

## ALM PRODUCTS COMPARED

Alphen, Joeri van; As, Jelles van; Brings, Hans F.; Heerdt van, Wout; Steenkamp, Tom;  
Valkenburg, Falco R.; Wenting, Dick

VBA Committee Portfolio Management  
Dutch Society of Investment Analysts (VBA)  
c/o Actuarieel Bureau Hammer  
Postbus 1364  
3000 BJ ROTTERDAM  
The Netherlands

Telephone: +31 10 207 55 00  
Facsimile: +31 10 456 07 57  
e-mail: C.F.Hammer@hammer.nl

### Abstract

In June 1996 a product presentation of five ALM consultants was organised by the VBA Committee Portfolio Management. To our knowledge this has been the first time in the world that five providers of ALM models presented their products on the same day, on the same floor, using the same model pension fund. The five providers were:

- ▲ Frank Russel Company
- ▲ ORTEC Consultants
- ▲ PVF Nederland
- ▲ Towers Perrin
- ▲ W.M. Mercer Klein Haneveld

This paper summarizes the findings of this most interesting event.

The objectives were getting to know better the different approaches to ALM, offering pension funds and insurance companies the possibility to see five ALM organisations on one day and learning where the differences in the approaches are and why. It has not been the objective to come to a kind of ranking of the providers of ALM models.

As an introduction a short overview of the Dutch history in ALM is given. The case the working group has put together for the providers of ALM models is introduced in the second part of the paper. All providers of ALM models have received the same case, scenario's and questions. This in order to be able to compare the results and, more important, the approach to come to the results as good as possible. In the third and most important section the main results and the differences in approach are discussed. The highlighted topics are:

- ▲ Organization
- ▲ ALM approach
- ▲ Planning horizon

- △ Scenario's
- △ Economical assumptions
- △ Management devices
- △ Recommended investment policy
- △ Findings case-study

We, and with us all participants of this very practical ALM event, have enjoyed this day extremely and have found it very valuable. We hope the findings are also of interest for colleagues outside the Netherlands. We strongly recommend to organize similar events in your own country.

## CONTENTS

Abstract	1
1. Preface	4
1.1. VBA Committee Portfolio Management	4
2. Pensions and Investments in the Netherlands	4
3. ALM in the Netherlands	7
3.1 Introduction	7
3.2 ALM is integral risk	9
4. Description of the case “A Dutch pension fund”	11
5. Analysis of the results of the ALM studies	16
5.1 Introduction	16
5.2 Organisation	16
5.3 ALM approach	16
5.4 Planning Horizon	17
5.5 Scenarios	18
5.6 Economic assumptions and assumptions about the financial market	18
5.7 Instruments	19
5.8 Advice on investment policy	20
5.9 Findings from the case study	20
5.10 Conclusions	21
6. Bibliography	22
7. Endnotes	22

## 1. Preface

### 1.1 VBA Committee Portfolio Management

The Committee Portfolio Management was founded at the end of 1988 initiated by several members of the Dutch Society of Financial Analysts (VBA). The Committee's objectives are as follows: to gather, analyse, discuss and present theoretical and practical aspects of portfolio management in a changing world. The Committee has about forty members. They come from banks, insurance companies, consultancy practices (including actuarial), pension funds and universities. The expertise of the individual members is fully brought to bear in the selection of study topics, which are then pursued in further detail by small working groups. The results are published in reports and announced at presentations.

At the end of 1990 an "Asset & Liability Management" working group was set up within the Committee Portfolio Management. End 1992 this group presented its first findings in a detailed report in Dutch. A translation of an abridged version was presented at the third AFIR Colloquium in Rome (1993). In 1994 the results of a survey on assets, liabilities and ALM amongst Dutch pension funds were presented. In 1995 a seminar on the same topics was organised.

## 2. Pensions and Investments in the Netherlands

The Dutch pension scene is undergoing significant changes. The ageing of the population (baby boomers) places pressure on the future costs of provision for old age in general and early retirement in particular. Not only the pension funds are confronted by this, but it is above all the public sector which has to struggle with increasing costs within the social insurance system.

Another aspect is that the citizens are becoming aware of the need to cater for their individual needs and demand opportunities to do so.

