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A global approach for financial flows management in insurance companies. The Italian experience.

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Summary: 1. Introduction – 2. Financial planning and programming in insurance companies – 3. Causes of variability of expected financial flows – 3.1 *The financial flows' variability due to technical factors* – 3.2 *The growing importance of interest rate risk* – 4. The progressive achievement of Asset/Liability Management for interest risk management – 5. Conclusions

Abstract

In insurance companies the financial flows' dynamics is influenced by heterogeneous factors, some of them linked to technical features of insurance field and some others common to all financial dealers (i.e. market risks).
The main recent changes which took place within the insurance field intensified competitive pressure and underlined the key role of financial area in defining the overall firms' profitability and imposing, at the same time, a higher attention to the financial risk control. Particularly important is the interest rate risk, for its effect on financial flows and on solvency firms conditions.
Knowing that financial and technical activity are related in insurance companies, the main research question is: it is still worthy to look separately risks and investment policies or if it is better to acknowledge a new important management variable which fosters a global management approach (*Asset and Liability Management - ALM*), within a decisional process oriented to the long term firm value creation and to the stabilization of profit margins?

Keywords: *insurance companies; financial flows; asset and liability management; market risks; financial area; interest rate risk.*

1 – Introduction

The planning of financial flows in an insurance companies must take into consideration not only the variability of the financial flows related to the technical factors, but also the variability related to the financial factors, such as interest rate, change rate and so on (Doffou, 2005; Vanderhoff, 1972).

Traditionally, the attention of Italian insurance managers focused on risks' control deriving from technical factors. The increasing of the competitive pressure in the environmental context of the insurance companies stressed the financial management and

the control of its risks, particularly the risk related to the interest rate, relevant especially for the life-insurance companies (Babbel & Santomero, 1999).

In a static context, strategy followed by companies to control the interest rate risk consisted to fix an interest rate lower then the market interest rate in defining the contractual conditions. This situation favoured a management which treated separately the problems of risk assumption policy and investment policy (Staking & Babbel, 1995; Bacinello, 1999).

Nowadays, managers of insurance companies must consider that variations in the net firm value are related not only to the technical insurance activity, but also by the expiry of financial flows of the different budget items (Kong & Singh, 2005).

A valid help to manage the risk exposure, in a more systematic and effective way came from Asset Liability Management (ALM), an integrated approach to the portfolio management (Babbel, 1995; Doffou, 2005; Frenkel et al., 2005).

The ALM is integrated management philosophy, able to realize an opportune synthesis between the technical and the patrimonial component of the management and represents for insurance companies a valid tool for controlling and supporting management decisions, by rewarding after all the firm's solvability (Babbel, 2001).

The main aim of the paper is to highlights the motivations, the environmental circumstances and the historical stages which justify the adoption of an integrated approach to the portfolio management in the Italian insurance companies, trough the Asset Liability Management (ALM) techniques (Wise, 1984). Notwithstanding ALM is a well known and used approach since 70s in USA (Doffou, 2005) and spread in different sectors (Drijver, 2005; Kosmidou & Zopounidis, 2004; Detemple J. *et al*. 2007),) and in different countries (Babbel, 1995; Albrecth & Weber II, 2003; Dupacova & Polivka, 2009; Carino *et al.*, 1994), in Italy has been applied firstly in the Italian banking sector since '90s, but it constitutes a relatively new approach for the Italian insurance sector (Vallisneri 1998; Moro 1997; A.A.V.V. 1998).

The research path is structured in two steps. The first step concerns the identification of the scientific basis that represents the foundation of the research. Hence, the analysis regards the studies focusing on insurance companies, financial flows' variability and on the different type of factors, technical and financial, which impact on their variability, and then on their planning. The method used is a critical review on the literature existing on the main causes of variability linked to technical and financial factors. The second step regards the study of an approach able to manage, in a systematic way, the exposure to the companies' risks especially the interest rate risk. The approach embraced in the paper is the Asset Liability Management one. The method used is a critical review of most important studies and of the experience realized in similar sectors, like bank sector in Italy. From the analysis emerged the opportunity to introduce the ALM approach in the insurance companies, since it is a sector in which the financial

activity is strictly penetrates in the technical activity, notwithstanding its introduction requires an important cultural change.

In Italy, the use of ALM approach does not currently have a widespread diffusion. The future research stream could focus on an analysis of the opportunities to introduce ALM in insurance companies, by considering as well the difficulties related to the implementation of this approach.

