

The Treatment of Property-Casualty Insurance in the Canadian Consumer Price Index

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**This paper reflects the views of the author and not necessarily those of Statistics
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Introduction and Background: This paper is about the treatment of property-casualty insurance in the Canadian CPI, the three categories of such insurance being vehicle, homeowners' and tenants' insurance. The current treatment of insurance is explained in terms of scope, weight and pricing with comparisons to the discussion of insurance in the new international CPI manual.

The paper was motivated mainly by two events. First, Statistics Canada is reviewing its methods in light of the new CPI manual. Second, there has been significant public attention on property-casualty insurance in the Canadian CPI.

All insurance categories have increased considerably more than the All-items CPI in the last few years. Insurance industry sources have attributed rising vehicle premium rates to increased claims costs, including higher pain and suffering awards made in the justice system, higher hospital care costs (described as much higher "human body repair" than "auto body repair" costs), and, increased rates of fraudulent claims. Lower returns on investment of premiums (i.e. premium supplements) were also cited as a factor driving up premium rates by some analysts and commentators, although industry representatives have stated that this is not a major factor.

The criticisms of the Canadian CPI arose in part because timing problems caused some premium rate increases to be reflected in the CPI later than when the rate increases actually occurred, particularly for vehicle insurance. Lags in the provision of information to Statistics Canada on premium rate changes by some companies occurred. As a result, the premium rate increases that occurred in fact over a three year period were compressed into about an 18-month time period in the CPI. These timing problems should be avoided in future based on recent work with the insurance industry association and with individual insurance company respondents to ensure better and timelier reporting.

The Canadian CPI was also criticized as using inappropriate concepts and inconsistent methodology for property-casualty insurance. Some of these criticisms were that the Canadian CPI basket placed too much weight on insurance, that the price change should be not be based on

changes in gross premiums concept but rather on changes in “premiums less claims”, and that the CPI should hold the probability of occurrence of risk events constant in its pricing methods.

Scope in the Canadian CPI: Property-casualty insurance (homeowners’, tenants’, vehicle) categories are currently included in the Canadian CPI. Homeowners’ insurance is included in the official Canadian CPI since a homeowner-cost concept rather than rental equivalence method is used for owner-occupied housing.¹

Whole life insurance is excluded from the CPI, mainly because the investment element of whole life insurance cannot be separated from the term insurance component. Term life and disability insurance are currently not included in the Canadian CPI due to the practical difficulties of producing suitable price indexes rather than for any conceptual reasons. In practice some disability insurance is in fact reflected in the CPI via the vehicle insurance component since there is usually a disability insurance component in vehicle insurance premiums.

Health services received by the population via the publicly-funded health “insurance” system are excluded from the CPI. In some provinces these services are completely financed by taxes and therefore are treated as a public service. In other provinces, households pay public health “insurance premiums” but these are considered similar to income taxes (and in fact are often administered similarly to income taxes) and thus are outside the scope of the Canadian CPI.

Private supplementary health, pharmaceutical and dental insurances are not included in the CPI but are not excluded on conceptual grounds. To date, they are not reflected in the CPI due to the practical difficulties in producing price indexes for these services.

Scope in the new CPI manual: The concepts and scope chapter in the new CPI manual discusses insurance in paragraph 3.49. *“In the case of non-life insurance, the net premium is essentially a transfer that goes into a pool covering the collective risks of policy holders as a whole. As a transfer, it falls outside the scope of a CPI. In the case of life insurance, the net*

¹ However, for analytical and comparison purposes, data are published regularly using other conceptual treatments for owner-occupied housing including rental equivalence, money outlays and net purchase concepts.

premium is essentially a form of financial investment. It constitutes the purchase of a financial asset, which is also outside the scope of a CPI”.

The manual therefore considers the portion of premiums used to fund claims to be a transfer and outside the scope of the CPI. This would imply that the weights for non-life insurance in a CPI should exclude the portion of gross premiums that funds claims. This treatment apparently derives from a risk-pooling view of insurance, i.e. provision of insurance administration services on behalf of a population. As will be explained in this note, this is not consistent with the current treatment of non-life insurance in the Canadian CPI.

It seems that the subsequent discussion of insurance in the CPI manual in Chapter 10 is also not consistent with the scope statement for insurance in Chapter 3. If the portion of premiums used to fund claims is out of scope as stated in Chapter 3, then the only conceptually consistent weighting basis for insurance is premiums net of claims.

