

Loss reserving

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Volume 50, Number 3, 1982

URI: <https://id.erudit.org/iderudit/1104183ar>

DOI: <https://doi.org/10.7202/1104183ar>

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Publisher(s)

HEC Montréal

ISSN

0004-6027 (print)

2817-3465 (digital)

[Explore this journal](#)

Cite this document

Murray, J. (1982). Loss reserving. *Assurances*, 50(3), 281–289.
<https://doi.org/10.7202/1104183ar>

Article abstract

À plusieurs reprises, nous avons présenté à nos lecteurs le problème des réserves pour les sinistres en cours de règlement. Nous avons dit à quel point l'essor et la survie même de l'entreprise d'assurance étaient liés à une politique prudente et suivant de très près l'évolution du dossier. C'est avec grand plaisir que nous accueillons aujourd'hui l'article de M. J.B.M. Murray, l'un des actuaire de notre groupe qui, lui, va beaucoup plus loin dans l'étude du sujet. Il montre la marche du dossier à travers les années, tant qu'il n'est pas réglé. Si son travail se rapporte principalement à l'assurance de responsabilité, il souligne combien l'avenir d'une société d'assurance est lié à sa politique de règlement, surtout en période d'inflation. Car celle-ci se manifeste non seulement dans le montant final du règlement, mais encore dans l'augmentation des frais. Et c'est pourquoi une société bien dirigée doit avoir une méthode de règlement suivie de très près par des gens d'expérience et d'une grande prudence. À tel point que la politique de réserves est vraiment la pierre d'achoppement d'une entreprise d'assurances, en particulier quand le marché financier est constamment perturbé par des événements sur lesquels l'assureur n'exerce aucun contrôle ou aucune influence.

Loss reserving

by

J.B.M. MURRAY⁽¹⁾

À plusieurs reprises, nous avons présenté à nos lecteurs le problème des réserves pour les sinistres en cours de règlement. Nous avons dit à quel point l'essor et la survie même de l'entreprise d'assurance étaient liés à une politique prudente et suivant de très près l'évolution du dossier. C'est avec grand plaisir que nous accueillons aujourd'hui l'article de M. J.B.M. Murray, l'un des actuaires de notre groupe qui, lui, va beaucoup plus loin dans l'étude du sujet. Il montre la marche du dossier à travers les années, tant qu'il n'est pas réglé. Si son travail se rapporte principalement à l'assurance de responsabilité, il souligne combien l'avenir d'une société d'assurance est lié à sa politique de règlement, surtout en période d'inflation. Car celle-ci se manifeste non seulement dans le montant final du règlement, mais encore dans l'augmentation des frais. Et c'est pourquoi une société bien dirigée doit avoir une méthode de règlement suivie de très près par des gens d'expérience et d'une grande prudence. À tel point que la politique de réserves est vraiment la pierre d'achoppement d'une entreprise d'assurances, en particulier quand le marché financier est constamment perturbé par des événements sur lesquels l'assureur n'exerce aucun contrôle ou aucune influence.

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1. Introduction

Reserves for unpaid claims represent a large portion of a property and casualty company's liabilities, and therefore the whole subject of loss reserving is of major importance in a company's operations. If the reserves for unpaid claims are inadequate to any appreciable extent a chain reaction may be started which will have serious repercussions throughout the entire company's operations and from which it may be very difficult for the company to recover.

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The first effect of inadequate loss reserves is, of course, that the Annual Statement for the company will give a better than true picture of the company's trading position. This, in turn, may induce the company to relax on its underwriting standards or to institute lower rates than are actuarially necessary. The effect of this may not be determined until a couple of years have gone by, and by this time the company will have been operating at uneconomic rate levels for an extended period of time. And when a company gets too far behind in its rate level it can often take a couple more years to catch up.

282 The effects of low rates has another serious consequence, because lower than necessary rates mean lower than necessary unearned premium reserves. When the seriousness of the situation is finally being recognized along comes the reinsurer, whose treaty results for the current year have been hit by increased reserves on prior years' losses, and he demands corrective terms for treaty renewal, just when the company is struggling desperately to get back to economic trading.

It can thus be seen that a serious loss reserving inadequacy can be a major problem for a property and casualty insurance company and one to be avoided at all costs.

That the problem is real is, of course, occasioned by the fact that the loss reserves are estimates and cannot, as in the case of unearned premium reserves, be calculated exactly. Thus it is virtually impossible to produce absolutely accurate loss reserves for all classes of business year in and year out. We are dealing with estimates of the future consequences of past events, we are dealing with all the vagaries of human nature and the multitude of different effects which injuries can have on individuals of different ages and different social positions. The best we can hope for is that the reserves which are set up at the end of the year's transactions will prove to be within an acceptable range of the the true claim cost when all the claims are settled and when the exact cost is finally accurately known.