2 – Financial planning and programming in insurance companies

In the frame of general enterprise planning carried out by insurance companies, financial plans express the financial aspect of management and help trace the credit and debt movement (*competence plans*) beforehand, or the movement of collections and payments (*cash plans*) that are foreseen to occur in a specific period of reference. In the first case, this means comparing the complex of credits and the complex of debts, both ordered according to their expiry, while in the second case, the presumable collections with the presumable payments will have to be compared (Cassandro, 1975). The financial plans of *competence* do not allow us to know the presumed movement of money in the specific period, but they actually represent the referential basis for the formulation of *cash plans* which are purposed to that scope. In fact, although the collections and the payments do not coincide with the sums which are settled and engaged in the period, they strongly depend on these to the extent that no cash estimate would be possible if an estimated competence were not initially made. Cash plans demand a deeper study of the concrete financial dynamics of the company, whereby it is possible to determine in which measure and in which time span collections and payments will be distributed during the administrative year referred to by the plan. Therefore, they concur, in advance, in verifying the existence of cash balance which is an indispensable functional condition for any type of company. Furthermore, they also show possible situations of hyper liquidity which are harmful for company profit at least as much as cases of illiquidity.[1]

The arrangement of financial plans draws its natural origins from economic programming. Therefore, a brief overview of business plans drawn up by an insurance company will help us gain insights into which and into how many aspects the financial plan will, subsequently, have to take part in. Given that economic plans concern both the technical-insurance management and the patrimonial one, the following are included in the first (Cassandro, 1991a):

- the production plan, that is, the program of new insurances that the company deems to be able to place in the administrative period;
- the plan of the reinsurances and of the retrocessions to be implemented in relation to new assumptions of risks foreseen in the year;

[1] For a in-depth analysis see Terzani S. (1999); Masi M. (2000).

- the plan of variations of portfolio risks, whereby qualitative and quantitative modifications are foreseen to possibly occur in the existing portfolio at the beginning of the annual period[2];
- the plan of the variations that will be recorded in reinsurances and in retrocessions due to the modifications foreseen in the aforementioned plan;
- the plan of the burdens that will weigh on the company in the period related to the assumed risks;
- the estimate of the indemnifications that the company will have the right to obtain from reinsurance companies on the basis of reinsurance contracts;
- the plan of the costs of insurance management (administrative, fiscal, amortizations, etc.).

Economic plans related to the patrimonial management will, instead, be:
- the plan of investments to be carried out in the financial year;
- the plan of realization expected for the year[3];
- the plan of proceeds (interests, rents, dividends, etc.) and of the burdens (taxes, amortizations, etc.) of the patrimonial management.

Composed in a single prospect, the set of plans related to technical management and to patrimonial management provide information on the entire economic aspect of insurance management in the future period of reference and are the starting-point for financial-type expectations. More specifically, in the financial aspect, the technical management will originate a flow of incomes given by insurance premiums and by the indemnifications obtained from the reinsures and an expenditure flow represented by reinsurance premiums, by the indemnifications paid to the insured and by the burdens of the administration. On the other hand, the patrimonial management will originate an expenditure flow connected to the investment of financial resources and annexed burdens related to their administration and an income flow deriving from the proceeds of the investments and from the realization of the disinvestments (Cassandro, 1991b).

Financial planning carried out by insurance companies in the average period is expressed in the draft of a triennial plan in which it is possible to find the expectations related to the future debt and credit situation of the company as a consequent development of its productive activity. On the other hand, programming which involves a short-term span, finds its implementation in the formulation of an annual budget in which expectations concerning cash movements regarding the period will be made. Expectations related to income and expenditure monetary flows, formulated during the budget phase, are normally reviewed quarterly or semi-annually. This is done in order to become aware of possible shifts between the expected financial movements and the effective

[2] In other words, this implies determining which contracts, expiring in the period, will not be renewed, or which contracts will undergo modifications proportioned to the insured sums or in terms of risk clauses. The expectation of these modifications can find a sound grounding in the trend that the portfolio of several branches has followed in previous years.
[3] For example, correlated to the expiry of mortgages, to the drawing of bonds for reimbursement, to the convenience of investment changes and similar.

ones and in order to identify the possible reasons of such shifts. The procedure continues with the possible correction of those expectations already formulated for the remaining part of the year and further foresees the draft of a budget for each month of the year with the aim of making expectations for the income and expenditure monetary flows as precise as possible in every sub-period of the year and in such a way as to assure the achievement of cash balance or treasury. The corrections made to the annual budget, in relation to manifested unexpected events compared to expectations initially formulated, also impact expectations included in the triennial plan. These will, in turn, be reviewed and upgraded at the end of every administrative year by resetting the whole triennial plan in an on-going upgrading process.

3 – Causes of variability of expected financial flows

Active and passive financial contracts realised by insurance companies differ under the profile of *certainty* of the date in which they will give rise to a monetary flow (positive or negative) and under the expected *dimension* of the same flow. In particular, such contracts can be grouped in three categories: 1) contracts which generate a certain flow in a certain date (policies with periodical premium instalments, life-policies); 2) contracts which produce a certain flow in life but at an uncertain date (life-policies of a mixed type); 3) contracts which produce a flow of uncertain dimension both in the amount and in the date of manifestation (damage compensations of primary insurance branches). If insurers stipulated active and passive contracts pertaining exclusively to the first category, and excluding the case of defaulting contractors, problems revolving around financial planning and programming connected to the technical-insurance management would assume an extremely simplified shape. It would, in fact, be possible to easily realize the expectations for income and expenditure flows in the short-term and even in the medium-long term period. Instead, the prevalence of financial contracts pertaining to the last two categories considered forces companies to face more rather complex problems, imposing them to assign a distribution of probability to the income and expenditure flows under uncertain conditions. Therefore, it follows that companies need to build alternative scenarios in which the search for balance of flows in short and medium-long term periods is set up, estimating the expected value singularly (Locatelli, 1995).

