and guarantees as defined in Principle 7.

Principle 7: Allowance must be made in the EV for the potential impact on future shareholder cash flows of all financial options and guarantees within the in-force covered business. This allowance must include the time value of financial options and guarantees based on stochastic techniques consistent with the methodology and assumptions used in the underlying embedded value.

Principle 8: New business is defined as that arising from the sale of new contracts during the reporting period. The value of new business includes the value of expected renewals on those new contracts and expected future contractual alterations to those new contracts. The EV should only reflect in-force business, which excludes future new business.

Principle 9: The assessment of appropriate assumptions for future experience should have regarded to past, current and expected future experience and to any other relevant data. Changes in future experience should be allowed for in the value of in-force when sufficient evidence exists and the changes are reasonably certain. The assumptions should be actively reviewed.

Principle 10: Economic assumptions must be internally consistent and should be consistent with observable, reliable market data. No smoothing of market or account balance values, unrealised gains or investment return is permitted.

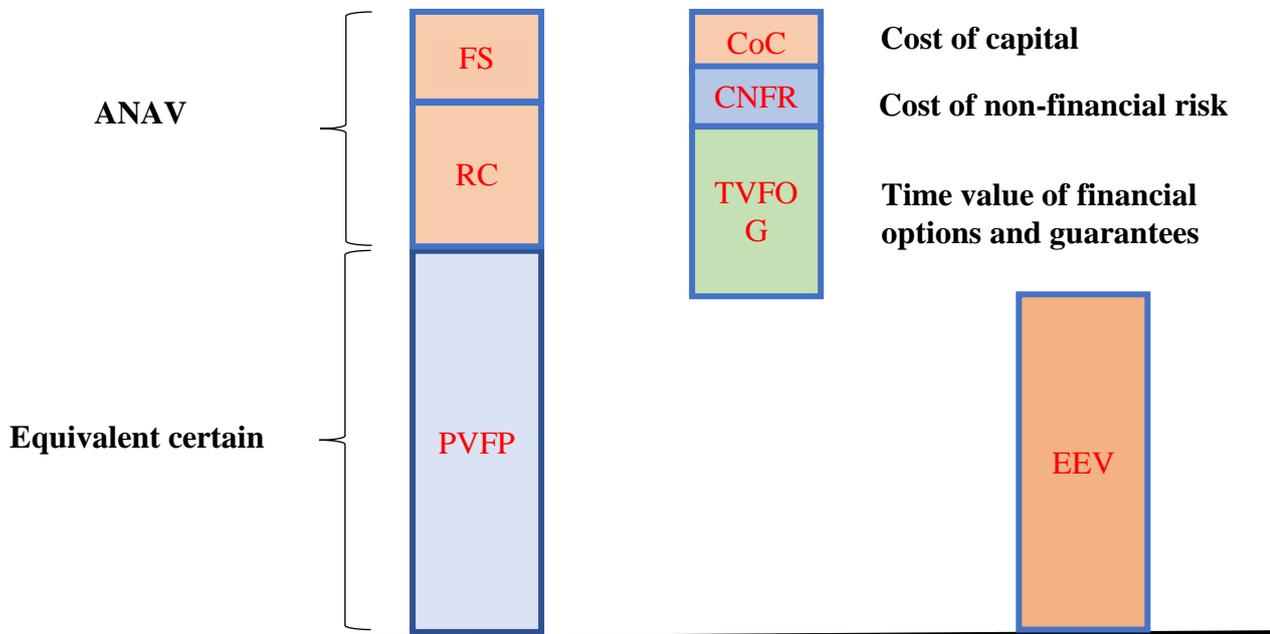
Principle 11: For participating business the method must make assumptions about future bonus rates and the determination of profit allocation between policyholders and shareholders. These assumptions should be made on a basis consistent with the projection assumptions, established company practice and local market practice.

Principle 12: The scope of disclosures should be commensurate with the EV results presented. The level of disclosures should be sufficient to enable users to understand the methodology and assumptions, key judgements and sensitivities of the EV results being presented to key assumptions. As a minimum the following should be disclosed:

- Assumptions, methodology and key judgements underlying the EV results shown;
- Sensitivities of results shown to changes in key assumptions;
- An explanation of results compared to the prior period; and

- Any areas of non-compliance with the EV Principles and Guidance.

3.3) Constitution of the European Embedded Value



The European Embedded Value is thus determined by two main items:

➤ The Adjusted Net Asset Value (ANAV) corresponds to the market value of the assets representing own funds (including the unrealized) and certain reserves for shareholders. Usually, it is calculated on the basis of the net assets published under IFRS with some restatements of provisions. It can itself be subdivided into 2 items:

- Required capital (RC): should include any amount of assets attributed to the covered business over and above that required to back liabilities for covered business whose distribution to shareholders is restricted.
- Free surplus (FS): is the market value of any capital and surplus allocated to, but not required to support the in-force covered business.

$$\text{ANAV} = \text{RC} + \text{FS}$$

➤ The Value of in-force (VIF) consists of:

- Certain equivalent (Present value of future profits – PVFP): It is the present value of future profits generated by inforce business.

- Time value of financial options and guarantees (TVFOG): generally, this value is calculated as the difference between the value of the portfolio from the average of all stochastic scenarios and the value of the certain equivalent.
- Cost of capital (CoC): is the difference between the amount of required capital and the present value of future releases, allowing for future investment return, of that capital.
- Cost of Non-Financial Risk (CNFR): Under operation risks, a risk premium is included in the calculation of EV.

$$\text{VIF} = \text{PVFP} - \text{TVFOG} - \text{COC} - \text{CNFR}$$

And Finally:

$$\text{EV} = \text{ANAV} + \text{VIF}$$

3.3.3) The choice of Risk Discount Rate

The choice of Risk Discount Rate is the fundamental element in the calculation of EEV.

The RDR illustrates the rate of return on investment expected by shareholders on their shares which have been invested in the insurance company. Despite the European Embedded Value Principles provided elements for more accurately calculating this rate, they did not set out a precise methodology. Thus the tricks regarding the choice present during the Traditional Embedded Value quickly reappeared.

In practice, the RDR is calculated according to two main methods:

● Top-down approach

This is the simplest method. It consists of adopting a WACC (Weighted Average Cost of Capital) typically using the CAPM model (Capital Asset Pricing Model) based on historical volatility of the share of insurance company. However, for non-listed companies this method is difficult to apply. In addition, this approach delivers a single rate for the entire company. There is no distinction by country or product type. Even so, the Top-down approach is just from a theoretical point of view. It does not correspond ultimately to the philosophy of the European Embedded Value. Objective is the best approximate the economic value of the portfolio.

Finally, the CAPM is invalidated by several studies.

WACC and CAPM

The average cost of capital is a financial theory. A company makes money by obtaining returns on investment above its cost of capital. WACC is expressed as a percentage. For example, if a company has a WACC at 10%, this means that all investments must have a return higher than 10% to avoid losing money.

The WACC is calculated as follows:

$$\text{WACC} = \frac{D}{P} r_d (1 - t_c) + \frac{E}{P} r_e$$

Where:

D: the company's debt

E: market capitalization of the company at market value

P = D+E = the company's liabilities

r_d : the cost of debt

r_e : the cost of equity

t_c : the company tax

The cost of equity is often calculated using the CAPM:

$$r_e = r_f + \beta (r_m - r_f)$$

Where:

r_f : the risk free rate

β : the volatility of the profitability of the insurance company compared with that of the market

$r_m - r_f$: the risk premium

The method is based on the β of the whole company. However, the purpose here is to evaluate only the Life sector of the company. Some papers propose to adapt WACC to adjust it but this approach remains satisfactory to calculated Embedded Value.

	AEGON	Allianz	Aviva	ING	L&G
Currency	Euro	Euro	Sterling	Euro	Sterling
Risk free	3.60%	3.60%	4.60%	4.60%	4.50%
Equity Risk Premium	3.20%	3.50%	3.00%	3.60%	3.00%
Beta	N/A	0.90	1.40	1.20	1.35
Cost of Equity	N/A	6.75%	8.80%	8.92%	8.55%
Cost of Debt	N/A	-	3.90%	4.50%	3.90%
Debt/equity ratio	N/A	0/100	30/70	30/70	20/80
Group WACC	N/A	6.75%	7.40%	7.59%	7.60%
Adjustments to Group WACC	N/A	-	(0.10)%	-	(0.10)%
RDR	6.80%	6.75%	7.30%	7.59%	7.50%
Risk margin	3.20%	3.15%	2.70%	2.90%	3.00%

● Bottom-up approach

The underlying idea behind the Bottom-up approach is that the choice of RDR should reflect the risks undertaken by the company. This is therefore determined according to the product profile and the geographical location. It will be noted that this point is specifically mentioned in The European Embedded Value principles 22. Nevertheless, it is necessary to distinguish several Bottom-up approaches:

➤ Bottom-Up Direct Market-Consistent Approach

This is the most successful form of Bottom-up approach. It foreshadows what will be called the Market Consistent Embedded Value (MCEV) approach.

