



EUROPEAN COMMISSION

Internal Market DG

FINANCIAL INSTITUTIONS

Insurance

MARKT/2528/02-EN

Orig.

Report

of the working group

on life assurance

to the IC Solvency Subcommittee

September 2002

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Contents

1. EXECUTIVE SUMMARY	4
1.1. Background	4
1.2. Methodology.....	4
1.3. Conclusions.....	5
1.4. Next steps	6
2. INTRODUCTION.....	8
3. DESCRIPTION OF NATIONAL MARKETS AND IDENTIFICATION OF COMMON PRUDENTIAL THEMES.....	10
3.1. Diversity of national markets	10
3.2. Common prudential themes	11
3.2.1. Guaranteed interest rates.....	12
3.2.2. Annuities and mortality risk	12
3.2.3. Profit-sharing clauses	13
3.2.4. Unit-linked products	13
3.2.5. Options.....	14
4. ASSESSMENT OF THE DIRECTIVES AND SUGGESTIONS FOR IMPROVEMENT.....	15
4.1. Preliminary remarks on premiums.....	15
4.2. Guaranteed interest rates.....	16
4.2.1. What does the Directive say and how is it implemented?	16
4.2.2. Discussion (assessment of the current provisions in the Directive)	19
4.3. Annuities and mortality risk.....	23
4.3.1. What does the Directive say?	23
4.3.2. Discussion	23
4.4. Profit-sharing	25
4.5. Unit-linked (and index-linked) products.....	27
4.5.1. Current principles for provisioning.....	27
4.5.2. Investment risk	28
4.5.3. Operational risk	29
4.5.4. Legal risk.....	30

4.6.	Options	31
5.	ALM PRACTICES IN INSURANCE COMPANIES.....	33
5.1.	Description of ALM practices	33
5.1.1.	General background.....	33
5.1.2.	Main objectives.....	34
5.1.3.	ALM tools in use	34
5.1.4.	Who is in charge of ALM?	35
5.1.5.	Professional recommendations	35
5.2.	Supervisory issues	35
5.2.1.	Existing regulatory requirements or recommendations.....	35
5.2.2.	ALM in a future regulatory framework	37
6.	CONCLUSION	40

1. EXECUTIVE SUMMARY

1.1. Background

1. Under the Solvency II project, a working group was set up in 2001 to study two major issues of life assurance: rules for calculating mathematical provisions and asset-liability management methods. This working group was composed of experts from Member States and a representative of the Groupe Consultatif Actuariel Européen.
2. The group completed its study during the first phase of the work undertaken by the IC Solvency Sub-committee: this phase seeks to take a decision on the form of a new solvency regime. Its findings, as set out in this report, are to be discussed by the Sub-committee so that technical issues specific to life assurance can be taken into account in the concluding debates of the first phase of the project.

1.2. Methodology

3. To fulfil its mandate, the working group adopted the approach described below.
4. Firstly, the group members shared their experience by describing the characteristics of their different national markets. On the basis of the common knowledge acquired, they identified a series of common prudential concerns for which it made sense to try to supply a European solution. These are:
 - guaranteed interest rates
 - annuities and mortality risk
 - profit-sharing clauses
 - unit-linked products
 - options embedded in the contracts.
5. In a second stage, for each of the prudential themes identified, the group assessed the existing European legislation. Then, according to the case, they discussed possible proposals for change or improvement of the Directives.
6. In its approach of the different prudential themes, the group focussed on the principles and methods for establishing mathematical provisions. However, the group also felt it necessary to have a preliminary discussion on the principle of premium sufficiency.
7. The discussion on asset-liability management methods and their possible use for supervisory purpose developed along the same lines (description of national practices, assessment of the directives, ideas for change or improvement).

1.3. Conclusions

8. The group identified several ideas for changing or improving the European legislation, including general principles as well as more technical questions related to specific actuarial or supervisory methods.

Principles:

9. The group believes that ***the Directives contain most of the necessary prudence principles***. In particular, the group considers that the principle of premium sufficiency, the general principles of calculation of mathematical provisions and the principle of adequacy of the investments to the business carried on are relevant and useful.
10. Suggestions were made to supplement these principles in two respects: develop a principle of prudence in the choice of the mortality table (which would be the equivalent of the existing principle of prudence in the choice of interest rate) and create a principle of asset diversification applicable to unit-linked products (which are excluded, for the time being, from any diversification principle).
11. In addition to these traditional prudence principles, the group felt on several occasions that ***other types of principles could be created or strengthened in the Directives***.
12. Firstly, principles aimed at the ***protection of the policyholder*** and a fair conduct of business. The group identified two of these: for with-profits products, it might be valuable to investigate whether a general principle of “fair-sharing” of the profits should be established at an EU-level; for unit and index-linked products, disclosure principles would be necessary to ensure policyholders’ awareness of the risks of these products. It must be pointed out that such principles would protect the holders of the contracts concerned but also the community of all policyholders by reducing the legal risk facing the insurance company.
13. Secondly, the group was aware of the discussions of the Solvency Sub-committee related to the Basle project and, in particular to its second pillar, concerning the “supervisory review process”. On several occasions, the group felt that such ***principles regarding risk management and supervisory review*** could add a value to the current European legislation.
14. A major step in this direction would be to introduce ***a requirement for companies to use appropriate prospective tools for their asset-liability management***. These ALM tools could also be a basis for supervision.
15. If a more general framework for risk management and supervisory review is to be created, the group thinks that, in addition to the ALM requirement mentioned above, specific principles and standards could address, within this framework, procedures for assessing premiums sufficiency, the profit-sharing policy of the company, its monitoring of mortality trends and unit-linked business.

Methods:

16. As regards **quantification methods**, the group focused on interest rates used in the calculation of provision and suggested two possible ways of improving the main method used in the Union for calculating mathematical provisions (“option 1”). One of them would be to make a more precise reference to current market interest rates. The other one would be the introduction of a “resilience provision”, which would have the advantage of creating an incentive to proper asset-liability management as well as the conditions of a convergence with option 2 in the Directive.
17. Furthermore, the group thinks that it is possible, at a technical level, to harmonise the method of establishing the reference rate for the first option in the euro zone.
18. Another area of technical work is the harmonisation of the rules on provisioning parallel guarantees for unit-linked products.
19. In addition, if principles for risk management and supervisory review process are to be laid down at European level, the consistent application of these principles will necessitate **harmonised or co-ordinated supervisory methods**. This concerns the different roles of supervisory authorities.
20. Firstly, supervisory authorities will have to set **benchmarks or references**. In addition to the maximum interest rate used for the calculation of provision (already mentioned), the group discussed the need for supervisors to provide their national markets with reference mortality tables or, for asset-liability management, reference adverse scenarios. Even though these references and benchmarks will depend strongly on the characteristics of national markets, a coordination should be sought to avoid major discrepancies in the level of prudence at European level.
21. Secondly, supervisors have a **monitoring role** at market level. In this respect, it would be beneficial to exchange information between supervisors on the basis of common indicators or statistical data. This idea was suggested for monitoring mortality trends.
22. Thirdly, in the supervisory review process, **supervisory powers** should be defined. In particular, the group is of the opinion that supervisors should be enabled to require more capital when management procedures of unit-linked business are not satisfactory (since operational risk may be very significant for this type of business). Similarly, the assessment of the asset-liability management of a company should lead to constraining actions if supervisors identify severe weaknesses. This means that mechanisms should be put in place to ensure an equitable treatment of companies by supervisors. Consistency of supervisory practices in Europe will also have to be sought.

1.4. Next steps

23. All the ideas mentioned above are potential areas for future work. These should be tackled at different levels of regulation: in this respect, the potential of a Lamfalussy approach deserves further study.

24. Further technical work in life assurance depends very much on the decision which will be taken on the form of the new solvency regime at the end of the first phase of Solvency II. In particular, the working group would like to highlight three issues.
25. The first one is the existence of strong links between accounting rules and the solvency regime. The current international IAS project for insurance is still at an early stage and it is likely that most of the accounting issues related to the identification, classification and calculation of insurance liabilities will not be solved before 2007. The group is aware that it will be difficult to design a new solvency framework if the accounting basis is not fully defined. This concern could be addressed more specifically, if needed, by considering an acceptable level of double reporting. Better co-operation between IASB and European supervisory authorities would avoid costs and the inefficiency that would be created if accounting standards were too far from supervisor's reporting needs. It would therefore be a helpful step forward.
26. The second point is harmonisation: the Subcommittee would be expected to give an indication on the level of harmonisation it wishes to achieve for each of the principles and methods suggested by the working group. The group understands that this exercise will also be done in a wider context for the whole Solvency II project.
27. Finally, the group underlines the importance of the issues related to internal risk management and the role of supervisory authorities. The group believes that many of its suggestions will contribute to building a "second pillar" in the European insurance regulation related to these topics.

