

Methodology of the Monthly Index of Services

Insurance and Pension Funding Industry, Except Compulsory Social Services Review

Introduction

At the launch of the experimental Index of Services (IoS) in December 2000, a commitment was made to review and improve where practical, the sources and methods used to measure the service sector. This paper outlines the findings of the Insurance and Pension Funding, Except Compulsory Social Services Industry Review.

Summary

The industry review for Insurance and Pension Funding, Except Compulsory Social Services (known hereafter as Insurance and Pension Funding) has recommended:

- Life insurance and pension funding should be separated out
- UK motor insurance should be measured using volume indicators
- Non-life excluding UK motor insurance should be measured using deflated provisions adjusted for claims.

Although the methodology will be changed all the way back to 1994 in the IoS and GDP(O) systems, only the period from 1995 will be revised. The main impact of the new methodology is steady output, rather than a fall, in recent years. The data path is considerably smoother.

How important is Insurance and Pension Funding?

In terms of gross value added (GVA) weights in 2003, financial intermediation (SIC¹ Division 65) represents:

- 2.2% of the IoS
- 1.6% of Total GVA

Insurance and Pension Funding is published as part of the Business Services and Finance² component within the IoS.

¹ The SIC is the Standard Industrial Classification, and this is the classification system used in the UK to define industrial groupings. The 4-digit refers to the level of detail and is generally the level at which data is collected and aggregated from within GDP(O) and IoS. More detail on this can be found in the IoS Methodology documentation

² This covers the following sections of the UK SIC: J Financial Intermediation and K Real Estate, Renting and Business Activities

Conceptual Issues

Before explaining the methodological change for this division, it is worth setting out some of the theoretical difficulties in measuring insurance and pension funding.

There are essentially two theoretical viewpoints on measuring the insurance industry. They are fundamentally different. Not even the unit of transaction is agreed upon. Below is a brief summary of the two approaches.

Gross premium approach

This is often referred to as the ‘risk assuming model’. Insurance is purchased as protection against loss and the cost of this protection is the full premium. Under this system, consumers pay more for insurance but insurance companies spend money on claims. In the event of a car being stolen, the insured gets a replacement, but the financial loss is suffered by the insurance company.

The ‘gross premiums’ view of the industry is closer to that of conventional economists and the industry itself. They see their output as the premium, akin to turnover. Claims are seen as intermediate consumption, i.e. insurance companies assume the risk they have contracted to with the insured.

Two things should be noted here. Firstly, this approach does not change the level of GDP. Secondly, the amount of risk in the economy does not change under this system. A purchaser of insurance will certainly part with a small amount of money. Were they not to insure the same item they risk the *possible* loss of a large amount of money. The expected outcome is the same.

Net premium approach

The insurance company is viewed as providing an administrative service and its output is this service. This is often referred to as the ‘risk pooling model’. It is endorsed in the 1993 System of National Accounts³ (SNA 93) and is overwhelmingly the way in which insurance is measured in national accounts worldwide. Consumers are treated as paying only the net premiums for insurance. Under this approach, an insurance premium could be seen as having two components, an administrative fee paid to the insurance company and a transfer payment to a pool of money for use in the settlement of claims. Claims often exceed premiums and so, unless investment income is incorporated, there is a risk of negative output. This can never be correct.

Under SNA 93 insurance companies are assumed to act as agents for policy holders. Investment income belongs to and is therefore imputed to the purchaser of insurance. This is driven by the SNA convention that investment income, like interest, can never be treated as a productive service. It is further assumed that the policy holder pay the investment income back to the insurer in the form of higher premiums (hence the use of the phrase ‘premium supplements’ to describe investment income in the Price and Volume Handbook and SNA).

³ The SNA or System of National Accounts is the guide for measuring national accounts. The manual was first released in 1953 with updates in 1968 and 1993.

Implications of the two approaches the for measurement of output

The definition of GVA is the same for both systems, but the definition of output differs. Under the gross premiums approach, the output unit is the insurance policy and growth in the industry output is best measured by the number of policies sold adjusted for quality changes. Under the net premiums approach, the output unit could be seen as the service provided per policy or per policy holder. Investment income is sometimes not incorporated in this approach, thus running the risk of recording negative output.

Price effects and volume changes

The amount of risk being assumed (or pooled) is not adequately described by the cost a potential claim might incur on the insurance company. Rather it is the product of this cost and the probability of such a claim. In simple term, if my painting is insured against theft with an insured value is £1,200 then, given that it has a 1% probability of being stolen, the amount of risk being transferred is £12. Say the incident of art theft increases so that the probability of my painting being stolen rises leading to an increase in premium prices, then this is a volume change. However, if the value of my painting increases with a subsequent increase in the cost of insurance, then this is a price effect.

