Rethinking the NIPA Treatment of Insurance Services

For the Comprehensive Revision

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Abstract: BEA is studying proposals to change the treatment of insurance services in the national accounts. There are 5 proposed changes: investment income will be added as a supplement to the premiums paid by policyholders; investment income is to include interest, dividends and capital gains; a measure of expected investment income will be incorporated; a measure of expected claims will be incorporated and real insurance services will be computed by double deflation.

Background

There has been considerable attention on the measurement of the service output provided by insurance firms, in part driven by the tremendous growth in the financial services sector in recent years and the attending importance to the production of reliable estimates of GDP. The plan for the next comprehensive revision, slated late 2003, is to improve the measurement of insurance output in the national accounts. The attention will be directed to two aspects of the current measure of insurance services. First, the current measure of insurance understates the purchases of insurance services because it does not include the investment income arising from reserves that is part of the funding of the insurance services; both policyholders and insurers view such income as a supplement to the actual premiums paid. Second, the current treatment of disasters results in large payouts that cause jumps in claims and thereby lead to one-time decreases in nominal expenditures and prices of Personal Consumption Expenditures and Imports.

In addition to the BEA examination of its treatment of insurance services, there is also an OECD Task Force on Non-Life Insurance, on which I serve as BEA's representative, that is studying ways to improve the treatment of insurance services in the national accounts. I should add that because insurance services are internationally traded, changes are also being contemplated for the international accounts. The discussion today will focus only on the changes in the National Income and Product Accounts.

Though there does not seem to be a clear consensus on all aspects of how insurance output should be measured, there are some common threads in many theoretical models. Most models of insurance firms recognize that the service output includes the transfer of risk, financial intermediation and administrative services such as the handling of claims. Furthermore, models generally recognize that insurers maximize profits by setting premiums based on their expectations regarding future claims and investment returns.[1] The proposed changes in the treatment of insurance capture these features.

A main feature of past discussions in academia and statistical agencies of the measurement of insurance services output is whether a gross premium approach or a net premium (premium less claims) approach should be used. Briefly, the intuition underlying the net premium approach is that it captures the two main activities of insurers, taking in premiums and paying claims; these activities are broadly defined so as to include the financial intermediation and risk transfer services.

Several years ago BEA extensively examined the gross versus net premium issue and found no clear consensus about which should be used. However, the use of the gross premium approach would require many imputations in order to prevent the double counting of claims paid. More specifically, the gross premiums would be recorded as final demand and the claims paid for say auto repair would be treated as imputed intermediate products purchased by the insurance company. Such imputations would be problematic if the claim payments received by the insured were not used to pay for auto repair services during the period.

In view of these considerations, the widespread use of the premiums less claims approach by most national accounts agencies, and the fact that it is the recommended approach in the 1993 System of National Accounts (SNA) guidelines, it was decided that for the 2003 comprehensive revision the proposal to change the treatment of insurance services would retain the net premium approach

As explained in paragraphs 6.137 and 6.138, the net premium approach recommended in SNA 1993 treats insurance output as the sum of premiums earned plus premium supplements less claims paid. Premium supplements are

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[1] Since insurance policies are typically renewed annually, the expected profit maximization problem can be thought of as one-period problem.

equal to the investment returns earned by the insurer on technical reserves[2] that are used to help finance the insurance; the premium supplements are viewed as belonging to the insured and are treated as payments by policyholders. In other words, it is maintained that the insured understand that the insurer invests the premium flow and that subsequent investment returns are used to help finance the insurance and thereby affect the premium charged.

The proposed plan entails changes in both the nominal and real measures of insurance services output. BEA separately measures different lines of insurance, for example homeowners and auto, but the discussion will be general and applicable to each line. The computations of the nominal and real measures are discussed separately below.

Changes in computing the nominal measure

The proposed nominal measure of insurance output, I, is given by

(1) $I = P \ (\equiv \text{Premiums}) + PS \ (\equiv \text{Premium Supplements}) - EC \ (\equiv \text{Expected Claims}).$

Premiums here represent the premiums earned in the period. Under accrual principles, it is recognized that the insured typically pay premiums in advance and that only that portion earned in the considered period can be assigned to output in the period. This measure of premiums is unchanged from the current treatment of premiums.

Premium Supplements represent the investment income that is assigned to the insured. Though the inclusion of this term is found in the SNA measure of nominal insurance output, its inclusion would be new to the BEA measure. There are several aspects to the computation of this term and these are considered separately below. A main innovation of the proposal is the use of an expected investment income measure so as to be consistent with the conceptual model of insurer behavior.

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[2] Technical reserves, in general, consist of pre-paid (unearned) premiums and reserves against outstanding (unpaid) claims. See Annex IV, SNA 1993, paragraph 16.

Expected Claims represents a measure of the insurer's expectation of the claims to be paid in the period. Of course, expectations are not directly observed, so in practice a normal or average level of claims is used, as described below. The inclusion of this term is an innovation as both the SNA and BEA's current procedure use the actual losses incurred (claims paid) in the computation of nominal insurance output. Again, the underlying conceptual model of the insurer motivates the use of an expected claims measure. The discussion of the computation of expected claims is explained in detail below.

