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Measurement of Life Insurance: Theory and Practice

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The views expressed in this paper are those of the authors and do not necessarily reflect those of Statistics Netherlands

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1. Introduction

1. Western developed economies are nowadays more and more confronted with an ageing society. The same is true for Asian countries such as Japan. A baby boom after World War II, growing economic prosperity, secularisation and decreasing family seize, and improved medical care have resulted in an unprecedented change in age structure of Western population. Demographic forecasts show a dramatic increase in the years to come. For example, in the Netherlands, the maximum share of senior citizens will be reached in 2040 with a share of 23 % of total population.

2. At the same time, providing for the elderly population has very much changed. Not that long ago, it was considered normal practice that children maintain their parents, both socially and financially. Nowadays, this has been fully institutionalised. In our affluent society, people who cannot live independently anymore are taken care of in homes for the elderly and nursing homes. From a financial perspective, starting in the sixties with minimum pensions provided by government as part of social security, it has now become common practice to build up extended pension rights as part of wage contracts. Self-employed and other people without collective pension arrangements in general take responsibility for their future financial position by purchasing individual life insurance contracts. This results in the well known three-pillar-system of pension arrangements.

3. Usually, pensions provided by government as part of the social security system are financed on a pay-as-you-go basis: today's benefits are financed from today's taxes and premiums. The growing share of people aged 65 and older, in combination with a decreasing share of people between 15 and 65 years of age, has raised questions about the financial sustainability of the present system. Nowadays, it sometimes seems that political awareness about sustainable economic growth is more related to the financing of future pensions than to environmental pollution and depletion of mineral resources. In order to increase the financial basis for the future burden of the ageing society, there is a strong call for innovation and flexibility to increase future labour productivity (see e.g. European Commission, 2000).

4. In addition to worries about government finance, there is also increasing awareness of shareholders, business analysts and standard setters of business accounting about future pension obligations of enterprises. Until a few years ago, financing of these obligations seemed to be rather unproblematic due to a continuous value growth of funds set aside for future pensions. Significant holding gains on shares even gave rise to one-off payments in the order of hundreds of million euros from the pension schemes to the sponsoring enterprises. The recent crisis in the stock markets, however, resulted in significant underfunding of the pension obligations showing the vulnerability of the system. As such underfunding may have serious repercussions for the net worth of an enterprise, the financial sustainability of enterprises is questioned.

5. In the Netherlands pension schemes are very much institutionalised. Special independent funds have to be created for the handling of pension schemes. Since the seventies, these pension funds have invested more and more in shares. In 1995 the percentage of funds invested in shares was equal to 23 %. In 2000 it had grown to a total of 48 %. As compared to Dutch Gross Domestic Product (GDP), pension funds had invested 53 % in shares. Due to a worldwide decline in stock markets in 2001 and 2002, available funds as compared to future pension obligations

decreased from 141 % in 2000 to 108 % at the end of 2002. Several pension funds were confronted with serious underfunding. As a consequence, the Pension and Insurance Chamber, the watchdog (prudential supervisor) of Dutch insurance corporations and pension funds, called for measures to improve the financial situation. Premiums to be paid by employers and employees were increased and future pension benefits were renegotiated. For e.g. civil servants, the pension benefits were changed from 70% of the end-wage to 70% of the average wages earned during lifetime.

6. The growing importance of pensions and other life insurance also raised questions whether or not this type of insurance was properly accounted for in business accounting. The urgency of answering these questions significantly increased as a consequence of the above-mentioned problems. Voices were raised for a more transparent recording. Here, the main question relates to the recognition of pension obligations in the records of the relevant company. What should be the criteria for recognising such obligations? Should, in addition to legal obligations, constructive liabilities be recognised as well? How to deal with cases of underfunding or overfunding of institutionally separate pension schemes in the accounts of the sponsoring employer? What should be the main valuation principles for the pension obligations and related transactions?

7. The same questions were raised in view of the registration in the system of national accounts, and it has been decided to include these issues in the discussions about the update of the System of National Accounts (SNA) 1993 to be finalised in the year 2008. In addition, however, the SNA will have to deal with an issue quite specific to national accounting, i.e. the valuation and measurement of output and value added of life insurance. In the present SNA, output is measured according to the following algorithm: actual premiums *plus* premium supplements (= property income attributed to insurance policy holders) *minus* benefits paid *minus* changes in life insurance and pension fund reserves. Each of these items has to be recorded excluding holding gains and losses. However, as stated before, pension funds and other life insurance corporations nowadays invest a significant part of available funds in shares giving rise to more volatile holding gains and losses. Especially in the case of defined benefit schemes [1], the output algorithm gives rise to very volatile and, in some years, even negative results that are highly implausible from an economic point of view. This in turn raises questions about the productive activities of pension funds and life insurance corporations: what is their economic role, how to define and measure the relevant output and value added of these units?

8. In this paper, we will mainly deal with questions related to the preferred recording of life insurance (including pension funds) in the system of national accounts. In section 2, we will start with a short introduction to the present treatment of life insurance in the 1993 SNA, including a summary of the main practical as well as conceptual problems related to this treatment: the measurement of output and the delineation of life insurance obligations. Subsequently, in section 3, we will draw attention to the role and position of life insurance as perceived by the relevant actors. Doing so, we will primarily focus on the services provided by the insurers: how do pension funds and other life insurance corporations calculate reimbursements for costs and profits related to life insurance activities? Here too, proposals for changes in the 1993 SNA will be made regarding the calculation of output. In section 4, the (non-)recognition of pension liabilities will be discussed in more detail.

[1] A defined benefit scheme is a pension scheme in which the future benefits are not directly linked to the premiums (or contributions) paid *plus* the income earned on the investment of prepaid premiums. In this case, the future benefits usually are related to wages.

9. This paper almost exclusively deals with the registration of life insurance transactions in the core system of national accounts. Recent policy questions, however, ask for a more elaborate system of data related to the problems of an ageing society. To meet these user demands, Statistics Netherlands has recently decided to put more emphasis on the development of such a systematic overview. In section 5, we will shortly discuss the main areas of research on this topic. Section 6 finalises this paper with conclusions and suggestions for further investigations.

10. It should be noted up front that this paper heavily draws upon the excellent work of the Electronic Discussion Group (EDG) on Pensions. This discussion group was set up in view of the future update of the 1993 SNA. Without ignoring the intellectual input and work by others, we would like to especially acknowledge the extensive labour and great ideas of Anne Harrison, Francois Lequiller and, last but certainly not least, the moderator of the EDG, Philippe de Rougemont. Furthermore, the input from the papers and discussions in the Organisation for Economic Co-operation and Development (OECD) Task Force on the measurement of financial services, moderated by Ruth Meier and Paul Schreyer, should be mentioned here. Without the input by all these people, this paper could not have been written.

2. The treatment of life insurance in the 1993 SNA

11. In this section, attention will be paid to the treatment of life insurance (including pension funds) according to the SNA 1993. For an extensive discussion of the international guidelines, reference is made to annex IV of the 1993 SNA; also Harrison (2003) provides an excellent overview of the presently recommended recording of life insurance transactions. Furthermore, we will briefly mention the main theoretical and practical problems in relation to the application of the present SNA-guidelines.