### These circumstances lead to the following picture:

In their traditional form pension schemes were created in the Netherlands on the basis of the concept of caring for people, paying attention to financial security in old age and the covering of risks related to death and disability. In addition to the provision of pensions, early retirement schemes were created, in which making employment available to others was the primary aspect.

In recent years the view has arisen that the traditional schemes are too rigid and that in particular the Voluntary Early Retirement Schemes (VUT) offer little security. By definition VUT schemes are temporary and in many cases there is concern about their cost. Naturally conversion to a pension also results in costs but these are easier to manage. For the employees it is important that a pension offers more security in the long term and that the entitlements are accrued during employment, which reduces the likelihood of a shortfall in pension. Social developments lead to the demand for more flexible schemes in order to offer

employees more options in order to be able to cater for individual needs. Family circumstances can be an important factor in this.

The Dutch government also recognises the altered circumstances which have resulted in a loss of social security. Thus the WAO [Dutch law on invalidity insurance] and AWW [Dutch Widows and Orphans Act] have been considerably restricted. In many cases the social partners adapt to this by making substitute provisions within the pension schemes.

In fiscal terms the increasing desire for individualisation has led to a study to determine adjustments in the fiscal treatment of supplementary pensions and the associated fiscal regulations are desirable and possible. A report was issued on this in 1995<sup>1</sup>. Far-reaching possibilities for increasing flexibility were proposed.

There can thus be said to be an enormous shift in the system of provision. The Dutch government is taking a step back and at the same time the funds are adapting their schemes in the private sector.

A great deal is at stake:

Within Continental Europe the Netherlands holds first place in terms of pension assets. Internationally the Netherlands holds fifth place behind countries such as the USA, the United Kingdom, Canada and Japan. The Netherlands also score well in terms of pension coverage: a good 85% of employees are covered by a pension scheme, with invested assets of some Fl. 600,000 million (USD 315,000 million)

It is not only in terms of absolute value that what is at stake is increasing. This is emphasised by looking at the trend of pension fund assets in relation to the GDP:

	1970	1975	1980	1985	1991	1995	3rd quarter 1996
Netherlands	29	36	46	68	76	86	88
United Kingdom	21	18	28	57	73		
United States	29	35	41	51	66		

So far we spoke about the content of the pension schemes was discussed. However, also on the yield side a lot is happening. The Netherlands is not alone in this. The stock markets in Europe and America have performed magnificently in recent years. Interest rates are now historically low and share prices regularly break records. Thus in the years 1993-1995 the Dutch pension funds achieved a performance of 22%, - 3% and 15% respectively<sup>2</sup>.

It is clear that among the pension funds there is an increasing inclination to invest in commercial securities. The private sector is also making a considerable contribution to shaping share prices on the stock markets. The investment funds benefit from this too. There is also a clear case of a self-fulfilling prophecy, the investors themselves supporting the shaping of share prices and maintaining them. The pension funds want to reduce contributions by means of higher investment yields and if possible also use these to finance the conversion of voluntary early retirement schemes into early retirement pension schemes.

All this can lead to dangerous situations. The risks increase as share profits are actually used to finance backservice and profits are thus distributed. Pension funds are increasingly seen as a profit centre by the sponsor. The fund is capable of making a contribution to the profit of the sponsor. Pension costs form 5 to 15% of wage costs. Pressure on the fund to perform is increasing. That has its good and its bad sides. Another trend that is important to avoid is that the beneficiaries become accustomed to the annual index-linking of their pension and come to regard inflation-proofing as a matter of course. In most cases index-linking is conditional. The question is whether the beneficiaries recognise that it is conditional. It becomes an unwritten law. This increases the risks for the funds. ALM studies can demonstrate this. The importance of this is emphasised by the following.

In 70% of the supplementary schemes there is a provision for index-linked wage-related pension provisions. This applies to 75% of the members of supplementary pension schemes. About 95% of these members have a final pay scheme at the level of 70% or more.

Until recently pension schemes were characterised by collectivity and solidarity. This is decreasing. In many schemes collectivity is being decreased in favour of individual options. This too means an increase in the risk which can be managed by ALM.