Weight of Property-Casualty Insurance in the Canadian CPI: The CPI for Canada uses gross expenditures on property-casualty insurance premiums of households as reported to the Survey of Household Spending or SHS (up to 1996 called the Family Expenditure Survey) as the basis of weights for vehicle, tenants’ and homeowners’ insurance categories. In the most recent basket update based on expenditures in 2001, vehicle insurance has about 2.7% of the total basket weight, homeowners’ (home and contents) insurance about 1% and tenants’ insurance 0.1%.

Insurance is weighted on the basis of gross premiums and expenditures on all other goods and services are supposed to be net of consumers’ purchases financed by insurance claims (this is the option in the CPI manual, paragraphs 10.159 and 10.160). In the Canadian SHS, households are asked to include expenditures on goods or services, and any “deductible” or co-insurance amounts paid by consumers but excluding the portion of purchases paid for or financed from claims. This approach is used to avoid reporting problems when the amounts financed by claims are not known to the consumer. For example, in Canada it is not unusual that the costs of vehicle repairs are sometimes negotiated and paid directly by an insurance company to the vehicle repair

garage. However, some respondents to the SHS cannot or do not always remember to exclude claims-financed expenditures so tradeoffs exist no matter how the questions are asked.

Note that expenditures on some forms of insurance associated with other specific commodities such as travel insurance or the purchase of extended warranties (a form of insurance) on vehicles or appliances are currently included in the CPI with the expenditure weights for these products. In practice, the product specifications for pricing purposes usually do not include insurance or extended warranties, at least for products for which only a minority of consumers buy such insurance or extended warranties. In effect, changes in the prices of the commodities themselves are used as proxies for changes in the prices of the associated insurance services.

Weights in the CPI Manual: The CPI manual discusses options for weighting insurance under the payments, use and acquisitions approaches in Chapter 10. Three plausible options are: 1. Gross premiums, net expenditures 2. Net premiums, gross expenditures and 3. Gross premiums, gross expenditures. The manual points out that not all proceeds from claims are used to replace or repair damaged items. Households can use the claims funds for other purposes and some claims are paid to non-households (businesses or government) to compensate for damage or destruction to their property, for example.

The Canadian CPI uses the first option (gross premiums, net expenditures) despite these problems. The property insurance weights in the Canadian CPI reflect gross premiums paid but weights for all other goods and services reflect expenditures reduced to the extent that Canadian households consider that insurance claims proceeds were used to purchase other goods and services. To date the third option (gross premiums, gross expenditures) has not been adopted because this option has been viewed as “double-counting” expenditures since it includes both gross insurance premiums as well as expenditures on other goods and services financed in part by the gross premiums. However, the gross premiums, gross expenditures option has some advantages and will be considered for future basket updates. The main advantage of this option is that response to the Survey of Household Spending would be simpler, avoiding problems of inconsistent exclusions of claims-funded expenditures.

Measurement of Price Change for Insurance in the Canadian CPI: In the case of property insurance, the Canadian CPI measures price change by tracking gross premium rates for a sample of insurance policies. For example, for vehicle insurance, the method uses samples of insurance companies, of geographic regions, of driver profiles (age, gender and usage of vehicle and driving records), and of classes of vehicles, for insurance policies with fixed characteristics (such as deductible levels, any other co-insurance provisions, liability maximums, and other policy provisions). The policy characteristics and samples are updated periodically as judged necessary. Statistics Canada has recently updated these samples, based partly on data and advice from the Insurance Bureau of Canada.

No attempt is made to hold constant total expected claims costs of insurers. Adjustments are not made for changes in the probabilities of claims nor for “changes in the prices and repair costs of insured goods and altered health service prices” (Ralph Turvey, see Appendix of this paper). Therefore, the “quality” which is being held constant is the “security of the consumer, rather than the volume of the repairs, replacement and health treatment paid for by claims.” (Turvey)

In the case of homeowners’ insurance, the index measures changes in the cost of insuring a fixed stock of dwellings against a specified list of risk events or perils. This cost varies not only with changes in insurance rates for given property values, but also with changes in the values of properties covered which result from changes in dwelling prices. Thus, the price of homeowners’ insurance is estimated from the product of two component index series. The first measures the change in the value of properties as measured by the house component of the New Housing Price Index. The second component index measures the change in insurance rates of identical insurance policies for properties of given constant value, using premium rate information from insurance companies in the sample.