12. Leaving aside social security schemes run by government for the population at large, life insurance can be subdivided into social insurance schemes and individual life insurance schemes. Whereas the latter insurance policies are purchased by members of households on their own initiative on an individual basis, social insurance involves schemes "where the policyholder is obliged or encouraged to insure against certain contingencies by the intervention of a third party" (SNA 1993, annex IV, para. 5). In the case of life insurance, this usually relates to pension schemes operated by employers (including government as an employer) on behalf of their employees.

13. The main difference in treatment between individual life insurance policies and (autonomous) pension schemes concerns the recording of premiums and benefits. In the latter case, premiums (including premium supplements) and benefits are also recorded as income transfers, in addition to the recording as financial transactions (i.e. as a form of saving). To adjust for this dual recording, an adjustment item has to be included in the use of disposable income account. Such a registration as income transfers reflects the element of solidarity often included in these schemes (see subsection 3.1). It also takes account of the point of view of households in which pension premiums are often looked upon as a current outlay and benefits as a type of income.

14. In the case of social insurance pension schemes, schemes may be arranged with an insurance corporation or they may be managed by the employing unit. In the latter case, the scheme may be funded or unfunded. An unfunded scheme "is one where there are no identifiable reserves assigned for the payments of benefits. In such cases, benefits are paid from the receipts of contributions with any surplus or deficit going into, or being drawn from, the scheme

manager's other resources" (SNA 1993, annex IV, para. 11). Funded schemes managed by the employing unit "are divided into those that are autonomous, that is they constitute separate institutional units operating on their own behalf, … and those where the funds are segregated from the rest of the employers' own funds but are not autonomous" (SNA 1993, annex IV, para. 12).

15. For unfunded and non-autonomous (funded) schemes, no output is recorded in the system of national accounts. In the case of pension schemes run by insurance corporations or by autonomous pension funds, output is set equal to actual premiums earned *plus* imputed premium supplements *less* benefits due *less* increases (*plus* decreases) in pension reserves (SNA 1993, annex IV, para. 18). In this algorithm, imputed premium supplements represent property income received from the investment of technical provisions set aside for the future payments of pension benefits. As the policyholder effectively is to be considered as the owner or holder of the pension reserves, property income earned on these provisions is first distributed to the policyholder and subsequently paid back as part of premiums. Furthermore, it is noted that each of the items of the algorithm is to be recorded excluding holding gains and losses. For individual life insurance, the output algorithm is basically the same as the one for pension schemes run by insurance corporations and autonomous pension funds. A major difference between unfunded and funded schemes is that in the former case no pension liabilities are recognised.

16. The above guidelines give rise to some theoretical and practical concerns. Two issues concern the calculation of output for life insurance in the system of national accounts. The first one relates to the inclusion or exclusion of property income from own funds, both in case of social insurance schemes and in case of individual life insurance schemes. The output algorithm according to the present international guidelines explicitly excludes this property income from own funds (SNA 1993, annex IV, para. 16); only property income earned on the investment of the relevant life insurance provisions and attributed to the policyholders is to be taken into account. The other issue relates to the exclusion of holding gains and losses. As a consequence of this exclusion, especially for defined benefit schemes, the present output algorithm gives rise to highly volatile and/or negative results that, from an economic point of view, are (nearly) unexplainable[2].

17. Furthermore, the non-recognition of pension liabilities in the case of unfunded schemes is seriously challenged. And indeed, one can question the suitability of recognising liabilities on the basis of the availability of specific assets to finance the future payments. Related to this issue is the discussion on the recording of under- and overfunding in the case of defined benefit pension schemes. In the case of underfunding (overfunding), assets available for the payment of future pension benefits are lower (higher) than the actuarial pension reserves or provisions. Here, one can question whether or not this underfunding (overfunding) should be recorded as a liability (asset) of the sponsoring unit, i.e. the employer. This issue is not only relevant for national accounting, but also, or perhaps even more so, for business accounting. Company accounts should properly reflect the financial health of the company. And non-recording or under-recording of pension obligations may seriously hamper a proper evaluation of the financial situation.

18. In the following sections, the above issues will be discussed more extensively. First, section 3 deals with the measurement of output. Subsequently, in section 4, attention will be paid to the (non-)recognition of pension liabilities and the recording of under- and overfunding.

[2] See Roymans (2004) for a discussion of the output of defined benefit pension schemes in the Netherlands.

3. Definition and measurement of productive activities by pension funds and other life insurers

3.1. The role of insurance in the economy

19. In this subsection, we will first focus on the role that insurance in general, and life insurance in particular, plays in the economy, starting with the customer, i.e. the policyholder. We try to identify the services that insurers provide and that constitute the macro-economic output and consumption of respectively the insurer and the customer.

20. Customers of life insurance services are always households, never companies. The insurers provide protection against the financial consequences of risks. The reason the customer wants to pay for this service is the customer's risk aversion. This risk aversion stems from the assumed concavity [3] of the individual's utility function. From the concavity of this continuously increasing function, it follows that a fixed increase of consumption is more valued in a state of lower consumption than in a state of higher consumption. As a consequence, an individual is willing to pay in good times for an asset that pays out in bad times. In other words: an individual strives for smoothing of consumption over time in order to maximise its utility.

21. Consumption smoothing can be done in two ways: over time and between individuals [4]. Smoothing consumption over time is achieved by saving in good times and dissaving in bad times. Smoothing consumption between individuals is achieved by risk pooling, i.e. the sharing of risks between individuals. Pooling can only be done with non-systematic, independent risks. The insurer acts as an intermediary between the individual pool members. Through pooling each individual pool member receives an expected (statistical) welfare gain. This is why consumers buy insurance services and are willing to pay a service charge for it. Seen from the point of view of the insurer, pooling is the way insurers diversify away their risks. By diversifying risks, losses do not disappear but they become more predictable.

22. The micro-economic theory of utility explains why, on the demand side, consumers are willing to pay a surcharge for insurance services. It does not explain why, on the supply side, the insurers (in fact their shareholders) demand a profit for taking on insurance risks. These risks could in theory be completely diversified away and therefore would not demand an extra return in a perfect market. Only the part of the shareholder's capital that is invested in plant and equipment would require an appropriate return (Ward, 2002). The explanation for this puzzle lies in the extra frictional capital costs associated with the insurance business, as explained in Hancock et al., 2001. These frictional capital costs arise because of double taxation, the risk of ruin, lack of transparency and control and regulatory restrictions.

23. Pooling often involves an element of solidarity. Under the assumption that the utility function is more or less the same for all individuals, solidarity can raise the welfare of a group or a society as a whole through smoothing consumption between individuals, even though some individuals may lose utility. This is why companies and governments often support insurance schemes with a solidarity component. Although the term solidarity is sometimes used for all distribution of income, we want to adopt a narrower definition here: solidarity, in the context of

[3] Note that the fact that so many people buy insurance and at the same time play in the lottery means that their utility function cannot be concave everywhere.

[4] That is, under the assumption that the characteristics of the individuals utility function do not change much between individuals or over time.

insurance, occurs when the premium paid is higher than the actuarially fair [5] premium for some individual pool members, and lower for others. This results in an expected (statistical) redistribution of income between individuals [6]. Pooling and solidarity are hard to disentangle because the exact risk exposure of the individual is hard to determine. Also for a proper assessment of a person's benefit from a solidarity scheme the risk exposure during the whole lifetime of the person should be taken into account. For example, many life insurance contracts have a constant annual premium, while the risk exposure of the policy holder changes with age. This again is a form of consumption smoothing.