Computation of Expected Claims

The Australian Bureau of Statistics has already adopted the use of a measure of expected claims. Their measure is a 5-year centered moving average for routine or normal claims and a 19-year centered moving average for catastrophic claims.[3]

In addition, the OECD Task Force on non-life insurance recommends the adoption of concept of expected claims. However, there has been no recommendation of a method of computation. Several methods are being considered including the moving average approach, an econometric approach, an accounting approach and an approach based on the expected return to capital. No decision about the preferred method has been made.[4]

BEA is exploring both the moving average approach and an econometric approach. However, instead of using a centered moving average, BEA is exploring a moving average of past claims. It is inconsistent with the conceptual model of the insurer to have actual future claims affect the insurer's expectation of future claims.

Computation of Investment Income

The computation of investment income has many aspects to consider. Among the main ones are the selection of components of investment income and

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[3] Australian Bureau of Statistics, "The Measurement of Non-Life Insurance Output in the Australian National Accounts," Paper presented at the OECD Meeting of National Accounts Experts, Paris September, 1999.

[4] See "Report of the OECD Task Force on the Treatment of Non-Life Insurance in the National Accounts and Balance of Payments," Paper presented at the OECD Meeting of National Accounts Experts, Paris, October 2002.

whether those components should be at the product level or the firm level. The latter is the simplest to address because the data available, primarily from AM Best Inc., are only at the industry level without any product detail.

A much-debated issue concerning the components of investment income is whether capital gains and the income on own funds should be included. In the SNA, the investment income is confined to the interest and dividend income earned on technical reserves, which are defined as unearned premiums plus unpaid claims. In the US, the States have regulatory authority over the operations of insurance firms and so the identification mandated reserves and a consideration of their possible inclusion will also be considered.

BEA is considering an extension of the boundary of relevant sources of investment income. For example, Fixler and Moulton (2001) argue that capital gains should be included.[5] Also, Hill (1998) states, "There seems to be a good case for treating holding gains and losses the same way as investment income."[6] Furthermore, because investment funds are fungible as well as difficult to precisely identify on an insurer's balance sheet, it is not clear what funds should be excluded as contributing to investment income. As a result the proposed measure of the premium supplement will strike a balance between different concepts of investment income.

More specifically, one possible approach to measuring premium supplements would compute them as:

(2)   PS= ER (≡expected investment rate of return) X
           TR (≡technical reserves).

The computation of expected investment returns has two parts. First, the actual investment rate of return must be calculated. Second, the time series of these rates would be used to form a measure of the expected investment rate of return.

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[5] Dennis Fixler and Brent Moulton, "Comments on the Treatment of Holding Gains and Losses in the National Accounts" presented at the OECD Meeting of National Accounts Experts, October 2001.

[6] Peter Hill, "The Treatment of Insurance in the SNA," presented at the Brookings Workshop on Measuring the Price and Output of Insurance, April, 1998.

The computation of the actual investment rate of return would be accomplished by taking net investment income (total investment income less investment expenses incurred) and dividing it by the earning assets (cash and invested assets) on the consolidated industry balance sheet. Such a computation can only be performed at the industry level without any detail regarding line of insurance. This approach attempts to strike a balance among many much debated issues regarding investment income. While the computation of the rate of return is based on a broad concept of sources of investment income, the base to which the rate is applied is narrow. If it is assumed that technical reserves are some proportion of earning assets and the income on stocks, bonds and capital gains are allocated according to the same proportion, then investment income in the above equation treated as premium supplements is same proportion of total investment income.

The computation of the expected investment return is still being investigated. Econometric and moving average approaches are being considered, with particular attention being paid to the determination of the proper lag length.

An Example

The following example illustrates how the proposed changes in the nominal measure of non-life insurance will affect the national accounts. The T-accounts present a simple case of the purchase of auto insurance and a paid claim. Suppose a household (the insured) pays a premium P for the insurance that is entirely earned in the period. Further suppose that the insurer pays a claim C. to the insured and this amount is used to purchase auto repair services. To keep the analysis simple, suppose that the auto repair costs C—in other words, assume that there is no deductible and the coverage is complete so that there are no further expenses by the insured.[7] The following tables show both the current and proposed treatments of these transactions.

For the insurer, under the current system, the output would be P-C, which is entered as a source of funds and it is used to purchase inputs and earn a profit.   In the proposed treatment, expected claims, EC, are used in the measure of output, as is the premium supplement, PS. Observe that in the proposed treatment there is a new term, C-EC, that represents the difference between the actual claim paid and the expected claim. This difference must be

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[7] To keep the analysis simple I ignore the possibility that the repair could be for a different amount (e.g. less than C) and that the repair could take place in a different time period or not at all.

accounted for and one way to do is to record it is a transfer by the insurer to the insured. Also observe that the insurer is recorded as making a payment of PS, reflecting the idea that the premium supplement belongs to the policyholder.

