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Producer Price Indexes for Property/Casualty and Life Insurance

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Abstract

The paper presents an overview of the methodologies employed in surveying the Property and Casualty Insurance Industry and the Life Insurance Industry for the U.S. Producer Price Index. The approaches used were based on four goals: 1) sampling efficiency, 2) effective operationalization of the industry output concept, 3) maintenance of a constant quality index, and 4) net transaction pricing. Individual industry products had to be analyzed to determine if the output represented transfer of risk, financial intermediation, or both. The statistical agency had to work closely with the industry to formulate pricing methodologies for each industry product that accurately reflected price movement while maintaining the constant quality assumption. Finally, account had to be taken of the present value of money. This required identification of product specific escalators to adjust for this phenomenon.

INTRODUCTION

The Producer Price Index (PPI) measures average changes in selling prices received by domestic producers for their output. Most of the information used in calculating the PPI is obtained through the systematic sampling of virtually every industry in the mining and manufacturing sectors of the economy. The PPI program includes some data from other sectors as well—agriculture, fishing, forestry, services, and gas and electricity. Monthly measures of price change classified by industry form the basis of the program. These indexes reflect the price trends of a constant set of goods and services which represent the total output of an industry. Industry index codes are based on the Standard Industrial Classification (SIC) system and provide comparability with a wide assortment of industry-based data for other economic phenomena, including productivity, production, employment, wages, and earnings.

From its inception in 1902 to its last major methodological revision completed in 1986, PPI measurement efforts focused almost exclusively on the goods-producing sector of the U.S. economy. At the completion of the revision in 1986, we gradually began to shift our attention to the service sector in recognition of its growing importance in the U.S. economy. The stepped-up application of program resources beginning in 1990 has significantly accelerated the rate of service sector coverage expansion. We have now set as a goal the publication of an aggregate index combining goods and services by January 2003.

The PPI Program has adopted the National Income and Product Accounts (NIPA) framework for defining output and for creation of aggregate indexes and for weighting those aggregates. PPI coverage of U.S. production will be quantified using gross product originating by industry. The PPI Program began work in 1995 to include the insurance sector in PPI index coverage. SIC 6331 Property and Casualty Insurance was chosen as the first insurance industry to include. Work on SIC 6311 Life Insurance began in 1996. Finally, work began in the Health Insurance industry in 1998. Publication is scheduled for July 1998 for Property and Casualty Insurance, January 1999 for Life Insurance, and January 2002 for Health Insurance.

This paper will present the sampling and pricing methodologies developed for both the Property and Casualty and Life Insurance industries. The paper will be divided into three sections. The first will present the major goals behind the insurance sector expansion initiative. The second section will provide an overview of the development of the Property and Casualty Insurance industry.   This section will be further divided into five sub-sections: a) industry output definition, b) publication goals, c) sampling design, d) pricing methodology, and e) quality adjustment. The third section will provide an overview of the Life Insurance Industry. It will be divided into the same five sub-sections.

I.   INDUSTRY INDEX GOALS

In surveying an industry for inclusion in the PPI, four major concerns are paramount in the selection of a sample design and pricing methodology. These concerns are: a) sampling efficiency, b) effectively operationalizing the industry output concept, c) maintaining a constant quality index, and d)   securing   net   transaction   prices.

A. Sampling efficiency

Resource constraints, reporter burden limitations, index publishability needs, and variance minimization all relate to the goal of sampling efficiency. A sample design is optimal if it permits publication of the most meaningful set of product line indexes thus maximizing the utility of the indexes to a wide variety of data users. A fitness for use criteria includes minimization of variance, yielding a sample statistic that closely approximates the population value. In a voluntary survey program, such as the PPI, there are firm limits on how much data companies are willing to provide to the statistical agency. Finally, limited program resources exert discipline on sample sizes.

