REALISTIC ACCOUNTING OF BALANCE SHEET RISKS

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SUMMARY

The goal of this paper is to discuss a number of ideas designed to improve the information about balance sheet risks. One idea is to measure exposure of individual asset classes to financial risk (as well as opportunity), another to describe the extent of present and future matching between assets and liabilities. Special attention is given to reinsurance cover seen as an asset and to assets that are backed by other assets or by various guarantees, including credit insurance cover. Finally, some comments are made regarding a Swedish proposal on how to implement the investment rules according to the third generation of EC insurance directives.

Comptabilisation réaliste des risques de bilan

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Résumé

Le présent article examine un certain nombre d'idées concues pour améliorer l'information en matière de risque de bilan. Une des idées avancées est de mesurer l'exposition des différentes catégories d'éléments d'actif au risque financier (de même qu'à l'opportunité), et une autre de décrire la situation présente et future de l'actif et du passif. On accorde une attention particulière à la couverture de réassurance en tant qu'élément d'actif et aux actifs protégés par d'autres actifs ou par diverses garanties, y inclus la couverture d'assurance crédit. L'article présente enfin quelques remarques sur une proposition suédoise relative aux modalités de mise en oeuvre des règlements d'investissement conformément à la troisième génération de directives de la CE applicables au secteur de l'assurance.

1. CONCRETE QUESTIONS ABOUT BALANCE-SHEET RISKS

By its very nature the balance-sheet of an insurance company is, to a large extent, a static picture or a snap-shot of the financial situation by the end of the accounting period. It is, however, most natural to ask questions of the *quo vadis?* type, that is, where is the company heading, and expect that the balance-sheet or some comment to it should provide answers. Other questions which go beyond the snap-shot level are:

- Which items have been difficult to evaluate?

- Which items are sensible to external changes or shocks, and in what way?

- What external changes or shocks are likely to have an impact on the financial situation?

It should also be observed that the expectations on the balance-sheet and the information it can give are notoriously multifarious. Some of the most important interested parties are:

- policyholders, present and future

- shareholders and investors

- lenders

- supervisors

- fiscal authorities

- reinsurers

- ceding companies

The most obvious difference between various interests is probably the choice of horizon or time perspective. Apart from that aspect, there should actually be a rather broad consensus as to what is good and realistic information about balance sheet risks. The time perspective does, however, enter into various ways, as we shall see.

An actual issue, as far as EC concerns, is the choice of valuation principles. One choice stands between current value and purchase cost for assets. Using current value implies an interest in the short-term perspective, while the use of purchase cost at least has the merit of referring to a value that with certainty have been observed, even for assets, the current value of which is difficult to determine. In a sense valuing at purchase cost is looking for the key under the lamp-post and does not involve any aspect of time. A third principle, amortized cost, does however take a longer perspective into account, in that it accepts an anpproximation that approaches the value at maturity for assets like bonds. For this to be a reasonable approach, it must be possible to expect that the asset only with small probability cannot be held until maturity. This will be the case in two important cases:

- when a closed portfolio is at least reasonably well matched

- when an open portfolio can be expected to show good liquidity

If the outflow of payments is difficult to predict, due to problems in determining when claims are to be paid or when and to what extent surrenders occur, valuation on a long-term basis must be modified or given up altogether.

Another anomaly is the different aproaches usually taken to the valuation of assets and the valuation of liabilities. In theory, they both represent cash flows and so should be valued uniformly or along similar principles.

One area that has become important lately is financial reinsurance. It has been demonstrated that problems from the accounting aspect stem from using different approaches to valuating gross liabilities and the reinsurer's part of the liabilities. There are similar problems with off-balance items such as guarantees and some instances of derivative instruments. They are in some senses close to insurance or reinsurance, but are not usually valued as such items.

It is clear that most balance-sheet schemes try to rank at least assets roughly after degree of liquidity. This is in itself the rudiments of an anlysis of liquidity, but a more realistic accounting would have to go further.

Finally it should be pointed out that earlier studies have discerned at least three approaches to the balance-sheet or the financial situation in wider meaning. These are termed winding-up, going concern and emerging costs. Various approaches have their specific consequences as to the valuation principles. Winding-up puts emphasis on liquidity, going concern on matching and emerging costs on risks for future mismatch. Theses observations are well-known and play an important role in the work made by actuaries of the United Kingdom, see for instance Daykin and others (1987).

2. APPROACHES TO BALANCE SHEET RISKS

On a general and abstract level the problem of balance sheet risks can be described as sensitivity of the balance sheet to changes in underlying exogenous variables and structures. The value of assets, liabilities and groups of assets or liabilities are mathematically speaking functions of underlying variables and structures, most of which can be seen as random variables or random processes. The approach taken by actuaries of Finland and the United Kingdom, see for instance Daykin and others (1987) or Pentikäinen and Rantala (1982), is to leave the balance sheet as such and by use of simulation exploring the balance sheet risks and their impact on solvency in

particular. Since economic processes are hard to model and predict, one alternative to studying (simulated) confidence intervals is to study how the value is effected by changes in one or several of the exogenous variables and structures.