In spite of this fact, the authoritative doctrine has often evaluated problems regarding liquidity and treasury in insurance companies as unimportant; in this view Selleri (2003), Petix (1984), Basile (1990). Such an evaluation probably derives from an excessively simplified and perhaps very optimistic vision of the insurers' activity. Even recent experience confirms that liquidity is not always the physiological element of insurance management and attributes relevance to the problem of liquidity and to the balance of treasury that both the literature and the operating praxis have still not fully acknowl-

edged; in this view Cassandro (1991a), Paci (1990). Generally-speaking, merit is attributed to the well-known inversion of the productive cycle in spontaneously realizing the balance between income and expenditure monetary flows, since the latter, generated by periodic premium payment, should be sufficient to supply expenditure flows determined by the payment of the indemnifications in the hypothesis of a normal course of management (Cassandro, 1975).

Another element which is considered to be simplifying in the attainment of balance positions is the structure of company budgets: the type of active and passive contracts which constitute the structure are such that companies can exert effective control on the structure in terms of expiry and modalities of active and passive movements (Locatelli, 1995)[4].

After all, the fact of being able to choose the moment in which to carry out compensations due to one's own insured, within certain limits, and the remarkable flow of premiums proportioned to the expenditures for the payment of indemnifications support the thesis that, in our companies, the tensions of treasury have an episodic character (Basile, 1990). Indeed, even if we admit that thanks to the inversion of the productive cycle, liquidity and treasury management are less crucial for insurance companies than for other financial intermediaries, it is not possible to abruptly conclude that the issue is *tout court* irrelevant if we follow the observations previously made. Firstly, we cannot neglect that often liquidity imbalances lead to solvency crisis and, at times, tensions in treasury are tangible proofs. Moreover, problems concerning treasury and liquidity are presented in different ways even in relation to the developmental phase in which the company stands (Selleri, 1991)[5]. In addition, the features in terms of active and passive expiry differ noticeably within the various typologies of insurers and the technical reserves actually introduce different degrees of demand. In the companies operating in the life branches, mathematical reserves, for example, can be invested on long-term horizons and for this reason, they are traditionally included in the consolidated liabilities. However, they present a degree of somewhat advanced demand, as quite often the insured have either the faculty of redeeming the contracted policies beforehand or of being refinanced by the same insurance company. At the other end, it is worth noticing how the premium reserves and the accident reserves of companies operating in the elementary branches are normally considered current liabilities, while their effective degree of demand is relatively low since it is not possible to hypothesize any type of prior

[4] In particular, it is known that insurers' passivity is mainly given by technical resources which are broadly not collectable by creditors, with the exclusion of some contracts from the life-capitalization branch which are redeemable and which require the corresponding reserve. Beyond this case, the insured have the single right to demand monetary indemnity only after the harmful event occurs and in consideration of the insurance contract. In turn, insurers' activity is mainly composed of debt contracts which can be easily demobilized since they are incorporated into real-estate values, negotiable on the secondary market.

[5] More precisely, in an expansion phase of activity, characterised by a bulk of significantly increasing annual premiums, income flows will be particularly abundant and will easily cover expenditure flows. In an advanced phase, monetary expenditure flows due to compensations could exceed the bulk of income flows produced by premiums collected.

demobilization for them (Basile, 1990; Locatelli, 1995). Regarding the active, its liquidation does not represent an absolute characteristic, but rather relies on the modalities of investment which are pre-chosen by the insurer. Therefore, the greater the weight of the credits which are not incorporated into negotiable values on a secondary market, the higher the risk of immobilization will turn out to be (Gardner and Mills, 1988).

In addition to the previous issues, it is necessary to consider other factors connected to the two typical company managerial areas (technical-insurance and patrimonial) which are able to generate unexpected variations in the income and expenditure flows expected.

3.1 – *The financial flows' variability due to technical factors*

Regarding the technical-insurance management, it may be helpful to briefly review the process of determination of premiums in various branches of activity in order to better understand the influence of such elements on the balance of treasury (Basile, 1990; Petix, 1984).