B. Industry Output Concept

The PPI measures monthly price change for a sample of the various outputs of an industry. A two-step process generally needs to be followed in many service sector industries. Firstly, a conceptual definition of output must be agreed upon. For example, in the insurance sector is it "pooling of risk" or "transfer of risk"? Pooling of risk defines the insurer as an intermediary between various policyholders where the insurer's function is to collect premiums and disburse them to claimants. The policyholders retain the risk in this model. In the transfer of risk model, the insurer assumes the risk and must pay out for all claims even if they exceed the anticipated level. Secondly, the conceptual definition must be operationalized. This is the process of identifying actual products of the industry that truly represent the output and whose price is measured in a manner consistent with the output concept. If the output is "pooling of risk", then the payment of fees to the insurer (premiums less claims) represents the output. If the output is "transfer of risk", than the output is represented by premiums or premiums plus rate of return on investment[1].

C. Constant Quality

The PPI is calculated as a modified Laspeyres Index designed to estimate a fixed-input output price index model. This assumes that output is fixed. In most industries, this would involve quality adjustment as goods are periodically modified to adjust for technological or style changes. The adjustment process involves factoring out the cost for any changes made to the product. In the realm of insurance, fixed quality may well refer to adjustment for additional features added to a policy but it also refers to holding underlying risk constant.   This is a very different quality concern. Additionally, risk assumption could be valued in nominal terms or in replacement goods terms. The latter valuation implies a built in escalator mechanism to keep pace with the cost of home repair or auto repair.

D. Net Transaction Prices

The price index, to be truly useful, should reflect the price of representative actual transactions occurring monthly in the marketplace. Index prices should reflect all ongoing discounting and surcharges. All types of pricing mechanisms should be reflected in the index. Yet this goal often conflicts with the constant quality goal. If we priced an actual auto insurance policy over time, the make, model and model year of the vehicle would remain unchanged. Do we preserve our constant quality assumption if we are repricing a new car in year one, a year old car in year two, a two year old car in year three, etc. Or should we substitute in year two to a replacement new car and reprice that for the next 12 months? The former methodology allows us to price an actual policy. The latter

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[1] Sherwood [1997].

methodology removes us from the realm of the actual and introduces estimation methods. This complicates the mission of assuring that the price truly represents actual current transactions.

II.   Property and Casualty Insurance

This section will present the methodology employed to survey the industry. Publication will commence in July 1998.

A.   Output Definition

The conceptual definition of output was determined to be the assumption of risk (transfer of risk from the policyholder) and financial intermediation. Financial intermediation is the investing of someone else's money with the goal of partially offsetting the size of the premium payment. The Bureau of Labor Statistics staff responsible for this formulation was Mark Sherwood of the Office of Productivity and Technology and Dennis Fixler of the Office of Prices and Living Conditions. Staff of the Bureau of Economic Analysis was kept abreast of the Bureau's work in this area throughout this project.

The Bureau of Economic Analysis uses the "pooling of risk" concept in the National Income and Product Accounts. Our decision to abandon the pooling of risk model was made only after extensive research and discussion with the industry. The operational definition of assumption of risk plus financial intermediation was premium plus rate of return on investment. While there was initial reluctance among industry representatives to accept the rate of return price component, they ultimately agreed with our definition. The difficulty was of a practical nature in that the state regulatory authorities were accustomed to thinking of premium as equaling price. The introduction of an official price series based on a different price definition introduced uncertainty to the industry. Eventually, there was the realization that investment income was crucially important to the industry and greatly affected their pricing decisions and its inclusion should yield a smoother statistic which would facilitate the regulatory decision-making process. Companies may well reduce premiums when the rate of return increased in response to competitive pressures, as well as raise premiums when the rate of return was lower.

The policy issued by the insurer to the insuree represented a unique output. The policy listed the occurrences and coverages for which restitution would be made to the policyholder in case of damages. The amount of risk being transferred to the insurer is clearly stated in terms of covered events (and events not covered) and it obligates the insurer to pay claims for all such occurrences. So the output is a contract transferring financial coverage liability from the asset holder to the insurance company.