24. Non-life insurance mainly involves pooling. The insurer acts as an intermediary between the individual pool members. Life insurance (including pension schemes) mainly involves saving, although it also contains some elements of pooling. Life insurance corporations and pension funds act as investment funds on behalf of the policyholders. Pension schemes typically contain a solidarity element. In fact, in the Netherlands, where pension funds are exempted from income tax, their activities are limited by law to activities with some element of solidarity. Where premiums are determined on a free market, like for voluntary individual life insurance, solidarity in general is absent.

25. Pension funds provide for intergenerational risk sharing. Some systematic risks pension savers are exposed to, like a world wide temporary decrease in investment return, cannot be pooled with existing generations or insured on the market. They can only be pooled with future generations. Mandatory pension schemes provide for such a contract with future generations. This contract however is vulnerable to a change in politics.

26. Insurance in general can, besides positive, also have negative effects on total welfare. It gives opportunity to misuse (fraud) and could lead to a reduced effort of the insured to reduce risks (moral hazard). Another problem is adverse selection that results from information asymmetry between policyholders and insurer. Often individuals have more information about their risks than the insurer. When pool members know they pay higher than actuarially fair premiums they try to step out, whereas they are attracted when they know they pay lower than actuarially fair premiums.
Mandatory solidarity schemes can also have negative effects on the society's total welfare because they often act as a tax on labour income, thereby making labour less attractive. Insurance schemes with a strong solidarity element are often mandatory, to prevent adverse selection.

27. Pooling involves redistribution of income. Therefore, non-life insurance flows, i.e. premiums and claims, are recorded as non-financial transactions on the secondary distribution of income account. The presence of income redistribution and solidarity and is, in our opinion, one of the main arguments in favour of the dual recording of pension contributions and benefits, on both the non-financial and financial accounts. Life-insurance is considered individual saving and is therefore only registered on the financial account.

[5] If the premium paid, net of a service charge, equals the expected losses during a period, the premium is called actuarially fair.
[6] This definition of solidarity does not imply any increase in total welfare per se.

3.2. Services provided by life insurers

28. To gain more insight in the services provided by life insurers (including pension funds), it is useful to look at what a person has to do to insure himself against risks like absence of income because of retirement. In theory, pooling could be achieved by setting up a pooling arrangement with other persons. Saving can be done by buying a risk free bond with the proper time to maturity. This however demands expertise and is costly to do. That is why a person pays an insurer to do this. So, first of all, the insurer provides *administrative services and expertise*.

29. However, the insurer provides more than these basic services. It also provides services related to *risk taking and risk management*. The individual will have difficulties to find proper financial assets on the market to match his risks. For example, saving for an old age pension involves a period of sometimes more than 40 years. No bond exists on the market with the same maturity. What is more, some risks, for example the "risk" of a long life, cannot be matched with assets on the financial market. Furthermore, the financial market also introduces extra risks, for example interest rate risk. The insurance company takes over these risks. It can bear some risk because usually it holds large financial buffers. Furthermore, it can, because of its mere size, more easily diversify away risks. It can also transfer risks to other parties like re-insurers or to the financial market. The risks the insurer deliberately takes consist of the mismatch between its assets and liabilities. Matching assets and liabilities comprises the risk management of the insurer. The insurance company may, however, also introduce an extra risk to the policyholder because it can default on its obligations. Lack of transparency introduces another risk associated with insurance and pension schemes.

30. Saving by itself will not always provide a person with sufficient liquidity at the moment he needs it. This is because savings invested in the capital market can usually not be made liquid at any given time. Therefore, the *provision of liquidity* is an important service of the insurer as well. The insurer guarantees that it can at all times meet its obligations. Often the law sets minimum requirements for the insurer's solvency.

31. *Profit and investment return sharing* is another service provided by an insurance company. Because insurance policies have low risks, the customer is in general willing to receive low returns on them. However, to attract customers, insurers can pay extra return. This extra return depends on the investment performance or profit of the insurer. Insurers are able to do this because their larger ability to take risks allows them to collect the equity premium, i.e. the risk premium on the return of more risky assets like equity.

32. These different services, administrative services and expertise, risk management, liquidity provision and investment return sharing, are reflected in the way insurers often organise their business in three separate functions (Hancock et al. 2001):

- An underwriting function. This function performs the main insurance activities. It calculates the actuarial value of the liabilities, maintains relations with the policyholders, collects premiums and pays benefits.
- A treasury function. This function involves the risk management. It determines the risk profile of the investment portfolio (strategic asset allocation). It also attracts risk capital from investors and manages the own funds. The own funds are necessary to assure the insurer's solvency.
- An investment function. Given the strategic risk profile set by the treasury function, the investment function determines the actual asset portfolio. It tries to outperform the strategic benchmark return.

3.3. Measurement of output by life insurers

33. Insurers want to be compensated for their services by a service charge to cover the costs and provide a profit. The latter is a demand from the shareholders. They demand a return on their invested capital. This service charge is collected through a surcharge (loading) on the premiums. For each service provided a separate surcharge is calculated:

- For the basic administrative services in general a surcharge as a percentage of the premiums is collected. In addition, a charge for expected future administrative pay out costs is collected this way and added to the insurance technical provisions.
- Extra risks taken by the insurer are compensated for by an extra surcharge on the premiums, often calculated as a percentage of the insurance technical provisions.
- Liquidity constraints decrease the insurer's return on investment and are therefore compensated for by a premium surcharge, also often calculated as a percentage of the technical provisions.
- Excess returns on investment are transferred to policyholders less a fee of some percentage points.

In addition, insurers may produce other services than insurance services that are usually directly charged to customers, such as real estate rents and other financial services.

34. Incoming and outgoing insurance flows are typically very volatile. However, the insurer has more than one way to cope with this. As already mentioned, smoothing of financial flows is essential to the insurance business. To achieve this, insurers diversify their risks and hold large financial buffers. If necessary, the own funds too act as a reserve for unexpected losses, assuring the insurer's solvency. Results can be smoothed by returning excess profits on investments to the policyholders after realisation. Furthermore, because of the typical long-term character of life insurance contracts, flows can easily be allocated to a different period than the one they occur in. This provides a lot of flexibility because allocation to a period can be done according to the performance in that period:

- Future outgoing flows, like costs, that are covered by present income can be allocated to the current accounting period by adding them to specific reserves. Because these are expected flows the insurer has considerable flexibility in determining the necessary reserves. For example, claims can be smoothed by keeping special equalisation reserves.
- Present costs that are covered by future income can be activated in the form of a fictional asset and written down in later periods. This is often done for acquisition costs. These deferred acquisition costs are sometimes recorded as a negative part of the insurance technical provisions.
- The moment of recording realised or unrealised holding gains or losses on investments in the profit and loss account can in many countries be chosen with a considerable degree of freedom.

Although all these accounting practices smooth profits in the insurance business, they also decrease transparency. They make it hard, also for statisticians, to determine the level of output and profit for a given period. Therefore, modern accounting standards like the International Accounting Standards (IAS) currently under revision tend more and more towards fair value accounting and immediate recognition of flows.

35. The insurance premiums are in general determined beforehand (prospectively) depending on the expected flows and desired profit. This process is called rate-making. The total premiums in a period are the sum of the actuarial (risk) premiums, a premium surcharge and a possible extra premium that can be either positive or negative (discount):

(1) $$\text{Premiums}_{\text{ex ante}} = \text{Premiums}_{\text{actuarial}} + \text{Premiums}_{\text{surcharge}} + \text{Premiums}_{\text{extra}}$$

This extra premium surcharge can be necessary when the size of the own funds is too low to meet solvency requirements. It can also take the form of premium discounts [7], which can be given when past investment income, past performance or the size of the own funds or reserves allow this.