For the definition of pure premiums in the damage branches, the frequencies of past damages are taken into account and, in some elementary branches, the relative average cost and the incidence of great risks; loadings, instead, are fixed on the basis of the presumed operating costs. It is possible, therefore that, a posteriori, the formulated hypotheses are not confirmed by facts and that the pure premiums do not succeed in exactly covering the compensations corresponded to the insured in a year. For example, the technical bases employed could appear to be inadequate (for shifts between effective frequencies and estimated frequencies, or for the delay in liquidation which induces to underrate the average cost of the damages), or because the company has a structure of portfolio risks which differs from the average one in the field which is normally referred to when the possibilities of incurring into damages are estimated (Cassandro, 1975; Basile, 1990). The situation becomes more complicated in the case of companies operating in the field of liability, in which appraisal of damages is often carried out on a judicial basis, introducing an exogenous factor which is difficult to ponder in economic-financial management. Even a trend in cost management which differs from the one expected and which is incorporated in the loadings, can cause a higher expenditure flow than the one planned. More than in the damage branches in which the contractual conditions are annually reviewed, this problem has an impact on the life branches. Here, there should be a previous estimate of the costs of acquisition, proceeds and management related to the entire duration of contracts and profits to determine an average load which is added to the pure premium. Without considering that acquisition commissions due to the agents are entirely corresponded to them when contracts are stipulated, regardless of their outcomes, while their worth is recovered on the premiums only in due time. It is, therefore, completely normal that the costs actually sustained shift from those initially

estimated due to the practical impossibility of correctly foreseeing which structural investments will be realized, which inflationary dynamics will occur, which commercial policies will be followed over an extensive temporal span.

Even in the life branches, variability of expected flows has a prior connection with technically-based factors. Here the process of determination of pure premiums is founded on demographic and financial hypotheses. For this reason, it is possible that technical bases of a demographic type appear inadequate since population composition in terms of gender, age and mortality rate is progressively modified over time and, above all, since factors could not be the same across the national territory. The case could also be that the financial hypotheses assumed, related to the expected outcomes from the investments created to meet the mathematical reserves, are easily disregarded, given the cautious approach with which the technical rate is fixed and the refuse that is commonly manifested in comparison to the effective average production of the reserves. Finally, a further source of potential imbalances could be provided by the opportunity which allows the insured to modify their original commitment, taking advantage of the chances of abandonment, reduction and redemption which would involve the review of the bulk of the mathematical reserves and of the company's financial *budget*.

The endogenous nature of all the phenomena examined induces us to consider as "physiological" the negative economic and financial effects imputable to insurance companies, rendering them not completely dismissible, but controllable through adequate management techniques (Basile, 1990; Petix, 1984). And it is right on the control of the typical risks of the technical-insurance area that attention has been placed by company managements for a long time. In doing so, a series of effectively acknowledged managerial techniques have been made available, although they have unfortunately not been sufficient to guarantee companies solvency conditions[6].

The importance of the latter aspect has recently directed the attention of both the vigilance Authorities in the field and that of those involved in management towards monitoring the risks of the second great macro-area of company effectiveness: patrimonial management.

3.2 – *The growing importance of interest rate risk*

Among its typical risks, there are various typologies which are not peculiar to insurance companies, but which target the more general financial intermediaries (credit risk, liquidity risk, exchange rate risk, interest rate risk).

6 Such managerial techniques are classified in three categories: 1) adoption of selection procedures of insured risk and of the insurance applicant; 2) adoption of formulas of contractual precautious negotiation (exemption, overdraws, lacks or wait); 3) share of risks with other sector companies by means of agreements and various links (constitution of groups, co-insurances, reinsurances).

The unaware way in which, until not so long ago, the majority of Italian insurance companies have exposed themselves to such a typology of risks has not in any way negatively affected the sphere of profits. Thanks to circumstances such as the favourable situation of the real-estate market and to the possibility of operating in a market which has been safeguarded from foreign competition and strongly restricted (therefore substantially stable), there has been a contribution in management to the spread of an attitude of contained relevance compared to the effective danger of exposure. The important changes which have occurred in recent years in the field (the creation of the European market of insurances, an integration with other financial intermediaries, the advent of the euro, etc.) make the persistence of a similar situation somewhat improbable in the future and impose companies to careful reflect on the validity of the competitive strategies adopted.

After all, the substantial increase of competitiveness that they stimulate, will involve a deterioration of the already weak contribution to company profit coming from technical-insurance management and will induce companies to rely more and more on profit contribution deriving from patrimonial management. This, of course, means devoting greater attention to the control of relative risks.

Among these, the *risk of interest rate* is considered particularly meaningful. It is tied to uncertainty associated with the trend of interest rates and to the impact of such a trend on cash flows and on market values of financial activities and liabilities (Manghetti, 2000a; Gualandri, 1991; Masera, 1993)[7]. This risk occurs due to the intermediary's vulnerability to market rate fluctuations which are measurable by the analysis of impacts on management performance. Moreover, this risk appears every time the structure for expiries and for rate review dates is not perfectly balanced[8]. In these conditions, rate variations produce different impacts on the value of active and passive items, causing an alteration in the value of the net patrimony or the intermediary's margin of interest (Gualandri, 1990)[9].