2. INTRODUCTION

28. In May 2001, when the arrangements for the Solvency II project were discussed in the IC Solvency Subcommittee, it was felt necessary to address specifically a number of issues related to life assurance. These issues were not part of the terms of reference of the study commissioned from KPMG, and no other synthesis report on these subjects seemed to be available.
29. It was therefore decided to set up a working group bringing together experts from Member States as well as a representative of the Groupe Consultatif des Actulaires. Two interconnected themes for the study were identified:
 - rules for calculating mathematical provisions;
 - asset-liability management methods and their possible use for regulatory purposes.
30. The aim assigned to the working group was to shed light on these major technical issues so as to prepare the Subcommittee's debate on the "design" of the new solvency regime (end of the first phase of the project). The Subcommittee had actually to be aware of technical possibilities and constraints before deciding on the general layout of the system.
31. To achieve its objectives, the working group adopted the following approach:
 - description of national markets: this step was necessary to build a common knowledge of the different market practices and regulations;
 - identification of common prudential themes: on the basis of this common knowledge, the members of the group identified some common prudential concerns for which it made sense to try to supply a European solution;
 - assessment of the Life Directives: for each of the prudential themes identified, the group discussed whether the principles laid down by the present Directives were relevant and sufficient;
 - proposals for changes or improvements: depending on the assessment made of the Directives, the working group tried to make proposals for changes or improvements to the European legislation. The purpose of the working group was by no means to elaborate fully workable technical solutions: this would not have been relevant since the design of the solvency regime is not decided yet. The purpose was rather to indicate the possible ways forward with their advantages and drawbacks.
32. The group was composed of experts from the supervisory authorities of Denmark, Finland, France, Germany, Italy, the Netherlands, Portugal, Spain and the United-Kingdom, an actuary from the Groupe Consultatif des Actulaires and facilitators from the Commission departments. It met six times, from September 2001 to September 2002.

33. Discussions on the basis of replies to detailed questionnaires alternated with presentations by members of the group, focusing on a national specific practice or study. A number of papers from actuaries and/or supervisors were also circulated to stimulate the discussions.
34. This report summarises the findings of the working group. It is divided into three parts, as follows:
- description of national markets and identification of common prudential themes;
 - assessment of the Directives and suggestions for improvement;
 - asset-liability management (ALM).
35. A number of more detailed papers are also attached to the report.
36. As already mentioned, this report is the result of discussions between insurance experts. It does not necessarily reflect the Commission's opinion. Its goal is rather to describe several possible ideas which deserve further discussion in the Solvency Subcommittee.
37. It should also be noted that the context in which a number of issues was discussed in the working group may evolve due to international developments in the actuarial and accounting fields.

3. DESCRIPTION OF NATIONAL MARKETS AND IDENTIFICATION OF COMMON PRUDENTIAL THEMES

3.1. Diversity of national markets

38. National life assurance markets are very different one from another. Many factors may explain this diversity: taxation rules, contract laws, different retirement systems leading to different needs of consumers, etc. Depending on all these factors and on possible local traditions, some markets present strong specificity whereas some others are more influenced by new product developments at European or international level.
39. It is not the purpose of this paper to draw a full picture of these differences but it is thought useful to summarise below the main characteristics of the different national markets that were presented in the working group. Detailed descriptions made for each country can be found in Annex 1 to the report.
40. In a number of markets traditional life assurance with regular premiums endowment contracts is still predominant. This is particularly the case in Germany, but also in Italy, Spain and the Netherlands. For the Netherlands, one specificity can be mentioned: mortgage business, where an endowment contract is combined with a mortgage loan (sometimes granted by the insurance company).
41. In some other countries, saving contracts show a very reduced, sometimes non-existent mortality risk. Premiums can be paid more freely than in traditional life contracts and surrender conditions are generally better for the policyholder. These contract types predominate in Finland, France and Portugal. They are also increasingly sold in Spain.
42. Above all, in nearly all markets (except Denmark and Germany), unit-linked products have significantly increased their market share. The United-Kingdom and Italy are the countries where these products are sold the most (around 60 % of all premiums written) but France, the Netherlands and Spain can also be mentioned for the significant proportion of the business written in unit-linked contracts (around 40%). Nevertheless, several delegations have pointed out that the business written in unit-linked products was closely correlated with stock exchange fluctuations.
43. The Netherlands and especially Denmark are characterised by the importance of group insurance¹ in the business written.
44. A more detailed analysis of products sold in different national markets show a wide diversity in the definition of guarantees, even where the purpose of the products is similar. Some examples may illustrate this point:

¹ Occupational pension schemes in Denmark.

- Duration of guarantees: for insurance group contracts, Danish practice is to give guarantees for the whole duration of the contract whereas in the Netherlands contracts of this kind are usually concluded for five years and may be renegotiated after this period. Another example would be the average duration of saving contracts, which is extremely variable from one country to another;
 - Annuity options: in some markets, guaranteed annuity options² are quite commonplace, in others options of this type are not common practice (e.g. Denmark, Netherlands) or are being abandoned (e.g. UK, Spain);
 - Concerning the possibility of surrender, a wide range of situations exist, ranging from the possibility of surrender at any time and sometimes with a low penalty (savings contracts in Finland, France) to no possibility of surrender (some short-term savings contracts with high guaranteed rates in Spain) or to guaranteed surrender values only at some restricted points in time or with financial penalties for the policyholder (UK);
 - Profit-sharing mechanisms: the descriptions gathered in the working group have shown very different practices in this field as well as very different approaches and concerns on the part of national regulators and supervisors. In some countries, contractual or regulatory rules make profit-sharing mechanisms a real constraint for companies whereas, in others, the distribution of profits is much more at the discretion of the company.
45. In addition, within a single national market, products that are apparently similar may actually contain very different guarantees. For example, the duration of a typical savings contract in France can vary from eight years to whole life and a minimum interest rate may be guaranteed for the whole duration of the contract or for a limited period of time.

3.2. Common prudential themes

46. In spite of this diversity, common themes have emerged from the group's discussions:
- Guaranteed interest rates;
 - Annuities and mortality risk;
 - Profit-sharing clauses;
 - Unit-linked products;
 - Options embedded in the contracts.

² A guaranteed annuity option gives the policyholder the right to choose at maturity of a life insurance contract not to have the benefit in cash but to receive an annuity of a guaranteed amount.

3.2.1. *Guaranteed interest rates*

47. In the past decades, the regular decline in interest rates has raised concern regarding interest rate guarantees offered by life insurance contracts.
48. Since the late 1990s, interest rates guaranteed by insurance contracts have also followed this trend, albeit with a certain delay. However, there remain a number of contracts in insurers' existing portfolios in which interest rate guarantees are high compared with present market rates.
49. In some countries, this is the case for the majority of old contracts with a very long duration, such as traditional regular premiums contracts for retirement. In others, while contracts do not generally include interest rate guarantees for long periods, concerns focus more on a specific category of long-term contracts where high interest rates were traditionally guaranteed, such as mortgage contracts or annuities.
50. In some countries, some contracts also fix interest rate guarantees for additional new premiums, which can lead to open-ended commitments.
51. Besides these issues related to past business, guaranteed interest rates are considered as an important theme also for new contracts, since rules on interest rates may influence the conduct of business and competition.

3.2.2. *Annuities and mortality risk*

52. The main risks affecting annuities are interest rate risk and longevity risk. In the recent past, lower interest rates combined with higher longevity have increased the cost of annuities.
53. Interest rate risk has already been mentioned in a wider context. It will be remembered here that annuities are long-term products, so particularly exposed to this risk³.
54. The additional risk for the insurer in selling annuities is to underestimate the increase in longevity of the population insured⁴. The insurer must ensure that the table used for its tariff include its anticipations of the evolutions of longevity; even so, its anticipations may be inadequate.
55. The drawing-up of a mortality table is a very complex task for an insurer: on the one hand, it must reflect the actual mortality of the population insured; on the other hand, in most cases, the population insured by the insurer is not large enough to be a valid statistical basis for a mortality table. Tables must also be updated regularly.

³ This risk varies between different markets depending on the availability of long-term assets and asset-liability matching practices.

⁴ There may be particular cases. For example, in Portugal, the rapid increase of the insured population led, in the past, to limited periods where the reverse phenomenon was observed.

56. In most countries, annuities are with-profit products: the margin of prudence in guaranteed interest rates can be seen as a buffer against the increase in longevity, at least as long as the decrease in interest rates has not reduced this buffer to nil. In a few countries, however (e.g. the UK and, for some products, Spain) annuities are without-profit and, for competitive reasons, guaranteed interest rates are much higher. The smaller margin of prudence in tariffs and provisions makes the adequacy of mortality tables an even more acute question.
57. Given the time constraints, the group did not attempt to discuss other types of mortality risk, in particular those related to protection policies (insurance in case of death).