Each cash-flow is measured using similar financial instruments: the choice of RDR for a cash flow from an equity asset will be evaluated by an equity model that will differ from a bond cash flow evaluated by a bond model. Cash flows are thus updated according to the RDR of their own providing the value of EV. The rate used for the same product may also differ according to the calculation carried out: NBV or EV.

This approach is technically cumbersome since the granularity is finer. It requires to establish a rate of return and an RDR for each product which can be difficult to achieve in practice when the products are complex.

Example:

Consider the example of a company financing 80% of a debt at an interest rate 5% and having 20% of capital. This company has 100 assets with rate of return established in Best Estimate at 7%

	Year 0	Year 1
Assets	100	107
Debt	80	84
Capital	20	23

Thus, the value of the firm is 20 in year 0. To move from one year to another, assets must be discounted at the rate of 7%, the debt at the rate of 5%. The RDR is calculated as follow:

$$\frac{100 * 7\% - 80 * 5\%}{100 - 80} = 15\%$$

For no confusion, it must be understood that the RDR is only an output of the methodology. It is the establishment of the correct RDR according to the Asset returns that may be a problematic.

➤ Bottom-Up Indirect Market-Consistent Approach

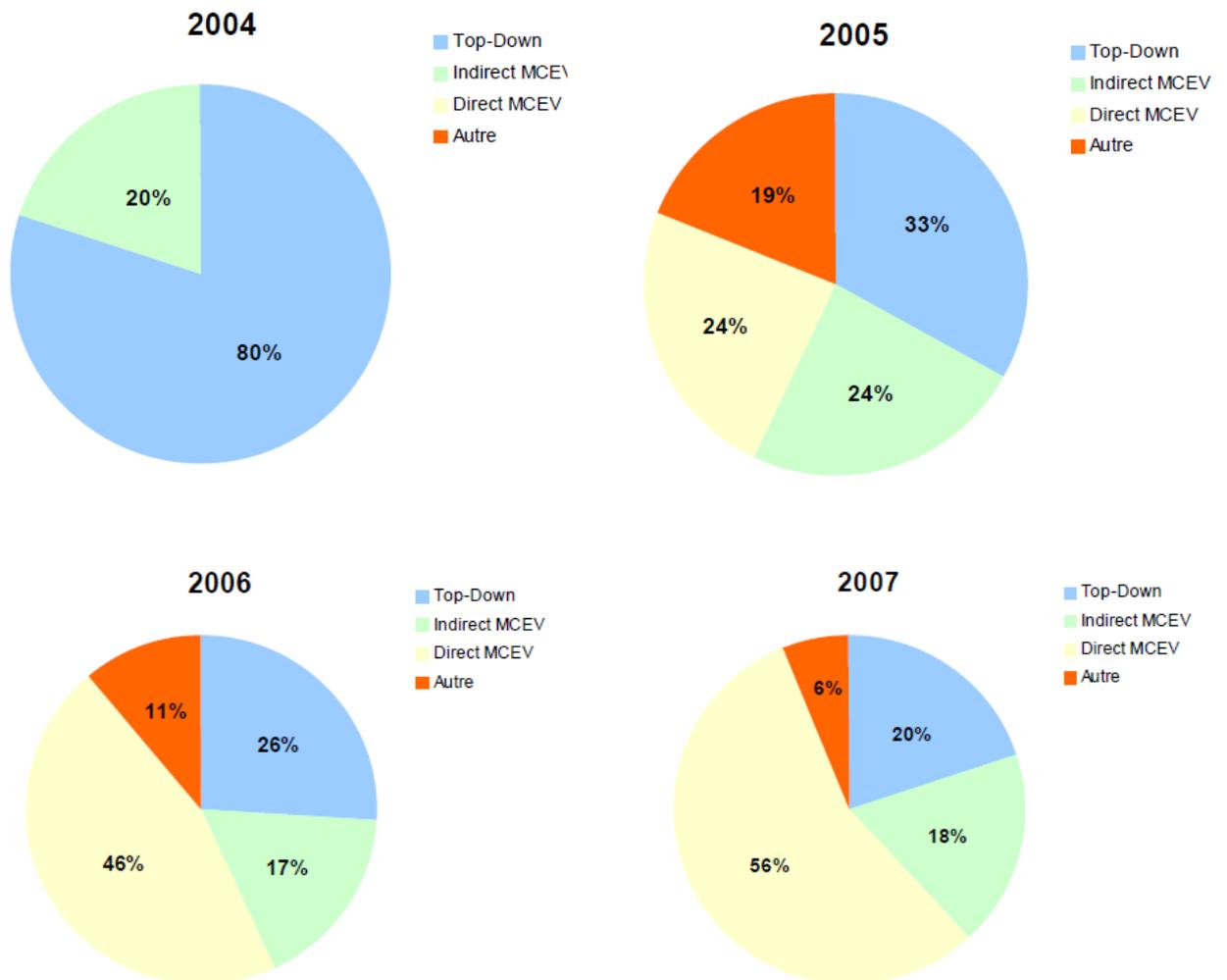
The indirect approach has been developed recently. The aim is to simplify the calculations. Indeed, any future cash flow needs to be discounted with a rate coherent with the rate of return assumption. The trick is to establish future cash flows adjusted by the risk free rate. These cash flows are then all discounted at the risk free rate. This approach is easier put in place in practice: the choice of RDR is obvious, this is the risk free rate.

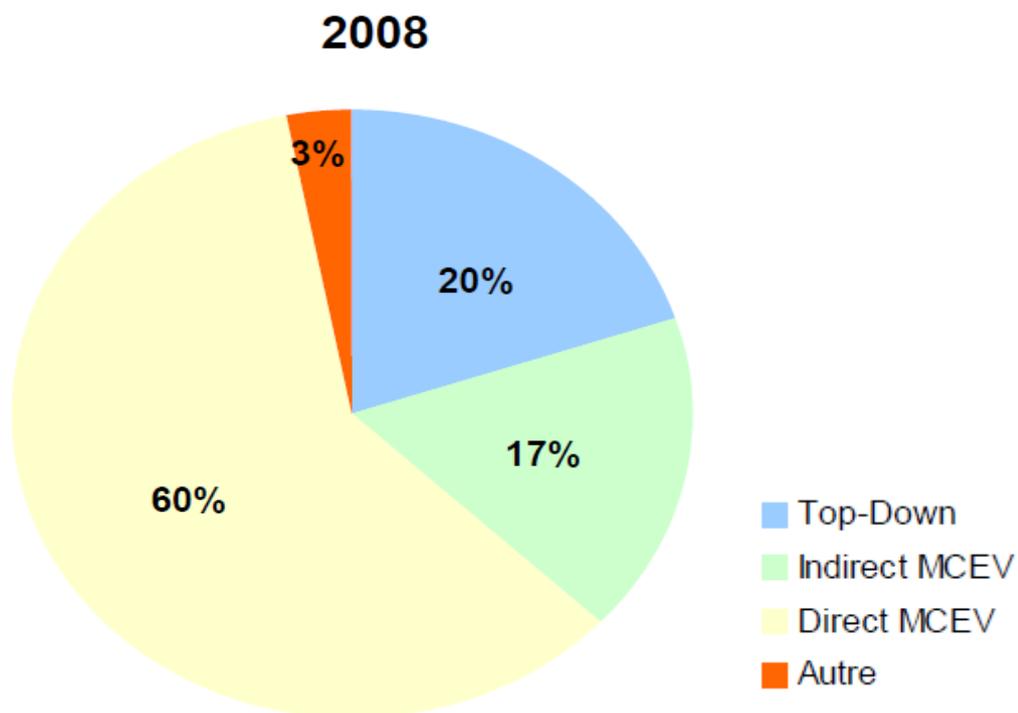
Let us take again the example as before, simply choose the rate of return for financial assets is the risk free rate, say 5%. And:

	Year 0	Year 1
Assets	100	105
Debt	80	84
Capital	20	21

Thus, the RDR in this case is 5%.

Here is the breakdown by year of the different methodologies for the calculation of Embedded Value:





Source: Towers Perrin

The trend towards an Embedded Value publication using MCEV methodology and more precisely Direct Bottom-Up MCEV appears here clearly. In 2008, more than 75% of the companies that have published the Embedded Value which follow the MCEV evaluation.

Chapter 4

Market Consistent Embedded Value

4.1) Market Consistent Embedded Value

On June 2008, The CFO Forum originally published Market Consistent Embedded Value ('MCEV') Principles, in order to bring greater consistency and improved disclosure to the European insurance industry's Embedded Value disclosures. Specifically, the MCEV Principles were designed to bring:

- A shareholder's perspective on value, being the present value of future cash flows available to the shareholder, adjusted for the risks of those cash flows.
- A market consistent approach to financial risk.
- A greater focus on disclosing cash emerging from covered business.
- Disclosure of combined Group MCEV information.

Principle 1: Market Consistent Embedded Value (MCEV) is a measure of the consolidated value of shareholders' interests in the covered business. Group Market Consistent Embedded Value (Group MCEV) is a measure of the consolidated value of shareholders' interests in covered and non-covered business.