Discussion of the Current Approach: The insurance price indexes in the Canadian CPI reflect changes in the price to consumers of obtaining insurance coverage against the economic consequences of a specified list of perils, based on changes in gross premiums for a sample of identical (or at least very similar) insurance policies. By comparing changes in premiums of identical insurance policies, the methods used ensure that the Canadian CPI does not reflect as

price change the impacts of any changes in the type of property or in the population being insured. For example, the vehicle insurance price index will not change due to changes in the mix of vehicles or demographic profile of the driving population.

Insurance premiums provide the funds from which claims are paid out. Premiums also compensate insurance companies for the services they provide (the ‘implicit service charge’). These insurance services include setting premium rates, collecting premiums, investing premiums (i.e. earning the “premium supplements”), and settling claims fairly (including minimizing fraudulent claims).

The current Canadian method reflects any change in gross premiums for an identical policy (i.e. with all contract details and conditions including driver and vehicle classes held constant) as a price change, whatever the reason for the change. Premiums for policies can change as a result of changes in expected claim values (arising from changes in the probabilities of the occurrence of risk events or in the value of claims arising from risk events occurring) or changes in the implicit service charges of insurance companies for administering insurance.

The method used is partly based on pragmatism. The gross premium rates for insurance policies are observable and, despite the recent timing problems, usually available in the time frame required for a CPI. However there is no direct method of holding constant some or all of the expected claims costs. In other words, there is no method available for determining whether a change in premiums is due to changes in the level of expected claims, changes in “premium supplements” or changes in the implicit service charge.

Consider the range of factors affecting risks which can cause changes in premiums in vehicle insurance for example. Expected claims costs are affected by changes in the probabilities of the perils and in the likelihood that a claim will be made, and in the level of payouts for claims. Changes in the probabilities of the occurrence of risk events are the result of many factors including highway and vehicle design, the amount of traffic congestion, even levels of enforcement of speeding laws. The probability of a claim being made is affected by changes in the willingness of potential claimants to make, or not make, a claim when legitimately entitled to

do so. Drivers often face the choice of making a claim and risking personal rate increases or not making a claim and keeping a clean record with their insurer. As well, the probability of claims is affected by the rate of fraudulent claims. The average payout level of claims is affected by many factors, including changes in replacement and repair costs of property insured, health care costs, income levels (affecting payout for time lost from work) and even changes in the justice system in making awards for pain and suffering claims.

Jack Triplett² calls the two views of insurance the risk-assuming and risk-pooling views (the latter reflected in the 1993 System of National Accounts). The scope statement discussed earlier takes the risk-pooling view. “In the risk-assuming view of insurance, the policy holder buys the service of having assets or income protected against loss” (Triplett). The Canadian CPI treatment is consistent with the risk-assuming view of insurance.

It is how insurance services are defined that becomes the key issue in the debate in its CPI treatment. In effect the Canadian treatment of property insurance views insurance as a form of “replacement guarantee”, that is, property insurance from the consumer point of view is “considered the price of a guarantee that goods will be restored or replaced up to specified limits, in cases such as accident, fire and theft.”³ Risks transferred to insurers include the economic costs arising from loss or damage to property, the costs of health care and rehabilitation, loss of income due to personal injury arising from an accident, and liability for property damage or injuries to others. Change in price of insurance becomes any change in the price of providing the replacement guarantee within the terms and conditions of the insurance policy.

Much debate at Statistics Canada has been on the question of what should be “held constant” for insurance. The current treatment in the CPI is said to hold constant the “level of security”.

² “Chapter Six: Price, Output and Productivity of Insurance: Conceptual Issues in Services” in Productivity in the United States, New Sources of Economic Growth, Jack Triplett, Brookings Institution, pending.

³ Canadian CPI reference manual, 1957 and subsequent editions.

Bohdan Schultz⁴ suggested approaching the problem from the perspective of the services rendered to the consumer; for example vehicle insurance as a component of private transportation services. The Canadian CPI has ten component indexes that comprise an index for private transportation services, including purchase and leasing of automobiles, gasoline, vehicle parts and supplies, maintenance and repair services, and insurance. From this perspective, any change in vehicle insurance premiums for an identical policy, whether due to changes in the probabilities of claims, in the average costs of claims or in the implicit service charges of insurance companies, would not change the amount or quality of private transportation service received by consumers and thus should be considered price change.