3.2.3. Profit-sharing clauses

58. The risk for companies is to distribute more profits – or distribute them faster— than the business can generate.
59. In some markets (e.g. France, Italy, Portugal) contractual clauses tend to define precisely what part of the profits should be distributed to the policyholders. These profits are generally rapidly (often yearly) integrated into the guaranteed amount. In these cases, profit-sharing clauses can be a real constraint for companies and may limit their room for manoeuvre to smooth profits over time.
60. In other markets (e.g. Denmark, UK, Netherlands), profit distribution is much more at the discretion of the company. However, even if there is no guarantee, the company may need additional reserves in order to have a distribution policy that meets the expectations of policyholders. Because of the absence of a real “guarantee”, the right amount and the legal status of these reserves may be subject to uncertainty. Companies may also be exposed to legal risk if they do not meet policyholders’ expectations.
61. In order to protect the policyholder, some supervisory authorities check that a reasonable amount of profits is distributed to policyholders. As the case may be, this supervision is based on a general principle – the profits must be “fairly” shared (e.g. Denmark, Finland) – or on a precise quantitative rule (e.g. France, Germany).

3.2.4. Unit-linked products

62. Unit-linked contracts are becoming increasingly popular in most countries represented in the group, and have a substantial share of the business written (except in Denmark and Germany). Index-linked products seem to be significant in the UK, Spain and Italy.
63. The main risks mentioned by the participants are the following:
- Design of the contract: the most common risk lies in the fact that expenses may not be covered by the income that the insurer can get from the units. Also, some contracts offer a guaranteed amount at maturity and/or in other circumstances (in case of death). There is also a specific risk if the contract allows the policyholder to switch freely between different funds, some of which guarantee an interest rate;

- Operational risk: the company may make errors in evaluating the units or when buying and selling the corresponding assets;
 - Investment risk: for some contracts, there is a liquidity risk for the insurer (e.g. property, non-listed assets). In addition a perfect matching of assets to liabilities is not always possible (especially for index-linked products). Counterpart risk may also be mentioned here;
 - Legal risk: policyholders may not have fully understood the policy conditions and may complain about bad advice. This is particularly true when policyholders are offered very risky assets.
64. Some participants underlined the complexity of new types of contracts and were concerned that companies do not always manage properly these products, which require a certain sophistication (e.g. use of derivatives). In these cases, technical, legal and operational risks may be particularly significant.

3.2.5. *Options*

65. The presentations showed that, even within a single national market and for comparable products, there might exist a wide variety of options given to the policyholder. These options are mainly:
- Guaranteed surrender (or transfer) values, possibility of switching between funds;
 - Interest rate guarantees of a different kind (at one point in time, for future premiums);
 - Guaranteed annuity options (calculated with old mortality tables).
66. Companies do not always have a clear view of the cost and risk of such options. They should be encouraged to “price” these options and to reflect them in the provisions. However, it is not always easy to price these options.
67. The valuation of option is dictated by two elements. Firstly, intrinsic value, which could vary over time depending on whether in or out of the money. Secondly, time/uncertainty value, which is more difficult to value, particularly for long term options. Current capital market techniques for this do not really stretch out to long term.
68. It should be noticed that methods for prudent valuation of options may substantially differ from the methods used for market valuation.
69. In addition, policyholders do not always adopt efficient decisions, since they are influenced by many non-economic factors.

4. ASSESSMENT OF THE DIRECTIVES AND SUGGESTIONS FOR IMPROVEMENT

4.1. Preliminary remarks on premiums

70. When discussing technical provisions, it appeared that many problems encountered in this field had their origin in the fact that insurance companies did not always have a full understanding of the products they initially sold. In particular, insurance companies have sometimes provided their policyholders with “free” options, the real price of which they were not aware of.
71. A sound principle of management would require insurance companies to be able to value all the commitments they take when selling an insurance product.
72. This principle is implicitly addressed by Article 19 of the Third Directive, which lays down the principle of premium sufficiency:

Premiums for new business shall be sufficient, on reasonable actuarial assumptions, to enable assurance undertakings to meet all their commitments and, in particular, to establish adequate technical provisions.

For this purpose, all aspects of the financial situation of an assurance undertaking may be taken into account, without the input from resources other than premiums and income earned thereon being systematic and permanent in such a way that it may jeopardise the undertaking's solvency in the long term.

73. This Article is regarded by the majority of the working group as a useful prudential principle as well as a basis for supervisory action. In a number of countries, this Article has been implemented by setting precise rules on guaranteed interest rates and sometimes other technical features of the contract (mortality tables, expenses). In one case, the supervisory authority asks for profit tests to ensure that this principle is fulfilled.
74. However, the discussions of the working group showed that this Article could be improved in two ways.
75. Firstly, the requirement concerning risk management should be strengthened. The company must not only fulfil any national quantitative requirements on tariffs; it must also assess the adequacy of the premium on its own, taking into account and modelling all the characteristics of the contract.
76. Such an assessment should be done under a range of scenarios (including worst case scenarios). The initial analysis might then be monitored on a yearly basis.
77. Secondly, a number of participants questioned the second paragraph of Article 19, which allows for taking into account “all aspects of the financial situation” when assessing the sufficiency of premiums. According to them, this possibility should not be regarded as a general rule but as a possibility of derogating from the principle laid down in the first paragraph for a limited period of time.
78. Other participants pointed out the sensitivity of this subject in very competitive markets. For them the key point is to see that the company overall has adequate financial resources.

79. The use of the second paragraph nevertheless poses solvency questions. That is why, when the premiums are not sufficient in relation to the contract:
- it should be explicitly stated (for example in the profit test mentioned above). The company should be able to provide the supervisor with a prospective analysis of the consequences of its business written on the level of available capital; if a provision for shortage of premiums is constituted, this should be explicitly mentioned in the supervisory returns;
 - it requires specific monitoring on behalf of the supervisor;
 - the supervisory authority should have strengthened powers. Depending on the opinions expressed in the working group, the supervisory authorities should have the power to grant a derogation on a case-by-case basis or, alternatively, should be able to stop the marketing of the contract.

Main ideas:

- Keep the principle of premium sufficiency, as laid down in Article 19 of the Third Life Directive (first paragraph);
- Strengthen this principle by requiring a “profit test” from the company issuing a new contract: this profit test would analyse the sensitivity of profits under a range of different scenarios;
- Clarify the second paragraph of Article 19: possibilities of use, specific monitoring requirements.

4.2. Guaranteed interest rates

4.2.1. What does the Directive say and how is it implemented?

80. Article 17 of Directive 79/267/EEC, as amended by Article 18 of Directive 92/96/EEC, provides two main options:

B. (a) For all contracts, the competent authority of the assurance undertaking's home Member State shall fix one or more maximum rates of interest, in particular in accordance with the following rules:

(i) when contracts contain an interest rate guarantee, the competent authority in the home Member State shall set a single maximum rate of interest. It may differ according to the currency in which the contract is denominated, provided that it is not more than 60% of the rate on bond issues by the State in whose currency the contract is denominated. In the case of a contract denominated in euro, this limit shall be set by reference to euro-denominated issues by the Community institutions.

If a Member State decides, pursuant to the second sentence of the first subparagraph, to set a maximum rate of interest for contracts denominated in another Member State's currency, it shall first consult the competent authority of the Member State in whose currency the contract is denominated;

(ii) however, when the assets of the assurance undertaking are not valued at their purchase price, a Member State may stipulate that one or more maximum rates may be calculated taking into account the yield on the corresponding assets currently held, minus a prudential margin and, in particular for contracts with periodic premiums, furthermore taking into account the anticipated yield on future assets. The prudential margin and the maximum rate or rates of interest applied to the anticipated yield on future assets shall be fixed by the competent authority of the home Member State.

81. For some categories of contracts, these rules may not apply:

B. (c) the home Member State may decide not to apply (a) to the following categories of contracts:

- unit-linked contracts,*
- single-premium contracts for a period of up to eight years,*
- without-profits contracts, and annuity contracts with no surrender value.*

In the cases referred to in the second and third indents of the first subparagraph, in choosing a prudent rate of interest, account may be taken of the currency in which the contract is denominated and corresponding assets currently held and where the undertaking's assets are valued at their current value, the anticipated yield on future assets.

Under no circumstances may the rate of interest used be higher than the yield on assets as calculated in accordance with the accounting rules in the home Member State, less an appropriate deduction.

82. However, the Directive specifies that:

B. (d) the Member State shall require an assurance undertaking to set aside in its accounts a provision to meet interest-rate commitments vis-à-vis policy-holders if the present or foreseeable yield on the undertaking's assets is insufficient to cover those commitments.

83. Concerning the possible change of the interest rate used for establishing mathematical provisions, the following part of the Article must also be quoted:

F. The method of calculation of technical provisions shall not be subject to discontinuities from year to year arising from arbitrary changes to the method or the bases of calculation and shall be such as to recognise the distribution of profits in an appropriate way over the duration of each policy.