Principle 2: The business covered by the MCEVM should be clearly identified and disclosed.

The MCEVM should, where material, include, as a minimum, any contracts that are regarded by local insurance supervisors as long-term life insurance business.

The MCEVM may cover short-term life insurance such as group risk business and long-term accident and health insurance business. Where mutual funds and short-term healthcare are regarded as part of or ancillary to a company's long-term life insurance business, then it may be regarded as covered business.

The MCEVM may be applied by group companies that are not predominantly long term insurance companies. For example the MCEVM may be applied to covered business provided by non-insurance groups and operations such as banking groups and pension funds.

Principle 3: MCEV represents the present value of shareholders' interests in the earnings distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business. The allowance for risk should be calibrated to match the market price for risk where reliably observable. The MCEV consists of the following components:

- Free surplus allocated to the covered business
- Required capital; and
- Value of in-force covered business (VIF).

The value of future new business is excluded from the MCEV.

Principle 4: The free surplus is the market value of any assets allocated to, but not required to support, the in-force covered business at the valuation date.

Free surplus is determined as the market value of any excess of all assets attributed to the covered business but not backing liabilities over the required capital to support the covered business.

Principle 5: Required capital is the market value of assets, attributed to the covered business over and above that required to back liabilities for covered business, whose distribution to shareholders is restricted.

The level of required capital allocated to each regulated entity should meet at least the shareholders' portion of the level of solvency capital in respect of covered business at which the supervisor is empowered to take any action. It would also include any amount "encumbered" by local supervisory or legal restrictions that prevents its distribution or removal from supporting the covered business.

The required capital should include amounts required to meet internal objectives. The internal objectives could be based on an internal risk assessment or that required capital to obtain a targeted credit rating.

Principle 6: The value of in-force covered business (VIF) consists of the following components:

- Present value of future profits (where profits are post taxation shareholder cash flows from the in-force covered business and the assets backing the associated liabilities) (PVFP)
- Time value of financial options and guarantees as defined in Principle 7
- Frictional costs of required capital as defined in Principle 8
- Cost of residual non hedgeable risks as defined in Principle 9.

Principle 7: Allowance must be made in the MCEV for the potential impact on future shareholder cash flows of all financial options and guarantees within the in-force covered business. The allowance for the time value of financial options and guarantees must be based on stochastic techniques using methods and assumptions consistent with the underlying embedded value. All projected cash flows should be valued using economic assumptions such that they are valued in line with the price of similar cash flows that are traded in the capital markets.

Principle 8: An allowance should be made for the frictional costs of required capital for covered business. Where Solvency II is adopted for solvency reporting, and the Solvency II risk margin contains sufficient allowance for the frictional costs of required capital, no further allowance for frictional costs of required capital is required.

Principle 9: An allowance should be made for the cost of non hedgeable risks not already allowed for in the time value of options and guarantees or the PVFP. This allowance should include the impact of non hedgeable non financial risks and non hedgeable financial risks. An appropriate method of determining the allowance for the cost of residual non hedgeable risks should be applied and sufficient disclosures provided to enable a comparison to a cost of capital methodology.

Principle 10: New business is defined as that arising from the sale of new contracts and in some cases increases to existing contracts during the reporting period. The value of new business includes the value of expected renewals on those new contracts and expected future contractual alterations to those new contracts. The MCEV should only reflect in-force business, which excludes future new business. The value of new business should reflect the additional value to shareholders created through the activity of writing new business.

Principle 11: The assessment of appropriate assumptions for future experience should have regarded to past, current and expected future experience and to any other relevant data. The assumptions should be best estimate and entity specific rather than being based on the assumptions a market participant would use. Changes in future experience should be allowed for in the VIF when sufficient evidence exists. The assumptions should be actively reviewed.

Principle 12: Economic assumptions must be internally consistent and should be determined such that projected cash flows are valued in line with

the prices of similar cash flows that are traded on the capital market. No smoothing of market or account balance values or unrealised gains is permitted.

Principle 13: VIF should be discounted using discount rates consistent with those that would be used to value such cash flows in the capital markets.

Principle 14: The reference rate is a proxy for a risk free rate appropriate to the currency, term and liquidity of the liability cash flows.

➤ Where the liabilities are liquid the reference rate should, wherever possible, be the swap yield curve appropriate to the currency of the cash flows.

➤ Where the liabilities are not liquid the reference rate should be the swap yield curve with the inclusion of a liquidity premium, where appropriate.

The basic risk-free interest rate term structure, credit risk adjustment, Matching Adjustment and Volatility Adjustment as calibrated and applied in Solvency II is a possible application of this Principle.

Principle 15: Stochastic models and the associated parameters should be appropriate for the covered business being valued, internally consistent and, where appropriate, based on the most recent market data. Volatility assumptions should, wherever possible, be based on those implied from derivative prices rather than the historical observed volatilities of the underlying instruments.

Principle 16: For participating business the method must make assumptions about future bonus rates and the determination of profit allocation between policyholders and shareholders. These assumptions should be made on a basis consistent with the projection assumptions, established company practice and local market practice.

Principle 17: The scope of disclosures should be commensurate with the MCEV results presented. The level of disclosures should be sufficient to enable users to understand the methodology and assumptions, key judgements and sensitivities of the MCEV results being presented to key assumptions. As a minimum the following should be disclosed:

- Assumptions, methodology and key judgements underlying the MCEV results shown;
- Sensitivities of results shown to changes in key assumptions;
- An explanation of results compared to the prior period; and
- Any areas of non-compliance with the MCEV Principles and Guidance.

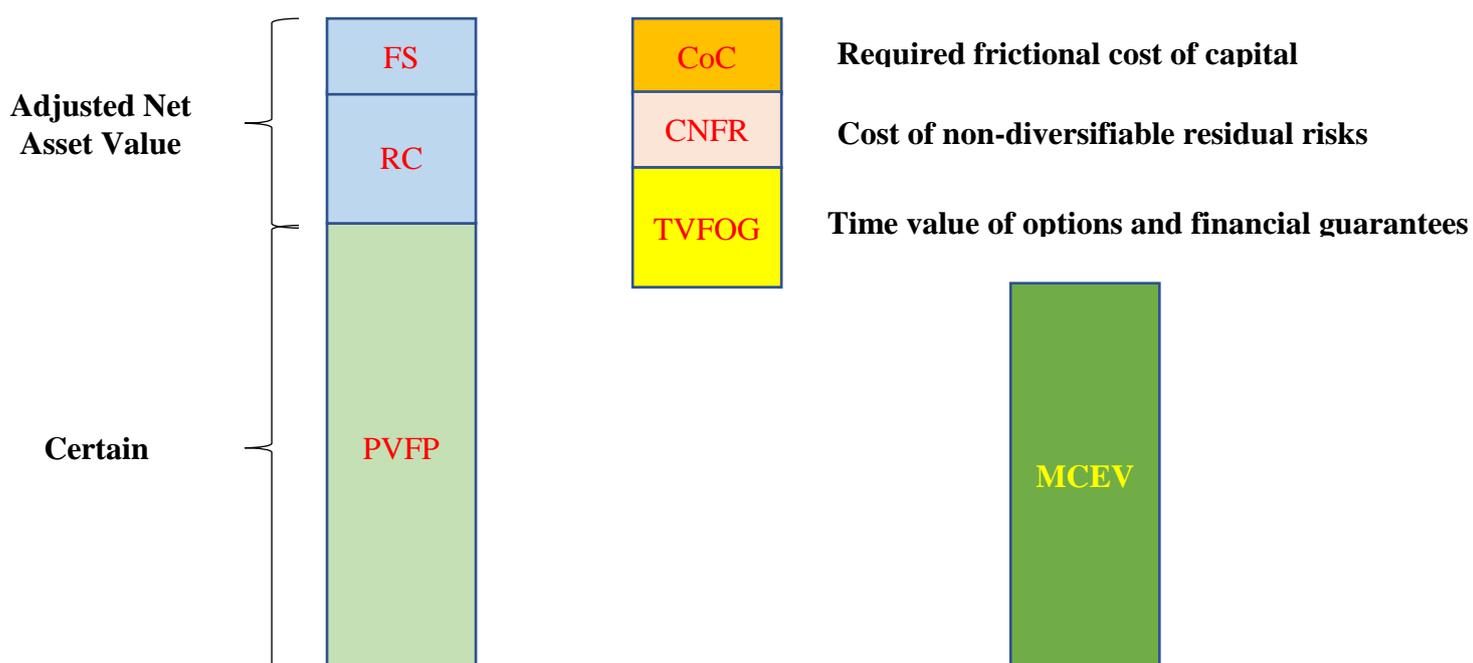
4.2) The Market Consistent Embedded Value – Key points

These adoptions of these principles has several objectives:

- Allow an easier comparison between different companies.
- Correct principal defects of EEV (RDR) so that finally the Embedded Value becomes an indicator to be used with confidence and more easily. But the MCEV principles not only make a correction, they guarantee a better homogeneity of publications.
- To allow a comparison at group level since a Group MCEV must finally be calculated.
- To understand how the future profits of the VIF will materialize in cash flows.