2. **Kinds of reserves**

Case reserves are the reserves which are allocated to individual claim files by the claims examiner. These are determined on a case by case basis following a consideration of the injury or dam-

age caused in the accident, the degree of liability, the extent of coverage, and so on. An initial reserve will be set up when the claim is first reported and this reserve will be adjusted as necessary when the full details become available. Periodically throughout the life of the claim the case reserve will be reviewed and adjusted until the claim is finally closed and the reserve reduced to zero.

For some classes of business where the size of the claim usually only varies within a narrow range, and where there is a large number of such cases, it is the practice of some insurers to use formula reserves. Automobile comprehensive claims would be a good example. From past experience the average cost of such claims can be approximately determined and this figure (adjusted regularly for inflation) can be used on all reported claims in that class. Under this method it is usual to transfer formula reserves to case reserves where there is an exceptionally large loss, or where a loss has been outstanding for an extended period.

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All claim reserves, whether case or formula, should of course include not only the amounts expected to be paid to, or on behalf of, the insured, but also any amounts expected to be paid to independent adjusters, lawyers, engineers, etc., who may be retained to assist in the settlement of the claim. Such expense items are referred to as Allocated Claim Expense since such expense items relate specifically to an individual claim file, ie. the expense is allocated to that particular claim file.

3. Comprehensive IBNR

When the last day of the accounting period has been reached and the books are closed for the period, it is necessary that the reserve to be set up will be sufficient to cover all future payments on all losses which have occurred on or before the last day of the accounting period. This reserve must be sufficient to cover the following items :

1. All claims which occurred before year-end and for which case reserves and/or formula reserves have been established in the records prior to year-end.
2. Claims which have occurred before year-end but which have not yet been reported to the company.
3. Claims which were closed prior to year-end but which are re-opened subsequently.

4. Increases (or decreases) in reserves which were established prior to year-end.
5. Claims which have occurred prior to year-end and have been reported to the company prior to year-end, but which have not yet been recorded in the company's books prior to year-end.

Item 2 is the true or pure IBNR — the incurred but not reported losses. Item 5 is the RBNR — the reported but not recorded losses. Items 2, 3, 4 and 5 together make up the Comprehensive IBNR or CIBNR.

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It will be seen therefore that in order that a company may have adequate reserves, the case reserves (and formula reserves) and the Comprehensive IBNR must be adequate on the last accounting day of the year in which the loss occurred. If these reserves are not adequate on that day they will NEVER be adequate. The increase of a reserve subsequent to that date has to be paid out of subsequent revenue. Failure to realize the importance of this fact is the root cause of many companies reserving problems. Some companies consider a claim file to be adequate if the total payments are less than the reserve carried on the closing date of the file. This is only true in those cases in which the loss is settled in the same year in which it occurred. In all other cases it is a fallacy. The correct adequacy test must ALWAYS be related to the reserve which was carried on the last day of the year in which the loss occurred.

4. Striving for adequacy

In setting up a new claim file it often happens that there is insufficient information available to determine an accurate reserve. Some companies then set up a nominal reserve knowing that this will be reviewed and adjusted when the adjuster's detailed report is received. Others set up an average reserve. In such cases it is most important to abeyance the file in order to make sure the reserve is corrected within, say 30 days. However, if in the meantime the year-end date is going to intervene, it may be necessary to telephone the adjuster (especially in bodily injury cases) before the books are closed to ensure that a realistic reserve is applied. Many companies fail to do this with resulting loss of reserve accuracy.

In fact it is my recommendation that during December of each year, independent adjusters and lawyers be asked to update the reserves on all open files they are handling and the company examiners should then make sure that these claims and all other bodily injury and large claims are reviewed for reserve revisions before year-end.

Where formula or average reserves are adopted it is most important that they be kept up-to-date. It is a good practice to have a cumulative statistical exhibit of average opening reserves by class and coverage produced each month and which should be reviewed each month or each quarter to make sure that opening reserves are keeping up with inflation.

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In setting up opening reserves some companies use a figure corresponding to the amount which would likely be paid if the loss were to be settled immediately. This is not really good enough for bodily injury claims. An estimate should be made as to how long it is likely to settle the claim. Hospital, medical, nursing and other costs must be estimated for the relevant period, plus loss of wages, plus an allowance for inflation, interest, and adjusters', legal and possibly court costs. It must always be remembered that it is the *ultimate* cost of the claim that is the target figure.

Some companies take the estimated degree of negligence into account in setting the reserve. This is probably acceptable if there is no doubt about the split, but otherwise a conservative approach calls for the assumption of 100% liability.

Estimated recoveries from other sources may be taken into account in setting the net reserve, but, again, if there is any doubt the conservative approach should be taken. If expense must be incurred in order to effect the recovery then that expense should be included in the reserve. It is not permissible to set up negative reserves even if you are certain that the recovery will be greater than the cost of the claim payment. In such cases, a small nominal reserve may be established.