84. The table below summarises the ways Member States represented in the working group have implemented the Directive.

Country	Option of the Directive	Typical interest rate guarantees	Interest rate used for mathematical provisions	Did the change of interest rate apply to mathematical provisions of already existing policies?	Products for which the MS has chosen a different option or neither of the two options
Denmark	(i)	5% before 7/1994 3% between 7/1994 and 7/1999 2% after 7/1999	The maximum interest rate changes daily. (see paragraph 100)	Yes	All the exceptions mentioned in the Directive
Finland	(i)	4.5% before 1998 3.5% since 1998	In general, rates used for premiums calculation For new contracts: max 3.5%	No	All the exceptions mentioned in the Directive
France	(i)	4.5% before 7/1993 3.5% now: 3%	Rates used for premiums calculation	No	Single premiums for a period of up to eight years
Germany	(i)	3% until 1986, 3.5% until 1994 4% until 6/2000 3.25% now	In general, interest rate used for premium calculation corresponds with the interest rate used for TP	No	Single premiums for a period of up to eight years and annuities with no surrender value
Italy	(i)	4% (old contracts) 3 or 2% (new contracts)	Rates used for premiums calculation	No	Without profits pure risk contract. Single premiums for a period of up to eight years. Annuities with no surrender value.
Netherlands	(ii)	4% until 1.8.1999; 3% thereafter	B. (a)(ii)	No	None
Portugal	(i)	Since 1995, max: 4% Current practice: 3%	In transition: option B. (a)(ii) will be adopted in 2003	No	-
Spain	(i)	2001: 3.15% 2002: 3.11%	Before 1999: rates used for premiums calculation 1999: 3.2%, 2000/01: 3.15% 2002: 3.11%	Yes for contracts written since 1999.	Products for which "immunisation" techniques are used.
United-Kingdom	(ii)	Varies between different offices and products. Between 0 and 1% for most policies.	B. (a)(ii)	Yes	None

4.2.2. Discussion (assessment of the current provisions in the Directive)

4.2.2.1. Context

85. The technical interest rate used is of utmost importance in the calculation of mathematical provisions. Currently, harmonisation is only partial in this field and this may be considered harmful: from the point of view of competition, lack of harmonisation might lead to an uneven playing field; from a prudential perspective, it may be difficult to design a very detailed and harmonised “risk-based” capital requirement if it applies on top of provisions calculated in various ways.
86. After discussion in the working group, the competition issue does not seem to be very significant in practice, at least in the present context of low interest rates. No participant reported any case where different national rules on technical provisions had led to competition issues in their country. This feeling is reinforced by the conclusion of a working group of the Conference of European Supervisory Authorities set up in 1998 on the “euro’s impact on technical rate of interest”: in its report (FIN/98/01), this group states that, although differences in interest rates may have an impact on competition, several other factors influence competition even more.
87. The recent development of accounting issues also influenced the debate in the working group. Some of the participants see in IAS developments the possible way toward more harmonisation. Others doubt that the process is adapted to supervisory needs. However, there is at present no precise methodology for calculating provisions at their “fair value”. A project initiated by the International Actuary Association (IAA) aims at proposing such a method but it is still at a very early stage.
88. The new Danish legislation showed also that it is possible to combine two different notions of provisions: a “fair-value” provision and a provision calculated according to the Directive. It may be valuable to adopt in the future a similar approach which allows a better identification of the different parts of the provision. However, the main objective for prudential regulation remains to determine the total amount necessary to meet commitments vis-à-vis policyholders, with a satisfactory level of prudence.
89. The group therefore stuck to this prudential perspective. Given the lack of workable alternative provisioning methods, it focused on the existing rules and the possible ways of improving them.

4.2.2.2. Analysis of the two options

90. The reason for requiring a margin of prudence in life mathematical provisions (in respect of asset risk) is twofold:
 - Even if the value of assets currently cover the value of liabilities, assets and liabilities may not be properly matched: in this case, a move in interest rate or in equity markets may create an insufficiency of assets backing the liabilities. A margin of prudence can be required to face this risk;

- Even if there is no present significant mismatch between assets and liabilities, since life contracts are long-term contracts, mismatches may appear in the future, especially as the conditions for investing in the future cannot be precisely predicted. A margin of prudence may also be necessary in this respect.
91. The current options in the Directive allow for different ways of recognising this need for a margin of prudence.
 92. The second option in the Directive, used in few Member States, does not specify the method for determining the level of prudence of provisions. The deduction made from the technical rates for prudential purposes is at the discretion of the national regulator. In addition, although this is not explicitly stated in the Directives, the usual practice is to require a “resilience provision” from the companies, which is calculated under certain unfavourable assumptions (fall in equity market, moves in interest rates). Again these assumptions are at the discretion of the national regulator and can change over time: the principle of the resilience provision seems nevertheless to be a valid method for recognising explicitly the current mismatch between assets and liabilities.
 93. The first option in the Directive proposes a more (although not fully) harmonised approach: the margin of prudence is obtained by reducing the reference interest rate by 40%. This initially higher prudential margin is intended to be sufficient to face future uncertainties concerning investing conditions. Nevertheless, this approach also suffers from drawbacks. A first criticism may be that it does not create any incentive for proper asset-liability management; on the contrary, it may provide companies with a false impression of security. The main criticism is however related to the ambiguity of the option: in the majority of the countries using this option, the technical interest rate for the calculation of a mathematical provision is fixed at the beginning of the contract. If market interest rates decrease significantly after the conclusion of the contract, the yield of assets covering the liability may become insufficient to face the yearly increase of this liability: in this case, the use of the initial interest rate in the calculation of the liability is not relevant any more. The risk of facing such a scenario⁵ has increased in recent years with the drop in market interest rates in the euro zone.
 94. Indeed the Directive contains a backstop: an additional provision is required if the present and foreseeable yield on the undertaking’s assets is insufficient to cover the commitments. But on the one hand, this provision of the Directive is not very precise and, on the other, several participants consider that the mechanism it describes is too late to react to a deterioration of market investing conditions.

⁵ Reference was made to a Japanese type of scenario, where interest rates and equity markets have been very low for a long period of time.

4.2.2.3. Proposals for improvement

95. Leaving aside the question of the level of prudence, the two options propose two different references for determining the interest rate. The first option uses market rates as a reference: this type of external reference would also be used, although with a different prudence margin, in the IAS project. The second option uses an internal reference (yields on the undertaking's assets); option 1 also refers partially to this internal reference if an additional provision is needed.
96. The group did not express any preference for one or other method, especially as long as, even for the first option in the Directive, a reference is made to the yields on the undertaking's assets. The group did not find the link between the options in the Directive and the accounting method used for assets to be self-evident.
97. Since the first option is the most used in the EU, comments and suggestions for improvement focused on this option.
98. The conclusion of the group is that the Directive is not precise enough for the calculation of provisions in respect of already existing policies. Several methods were suggested to remedy the problems highlighted above.
99. A first method would be to specify that the technical rate to be used for all policies is 60% of the current market rate (on government bond issues). The advantage of this method is that it is simple and maintains a constant margin in the interest rates for prudence in the provisions. One drawback in countries where assets are valued at historical cost is that it may create unnecessary fluctuations of the provisions. It can also be argued that the level of prudence so required is too high. This method has recently been introduced in Spain (for contracts written since 1999; see table above).
100. An alternative method would be to have two references: 60% of the initial market rate and a higher percentage of the current market rate. At the beginning of the contract, the required level of prudence would be the same as in the first solution, but this level of prudence could fluctuate as long as it did not fall under a certain limit (determined by the current market rate reference). This solution was recently put into practice in Denmark.

101. A third solution would be to keep the technical interest rate at its initial level (60% of government bond rates) and to introduce a sort of “resilience test” to require an additional provision or capital requirement if needed. The current requirement to set aside a provision if the present or foreseeable yield on the undertaking’s assets is insufficient would be changed to a requirement to set aside a provision (or reserve) if the yield on the assets, projected under a given unfavourable scenario, was insufficient to meet the commitments. This approach would be a response to the criticism levelled at the current requirement (the mechanism triggers additional provisioning too late). It would also create an incentive for proper asset-liability management. Recent developments in ALM projection tools seem to make this solution easy to implement in practice⁶. However, further work would be needed to design a resilience reserving mechanism that would be consistent with the characteristics of the different products sold across Europe.
102. Moreover, the concept of resilience provision is already in use in countries which have adopted option 2 in the Directive. The introduction of this mechanism also under option 1 would create a background for further convergence of minimum levels of prudence in provisions.
103. The more ancillary question of the harmonisation of methods for calculating the reference rate under the first option in the Directive was also mentioned in the working group. Opinions are divided on this topic. Some participants point out that the wording of the Directive is not precise enough and that, in a unified financial market, it would make sense to harmonise the different methods for calculating technical interest rates; others find the present system and the room for manoeuvre it allows to local regulators satisfactory. However, there do not seem to be any practical barriers to further harmonisation in this field, at least in the euro zone.

4.2.2.4. Policies not covered by the two options

104. All the countries using the first option in the Directive also make use of the exceptions. In the opinion of the participants, these exceptions are justified.
105. The underlying reason for this is that, generally, the investment risk borne by these products is reduced thanks to proper matching (in particular, there is no problem of reinvestment for short-term policies). Annuities, be it without surrender values, may constitute an exception in this respect.
106. Some participants expressed the view that some additional prudential principles, such as proper matching, should be explicitly added to the Directive so as to ensure that the underlying condition for the exception laid down in the Directive is fulfilled.

⁶ See below the part on ALM. Some countries, although they do not require additional “resilience provisions”, have introduced “stress tests” as an early warning system.