4.3) The important modifications

- i) The calculation of the VIF is slightly modified. It is now calculated as:
- The present value of future profits (no change),
 - Minus the time value of options and financial guarantees (TVOG)
 - Minus required the frictional cost of capital
 - Minus the cost of non-diversifiable residual risks

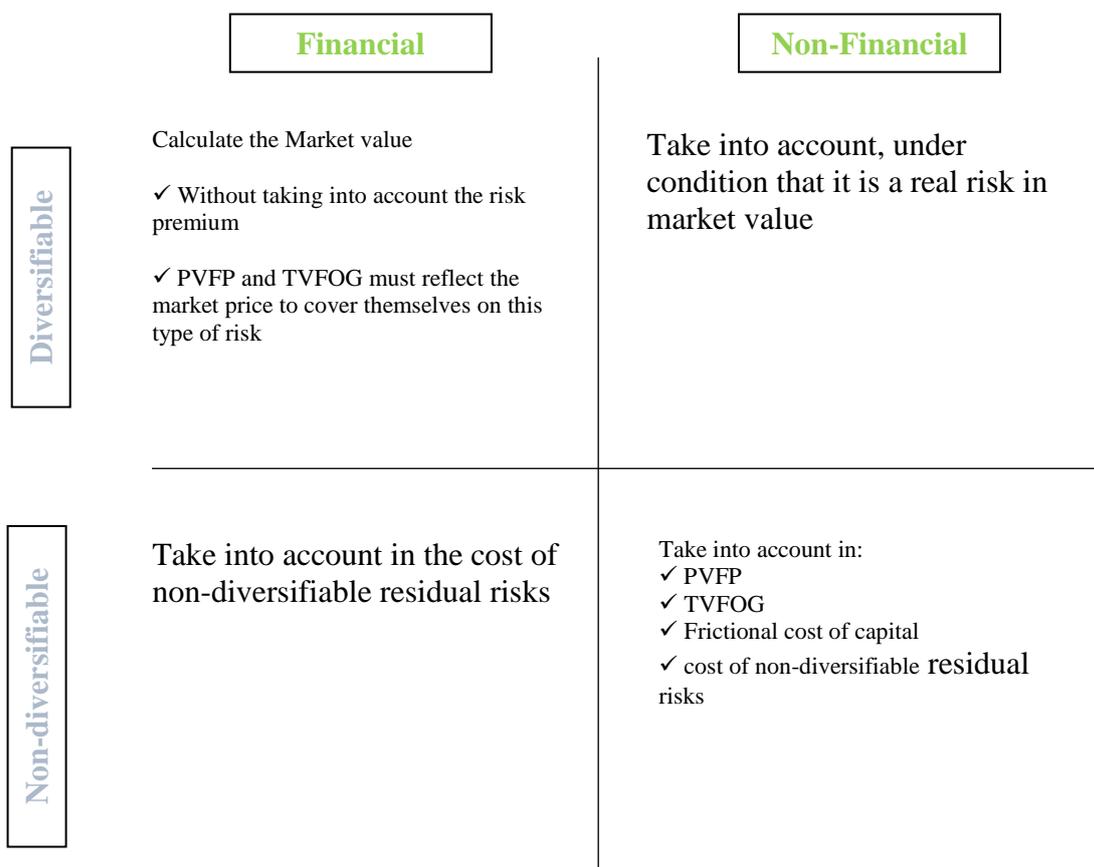


- ii) The required capital must be calculated at market value and net of subordinated debt or the funds from the policyholders. The MCEV principles do not stipulate how it is calculated but it must be at least equal to the minimum statutory required capital.
- iii) The risks are now valued via market value. The use of the market value concept is reflected in Guidance G3.3, focus on the interest of shareholders. The CFO Forum recognized that the most insurance liabilities are not directly evaluated in market value term. The valuation taking place as close as possible to the assets traded in the market which replicate the same cash flows.
- iv) The required frictional cost of capital consists of:
 - The tax: it takes into account the effect of double taxation. If the shareholder had the opportunity to invest directly in insurance business, he would not have to bear the double taxation, corporate income tax and capital gain tax. This phenomenon of double taxation has much been discussed. Even if the theoretical explanation is correct, it is totally false in practice. It is not be able to invest directly in insurance business, it means that he should create his own business. The main interest of taking into account of company tax is that the obtained final value can be compared with these which would be provided by other investments.
 - Investment costs related to the return on investments.
- v) The CFO Forum set out the reference rates to be used as the risk free rate: the swap rates. The CFO Forum is justified by giving the Advantages and Disadvantages of the choice of these reference rates in paragraph 139 of the Basis for conclusions. On the other hand, the CFO Forum is not more precise as the choice of the curve which could create slight distortion. Furthermore, no liquidity premium should not be added even if the CFO Forum recognized that there are arguments in his favor. The CFO forum believes that a liquidity premium is not added to allow easier comparison of the different results. The CFO Forum also notes that a few companies calculating an MCEV take into account the liquidity premium (the analysis was correct before the financial crisis).
- vi) The Market consistent valuation should take into account the risk of default of the company. This has been the subject of many debates. It is the fact that the shareholders should be compensated to invest in an asset that potentially goes into bankrupt.

vii) The stochastic models must be based on non-historical and implicated volatilities. Calibration can be done on the basis of volatilities of the market options which replicate as close as possible the options and guarantees of the liabilities. Nevertheless, Guideline G15.3 states that the volatility assumptions can be adjusted if the market seems to behave irrationally.

However, this Guidance is important because it demonstrates that the CFO Forum recognized that the MCEV is not a Fair Value and the price given by the market is not necessarily the real price. Finally, the MCEV is a little like democracy, it is “the least worst method”.

viii) The cost of non-diversifiable residual risks is probably the most difficult to decipher. To understand a little better, let us observe the following diagram:



Indeed, the CFO Forum considers that the MCEV should reflect all risks, including non-diversifiable residual risks to which shareholders are exposed. Thus, the allocation for non-diversifiable residual risks must correspond to the difference between the PVFP and the MCEV. These assessments of these risks are left to the management's discretion. This difference will result because of:

- Asymmetries in the impact of the risks on shareholder value; and
- Risks that are not allowed for in the time value of options and guarantees or the PVFP (e.g. operational risk).
- Model risk in evaluating Best Estimate Scenarios.
- Model risk when certain liabilities could not be estimated on the basis of the financial assets existing on the markets and thus had to be extrapolated.

ix) In the calculation assumptions, in addition to the new sensitivities to be published, there are two new elements which are compulsory to publish:

1. The movement analysis must decompose into Free surplus, Required Capital and VIF. The main work of the analyst is to understand how, year after year, the Embedded Value is materialized in cash and stumbling. Thus, the passage of the MCEV from year N-1 to year N must be published in the following format:

	Earnings on MCEV analysis			
	Free Surplus	Required Capital	VIF	MCEV
Opening MCEV				
Opening adjustments				
Adjusted opening MCEV				
New business value				
Expected existing business contribution (<i>reference rate</i>) ⁽¹⁾⁽²⁾				
Expected existing business contribution (in excess of <i>reference rate</i>) ⁽¹⁾⁽³⁾				
Transfers from VIF and <i>required capital</i> to free surplus				
Experience variances				
Assumption changes				
Other operating variance				
Operating MCEV earnings				
Economic variances				
Other non operating variance				
Total MCEV earnings				
Closing adjustments				
Closing MCEV				

⁽¹⁾This represents the following two components:

- Expected earnings on *free surplus* and *required capital*; and
- Expected change in *VIF*.

⁽²⁾The earnings assuming assets earn the beginning of period *reference rate*.

⁽³⁾The earnings is the component in excess of the *reference rate* reflecting the additional return consistent with the expectation of management for the business.

The amounts are net of taxes.

For illustration:

Description	Total	NAV	FS	RC	VIF
Opening MCEV	82 373	45 115	-324	45 439	37 258
Opening adjustments	-	-	-	-	-
Adjusted opening MCEV	82 373	45 115	-324	45 439	37 258
New business value	6 015	-985	-2 660	1 675	7 001
Expected business contribution (reference rate)	1 830	1 005	1 005	-	825
Expected business contribution (in excess of reference rate)	3 907	67	67	-	3 840
Transfers from VIF and required capital to free surplus	-0	9 399	9 040	359	-9 399
Experience variances	1 733	-2 485	-8 132	3 647	4 218
Assumption changes	4 213	-	-	-	4 213
Other operating variances	-223	-24	-1 687	1 663	-199
Operating MCEV earnings	17 475	6 977	-367	7 344	10 498
Economic variances	-2 314	2 052	2 163	-111	-4 366
Other non-operating variances	2 466	2 466	2 466	-	-
Total MCEV earnings	17 627	11 494	4 262	7 233	6 133
Closing adjustments	-	-	-	-	-
Closing MCEV	100 000	56 610	3 938	52 672	43 390

The adoption of the standard format for Embedded Value publications is not an innocuous point. Until now, all the publication present the different tables, the format was not the same. Although the information is generally presented, the adoption of the standard format for communications allows analysts to save their precious time since they do not have to familiarize themselves with the specificities of the publication of each company. This initiative should be encouraged and expand to other published material.