The analysis of interest rate risk can be carried out considering two different approaches: 1) the perspective of *current profits*, which identifies the risk of rate in the sensibility of accounting profits to variations in interest rates[10]; 2) the perspective of the

[7] Among other financial risks, there are: a) *credit risk*, connected with the possibility that the debtor is not solvent upon expiry both for causes due to his/her economic and financial situation and to the influence of a wide number of variables such as a monetary or a national political crisis (country risk); b) *liquidity risk*, determined by the chance that the intermediary is not able to transform investments in liquidity without sustaining capital losses upon contractual expiry; c) *exchange rate risk*, defined *ex ante* by the uncertainty associated with trends and by exchange rate fluctuations and *ex post* due to trend impact on cash flows and on the values of market activity and passivity.

[8] For a in-depth analysis see Barth M. (1995); Tilley J.A. (1986); Staking K., and Babbel D.F. (1995).

[9] The margin of interest is given by the difference between active and passive interests.

[10] According to this approach, interest risk can be decomposed into its two main components: profit risk and investment risk. The former takes into account the possibility of incurring in losses in terms of net profit interest caused by the lack of perfect synchrony between active and passive rates, due to market rate fluctuations: the latter derives, instead, from the variation in market value of financial activities and liabilities at a fixed rate as a result of interest rate variation and it occurs in the accounting of minus values or plus values with evident effects on the process of formation of accountable profits.

economic value, which identifies the risk of rate in the sensibility of the value of the net patrimony to the variations of market rates (Gualandri, 1991; Masera, 1993; Pietrantonio, 1994)[11]. In order to achieve a better definition and measurement of the degree of exposure to the risk of interest rate, it is worth employing a combination of the two approaches (Colombini, 1994; Gualandri, 1991).

The weight of the risk of interest rate for insurers depends on the role attributed to the fixation of an interest rate in the process of defining the technical-economic features that regulate insurance contracts. In this view, it is necessary to inquire into two aspects: a) the relevance of the interest rate among the contractual conditions; b) the chance to modify the reference rate following market rate variability. In the characteristic contracts of the elementary branches, the insurer is not committed to recognising the insured person a prefixed profit. Therefore, the profit rate of the technical reserves is not directly part of the constituent elements of the contract. On the other hand, it is true that the profit expected from the investment of technical reserves belongs to those elements which the company considers relevant for the appraisal of the bulk of premiums applicable to contracts. The expiry of usually annual contracts related to elementary branches makes the modification of the interest rates of reference, however, quite easy and, therefore, the risk of interest rate less meaningful[12]. Its influence is much more important for life-capitalization insurers, given the stronger savings component which characterizes the relative contracts. Here, it assumes contents which are closer to those of banks, which are emphasized with reference to some typologies of policies[13]. In more general terms, in life-capitalization branches, the choice of the "technical rate" represents a factor that significantly affects the definition of contractual conditions, even if it is not always explicitly expressed to the insured person and is never negotiated. It represents the profit rate of technical reserves that the insurer acknowledges to the insured person and which is employed as a variable for the anticipated definition of the bulk of premiums and of the capital insured. We are, therefore, dealing with the constant and minimal interest rate, whereby the insurer assumes that capitalization of mathematical reserves will be able to occur. This fact generates the assumption of a risk for the insurer that can turn out to be more serious the more the effective rates quickly shift in an unfavourable sense from those adopted for rate calculation and the greater the duration of the insurance contracts is. Therefore for life insurers, the risk of interest rate derives from the fact that a fixed passive and unchangeable rate for the whole length of the contract[14] must be compared with an active profit rate which, instead, is affected by the trend of market rates (Locatelli, 1995).

[11] Rate variations influence the value of the net patrimony both in modifying the flows connected to interests and in modifying the same rate of realisation.
[12] For a in-depth analysis see Campbell F.D. (1995).
[13] Reference is to contracts of pure capitalization in which the presence of a real interest risk charged to the insurer is identified.
[14] Indirectly recognised to the insured by the determination of the premium and the insurance capital.

The strategy that companies have at long followed in order to minimize such a risk is fundamentally based on the fixation of a technical rate which is much lower than the one on the current market at the moment of the definition of the contractual conditions[15]. Such a strategy has been, in fact, employed until the mid '90s, the period which has witnessed the triumph and the maximum spread of insurance tools, whose saving component was based on the trend of interest rates and on the guarantee of a minimal profit for those insured[16]. Given the context of high financial profits and the almost total absence of risk on the main part of the investments made up of governmental bonds, the profits offered by the companies did not arouse worries regarding the commitments taken with the insured. This was due to the fact that the rates used for the determination of the sums guaranteed upon expiry were greatly lower than the current market yield (Manghetti, 2000a). Therefore, the economic context of reference was such that it favoured company effectiveness which faced management aspects of passivity disjointedly from those of investment choices.

Adhesion to the euro currency and the subsequent convergence of macroeconomic variables have seen Italy's exit from a structural context of high interest rates and sustained inflation. The subsequent reduction of interest rates, together with the rise in share trends, has had an impact on the increase of the savings content of insurance products and has drawn attention to financial sustainability of the commitments undertaken with the insured over time. As a result, greater attention has been directed to the financial aspects of management both by the companies and by European regulators.

