Building a Simplified Stochastic Asset Liability Model (ALM) for a Malaysian Participating Annuity Fund

Seow Fan Chong, FSA
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Disclaimer: The views presented in this paper do not represent any position of the author's company, Hong Leong Assurance Berhad, but are sole opinions expressed by the author only. The assumptions and liability data used in building the ALM are fictional and do not represent any actual fund.

ABSTRACT

This paper demonstrates how to build a simplified stochastic Asset Liability Model (ALM) for a Malaysian Participating Annuity fund. The paper begins by outlining the purposes of building a simplified ALM. Next, the major steps to build the ALM are outlined. A description of the product is then given together with its associated assumptions. Liability cash flows are then modeled using fictional data. Next, the stochastic model for each asset class found in Malaysia is discussed in details. The asset classes modeled include cash, short term bond, long term bond, property and equity. Next, the liability cash flows and the asset cash flows are combined, and the results of the stochastic simulation are presented as balance sheet, and profit and loss statement using the mean portfolio investment return. The simulation results using portfolio investment return at lower tail of 75% and 99.5% confident intervals are also presented and compared to the mean result. Finally, the paper discussed the limitations of the simplified model.

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Chapter 1 Introduction

1.1 Purposes of Building a Simplified ALM

The Society of Actuaries, USA, defines Asset and Liability Management as the ongoing process of formulating, implementing, monitoring and revising strategies related to assets and liabilities to achieve an organization's financial objectives, given the organization's risk tolerances and other constraints. An important of Asset Liability Management is to set up an Asset Liability Model (ALM). This paper focuses on the process of modeling in an Asian context. It does not discuss the management issues.

Proprietary actuarial ALM software may require long training hours before a competent actuarial staff acquires the necessary skills to use it. The time taken to set up ALM programs for a new fund could take months. It may take days to run a simple stochastic model even for a one product fund with less than hundred thousands of policies. The cost of purchasing and maintaining such software may be exorbitant for many Asian insurance companies. Also, there are portions of the software that are not entirely transparent in allowing a user to verify or reproduce all the figures independently. Such black box effect makes an actuary extremely uncomfortable in presenting the ALM results to senior management, board of directors and regulators.

Another common challenge face by Asian actuarial practitioners is the lack of published literature on demonstrating numerically how to build a complete stochastic asset model for an Asian insurance fund. There are many papers produce on what need to be done to build credible ALM but few papers on how to do so. Furthermore, many papers only demonstrate how to match liability using fixed income assets. Such information is vastly inadequate as most Asian economies do not have liquid and developed bond markets to enable managing of long term life insurance liabilities relying primarily on fixed income assets. In practice, a significant portion is invested in equity and sometimes property.

Hence the purposes of the current paper are two folded, namely, to demonstrate how to build a simple spreadsheet based ALM to verify or check reasonableness of the results

produce by proprietary actuarial software[1], and to demonstrate how to build an ALM that includes not only fixed income assets but also equity, cash and property for an Asian insurance fund.

1.2 Outline of the Paper

This paper begins by outlining the purposes of building a simplified ALM. Next, the major steps to build the ALM are outlined. A description of the product is then given together with its associated assumptions. Liability cash flows are then modeled using fictional data. Next, the stochastic model for each asset class found in Malaysia is discussed in details. The asset classes modeled include cash, short term bond, long term bond, property and equity. Next, the liability cash flows and the asset cash flows are combined, and the results of the stochastic simulation are presented as balance sheet, and profit and loss statement using the mean portfolio investment return. The simulation results using portfolio investment return at lower tail of 75% and 99.5% confident intervals are also presented and compared to the mean result. Finally, the paper concluded with some remarks.

1.3 Limitations of the Paper

This paper does not discuss management issues in the asset and liability management of the annuity fund. It is based on the existing net premium reserving regime and does not consider the new Risk Based Capital regime. The asset classes modeled are limited only to cash, equity, bond and property with no detailed breakdown into small cap and large cap stocks, or short, median and long term bond, or residual, commercial and hotel properties, etc.

[1] In the "Results of the Survey on Asset Liability Management Practices of Canadian Life Insurance Companies" conducted by Canadian Institute of Actuaries in 2001, 39% of 71 survey insurance companies exclusively used internal software to model asset cash flows and 13% used internal software in combination with other software (Table 16.1). This indicates the fact that even in developed insurance industry, many life insurance companies still do not use specialized proprietary third parties actuarial software in projected asset models in their asset liability modeling. Hence it is important for an actuary practicing in the asset liability management and related fields to be able to build a simplified ALM to either validate an existing third party proprietary actuarial software or as the main tool in management.

Chapter 2 Overview on Building a Simplified ALM

The major steps to build the simplified ALM are as follows

(1) Specify the objective of ALM

(2) Project liability cash flows including reserve and solvency margin

(3) Specify stochastic models for all assets classes

(4) Estimate all the parameters for the asset models and state the assumptions

(5) Simulate the economic series using the stochastic asset models

(6) Combine projected liability cash flows and the asset cash flows to produce the net cash flow and the surplus.

(7) Summarize the results as balance sheet, and profit and loss

All steps, except the first, are discussed in the rest of the paper.

The first step in building the simplified ALM is to specify its objective. For the purpose of this paper, the objective is specified as selecting an investment strategy to ensure the annuity fund is statutorily solvent in most future years, if not all future years, subject to current Malaysian investment limit. Essentially, the objective is to specify an asset allocation strategy that meets the solvency requirement within the investment guideline.

Chapter 3 A Malaysian Participating Annuity Product

This chapter describes the product features of a typical single premium deferred participating annuity issued in Malaysia. Also the associated pricing assumptions and the corresponding reserve and solvency margin based on simplified existing reserve and solvency margin regime are stated. The methodology used in this paper is valid in any reserve regime.

3.1 Product Features

This is a single premium deferred participating annuity.

(1) Reversion Bonus Rate: 2.0% pa payable annually

(3) Vesting Age: 55

(2) Annuity Benefit guaranteed for 10 years

(3) Annuity payable after vesting: Annuity at inception increase annually at 2% pa

(4) Annuity payable monthly

(5) Death Benefit before vesting: 10 years annuity certain at accumulated annuity upon death

(6) No death benefit after vesting

(7) Surrender Benefit before vesting: 10 years annuity certain at accumulated annuity upon surrender

(6) No surrender benefit after vesting

3.2 Pricing and Liability Assumptions

(1) Expense

First Year	1.5% of Single Premium
Second Year onwards	5.0% of Accrued Annuity

(2) Total Commission: 3.5% of single premium

(3) Lapse

First and Second Year	20%
Third Year onwards before age 55	10%
Age 55 onwards	0%

(4) Mortality

Before age 55	70% of M83-88
After age 55	a(90) Male set back 2 years

(6) Investment Return: 7.5%

(7) Investment Income Tax: 8% on investment income, realized and unrealized gain

(8) Corporate Tax: 28% on transfer to shareholder

3.3 Reserve Basis, Solvency Margin and Transfer to Shareholder

(1) Reserve Basis

Mortality Table before age 55	70% of M83-88
Mortality Table after age 55	a(90) Male set back 2 years
Valuation Interest	4.5%

(2) Solvency Margin: 4% of reserve and 0.2% of sum at risk

(3) Transfer to shareholder: 10% of cost of bonus

The above modified mortality table is given in Exhibit I.

Chapter 4 Projected Liability Cash Flows

This chapter shows the summary of the projected liability cash flows, including reserve and solvency margin, according to the product benefits and the associated pricing assumptions specified in the previous chapter.

4.1 Data File Assumptions

Entry Age: 40
Sex: Male
Number of Policies: 10,000
Initial Monthly Annuity: RM 100
Single Premium per Policy: RM 9,000

4.2 Summary of Liability Cash flows

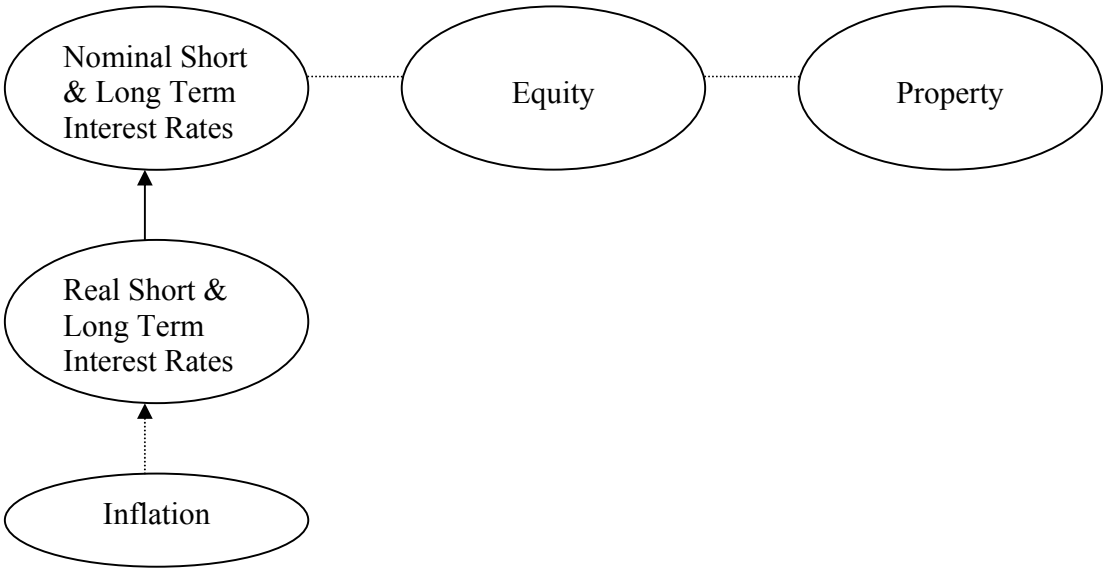
A summary of the liability cash flow is given in Exhibit II.