Insurer

Current			Proposed		
Uses		Sources	Uses		Sources
Input & Profit	P-C	Output P-C	Input & Profit	P-C	Output **P+PS-EC**
			Transfer paid	C-EC	
			Imputed Income Paid	PS	
			Total	**P+PS-EC**	

For the household, the T-account under the current treatment is straightforward given the simplifying assumptions. In the current treatment, since no source of funds is assumed, the purchase of insurance is financed from saving. Note that the purchase of auto repair, C, offsets the amount subtracted from premiums. Under the proposed treatment, the amount of the expected claim is again substituted for the actual claim. As mentioned above, the household account now records the transfer from the insurer reflecting the difference between the actual and expected claim as well as the receipt and payment of the imputation derived from the premium supplement.

Household

Current			Proposed			
Uses		Sources	Uses		Sources	
Ins. Purchase	P-C		Ins. Purchase	P-EC	Transfer rec	C-EC
			Imputed Ins. pymt	PS	Imputed Inc. rec	PS
Auto Repair	C		Auto Repair	C		
Saving	-P		Saving	-P		
Total	0	Total 0	Total	**PS +C-EC**	Total	**PS+C-EC**

The T-account for the auto repair services reflects the simple nature of the assumed transaction.

Auto Repair Provider

Current			Proposed		
Uses		Sources	Uses		Sources
Input & Profit	C	Sales C	Input & Profit	C	Sales C

The National Income and Product Account table captures the output of the insurer and the auto repair providers. The expenditures on insurance are in Personal Consumption Expenditure (PCE), which in fact is where most non-life insurance is recorded in the national accounts. Note that under the proposed treatment the income side now includes the transfer payment consisting of the difference between actual and expected claims and the imputed income payment. Finally, note that the proposed treatment will increase the level of GDP if PS+C-EC is positive. The premium supplement is likely to be positive; the rate of return on investment has been positive since 1960 and technical reserves are always positive. The difference between C and EC should be zero on average. The occurrence of a positive or negative difference in any given year will vary by line of insurance and thus the sign of the difference in the aggregate is difficult to determine. However, in years where there is a catastrophe, such as Hurricane Andrew or the attacks of September 11, 2001, the difference is likely to be positive. This potential effect of catastrophes on GDP illustrates one of the questions about the computation of expected claims that has yet to be answered—whether and how to incorporate such events in the computation of expected claims.

NATIONAL INCOME AND PRODUCT

INCOME				EXPENDITURE			
Current		**Proposed**		**Current**			**Proposed**
Insurers		Insurers		**PCE**		**PCE**	
Input & Profit	P-C	Input & Profit	P-C	Ins. services	P-C	Ins.serv.	P+PS-EC
		Imp. Inc. pymt	PS				
		Transfer	C-EC				
Auto Rep	C	Auto Rep	C	Auto Rep	C	Auto Rep	C
Total	P	Total	**P+PS+C-EC**	Total	P	Total	**P+PS+C-EC**

Changes in computing the real measure of insurance output

The proposal is to compute the real measure of insurance by double deflation. That is, the first two terms of equation (1) will be deflated by one price index and the last term in (1) will be deflated by another. The discussion below presents the details of each deflation.

Deflation of Premium plus Premium Supplement

For the deflation of premium plus premium supplement, the proposal is to use the BLS Producer Price Indexes for the relevant lines of property and casualty insurance. These indexes are based on a frozen policy; at the time BLS initiates an insurer into its sample a policy is selected for monthly pricing. However because of the different lines of insurance the index methodology varies. For example, the auto insurance index adjusts for a type of change in risk that is embodied in any change in the vehicle's symbol that forms a basis for the premium on an auto insurance policy. In homeowner insurance, by contrast, almost no change in risk is incorporated. However, changes in the replacement value of an insured home as measured by the E.H. Boeche Building Cost Index are captured but any premium change driven by such a change is considered a price change.

The BLS price indexes for insurance include investment return as part of the price of insurance. This feature makes them especially useful for the deflation of this component of the nominal measure of insurance output.

Deflation of Expected Claims (Losses)

Currently there are several ways that BEA deflates claims. In general, various components the Consumer Price Index and the Producer Price Index are used. For example, the computation of real estimates for Personal Property Insurance and Motor Vehicle Insurance uses components of the CPI while the computation of the real estimate of Worker's compensation uses components of the Producer Price Index.

The plan for the comprehensive revision is to examine the various components of both BLS price index programs to see if it is possible to assemble a composite price index that could be used more generally. The hope is to standardize the deflation process.

Summary

There are five essential components to the proposed changes in BEA treatment of non-life insurance in the national accounts:

1. Investment income will be added as a supplement to the premiums paid by policyholders.
2. Investment income is to include interest and dividends from all sources and capital gains.
3. A measure of expected investment income will be incorporated.
4. A measure of expected claims will be incorporated.
5. Real services computed by double deflation.