Industry output can be further categorized by type of asset insured. The major service lines and their premium and investment income in 1994 are as follows:

Service Line	Direct Premium	Investment Income
Private passenger auto	$100.4 billion	$13.8 billion
Homeowners	24.4 billion	3.3 billion
Commercial auto	18.0 billion	2.4 billion
Non-auto liability	30.3 billion	4.4 billion

Commercial multi-peril		20.3 billion	2.8 billion
Workers compensation	31.1 billion	4.2 billion
Inland marine		6.8 billion	.9 billion
Surety		2.5 billion	.3 billion
Fidelity		1.0 billion	.1 billion

B.   Publication Structure

We anticipate being able to publish the full set of publication goals shown below starting with the release of the July 1998 PPI. These data will appear in *Table 5. Producer price indexes for the net output of selected industries and their products, not seasonally adjusted.*

6331	Property and casualty insurance
6331P	Primary services
63311	Private passenger auto insurance
6331101	Private passenger auto insurance, California
6331102	Private passenger auto insurance, New York
6331103	Private passenger auto insurance, Texas
6331104	Private passenger auto insurance, Florida
6331105	Private passenger auto insurance, Pennsylvania
6331106	Private passenger auto insurance, Illinois
6331107	Private passenger auto insurance, Ohio
6331108	Private passenger auto insurance, Michigan
6331109	Private passenger auto insurance, New Jersey
6331111	Private passenger auto insurance, North Carolina
6331112	Private passenger auto insurance, All other areas
63312	Homeowners insurance
6331201	Homeowners insurance, California
6331202	Homeowners insurance, New York
6331203	Homeowners insurance, Texas
6331204	Homeowners insurance, Florida
6331205	Homeowners insurance, Pennsylvania
6331206	Homeowners insurance, All other areas
63313	Commercial auto insurance
63314	Non-auto liability insurance
6331401	Product liability insurance
6331402	Medical malpractice insurance
6331403	Other non-auto liability insurance
63315	Commercial multiple peril insurance
63316	Workers compensation insurance
63317	Inland marine insurance
6331701	Personal inland marine insurance
6331702	Commercial inland marine insurance
63318	Surety insurance
63319	Fidelity insurance

6331A   Other property and casualty insurance
6331SM   Other receipts

A. Sample design

The A.M. Best Company's Property and Casualty Key Rating Guide was selected for this industry's frame. This frame contains 2,924 insurance companies, which were then aggregated into 1,551 insurance groups, representing approximately 95% of all insurers. An insurance group is a corporate headquarters unit and each individual subordinate operating company. In addition, this frame has one frame record for each line of insurance that each insurance group sells. 505 sample units were selected. Each sample unit represented a single line of insurance aggregated to the insurance group level.

The frame was stratified into 14 separate strata representing the lines of insurance in the Key Rating Guide. The table below identifies the individual strata, the number of sample units allocated to each stratum, and the range of the number of price quotes allocated to each sample unit. The larger number of quotes (number of actual insurance policies to reprice) was assigned to larger sample units. Each quote is selected using probability-proportionate- to-size sampling.

Insurance line	Sample Allocation	Quotes per Sample Unit
Private passenger auto	85	12-24
Homeowners	45	8-24
Commercial auto	50	6-12
Product liability	15	6-12
Medical malpractice	15	6-12
Other non-auto liability	40	6-12
Commercial multi-peril	35	6-12
Workers compensation	50	8-16
Inland marine	15	8-16
Surety	15	6-12
Fidelity	15	6-12
Other property and casualty	40	6-12
Multiple lines	85	6-16

B. Pricing methodology

Once an actual policy is selected, its price determining characteristics are identified to permit monthly repricing of the same unique item. The following policy characteristics are common in most property and casualty insurance lines:

1. Type of property/casualty description - This lists the characteristics of the insured property.

2. Type of coverage - This includes physical damage coverage and liability coverage.

3. Dollar limit of coverage - This is the maximum amount of money the insurer is legally obligated to pay in the event of a claim.

4. Coinsurance clause - The percent of the value of the property to be reimbursed by the insurer.

5. Deductible - The insured bears the first part of any loss covered by the policy up to a specified amount.

6. Length of policy period – This is the time frame for which the policy is in effect.

7. Perils covered – These are the specific risks that the insurer assumes.

8. Location of the insured property – Risks vary by geographic location.

9. Past loss experience – Premiums generally are lower if the insured has a past record of making fewer claims.

10. Valuation of insured property – This can be either the actual cash value of the property, which adjusts for depreciation, or the replacement cost.