Main ideas:

- Make the first option more precise for the calculation of provisions for existing policies. This can be achieved in various ways:
 - Reference to the current market interest rates;
 - Introduction of a resilience test requirement (with an incentive to proper asset-liability management);
- Possibly, harmonise the method for establishing the reference rate in the euro zone;
- For the exceptions, lay down a principle of proper matching of assets to liability.

4.3. Annuities and mortality risk

4.3.1. What does the Directive say?

107. The general principles laid down in Article 17 of Directive 79/267/EEC as amended by Article 18 of Directive 92/96/EEC apply; in particular, *“provisions shall be calculated by a sufficiently prudent prospective actuarial calculation”*.
108. The Directive does not give any further rules specific to annuities: annuities without surrender values do not fall within the scope of paragraph B (a) (which lays down detailed rules on technical interest rates) and there is no provision related to the use of mortality tables, except a very general principle of prudence⁷.
109. In a number of countries, a regulatory mortality table has been established (at least for reference): such regulatory tables were generally changed during the 1990s and, for old contracts, transitional periods have been granted to companies in order to reach the level of provisions according to these new tables. In some other countries, even though there is no regulatory table, a common table is used by companies.

4.3.2. Discussion

110. In order to gain a better understanding of the methods and parameters used by companies when provisioning annuities, participants provided and commented on examples of the calculation of an immediate annuity for a 60 year-old man. The Groupe Consultatif extended the exercise to 15 European countries (including non-EU countries). The results of this survey is attached to this report (Annex 2).
111. The survey shows a great diversity of results: this diversity naturally reflects the differences between national markets (differences of life expectancy, with–or without–profit annuity, different investment conditions, expenses) but it also suggests that prudence is differently incorporated in the main parameters used for calculating provisions (interest rate, mortality table, expense loading).

⁷

Article 18 of Directive 92/96/EEC, paragraph C.

112. It was in this context that the group discussed the question of the levels of prudence in parameters.
113. From a supervisory point of view, two approaches are possible. The first one is to ignore the way prudence is incorporated in the different valuation parameters and to require companies to disclose the overall level of prudence in their provisions. In this view, if harmonisation is needed, it should be sought at this overall level, e.g. by setting a quantified minimum level of prudence. The advantage of this approach is that it focuses on the main supervisory question (what is the overall level of prudence in the provisions?), the drawback is that it still needs important theoretical developments and market evolutions to correspond to the practice of most companies. The second approach is to review the main parameters used for calculating provisions and ensure that each of them is estimated by companies with enough prudence. This more traditional approach does not give a direct answer to the question of what is the overall level of prudence in provisions but it nevertheless makes it possible to ensure that an approximate and undue compensation has not been made between a prudently estimated parameter and an insufficient or outdated parameter. The debates of the group developed along the lines of this second approach.
114. Afterwards, the discussion focused on mortality tables. The group recognised the difficulty of predicting possible improvements in mortality. Issues specific to small and/or changing markets (e.g. Portugal), in which data from past experience can hardly be used as a basis for projections, were also raised in this respect. In addition, the need for a company to use mortality assumptions adapted to the population insured was emphasised.
115. Several ideas were then formulated in the group.
116. Firstly, the Directive should clearly lay down a principle of prudence related to the use of mortality tables. This principle should specify that future improvements of mortality must be included in the tables used for provisioning annuities.
117. Since, for many different reasons, mortality assumptions can rightly differ from one company to another, it was not considered possible to accompany this principle of prudence with a precise regulation on a “margin of prudence” for mortality assumptions.
118. Nevertheless, some members of the group felt that supervisory authorities could play a useful role in providing the industry with reference tables. As experience shows in countries where this system already exists, such tables are very helpful, especially for small and medium-sized companies. A possible next step could be to ensure the consistency of these different national “benchmarks” in designing, at technical level, a common EU method for establishing reference tables.
119. An alternative idea is to provide the market with reference methods and not reference tables. Some participants expressed their doubts on this idea, given the diversity of existing methods and their foreseeable evolutions.

120. In any case, the existence of reference tables or methods should not let companies think that the technical responsibility is on the supervisor's side. Companies would still have the responsibility for defining the prudent mortality assumptions fit for their own case.
121. Besides, publishing benchmarks *ex-ante* is not sufficient to ensure that companies properly anticipate mortality evolutions. Continuous monitoring of the adequacy of mortality assumptions (*ex-post*) should be part of the "supervisory review process".
122. At company level, this means that every company should be formally required to monitor regularly the mortality trends and the adequacy of its assumptions in the light of its updated statistical observations. The level of prudence in the assumptions should be transparent and disclosed.
123. At supervisory level, on the basis of companies' reporting, supervisory authorities should ensure that companies' monitoring is satisfactory and that the level of prudence in the technical provisions is adequate across the market. It could also use its broader view to play a whistle-blowing role if it appears that mortality trends are not properly anticipated by market players.
124. Furthermore, if supervisory authorities defined at European level a common set of data for monitoring mortality trends, they would have the tool to assess the consistency of approaches across Europe and could take appropriate measures if the levels of prudence differed too greatly between different markets or players.

Main ideas:

- Develop a principle of prudence for the use of mortality tables;
- Strengthen this principle with a benchmark to be provided by the supervisory authority:
 - a reference method for establishing the table; or
 - a reference table;
- Formulate specific principles of internal management and supervisory review process: supervisory authorities should ensure proper monitoring by the company of the mortality experience; at EU level, they could monitor mortality trends on the basis of a common set of data.

4.4. Profit-sharing

125. When assessing the financial strength of a life insurer, a supervisor must take into account the profits which will be distributed to policyholders. For several reasons, these future commitments do not always correspond to a provision in the insurer's balance sheet: for companies which book their assets at historical cost, some of the profits may not be recognised yet (so they cannot be shared); moreover, insurance policies often give the insurer room for manoeuvre as regards the timing of distribution and the amount of profits shared.

126. The current Directives reflect this uncertainty, stating a rather vague principle (Article 17 of Directive 79/267/EEC as amended by Article 18 of Directive 92/96/EEC):

D. In the case of participating contracts, the method of calculation for technical provisions may take into account, either implicitly or explicitly, future bonuses of all kinds, in a manner consistent with the other assumptions on future experience and with the current method of distribution of bonuses.

127. In the view of many participants, it would be difficult to define more precise principles. They underlined the buffer role played by the provision for bonuses: part of the profits realised are set aside before being distributed, according to the characteristics of the contracts, the commercial strategy of the company (which is usually aimed at meeting policyholders' expectations) and, sometimes, the legislation. This provision may also be reduced, to some extent, in the event of adverse experience (e.g. on mortality) resulting in a loss for the insurer. Since the provision for bonuses does not correspond to fully determined individual guarantees, there is no single answer as to the amount of provision necessary.
128. A possible method, which is being explored by the UK, would be to require a "realistic provisioning" of this amount, that is to say to evaluate it under a realistic assumption of what will be distributed, which is usually far higher than what is guaranteed. However, the practicability of such a method does not seem self-evident⁸.
129. A less formal tool for supervisors would be to require ALM testing of the profit-sharing policy. A definition of a profit-sharing strategy by the company would be a prerequisite for this (e.g. including the policy on any smoothing of bonus rates). Alternative profit-sharing policies could be tested as well.
130. Supervisors not only have to assess whether the company is able to carry on with its profit-sharing policy but also have to ensure that this policy is "fair", since the supervisors' role is to protect policyholders.
131. Hence, one of the concerns of supervisors is that companies do not create undue expectations. The group agreed that principles for greater transparency were probably necessary. The Finnish example, where the "bonus philosophy" has to be publicly disclosed by the company so as to create a realistic basis for policyholders' expectations, was discussed within the group. Some expressed their doubts about this solution: more disclosure could actually damage the company by creating even more expectations; a risk exists that this "bonus philosophy" may be interpreted as a guarantee.
132. Some participants suggested that principles for transparency should focus on avoiding confusion between what is guaranteed and what is not.

⁸ It is really in the first instance a retrospective accumulation of premiums less expenses. In the UK there are currently firm proposals to realistically value the bonuses, guarantees and options under with-profits policies and, if these are greater than the prudential liabilities and solvency margin, to require companies to hold extra capital accordingly.

133. Even though policyholders are aware of the real guarantees and mechanisms of the contracts, some supervisors feel that an additional requirement is needed in order to ensure that the company uses its discretion in bonus distribution in a fair way.
134. At EU level, a general principle of “fair-sharing” the profits could be of use. However, the discussion showed that this principle would necessarily be transposed in different ways in different countries, according to the different national framework. Difficulties in defining more precisely this concept were stressed by some participants. One participant even considered that such a principle would contradict the abolition of premiums control.

Main ideas:

- Require the definition of a profit-sharing policy and consider this policy in ALM requirements;
- Define transparency rules or standards on effective guarantees and profit-sharing mechanisms;
- Investigate further whether a general principle of fair-sharing the profits should be stated at EU-level.