The opposing risk-pooling view is that any changes in premiums due to changes in expected levels of claims should not be considered to be price change but rather a change in the size of the pool of funds needed to pay claims. If insurance is the administering of the pool of funds, then changes in premiums to provide the pool of funds are not price changes.

The Purposes of the CPI and the Treatment of Insurance: In this situation of two quite different views of the definition of insurance services, we consider the question in light of the purposes of the CPI. While the official Canadian CPI is a multi-purpose indicator, the primary role of the Canadian CPI is stated to be “to provide an adequate indicator of price-induced changes in the purchasing power of the consumer dollar”.⁵ This has been paraphrased as “to estimate price-induced changes in living costs, a role which is frequently referred to as the escalator function.”⁶ An index using gross premiums for weights and price change rather than a ‘net of claims’ measure seems more consistent with this primary purpose of the Canadian CPI as an escalation index.

If the primary purpose were different, other methods for weights would seem to be more appropriate. Keith Woolford of ABS has stated that “changes in gross premiums alone would

⁴ “Alternative Estimates of Price Change for Private Transportation”, Bohdan Schultz, 5th Meeting of Ottawa Group, 1999, Reykjavik Iceland. The point is also mentioned in Triplett, op. cit. Section V.

⁵ CPI Reference paper

⁶ Bohdan Schultz, “Treatment of Owner-Occupied Accommodation in the CPI”, Discussion Paper, 2001.

be relevant in the construction of an index designed to measure changes in household living costs because the amounts received by way of claims are not relevant as they are regarded as sources of income. Another way of looking at this is ...in constructing an inflation index, it is important that each item in the index is accorded a weight which reflects its real economic significance, while in constructing a living cost index it is important that each item be accorded a weight which reflects its relative share of gross household expenditures”.⁷ The Australian Bureau of Statistics defines the principal purpose of the Australian CPI as to provide a general measure of price inflation for the household sector as a whole. The Australian CPI uses a net ‘premiums less claims’ weight for insurance but movements in gross insurance premiums as the price measure.

So it is argued that a gross premiums weight is appropriate for an escalation index. But what does that imply that pricing insurance for an escalation index? Adherents of the risk-assuming view argue that changes in the purchasing power of the consumer to buy a fixed level of security are best measured by changes in gross premiums.

But supporters of the risk-pooling definition of insurance in Statistics Canada argue that changes in premiums arising from changes in the size of the risk pool are not related to the price of insurance services at all. Even if the weight is based on gross premiums, the risk-pooling definition of insurance implies a pricing measure based on the implicit service charge only.

Discussion of the New CPI Manual on the Pricing of Insurance: The manual in Chapter 10 discusses pricing gross insurance premiums in paragraphs 10.167-170. The CPI manual appears to take the position that it would be desirable to make quality adjustments for changes in risk levels but in practice this is usually not done due to the practical difficulties.

10.168 While it is clear that pricing to constant quality requires these conditions to be held fixed, there is also a question about whether the risk of a claim being made should be held constant. In other words, if the incidence of, say, vehicle theft increases, should this be regarded as a quality improvement or simply a price change? If, on the one hand, it is argued that as the consumers’ decision to insure is based on their assessment of the likelihood of suffering a loss compared to

⁷ “Treatment of Insurance Services in the Australian CPI, ABS Website.

the premium charged, the risk factors should be held constant. On the other hand, it may be argued that, once insured, the consumer simply expects to be compensated for any loss. From the perspective of the consumer, any increase in risk simply represents an increase in the insurer's cost base (which may or may not be passed on to the consumer by way of a price change). Obtaining data of sufficient reliability to make quality adjustments in response to changes in risk is problematic, so in practice most indices reflect changes in risk as a price change.

This paper suggests that it is not necessarily desirable to make quality adjustments for changes in risk, depending on the definition of insurance service and the purpose of the index.

In any case, it appears that no practical price measurement methodology for the implicit service charge component of insurance has yet been developed for use in a CPI. There is simply no directly observable price for the implicit service charge element of insurance. In fact, if the implicit service charge were the target concept for measurement, one could argue that an administration or management services index would be a reasonable pricing basis to use.⁸

Gross premiums of a consistent set of insurance policies are directly and objectively observable and so far this approach seems to be the only practical option for CPI measurement purposes. Even in countries where the implicit service charge is the target concept for insurance in the CPI, gross premium rates are used as a proxy price indicator. There are significant advantages in public acceptance and credibility for the CPI to use pricing methods based on observable transactions. The “implicit service charge” approach to insurance in the CPI would suffer from a lack of identification by consumers with the definition of the product being priced in the basket.