On their side, companies have gradually addressed investments with higher risks. They have also targeted a more dynamic management of bond investments in relation to the trend of interest rates and to the offer of new products whose investment risk has been transferred to the insured and whose activities are characterized, in counterpart, by a marked foreign share component[17]. From 1997, life companies have progressively increased the quota of assets to cover the reserves provided by fixed-rate bonds, with a trend in extending the terms of expiry. For the first time during 1999, some companies resorted to structured bonds with a long duration, a minimal guaranteed profit and profits based on the trend of long-term *swap* rates. The purpose was to immunize the risks of the minimal rate recurring in the revaluable policies already issued. At the same time, there was an increase in the offer of insurance tools in which the risk due to the trend of market variables was covered by financial tools of investment which replicate the trend of the offered profits on the *index linked*, or transfer the financial risk entirely to the insured person, as in the case of *unit linked* policies. Due to all these elements, companies

[15] Even if the length of the temporal horizon which usually characterized such contracts implies a rate risk which is difficult to eliminate.
[16] The revaluable policies – life product mostly sold from the mid-eighties- have almost completely assured a minimal profit for insurance companies and participation in financial management results.
[17] Innovations such as the index of premiums and of insurance capitals or profit partecipation can be certainly interpreted as attempts to acknowledge the insured with the advantages deriving from profit oscillation, but also as a way of transferring to them part of the rate risk which burdens the insurers.

have devoted an ever-increasing attention to such problems both in terms of a more careful management of assets covering the technical reserves and of the structuring of new insurance products. What probably still does not emerge clearly in the insurance operators' acquired awareness is the strict link currently existing between the building of rates, mechanisms of valorization of the saving component inherent in the life policy, and the financial management of the covering assets (Manghetti, 2000b).

Even from the control Authorities' point of view, there has been a remarkable increase in the attention devoted to the financial aspects of company management both at national level and within the European community. Beside the risks related to a more strictly statistical-demographic nature, financial ones connected to the credit risk but, above all, to the so-called market risks, have progressively become important. The latter refer to the probability of losses due to unfavourable trends of financial variables, caused by movements in interest rates and in exchange rates and by variations in share trends. The risk of interest which is taken into account when rates are formed, therefore, needs subsequent controls during the evaluation of reserves. This regards the financial sustainability of the commitments assumed over time and is considered in the light of possible changes in economic variables and in the structure of rates (Manghetti, 2000a).

4 – The progressive achievement of Asset/Liability Management for interest risk management

The insurance profession has always (and rightly) given prominence to the typical activity component: the frequency and the entity of the event. This has taken place in a static context, as the one resulting from the formulation of accounting deriving from budget description of reserves and investments set for their covering. However, such description does not provide useful information on the risks deriving from the effects of the evolution of financial variables, according to the temporal dimension of assets and liabilities. In the current market situation, it is not a matter of rejecting this approach as much as seeking the opportunity for insurers to become aware of the fact that it is necessary to also have indications about the evolution of the different budget components according to the various financial scenarios. This serves the purpose of highlighting decreases or increases in the company's net value, which are not due to the typical insurance activity, but are generated by the expiry structure of the flows of different budget items. It is not sufficient, in fact, that the value of reserves is correctly estimated and that there is an investment of equal amount in counterpart: interest rate variations and share trends can change the effective value of assets and of liabilities[18].

[18] It could occur, for example, that when liabilities expire, the realisation of assets with longer expiry terms create significant oscillations in their market value: or else at the expiry of a single asset, reinvestment conditions do not allow to reach a sum of cash flows in the same time assured by liabilities of longer duration. In the Vigilance Authority's view, a similar circumstance would make guarantees for the insured void, even though within an apparently respected and disciplined context. On the other hand, in the

As for every other financial intermediary, insurers are exposed to risks deriving from their assets and from their liabilities and from the relations elapsing between them. Nevertheless, the *mismatching* management between assets and liabilities is a much more arduous task for them as their passivities often reveal uncertain profiles and frequently include mechanisms of guaranteed result. Therefore, possible deficiencies of resources employed to face commitments are reflected in the company's net value and in its solvency[19]. In a similar context, a valid support for estimating and managing risk exposures in a systematic and efficient way could be given by the *Asset/Liability Management* (ALM), a global approach to portfolio management which enables the realization of a better harmonization of the technical portfolio and the financial portfolio (Swiss-Re, 1995; Selleri, 1993)[20]. This is of greater evidence in a field, such as the insurance one, in which the financial and investment activity realised by the company strongly penetrates the proper technical activity.

ALM is a complex approach that has its origin in the United States in the '70s. Created as a tool with strictly operating purposes due to the urge of facing the phenomena deriving from a financial context at high risk, it is, subsequently, adopted during planning (therefore with a strategic function) and during budget definition.