4.5. Unit-linked (and index-linked) products

4.5.1. Current principles for provisioning

135. As regards unit-linked and index-linked products, there is no precise rule for establishing provisions. However, the general principles laid down in Article 20(1)(A) of the codified Directive apply.
136. These principles were found relevant by the working group and little need for having more precise rules was expressed.
137. In particular, the principles of the current Directive for recognising and provisioning future expenses are considered adequate (expenses risk is a major concern for supervisory authorities as regards unit-linked products).
138. In one case, where a contract includes a parallel guarantee at maturity or in case of death, the Directive was not considered explicit enough. The Directive refers to an additional provision to face this guarantee but does not give any principle for calculating it. As a matter of fact, the methods used in practice for setting up this additional provision can differ significantly and are not always regulated at national level. These methods may be inadequate and give the company a wrong idea of the cost of the guarantees they have included in their contracts (it was often the case that companies included guarantees in case of death, without even pricing it). It is therefore important to make companies aware of their risks in this field: technical common guidance at European level may help supervisory action for this.

139. Stochastic modelling may be a basis for developing more detailed principles for the additional provision referred above. The subject is complex and the group did not have the time to embark on an in-depth study of it. Neither is there, to its knowledge, an already fully elaborated methodology for this. On the contrary, some members stressed the fact that financial option pricing methods did not give a fully relevant modelling of unit-linked contracts sold by life insurers.

4.5.2. Investment risk

4.5.2.1. Matching risk

140. For unit-linked products, matching risk should already be limited by the rules laid down by the Directives. Article 23 of Directive 92/96/EEC reads as follows:

1. Where the benefits provided by a contract are directly linked to the value of units in an UCITS or to the value of assets contained in an internal fund held by the insurance undertaking, usually divided into units, the technical provisions in respect of those benefits must be represented as closely as possible by those units or, in the case where units are not established, by those assets.

2. Where the benefits provided by a contract are directly linked to a share index or some other reference value other than those referred to in paragraph 1, the technical provisions in respect of those benefits must be represented as closely as possible either by the units deemed to represent the reference value or, in the case where units are not established, by assets of appropriate security and marketability which correspond as closely as possible with those on which the particular reference value is based.

141. These principles were considered sufficient and a satisfactory basis for supervisory review.

4.5.2.2. Liquidity risk

142. The group then discussed liquidity risk. This risk was observed in some countries a few years ago, with the fall in the real estate market. Companies had to face liquidity problems, since they had to meet their commitments in case of surrender although they could not sell the corresponding asset simultaneously.
143. Two main alternative solutions were debated in the group.
144. The first solution would be to limit the liquidity risk by appropriate diversification principles.
145. A diversification principle is already applied in some cases. This is implicitly the case when the contract is backed by a UCITS, since UCITS are subject to diversification rules. Some countries, where internal funds are common practice, more explicitly require a certain diversification from the fund and prohibit investment in certain categories of assets (e.g. commodities).

146. There are various ways of envisaging the introduction of a diversification principle for unit-linked business: the principle can be applied at either contract or company level. Some participants mentioned that a diversification principle at contract level would offer better protection to the policyholder: they made the link with the reputation and legal risk an insurer may face after selling products whose risk is not fully understood by policyholders.
147. However, the simplest way would probably be to impose a diversification principle at company level to those assets which are not liquid enough or not already subject to diversification rules at fund level.
148. The advantage of laying down a diversification principle and possible diversification rules for unit-linked products is the simplicity of the mechanism. The drawback is that it would not take into account cases where the insurer proposed illiquid assets to customers and transferred to them the whole liquidity risk with contractual clauses such as the possibility of delaying surrender or no possibility of surrender at all.
149. The second solution would be to require a higher provision which would take into account the risk for the insurer of making losses during the time interval in which he has to carry the asset corresponding to a surrendered contract. This solution would have the advantage of better reflecting the characteristics of the contract. The drawback of this solution is that no methodology exists for the time being: such a solution is likely to be very complex to implement in practice.

4.5.2.3. Other investment risks

150. Other aspects of investment risk related to unit-linked contracts were not extensively discussed in the working group. Nevertheless, the relationship between investment risk and the current calculation of solvency margin was briefly mentioned.
151. A Conference report (IT/249/01) had already noted that there is no unique interpretation within the Community of the existence of an “investment risk” (which leads to a 4% margin requirement instead of a 0 or 1% margin requirement).
152. In consequence, most of the participants would advocate a more precise definition of “investment risk” as it is used in the Directive for the margin calculation rules.
153. However, it was mentioned that this question should be put in a wider context. One of the drawbacks of the current rule is that it is binary: as soon as there is an investment risk, the capital charge is increased by the same level whatever the size of the “investment risk”. A more risk sensitive capital requirement may be needed. As this question fell outside the scope of the working group, no concrete proposal was discussed.

4.5.3. Operational risk

154. Although operational risk is a general issue, it was mentioned as being possibly particularly significant for unit and index-linked business (see above, description of common prudential themes).

155. The discussion showed that there is no workable method for calculating a quantitative requirement (an additional provision or a capital requirement) which would reflect operational risk. Some participants suggested following the Basle approach in order to be consistent with the banking sector. Some other participants expressed their doubts that a method could be developed before several years.
156. According to the group, operational risk should be reduced as much as possible by proper risk management. Requirements on risk management, based on good practices, as well as supervisory review could help in that respect: a reference was made to the Basle second pillar type of approaches.
157. In addition, capital requirement could be used as an incentive for companies to strengthen their risk management procedures when needed. The idea developed by most participants was not to have a specific capital requirement for operational risk, since no methodology is available, but rather to allow supervisors to require higher capital if risk management procedures are not satisfactory. The Solvency 1 Directive makes it possible to require higher capital “*where policyholders’ rights are threatened because the financial position of the undertaking is deteriorating*”. This provision could usefully be extended to the case of poor risk management, which may also threaten policyholders’ rights.

4.5.4. Legal risk

158. Although it is convenient for presentation purposes to use the term “legal risk”, it was stressed by some members of the group that, from the supervisory point of view, this issue is broader than the legal risk facing the company. The supervisory authorities’ role is primarily to protect policyholders. In consequence, they have a twofold interest in reducing the causes of legal risk: on the one hand, creating undue expectations is in itself harmful to policyholders; on the other hand, if these expectations are recognised as legitimate by courts, this may be harmful to the other policyholders of the company, whose solvency might then be under threat.
159. According to the participants, since policyholders of unit or index-linked products bear the major part of investment risk, it is of utmost importance that they should be aware of the real nature of their contracts.
160. Several countries have laid down specific disclosure rules; others are considering the introduction of such requirements. The group thinks it useful to establish at European level some disclosure principles related to these contracts. These could be:
 - Inform the policyholder about the underlying funds⁹, update this information regularly (e.g. assets held by the unit fund, market value and change in value in the course of time, sensitivity of market values of the funds to the changes in rates or indexes);
 - Emphasise that the policyholder bears the investment risk;

⁹ This principle is already mentioned in Annex II to the Third Directive. However, the group thinks it could be strengthened.

- Provide information about the risks resulting from a low value of the funds at maturity;
- Stress that the historical values of the funds by no means allow future developments to be forecast;
- Point out that all descriptions of non-guaranteed benefits are hypothetical in nature;
- Disclose the expense charges.

Main ideas:

- Improve and harmonise – at technical level – the rules on provisioning parallel guarantees for unit-linked products: the use of stochastic modelling could be studied further in this area;
- Define a diversification principle for illiquid assets possibly backing unit-linked products, at company level where not at fund level;
- Develop principles and standards for risk management and supervisory review of unit-linked business; give the supervisor the possibility of increasing the capital requirement when a company's procedures are not satisfactory;
- Establish disclosure principles to ensure policyholders' awareness of the risks of unit-linked products.

4.6. Options

161. The current Directives lay down the following general principle (Article 18 of Directive 92/96/EEC):

The amount of the technical life-assurance provisions shall be calculated by a sufficiently prudent prospective actuarial valuation, taking account of all future liabilities as determined by the policy conditions for each existing contract, including: (...) all options available to the policy-holder under the terms of the contract.

162. In addition, the Directive specifies that:

where the surrender value of a contract is guaranteed, the amount of the mathematical provisions for the contract at any time shall be at least as great as the value guaranteed at that time.

163. The group agreed that these principles were relevant and they discussed whether more precise methods for evaluating options could and should be described.

164. The difficulty of the issue lies in the fact that the subject is evolving and robust actuarial methods are not always available. These methods depend heavily on the precise type of the embedded options; account must also be taken of the method for calculating the “main” provision. Modelling policyholders’ behaviour is also problematic.
165. In this context, companies may have to make several subjective assumptions: supervisors are therefore faced with the issue of checking the reliability of these “tailored” assumptions against references which must be objective enough to constitute a legal basis.
166. Other projects, notably the international accounting project, are trying to address the issue but solutions will take time. A participant also mentioned the project ongoing in the solvency working group of the IAA (International Actuarial Association) which may, at a later stage, throw some light on the issue.
167. Some participants noticed that a “Lamfalussy approach” of regulation would be particularly appropriate to the subject, since precise methods, adapted to different types of options, are needed rather than principles or general methods.
168. The present working group itself did not have the time to study in-depth case studies. In the opinion of some of the participants, it might yet have been useful, on the one hand, to assess more precisely the relevance of the current Directives, on the other hand, to test the feasibility of a Lamfalussy type of regulation in this field.