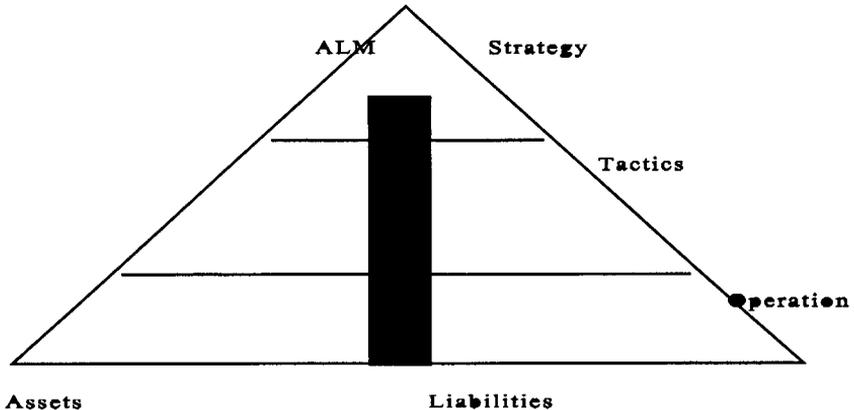
In connection with the calculation of correct performance many funds are switching to valuation at market value instead of at face value. The Anglo-Saxon valuation methods are being used more (SAP24 and FAS87). ALM studies can show what this can mean for the risks run by the pension fund and the sponsor.

The altered attitude to risk makes the responsible use of ALM methods essential. This is therefore the trend which we see arising and which we expect to intensify. Fortunately in the Netherlands ALM applications are increasingly being developed by pension funds and sufficient help is being offered to achieve adequate ALM studies. This paper therefore discusses this.

### 3. ALM in the Netherlands

#### 3.1. Introduction

The organisation of a pension fund or insurer can be represented by a triangle:



The left- and right-hand halves represent the investments and/or the liabilities. Here two different disciplines dominate at different levels. At the base is administration and enrolment, the operational level. Enrolment can be used to make predictions for the medium term, the tactical level. The policy makers who are situated at the top outline the long-term strategic policy. At the operational and tactical level the two disciplines can operate separately. Contact between the two is not necessary for their work. In the diagram this is represented by a wall between the two disciplines. However, at the strategic level this wall can no longer exist. This is the level at which ALM is used and the investments and liabilities are connected to one another. Here there must be open communication.

There can be no ALM without focus. Or, as a Chinese proverb teaches us: "If you don't know where you're going, it doesn't matter which direction you go"

The first stage in the process of ALM is to determine the aims that are being sought. On the basis of this an ALM study can be created.

The main aim is always as follows:

▲ at all times to be able to meet the obligations undertaken

In addition, aims such as the following are often formulated:

- ▲ at cost as low as possible;
- ▲ at cost as stable as possible .

It is clear that the terms yield and risk play an important role here. The term risk, in particular, is interpreted in different ways. Here some choose standard deviation or downside risk, others choose concepts such as the likelihood of loss or the likelihood of ruin (over what period?) The degree of fluctuation in the contributions can also be seen as a risk factor.

It is of the greatest importance at the beginning of an ALM study to take ample time to define the risk. This can be different in each individual situation and can to a large degree influence the outcome of the study. The best definition is the one with which the client is most comfortable. The client's attitude to risk, the profile of both the sponsor and the fund, its financial position, etc., all play an important role.

ALM has only been actively used for about ten years. But even in this short period there has already been clear development. It began with a deterministic approach to both investments and liabilities. On the basis of a limited number of scenarios a number of possible views of the future were examined. In case of a deterministic approach we advise the use of an even number of scenarios. ALM is all about a process of learning or becoming aware. We have seen that part of the learning effect threatens to be lost if a uneven number of scenarios is used and that number is usually three. In the case of three scenarios everyone is inclined to leave the two outer ones alone and only to look at the middle one, the "most probable". In the case of an even number of scenarios there are fortunately two middle scenarios, so that there has to be further consideration of at least two scenarios.

The purely deterministic models were followed by stochastic models. Initially a stochastic approach was primarily applied to the investments, subsequently it was also applied to the liabilities. Starting from the scenario outlines of many scenarios (e.g. 500 or 1000) an examination is made of which current investment mix displays the most robust behaviour in achieving the aims.

The latest development, only used very recently, is the dynamic approach. In this stochastic approach the search is not for a single fixed investment mix which provides the most robust result of all the scenarios, but the model takes into account the fact that in real life managers can adapt the investment mix along the way. The dynamic approach is powerful when decision rules can be formulated and not only with respect of investment strategies, but also for allowing dynamic contribution policies and the problem of raising pensions in line with inflation but with a maximum of the available profit on investment. It is of course not the case that managers sit with their arms crossed if in practice it becomes apparent that an adverse undesired scenario seems to develop. In that case an intervention will be made and the management will adapt their policy to the economic circumstances. In all these cases a dynamic approach is very powerfull in modeling the reality.