A few simple examples should illuminate the point. The current value of a gilt-edged bond with fixed coupon is calculated as the present value of the cash flow of the bond, using the proper market interest rate for discounting. The market interest rate is the exogenous variable and one approach would be to consider the present value of the deterministic cash flow as a random variable, being a function of the underlying stochastic market rate. Much work has been in this area, deriving expected values, variances and distributions of pertinent functions. All the same, the risk of short-term large fluctuations in the market rate is considerable and this aspect is not easily covered with the mentioned approach. If, however, the present value is considered a function of an exogenous variable and the deterministic cash flow, the change in value can either be calculated directly for one or several given changes in the exogeneous variable, or its first order derivative with respect to the exogeneous variable can be taken as a proxy for the sensitivity to changes.

Another example should clarify the use of the term 'strucure' used above. Since market rates occur in families or bundles labelled by term to maturity, a phenomenon usually referred to as the term structure of interest rates, a single bond or at least a group of bonds having different maturity dates are sensitive to changes in the term structure. If a change in structure can be specified, the corresponding change in value of the assets can be described. Theoretically such a change may be given in parametrized form and the derivative of the value with respect to this parametrization will be a measure of sensitivity in a certain direction.

The merits of simpler approaches compared to simulation are their closer connection to the balance sheet as it is known to most users of

it. It is the opinion of the author that much can be done to improve the information about balance sheet risks before taking recourse to simulation. Simulation and projection will, of course, continue to be valuable tools in the hands of expert analysts, provided that sound assumptions can be made.

One lesson taught by portfolio theory is that the portfolio risk is usually not the "algebraic" sum of the risk of its elements. This has at least two implications. The combined sensitivity to risk of the total assets should be illuminated. Secondly, the extent of mismatch between assets and liabilities and the risks stemming from such a mismatch should also be measured.

Questions about matching as such and liquidity in particular may depend on the evolution of the portfolio of policies. It seems to go to far to take a long perspective on such an evolution, although it may have bearing on a life company, and should be reserved for the simulation or projection approach. But some aspect of the dependance on stable or increasing volumes of business should be described; the shock of steep decreases in new business due to changing economic and fiscal conditions, or massive surrenders are not unknown.

3. IMPROVED INFORMATION ABOUT BALANCE SHEET RISKS

The following is a provisional and rather unstructured list of ideas on concrete improvements regarding balance sheet risks and balance sheet information on the whole. In an incomplete manner we are speaking about a kind of "prospective" profit and loss account that would seem to be one natural extention of the balance sheet.

3.1. Information about interest rate risk

The interest rate risk of fixed-income assets should be estimated.

Discounted technical reserves should perhaps also be described from this point of view.

3.2. Information about inflation risk and other price risks

The inflation risk is important for liabilities to the policyholders as well for assets. As a complement, the risk due to the level of the real interest rate may be illustrated.

3.3. Information about matching

One should try to find forms for describing matching between assets and liabilities. If parts of the portfolio are well-matched with respect to fixed-income assets or any other group, this may be disclosed. If suitable, estimated average duration of relevant assets and liabilities may be given.

3.4. Information about reinsurance cover

As has been pointed out by a U.K. working party on financial reinsurance, see Wilkinson and others (1993), if the reinsurance cover is valued along the same principles as the gross liability, information is enhanced and certain anoalies may be removed. What is more problematic is the default risk of reinsurers. One piece of important information would be to have the reinsurance cover explicitly grouped according to the claims-paying ability of reinsurers, much in the same way as fixed-income assets and other assets usually are grouped according to liquidity.

3.5. Information about large exposures

It seems natural to disclose any large exposures in assets, especially if there are official limits to such exposure.

A slightly more controversial point is whether, apart from a complete listing, some information should be given as to the

exposure to the risk of being largely dependent on a single reinsurer.

Even more controversial, perhaps, would be to require information on large exposures on the liability side. To the extent this is not considered a business secret, such information is crucial.

3.6. Information on assets backed by other assets or guarantees

Some assets, such as shares or participating interests, may refer back to underlying assets, such as property or guarantees by others, or even the company itself. The situation can be compared with the one for reinsurance cover described above, and could perhaps be given similar treatment, although this is probably not simple. Particular instances of backing are the use of credit insurance or financial guarantees by banks.

4. COMMENTS ON A SWEDISH PROPOSAL FOR INVESTMENT RULES

An official memo on the future investment rules for insurance companies has recently been published by the Department of Finance of Sweden, see Nyberg (1993). It suggests changes in legislation due to the EEA Treaty that will be considered by the Swedish Riksdag by the beginning of 1994 if all goes as planned with the Treaty. The main idea has been to implement the rules of the third generation of EC Insurance Directives in an atmosphere of prudent portfolio management.

The comment I would like to make here is that much emphasis is placed on relevant information to the Board of Directors, investment rules and policies adopted by the Board and available to the Supervisory Authority. One tool for the company management to assess the financial situation and future risks would be the simulation or projection approach, another continuous monitoring of the balance sheet and its risks, using as much as possible and suitable of the

aspects taken up in this paper.

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