Unsurprisingly, changes in administrative costs are also price effects. More subtly, changes in stock market performance effect output and are viewed as price effects.

As previously discussed, national accounts regards insurance companies as acting as agents for the policy holders, acting in an administrative capacity to pool the risk, pay claims and invest the reserves. The technical reserves are viewed as being owned by the policy holder. The income from investment, ('premium supplements' in national accounting parlance) is imputed back to the policy holder who then pays them to the insurer as part of the premium. This set of assumptions leads to a service charge that is not recognised by the industry and naturally no price exists for it. Hence, deflating the current price output is not an option.

Given the similarity of the output definition of insurance to that of pension funding (see methodology section), it is no surprise that an analogous situation exists for pension funding. Again it is common practice to invest money paid into pension schemes by clients and national accounts theory regards earnings on these investment as imputed back to the purchaser in the form of reduced pension fees.

A much fuller discussion of these issues and, in particular, a detailed comparison of the two approaches can be found in 'Productivity in the Insurance U.S. Services Sector' by Jack E. Triplett and Barry P. Bosworth.

Methodology

Previous methodology⁴

Within Division 65 there are three 4-digit SICs. Table 1 below gives the detail of the groups as well as the methodology that was previously used:

Table 1 – Previous Methodology

Group /Class	Industry Description	Output Indicator	Source	Current Deflator	GVA weight per 1000	Weight within division
66.01 and 66.02	Life Insurance and Pension funding	HE on the administrative costs of life assurance and pension funds	ONS	Deflated at source using average earnings index for financial intermediation.	18.5	93.8%
66.03	Non-life insurance	1. Annual gross premium income from UK motor insurance (£m) 2. Annual gross premium income from USA motor insurance (£m) 3. Annual gross premium income other than from UK or USA motor insurance (£m) 4. Annual gross premium income from UK non-motor insurance (£m) 5. Annual gross premium income from USA non-motor insurance (£m) 6. Annual gross premium income other than from UK or USA non-motor insurance (£m)	Association of British Insurers	1. HE deflator: Vehicle insurance 2. HE deflator: Vehicle insurance adjusted * 3. HE deflator: Vehicle insurance adjusted ^ 4. i. RPI: Household goods ii I implied index of GB construction costs 5. i. RPI: Household goods ii Implied index of GB construction costs adjusted * 6. i. RPI: Household goods ii Implied index of GB construction costs adjusted ^	1.2	6.2%
Notes:	*Adjusted for exchange rate fluctuations using middle closing spot rate, end-period US\$ and differences in price inflation using a factor derived from the annual average UK RPI divided by annual average US consumer price index ^Adjusted for exchange rate fluctuations using Sterling effective exchange rate (excluding US\$) and differences in price inflation using a factor derived from the annual average UK RPI divided by annual average OECD consumer price index (excluding UK and USA). ‘Gross’ premiums are gross of claims but net of re-insurance.					

Life insurance (SIC6601) and pension funding (SIC6602) are covered by a single indicator based on administrative costs. It is deflated using the Average Earnings Index for financial intermediation. Non life insurance is covered by six indicators – motor and non-motor for three regions: United Kingdom, the United States of America and the rest of the world.

Reasons for review

The main reasons for reviewing the financial intermediation industry were as follows:

⁴ In this report, the previous methodology refers to the methodology used prior to Blue Book 2006, and the new methodology to the methodology taken on at Blue Book 2006

- The structure of the industry has changed since the current methodology was introduced.
- The current weighting system is based on gross value added but ignores investment income for non-life insurance. This results in the non-life weight being unduly small at 6.2% of the divisional weight.
- Life and pension funding is measured using administrative costs. This is inappropriate method.
- A single indicator is used to cover all of life insurance and pension funding. This is not adequate given the large number of different product types covered.
- Household Expenditure (HE) on vehicle insurance is used as a deflator for the three motor insurance series. This is inappropriate for the mixed market.
- Retail Price Index (RPI) for household goods is used as a deflator for the three non-motor insurance series. This is inappropriate for the mixed market and not fully representative of the services covered.
- Implied index of construction costs is used as part of the deflator for the three non-motor insurance series. This is not appropriate for the mixed market.

What should we be doing?

In 2001, Eurostat (European Union's Statistical Office) published the [Handbook on Price and Volume Measures in National Accounts](#). The handbook provides guidance by product, on what price and volume methods should ideally be used (A methods), acceptable methods (B methods) and those methods that should not be used (C methods). The handbook has been written in the context of annual data but the same rules apply to sub-annual data.