In addition, this format allows analysts to understand how transformation of value into cash. It is now possible to understand how much value is reinvested in the company for its development and which part of the value created is redistributed to the shareholders. From the point of view of analysts, it is the vital point to make the Embedded Value credible.

2. The publication of Group Embedded Value: in order to avoid the Embedded Value is the calculation which is limited to the actuarial services of the insurance company and not being considered by the management, it is necessary to publish an estimation of the Total value of the enterprise. In addition, markets and analysts are not interest in a partial value of a company but rather the completeness of the group. This is now done on the basis of this Group MCEV which

is the Net Asset Value in IFRS format. Several Guidances detail the calculation methodology. Finally, the CFO Forum provides, like the movement analysis, the publication format:

	<i>Covered business MCEV</i>	<i>Non covered business IFRS</i>	<i>Total Group MCEV</i>
<i>Opening Group MCEV</i>			
<i>Opening adjustments</i>			
<i>Adjusted opening Group MCEV</i>			
<i>Operating MCEV earnings</i>			
<i>Non-operating MCEV earnings</i>			
<i>Total MCEV earnings</i>			
<i>Other movements in IFRS net equity</i>			
<i>Closing adjustments</i>			
<i>Closing Group MCEV</i>			

4.4) The difficult of applying MCEV concept in Vietnam

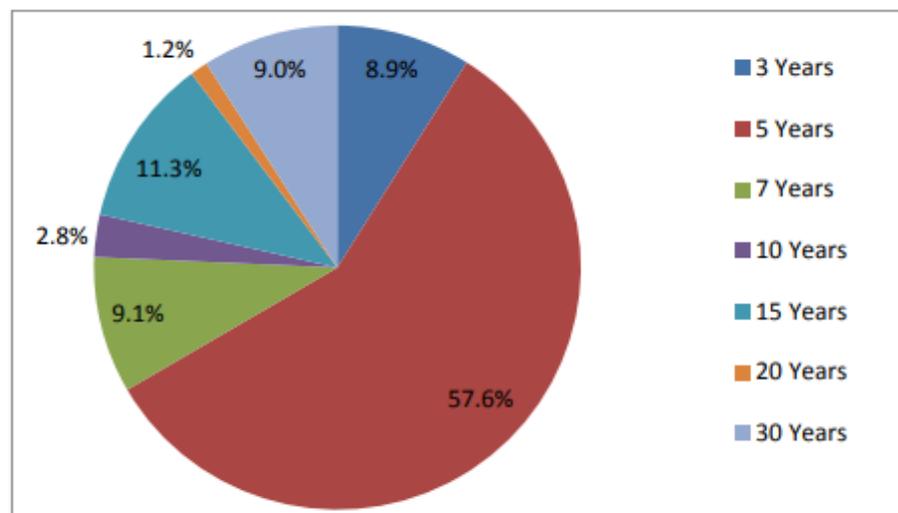
✓ MCEV concept is quite new concept to the life insurance company in Vietnam. No life insurance companies in Vietnam publish their MCEV report to the public. All the future projection cash flows will use the risk free rate in the risk neutral world. The Risk Discount Rate (RDR) will also be the risk free rate. It is one of the advantages of market consistent approach. RDR is not subjective to the management of the life insurance company. But to evaluate the Time value of options and guarantees (TVFOG), we need to use 1.000 to 2.000 interest rate scenarios for the stochastic simulation. The suitable interest rate scenarios are critical input for the stochastic simulation which produces a reasonable result. Prevoir Vietnam has bought this 1.000 interest rate scenarios from Tower Watson firm with quite expensive price. But the interest rate scenarios are created from the Economic Scenario Generation (ESG) software of the consulting firm at a point in time. In the future, the interest rate scenarios will change and the life insurance company should buy another 1.000 interest rate scenario set to capture many changes in the market. This process may take a lot of resources and expenses of the company.

Prevoir 1.000 interest rate scenarios

Scenario	Period	GOV_1	GOV_2	GOV_3	GOV_4	GOV_5	GOV_6	GOV_7	GOV_8	GOV_9	GOV_10	GOV_11	GOV_12	GOV_13	GOV_14	GOV_15
1	0	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
1	1	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
1	2	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
1	3	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
1	4	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
1	5	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
1	6	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
1	7	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
1	8	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
1	9	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
1	10	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	0	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	1	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	2	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	3	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	4	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	5	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	6	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	7	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	8	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	9	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081
2	10	0.044	0.048	0.052	0.054	0.057	0.058	0.059	0.061	0.064	0.066	0.069	0.07	0.072	0.074	0.081

✓ MCEV concept requires projected cash flows are valued in line with the prices of similar cash flows that are traded on the capital market. But in practice, we may have difficulty to find the similar assets with the projected cash flows of life insurance company. The assets are easy to find the market value is bond assets. But we may not find the suitable zero coupon to replicate the liability cash flows of life insurance company. The stock market in Vietnam has just developed in recently. The stock market may be not liquid and the assets in the market are not diversity. For the bond market, we can find only government bond of 10 years or 15 years. If the liability cash flows of life insurance company is longer than 15 years, it is difficult to find a bond to match with this liability.

Figure 2: Tenor structure of bond issued in 2016



Source: HNX, VBMA

✓ MECV requires the proxy for the risk free rate as the swap yield curve. The swap market in the developed countries is very large and liquid. But in Vietnam, the swap market has not developed yet. It is difficult to have enough market data to construct the swap yield curve as proxy for the risk free rate. We just use the government bond yield curve as the proxy for the risk free rate. The swap market in Vietnam is also illiquid. So we should add the liquidity premium to the swap yield curve as the proxy for the risk free rate. But we may not have enough market to calculate the liquidity premium for the swap market in Vietnam.

✓ Principle 15 of MCEV principle state that volatility assumptions should, wherever possible, should be based on those implied from derivative prices rather than the historical observed volatilities of the underlying instruments. The Vietnam government has just recently established the derivative market in year 2016 for the investors have an insurance tool to protect their stock portfolio. The stock market in Vietnam is an unstable stock market. The market price can increase or decrease so much in the short time period. The increase in price of stock may not depend on the increase in value of the underlying company. It may be due to the speculation and mentality of the investors. So we should be careful to use the Vietnam stock price to estimate the parameters for our financial models. The estimation of volatility may be too high in one period because the high volatility of the stock price. The derivative market is very young and not mature. So it is not reliable to estimate the implied volatility from the derivative market data in Vietnam.

On 1 July 2015, Decree 42/2015/ND-CP (**Decree 42**) became effective. This represents the first phase in setting out the legal framework for trading derivatives securities in Vietnam and is an important step in the development of the derivatives market in Vietnam generally.

1. Background

To date, the derivatives market and related legislation in Vietnam has been in its infancy. Before Decree 42, permissible derivatives were limited to basic currency products such as foreign exchange transactions, interest rate swap transactions and commodity swap transactions entered into for hedging purposes between a Vietnamese bank or a Vietnamese branch of a foreign bank (each licensed under the relevant regulations of the State Bank of Vietnam (**SBV**)) and a Vietnamese counterparty. A licensed Vietnamese bank or a Vietnamese branch of a foreign bank could also enter into cross-border derivative transactions (such as an interest rate swap) with an offshore counterparty depending on the transaction and counterparties involved and subject to approval from SBV which was granted on a case-by-case basis.

✓ Principle 17 of MCEV principles state that the scope of disclosures should be commensurate with the MCEV results presented. The level of disclosures should be sufficient to enable users to understand the methodology and assumptions, key judgements and sensitivities of the MCEV results being presented to key assumptions. In Vietnam, no life insurance companies publish their MCEV report (except Daiichi life Vietnam just calculate their MCEV but consolidate at their group level in Japan. In Asia, only Japan companies use MCEV as the embedded value standard reporting to the market.). In Vietnam, as there are no reports of MCEV from the life insurance companies, so we do not have any information about how the life insurance companies apply the MCEV concept in their management reporting system. The life insurance companies have also not been listed in the stock market. So it is difficult for the public to evaluate the fair value of the life insurance company in Vietnam. We also do not know how to link the embedded value of life insurance company with their market stock price. This problem will create the difficult for the management of life insurance company to manage the company in the aspect that their decision will create the value for the shareholders and the