A Short Digression on Fraudulent Claims and the Implicit Service Charge

The implicit service charge component of insurance is the “fee charged for calculating the risks, determining the premiums, administering the collection and investment of premiums, and the

⁸ Z. Griliches made this point. See Section V of Triplett, “Chapter Six: Price, Output and Productivity of Insurance: Conceptual Issues in Services” in Productivity in the United States, New Sources of Economic Growth, Brookings Institution, pending.

payment of claims (paragraph 3.47 in CPI manual). Insurance services are calculated as gross premiums plus premium supplements less claims less changes in actuarial reserves.

Should the implicit service charge concept exclude fraudulent claims? Honest consumers would want (and expect) insurers to minimize the paying of fraudulent claims as part of the service of administering insurance. If the rate of fraudulent claims were to increase causing an increase in premium rates, any price measure of the implicit insurance service to consumers should increase as well. However, the definition of the implicit service charge seems to exclude all claims, legitimate and fraudulent alike. I would argue that any CPI measure of the implicit insurance service charge should include fraudulent claims as part of that charge. However, measuring the level of fraudulent claims is very difficult and any feasible pricing method may have to assume a constant level of fraudulent claims for practical purposes.

Concluding remarks: The “gross premiums, net expenditures” weighting approach used for insurance in the Canadian CPI seems more appropriate than “net premiums, gross expenditures” weights given the primary purpose of the index. The “gross premiums, gross expenditures” approach is a possible alternative weighting basis that may be adopted in Canada. Weights based on net premiums and gross expenditures would be more appropriate if the “implicit service charge” concept of insurance were adopted.

Price change for insurance is currently measured based on changes in gross premiums, holding all insurance policy provisions constant but not the risk probabilities or levels of payouts of claims. Thus the “security of the consumer” is the quality being held constant and any changes in risk factors reflected in premiums are reflected as price change. This seems appropriate as a reflection of the price to consumers of the insurance input to private transportation services. When vehicle insurance is viewed as a cost of owning and operating a private vehicle to obtain private transportation services (or tenants’ insurance is viewed as a part of the cost of obtaining rental shelter services), any change in gross premiums is seen as a change in the price to consumers of the service purchased, whether the premium change arises from a change in the implicit service charge or in expected claims.

Changes in risk probabilities affect the level of expected claims. Therefore, if one wants to hold risk factors constant, it is conceptually equivalent to pricing only the “implicit service charge” of insurance. Given the diversity of the risk factors, their effects through time and the difficulties of measurement (even more difficult for the timely requirements of a non-revisable CPI), there is no practical direct method of pricing the change in insurance premiums holding all risk factors constant. The best apparent method of measuring the implicit service charge only that is conceptually defensible and practical might be some form of management services proxy.

This paper argues that even if a direct method of holding all risk factors constant could be developed, it would not necessarily be desirable for the purposes of the official Canadian CPI, based on a risk-assuming definition of insurance services. Tracking changes in the gross premiums of insurance policies of constant terms and conditions without adjusting for risk probabilities is the most appropriate method for a CPI whose primary purpose is to reflect changes in the purchasing power of the consumer dollar. .

Appendix 1: Ralph Turvey: Note on Insurance, extract from his website

Life insurance and pension fund contributions are not appropriately included in a consumer price index, but there seems to be general agreement that household expenditure on insurance which provides some reimbursement of expenditure on medical or emergency services or on the repair or replacement of damaged or stolen goods ought to be included. There appear to be two alternative internally consistent methods of doing this:

- 1) **Net net.** The weight should be payments less claims paid and less changes in actuarial reserves. This net amount equals insurance companies' costs and profits for the service they provide:- collecting premiums and paying claims. Similarly, the price indicator should relate only to net premiums. Household expenditure on cars, furniture, health services etc., which are paid for by insurance claims would then be dealt with in the same way as all other expenditure on these things.
- 2) **Gross gross.** The weight should be gross premium payments (the weights in the rest of the index for expenditure on health services, cars, furniture, etc., excluding the part paid for by insurance claims) The price indicator should correspondingly relate to gross premium payments.