It defines the output of insurance services as:

- total premiums earned
- plus total premium supplements (equal to the income from the investment of the insurance technical reserve)
- minus total claims due
- minus the change in the actuarial reserves and reserves for with profit insurance.

Similarly, the output of pension funding services is defined as:

- total actual pension contributions
- plus total supplementary contributions (equal to the income from investment of the pension funds technical reserve)
- minus the benefits due
- minus the change in the actuarial reserve.

An A method is not considered possible given that ‘there is no directly observable price or quantity that is truly representative of the output’. Volume methods based on the number of policies acquired or administered, and those based on claims obtain a B rating. Indicators ‘at a very detailed level that take account of the product mix’ are required.

Provisions adjusted for claims are seen as an indicator to the level of risk taken on by insurance companies. Their use also receives a B rating provided a deflator that measures the change in the underlying purchasing power of money is used.

Two price effects are mentioned. Provisions might not be representative in the case of unexpected large claims. Changes in investment activity will have an impact on provisions. These should be adjusted out.

It should be noted that deflation by an index of gross premiums is described by the price and volume handbook as ‘conceptually inappropriate’ because ‘change over time of gross premiums is unlikely to be a good reflection of the changing price of the service charge’.

Issues faced by the industry review

66.01 and 66.02 – Life insurance and pension funding

Key features

There are two types of insurance, life and non-life. The SNA defines life insurance as ‘an activity whereby a policy holder makes regular payments to an insurer in return for which the insurer guarantees to provide the policy holder with an agreed sum, or an annuity at a given date, or earlier if the policy holder dies beforehand. There is *always* a pay out for a life insurance policy’⁵. This is the characteristic that distinguishes it from non-life insurance. This definition differs from that of the industry in that products such as term insurance (a policy whereby there is a pay out in the case of death before a certain date, but not otherwise) are classified as non-life. However, for practical reasons SNA guidance allows for the treatment of term insurance as non-life insurance.

An individual makes regular payments into a pension fund and receive a regular income commencing at a future date (usually retirement).

Issues

- Use of Association of British Insurers data
- Use of volume data

i) Association of British Insurers data

Life insurance and pension funding is served by a large and varied range of products that constantly changes. Using a single indicator to cover both these groups is not appropriate. The Association of British Insurers (ABI) publish both current price and volume data on a comprehensive range of life insurance and pension products. Data are published in September for the previous year and the periodicity is annual. This necessitates the use of forecasting and interpolation. However, the volume of risk is steady and the smooth nature

⁵ Source: *System of National Accounts 1993* (Annex iv)

of the data path should reduce any inaccuracies caused by these techniques. Coverage is very good with about 96% of the market (in terms of premium paid) accounted for.

ii) Volume Data

As previously discussed, there are conceptual difficulties with deflation in this industry. A crucial part of income comes from investment of funds held by insurance companies on behalf of their clients and the profits from this are, according to SNA theory imputed back to the purchaser. This obscures the theoretical price and makes deriving a suitable inflator impossible.

This makes the use of volume data an attractive idea, as it avoids the thorny issue of deflation. The price and volume handbook describes the use of 'volume indicator methods that make use of detailed indicators' as a B method. The indicators should 'take account of changes in product mix'.

Recommendations

Life insurance and pension funding should be measured by volume indicators sourced from data published by the Association of British Insurers. They should be treated as two distinct groups, with seven indicators for life insurance and eight indicators for pension funding.

66.03 – Non-life insurance

Key features

The key point that differentiates non-life insurance from life insurance is that, in non-life, a claim is paid only if a specific contingency arises and not otherwise.

There previous methodology used six indicators, derived from ABI data for non-life. They were all based on premiums gross of claims but net of re-insurance. They are split into motoring and non-motoring, each of these being sub-divided into UK, USA and rest of the world. For non UK business, adjustments are made for variation in inflation rates and for currency market fluctuations. In the case of the three motor insurance indicators, the HE deflator for vehicle insurance was used. For non-motor insurance, a mean of the RPI for household goods and the implied index for construction output was used.

Issues

- Suitability of volume data for UK motor insurance
- Use of provisions for claims as an indicator
- Re-insurance
- Lloyd's of London

i) ABI volume data for UK motor insurance

The ABI publish volume data for UK motor insurance, namely risk exposure in years for private cars, motor cycles and other vehicles. A split into comprehensive and non-comprehensive is given for the first of these. These are quarterly data with good coverage

(about 95% of premiums written in the UK). Their use avoids the problematic issue of deflation.

ii) Provisions adjusted for claims

This is the sum of the general business technical reserve and expenditure on claims net of amounts recoverable from re-insurers. This approach is very much of the gross premiums school of thought (see paragraph 4.2) as it aims to approximate the transfer or pooling of risk. The Price and Volume Handbook states ‘the use of provisions adjusted for claims deflated by a price index that measures the change in the purchasing power of money...is also a B method’. The data for this indicator are collected by ONS in both the quarterly and annual Income and Expenditure Questionnaires.