Chapter 5 Asset Models

5.1 Overview of Asset Models

The asset models used in this paper are adapted from the models built by Kevin C. Ahlgrim, Stephen P. D'Arcy and Richard W. Gorvett (ADG) in their award winning article "Modeling Financial Scenarios: A Framework for the Actuarial Profession". Their models were in turn based upon work done by Wilkie (overall equilibrium model approach), Hibbert, Mowbray, and Turnbull (two factor interest rate model, HMT) and Hardy (regime switching log normal equity model, RSLN).

The diagram below summarizes the four asset models used in this paper, namely, inflation, interest rates (short and long term), equity and property.



5.2 Inflation Model

Inflation (denoted by inf) is assumed to follow one factor Vasicek model

$$\inf_{t+1} = \inf_t + \kappa_{\inf}(\mu_{\inf} - \inf_t)\Delta t + \varepsilon_{\inf,t}\sigma_{\inf}\sqrt{\Delta t} \qquad (5.1)$$

The expected level of future inflation is a weighted average between the most recent value of inflation ($\inf_t$) and a mean reversion level of inflation, μ_{inf}. The speed of reversion is determined by the parameter κ_{inf}.

The change in Brownian motion is represented by ε_{inf}. The uncertainty is scaled by the parameter σ_{inf}, which affects the magnitude of the volatility associated with the inflation process.

5.3 Real Interest Rates Model

Real interest rates are assumed to follow a two-factor Hull-White model. The short-term real interest rate (s) reverts to a long-term real interest rate (l). Both rates are stochastic. In the long run, l reverts to a deterministic average mean reversion level μ_l.

$$\begin{aligned} \Delta s_t &= \kappa_s (l_t - s_t)\Delta t + \sigma_s \varepsilon_{st} \\ \Delta l_t &= \kappa_l (\mu_i - l_t)\Delta t + \sigma_l \varepsilon_{lt} \end{aligned} \tag{5.2}$$

Bond prices (P) are derived from the above short term and long term real interest rates following the one-factor Vasicek:

$$P(t,T) = A(t,T)e^{-r_t B_1(t,T) - l_t B_2(t,T)} \tag{5.3}$$

where r_t and l_t are the values for the short term and long term real interest rate and A, B_1, and B_2 are functions of underlying parameters in the two-factor Hull-White specification for real interest rates (see HMT for further details).

$$\begin{aligned} B_1(t) &= \left[\frac{1-e^{-\mathrm{K}_s t}}{\kappa_s}\right] \\ B_2(t) &= \frac{\kappa_s}{\kappa_s - \kappa_l}\left[\frac{1-e^{-\mathrm{K}_l t}}{\kappa_l} - \frac{1-e^{-\mathrm{K}_s t}}{\kappa_s}\right] \\ A(t) &= \left(B_1(t) - t\right)\left[\mu - \frac{\sigma_s^2}{2\kappa_s^2}\right] + B_2(t)\mu - \frac{\sigma_s^2 B_1(t)^2}{4\kappa_s} \\ &\quad + \frac{\sigma_l^2}{2}\left[\frac{t}{\kappa_l^2} - 2\frac{\left(B_2(t) - B_1(t)\right)}{\kappa_l^2} + \frac{1}{\left(\kappa_s - \kappa_l\right)^2}\frac{\left(1-e^{-2\kappa_s t}\right)}{2\kappa_s} - \right. \\ &\quad \left. \frac{2\kappa_s}{\kappa_l(\kappa_s - \kappa_l)^2}\frac{\left(1-e^{-(\kappa_s+\kappa_l)t}\right)}{\left(\kappa_s + \kappa_l\right)} + \frac{\kappa_s^2}{\kappa_l^2(\kappa_s - \kappa_l)^2}\frac{\left(1-e^{-2\kappa_l t}\right)}{2\kappa_l}\right] \end{aligned} \tag{5.4}$$

5.4 Nominal Interest Rates Model

Inflation rates are added back to the short term and long term real interest rates to obtain the nominal short term and long term interest rates respectively.

5.5 Equity Model

The equity model follows a Regime Switch Log Normal (RSLN) model (refer to Hardy for details). The article by Hardy gives a very clear description of the RSLN model.

Instead of assuming a simple log normal distribution for equity, a two state regime switching log normal model is used in this paper.

The equity market is assumed to behave in two states, one state being lowly volatile and high average return, and the other being highly volatile and low or negative average return. Within each state of the regime, the equity returns are assumed to follow a simple log normal distribution with a fixed volatility that is state dependent. It is also possible to transit from one state to another with certain probability. Hence the transition 2x2 probability matrix also needs to be estimated.

Let S_t be the stock price at time t, ρ_t denote the regime applying in the interval [t,.t+1) where $\rho_t = 1$ or 2, and $\mu_{\rho t}$ be the mean and $\sigma_{\rho t}$ be the standard deviation then

$$\log \frac{S_{t+1}}{S_t} \Big| \rho_t \sim N(\mu_{\rho t}, \sigma_{\rho t}^2) \tag{5.5}$$

The transition matrix **P** denotes the probabilities of moving from one regime to another or remain in the same regime in the interval [t,.t+1), that is,

$$p_{ij} = P[\ \rho_{t+1} = j \mid \rho_t = i\ ] \quad i = 1,2,\ j = 1,\ 2$$

There are 6 parameters to be estimated,

$$\vartheta = \{\mu_1, \mu_2, \sigma_1, \sigma_2, \rho_{2,1}, \rho_{1,2}\}$$

5.6 Property Model

Similar to inflation, property (denoted by prop) is assumed to follow one factor Vasicek model

$$prop_{t+1} = prop_t + \kappa_{prop}(\mu_{prop} - prop_t)\Delta t + \varepsilon_{prop,t}\sigma_{prop}\sqrt{\Delta t} \tag{5.6}$$

The expected level of future inflation is a weighted average between the most recent value of prop ($prop_t$) and a mean reversion level of inflation, μ_{prop}. The speed of reversion is determined by the parameter κ_{prop}.

Chapter 6 Parameters Estimation and Assumptions of Asset Models

6.1 Overview on Parameters Estimation and Assumptions of Asset Models

This chapter shows how the some parameters of the asset models specified in the previous chapter are estimated. After these parameters have been estimated, the actuary has to make actuarial judgment, after consulting his investment colleague, on the final assumed parameters to be used for the projection of economic series of the asset models. Such process is very similar to deriving pricing or valuation assumptions based on experience analysis which life insurance actuaries have been practicing since the beginning of actuarial science.

6.2 Inflation Model

From equation (5.1), we can estimate the parameters of the inflation model using the following time series regression:

$$\inf_{t+1} = \alpha + \beta \inf_t + \varepsilon'_{\inf,t} \tag{6.1}$$

The coefficients of the regression in (6.1) are derived from equation (5.1):

$$\beta = (1 - \kappa_{\inf} \Delta t)$$
$$\kappa_{\inf} = \frac{1-\beta}{\Delta t} \quad \text{and} \tag{6.2}$$

$$\alpha = \kappa_{\inf} \mu_{\inf} \Delta t = \frac{1-\beta}{\Delta t} \mu_{\inf} \Delta t$$
$$\mu_{\inf} = \frac{\alpha}{1-\beta} \tag{6.3}$$

Annual Malaysian Consumer Price Index (CPI) data were obtained from BNM website from 1972 to 2006 as the measures of inflation to run regression (6.1) to estimate κ_{inf} and μ_{inf}.

The annual rate of inflation was measured as:

$$\inf_t = \ln \frac{CPI_t}{CPI_{t-1}} \tag{6.4}$$

where CPI_t is the reported index value for year t and CPI_{t-1} is the prior year's reported index value. The CPI data are given in Exhibit III.

The results of the regression are given in the table below.

Time Period	κ_{inf}	μ_{inf}	σ_{inf}
1972-2006	0.49	3.9%	3.0%

6.3 Real Interest Rates Model

From equation (5.2), the following 2 stage regressions are run using monthly data obtain from Bloomberg after deduction inflation rate:

$$\begin{aligned} &\text{Stage 1}: \; l_{t+1} = \beta_1 + \beta_2 l_t + \varepsilon'_{2t} \\ &\text{Stage 2}: \Delta s_{t+1} = \alpha_1 (\hat{l}_t - s_t) + \varepsilon'_{1t} \end{aligned} \tag{6.5}$$

In stage 1, a simple regression is run to obtain estimates for the long term real interest rates, $\hat{l}_t$. In stage 2, a simple regression is run based on $\hat{l}_t$ from stage 1 to obtain the short term real interest, s_t.

$$\begin{aligned} \beta_1 &= \kappa_l \mu_l \\ \beta_2 &= (1 - \kappa_l \Delta t) \\ \varepsilon'_{2t} &= \sigma_l \varepsilon_{1t} \end{aligned} \qquad \text{and} \tag{6.6}$$

$$\begin{aligned} \alpha_1 &= \kappa_s \Delta t \\ \varepsilon'_{1t} &= \sigma_s \varepsilon_{st} \end{aligned} \tag{6.7}$$

1-year Malaysian Government Security (MGS) yield rates less inflation rates (inf) are used as a proxy for the short term real interest rate and 10-year MGS yield rates less inf are used as a proxy for the long term real interest rate. The data were obtained from BNM website. The MGS less inflation rates data are given in Exhibit IV.

The results of the regression are given in the table below.