11. Valuation of risk exposure – This is a valuation for liability coverage.

The first requirement is to develop a pricing methodology that values transfer of risk and financial intermediation. Premium plus rate of return on investment provide the price to accomplish this. Each value was separately derived from insurance company records.

To track premium movement in the property and casualty industry, insurance companies will be asked to provide estimated premiums for "frozen" policies. This is an actual policy selected by probability where the premium determining characteristics are held constant while the policy is repriced on a monthly basis. However, those premium determining characteristics that are influenced by inflation are periodically escalated. The insurance company would estimate the current premium for this "frozen" policy by using current charges applied to the policy characteristics of the actual policy.

The major difference in repricing a frozen policy versus repricing an actual policy is that the insured may modify the policy over time. For example, on an auto policy the insured could add a teenage driver in year two of the policy, increase the liability , or reduce the deductible. Such a change in the repriced item violates the Laspeyres assumption of fixed quality. By freezing the policy characteristics, the fixed quality assumption is realized.

The exception to the frozen policy methodology is for inflation-sensitive policy characteristics. For homeowners insurance, the dollar limit of coverage would be escalated annually to account for construction price inflation. The assumption is that the policyholder is insuring to secure a constant flow of services from the insured property. If there is price inflation affecting the cost of repair or replacement of the damaged property, the coverage limit should be escalated to reflect this increase. This adjustment is made annually on the anniversary date of the policy. This reflects what actually occurs – where the company makes these coverage adjustments at the time of policy renewal. As the index is tracking several thousand policies selected on a probability basis, there is a spread of policy anniversary dates throughout the year. This yields a smoother behaving index than making this adjustment for all repriced items at one time.

The source to be used for the escalation is dependent upon the insurance company. If the company cannot make a recommendation on how we should escalate the inflation-sensitive policy

characteristic, we will decide upon an appropriate index to use. For example, we would use the E. H. Boeckh Building Cost Index to escalate the coverage limit for homeowners insurance. A different procedure will be used for Workers Compensation Insurance. We would hold the workforce in the group constant (same number of people in the same jobs) but we would need to escalate the wage rates to account for general wage inflation. In this case we would use the Bureau of Labor Statistics' Employment Cost Index.

The investment rate of return is calculated by all insurance companies as a percentage of the premium. An annual report is prepared by all companies which includes this calculation. The investment gain percentage (column 18) is found in the Insurance Expense Exhibit, Part II – Allocation to Lines of Business Net of Reinsurance. The report provides the investment rate of return by insurance line calculated as a percent of premium. As we saw in Section A. Output Definition, the rate of return varies considerably by insurance line. As with the inflation-sensitive policy characteristics, the rate of return is updated annually for each priced item on the policy anniversary date.

A. Quality Adjustment

The Pricing Methodology section outlined how the policy terms and price determining characteristics would be treated to help secure a constant quality price index. Underlying the pricing methodology is the goal of holding risk constant. Risk has two components: 1) the risk of damages to covered property or personal liability, and 2) the risk that the insured will not receive prompt and complete payment on claims.

The first category of risk is difficult to identify and quantify in practice. If the incidence of theft increases in a given jurisdiction, this would affect the amount of risk in the theft coverage of homeowners insurance. Better training or more equipment for the fire company may reduce the risk of fire. Over time, steady increases in population density may increase the risk of accidents and auto theft for auto insurance. We were unable to identify reliable methods to identify and quantify the effect of these changes. Therefore, we will not attempt to quality adjust for changes in underlying risk.

It is not always clear we would know when a shift truly occurred in underlying risk. Hurricane activity was more severe in 1995 and 1996 than in many previous years. Was this part of the normal cycle of weather that occurs over a ten, twenty, or thirty year cycle? Or was there a real shift, perhaps caused by global warming. Decisions must be made in real time, and sufficient data simply may not be available in the current month to make the determination. If we quality adjusted out the premium increases that occurred to help cover the higher claims paid out in 1995 and 1996, what should we have done in 1997? In 1997 the activity was at a very low level.