5. ALM PRACTICES IN INSURANCE COMPANIES

169. An IAIS supervisory standard¹⁰, dating from December 1999, gives the following definition of asset-liability management (ALM).
170. “A key driver of the asset strategy adopted by an insurer will be its liabilities profile, and the need to ensure that it holds sufficient assets of appropriate nature, term and liquidity to enable it to meet those liabilities as they become due. Detailed analysis and management of this asset/liability relationship will therefore be a prerequisite to the development and review of investment policies and procedures which seek to ensure that the insurer adequately manages the investment-related risks to its solvency. The analysis will involve, inter alia, the testing of the resilience of the asset portfolio to a range of market scenarios and investment conditions, and the impact on the insurer’s solvency position.”
171. The group is aware that this definition should be discussed in detail and possibly amended. In particular, more emphasis could be put on the aspects of this management which are related to the liability side.
172. However, the purpose of the group was not to give a precise definition of what asset-liability management is or what it should be. It was rather to describe the various tools used by companies for such management and to discuss the advantage to supervisors of using these tools when defining requirements or performing a supervisory review. For this purpose, the above definition mentioned was thought useful.

5.1. Description of ALM practices

173. The members of the working group shared their experience of ALM practices in their respective countries. This part summarises their main findings.

5.1.1. General background

174. Asset-liability management developed significantly from the 1990s onwards in most countries.
175. Several reasons for this development can be mentioned:
- The main reason is that companies have endeavoured to better monitor their financial risk in a more risky environment (competitive pressure, fall in interest rates, new guarantees);
 - Development of research and computing capacity has also played a decisive role in the refinement of earlier approaches;

¹⁰ IAIS investment subcommittee: supervisory standard on asset management by insurance companies.

- More recently, regulation may also have created an incentive for companies to develop their asset-liability management techniques by setting up stronger risk management requirements (Finland, Italy, Germany).

176. However, in a number of countries asset-liability management tools are not used in every life insurance company. In addition, a great diversity of ALM tools and very different levels of sophistication exist in all countries.

5.1.2. Main objectives

177. The main objective of ALM tools is to monitor the matching – or relative mismatching – of assets to liabilities by assessing financial risks related to the mismatching (differences in the duration of assets and liabilities, risk of not having sufficient yields, liquidity risks, risks related to parallel guarantees, market risk, etc.).

178. These tools are therefore commonly used by companies when taking decisions on:

- asset allocation (shares, bonds, property);
- profit sharing and profitability of new contracts.

179. Participants also mentioned other objectives of ALM tools, such as:

- results planning, including assessing the “accounting risk” to account for supplementary provisions;
- performance assessment of different business segments by providing a consistent framework for measuring risk and return.

5.1.3. ALM tools in use

180. ALM projections can be made on a deterministic basis (a given scenario) or a stochastic basis (different scenarios with their associated probabilities). Stochastic approaches, which require more sophisticated models, are more recent and it is not obvious, from the replies, that this kind of approach is widespread among insurers.

181. Deterministic ALM projections provide the company with cash flow projections and therefore a knowledge of possible matching gaps. Average duration of assets and liabilities and present values are also common output of these exercises.

182. Stochastic models provide the company with probabilities of occurrence of a risk. Probabilities looked at by companies can either be “solvency-based” (likelihood of becoming “insolvent”) or “profitability-based” (likelihood of having to reduce profit-sharing).

183. Stress tests are commonly used in most countries.

184. Initially, companies used to develop their own “home-made” system. Development of standard software by actuarial firms has changed this situation in a number of countries, where standard software and home-made systems are now equally spread. However, there seems still to be a need for “in house” modelling for some specific liabilities.

185. Weaknesses pointed out in current models can be classified into two categories:

- implementation of the ALM tool: ALM models are often not comprehensive, sensitivity analysis may be missing in some cases;
- theoretical weaknesses of the ALM model: theoretical models may not be well adapted to insurance (especially the time horizon for asset modelling), there are also problems in modelling insurance risks which do not occur frequently: for these risks, assumptions are fragile. Some commentators also mentioned the absence of operational risk as a weakness of ALM models.

5.1.4. Who is in charge of ALM?

186. ALM exercises involve several players in the companies: investment, actuarial and/or technical departments. The department responsible for ALM seems to vary from one company to another. Predominant practices differ also according to the countries: in the UK, the actuarial department is usually responsible for ALM, while in Finland and France ALM tends to be entrusted to financial departments. A third solution, chosen by few companies, is to set up ad hoc ALM committees.

187. A great variety of answers was also given to the two following questions: at which level is ALM organised and is ALM integrated into the overall control system?

188. In Italy and in the UK, ALM is a matter for each entity whereas in the Netherlands and in France, the group level has sometimes played a leading role in implementing ALM.

189. In Finland, France and Italy, ALM is generally integrated into the overall control system. This is not yet standard in the Netherlands. In the UK, ALM is usually not integrated into the overall control system.

5.1.5. Professional recommendations

190. Except in the UK, there are no professional standards or recommendations on ALM.

191. In the UK, professional guidance has been issued for the preparation of the Financial Condition Report (this report is not compulsory). This report usually includes asset and liability projections for a “central” scenario as well as for a number of other scenarios. (See detailed description in the paper submitted by the UK.)

5.2. Supervisory issues

5.2.1. Existing regulatory requirements or recommendations

192. A number of countries have very general requirements on risk or investment management. These can be considered to be implicit requirements for proper asset-liability management. The Third Life Directive itself contains such a requirement in Article 19: “*the assets covering the technical provisions shall take account of the type of business carried on by an undertaking in such a way as to secure the safety, yield and marketability of its investments*”.

193. In addition to this general requirement, some Member States require that a report be prepared. For example, in France, a solvency report must be submitted to the board and approved by it. More specifically, in Finland, the actuary must give a written statement about the requirements that the nature of liabilities imposes on assets. He must certify that the investment plan fulfils these requirements. In these two cases, no specification is made concerning the content or the method to be used for these reports. (See also above, financial condition report in the UK.)
194. There are also more precise requirements on ALM in some countries (see the descriptions by members of the group in Annex 1 for further details):
- Denmark: at least every six months, a report on ALM must be sent to the supervisory authority¹¹. The aim of the report is an evaluation of the soundness of the company under certain assumptions regarding interest rate risks and credit risks in respect of assets and liabilities, risks in the price of shares, risks in the rate of exchange and risks in investments in real estate;
 - France: since 2001, companies (life or non-life) have to assess their financial risks by making an evaluation of the impact on assets and liabilities of variations in interest rates and equity markets and also a comparison between liquidity of assets and maturity of liabilities. A quarterly report (“état T3”), including stress tests, has to be sent to the supervisory authority (presentation made at the meeting of 14.11.2001);
 - Italy: ISVAP has recently laid down a reference method for calculating the foreseeable yield of assets covering technical provisions. The estimate of the foreseeable yield must be made at least twice a year (June 30 and December 31), assuming a time horizon of four years and a run-off portfolio;
 - UK: the regulation provides for a resilience test under a set of specified scenarios. This resilience test can lead to the addition of a provision to the balance sheet. A new regulation currently in preparation will add further requirements on ALM. Companies will be required to identify realistic adverse scenarios and to ensure that in the event of each scenario, they would still have adequate financial resources to meet liabilities to customers. The resilience test is currently being reviewed as part of new rules on capital requirements.
195. The group also commented briefly on the relationships between ALM requirements and rules on asset limitations (are they regarded as substitutes or complements?). According to these comments, there is no contradiction between the two types of regulation. On the contrary, they may be considered as complementary.
196. Asset limitation rules are more basic than results of ALM studies, but they allow for triggering regulatory action on the basis of easily checked rules. ALM studies allow a better understanding of risks, but the assessment is more subjective and therefore it may be difficult to initiate regulatory action on this basis.

¹¹ The reports were required in connection with the possibility of the companies to invest in up to 70% of the assets covering technical provisions in shares.

5.2.2. ALM in a future regulatory framework

197. The first question discussed was whether ALM tools could be used for determining quantitative requirements or should rather be considered as part of the “supervisory review process”¹².
198. The feeling of the group is that ALM tools do not provide a sufficiently consistent and robust environment to provide a basis for major usual quantitative requirements, such as the setting-up of all the provisions or the calculation of capital requirements. According to the Groupe Consultatif des Actuaire, there is documented evidence that different models produce very different results and are open to interpretation in different ways.
199. However, many participants think it possible that, for a limited number of cases, ALM tools provide a more adequate result than the standard rule. The following examples were given: option provisioning, assessment of the adequacy of expenses charges, setting a capital requirement for fast growing companies. The “resilience provision” may also fall in the category of quantitative requirements which are evaluated by ALM tools.
200. Nevertheless, the examples mentioned above are rather regarded as a possibility of derogating from common rules, following a dialogue with the supervisory authority: that is why they also fall within the scope of the supervisory review process.
201. The group believes that it would be very useful to recognise ALM tools in the “supervisory review process”. This point of view is developed hereafter.