Time Period	κ_s	μ_l	σ_s	κ_l	σ_l
Jan 96 – Dec 06	1.48	3.04%	3.802%	12.01	4.43%

6.4 Equity Model

The parameters of the RSLN equity model from historical monthly Malaysian Kuala Lumpur Composite Index (KLCI) data, the most widely used Malaysian equity index. This index only captures the capital appreciation of stocks. The reader shall refer to

Hardy for details on the estimation of the RSLN parameters and the worksheet posted on the Society of Actuaries website

The KLCI data were obtained from BNM website and are given in Exhibit V. The results of the regression are given in the table below.

Time Period	μ_1	μ_2	σ_1	σ_2	p_{12}	p_{21}
Jan 99 – Apr 07	16.15%	2.99%	10.53%	23.92%	0.0109	0.0122

6.5 Property Model

From equation (5.6), we can estimate the parameters of the property model using the same approach for inflation model. The data used were the Malaysian House Price Index obtained from BNM website.

Although most insurance companies in Malaysia invest in office property for rental income and capital inflation rather than residential housing, there is lack of credible statistics on commercial housing index in Malaysia. Hence the House Price Index was used as a proxy since there exists high correlation between the residential house prices and office prices. The quarterly House Price Indicators data are given in Exhibit VI.

The results of the regression are given in the table below.

Time Period	κ_{prop}	μ_{prop}	σ_{prop}
1972-2006	1.56	11.4%	2.7%

6.6 Correlation of Asset Classes

The correlation matrix among the asset classes was estimated using the Excel function. It goes without saying that it is crucial and common sense that the data used in estimating the correlation for all asset class must come from the same time period. The data used to derive the correlation are given in Exhibit VII.

The results of the correlation analysis from 1992 to 2005 are given in the table below.

	Inflation	**1-year bond**	**10-year bond**	**Equity**	**Property**
Inflation	1	0.7753	0.6595	0.1119	0.0356
1-year bond	0.7753	1	0.8714	(0.0615)	0.4113
10-year bond	0.6595	0.8714	1	(0.1331)	0.2601
Equity	0.1119	(0.0615)	(0.1331)	1	0.0482
Property	0.0356	0.4113	0.2601	0.0482	1

Chapter 7 Simulation of Economic Series Using the Asset Models

7.1 Summary of Asset Models Use for Simulation

After specifying the asset models and estimating all the parameters in the previous two chapters, we are now ready to simulate future economic series. As the parameters of the asset models were estimated from historical data, they may not reflect future expected long term rates. Hence, before commencing the simulation, it is critical to check with the equity, fixed income and real estate investment managers for any adjustment to the parameters, especially the long term mean values.

The final system of asset models used for simulation is summarized below:

$$inf_{t+1} = inf_t + 0.49*(0.039 - inf_t) + 0.03\varepsilon_{inf,t} \quad (7.1)$$

$$\Delta s_t = 1.48*(l_t - s_t) + 0.03802\varepsilon_{st} \quad (7.2)$$

$$\Delta l_t = 12.01*(0.0304 - l_t) + 0.0443\varepsilon_{lt} \quad (7.3)$$

$$logS_{t+1} = logS_t + \mu_{\rho t} + \sigma_{\rho t}\, \varepsilon_{St} \quad (7.4)$$

Where
$\rho t = 1$, $\mu_1 = 0.1615$, $\sigma_1 = 0.1053$
$\rho t = 2$, $\mu_2 = 0.0299$, $\sigma_2 = 0.2392$
$p_{11} = 0.9891$, $p_{21} = 0.0122$, $p_{12} = 0.0109$, $p_{22} = 0.9878$

$$prop_{t+1} = prop_t + 1.56*(0.114 - inf_t) + 0.027\varepsilon_{prop,t} \quad (7.5)$$

Refer to the table given in section 6.6 for the correlation matrix used in this system of asset models.

7.2 Software Use for Simulation

The software used in performing the simulation is a relatively inexpensive Excel Add-in software @Risk. The simulation was implemented by modifying the spreadsheet built by ADG. 10,000 simulation runs were generated to develop the distribution for each asset class modeled for each of the next 50 years.

Samples simulation output are given in Exhibit VIII.

Chapter 8 Results of the Simplified ALM and Concluding Remarks

8.1 Results of the Simplified

The final stage in the simplified ALM process is to combine the liability and asset models to produce the balance sheet, profit and loss statement and mean investment returns.

The results are presented in Exhibit IX.

8.2 Concluding Remarks

The table below shows the final selected asset allocations after numerous scenario runs where each scenario run consist of 10,000 simulation runs of the asset models.

Asset Class	Allocation Rate
Cash	15.0%
MGS – 1 year	10.0%
MGS – 10 year	20.0%
PDS – 1 year	10.0%
PDS – 10 year	25.0%
Property	5.0%
Equity	15.0%

The selected asset allocations also take into account the typical asset allocation commonly practiced by Malaysian insurance companies and thus they are more readily acceptable to investment managers, senior managers and board members.

The internal rate of returns for shareholders for an initial capital of RM17.5 under various percentiles are given by the table below

Asset Class	Allocation Rate
5 percentile	Negative
25 percentile	3.00%
Mean	4.09%
75 percentile	4.58%
95 percentile	5.46%

Finally, a graph is given in next page showing the mean, 5 percentile, 25 percentile, 75 percentile and 95 percentile of the discounted (at 7.5%) surplus after transfer to shareholder. The Annuity Fund remains mostly solvency throughout the projected period.

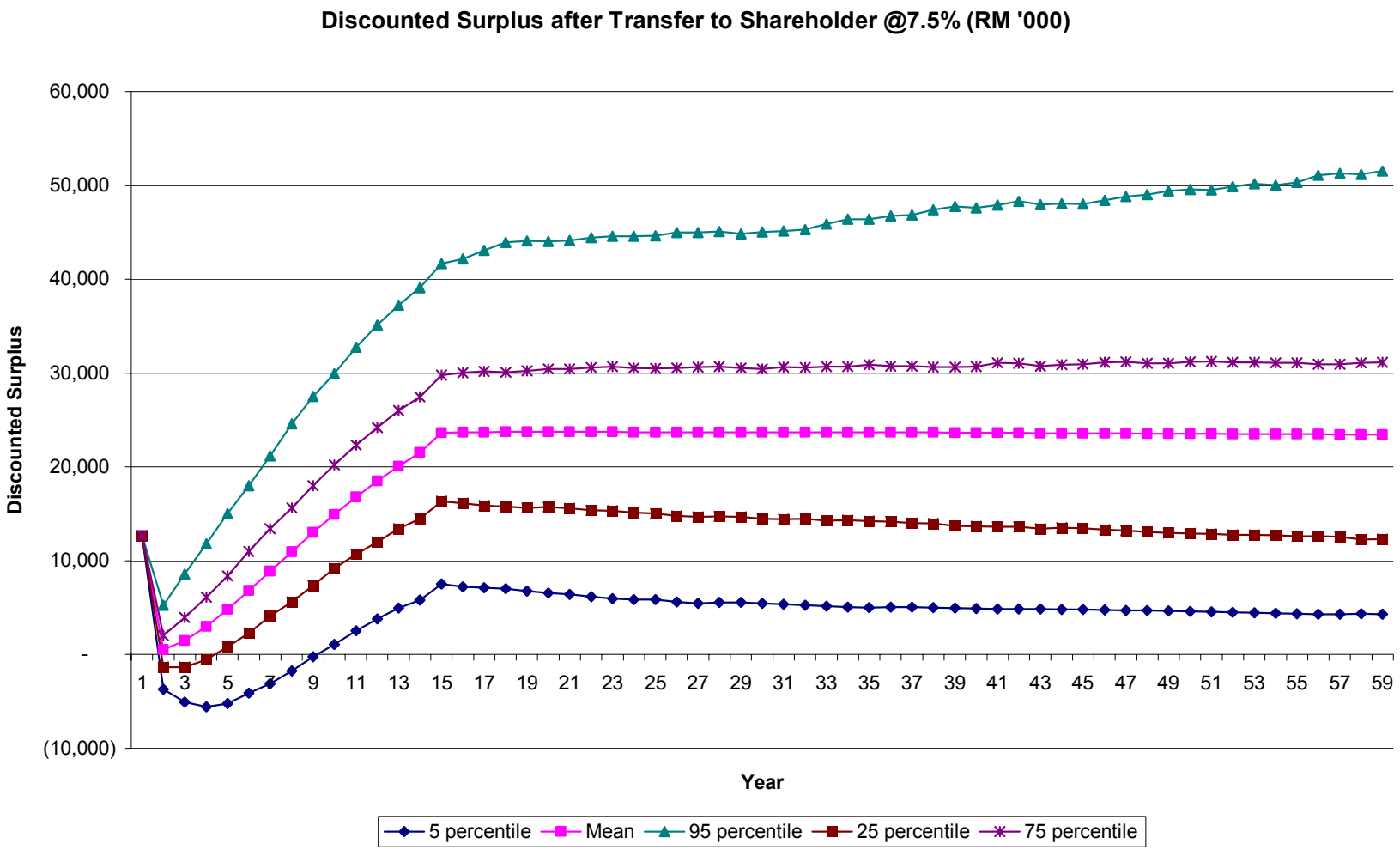

Discounted Surplus after Transfer to Shareholder @7.5% (RM '000)
Discounted Surplus
60,000
50,000
40,000
30,000
20,000
10,000
-
(10,000)
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59
Year
5 percentile
Mean
95 percentile
25 percentile
75 percentile