(1) measures the service charge, the cost of the administrative functions and risk-pooling provided by insurance companies. A rise in repair and replacement costs, in health service prices or a rise in risks will not raise this component of the index unless accompanied by an increase in the companies' costs or profits.

(2) could measure the cost to consumers of buying a constant amount and quality of repairs, replacements, health services etc through the intermediation of insurance. A premium increase reflecting higher prices of these services as well as higher insurance company administrative costs and profits would raise the index, but a premium increase reflecting increased risks should not. On the other hand, looking at the issue purely from the consumers' point of view, it could measure the cost to them of preserving a certain level of security against the financial consequences of ill health, fire, accident and theft. In this case, not only a rise in health service prices or repair and replacement costs but also an increase in risks would raise the index, reflecting a greater cost to consumers of obtaining the level of security which they had in the reference period.

The choice made must depend upon the relative feasibility of these alternatives. Since this will vary between countries for institutional reasons, no generalisations can be offered. The main issues are as follows:

- Is it easier (1) to establish weights which do not distinguish expenditure financed by insurance claims from other expenditure and to deduct claims paid from premiums to obtain a weight for net premiums, than it is (2) to establish weights reflecting gross premium payments and to exclude from expenditures on health services, cars, furniture, and so on, those which are financed by claim payments?
In (2), claims paid to reimburse consumers will have to be deducted from those of their expenditures which the claims helped to finance. In (1) it is the other way round; claims paid on consumers' behalf directly to the suppliers of repairs, replacements, medical treatment, and so on, will have to be added to their own expenditures. In (1), in order to obtain net premium payments from the gross payments recorded in a household survey, the share of gross premium payments in the reference period which were received back as claim payments or added to reserves will have to be ascertained from insurance companies or estimated from their published accounts.
- In (2), gross premiums must be ascertained for a sample of policies holding constant such characteristics as deductibles and, maybe, (with more difficulty) risk
- Gross premiums are fixed by insurance companies in the light of their risk expectations and the competitive situation. In any month some of the claims settled will be on policies taken out in a previous year and claims on some of the policies for which premiums are currently paid will not be settled until a future year. How can a monthly index of the cost of the administrative and risk-pooling service provided by insurance companies, as required by (1), be calculated?
- The actual cost of the service in any year, if defined as that year's premiums less that year's claims paid, can be negative in years when claims exceed premiums. The difference is covered by a reduction in insurance companies' reserves. The companies fix premiums so that, together with interest earned on their reserves, they cover expected claims plus the expected cost of the service, including normal profits *on average over future years*.
This problem might be resolved by dividing the year's total value of claims by the actual average number of claims per policy in the year and multiplying by the average number of

claims per policy computed for the past five years.

- An index of the cost of the insurance cover provided by insurance companies, as required by (2) requires the measurement of premiums for a sample of clearly specified types of insurance. The question then arises whether the gross premiums should be quality adjusted for changes in risks as well as for changes in the prices and repair costs of insured goods and altered health service prices. If not, correction would be limited to the changes in health service prices and the prices and repair costs of the goods insured, thus accepting any increase in premiums stemming from increased risks as a price increase. In this case the premiums on a sample of insurance policies for specified objects would each be deflated by an appropriate price sub-index. Alternatively, no correction would be made, in which case the quality being held "constant" would be the security of the consumer, rather than the volume of the repairs, replacement and health treatment paid for by claims.⁹

Faced with all these problems, most countries estimate a sub-index for *gross* premiums, unadjusted for changes in risk, but give it a *net* weight. Gross premiums are thus treated as a proxy for net premiums. This approach has been adopted in the European Harmonised Index of Consumer Prices, the text of the relevant Regulation being available at. europa.eu.int/eur-lex/en/lif/1999/en_399R1617.html

Adoption of this sensible practicable approach raises a problem when insurance premiums are subject to taxation levied on the gross premiums. Adoption of the sensible practicable net-weight, gross-premium approach raises a problem when the gross premiums are taxed. The solution is to decompose the net service charge weight into two components: the charge before tax and the tax. The first component then provides the weight for gross premiums before tax, and the second component provides the weight for the tax.

⁹ Even an indicator of this latter type can be complicated. The article "The measurement of liability insurance premium trends and their inclusion in the French consumer price index" by A. Marret, reprinted in the appendix of the 1989 ILO Manual, explains how such an indicator can be calculated.