In the case of the dynamic ALM models, decision-making rules are used to adapt the investment mix continuously to the economic circumstances in the scenario that is being examined. Naturally only the knowledge that is available at the time of the decision is used.

The future belongs to the dynamic method. We have already heard many managers say that the current ALM models are not very realistic, because no account is taken of the actions of the management. We think that the models in which these actions can be modelled have a great future.

### 3.2 ALM is integral risk analysis

In essence ALM pictures incoming and outgoing cashflows in the light of many economic and actuarial scenarios, taking into account the dynamic (re)actions of the managers. In order to make an integral risk analysis of both investments and liabilities, models are required. Many models are now available that are marketed by various professional suppliers. In this paper the approaches and products of five professional suppliers are examined more closely. Insofar as we know, nowhere in the world has a day yet been organised in which five professional suppliers have placed themselves in such a vulnerable position. Even in the United States and the United Kingdom, countries where professional ALM has been practised for much longer, it has not yet happened that a number of suppliers have been willing to take the stage one after another before a hall of ALM-experts and potential customers in order to explain their model using one and the same case.

How should one compare the results of ALM studies? How should one compare results from different scenarios within a single study?

Indices are a useful aid in this. It is of course very important that the indices give an accurate reflection of the results, taking into account the formulated aims. Indices reproduce the expected result in relation to relevant aspects. In addition, it is important to gain insight into the distribution of the results. Sensitivity analysis is possibly the most important element of an ALM study. Too much importance must not be attached to the score in indices in itself. Such an enormous number of assumptions has been made in order to reach a result that the absolute value must be qualified as unreliable. However, what is of great importance is the alteration in the result if an assumption changes. This gives information about how sensitive the pension fund or the insurer is to the various factors.

When several indices are used it is usually not immediately clear which result is the best. In one instance one index appears better than in another case and that differs again from index to index. In order to reduce indices to a common denominator one can use multi-criteria analysis. This paper is not an appropriate place to discuss this in detail. But the method must at least be mentioned. It is known of PGGM, the second largest pension fund in the Netherlands, that its ALM model compares results on the basis of multi-criteria analysis. Multi-criteria analysis amounts in brief to the setting of relevant criteria. Then each criterion is weighted. The weighting clearly depends on the point of view from which the results are being seen. Thus a manager may use different weightings from a member or beneficiary, a sponsoring company, the Dutch Chamber of Insurance (Verzekeringskamer), etc. Multi-criteria analysis has methods of reducing the scores for various criteria, taking their weightings into account, reducing them to a single denominator and reaching a single figure. Multi-criteria analysis is a very powerful and practical method which in our opinion receives too little attention within the context of ALM.

#### 4. Description of the case "A Dutch pension fund"

A case was created for the purpose of presenting ALM products at the ALM seminar. This case serves as a guideline for an ALM study which is performed using the models of the various suppliers.

The aim of the case study is:

- 1) To gain insight into:
  - △ the structure of the model used in ALM products;
  - △ the operation of ALM models, including the importance of model assumptions and input;
  - △ the connections between the investments and liabilities of pension funds.
- 2) To compare ALM products and ALM studies on the basis of:
  - △ user-friendliness (clarity);
  - △ transfer of ALM knowledge;
  - △ product characteristics: approach, functionality.
- 3) To learn to assess the value of ALM studies.

In order to achieve these aims a number of simplifications were made to some parts of the case. In this case a fictitious Dutch pension fund was used which had the following characteristics in its initial situation:

- △ aim of the pension fund (general): little likelihood of inadequate cover of liabilities with a low contribution and a stable contribution trend;
- △ structure of the liabilities of the pension fund.

#### Membership

The membership consists of three sub-memberships with only male (former) employees:

- △ active members                      2000
- △ paid-up former members        1470
- △ pensioners                            950

The following are the ways in which the members of the three sub-memberships join and leave the fund:

- △ active members                      death, retirement, joining and leaving
- △ paid-up members                    death and retirement
- △ pensioners                            death and retirement

For the active members the number of people joining over a period is the same as the number of retirements plus the number of deaths over the same period. The number of people joining is evenly distributed over the ages 25 to 34.