Exhibit I – Modified Mortality Table

Age	Mortality Rate	Age	Mortality Rate
40	0.001208	70	0.018316
41	0.001341	71	0.01988
42	0.001502	72	0.021576
43	0.001691	73	0.023412
44	0.001901	74	0.025401
45	0.002132	75	0.027554
46	0.002391	76	0.029884
47	0.002671	77	0.032404
48	0.002968	78	0.035129
49	0.003294	79	0.038074
50	0.003654	80	0.041255
51	0.004053	81	0.04469
52	0.004498	82	0.048397
53	0.004981	83	0.052394
54	0.005495	84	0.056701
55	0.003759	85	0.06134
56	0.004232	86	0.066332
57	0.004778	87	0.071699
58	0.005404	88	0.077463
59	0.006111	89	0.08365
60	0.006897	90	0.090283
61	0.007753	91	0.097385
62	0.008673	92	0.104982
63	0.009651	93	0.113097
64	0.010682	94	0.121754
65	0.011768	95	0.130976
66	0.012914	96	0.140784
67	0.014133	97	0.151199
68	0.015443	98	0.162239
69	0.016863	99	0.17392

Exhibit II – Projected Liability Cash-Flows for a Hypothetical Annuity Fund

Liability Cash Flow (All figures in Ringgit '000; 100,000 policies; Each policy single premium RM12,000)

Age	Premium	Commission	Expense	Annuity	Death Benefit	Surrender Benefit	Age	Expense	Annuity
41	90,000	3,150	1,350	-	107	17,688	70	165	3,311
42			489	-	97	7,207	71	166	3,315
43			448	-	99	6,606	72	166	3,314
44			411	-	103	6,054	73	166	3,307
45			377	-	106	5,547	74	165	3,294
46			345	-	109	5,081	75	165	3,275
47			316	-	112	4,654	76	164	3,248
48			289	-	114	4,261	77	162	3,214
49			265	-	116	3,900	78	161	3,172
50			243	-	118	3,568	79	159	3,122
51			222	-	120	3,264	80	156	3,063
52			203	-	121	2,984	81	153	2,996
53			186	-	123	2,727	82	150	2,919
54			170	-	125	2,491	83	146	2,833
55			155	2,829	-	-	84	142	2,739
56			141	2,886	-	-	85	137	2,635
57			144	2,943	-	-	86	132	2,523
58			146	3,002	-	-	87	126	2,403
59			148	3,062	-	-	88	120	2,275
60			150	3,123	-	-	89	114	2,141
61			152	3,186	-	-	90	107	2,001
62			154	3,250	-	-	91	100	1,857
63			156	3,315	-	-	92	93	1,709
64			158	3,381	-	-	93	85	1,561
65			160	3,221	-	-	94	78	1,412
66			161	3,247	-	-	95	71	1,265
67			162	3,269	-	-	96	63	1,121
68			163	3,287	-	-	97	56	982
69			164	3,301	-	-	98	49	851
							99	43	727

Reserve and Solvency Margin (RM '000; 100,000 policies)

Age	Reserve	Solvency Margin	Age	Reserve	Solvency Margin
41	90,294	3,612	70	37,822	1,512.87
42	87,819	3,518	71	36,869	1,474.76
43	85,049	3,416	72	35,849	1,433.94
44	82,054	3,306	73	34,762	1,390.47
45	78,898	3,190	74	33,611	1,344.42
46	75,631	3,070	75	32,397	1,295.88
47	72,300	2,947	76	31,124	1,244.98
48	68,940	2,823	77	29,796	1,191.85
49	65,585	2,700	78	28,417	1,136.68
50	62,261	2,578	79	26,991	1,079.66
51	58,987	2,457	80	25,526	1,021.02
52	55,783	2,340	81	24,026	961.03
53	52,662	2,226	82	22,499	899.96
54	49,635	2,115	83	20,953	838.13
55	44,551	1,782	84	19,397	775.86
56	44,492	1,780	85	17,838	713.51
57	44,382	1,775	86	16,286	651.44
58	44,217	1,769	87	14,750	590.02
59	43,997	1,760	88	13,241	529.62
60	43,722	1,749	89	11,766	470.63
61	43,394	1,736	90	10,335	413.40
62	43,012	1,720	91	8,957	358.27
63	42,581	1,703	92	7,639	305.56
64	42,103	1,684	93	6,388	255.53
65	41,559	1,662	94	5,210	208.41
66	40,948	1,638	95	4,110	164.39
67	40,270	1,611	96	3,089	123.58
68	39,522	1,581	97	2,151	86.03
69	38,706	1,548	98	1,293	51.73

Exhibit III – Consumer Price Index (CPI)

Year	CPI
1971	29.35
1972	30.30
1973	33.50
1974	39.30
1975	41.07
1976	42.15
1977	44.17
1978	46.31
1979	48.01
1980	51.21
1981	56.18
1982	59.45
1983	61.65
1984	64.05
1985	64.27
1986	64.75
1987	64.95
1988	66.60
1989	68.47
1990	70.57
1991	73.63
1992	77.13
1993	79.88
1994	82.83
1995	85.69
1996	88.68
1997	91.04
1998	95.84
1999	98.47
2000	99.99
2001	101.41
2002	103.24
2003	104.40
2004	105.90
2005	109.10
2006	113.01

Exhibit IV – Malaysian Government Security (MGS)

Date	1-year MGS	10-year MGS	Date	1-year MGS	10-year MGS
Jan-96	0.06214	0.06614	Mar-99	0.05092	0.06174
Feb-96	0.06458	0.06564	Apr-99	0.03401	0.05774
Mar-96	0.06256	0.06564	May-99	0.02824	0.05854
Apr-96	0.06241	0.06464	Jun-99	0.02623	0.06254
May-96	0.06234	0.06464	Jul-99	0.03103	0.06487
Jun-96	0.06414	0.06534	Aug-99	0.03510	0.06695
Jul-96	0.06464	0.06544	Sep-99	0.03288	0.06651
Aug-96	0.06473	0.06544	Oct-99	0.03083	0.06195
Sep-96	0.06404	0.06524	Nov-99	0.03199	0.06093
Oct-96	0.06414	0.06534	Dec-99	0.03142	0.06101
Nov-96	0.06484	0.06524	Jan-00	0.03103	0.05978
Dec-96	0.06413	0.06494	Feb-00	0.03041	0.05916
Jan-97	0.06390	0.06541	Mar-00	0.03197	0.05885
Feb-97	0.06356	0.06516	Apr-00	0.03185	0.05960
Mar-97	0.06421	0.06591	May-00	0.03128	0.05928
Apr-97	0.06617	0.06611	Jun-00	0.02897	0.05787
May-97	0.06682	0.06611	Jul-00	0.03291	0.05772
Jun-97	0.06577	0.06561	Aug-00	0.03516	0.05836
Jul-97	0.06681	0.06521	Sep-00	0.03497	0.05813
Aug-97	0.06361	0.06521	Oct-00	0.03297	0.05766
Sep-97	0.06381	0.06544	Nov-00	0.03253	0.05641
Oct-97	0.07018	0.07106	Dec-00	0.03228	0.05566
Nov-97	0.07469	0.07701	Jan-01	0.03087	0.05133
Dec-97	0.06790	0.07618	Feb-01	0.02927	0.04733
Jan-98	0.06731	0.07408	Mar-01	0.02952	0.04577
Feb-98	0.06521	0.07321	Apr-01	0.02948	0.04627
Mar-98	0.06971	0.07306	May-01	0.02906	0.04508
Apr-98	0.08071	0.07408	Jun-01	0.02892	0.04352
May-98	0.09571	0.07617	Jul-01	0.02883	0.04221
Jun-98	0.09700	0.07739	Aug-01	0.02814	0.04083
Jul-98	0.08571	0.07809	Sep-01	0.02734	0.03448
Aug-98	0.06407	0.07493	Oct-01	0.02703	0.03328
Sep-98	0.06699	0.07250	Nov-01	0.02724	0.03388
Oct-98	0.06458	0.07110	Dec-01	0.02812	0.03693
Nov-98	0.05390	0.06583	Jan-02	0.02876	0.04221
Dec-98	0.05363	0.06271	Feb-02	0.02754	0.04309
Jan-99	0.05723	0.06462	Mar-02	0.02758	0.04676
Feb-99	0.05414	0.06429	Apr-02	0.02749	0.04708

Date	1-year MGS	10-year MGS	Date	1-year MGS	10-year MGS
May-02	0.02761	0.04558	Sep-04	0.02623	0.04968
Jun-02	0.02754	0.03948	Oct-04	0.02406	0.04798
Jul-02	0.02764	0.03939	Nov-04	0.01651	0.04539
Aug-02	0.02749	0.03901	Dec-04	0.02123	0.04621
Sep-02	0.02743	0.03723	Jan-05	0.02210	0.04377
Oct-02	0.02746	0.03713	Feb-05	0.02252	0.04260
Nov-02	0.02744	0.03904	Mar-05	0.02507	0.04452
Dec-02	0.02786	0.03909	Apr-05	0.02335	0.04377
Jan-03	0.02799	0.03682	May-05	0.02394	0.04140
Feb-03	0.02797	0.03690	Jun-05	0.02464	0.04002
Mar-03	0.02795	0.03629	Jul-05	0.02382	0.03944
Apr-03	0.02790	0.03535	Aug-05	0.02502	0.03797
May-03	0.02784	0.03467	Sep-05	0.02744	0.03705
Jun-03	0.02784	0.03439	Oct-05	0.02852	0.03925
Jul-03	0.02857	0.03862	Nov-05	0.02994	0.04036
Aug-03	0.02839	0.04049	Dec-05	0.03054	0.03990
Sep-03	0.02824	0.04135	Jan-06	0.03012	0.03804
Oct-03	0.02767	0.04515	Feb-06	0.03107	0.03849
Nov-03	0.02839	0.04774	Mar-06	0.03140	0.03829
Dec-03	0.02832	0.04757	Apr-06	0.03439	0.04188
Jan-04	0.02639	0.04584	May-06	0.03714	0.04598
Feb-04	0.02548	0.04956	Jun-06	0.03769	0.04753
Mar-04	0.02606	0.04964	Jul-06	0.03728	0.04421
Apr-04	0.02623	0.04981	Aug-06	0.03486	0.04056
May-04	0.02656	0.05049	Sep-06	0.03438	0.03864
Jun-04	0.02631	0.05073	Oct-06	0.03363	0.03685
Jul-04	0.02618	0.05006	Nov-06	0.03268	0.03504
Aug-04	0.02638	0.04998	Dec-06	0.03253	0.03484