This ease of availability is offset by some disadvantages. Claims are often not settled for several months or even years. This means that a significant percent of the provisions held by insurance companies will be for claims that were made some time ago but are yet to be settled. This will have an adverse effect on the quality of any proxy based on provisions. However, insurance output has low volatility which should reduce this effect.

For reasons of data availability the use of provisions adjusted for claims represented our only option for changing from a C method to a B method.

iii) Re-insurance

Re-insurance plays a significant role in non-life insurance. It is difficult to measure directly as a particular risk might be re-insured more than once. The provisions adjusted for claims indicator should give a reasonable measure of re-insurance. Insurance companies do not hold funds to cover risk they have re-insured but will have provisions for risk they have undertaken through selling re-insurance.

Of concern is re-insurance ceded in the area of UK motor insurance. There is a danger of double counting in that the risk insured will be picked up by the provisions adjusted for claims indicator. Exported re-insurance will not be accounted for.

iv) Lloyd's of London

Lloyd's is an insurance market of members, rather than an insurance company. It is the oldest continuously active insurance marketplace in the world and has retained some structures and practices that are not seen elsewhere in the industry today. Lloyd's is the world's leading specialist insurance market and expects to have the capacity to write approximately £14.8bn of business in 2006.⁶

The Lloyd's website contained some data that were suitable to our needs, namely changes in premium transaction volume. However, the data series contained gaps and ended with the 2003 observations. Correspondence with Lloyd's indicated that they had discontinued publication of these data. The lack of a suitable indicator for Lloyd's is of concern given that it is a key player in the international market.

⁶ Lloyd's web site: <http://www.lloyds.com/>

Recommendations

UK motor insurance should be covered by four volume indicators:

1. Exposure: vehicle years: private cars: comprehensive
2. Exposure: vehicle years: private cars: non-comprehensive
3. Exposure: vehicle years: other vehicles
4. Exposure: vehicle years: motor cycles

The remainder of non-life insurance should be covered by one indicator: provisions adjusted for claims and deflated using the implied GDP(E) deflator.

Who was consulted as part of the Industry Review process?

Within the ONS, there was comprehensive consultation with relevant teams both within National Accounts and in the survey areas. In terms of external consultations we are grateful to the assistance received from the Association of British Insurers and Eurostat.

New methodology

In summary the industry review for insurance and pension funding has made the following recommendations that were implemented at Blue Book 2006:

- To introduce indicators based on the volume of policies or in the case of group schemes, number of members for measuring life insurance and pension funding services.
- To introduce volume indicators based on exposure to risk of insurance companies to measure UK motoring insurance
- To introduce an indicator based on provision adjusted for claims to measure the remainder of non-life insurance

Benefits and assumptions of new methodology

Benefits		Assumptions
All methods used now get a B rating under Eurostat guidance	V	Provisions adjusted for claims provide an accurate indication of the level of risk assumed by insurance companies
Product mix for life insurance and pensions is accounted for.		Forecasting and interpolation of ABI data will not lead to unacceptable inaccuracies
Deflation methods that do not meet established guidelines are avoided		Re-insurance volatility is low
Methodology avoids the problem of adjusting out exchange rate fluctuations.		Lloyd's output moves in the same way as the rest of non-life insurance