The likelihood of leaving for active members is  $0.9$  to the power  $x$ , where  $x$  stands for the age of the member.

### Initial memberships

Per sub-membership the following information is given: the number of people per age category, pay, pensionable pay and acquired pension.

### Actuarial principles

The calculations are based on the mortality tables of the Dutch Civil Registry of Births (Men) for the period 1985-1990 (GBM 1985-1990), with 1 year's reduction in age. The actuarial rate of interest is 4%.

### Pension scheme

- ▲ retirement pension only;
- ▲ age of entry is 25;
- ▲ final pay scheme;
- ▲ pension percentage 1.75% per year of service ;
- ▲ total retirement pension attainable with 40 years of membership is 70% of the pensionable pay applying most recently;
- ▲ pensionable pay: pensionable salary - AOW franchise;
- ▲ pensionable salary = 12.96 x monthly salary;
- ▲ state pension (AOW) offset is initially Fl. 24,643;
- ▲ pension liabilities financed by money purchase;
- ▲ gross contribution percentage: total of money purchase/total of salaries;
- ▲ time horizon is 35 years;
- ▲ inflation of wage costs is the Dutch average.

### Index-linking policy

Index-linking to increases in Dutch consumer prices is not conditional. The pension entitlements of the paid-up members and the pensioners are increased annually by the same percentage. The gross annual salary and the franchise are increased annually by the same percentage.

### Asset position

A number of parameters are to be derived from the initial membership such as the provisions for pension liabilities for active members (Fl. 123,363,286), paid-up members (Fl. 22,836,070) and retirement pensions that have commenced (Fl. 170,792,135).

The surplus is 15% of the total reserve.

The definition of the degree of maturity is: reserve for non-active members/total reserve.

### Financing policy

- ▲ Free reserve: lower limit: 0%, upper limit: 30%
- ▲ Cover shortfall: cover < 100% before any contribution supplement  
In the event of shortfall in cover, obligatory contribution supplement, if upper limit is exceeded, restitution.

- ▲ Net contribution: gross contribution less contribution reductions plus contribution supplements

#### Investment policy

- ▲ Current aim of the investment policy, with benchmarks
- ▲ Fixed-interest securities:
 

Netherlands	50% Salomon Brothers Netherlands
abroad	15% Salomon Brothers world
- ▲ Shares:
 

Netherlands	20% MSCI Netherlands
abroad	15% MSCI world
- ▲ Foreign exchange policy:
  - foreign exchange exposures 100% unhedged

#### Economic environment

The level of economic variables in the initial position is 6% for interest in financial markets and 2% for inflation.

#### Assignments

##### A. Introduction

Give an explanation of the ALM model used by you. In doing this you can pay attention to the following characteristics:

- ▲ the structure of the model: construction from sub-models and the links between them;
- ▲ the operation of the model; type of model; scenario analysis or stochastic simulation, number of scenarios, number of periods;
- ▲ the input cross-table: yield, volatility and correlation between assets and the economy;
- ▲ the valuation principles for the investment categories;
- ▲ other specific characteristics.

##### B. Basic study

On the basis of the initial situation outlined in the introduction, state the future projections of what you consider to be the most important characteristics of the pension fund. Here one might consider:

- ▲ the gross and net contribution (development over time, average) and the volatility of contributions;
- ▲ the average degree of cover;
- ▲ the likelihood of a shortfall in cover (development over time, final value);
- ▲ the degree of maturity (development over time);
- ▲ the core data of the investment mix;
- ▲ the core data of the macro-economic environment;
- ▲ the connections between investment yields, wage growth and inflation.

### C. Optimisation of the investment mix

Questions: Which strategic investment mix is optimal, if what is sought is minimal maintenance of the current average degree of cover, average net contributions and average volatility of contributions, as calculated in part B? State the most important characteristics of the pension fund in this situation. Here one might think of:

- ▲ the composition of the investment mix;
- ▲ the average investment yield;
- ▲ the average net contribution and contribution volatility;
- ▲ the average degree of cover and the likelihood of a shortfall in cover.

### D. Robustness of the model results

The model results, such as the recommended optimum investment mix, are influenced by a large number of endogenous and exogenous factors from the ALM model. In this context please discuss one or several of the questions below.