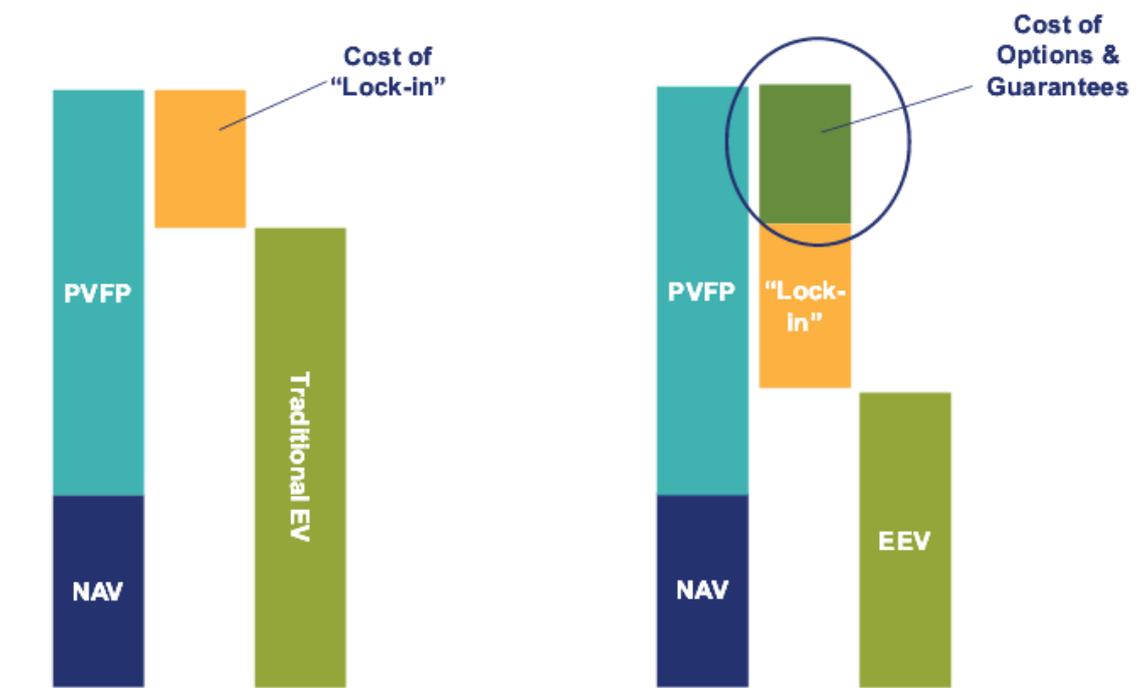
customers. The embedded value system is an important tool for the management of life insurance company to manage the company in right direction that create the value for the shareholders and the customers. I think that Vietnam should develop the traditional embedded value system first because the stock market data can support the CAPM model to calculate the Risk discount rate (RDR). We can define the reasonable assumptions for mortality/morbidity rate, investment return and lapse rate assumption to have quite reasonable projected future cash flows. With the reasonable RDR (in Vietnam RDR range is from 8% to 12% depend on the risk profile of each company). Finally, we can estimate quite reasonable embedded value for life insurance company in Vietnam. It is a great advantage for the Merger and Acquisition (M&A) in Vietnam and the development of Vietnam insurance market. Many large international insurance companies will enter the Vietnam insurance market in the future. And the fast way to growth and acquire the market share is to acquire the operating insurance company in the market to save time to get the license and build the company from zero. The successful story in Vietnam market is Daiichi life Vietnam, a Japanese company. They acquired the Bao Minh CMG life company and invest more capital to develop their agency force and bancassurance channel. For around 7 years, they lead the Vietnam life insurance market as the second largest life insurance company in the market (in term of new business sale volume). Daiichi save a lot of time and effort to get the life insurance license and build a life insurance company from the beginning. For the MCEV concept, it may take long time and high cost for the insurance company (resources, system, technology) to produce a reliable market consistent report in Vietnam because the stock market, bond market and swap market have not developed yet. The market is quite illiquid, unstable and not matured. It can not provide a reliable data for the financial models to work well.

Chapter 5

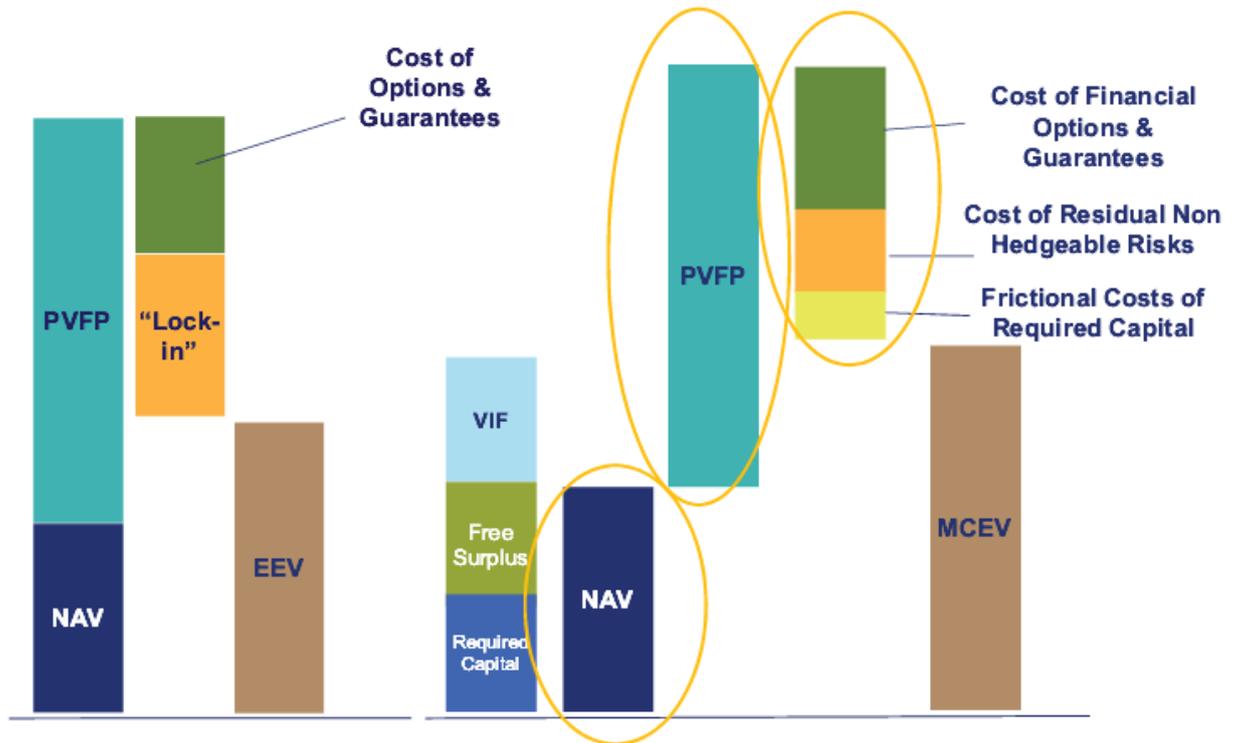
TEV, EV and MCEV Comparison

5.1) TEV, EV, MCEV – comparison of methods and assumptions

TEV versus EEV



EEV versus MCEV



5.2) TEV, EEV and MECV – Derivation of cash flows

Traditional EV (“TEV”)	European EV (“EEV”)	Market-Consistent EV (“MCEV”)
<ul style="list-style-type: none"> ■ Deterministic approach 	<ul style="list-style-type: none"> ■ Deterministic approach for products with no guarantees ■ Stochastic approach for TVFOG of products with embedded future options and guarantees 	<ul style="list-style-type: none"> ■ Deterministic approach for products with no guarantees ■ Stochastic approach for TVFOG of products with embedded future options and guarantees

5.3) TEV, EEV and MECV – Economic assumptions

Traditional EV (“TEV”)	European EV (“EEV”)	Market-Consistent EV (“MCEV”)
<p><u>Deterministic</u></p> <ul style="list-style-type: none"> ■ Government bonds earn risk free rate of appropriate term ■ Other asset classes earn risk free rate plus a risk premium margin ■ Inflation derived considering CPI 	<p><u>Deterministic</u></p> <ul style="list-style-type: none"> ■ Same as TEV <p><u>Stochastic</u></p> <ul style="list-style-type: none"> ■ Simulation based on real world assumptions ■ Must be internally consistent but not necessarily market consistent 	<p><u>Deterministic</u></p> <ul style="list-style-type: none"> ■ Assets earn the risk free rate e.g. the swap yield curve <p><u>Stochastic</u></p> <ul style="list-style-type: none"> ■ Risk neutral or real world simulations ■ Must be market consistent ■ Volatilities implied from market option prices

5.4) TEV, EEV and MECV – Non economic assumptions

Traditional EV (“TEV”)	European EV (“EEV”)	Market-Consistent EV (“MCEV”)
<ul style="list-style-type: none"> ■ Expenses ■ Lapse rates ■ Mortality ■ Disability/morbidity ■ Close to best estimate. Reflect company experience, level of prudence depends on margins to be capitalised/ released over time 	<p><u>Deterministic</u></p> <ul style="list-style-type: none"> ■ Usually as per TEV <p><u>Stochastic</u></p> <ul style="list-style-type: none"> ■ Dynamic lapse and take up assumptions allow for policyholder behavior for products with guarantees ■ May also allow for dynamic management behavior (e.g change in asset mix) 	<p><u>Deterministic</u></p> <ul style="list-style-type: none"> ■ Usually as per EEV <p><u>Stochastic</u></p> <ul style="list-style-type: none"> ■ Dynamic lapse and take up assumptions allow for policyholder behavior for products with guarantees ■ May also allow for dynamic management behavior (e.g change in asset mix)