Exhibit V – Kuala Lumpur Composite Index (KLCI)

Date	KLCI	Date	KLCI	Date	KLCI
Jan-99	591.43	Nov-01	638.02	Sep-04	849.96
Feb-99	542.23	Dec-01	696.09	Oct-04	861.14
Mar-99	502.82	Jan-02	718.82	Nov-04	917.19
Apr-99	674.96	Feb-02	708.91	Dec-04	907.43
May-99	743.04	Mar-02	756.10	Jan-05	916.27
Jun-99	811.10	Apr-02	793.99	Feb-05	907.38
Jul-99	768.69	May-02	741.76	Mar-05	871.35
Aug-99	767.06	Jun-02	725.44	Apr-05	878.96
Sep-99	675.45	Jul-02	721.59	May-05	860.73
Oct-99	742.87	Aug-02	711.36	Jun-05	888.32
Nov-99	734.66	Sep-02	638.01	Jul-05	937.39
Dec-99	812.33	Oct-02	659.57	Aug-05	913.56
Jan-00	922.10	Nov-02	629.22	Sep-05	927.54
Feb-00	982.24	Dec-02	646.32	Oct-05	910.76
Mar-00	974.38	Jan-03	664.77	Nov-05	896.13
Apr-00	898.35	Feb-03	646.80	Dec-05	899.79
May-00	911.51	Mar-03	635.72	Jan-06	914.01
Jun-00	833.37	Apr-03	630.37	Feb-06	928.94
Jul-00	798.83	May-03	671.46	Mar-06	926.63
Aug-00	795.84	Jun-03	691.96	Apr-06	949.23
Sep-00	713.51	Jul-03	720.56	May-06	927.78
Oct-00	752.36	Aug-03	743.30	Jun-06	914.69
Nov-00	729.95	Sep-03	733.45	Jul-06	935.85
Dec-00	679.64	Oct-03	817.12	Aug-06	958.12
Jan-01	727.73	Nov-03	779.28	Sep-06	967.55
Feb-01	709.39	Dec-03	793.94	Oct-06	988.30
Mar-01	647.48	Jan-04	818.94	Nov-06	1080.66
Apr-01	584.50	Feb-04	879.24	Dec-06	1096.24
May-01	572.88	Mar-04	901.85	Jan-07	1189.35
Jun-01	592.99	Apr-04	838.21	Feb-07	1196.45
Jul-01	659.40	May-04	810.67	Mar-07	1246.87
Aug-01	687.16	Jun-04	819.86	Apr-07	1322.25
Sep-01	615.34	Jul-04	833.98		
Oct-01	600.07	Aug-04	827.98		

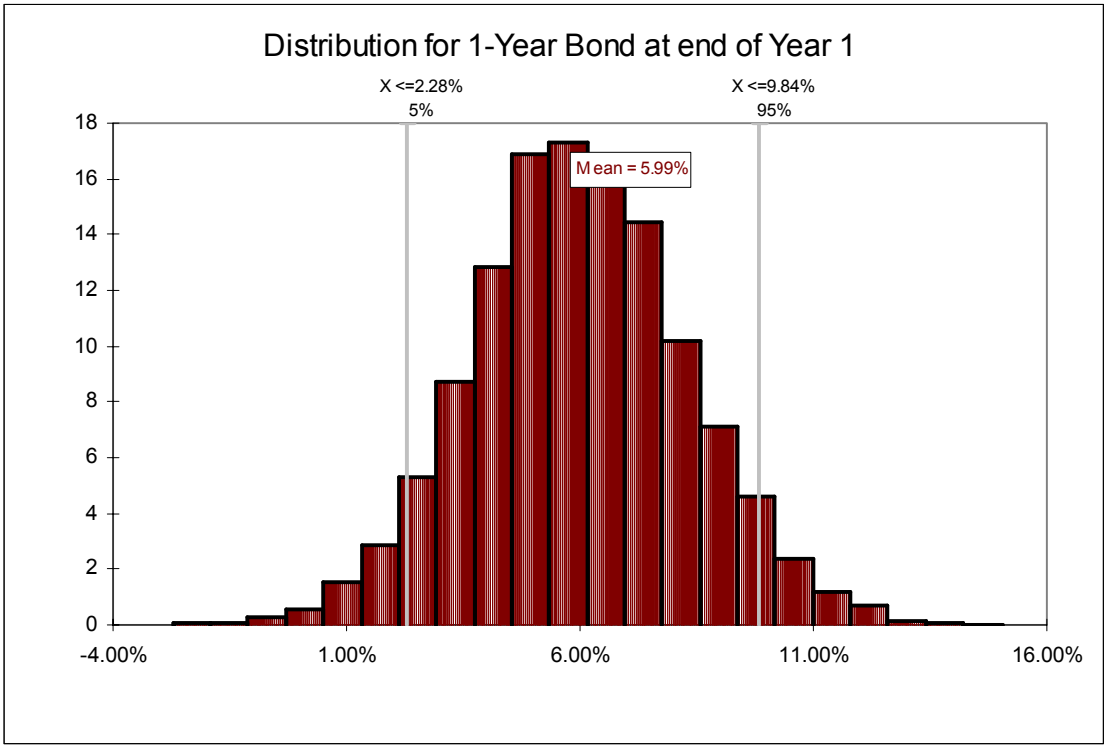
Exhibit VI – House Price Indicators

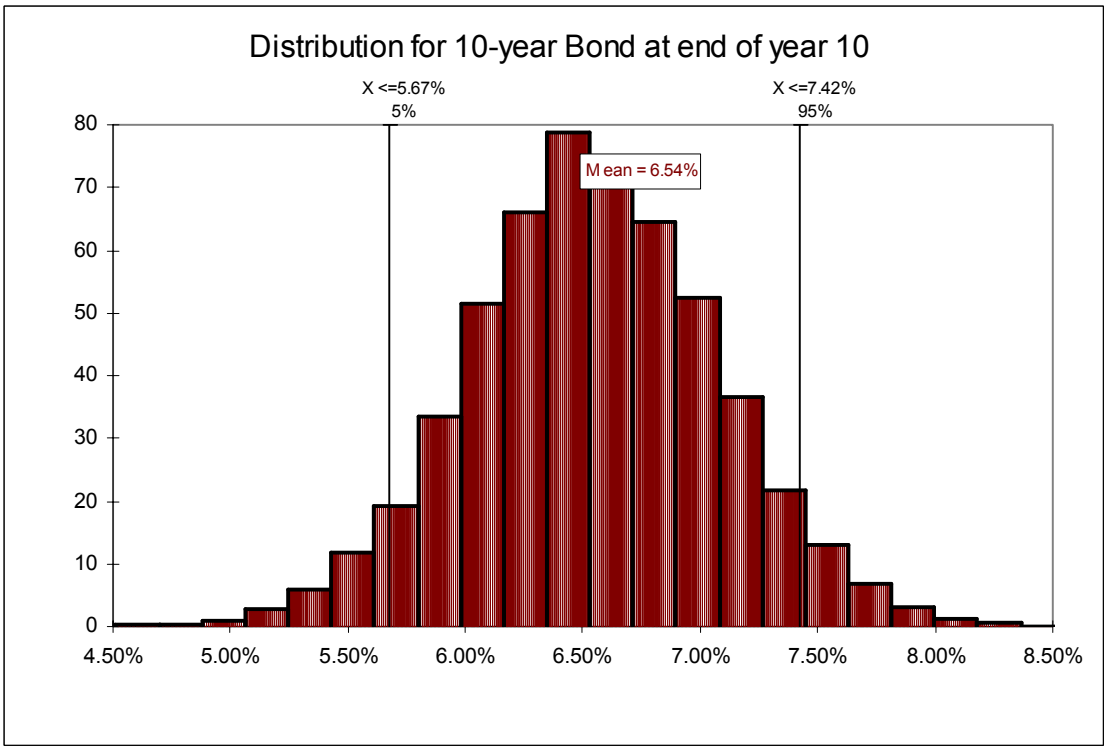
Date	Quarterly % Increase
1Q - 2001	2.8
2Q - 2001	0.7
3Q - 2001	1.0
4Q - 2001	0.8
1Q - 2002	1.8
2Q - 2002	2.7
3Q - 2002	3.2
4Q - 2002	4.8
1Q - 2003	4.7
2Q - 2003	2.9
3Q - 2003	4.8
4Q - 2003	3.7
1Q - 2004	5.3
2Q - 2004	5.7
3Q - 2004	2.6
4Q - 2004	2.6
1Q - 2005	2.0
2Q - 2005	3.4
3Q - 2005	2.7
4Q - 2005	2.6
1Q - 2006	2.5
2Q - 2006	1.4
3Q - 2006	2.1
4Q - 2006	2.1