#### D1

What is the influence on the optimum investment mix of adjustments in the financing policy and the length of the time horizon (buffering). Here you can for example discuss the consequences of the use of maximum contribution increases of 0.5% and the reduction of the horizon to 15 years.

#### D2

Is the recommended optimum investment mix also better than the current mix in a different economic scenario? Here you can for example compare the characteristics of the pension fund from question C for a situation in which both wage inflation and price inflation are 2% above the level originally expected.

#### D3

What is the influence of investment restrictions and the addition of other investment categories? Here you can think of a minimum percentage for fixed-interest securities of 60% and the addition of the investment categories of real estate and liquid assets, as well as investing in emerging markets within the share portfolio.

#### D4

Assume that you, unimpeded by limiting conditions from the assignments, were able to advise the pension fund. Which policy would you then recommend to the pension fund? Here you can also emphasise specific aspects of the ALM model used by you (index-linking, derivatives, actuarial rate of interest, addition of real estate and liquid assets, etc.)

### 5. Analysis of the results of the ALM Studies

#### 5.1 Introduction

The starting points of the VBA ALM seminar were aimed at acquiring insights into ALM and making ALM products comparable. We have sought to realise these aims by arranging for a case concerning a fictitious Dutch pension fund to be worked out by various suppliers of

ALM models.

On the basis of the case given the suppliers were asked to:

- A. give an explanation of the ALM model used;
- B. state the most important (ALM) characteristics of the pension fund case;
- C. investigate several ALM aspects and produce recommendations.

In this section we attempt to compare the outlines of the product presentations. These include:

- ▲ various suppliers of the ALM models;
- ▲ the philosophy and methodology behind the ALM models;
- ▲ the characteristics of the ALM models; planning horizon,
- ▲ scenarios and assumptions;
- ▲ the policy instruments;
- ▲ the recommended investment policy;
- ▲ findings from the case study.

The section ends with several general conclusions.

## 5.2 Organisation

Knowledge in the area of Asset Liability Management is developing at a tremendous pace. From an international perspective, the Dutch are among the leaders in this. A lot of knowledge is gathered by the companies within the financial sector. However, a lot of research is also performed at the universities, where this discipline has its roots. ORTEC, WM Mercer Klein Haneveld and Towers Perrin all drew attention to the close links maintained by their organisations with various universities.

The backgrounds of the suppliers of ALM models vary. Frank Russell Company, Towers Perrin and WM Mercer Klein Haneveld know that they are supported by an international network of consultants. The most internationally oriented is the Frank Russell Company. All of this company's ALM experience has been acquired outside the Netherlands. As well as advantages relating to data on investments, this can also have disadvantages relating to the modelling of complex Dutch actuarial practice. ORTEC Consultants and PVF Nederland mainly acquired their experience of ALM studies within the sector of Dutch pension funds.

## 5.3 ALM approach

In approaching the question of ALM for a pension fund, the Frank Russell Company emphasises its multi-period character. During the planning horizon account is taken of adjustments in policy at any time within that period. All policy choices are simultaneously assessed for their effects. Frank Russell distinguishes between short- and long-term aims and pays attention to the interests of the lagging company. It also points out the usefulness of derivatives. In particular options can be used in situations in which risks actually only exist in the downward sense (shortfall in cover).

At ORTEC Consultants the emphasis is placed on the learning effect of ALM studies, over and above the importance of the results generated by the ALM model. Here a clear distinction

is drawn between the various control instruments available to the management of a pension fund. ORTEC pays ample attention to the influence of the index-linking policy on the position of the pension fund.

In the analysis by PVF Nederland the aim of the pension fund is defined in terms of the controllability/manageability of the pension fund. The analysis is performed using this criterion, with defined policy alternatives being taken as the starting point. A conspicuous place is also occupied by the long-term scenarios of the Dutch Central Planning Bureau.

At Towers Perrin the emphasis is on the characteristics generally applicable to pension funds, such as the long-term nature of the liabilities and the implications for the investment policy. Attention is also paid to the altered world of pensions and the consequences of this.

In its ALM approach WM Mercer Klein Haneveld shows that it understands the responsibilities of the management of a pension fund. A major place is given to the criteria of the Dutch Insurance Chamber and the decisions on asset allocation in a pension fund. WM Mercer Klein Haneveld considers the concept of average net contribution misleading and therefore pays more attention to the expected net contribution and the likelihood of return of contribution.