The second category of risk, the risk of not receiving prompt and full claims payment, is more amenable to quality adjustment. A. M. Best Company regularly issues financial soundness ratings for insurance companies. We will interpret these ratings as a proxy measure for the ability of insurance companies to make prompt and full restitution. A change in the rating will trigger quality adjustment action.

IV. LIFE INSURANCE

A. Output Definition

The output of the life insurance industry is the assumption or transfer of risk from the policyholder to the insurance company and financial intermediation. Financial intermediation is managing someone else's money generally with the goal of increasing its value. This industry has two basic types of services: insurance products and investment vehicles (annuities). For both of these services, the output components vary.   The amount of risk being assumed by the insurance company in life insurance is specified in the death benefit. The amount of risk assumed by the insurance company in annuities is undetermined until the annuitant's death.   The costs or fees for providing these services most accurately measure output of the life insurance industry.

Life insurance provides protection against the risk of a premature death. Unlike life insurance, annuities can be viewed as investment vehicles. Annuities are tax-deferred investments made through an insurance company. The revenue generated by these two major service lines is shown in the table below. Life insurance is measured by premiums and annuities are measured by fees. These revenue figures also include investment income for each service.

SERVICE	1992 RECEIPTS (thousands)	% OF TOTAL
Primary services	$215,401,620	100.0 %
Life insurance	171,684,323	79.7 %
Annuities	43,717,297	20.3 %

Source: *1992 Census Sources of Revenue*

This output can be further categorized by the types of insurance policies and annuities offered by the industry. These primary service lines are reflected in the publication structure shown in the section below.

B. Publication Structure and Definitions

We plan to publish the complete publication structure as shown below. These data will appear in *Table 5. Producer price indexes for the net output of selected industries and their products, not seasonally adjusted.*

6311	Life insurance
6311P	Primary services
63111	Life insurance policies
6311101	Individual life insurance
631110101	Term life insurance
631110102	Whole life insurance
631110103	Universal life insurance
631110104	Variable life insurance
631110105	Other individual life insurance
6311102	Group life insurance
63112	Annuities
6311201	Variable deferred annuities

6311202	Fixed-rate deferred annuities
6311203	Immediate annuities
6311SM	Other receipts

Term life. With term life insurance, protection is provided for only a specified time period (1 year, 5 years, etc.). Policies may be renewed, but the premium increases with each renewal. Some policies may be converted to whole life. There is no cash value earned with term insurance. The death benefit is fixed and guaranteed.

Whole life. Whole life insurance is permanent protection (i.e. the policy is in force until it is canceled or upon the death of the policyholder). Unlike term insurance, the level monthly premiums earn fixed rates of interest that accumulate a surplus of cash value. The policyholder has access to these funds. These earnings are tax-free while policies are in force. For most policies, the death benefit is fixed and guaranteed; however, allowances exist to change the premiums and death benefit upon request.

Universal life. Universal life is basically permanent insurance with varying premiums. The timing of payments is also flexible. The premiums can vary depending on the cash flow and income of the insured. Cash value is earned at market interest rates and is tax free while the policy is in force. Generally the death benefit is fixed, but with one type of universal life, death benefits increase if the cash value increases at high rates.

Variable life. Variable life is also permanent insurance, but the individual policyholder, not the insurance company, assumes the investment risk. That is the policyholder may choose the type of investment portfolio in which the premiums will be invested.   The policyholder can choose between stocks, bonds, money market portfolios, international funds. etc. or even choose a mix of investments. The investment decision is not made at the discretion of the insurance company as it is for whole life and universal life policies. Death benefits are based on earnings from the cash value, and thus, will fluctuate with the investment. The death benefit is typically a percentage (for example, 250%) of the policy's account value. Although the death benefit can change, there is always a guaranteed minimum.

Group life insurance.   This is insurance issued on a group of people under a master policy usually without medical examination. The experience of the group forms the basis of the underwriting. Group members may be eligible for coverage at any time after the inception of the policy. But, they may also lose coverage before the contract is terminated.