Operating ALM can be defined as a management technique with the objective of arranging a set of optimal and co-ordinated budget assets and liabilities which enables to jointly pursue financial and economic balances, overcoming the strictly-speaking reductive formulation of financial management. In fact, while the latter essentially pursues a financial objective and, in relation to it, the economic component only has a tie value, the operating ALM firstly emphasizes an objective of profit, pursued by defining an optimal combination of sources/uses under the aspect of expiry structure and/or revision of price conditions. It substantially regards the management of budget bulks and of the qualitative budget composition according to specific expectations in the variation of rate conditions applied to the various items, assuring in any case a condition of liquidity. It follows that the economic and financial balances are jointly respected, while in the strict financial management greater emphasis is placed on the financial balance.

The decisions made by operating ALM find support in quantitative indicators which can be identified in the *gap* and in the *duration* and their realisation presupposes the use of instruments beyond the balance (such as *future*, options, *swap*) and/or the ability to

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sharers' view, there would be significant changes in the company's net value, as a result of the fact that flows generated over time by assets do not coincide with the outcomes deriving from contractual commitments o redemptions.

19 Enlightening in this regard are the experiences of life companies in USA in the 80s and, more recently, those of Japanese companies, indicating situations of crisis which can generate in contexts of high fluctuation of interest rates, above all, in the case of their dramatic fall.

20 The first author who faced the ALM's thematics in insurance companies was Redington. Cfr. Redington F.M. (1952).

affect budget items in terms of bulks and composition of assets and liabilities which are sensible to interest rate variations[21].

Here, it is worth revising some definitions in order to fully understand the meaning attributed to ALM which is considered as (Campana, 1987; Giudice, 1995):

- a management model which directly derives from the expiry structure of budget assets and liabilities;
- a process of planning, implementation and control of adequacy in terms of composition and expiry of assets and liabilities in order to maximize the interest net margin over time;
- a process of management of the budget structure which aims at maximizing profit compatibly with risk preferences which are considered bearable;
- a set of procedures, techniques and tools employed to identify the efficient border of possible risk/profit combinations with the aim of maximizing economic *performance* (Society of Actuaries, 1988)[22].

The reviewed definitions allow us to identify two contrasting objectives pursued by ALM: 1) minimization of interest rate risk by means of balanced expiry structures of assets and liabilities; 2) maximization of the margin of interest by means of an active and differentiated management of asset and liability expiry in order to draw advantage from market rate fluctuations. The choice between the two alternative objectives is conditioned by: a) the ability/possibility of carrying out reliable expectations on interest rate trends; b) the existence, accessibility and cost of markets which are specialized in the production of tools covering rate risk; c) the subject's inclination to risk.

If the company does not have the ability to foresee future dynamics of market interest rates with sufficient reliability, it is possible that it directs its management towards precaution and maintains a high dislike for risk, aiming at the uttermost protection of the interest margin from rate risks, by minimizing exposure to such risk. Theoretically, an insurer should be able to eliminate interest rate risk to which his/her company or part of its assets is exposed by perfectly aligning the assets and the liabilities whose *cash flow* are identical (*dedication*)[23].

Although dedication allows the elimination of interest rate risk, it may not be feasible for various reasons. One of the main impediments is given by the relative uncertainty when liabilities are presented: people insured in the life branch and profit benefi-

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[21] For a in-depth analysis on ALM see Babbel D.F. (1995); Babbel D.F., and Striker R. (1987); Corvino (1998); Smink M., and Van Der Meer R.A.H. (1997); Van Der Meer R., and Smink M. (1993); Wise A. J. (1984a); Wise A.J. (1984b)

[22] A useful definition is provided by the Society of Actuaries according to which: "ALM consists in the management of an activity in such a way that decisions regarding assets and liabilities are coordinated; it can be defined as the continuous process of formulating, implementing, monitoring and reviewing strategies related to assets and liabilities in the attempt to reach financial objectives for a specific set of tolerances to risks and restrictions (...) ALM is of decisive importance for the efficient financial management of every institution which operates investments to face liabilities".

[23] For example, a bond portfolio from the Treasury could be brought with expiry on the exact dates in which commitments assumed need to be faced. See Moro O. (1997); Vincenzini M., and Ziantoni G. (1999).

ciaries can, in fact, use the various options available at anytime and this can modify the trend of the future *cash flow*. Moreover, variations in exogenous factors, such as mortality rates, are a further source of uncertainty as far as expiries and entities of future payments are concerned. For companies working in damage branches, uncertainties appear even greater, since variations in the level of *underwriting* performance, in legislation on liability matters and in welfare costs can remarkably influence the *cash flow*. Without mentioning catastrophic insurers for whom setting aside sufficient capital to perfectly balance all potential losses would have forbidden costs. Even in situations in which it is possible to perfectly align *cash flows* of assets and of liabilities, it could appear to be too restrictive: the insurer who always pursues a precise balance of cash flows of assets and of liabilities may end up accepting profits on lower shares compared to what could be obtained if s/he were willing, instead, to face a slight discrepancy (Swiss-Re, 2000; IRSA, 2000).