36. The actuarial premiums are the minimum premiums necessary to support the insurance liabilities during the period. They are determined beforehand given the expected claims, the expected change in liabilities and the expected investment income available to the underwriting business:

(2) $$\text{Premiums}_{\text{actuarial}} = \text{Claims}_{\text{expected}} + \text{Change in insurance liabilities}_{\text{expected}} - \text{Investment income (available)}_{\text{expected}}$$

Only those flows are to be taken into account that stem from operating the insurance business during the period under consideration. The insurance liabilities equal the discounted values of the expected future claims. They are discounted using an actuarial interest rate. When the actuarial interest is lower than the expected investment income, a lower actuarial premium results. Note that in this definition of actuarial premiums, the difference between investment income and actuarial interest paid on the insurance liabilities, which is a resource for the insurer, is incorporated in the premium surcharge.

37. The premium surcharge has to cover the expected operating costs and the desired profit of the underwriting function. Operating costs typically include intermediate consumption, compensation of employees and consumption of fixed capital. It can be written as:

(3) $$\text{Premiums}_{\text{surcharge}} = \text{Costs}_{\text{expected}} + \text{Change in provisions for future costs}_{\text{expected}} + \text{Profit}_{\text{expected}}$$

In our opinion, this premiums surcharge equals the service charge and therefore corresponds best with the macro-economic concept of output. One could argue against this that realised, instead of expected flows, should be registered in the national accounts. However, in this case, the premiums surcharge set beforehand is what is actually charged to and paid by the insurance policyholder, as an implicit and inseparable part of gross premiums. It remains questionable whether extra premium surcharges or discounts are to be accounted for as part of the insurance output. Discounts are a sort of profit sharing and irregular by nature. They are, however, often part of the insurance contract and as such they should be accounted for as part of the insurance service. Extra premium surcharges are meant to increase the insurer's solvency by increasing the profit and the own funds. In our opinion, these extra premiums should, in the case of commercial insurers, be registered as part of output. In the case of non-commercial insurers, a registration as part of income transfers may be preferable.

38. If we assume, for the time being, that the extra premiums are part of the output:

(4) $$\text{Output} = \text{Premiums}_{\text{surcharge}} + \text{Premiums}_{\text{extra}}$$

the output of insurance services can be written, combining equation (3) and (4), as follows:

[7] These premium discounts are to be distinguished from discounts/bonuses that are given on individual policies that have lower than average risk or lower than average operating costs.

(5) $$\text{Output} = \text{Costs}_{\text{expected}} + \text{Change in provisions for future costs}_{\text{expected}} + \text{Profit}_{\text{expected}} + \text{Premiums}_{\text{extra}}$$

Alternatively, combining equation (1), (2) and (4), this can be written as:

(6) $$\text{Output} = \text{Premiums}_{\text{ex ante}} + \text{Investment income (available)}_{\text{expected}} - \text{Claims}_{\text{expected}} - \text{Change in insurance liabilities}_{\text{expected}}$$

39. The question remains how to determine the values of the items in either equation (5) or equation (6) that have to be attributed to the insurance business. They do not need to be equal to the totals for the whole company. Here, one can distinguish two opposite points of view, corresponding to two different business models. One point of view is that, just as for ordinary manufacturing companies, all resources are used to support the production process. In that case, all investment income, including investment income derived from the investment of own funds, is to be attributed to the insurance business. Output is then simply equal to the sum of total operating costs and total profit.

40. The alternative point of view is the one usually adopted in capital allocation theories. From this point of view, an insurer is comparable to a leveraged investment fund (Hancock et al., 2001). "The leverage, however, does not result from the use of debt capital, but instead is an insurance leverage resulting from the deferred nature of the insurance liabilities" (Ferrari, 1968). This model leads to a decomposition of the company, at least in theory but often also in practice, in an underwriting and an investment function, as described in para. 32 (we consider here, for convenience, the treasury function as part of the former). Each function takes its own part in the costs, investment income and generates its own profit:

(7.a) $$\text{Profit} = \text{Profit}_{\text{underwriting}} + \text{Profit}_{\text{investment,}}$$

(7.b) $$\text{Costs} = \text{Costs}_{\text{underwriting}} + \text{Costs}_{\text{investment,}}$$

(7.c) $$\text{Investment income} = \text{Investment income}_{\text{underwriting}} + \text{Investment income}_{\text{investment}}$$

41. The profit generated by the investment function equals the total investment income received *minus* the investment income attributed to the underwriting function, and *minus* that part of the investment costs that is not charged directly to the underwriting function:

(8) $$\text{Profit}_{\text{investment}} = \text{Investment income} - \text{Investment income}_{\text{underwriting}} - \text{Costs}_{\text{investment}}$$

Therefore, combining equations (7.a) and (8), the insurer's total profit can be written as:

(9) $$\text{Profit} = \text{Profit}_{\text{underwriting}} + \text{Investment income} - \text{Investment income}_{\text{underwriting}} - \text{Costs}_{\text{investment}}$$

This profit is required by the shareholders. The minimum profit required is called the benchmark return on capital [8]. For an insurance company, it is the same as for a leveraged investment fund (Hancock et al., 2001). It equals the benchmark return receivable on the asset portfolio *minus* the

[8] In this paper, the term "capital" is used as equivalent to own funds, or, in SNA-terminology, the sum of shareholders' capital and net worth on the liability side of the balance sheet. Net worth according to the SNA is equal to the balance of all assets and all liabilities.

benchmark return payable on the insurance liabilities. The latter is in general close to the risk free return, because the insurance risks are in general completely diversifiable. The former can be lower or higher depending on the market risk of the asset portfolio. It is important to realise that the benchmark return on capital is independent from the insurance activities. It only depends on the riskiness of the assets and liabilities. The decision to invest in less or more risky assets is a strategic decision of the insurer.

42. Insurers can only outperform the benchmark return on capital by outperforming the strategic asset portfolio benchmark return or by generating profits on the underwriting activities. According to this view, part of the profits, namely the benchmark return on capital, is generated independently from the underwriting activities. This profit is not part of insurance output and is not consumed by the policyholders. If considered partly as constituting a service, it is a service provided to the shareholders.

43. In general, insurers will operate according to a business model somewhere between both extremes. The investment income available to the underwriting function is limited by the benchmark return on capital. It will in general be close to the risk free return on the insurance liabilities, but in the case of investment return sharing it can be substantially higher. One would expect that for pension funds having no shareholders and for mutual insurance companies where the policyholders are the owners, the first model will prevail.