5.2.2.1. ALM tools and risk management

202. Appropriate asset-liability management tools are a prerequisite of sound and prudent management. Therefore, life insurance companies should be required to use ALM models.
203. Minimum criteria should be defined at European level. These might cover the following areas:
- ALM models should be comprehensive and provide for an appropriate description of assets and liabilities;
 - The different parts of the models and the various assumptions or parameters used in them should be validated against past practical experience;
 - Companies should perform sensitivity analysis of their asset-liability projections;
 - ALM procedures should be documented;

¹² The Basle II second pillar.

- ALM should be integrated to the overall risk management process. In particular, the results of ALM models should be presented to the board of directors, who could be in charge of the definition of a “contingency plan” (what the company does in an extremely adverse scenario).

204. The group does not feel it necessary to specify the exact form of the model. This will vary according to the size and the characteristics of each company. For most companies a deterministic modelling of assets and liabilities would probably be considered sufficient.

5.2.2.2. Supervisory assessment

205. Since ALM requirements, where they exist, have been very recently introduced, the group did not have much practical experience of supervisory review in this area.

206. In particular, for the time being, there is no formal procedure for testing and validating an ALM model.

207. However, supervisory authorities are increasingly including asset-liability management in their supervisory review process. Participants from Denmark and France mentioned that they assess asset-liability management during on-site inspection. It is worth pointing out that, in both countries, the supervisor can already get an idea of the ALM of companies through regular reports. Italy is planning a series of on-site inspections to verify the implementation of its new legislation. France and Italy have also performed market surveys on ALM issues.

208. In the cases where ALM tools are used by the supervisor to assess financial risks faced by a company, this assessment is done during on-site inspection by discussing the set of assumptions chosen by the company and possibly by requesting the company to supplement its studies with more prudent assumptions.

209. The group thinks that a fruitful method for assessing financial risks using ALM tools is to submit the company’s projections to a series of adverse scenarios. (A distinction should be drawn between sensitivity analysis, where small variations of parameters are studied to validate the model, and stress-test scenarios, where large variations and extreme cases are studied to assess the financial strength of the company.)

210. The group discussed whether this set of scenarios should be fixed by the supervisor or chosen by the company. The majority of the group thinks that, at least, a minimum set of scenarios, common to all companies, should be determined by the supervisor, so as to provide the market with a reference level of “pessimism”. Other scenarios, chosen by the company depending on its characteristics, could be tested as well¹³. In any event, the supervisor should be able to impose a given scenario.

¹³

The example of Canada was given by a participant: companies must test several scenarios that are fixed by the regulator for the whole market. The choice of additional scenarios (concerning non-standard variables) is left to the discretion of each company.

5.2.2.3. Supervisory action

211. What type of actions should supervisors be entitled to take, on the basis of their assessment of the company's asset-liability management?
212. The first level of action is the discussion of supervisory concerns with the company. ALM analysis will be a suitable starting point for discussing a wide range of issues with the company: profit-sharing strategy, investment policy, expenses, contingency plan.
213. However, the members of the group think that supervisors should be allowed to take more constraining actions if the ALM analysis reveals severe weaknesses or if policyholders' rights are in danger. Actions such as requiring additional provisions or more capital or restrictions on surrenders or on investments should be envisaged as possible supervisory responses to problems revealed by an ALM analysis.
214. This second level of action poses a problem for some supervisory authorities. It is indeed difficult to justify legally actions of this type if the analysis of ALM relies on subjective assumptions and interpretations. Therefore, before introducing actions of this type, mechanisms should be thought of which would ensure that supervisory action is taken after a proper analysis of the situation of companies, compared to the rest of the market. The group lacked time to discuss this issue in greater depth and make concrete proposals.

Main ideas:

- Require companies to use asset-liability models in their risk management process. Minimum criteria for ALM tools should be defined at European level;
- Make ALM assessment part of the supervisory review: for this purpose, the supervisor should define a common set of stress-test scenarios for all companies;
- Make constraining supervisory actions possible if ALM results reveal a severe weakness. Put in place proper mechanisms to ensure equitable treatment of all companies by the supervisor.

6. CONCLUSION

215. Under each section, the main ideas suggested in the working group have been presented. This conclusion proposes to sum up these suggestions, by distinguishing between general principles and more technical questions related to specific actuarial or supervisory methods.

Principles

216. The group believes that ***the Directives contain most of the necessary prudence principles***. In particular, the group considers that the principle of premium sufficiency, the general principles of calculation of mathematical provisions and the principle of adequacy of the investments to the business carried on are relevant and useful.
217. Suggestions were made to supplement these principles in two respects: develop a principle of prudence in the choice of the mortality table (which would be the equivalent of the existing principle of prudence in the choice of interest rate) and create a principle of asset diversification applicable to unit-linked products (which are excluded, for the time being, from any diversification principle).
218. In addition to these traditional prudence principles, the group felt on several occasions that ***other types of principles could be created or strengthened in the Directives***.
219. Firstly, principles aimed at the ***protection of the policyholder*** and fair conduct of business. The group identified two of these: for with-profits products, it might be valuable to investigate whether a general principle of “fair-sharing” of the profits should be established at EU level; for unit and index-linked products, disclosure principles would be necessary to ensure policyholders’ awareness of the risks of these products. It must be pointed out that such principles would protect the holders of the contracts concerned but also the community of all policyholders by reducing the legal risk facing the insurance company.
220. Secondly, the group was aware of the discussions of the Solvency Subcommittee related to the Basle project and in particular to its second pillar, concerning the “supervisory review process”¹⁴. On several occasions, the group felt that such ***principles regarding risk management and supervisory review*** could add value to the current European legislation.
221. A major step in this direction would be to introduce ***a requirement for companies to use appropriate prospective tools for their asset-liability management***. These ALM tools could also be a basis for supervision.

¹⁴

It should be noticed here that the Basle “supervisory review process” deals with internal risk management process as well as with supervisory review. The first of the four principles of the “supervisory review process” is that “banks should have a process for assessing their overall capital adequacy in relation to their risk profile and a strategy for maintaining their capital levels”. This process includes five features: board and senior management oversight, sound capital assessment, comprehensive assessment of risks, monitoring and reporting; and internal control review. (See www.bis.org/publ/index.htm for further details).

222. If a more general framework for risk management and supervisory review is to be created, the group thinks that, in addition to the ALM requirement mentioned above, specific principles and standards could address, within this framework, procedures for assessing premiums sufficiency, the profit-sharing policy of the company, its monitoring of mortality trends and unit-linked business.

Methods

223. As regards **quantification methods**, the group focused on interest rates used in the calculation of provision and suggested two possible ways of improving the main method used in the Union for calculating mathematical provisions (“option 1”). One of them is the introduction of a “resilience provision”, which would have the advantage of creating an incentive to proper asset-liability management as well as the conditions of convergence with option 2 in the Directive.

224. Furthermore, the group thinks that it is possible, at technical level, to harmonise the method of establishing the reference rate for the first option in the euro zone.

225. Another area of technical work is harmonisation of the rules on provisioning parallel guarantees for unit-linked products.

226. In addition, if principles for risk management and supervisory review process are to be laid down at European level, the consistent application of these principles will necessitate **harmonised or coordinated supervisory methods**. This concerns the different roles of supervisory authorities.

227. Firstly, supervisory authorities will have to set **benchmarks or references**. In addition to the maximum interest rate used for the calculation of provision (already mentioned), the group discussed the need for supervisors to provide their national markets with reference mortality tables or, for asset-liability management, reference adverse scenarios. Even though these references and benchmarks will depend strongly on the characteristics of national markets, coordination should be sought to avoid major discrepancies in the level of prudence at European level.

228. Secondly, supervisors have a **monitoring role** at market level. In this respect, it would be beneficial to exchange information between supervisors on the basis of common indicators or statistical data. This idea was suggested for monitoring mortality trends.

229. Thirdly, in the supervisory review process, **supervisory powers** should be defined. In particular, the group is of the opinion that supervisors should be enabled to require more capital when management procedures of unit-linked business are not satisfactory (since operational risk may be very significant for this type of business). Similarly, the assessment of the asset-liability management of a company should lead to constraining actions if supervisors identify severe weaknesses. This means that mechanisms should be put in place to ensure equitable treatment of companies by supervisors. Consistency of supervisory practices in Europe will also have to be sought.

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F. Cruz Alves: *Stochastic Simulations for Yields*, May 2002

List of Annexes

Annex 1: Descriptions of products and asset-liability management in different markets (November 2001):

- Denmark
- Finland
- France
- Germany
- Italy
- Netherlands
- Portugal
- Spain
- United Kingdom

Annex 2: Survey of the Group Consultatif des Actuaire on the calculation of a given annuity in different countries

Annex 3: Presentations made to the working group:

- Asset-liability management techniques in the UK
- Financial risk assessment by French insurance companies
- Fair-value accounting in Denmark