If on the other hand, the company is able to formulate sufficiently reliable expectations on market rate trends and has a certain inclination towards risk, it could pursue an objective of maximization of the interest margin, attempting to draw advantages deriving from the variations expected from the interest rates. In this case, it should be in the condition to profitably manage the imbalance of the expiry structure of the assets and the liabilities in order to expose the interest margin in a favourable way to the variability of market rates (Carbonaro, 1993; Mottura, 1991)[24].

In sum, by choosing expiries according to rates, ALM produces economic effects (on the interest margin) and financial effects (influencing the sequence of cash flows) at the same time. For this reason, it acts as the hinge between the financial aspect and the economic aspect of management and offers a model for a unitary administration of the economic balance and of the financial one. The formulations and the choices of expiry structures of the assets and liabilities make it possible to draw expectations related to both economic flows and to financial ones. Therefore, it is not incorrect to claim that ALM has a content which is substantially pre-ordered to company effectiveness planning, even if it is constantly oriented towards planning the adaptation of asset and liability expiry to the contingent expectations of market rate variations (Mottura, 1991). This explains how ALM should be placed within the function of planning and management control, since an articulated analysis of relevant company phenomena, which are stimulated and produced by it, offers powerful possibilities of support, not only for the process of budget formation and control, but also for the development of the institutional role of coordination and trend which is usually attributed to such a company function (Balossino, 1992).

[24] This means that when expectations in interest rate rise, it is preferable to shorten asset expiry (therefore, investing in short-term) compared to that of liability; on the contrary, in case of expectations of falling rates, it will be more advantageous to extend asset expiry (thus, investing in long-term) compared to those of liabilities.

5 – Conclusions

The increase in competitive pressure, that springs from the new normative and competitive frame in which companies currently operate, assures us that we are witnessing a scenario where the financial area takes on a prominent role and, thus, which differs from that depicted in the '80s and '90s. In this context, it is worth questioning whether it still makes sense to continue operating according to a short-sighted logic which has always characterized the management of our companies. Following this view, there has been a realization of disjointed policies regarding risk assumptions and those concerning investments. Perhaps, in terms of company culture, it is time to understand a new and important management variable which neither replaces nor innovates the variables used until now, but which simply integrates those retained traditionally essential by management. In this way, it is possible to achieve the required synthesis between the technical component and the financial one in management and to realise a decisive process targeted to the creation of company value and to the stabilization of profit margins over time[25].

Currently more than ever, the realization of new products, the determination of rates, business policies, ought to take into account the sustainability of assumed commitments over time, verifying their consistency with the investment choices made, controlling the effects of their potential development on the budget, in view of financial market trends and possible evolving scenarios. The act of completely eliminating risk and the relative uncertainty due to trends of market variables is, by no means, simple to realize. However, this does not necessarily mean giving up the fact of getting equipped with a choice of control and support tools which, by nature, imply a dynamic management of the desired levels of risk (Manghetti, 2000b)[26].

The use of ALM techniques by Italian companies does not currently have a widespread diffusion. Even in those contexts in which simulation models are used to plan and program financial decisions and, therefore, a use of concepts such as *duration* is made, prevailing attention appears to be placed essentially on assets, that is, on problems related to income flow expectations and to the most profitable way to employ them. On the other hand, no particular attention is paid to *liability* and to those problems related to the correlation of their expiry with those of the assets in order to avoid the possible negative exposure to interest risk. However, a precise willingness to apply ALM techniques, which opens the gates to a hopefully wider application in the near fu-

[25] A management policy which pays attention to the stabilization of the economic margin is, amongst else, an essential element for the valorization of the insurance company market, contributing to the reduction of the risk premium on its shares and making the companies' possible resort to the capital market less burdening.
[26] We would face a curious paradox if we had to admit that insurance companies which, due to their natural vocation, manage risks deriving from hazardous events, are not able to manage risks connected to the complex structure of their budget.

ture, is recognizable in the area of the management of pension funds (Detemple et al., 2007)[27].

The major impediment to the spread of ALM seems to lie in the way of thinking which still predominates among many insurers who remain in their watertight compartments and who separately make their decisions related to investments and those related to *underwriting* (Lord G., 2004). It will still probably take a number of years before ALM becomes a consolidated realty in Italian insurance companies. Its use will demand these companies to make a considerable cultural leap, considering the context in which they have been forced to operate for a long time and the "local" vocation which most of them have. At present, it is understandable how the need to acquire such a managerial technique is mostly perceived by bigger and more complex bodies as well as by those which are characterized by a marked international orientation, in which it is possible to find a greater sensibility towards those managerial changes which become indispensable when following market and environmental conditions of change.

The ALM approach have been implemented in different sectors and in different countries, but the Italian insurance sector shows a delay in acknowledging this approach; for this reason, future research opportunities open: 1) to verify the ALM application in real cases; 2) to compare the ALM applications in different, more advanced contexts.

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[27] On the applications of ALM's techniques within italian companies, see Vallisneri G. (1998); Moro O. (1997); A.A.V.V. (1998).

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