44. As explained in the above, in our opinion, the value of output of insurance services can be set equal to the premium surcharge *plus*, in the case of commercial institutions, the extra premiums (see equation 4). And, as such, it is determined in advance, based on expectations in relation to the relevant flows. To actually measure this level of output, it is possible to apply different methods:

- It can be obtained by surveying insurers directly for the value of this surcharge. However, they will probably be reluctant to give this strategic information.
- It can be calculated by using either equation (5) or equation (6). The flows as expected by the insurers could be approximated using data from the past. However, it will be difficult to apply, as the insurers use more data and more sophisticated methods and expertise than in general is available to statisticians. The methods applied by insurance companies will also vary. Using simple moving averages of past flows can only produce crude estimates. It would take many years, especially in low-frequency, high-severity lines of insurance, to obtain reliable estimates. Rate-making is prospective; retrospective methods cannot give adequate insights in the profit margin.
- It can also be calculated using either equation (5) or (6), approximating expected flows with realised flows. This is the approach taken in the SNA 1993 where output is calculated using equation (6) [9]. The setback of this method is that, especially in the case of defined benefit schemes, (the balance of) insurance flows (is) are, by nature, volatile. This is particularly true for holding gains and losses. Realised flows cannot be more than a very crude approximation of the expected flows [10]. Calculating output as the, relatively small, balance of relatively large, volatile flows can give a result that is even more volatile. Output can even become

[9] The income available to the underwriting business is called "premium supplements" in the SNA 1993. The insurance liabilities are equal to the insurance technical provisions.

[10] Note that sometimes it is assumed that the average realised and expected flows will be equal in the long run. If risks are constant this might be the case, but in a changing world risks can be consistently overestimated or underestimated. History provides us with many examples where insurance companies or even whole lines of insurance went bankrupt because of systematic underestimation of risks.

negative! Furthermore, in the case of risk pooling, the realised claims are only a good approximation of the expected claims when the whole pool is taken into account. If the pool extends beyond the border of the national economy, as is often the case for non-life insurance, this could lead to wrong values of output (Walton, 2003). In addition, profit and investment return sharing can make realised flows differ from the expected flows.

3.4. Measuring output of life insurance in the system of national accounts

45. After having discussed how the output of life insurance services can be defined and how it can be computed, in this section, a comparison will be made with the 1993 SNA approach discussed in section 2. This comparison will lead to some recommendations for the coming update of the SNA. Three questions arise from this comparison: should expected values, instead of realised values, be used in the calculation of output, what is the role of holding gains and losses and what is the role of the investment income on own funds in the calculation of output? Attention will also be paid to the way the recording of output affects the other transactions in the system of national accounts.

46. The output value of life insurance services is equal to the premium surcharge as defined by equations (1) and (2). In an ideal situation, the premium surcharge can be surveyed directly by statisticians. In general, however, this will not be possible and the premium surcharge has to be calculated using either equation (5) or (6). The best way to do this is to use expected values for the relevant items in these equations. Using realised values, as prescribed by the present SNA, will result in estimates that are unexplainably volatile from an economic point of view. As stated before, they can even become substantially negative. Furthermore, in our opinion, it is also inconsistent with the rate-making process of insurers, in which the price of the service charged to the policyholders is set beforehand. We therefore recommend changing the SNA on this point, in agreement with the proposals of the Electronic Discussion Group (EDG) on the measurement of the production of non-life insurance (Lequiller, 2003). One possible way to estimate expected values is using long term averages. This will only produce crude estimates for the output value, but at least they will better reflect the service charge and they will be positive and relatively stable.

47. The 1993 SNA prescribes to exclude all holding gains and losses from the calculation of output. However, the rate-making process of insurers makes no such distinction between expected holding gains and other expected income. Therefore, when calculating output using equation (6), the total expected investment income available should be taken into account, including any expected holding gains and losses. Doing so, expected changes in technical provisions that are revaluations should also be taken into account [11]. We recommend changing the 1993 SNA on this point. In our opinion, the output algorithm in the present SNA is based on two approaches: the first one calculates output as the best possible estimate of the premium surcharge, and the second one calculates output as the result of (all) economic transactions realised between the insurer and the customer. Both approaches are comparable but not completely compatible.

48. It is useful in this context to make a distinction between the type of life insurance where the benefits depend solely on the premiums and the available investment income and the type where they do not. The first type more or less corresponds to defined contribution pension

[11] If a revaluation in the technical provisions is of a long term character, for example due to a change in the actuarial discount rate, and has a too large impact on the output value, it should rather be spread over many years.

schemes and linked individual life insurance, and the second type corresponds to defined benefit pension schemes and non-linked individual life insurance. For the first type of insurance there is a direct relationship between investment income earned, including holding gains and losses, and the changes in the insurance liabilities. As these are the most volatile elements in the calculation of output according to equation (6), this makes the balance of all incoming and outgoing flows, or the profits, more predictable. As a consequence, realised costs *plus* realised profits will be a good approximation of output. For the second type of insurance there is a no such direct relationship. This makes the profits realised more volatile, especially when the insurer expects to finance its obligations with holding gains. As a consequence the present SNA algorithm leads to unexplainable output values. Therefore, especially for this type of insurance, using expected instead of realised values is to be preferred.

49. For defined contribution pension schemes and linked individual life insurance schemes, an important aspect is that some holding gains and losses are not attributed to the technical provisions (insurance business) but directly to the own funds (profit). In this respect, output, value added and operating surplus may differ from the results according to the output algorithm of the 1993 SNA. However, it should be noted here that the 1993 SNA is somewhat inconclusive on this matter. The value of output depends on the distribution of holding gains/losses and other investment to respectively insurance technical provisions and own funds. Often this distribution is not known in practice and assumptions have to be made, e.g. a proportional allocation of both kinds of investment income. In addition, output may differ from the 1993 SNA, when investment income from the own funds is allocated to the insurance business.

50. Therefore the question remains how to determine the (expected) investment income available to the insurance (=underwriting) business, as it appears in equation (6). The 1993 SNA (annex IV, para. 22) prescribes to take for this item the income on the invested technical provisions. This excludes holding gains and the investment income on the funds. However, the capital allocation theory described in para. 40-42 leads to a different view. When the insurer is a privately owned commercial enterprise, the shareholders demand that, besides all the income derived from the investment of own funds, also a part of the investment income on the invested technical provisions is directly attributed to profit. This investment income should not be considered as part of insurance output; it is to be recorded as part of the balance of property income received on the distribution of primary income account. As such, total profits are not affected; only the allocation between profits derived from (insurance) output and profits from a balance of primary income transactions is affected. The investment income that remains is available to the underwriting business. It is at least equal to the risk free return on the technical provisions. It can become substantially higher when the policyholders' entitlements give reason for this, for example when the policyholders are entitled to indexation or to a share in the total investment return. In the case there are no shareholders or in the case of non-commercial institutions, like mutual companies or pension funds, all investment income is available to the insurance business. In theory, the investment income available to the insurance business is what an insurer should register on the technical profit and loss account [12]. In practice, however, insurers have a lot of freedom in doing so and the insurer's technical account may not present reliable figures. How to determine this item therefore remains a problem. We would like the revised SNA to give room for all possible measures of investment income available to the insurance business, as they follow from the different business models.

[12] In the Netherlands, insurance companies split up their profit and loss account into a technical account directly related to the insurance business, and a non-technical account.

51. The calculation of output becomes much easier in the case of autonomous pension funds that are in general, at least in the Netherlands, non-profit institutions. For these pension funds, direct data on the premium surcharge is some times available. Alternatively, equation (5) can be used. Because pension funds in general do not strive to make a profit, the output is simply equal to the expected total operating costs *plus* the expected change in the provisions for future costs. Because costs are not very volatile, expected costs can be approximated very well with realised costs. Looking at this from a different angle, one could argue that non-commercial institutions will set the ex ante premiums equal to the expected change in insurance liabilities *plus* expected claims *minus* total expected investment income *plus* a service charge to cover the expected costs. We therefore recommend changing the SNA in this respect: output for non-commercial life insurance institutions, like most autonomous pension funds, should be calculated as the sum of expected operating costs and the expected change in the provisions for future costs.