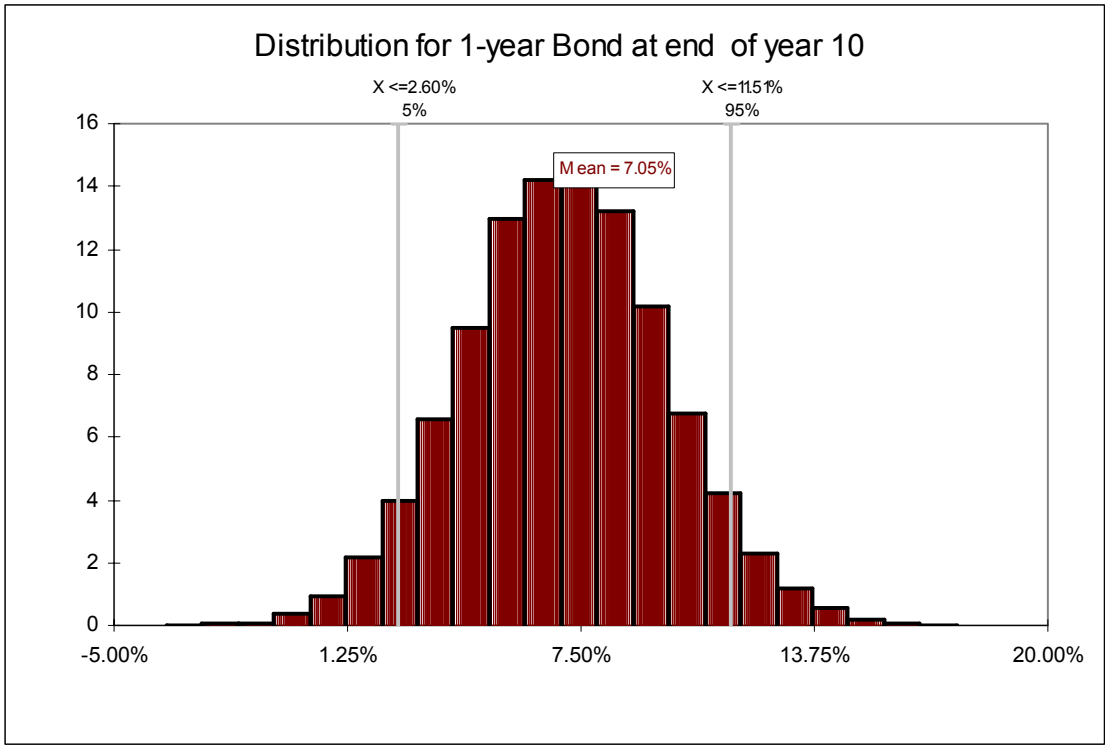
Exhibit VII – Correlation of Assets

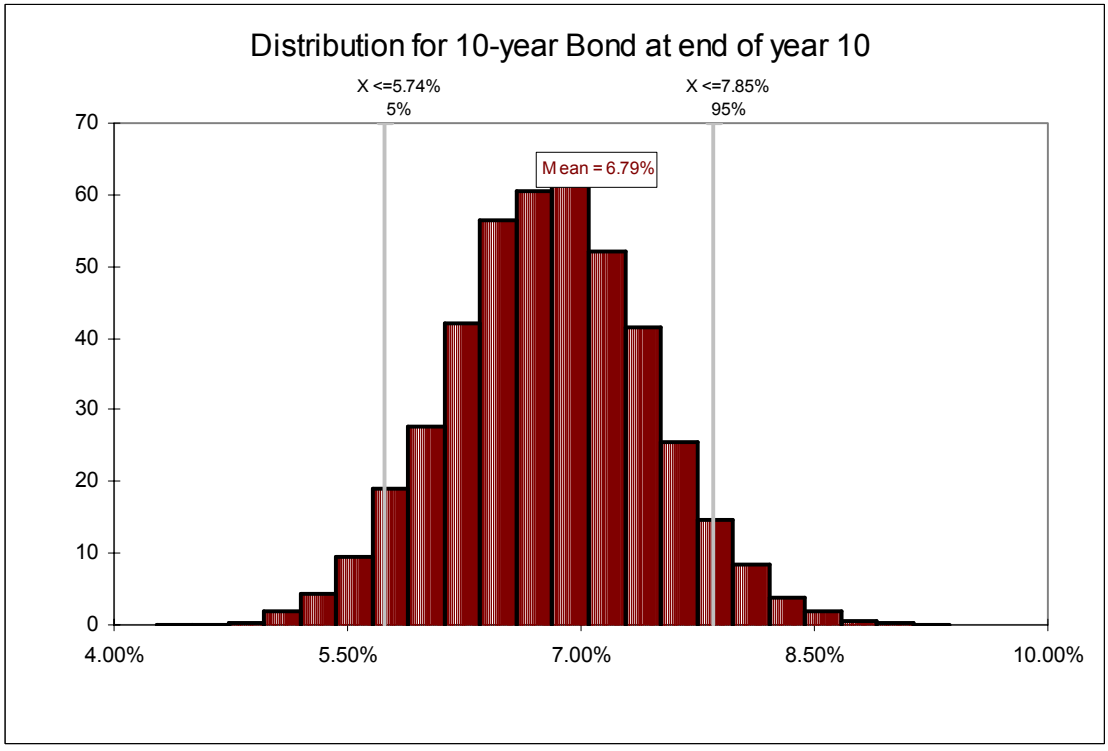
Year	Inflation	1-year bond	10-year bond	Equity	Property
1992	0.0476	0.0741	0.0750	0.1577	0.1220
1993	0.0356	0.0570	0.0575	0.9804	0.0490
1994	0.0369	0.0577	0.0625	(0.2385)	0.0800
1995	0.0345	0.0670	0.0690	0.0247	0.1840
1996	0.0349	0.0670	0.0678	0.2440	0.1289
1997	0.0266	0.0701	0.0784	(0.5198)	0.0188
1998	0.0527	0.0579	0.0670	(0.0140)	(0.0950)
1999	0.0274	0.0337	0.0633	0.3859	(0.0240)
2000	0.0155	0.0336	0.0569	(0.1633)	0.0600
2001	0.0142	0.0293	0.0381	0.0242	0.0110
2002	0.0181	0.0294	0.0406	(0.0715)	0.0250
2003	0.0112	0.0293	0.0485	0.2284	0.0400
2004	0.0144	0.0224	0.0474	0.1429	0.0480
2005	0.0302	0.0330	0.0424	(0.0084)	0.0240

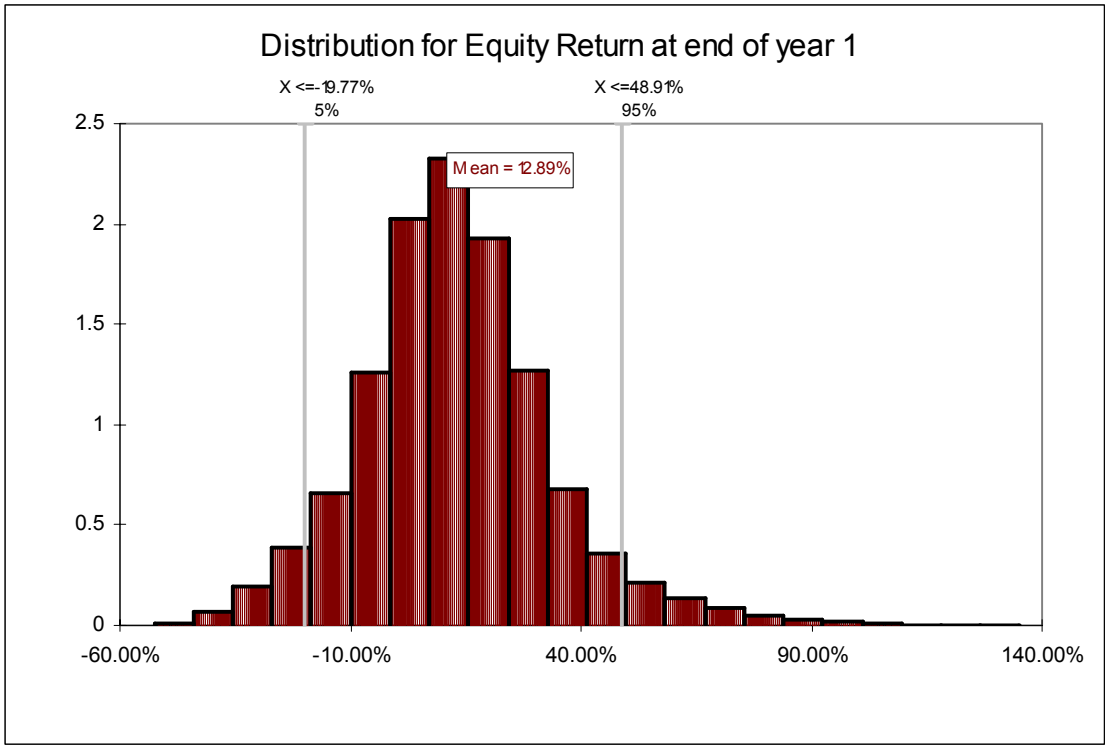
Exhibit VIII – Samples Simulation Output