#### The ALM models

Although the design of the seminar and the case study was not aimed at an analysis of the (scientific) design of the various ALM models, there were nonetheless several conspicuous differences relating to the planning horizon, scenarios and the set of instruments.

#### 5.4 Planning horizon

There was a major difference in the planning horizon used. The planning horizon on the one hand influences the risk and on the other hand the power of the control instruments. The likelihood of a shortfall in cover increases in the long term, whilst control by means of the contribution and index-linking can have a greater effect over a longer period (on the degree of cover).

Although the case mentioned a period of 35 years, most suppliers seem to have a preference for analyses (of alternative policies) based on a shorter (maximum) period, namely

▲ Frank Russell Company	10 years
▲ ORTEC Consultants	35 years
▲ PVF Nederland	20 years
▲ Towers Perrin	20 years
▲ WM Mercer Klein Haneveld	10 years

#### 5.5 Scenarios

The research in ALM studies is often performed with the help of scenarios. The scenarios simulate possible future circumstances. The policy of the pension fund can be assessed against this background. All the suppliers generate large numbers of scenarios in which the statistical characteristics of yields, volatilities and (inter-) connections are derived (estimated)

on the basis of historical periods. However, the scenarios are handled in various ways. Thus ORTEC weights recent periods more heavily. PVF Nederland gives scenarios a more predictive nature. They take four scenarios (three of which are based on the Dutch Central Planning Bureau) explicitly as the starting point of the ALM study. These scenarios form the basis of sensitivity analyses, which are in turn based on historical data. WM Mercer Klein Haneveld also uses various basic scenarios, namely one with a high (historical) level of inflation and one in which average inflation is reduced.

#### 5.6 Economic assumptions and assumptions about the financial market

In modelling reality, the assumptions made for the sake of simplification greatly influence the results of the models. These assumptions concern the risks and yields of investment categories, price and wage inflation, mutual correlations and auto-correlations. Below is a comparison of the assumptions presented by the suppliers concerning the expected average levels of the most important parameters (not all data are given).

Expected yields (average annual change as %)

	inflation		shares			fixed interest securities	
	wages	prices	total	Dutch	intern.	total guilders	int.
Frank Russell C.	4.5	2.4		9.5	9.0	6.5	6.5
ORTEC Consultants	4.6	3.5	11.5			7.5	
Towers Perrin	2.8	2.6	10.6			6.4	7.3
WM Mercer Klein H		4.5	10.4			6.7	
PVF Nederland				12.1	11.3	8.2	
PVF Ned. scenario 1	4.8	4.5		13.8	11.3	7.2	
PVF Ned. scenario 2	4.1	3.1		17.3	16.5	7.3	
PVF Ned. scenario 3	6.3	4.9		11.6	12.2	8.2	
PVF Ned. scenario 4	5.6	3.4		14.0	11.2	7.2	

Expected standard deviations (on an annual basis as %)

	inflation		shares			fixed interest securities	
	wages	prices	total	Dutch	intern.	total guilders	int.
Frank Russell C.	5.0	4.0		21.0	19.0	7.0	10.0
ORTEC Consultants	3.3	2.3	19.5			6.9	
Towers Perrin	1.5	1.7	18.4			5.1	10.0
WM Mercer Klein H		2.8	20.8			5.3	
PVF Nederland							

The figures in the above tables are not comparable because they are based on the one hand on different series and different historical periods and on the other hand subjective elements based on expectations have been included.

### 5.7 Instruments

In an ALM analysis of a pension fund a distinction is made between the various forms of policy that are available to the pension fund. These concern the investment policy, the policy on index-linking, the contribution policy and the scheme. The pension scheme is usually not viewed as a control instrument, but as a given fact. In one of the analyses by PVF Nederland there is an investigation of the effects of the switch to an accrued benefit pension plan.

The instruments are used in a playing field that is limited by external factors such as legislation and the requirements of the Dutch Insurance Chamber, and internal factors, such as the statutes of a pension fund and agreements between the social partners. The profit that each instrument can yield in terms of lower contributions and lower likelihood of a shortfall in cover should be examined. The ultimate choice of the mix (investment allocation/contribution policy/conditions for index-linking/scheme) is the result of a process in which all the parties involved in the pension fund must participate. WM Mercer Klein Haneveld in particular emphasises the (future) guidelines of the Dutch Insurance Chamber and their implications for ALM.