52. The EDG on pensions recommends to calculate output for non-autonomous pension funds and unfunded pension schemes too (Rougemont, 2003). This is a change to the current SNA 1993 (annex IV, para. 20 and para. 21). This output should, in our view, be calculated from the expected operating costs. We doubt, however, whether output for these schemes should be calculated at all, as in general it will be insignificant and the relevant data often will not be available.

53. By setting output equal to the expected operating costs, we neglected the extra premiums in equation (5). Because profit is assumed to be zero, these premiums cannot be part of profit and should be excluded from the calculation of output. They do, however, have an effect on the pension fund's net worth. In fact, these extra premiums are charged when the fund's net worth is insufficient to meet solvency requirements. On the other hand, premium discounts (premium holidays) are given when the fund's net worth exceeds these requirements. A possible way of recording is given by the EDG on the measurement of non-life insurance (Lequiller, 2003) and the EDG on pensions (Rougemont, 2003). When the output is calculated as being equal to the operating costs, the following identity does no longer hold:

(10) Change in net equity of households in pension funds reserves (D.8) =
Social contributions (D.61) - Social benefits (D.62)

The pension fund now exhibits savings that are the result of the extra premiums as they appear on the secondary distribution of income account, as part of social contributions D.61. So the change in net worth results from the secondary distribution of income instead of from output.

54. A remaining issue is the impact of the above proposals on the other relevant transactions and balancing items in the current accounts of the system of national accounts. Especially for defined benefit schemes, output, value added and operating surplus will differ significantly from the results according to the present SNA. The main reason for this is the implicit inclusion of expected holding gains. We therefore propose that the item "property income attributed to insurance policy holders" (D.44) equals the expected investment income available to the insurance business, including expected holding gains and losses. This assures that primary income and subsequent balancing items are not affected by holding gains. For pension funds all other differences between realised and expected flows will affect the identity of equation (10) and thus appear as income transfers in the national accounts.
A proper assessment of this issue in a revised SNA is necessary. Of course, the balancing items remain to be different from business accounting practice, mainly because (actual) holding gains and losses are not recorded as part of property income received.

4. The recording of pension liabilities

55. According to the 1993 SNA, only pension liabilities of funded schemes should be recognized as such. No entries should be recorded on the liabilities side of the balance sheet, if and when the pension entitlements are either part of an unfunded scheme operated by an employer or part of a social security scheme operated by the government. These SNA guidelines have been challenged by the EDG on pensions. Furthermore, there is discussion on the recording of underfunding (overfunding) of autonomous pension schemes which, according to the present SNA, is to be considered as a negative (positive) item included in the net worth of the relevant scheme. In this section, attention will subsequently be paid to both issues.

4.1. (Non-)recognition of pension liabilities

56. At present, there seems to be a growing consensus to recognise pension liabilities in the case of unfunded pension schemes. And indeed, there are many arguments in favour of such a recognition. In business accounting – International Accounting Standards (IAS) 19 - as well as in public sector accounting – e.g. standards set by the Public Sector Committee of the International Federation of Accountants (IFAC PSC) -, future pension obligations for employees are to be recognised as being part of constructive obligations or "obligations that derive from an enterprise's actions where (a) by an established pattern of past practice, published policies or a sufficient current statement, the enterprise has indicated to other parties that it will accept certain responsibilities; and (b) as a result, the enterprise has created a valid expectation on the part of other parties that it will discharge those responsibilities" (Rougemont, 2003).

57. Apart from the constructive character of pension obligations, one can argue that the payment of future pensions often is legally binding for the employer. Often, the contract of employment between employer and employee clearly stipulates future rights (e.g. for each year of employment, pensions are being built up) and obligations (e.g. payment of premiums by employer and employee) in relation to pensions. In our opinion, these obligations clearly fit the general definition of an asset/liability according to the 1993 SNA, according to which an economic asset "is an entity functioning as a store of value … over which ownership rights are enforced by institutional units" (SNA 1993, para. 13.12). It should be noted, here, that the 1993 SNA does not explicitly stipulate that the ownership rights should be enforceable "by law". For this reason, constructive obligations can, in our opinion, be considered as falling within the SNA-definition of assets, if and when one can reasonably assume that the obligations will be recognised in court.

58. From the perspective of the employee or household, liability recognition seems to be preferable as well, because economic behaviour in relation to consumption and saving is clearly driven by expectations regarding future pension entitlements. In absence of these expectations, households would be forced to invest more of their financial income into savings and/or individual life insurance policies to ensure future income levels.

59. Looking at the international guidelines for national accounting per se, another strong argument in favour of recognition is the clear inconsistency in treatment of pension obligations in the case of unfunded and the treatment in the case of funded schemes. There does not seem to be a logical argument for a difference in treatment. From a conceptual point of view, the recognition of a liability should not depend on the availability of assets that are explicitly allocated to the future payments of pensions. It should only depend on the ability to enforce the relevant payments, and in this respect, there usually is no (clear) difference between funded and unfunded

schemes. On practical grounds, however, the availability of separate funds may be an extra guarantee for meeting future obligations. Although also this argument does not hold if the overall solvency of the employing unit is in a bad condition. Furthermore, if and when one wants to use this argument of availability of explicitly designated funds, what does this mean for other liabilities?

60. The character of "contingency", i.e. "… one or more conditions must be fulfilled before a financial transaction takes place" (SNA 1993, para. 11.25), may be used as an argument for non-recognition of pension obligations. Indeed, from the perspective of the household, the payment of future pensions is conditional on the reaching of a certain age and on other conditions as well. However, the same holds for e.g. individual life insurance obligations that are nevertheless recognised in the system. Furthermore, although the pension entitlement may be conditional for the policyholder, this certainly is not true for the sponsor of the scheme: on average, for the total population in the scheme, the obligations are very real for the employer.

61. Whereas the arguments in favour of recognition of pension entitlements as financial assets and liabilities are very convincing, there still is room for the non-recognition of the entitlements as a whole or, what may be more often the case, for the non-recognition of part of the entitlements. Take the example of indexation of pension entitlements in the case of defined benefit schemes. The present guidelines of IAS 19 state that such indexation should be included in the estimation of pension liabilities in case it has been awarded in the latest three years. In our opinion, this condition of three years is not very convincing. Indexation may, for example, be conditional on the performance of the investment-portfolio. And the situation that pension schemes may have awarded indexation for a considerable number of years due to out-performing investments on the stock markets should not be decisive in the recognition of such rights. In our opinion, entitlements like the above example should only be recognised and included in the calculations of pension obligations, if and when there is a certain legal right on the part of the policyholder (e.g. in an employment and/or in a pension contract). One can, however, wonder whether such a distinction can actually be applied in practice. Probably not. Consequently, one will have to rely on the business accounting guidelines or go for full recognition of the obligations.

62. Of course, the above line of reasoning for unfunded pension schemes operated by employers also opens up the discussion on a further broadening of the scope of recognising pension entitlements as liabilities, in particular of recognising pension entitlements as a result of social security schemes for (large sections of the) whole community that are imposed and controlled by government. In our opinion, there are at least four arguments not to do so. Firstly, the relevant schemes are basically an instrument to redistribute income between groups of households in the same period; distribution of income and consumption over time is less dominant. Related to this is the predominant character of solidarity, and not insurance, of these schemes. As a consequence, the relationship between paid premiums and future benefits is not very strong.