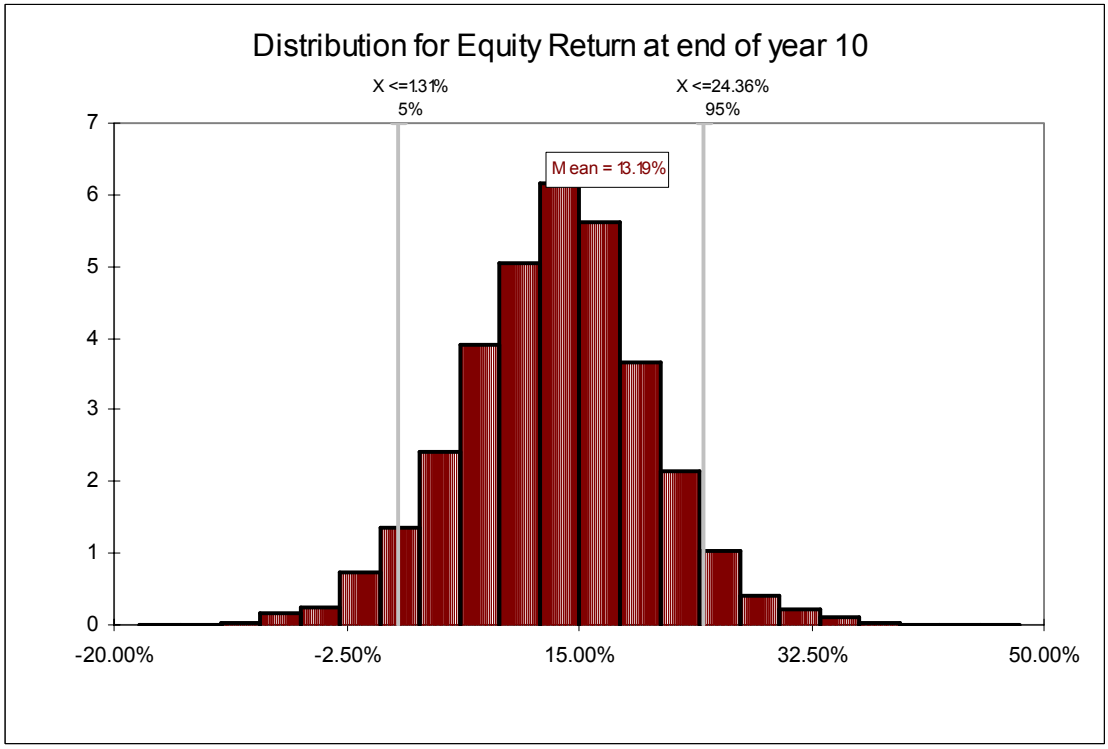


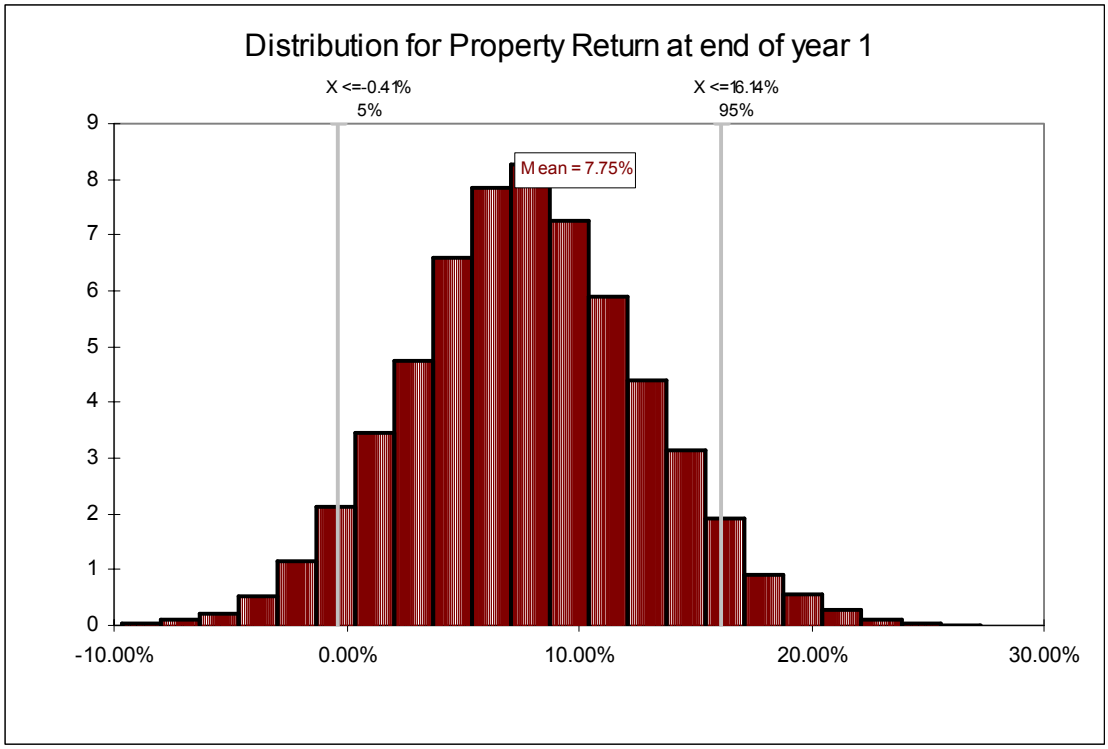



Distribution for 1-year Bond at end of year 10
X <=2.60%
5%
X <=11.51%
95%
Mean = 7.05%
16
14
12
10
8
6
4
2
0
-5.00%
1.25%
7.50%
13.75%
20.00%


Distribution for 10-year Bond at end of year 10
X <=5.74%
5%
X <=7.85%
95%
Mean = 6.79%
70
60
50
40
30
20
10
0
4.00%
5.50%
7.00%
8.50%
10.00%


Distribution for Equity Return at end of year 1
X <=-19.77%
5%
X <=48.91%
95%
Mean = 12.89%
2.5
2
1.5
1
0.5
0
-60.00%
-10.00%
40.00%
90.00%
140.00%


Distribution for Equity Return at end of year 10
X <=1.31%
5%
X <=24.36%
95%
Mean = 13.19%
7
6
5
4
3
2
1
0
-20.00%
-2.50%
15.00%
32.50%
50.00%


Distribution for Property Return at end of year 1
X <=-0.41%
5%
X <=16.14%
95%
Mean = 7.75%
9
8
7
6
5
4
3
2
1
0
-10.00%
0.00%
10.00%
20.00%
30.00%

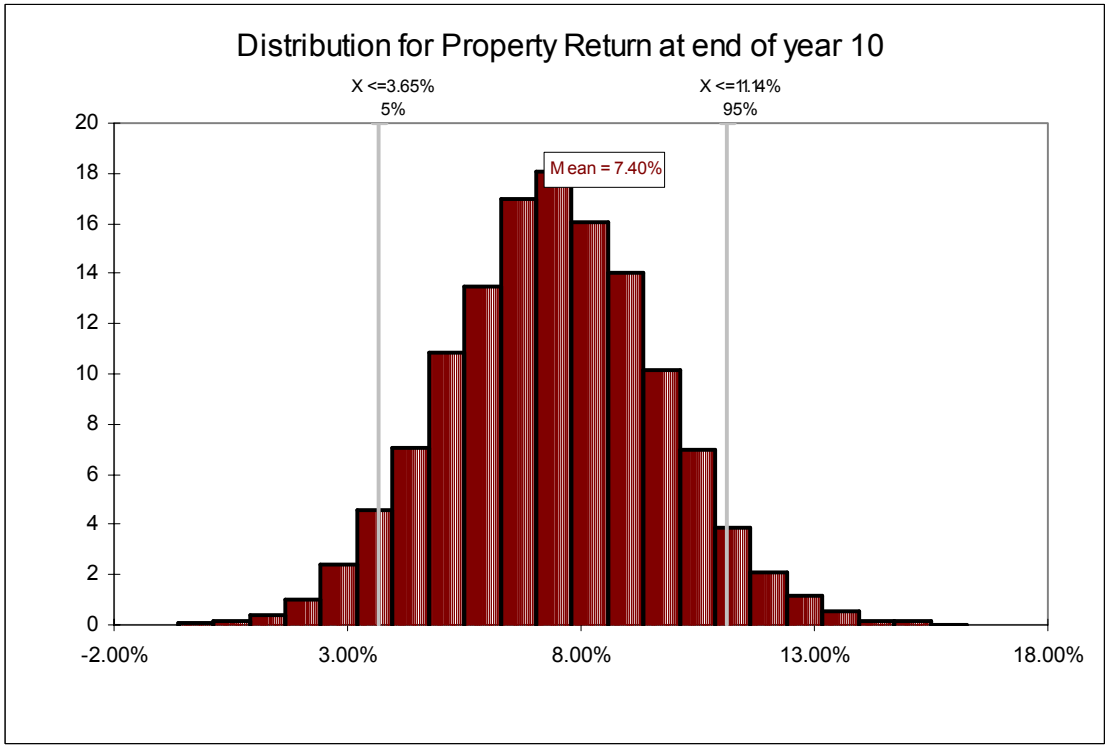

Distribution for Property Return at end of year 10
X <=3.65%
5%
X <=11.14%
95%
Mean = 7.40%
20
18
16
14
12
10
8
6
4
2
0
-2.00%
3.00%
8.00%
13.00%
18.00%

Exhibit IX – Samples ALM Output (Mean)

Profit and Loss Statement (RM '000)

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Premium	90,000														
Commission	(3,150)														
Expense	(1,350)	(489)	(448)	(411)	(377)	(345)	(316)	(289)	(265)	(243)	(222)	(203)	(186)	(170)	(155)
Annuity Benefit															(2,829)
Death Benefit	(107)	(97)	(99)	(103)	(106)	(109)	(112)	(114)	(116)	(118)	(120)	(121)	(123)	(125)	
Surrender Benefit	(17,688)	(7,207)	(6,606)	(6,054)	(5,547)	(5,081)	(4,654)	(4,261)	(3,900)	(3,568)	(3,264)	(2,984)	(2,727)	(2,491)	
Investment Return	7,529	6,875	6,895	6,912	6,944	7,014	7,110	7,239	7,414	7,630	7,884	8,181	8,520	8,897	9,109
Investment Tax	(602)	(550)	(552)	(553)	(556)	(561)	(569)	(579)	(593)	(610)	(631)	(654)	(682)	(712)	(729)
Transfer to Shareholder	(145)	(135)	(126)	(117)	(110)	(104)	(98)	(93)	(89)	(85)	(83)	(80)	(79)	(78)	(78)
Corporate Tax	(41)	(38)	(35)	(33)	(31)	(29)	(27)	(26)	(25)	(24)	(23)	(23)	(22)	(22)	(22)
Net Cashflow	74,446	(1,641)	(971)	(359)	218	785	1,335	1,877	2,426	2,982	3,543	4,115	4,702	5,301	5,297