5.5) TEV, EEV and MECV – Time value of embedded future options and guarantees (TVFOG)

Traditional EV (“TEV”)	European EV (“EEV”)	Market-Consistent EV (“MCEV”)
<ul style="list-style-type: none"> ■ Some implicit allowance for time value of options and guarantees in RDR, but allowance subjective ■ No stochastic modelling or dynamic management behavior or policyholder behavior captured 	<ul style="list-style-type: none"> ■ Stochastic valuation of time value of options and guarantees captures: <ul style="list-style-type: none"> - Management behavior - Policyholder behavior - Cost of shareholder capital injections ■ Assumptions used not necessarily market consistent 	<ul style="list-style-type: none"> ■ Stochastic valuation of time value of options and guarantees captures: <ul style="list-style-type: none"> - Management behavior - Policyholder behavior - Cost of shareholder capital injections ■ Assumptions used need to be market consistent

5.6) TEV, EEV and MECV – Discounting

Traditional EV (“TEV”)	European EV (“EEV”)	Market-Consistent EV (“MCEV”)
<ul style="list-style-type: none"> ■ Constant RDR, usually expressed as risk-free rate plus risk margin ■ Risk margin captures allowance for various risks, including options and guarantees 	<ul style="list-style-type: none"> ■ Similar to TEV, constant RDR set equal to risk free rate plus a risk margin ■ One exception is that the risk margin no longer contains an allowance for the cost of options & guarantees, as there is an explicit allowance for those in the calculation 	<ul style="list-style-type: none"> ■ Implementation of market-consistent arbitrage-free valuation method ■ Risk free yield curve used for products with no guarantees ■ Deflators (“Stochastic RDRs”) replace constant RDR

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5.7) TEV, EEV and MECV – “Locking in” Cost of Capital

Traditional EV (“TEV”)	European EV (“EEV”)	Market-Consistent EV (“MCEV”)
<ul style="list-style-type: none"> ■ Required capital often the statutory minimum ■ Cost of holding required capital reflected in EV ■ Usually, referred to as “cost of lock-in” ■ Cost of lock-in arises since in EV, typically, $RDR > \text{earned rate (net of tax)}$ 	<ul style="list-style-type: none"> ■ Required capital needs to consider both <ul style="list-style-type: none"> - Amount required by regulators, and - Amount required by internal measures ■ Cost of locked-in defined as per TEV 	<ul style="list-style-type: none"> ■ No “cost of lock in” in market-consistent world ■ Market risks allowed for in MCEV framework ■ Separate allowance made for specific costs and risks, i.e. frictional costs and non-headgeable risks

5.8) TEV, EEV and MECV – Cost of non-headgeable risks (CNHR)

Traditional EV (“TEV”)	European EV (“EEV”)	Market-Consistent EV (“MCEV”)
<ul style="list-style-type: none"> ■ Implicit 	<ul style="list-style-type: none"> ■ Implicit 	<ul style="list-style-type: none"> ■ MCEV is less clear on approach for non-market risk. CFO forum refers to non-headgeable risks. ■ Identify which risks are non-headgeable risks. Estimate amounts of capital for each. Allow for diversification ■ Project forward and apply a risk margin.

5.9) TEV, EEV and MECV – Frictional costs

Traditional EV (“TEV”)	European EV (“EEV”)	Market-Consistent EV (“MCEV”)
<ul style="list-style-type: none"> ■ No explicit calculation ■ “Locking-in” has implicit allowance for tax on investment return on required capital ■ Typically, no allowance for investment expenses on required capital 	<ul style="list-style-type: none"> ■ Similar to TEV 	<ul style="list-style-type: none"> ■ Relate to actual costs that a shareholder incurs due to investment via an insurance company ■ Frictional costs include investment expenses and tax on investment return on required capital

5.10) TEV, EEV and MECV – Disclosure compare

- EEV and MCEV have similar disclosure, and both have significantly more disclosure than TEV

	TEV	EEV	MCEV
Methodology	<ul style="list-style-type: none"> ■ Simple 	<ul style="list-style-type: none"> ■ Complex, plus guidance on disclosure 	<ul style="list-style-type: none"> ■ Complex, plus guidance on disclosure
Deterministic economic assumptions	<ul style="list-style-type: none"> ■ Flat 	<ul style="list-style-type: none"> ■ Flat 	<ul style="list-style-type: none"> ■ Curve
Stochastic assumptions	<ul style="list-style-type: none"> ■ None 	<ul style="list-style-type: none"> ■ Several tables of volatilities and correlations 	<ul style="list-style-type: none"> ■ Several tables of volatilities and correlations

● **Principle 1 - Introduction**

EEV	MCEV
<ul style="list-style-type: none"> ■ Embedded Value (EV) is a measure of consolidated value of shareholders' interest in the covered business 	<ul style="list-style-type: none"> ■ Embedded Value (EV) is a measure of consolidated value of shareholders' interest in the covered business ■ Group Market Consistent Embedded Value (Group MCEV) is a measure of the consolidated value of shareholders' interest in covered and non-covered business

● **Principle 2 – Coverage**

EEV	MCEV
<ul style="list-style-type: none"> ■ The business covered by the EVM should be clearly identified and disclosed 	<ul style="list-style-type: none"> ■ The business covered by the MCEVM should be clearly identified and disclosed

● **Principle 3 – EEV and MCEV Definitions**

EEV	MCEV
<ul style="list-style-type: none"> ■ EV is the present value of shareholders' interest in the earning distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business. The EV consists of the following components: <ul style="list-style-type: none"> ● Free surplus allocated to the covered business ● Required capital, less the cost of holding required capital; and ● Present value of future shareholder cash flows from in-force covered business (PVIF) <p>The Value of future new business is excluded from the EV.</p>	<ul style="list-style-type: none"> ■ MCEV is the present value of shareholders' interest in the earning distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business. The allowance for risk should be calibrated to match the market price for risk where reliably observable. The MCEV consists of the following components: <ul style="list-style-type: none"> ● Free surplus allocated to the covered business ● Required capital; and ● Value of in-force covered business (VIF). <p>The Value of future new business is</p>

excluded from the MCEV.

• Principle 4 – Free surplus

EEV	MCEV
<ul style="list-style-type: none"> ■ The free surplus is the market value of any capital and surplus allocated to, but not required to support, the in-force covered business at the valuation date. 	<ul style="list-style-type: none"> ■ The free surplus is the market value of any capital and surplus allocated to, but not required to support, the in-force covered business at the valuation date.

• Principle 5 – Required Capital

EEV	MCEV
<ul style="list-style-type: none"> ■ Required capital should include any amount of assets attributed to the covered business over and above that required to back liabilities for covered business whose distribution to shareholders is restricted. The EV should allow for the cost of holding the required capital 	<ul style="list-style-type: none"> ■ Required capital is the market value of assets, attributed to the covered business over and above that required to back liabilities for covered business, whose distribution to shareholders is restricted.

• Principle 6 – Value of In-force Covered Business

EEV	MCEV
<ul style="list-style-type: none"> ■ The value from future cash flows from in-force covered business is the present value of future shareholder cash flows projected to emerge from the assets backing liabilities of the in-force covered business (“PVIF”). This value is reduced by the value of financial options and guarantees as defined in Principle 7. 	<p>The value of in-force covered business (VIF) consists of the following components:</p> <ul style="list-style-type: none"> • Present value of future profits (where profits are post taxation shareholder cash flows from the in-force covered business and the assets backing the associated liabilities) (PVFP) • Time value of financial options and guarantees as defined in Principle 7 • Frictional costs of required capital as defined in Principle 8 • Cost of residual non headgeable risks as

defined in Principle 9

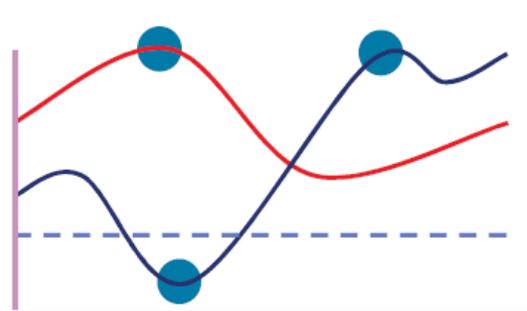
• Principle 7 – Financial Options and Guarantees

EEV	MCEV
<ul style="list-style-type: none">■ Allowance must be made in the EV for the potential impact on future shareholder cash flows of all financial options and guarantees within the in-force covered business. This allowance must include the time value of financial options and guarantees based on stochastic techniques consistent with the methodology and assumptions used in the underlying embedded value	<ul style="list-style-type: none">■ Allowance must be made in the MCEV for the potential impact on future shareholder cash flows of all financial options and guarantees within the in-force covered business. This allowance must include the time value of financial options and guarantees based on stochastic techniques consistent with the methodology and assumptions used in the underlying embedded value. All projected cash flows should be valued using economic assumptions such that they are valued in line with the price of similar cash flows that are traded in the capital markets.