63. Furthermore, social security pension schemes are first and foremost a collective agreement between government and the public at large. As such, the schemes can less properly be looked upon as a bilateral arrangement between two individual parties in which one party agrees to pay premiums in exchange of future benefits. Of course, pension schemes provided by employers are often obligatory as well; in this case, however, the persons involved always have the choice not to enter the employment contract.

64. Thirdly, government, although being a construct of society, also has the possibility to change the conditions of the scheme unilaterally. For example, due to the ageing society and the corresponding increase of the financial burden of social security pension benefits, plans are being developed, and presumably will be developed to a greater extent in the future, to decrease the level of social security benefits (e.g. for people with a higher level of income) in favour of individual arrangements. The sustainability of this system will, however, also depend on the future intergenerational solidarity; see e.g. Bovenberg (2001).

65. Finally, a full recording of social security pension liabilities will give rise to a number of (additional) imputations, e.g. the recording of an imputed interest flow. Such imputations will affect important macro-economic indicators such as government deficit and disposable income of households. One can wonder whether these changes actually better reflect the driving forces behind economic decision making in practice.

66. On the other hand, for the time being, economic behaviour of households still seems to be mainly driven by clear and undeniable expectations in relation to a certain minimum level of pension benefits to be derived from the social security system. Such behaviour calls for recognition of the relevant pension entitlements. Furthermore, the recording of a liability for unfunded schemes (including social security schemes), together with an imputed interest flow on this liability, enhances the comparability between funded and unfunded schemes. Hence, because the relative weight of both types of schemes in the pension system varies widely among countries, international comparability is enhanced as well. In doing so, the imputed interest in case of an unfunded scheme can be seen as the opportunity costs of not funding. Recognition of these opportunity costs makes unfunded schemes look less favourable compared to funded schemes and could help ease a transition from unfunded to funded schemes [13]. This is important as unfunded schemes may pose a problem in an ageing society. Especially in a country like the Netherlands this need for reform is felt. As one of the few countries in the Euro Area, the Netherlands has a pension system based predominantly on saving. The combination of an ageing society and large government controlled unfunded schemes in other countries in the Euro Area could result in higher inflation decreasing the value of pension savings. Notwithstanding the above arguments in favour of recognising pension liabilities in the case of unfunded schemes, we prefer, on balance, non-recognition of unfunded social security schemes in the core system of national accounts. In a satellite accounting framework on the ageing society, the entitlements should be taken into account; see section 5.

4.2. The ownership of the pension scheme's net assets

67. A second issue in relation to the recognition of pension liabilities concerns the recording of underfunding (overfunding) of a pension scheme as a liability (asset) of the sponsor of the relevant scheme. This issue is only relevant for defined benefit schemes run by autonomous pension funds and insurance corporations. In case of non-autonomous schemes, the deficit (surplus) of assets over pension obligations is automatically part of the financial overview of the sponsoring unit. Whereas in the case of defined contribution schemes, there is no such thing as underfunding (overfunding); pension liabilities are, by definition, equal to net premiums paid in the past *plus* investment income earned on these premiums.

[13] In itself the opportunity costs of an unfunded scheme are not reason enough to switch to funding. Funding (saving) is only wise when the return on investments is higher than the inflation. In general, ignoring the problems of ageing, a mix of both funded and unfunded schemes is to be preferred because it results in a better spreading of risks.

68. The International Accounting Standards (IAS) are very clear about this issue: they call for a liability-recognition in the accounts of the sponsor in case of underfunding. Such is needed in order to provide a fair overview of the financial situation of the sponsoring enterprise in question. Indeed, there seems to be ample reason to record such a liability in the accounts of the sponsoring unit, if and when it is unequivocally clear that the sponsor of the defined benefit scheme is responsible for covering the deficit. The IAS are also very straightforward about the definition of defined benefit and defined contribution schemes. According to IAS 19, a defined contribution scheme is a pension scheme where the sponsor pays fixed contributions into a fund but has no legal or constructive obligation to make further payments in the case the funds assets are insufficient to pay the employees benefits. A defined benefit scheme is in IAS 19 simply a pension scheme other than a defined contribution scheme.

69. The responsibility of the sponsoring employer, however, may not always be that clear cut. In the Netherlands, for example, most private pension schemes are defined benefit schemes in the sense that individual pension rights depend only on a person's salary and labour history. These private pension schemes by law have to be organised in a separate institutional unit (a non-profit institution), the council of which is constituted from representatives of the employer(s), the employees and, in some cases, the pensioners. The council has the obligation to take into account the interests of all participants and she is independent from the employer in taking decisions, including those on e.g. the way to deal with an eventual underfunding. It can change the policy of indexation and investment, change the rate of premiums, or it can ask the sponsoring employing unit to make an extra deposit. The latter, however, depends on the specific contract between the sponsor and the pension fund. Underfunding will thus, in general, not lead to an immediate obligation of the sponsor but rather to renegotiations of future benefits and premiums between all parties. Already build up pension rights, however, will remain untouched. Furthermore, in some cases, e.g. in the case of pension funds for employees of a certain industry as a whole, extra deposits by employers are not even possible. This is the reason why companies in the Netherlands want to be exempted from the rigid application of IAS 19. Although the IASB has allowed Dutch companies to deviate from IAS 19, some large accounting firms did not agree and negotiations are currently still going on.

70. The limited primary obligation of the sponsor in the Netherlands means that, for solvency reasons, a high degree of overfunding is necessary and premiums are relatively high. The prudential supervisor requires a minimum funding of 105% and a target of 130%. So, if one would want to recognise an asset in the accounts of the sponsoring employer here, it seems reasonable to recognise an asset of the sponsor only when funding exceeds 130%. This seems to be in line with the relevant UK Financial Reporting Standard (FRS) 17 stating that any overfunding of a pension fund should be registered as an asset of the sponsor only to the extent it is retrievable by the sponsor (Rougemont, 2003). Any overfunding between 100% and 130% could probably best be attributed to the fund itself and recorded in the national accounts as the fund's net worth.

71. In the above, the recognition of pension liabilities in the case of unfunded schemes and liabilities (assets) in the case of underfunding (overfunding) of defined benefit schemes has been discussed. All in all, we are in favour of recognising pension liabilities of unfunded schemes operated by employers. We do, however, have some doubts in relation to social security schemes operated by general government. It is, however, a grey area in which it may be needed to give some room to common sense in the interpretation of the actual circumstances. In relation to the recording of underfunding (overfunding) as a liability (asset) of the sponsor, we prefer to follow in the national accounts the companies' accounting practice.

72. A follow-up question in relation to the recognition of pension entitlements from schemes run by employers is the recording and valuation of premiums and premium supplements in the system of national accounts. Both Harrison (2003) and Rougemont (2003) provide a very elegant solution, at least from a theoretical point of view, for defined benefit schemes. In short, premiums are set equal to the additional pension entitlements earned in a year and premium supplements (= investment income) are set equal to the increase in the value of previously earned entitlements. The difference between on the one hand the actuarial amounts of premiums and premium supplements mentioned before, and, on the other hand, the premiums and investment income actually paid/earned, is recorded as an imputed premium paid by the employer with, as a counterpart transaction in the financial accounts, a change in the employer's liability towards the pension scheme. Doing so, also the calculation of output is rather straightforward [14], as opposed to the calculation of output for pension schemes whose underfunding (overfunding) can not be attributed to the sponsor (see para. 69).