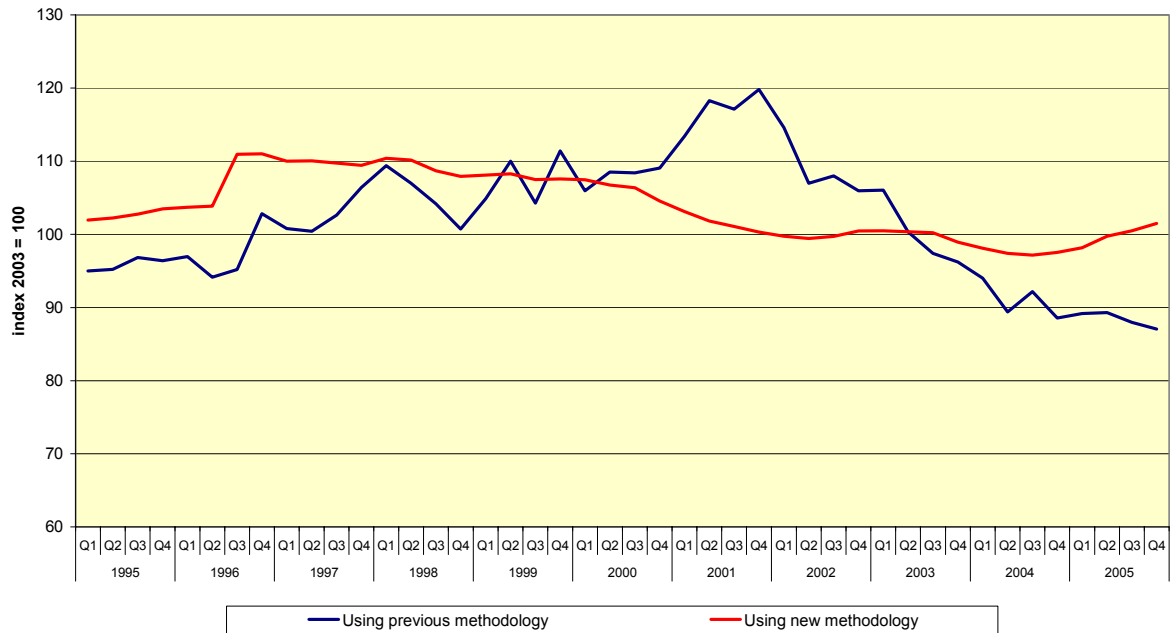
Impact of new methodology

The graph below shows the impact of the new methodology on Division 66. The data have been revised back to January 1995. This in line with the period open for revisions set-out in the National Accounts Revisions Policy for Blue Book 2006.

It should be noted that the output of Activities Auxiliary to Insurance and Pension Funding (part of division 67) will, in future be assumed to be the same as the output for division 66.

Figure 1

Insurance and Pension Funding, except compulsory Social Security (SIC03 division 66) constant prices seasonally adjusted



Contact Information

Any questions or comments on this article are welcome, as are offers to participate in the process of improving industry sources and methods. Any enquiries should be addressed to:

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Annex - Comparison of new and old methods

Table 2 - Summary of current versus proposed methods for insurance and pension funding

PREVIOUS METHODS					NEW METHODS				
SIC	Industry description	Class	Current output indicator	Previous deflators	New Group	New Class	New output indicator	M/Q/A	Eurostat rating Δ
6601/2	Life insurance and pension funding	660101	HE on administrative of life insurance and pension funding	Deflated at source using AEI for financial intermediation	6601 Life insurance	660101	Industrial branch business: number of policies	A	B
						660102	Individual life insurance in force at year end: non-linked: number of policies	A	B
						660103	Individual life insurance in force at year end: linked: number of policies	A	B
						660104	Collective life business in force at year end: number of lives covered	A	B
						660105	Income protection in force at year end: individual business : number of policies	A	B
						660106	Group income protection schemes: number of members	A	B
						660107	Group life cover schemes: number of members	A	B
					6602 Pension funding	660201	Deferred and contingent annuities: (not in course of payment)	A	B
						660202	Purchased life (immediate) annuities in force	A	B
						660203	Individual linked pensions in force at year end: number of policies	A	B
						660204	Individual non-linked pensions in force at year end: number of policies	A	B
						660205	Defined benefit pension schemes: number of members	A	B
						660206	Defined contribution pension schemes: number of members	A	B
						660207	Executive pension schemes: number of member	A	B
						660208	Free standing AVCs in force at year end: number of policies	A	B

6603	UK motor	660301	Gross premium UK motor income	HE deflator: vehicle insurance	6603 Short term insurance	660321	Exposure: vehicle years: private cars: comprehensive insurance	Q	B
	UK non-motor	660302	Gross premium UK non-motor income	RPI Household goods Implied index of GB construction costs		660322	Exposure: vehicle years: private cars: non-comprehensive insurance	Q	B
	USA motor		Gross premium income: USA motor	HE deflator: vehicle insurance adjusted		660323	Exposure: vehicle years: other vehicles insurance	Q	B
	USA non-motor	660304	Gross premium income: USA non-motor	i) RPI: household goods ii) Implies index of GB construction costs		660324	Exposure: vehicle years: motor cycles insurance	Q	B
	Rest of world motor (excluding USA)	660305	Gross premium income: rest of world motor	HE deflator: vehicle insurance, adjusted		660331	Provisions adjusted for claims deflated by GDP(E) implied deflator	Q	B
	Rest of world non-motor (excluding USA)	660306	Gross premium income: rest of world non-motor	i) RPI: household goods ii) Implies index of GB construction costs					

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