Variable deferred annuity.   Purchasing this annuity is similar to investing in a mutual fund. The premium for variable annuities buys accumulation units which are like mutual fund shares. These units are maintained by the insurance company in an account which is separate from its regular investment portfolio. This account buys shares in portfolios maintained for the variable annuity. The purchaser can choose among common stock and bonds offered by the company and is free to move money among those investments. There is no guaranteed interest rate. The purchaser will receive 100% of the gains of the annuity but will also suffer from any losses.

Premiums can be paid into the annuity either periodically or in one lump sum. Regardless of the premium payment method, the money begins earning interest once the first premium is paid. Part or all of the interest income can be automatically reinvested and payments will be made to the annuitant any time after twelve months.

Fixed-rate deferred annuity. Premiums are invested in the insurance company's portfolio of investments and earn a fixed rate of return and grow tax deferred. Payouts from the annuity are made at a future specified date (between the ages of $59^{1}/_{2}$ and 85). The rate of return is guaranteed for the duration of the contract. The purchaser decides on the rate to lock in based on the length of the annuity contract. Typically, the longer one is willing to invest funds in the annuity, the higher the rate of return will be.

Immediate annuity. For immediate annuities, payments will be sent to the annuitant right away, either monthly, quarterly or annually.   The premium is generally paid in a lump sum. There are different payout options which will determine the amount the annuitant will actually receive from the investment.

C. Sample Design

The frame used for sampling was a 1995 data file from the A.M. Best Company. This frame included many companies that provide accident and health insurance along with life insurance and annuities. Total-admitted assets in life insurance and annuities were used as the measure of size for a company.   Puerto Rican and Canadian companies were excluded from the frame along with companies that provide only accident and health insurance leaving a total of 1073 companies in the unclustered frame. The frame was clustered by group affiliation and then by president within group. One hundred seventy nine clusters were formed leaving 806 frame units in the final frame.   The companies or clusters of companies were ordered by their total-admitted assets and sample units were selected with probability proportional to total admitted assets. The total number of sample units selected was 197.   Quote allocations range from a minimum of 4 quotes per sample unit to a maximum of 16 quotes.

D. Pricing Methodology

Overview

For all services in this industry, the item being priced is a life insurance policy or an annuity contract. The policies or annuities priced are provided by insurance companies and are based on actual policies in effect or derived using characteristics of typical policyholders or annuitants.   All characteristics will remain constant for the duration of the survey except those that are inflation-sensitive. These inflation-sensitive variables include the face amounts and account values. We believe that these monetary amounts should be adjusted periodically to account for the time value of money.

During repricing, insurance companies will be asked to provide estimated premiums or fees for fixed policies or annuities. By using this fixed policy methodology, a constant quality service is priced over time.

Derivation of prices for life insurance

As the first step in developing our methodology, we reviewed early research papers written during our previous attempt at this industry some years ago. Based on this preliminary research, we approached the industry by defining output to be measured as premiums less payouts, the same as

BEA's definition. Investment income was later added based on our knowledge that premiums alone do not cover claims.

Using this definition of output, we looked to the American Council of Life Insurance (ACLI) to discuss the proper price measure. After consulting with ACLI representatives as well as several life insurance companies and an actuarial consultant, we derived the following formula to represent the "price" of life insurance:

$$(Premium)(1 + r) = MC + EXP + P + C$$

where r = earned rate on investments, MC = mortality costs, EXP = expenses, P = profits, and C = contingency allowances

The left side measures the premiums plus return on investments while the right side measures the fees. Thus, pricing either side of the equation would measure the output of the insurance industries. While several industry representatives felt that the expenses would be the best measure of price, it would be impossible to obtain the required data for ordinary life policies like term and whole life. However, they agreed that premium plus the return on investments would be a fair proxy for price.

Thus, for term, whole, adjustable and group life, the type of price is a combination of the premium

The following is a list of the various fees assessed for provision of these policies. Not all fees may be applicable to the chosen policy. The sum of these fees is captured as the PPI "price."

(a) Premium expense charge - This is comprised of a sales charge and premium tax. The sales charge is compensation for agent commissions, advertising, printing, etc. It is a percentage of the premium. Premium taxes are also a percentage of the premium. Taxes are not deducted from the premium as they are seen as a cost of doing business.