When examining the control power of the various policy instruments, the ALM models do not optimise integrally. The effects of adjustments to policy are usually analyzed separately. Admittedly the Frank Russell Company gives integral (and dynamic) optimisation a high priority. The attention paid to the various instruments also varies among the product suppliers. Where ORTEC sees a lot of "profit" in a more flexible index-linking policy, PVF Nederland focuses more on the advantages of a more flexible contribution policy for the pension fund.

It is also important how the instruments in the ALM model have been applied. For example,

with regard to the contribution policy this is the dependence of the (changing) pensionable pay and its conditional nature in relation to the degree of cover. The various ALM suppliers seem to deal with this differently.

### 5.8 Advice on investment policy

Summary of recommended weightings of investment categories:

	FIS total	FIS guilders	FIS intern.	Shares total	Shares Holland	Shares intern.
Initial position	65	50	15	35		
Frank Russell C.	65	64	1	35		
ORTEC Consultants	60			40		
PVF Nederland	40			60 *		
Towers Perrin	30			70		
WM Mercer Klein	50			50		

FIS = fixed-interest securities

fc = foreign currencies

\* including 15% real estate

Note:

The stated share percentages are usually the percentages that are viewed as the maximum acceptable for commercial securities. The optimum investment mix must be seen in combination with the recommended index-linking and contribution policy. This is one of the most important causes of the differences between the recommendations of the suppliers. The recommended optimum investment mix is also often not constant for the entire planning horizon.

### 5.9 Findings from the case study

During the analysis of the pension fund the product suppliers can create a picture of future developments in the membership. Not all suppliers point out some conspicuous aspects of the membership.

PVF emphasises that the unusual structure (by age) of the (current) membership has implications for the ALM results. WM Mercer Klein goes into the ALM consequences of the membership structure (ageing or not) in the greatest detail. However, the existence of "gaps" in the membership is not unusual, especially not in company pension funds. The membership reflects the company's history, with periods of growth, mergers, reorganisations, etc.

Policy recommendations are made on the basis of the development of the membership (ageing), assumptions about the development of the economic and financial markets and the current financial position of the pension fund. All product suppliers emphasise that advice about the investment mix must be seen in combination with a specific index-linking and contribution policy. With a combination of policy instruments of this kind the likelihood of a shortfall in cover is considered acceptable for the future.

## 5.10 Conclusions

The comparison of the ALM products made in this section forms only a partial analysis of the differences in the ALM methodology of the suppliers of the models. Many subjects touched on merit closer study. All the suppliers of ALM models emphasise that it is more important to gain insight than to calculate absolute results. Or as PVF put it: the result is not the expected degree of cover in 2005, but the connection between the investment mix, the liabilities and the cover risks (Ed. using specific index-linking and contribution policies). Nor can the results of the case studies be produced in isolation by the creator of an ALM model. There needs to be cooperation with the client along the way in which various crucial starting points should be discussed. The interpretation of the model results can only be performed in consultative discussions (learning process). In the case of the case study presented this process could not take place. Less importance should therefore be attached to the differences in the results of the case than to the differences in the methodology, approach and philosophy of the various product suppliers.

## 6. Bibliography

VALKENBURG, FALCO R., VERSLOOT, PETER, WAGENAAR-WALCH, MARGREET D., WENTING, DICK

Asset & Liability Management for Dutch Pension Funds - "Policy and Decisions", 3<sup>rd</sup> AFIR International Colloquium, Rome, 30 March - 2 April 1993, Volume 2, p. 959-984 (English)

VBA COMMITTEE PORTFOLIO MANAGEMENT

Asset Liability Management bij Pensioenfondsen - "aanpak en beleid", rapport werkgroep ALM, March 1993 (Dutch)

VBA COMMITTEE PORTFOLIO MANAGEMENT

Enquete-resultaten A.L.M., rapport werkgroep ALM, September 1994 (Dutch)

VBA COMMITTEE PORTFOLIO MANAGEMENT

Reader ALM Seminar, rapport werkgroep ALM, 10 June 1996 (Dutch, the contribution of the Frank Russel Company is in English)

7. Endnotes

- 
1. Report Comittee "Witteveen",
  2. Reported by WM Company.