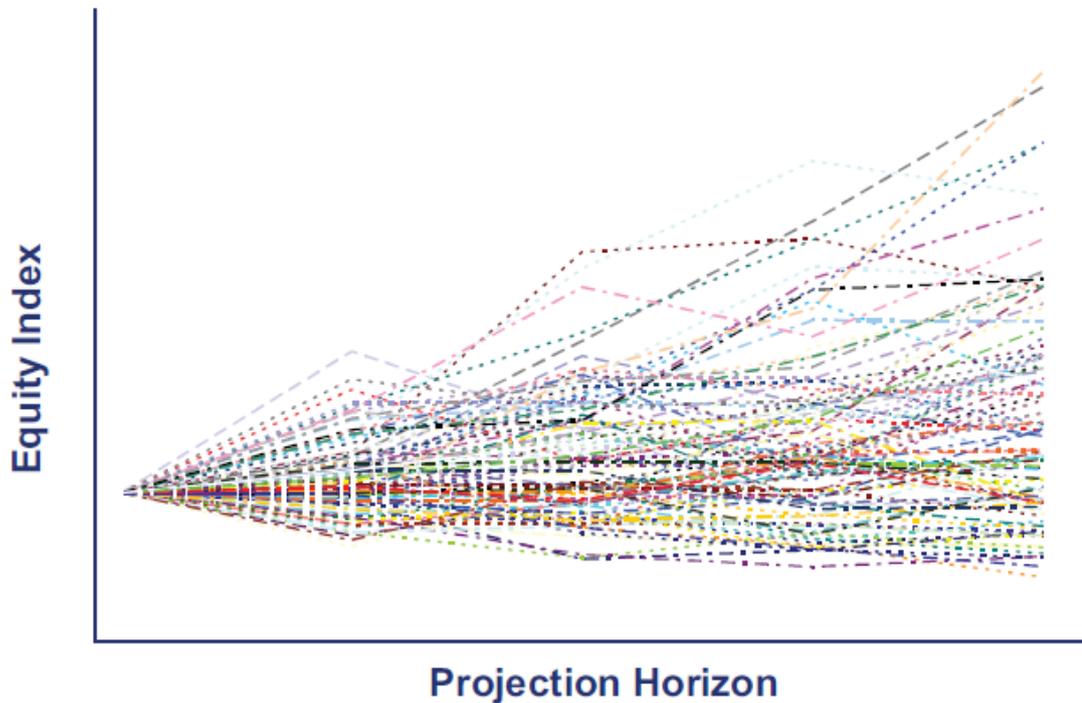
Traditional EV



EEV



Stochastic modelling scenarios



• Principle 8 – Financial Options and Guarantees

EEV	MCEV
<ul style="list-style-type: none"> ■ Allowance must be made in the EV for the potential impact on future shareholder cash flows of all financial options and guarantees within the in-force covered business. This allowance must include the time value of financial options and guarantees based on stochastic techniques consistent with the methodology and assumptions used in the underlying embedded value 	<ul style="list-style-type: none"> ■ Allowance must be made in the MCEV for the potential impact on future shareholder cash flows of all financial options and guarantees within the in-force covered business. This allowance must include the time value of financial options and guarantees based on stochastic techniques consistent with the methodology and assumptions used in the underlying embedded value. All projected cash flows should be valued using economic assumptions such that they are valued in line with the price of similar cash flows that are traded in the capital markets.

• Principle 9 – Frictional Cost of Required Capital

EEV	MCEV
<ul style="list-style-type: none"> ■ NA 	<ul style="list-style-type: none"> ■ An allowance should be made for frictional costs of required capital for covered business. The allowance is independent of the allowance for non headgeable risks.

• Principle 10 – Cost of Residual Non Headgeable Risks

EEV	MCEV
<ul style="list-style-type: none"> ■ NA 	<ul style="list-style-type: none"> ■ An allowance should be made for the cost of non headgeable risks not already allowed for in the time value of options and guarantees or the PVFP. This allowance should include the impact of non headgeable non financial risks and non headgeable financial risks. An appropriate method of determining the allowance for the cost of residual non headgeable risks should be applied and sufficient disclosures provided to enable a comparison to a cost of capital methodology

• Principle 11 – New Business and Renewals

EEV	MCEV
<ul style="list-style-type: none"> ■ New business is defined as that arising from the sale of new contracts during the reporting period. The value of new business includes the value of expected renewals on those new contracts and expected future contractual alterations to those new contracts. The EV should only reflect in-force business, which excludes future new business 	<ul style="list-style-type: none"> ■ New business is defined as that arising from the sale of new contracts and in some cases increases to existing contracts during the reporting period. The value of new business includes the value of expected renewals on those new contracts and expected future contractual alterations to those new contracts. The MCEV should only reflect in-force business, which

excludes future new business. The value of new business should reflect the additional value to shareholders created through the activity of writing new business.

• Principle 12 – Assessment of Appropriate Non-Economic Projection Assumptions

EEV	MCEV
<ul style="list-style-type: none"> ■ The assessment of appropriate assumptions for future experience should have regarded to past, current and expected future experience and to any other relevant data. Changes in future experience should be allowed for in the value of in-force when sufficient evidence exists and the changes are reasonably certain. The assumptions should be actively reviewed. 	<ul style="list-style-type: none"> ■ The assessment of appropriate assumptions for future experience should have regarded to past, current and expected future experience and to any other relevant data. The assumptions should be best estimate and entity specific rather than being based on the assumptions a market participant would use. Changes in future experience should be allowed for in the VIF when sufficient evidence exists. The assumptions should be actively reviewed.

• Principle 13 – Economic Assumptions

EEV	MCEV
<ul style="list-style-type: none"> ■ Economic assumptions must be internally consistent and should be consistent with observable, reliable market data. No smoothing of market or account balance values, unrealised gains or investment return is permitted. 	<ul style="list-style-type: none"> ■ Economic assumptions must be internally consistent and should be determined such that projected cash flows are valued in line with the prices of similar cash flows that are traded on the capital market. No smoothing of market or account balance values or unrealised gains is permitted.

• Principle 14 – Investment returns and Discount rates

EEV	MCEV
<ul style="list-style-type: none"> ■ NA 	<ul style="list-style-type: none"> ■ VIF should be discounted using discount rates consistent with those that would be used to value such cash flows in the

capital markets.

● **Principle 15 – Reference Rates**

EEV	MCEV
■ NA	■ The reference rates used should, wherever possible, be the swap yield curve appropriate to the currency of the cash flows

● **Principle 16 – Stochastic Models**

EEV	MCEV
■ NA	■ Stochastic models and the associated parameters should be appropriate for the covered business being valued, internally consistent and, where appropriate, based on most recent market data. Volatility assumptions should, where possible, be based on those implied from derivative prices rather than the historical observed volatilities of the underlying instruments.

● **Principle 17 – Participating Business**

EEV	MCEV
■ For participating business the method must make assumptions about future bonus rates and the determination of profit allocation between policyholders and shareholders. These assumptions should be made on a basis consistent with the projection assumptions, established company practice and local market practices	■ For participating business the method must make assumptions about future bonus rates and the determination of profit allocation between policyholders and shareholders. These assumptions should be made on a basis consistent with the projection assumptions, established company practice and local market practices

● **Principle 18 – Disclosure**

EEV	MCEV
<ul style="list-style-type: none">■ Embedded Value results should be disclosed at consolidated group level using a business classification consistent with the primary statements.	<ul style="list-style-type: none">■ MCEV results should be disclosed at consolidated group level using a business classification consistent with the primary statements, with clear description of what business is covered by MCEVM and what is not. Except where they are not considered material, compliance with the MCEV Principles is compulsory and should be explicitly disclosed.

Chapter 6

Conclusion

The Vietnam insurance market is a young and developing insurance market in Asia with a high market growth rate in recent years (from 15% to 20% per year). In life insurance market, there are around 17 life insurance companies which are mainly foreign life insurance companies. In the future, many foreign companies will come to the Vietnam market. The fastest way to start the business in Vietnam is through Merger and Acquisition actions (M&A) the old company in the market because it may take a long time (2-3 years) to get the life insurance license from the Ministry of Finance (MOF). So the demand for the Embedded Value report will be increasing in the future. Besides that, embedded value tool is a useful tool for life insurance companies for their long term profitability management. New business Embedded Value (NBEV) is an important indicator for life insurance company in deciding to launch a new product in the market. The management of life insurance company will use Embedded value tool for their decision in M&A activities with other life company, acquire new distribution channels, bonuses and dividend for policyholder, compensation for the company management....This thesis is just a preliminary study about the Embedded Value definition, assumptions and the results as an indicator for the Prevoir management in the M&A activities with the investor (one life insurance company from Korea). In this thesis, we also mention about the EEV and MCEV standard for reference. The Vietnam financial market is still very young, illiquid and unstable. So there will be a long way for the financial market to keep tract with the international standards such as IFRS, MCEV and Solvency 2 framework.

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