(b) Cost of insurance – This is a charge, which covers anticipated costs of paying death benefits.

(c) Mortality & expense charge - This is a charge which covers the company's bearing the mortality and expense risks.

(d) Rider charge - This is a deduction for additional coverage for riders under the policy.

(e) Expense charge - This a charge that covers expenses incurred in administering an insurance policy.

(f) Investment management fee (*variable and variable universal life only*) - This is a fee assessed for the management of the portfolio of a variable life insurance policy. This fee is a percentage of the average daily net asset value of the portfolio.

(g) Interest spread (*universal life only*) - This is the difference between the interest income actually earned by the insurance company and the amount credited to the policyholder.

Derivation of prices for annuities

Although companies receive a consideration, or premium, for provision of an annuity, they only retain a portion of it. The other portion is invested on behalf of the annuitant. The price to be collected is the same for both individual and group annuities. All money invested, net of any fees and/or interest retained by the insurance company, is intended to be returned to the annuitant. The outputs from annuities are measured by fees and/or interest.

For variable deferred annuities, we were able to adapt our fee methodology used for universal and variable insurance. Fees charged for provision of these annuities are generally some percentage of the account value. These fees cover expenses, mortality risks, and investment management.

(a) Mortality and expense risk charge - This is a charge for mortality and expense risks. It is typically a percentage of the account value and can be expressed in terms of an annual percentage.

(b) Administrative charge - This annual fee is deducted from the annuity account value for the costs of administering the annuity.

(c) Investment advisory fee - This is a fee assessed for advisory services provided in association with the annuity portfolio.

Therefore, the total fees are the PPI "price". The earned rate on investments will be used to adjust the account values for repricing purposes. This rate will not be added to the 'price'.

For fixed-rate annuities, companies only earn revenue from the difference in the interest that they earn and interest that they credit to the annuitant. The difference is applied to the account value. In addition to this interest spread, companies may charge a flat administrative fee.

Immediate annuities seemed more difficult to price due to concerns with mortality costs. Companies say that the best measure for price change is their actuarial rate. This is the rate at which they derive the premium or consideration. It is calculated as the present value of the payment of one dollar every month for the expected duration of the annuity. It can be obtained by dividing the premium paid by the monthly payout or by taking the reciprocal of the payout rate per $1000. Companies say that this rate is loaded with expected expenses, profits, and mortality costs. An example is the sale of an annuity with a payout to the annuitant of $12 per $1000 of premium. The "price" paid by the annuitant to purchase the annuity is $83.33 per $1 of benefit (=$1000/$12).

Companies can also earn an interest spread as they do for fixed-rate annuities. Another option is to price the front-end load earned on the premium. This is typically a small percentage of the total premium.

Escalating policy and annuity values

As stated previously any monetary values are to be adjusted periodically so that they are always stated in terms of constant dollars. For term, whole, and group life policies, it is a fixed purchasing power that is being provided. The face amount of these policies represent that fixed benefit and it is that amount which is adjusted annually by the All Items Consumer Price Index (CPI). It is the account value that is adjusted by the CPI for universal and variable life policies. For these policies, the death benefit is some percentage of the account value and it is to be adjusted in accordance with the adjusted account values. For all of these polices, the company assumes all of the risk.

The CPI is used to adjust the account values for fixed-rate and immediate annuities as the benefits for these annuities are fixed as they are for the term and whole life policies. However, for variable annuities, the benefits will vary based on the performance of the underlying investments chosen by the annuitant. Thus, the annuitant assumes some portion of the risk. The appropriate escalator for the account value in this case is the company's earned rate on investments for the particular annuity.

E. Quality Adjustment

Explicit quality adjustment will be performed for demographic changes. Changes in demographics will be reflected in the mortality tables that insurance companies use to set their rates. Therefore, insurance companies will have the information to facilitate explicit quality adjustment.

Quality adjustment may also be performed for changes in the financial soundness of the insurer. Insurance companies receive ratings on their financial soundness from A. M. Best Company. PPI will annually purchase the insurance ratings from A.M. Best.

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