Profit and Loss Statement (RM '000)

Year	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Expense	(141)	(144)	(146)	(148)	(150)	(152)	(154)	(156)	(158)	(160)	(161)	(162)	(163)	(164)	(165)
Annuity Benefit	(2,886)	(2,943)	(3,002)	(3,062)	(3,123)	(3,186)	(3,250)	(3,315)	(3,381)	(3,221)	(3,247)	(3,269)	(3,287)	(3,301)	(3,311)
Investment Return	9,544	9,989	10,482	10,975	11,510	12,090	12,736	13,394	14,140	14,891	15,740	16,633	17,581	18,600	19,698
Investment Tax	(764)	(799)	(839)	(878)	(921)	(967)	(1,019)	(1,072)	(1,131)	(1,191)	(1,259)	(1,331)	(1,406)	(1,488)	(1,576)
Transfer to Shareholder	(78)	(78)	(78)	(78)	(78)	(78)	(78)	(77)	(77)	(76)	(76)	(75)	(74)	(72)	(71)
Corporate Tax	(22)	(22)	(22)	(22)	(22)	(22)	(22)	(22)	(22)	(21)	(21)	(21)	(21)	(20)	(20)
Net Cashflow	5,654	6,003	6,396	6,787	7,215	7,684	8,214	8,753	9,371	10,221	10,976	11,776	12,629	13,553	14,555

Balance Sheet (RM '000)

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Cash	16,125	13,792	13,546	13,400	13,346	13,379	13,497	13,697	13,979	14,343	14,790	15,321	15,939	16,644	17,439
MGS -1 year	10,750	9,195	9,031	8,933	8,898	8,919	8,998	9,131	9,319	9,562	9,860	10,214	10,626	11,096	11,626
MGS - 10 year	21,500	18,389	18,061	17,867	17,795	17,839	17,996	18,263	18,638	19,123	19,720	20,428	21,251	22,192	23,252
PDS -1 year	10,750	9,195	9,031	8,933	8,898	8,919	8,998	9,131	9,319	9,562	9,860	10,214	10,626	11,096	11,626
PDS - 10 year	26,875	22,987	22,576	22,334	22,244	22,298	22,495	22,829	23,298	23,904	24,650	25,535	26,564	27,740	29,065
Property	5,375	4,597	4,515	4,467	4,449	4,460	4,499	4,566	4,660	4,781	4,930	5,107	5,313	5,548	5,813
Equity	16,125	13,792	13,546	13,400	13,346	13,379	13,497	13,697	13,979	14,343	14,790	15,321	15,939	16,644	17,439
Total Asset	107,500	91,946	90,306	89,335	88,976	89,194	89,979	91,314	93,191	95,617	98,599	102,142	106,257	110,958	116,259
Reserve	90,294	87,819	85,049	82,054	78,898	75,631	72,300	68,940	65,585	62,261	58,987	55,783	52,662	49,635	44,551
Solvency Margin	3,612	3,518	3,416	3,306	3,190	3,070	2,947	2,823	2,700	2,578	2,457	2,340	2,226	2,115	1,782
Surplus	13,594	610	1,841	3,974	6,888	10,493	14,733	19,551	24,906	30,779	37,154	44,018	51,369	59,208	69,926
Total Liability	107,500	91,946	90,306	89,335	88,976	89,194	89,979	91,314	93,191	95,617	98,599	102,142	106,257	110,958	116,259

Year	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Cash	18,233	19,082	19,982	20,941	21,959	23,042	24,194	25,426	26,739	28,145	29,678	31,325	33,091	34,985	37,018
MGS -1 year	12,156	12,721	13,321	13,961	14,640	15,361	16,130	16,951	17,826	18,763	19,785	20,883	22,061	23,324	24,679
MGS - 10 year	24,311	25,442	26,643	27,922	29,279	30,722	32,259	33,902	35,653	37,527	39,571	41,766	44,121	46,647	49,358
PDS -1 year	12,156	12,721	13,321	13,961	14,640	15,361	16,130	16,951	17,826	18,763	19,785	20,883	22,061	23,324	24,679
PDS - 10 year	30,389	31,803	33,304	34,902	36,599	38,403	40,324	42,377	44,566	46,908	49,464	52,208	55,152	58,309	61,697
Property	6,078	6,361	6,661	6,980	7,320	7,681	8,065	8,475	8,913	9,382	9,893	10,442	11,030	11,662	12,339
Equity	18,233	19,082	19,982	20,941	21,959	23,042	24,194	25,426	26,739	28,145	29,678	31,325	33,091	34,985	37,018
Total Asset	121,557	127,211	133,214	139,610	146,396	153,612	161,296	169,510	178,263	187,634	197,855	208,831	220,607	233,236	246,790
Reserve	44,492	44,382	44,217	43,997	43,722	43,394	43,012	42,581	42,103	41,559	40,948	40,270	39,522	38,706	37,822
Solvency Margin	1,780	1,775	1,769	1,760	1,749	1,736	1,720	1,703	1,684	1,662	1,638	1,611	1,581	1,548	1,513
Surplus	75,284	81,054	87,229	93,853	100,925	108,482	116,563	125,226	134,476	144,412	155,269	166,951	179,504	192,982	207,455
Total Liability	121,557	127,211	133,214	139,610	146,396	153,612	161,296	169,510	178,263	187,634	197,855	208,831	220,607	233,236	246,790

Investment Yield

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Cash	4.49%	4.99%	5.23%	5.36%	5.45%	5.49%	5.53%	5.54%	5.54%	5.55%	5.55%	5.57%	5.56%	5.56%	5.56%
MGS -1 year	5.99%	6.49%	6.73%	6.86%	6.95%	6.99%	7.03%	7.04%	7.04%	7.05%	7.05%	7.07%	7.06%	7.06%	7.06%
MGS - 10 year	6.54%	6.65%	6.71%	6.75%	6.77%	6.78%	6.79%	6.79%	6.79%	6.79%	6.80%	6.80%	6.80%	6.80%	6.80%
PDS -1 year	6.99%	7.49%	7.73%	7.86%	7.95%	7.99%	8.03%	8.04%	8.04%	8.05%	8.05%	8.07%	8.06%	8.06%	8.06%
PDS - 10 year	8.04%	8.15%	8.21%	8.25%	8.27%	8.28%	8.29%	8.29%	8.29%	8.29%	8.30%	8.30%	8.30%	8.30%	8.30%
Property	7.75%	7.59%	7.51%	7.47%	7.45%	7.43%	7.42%	7.41%	7.40%	7.40%	7.39%	7.39%	7.38%	7.38%	7.38%
Equity	12.87%	12.39%	12.48%	12.68%	12.75%	12.91%	12.93%	13.02%	13.10%	13.14%	13.17%	13.21%	13.23%	13.25%	13.27%
Weighted Return	7.61%	7.75%	7.88%	7.96%	8.01%	8.05%	8.07%	8.09%	8.11%	8.12%	8.12%	8.13%	8.13%	8.13%	8.14%

Year	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Cash	5.56%	5.56%	5.56%	5.56%	5.56%	5.57%	5.55%	5.56%	5.57%	5.57%	5.56%	5.57%	5.56%	5.56%	5.55%
MGS -1 year	7.06%	7.06%	7.06%	7.06%	7.06%	7.07%	7.05%	7.06%	7.07%	7.07%	7.06%	7.07%	7.06%	7.06%	7.05%
MGS - 10 year	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%	6.80%
PDS -1 year	8.06%	8.06%	8.06%	8.06%	8.06%	8.07%	8.05%	8.06%	8.07%	8.07%	8.06%	8.07%	8.06%	8.06%	8.05%
PDS - 10 year	8.30%	8.30%	8.30%	8.30%	8.30%	8.30%	8.30%	8.30%	8.30%	8.30%	8.30%	8.30%	8.30%	8.30%	8.30%
Property	7.38%	7.37%	7.37%	7.37%	7.37%	7.37%	7.37%	7.36%	7.36%	7.36%	7.36%	7.36%	7.36%	7.36%	7.36%
Equity	13.30%	13.31%	13.34%	13.35%	13.36%	13.38%	13.40%	13.40%	13.42%	13.43%	13.43%	13.43%	13.43%	13.43%	13.43%
Weighted Return	8.14%	8.15%	8.15%	8.15%	8.15%	8.16%	8.15%	8.16%	8.17%	8.16%	8.16%	8.17%	8.16%	8.16%	8.16%

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Bio-data

Seow Fan Chong is a Fellow of the Society of Actuaries. He is the Appointed Actuary of Hong Leong Assurance Berhad, a composite insurance company in Malaysia. Before moving to Malaysia in 2006, he worked in Singapore for more than 10 years covering product development, pricing and reinsurance. Recently he is actively transforming Actuarial Society of Malaysia (ASM) into a government recognized professional body by acting as the chairman of ASM Professional Committee. He graduated from the National University of Singapore majoring in Economics and Statistics in 1993. Besides reading actuarial journals and spending time with his wife and family, he started learning Japanese Language in 2005 and hope one day to communicate in Japanese.