73. A problem from the perspective of business accounting may be the high volatility of the asset/liability of the sponsoring employer due to the high volatility of investment income. Based on long-term expectations of higher returns on investments, a significant and growing part of funds is invested on the stock market. Year-by-year investment income, however, is considerably affected by holding gains and losses on these investments. As a consequence, for the relevant enterprises, the true long-term picture of economic performance may be seriously distorted by short-term movements of investment income on funds invested to ensure payments of future pension obligations. It may actually force enterprises into investing in assets with less volatile, but also less profitable, income. It is expected that, as a consequence, the IAS 19 will force companies to switch from defined benefit to defined contribution schemes (H. Schuijt, 2004).

5. User demands related to the ageing society

74. An ageing society gives rise to several, partly new, policy questions. To answer these questions, in some cases, additional statistical data are needed. In other cases, one can rely on presently available data; a rearrangement and linking with other socio-economic indicators, however, may be needed. Below, some of the main economic policy concerns and data needs in relation to an ageing society will be discussed. Doing so, we will mainly address these issues from the macro-economic point of view of national accounts.

75. One of the most important policy concerns is the financial sustainability of the ageing society. Will it be possible to uphold the present pension system? The answer to this question strongly depends on the future need for additional intergenerational income transfers. As such, a pension system on a pay-as-you-go basis is much more vulnerable than a funded system. This calls for better and more detailed data on the financing of future pensions, to start with a breakdown into the well-known three pillars: social security pensions, social insurance pensions and life insurance on an individual basis. Such information can usually already be derived from the system of national accounts. An additional breakdown into defined contribution schemes and defined benefit schemes, and, in the latter case, the availability of earmarked funds to finance future obligations (including the percentage of underfunding or overfunding), is a logical step forward.

[14] For a more extensive discussion, reference is made to the relevant papers.

76. Another question in relation to financial sustainability is the sustainability of government finance and the implied intergenerational income transfers. This does not only relate to the financing of social security pensions and pensions provided by government as an employer. Other income and outlay of government is also depending on the age-structure of the society. Obvious examples are healthcare, homes for the elderly, public transport and, on the opposite side, education and child care. The same holds for several taxes and premiums. For this reason, a breakdown of government transactions into age categories may provide very useful insights into future income and outlay of government.

77. Of course, changes in demography of the population directly affect future labour markets. The growing imbalance between the diminishing (potential) labour force and the total population may have a serious impact on the income basis for the collection of taxes and premiums and, again, the need for increased intergenerational income transfers. Furthermore, changing patterns of consumption may increase/decrease demand for certain types of labour. For the time being, economic policy, at least in the Netherlands, seems to be mainly concerned with increasing labour participation of women and the elder age groups in the labour force. In addition, on a European level, a policy oriented at increasing the innovative capacity of the economy to give a boost to (labour) productivity has gained much ground. These policy questions ask for more information on the labour market, in particular on labour participation by age and sex, and on supply of specific types of labour relevant for the expected changes in consumption patterns. In addition, information should be added on reasons for (not) entering the labour market, e.g. family situation, child care, taxation policy, etc. One could even go further by looking at policies to change demographic trends, e.g. fertility and immigration.

78. The above policy issues do affect households differently. A breakdown of the households sector into different socio-economic groups, in particular a distinction into age, kind and level of income, seems to be highly relevant for the provision of additional information on e.g. labour market participation, consumption patterns and future income position. To gain further insight into the latter, more information on the future income from pensions and individual life insurance, given the present status and welfare level, subdivided by kind of scheme, would be welcome. Actually, such information may be available from the records of pension funds and insurance corporations. The future income position is also affected by the availability of assets such as personal savings and a house, and by the presence of liabilities. For this purpose, a complete overview of the wealth of different household groups should be compiled. Finally, more detailed statistics on consumption patterns by age groups may provide useful information on future needs.

79. As stated in the introduction, Statistics Netherlands has recently decided to put more emphasis on the development of more systematic and detailed information to address the policy issues in relation to the ageing society. A small project team has started in the beginning of this year to look into the user demands and into the feasibility to meet these demands in the short term and in the long term. One of the goals in the near future is the development and compilation of a satellite account linked to the system of national accounts.

6. Summary and conclusions

80. From a macro-economic point of view, the ageing society in European countries has raised policy questions about the financial sustainability of economic developments in general, and government financing in particular. What about future intergenerational solidarity? Are future generations able and willing to finance the increasing financial burden of a growing population of elderly people? May we expect them to do this or should we take care of “our own business”?

Furthermore, on a micro-economic level, questions are raised about the soundness of financial reporting of companies, not properly reflecting the future obligations arising from the benefits to be paid for retired employees. Here, international accounting standards are more and more aware of the importance of additional guidelines.

81. The above concerns also raise questions in relation to the adequacy of the international guidelines for national accounts, the 1993 SNA and the 1995 ESA. In fact, recent examples of discussions within the European Union on the recording of pensions in relation to government deficit show the inadequacy of present guidelines (see e.g. Eurostat, 2004). In addition, the unconditional application of the present algorithm for the measurement of insurance output gives highly unsatisfactory results. As a consequence of the increasing importance of investments in shares and the associated holding gains and losses, e.g. output of life insurance becomes very volatile and, in some but not exceptional cases, even negative.

82. In this paper, we have tried to discuss some of the issues related to the recording of life insurance (including pension schemes). Doing so, we have first drawn attention to the role and function of life insurance in the economy. Subsequently, we have discussed the perception of the relevant corporations and institutions: how do life insurers look at their own business, how do they set their "prices", etc.? From this discussion we derived some recommendations for the coming revision of the SNA 1993. Regarding the measurement of the output value of insurance services:

- We recommend to calculate output using either equation (5) or (6) using expected values.
- We recommend that expected values for profit, available investment income and the change in the technical provisions should include expected holding gains and losses and other revaluations.
- We recommend to calculate output for non-commercial life insurance institutions, like autonomous pension funds, as the sum of expected operating costs and the expected change in the provisions for future costs.
- We recommend to take into account the different business models as described in para. 39-43 in determining the investment income available to the insurance business. This means that in the case of insurance companies owned by shareholders the investment income available to the insurance business excludes the investment income on the invested own funds.
- We recommend that the revised SNA describes how a revised calculation of output should affect the other relevant transactions in the national accounts.

83. In relation to the recognition of pension obligations, we are clearly in favour of recognising all liabilities of pension schemes operated by employers, whether or not they are funded. From a conceptual point of view, the recognition should depend on the ability to enforce the relevant entitlements, not on the availability of earmarked funds. Furthermore, in line with the International Accounting Standards (IAS), we prefer to record a liability (asset) in the accounts of the employing unit, if and when it is unequivocally clear that the employer is responsible for any payments (receipts) in relation to the underfunding (overfunding) of an autonomous pension fund. In practice, however, this may not always be that straightforward; see for example the case of pension schemes in the Netherlands.

84. For the reasons mentioned in section 4.1, we are reluctant to recognise the obligations of social security pension schemes operated by government in the core system of national accounts. The growth of these entitlements is, of course, an important factor in determining the financial sustainability of future government financing. As such, one would prefer a recording of the

relevant liabilities. However, in this respect, there are other important determinants as well, e.g. the future development in demand for health care or the future changes in the income basis for taxation. It is, in our opinion, simply impossible to take all issues in relation to an ageing society into account in the core system of national accounts. For this purpose, the compilation of a dedicated satellite account is to be preferred.

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