Prior to year-end it is also a good idea to carry out a file-by-file comparison with a computer run of outstanding claims. This will bring to light many discrepancies, some of them possibly serious. It will often be found that claims have been closed yet an outstanding amount still appears in the computer records. Sometimes it will bring to your attention claims which have eluded your abeyance system — often with serious results.

Sometimes in reviewing a file the claims examiner may think that, because there has been no activity, the claim file can be returned to file without changing the reserve. This is not so. The very fact that the claim is still open probably means that hospital and medical charges and wage losses are continuing. The fact is that an increase in reserve is probably called for.

286 One of the most important jobs during the last few days before closing off the year is to ensure that all claims which have been reported, whether by mail or telephone, get entered in the books, even if only average or nominal reserves can be applied. If there are any serious-looking bodily injury claims, it is probably worth a phone call to the adjuster to get up-to-date information.

Proper attention to efficient claims setting goes hand in glove with adequate reserving practices — the two are inseparable. On the one hand, in order to establish an accurate reserve the entire file must be studied in detail and that review may indicate something that should be done in order to get a better settlement, and on the other hand the regular review of outstanding claims will enable the examiner to carry more accurate reserves.

5. Dates of claims

There are several dates associated with claims and IBNR calculation :

The accident date is the date on which the accident occurred. The accident year is the year in which the accident occurred.

The report date is the date on which the claim is reported to the company.

The accounting date or coding date is the date on which the claim is actually entered into the company's records.

The valuation data is the date on which claim information is reviewed for reserve purposes.

The closing date is the date on which the claim is closed and the reserve deleted from the claim records.

6. Data required for loss reserve analysis

The basic data required is the number and amount of paid losses, outstanding losses and incurred losses by class of business

by accident year for each year of development. Automobile claims should preferably be sub-divided into BI & PD and Physical Damage and possibly also the Physical Damage should be split between Collision and Comprehensive. The classification depends on the size of the company. The aim is to group together as many claims as possible provided they exhibit approximately the same characteristics as to frequency and average size of claim. In other words, we want groups of claims which are homogeneous in nature and sufficient in number to provide credibility.

The claim data must of course include allocated claims expense. Paid losses should show (a) closed claims and (b) partial payments on open claims. Losses should be direct gross of reinsurance.

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In addition, it is useful to have information on large or catastrophe claims, earned premiums and earned exposures. Where the classification or grouping corresponds to industry statistics then it is also of value to compare the industry data on frequency and severity.

Table I, II, III and IV show examples of paid, outstanding, number of outstanding and incurred losses in a format that can be utilized for the calculation of loss development. They are referred to as loss development triangles. The first column shows the accident years involved and columns to the right show the successive development of the losses which occurred in each accident year.

For example in Table I the paid losses for accidents which occurred in 1977 amounted to \$153,690 as of 31st December 1977. The 12, 24, 36 ... at the head of the columns indicate the number of months development calculated from the beginning of the accident year. For 1977 accidents the paid losses had increased to \$277,350 at stage 24 which for 1977 accidents is 31st December 1978. Note that these paid losses are cumulative.

Table II shows the outstanding loss amounts at corresponding dates. These figures are, of course, not cumulative since they represent the case reserves at a particular point in time. Thus the total outstanding losses for accidents which happened in 1979 were \$789,360 as at 31st December 1980 and \$558,450 as at 31st December 1981.

The valuation date of these losses is seen to be 31st December 1981, since the latest figures shown are for 12 development months

for accident year 1981. If we want to know the total outstanding reserves as at 31st December 1981 for all accident years we would add the figures on the diagonal $\$675,920 + \$1,123,740 + \$558,450 + \$279,000 + \$57,000 = \$2,695,110$.

The number of outstanding losses at each development point is shown in Table III and Table IV exhibits the incurred losses which are obtained by adding corresponding figures of paid plus outstanding from Tables I and II.

288 These tables represent a very simple case where we are dealing with 5 years' development. Normally we should require a minimum of 8 or 9 years of development, especially for bodily injury liability claims — the so-called long tail lines. However, these tables enable us to calculate a comprehensive IBNR by studying the exhibited loss development and, of course, taking into account any factors which affect the development but which are not accounted for in the figures.

We have mentioned that loss reserves are estimates and it follows therefore that a large measure of judgement must be employed in the determination of the final CIBNR to be included in the company's accounts for the year. The exercise of this judgement will require a wide knowledge of the company's operations, particularly information as to changes in procedures in the Claims department and possibly also changes which may have occurred in its underwriting philosophy. For example, if a company which had previously only written standard general liability were to broaden its scope by writing medical Malpractice or products liability on aircraft parts, it is obvious that future loss development patterns will undergo exceptional changes. Similarly of the Claims department, perhaps by the addition of extra staff, were to settle losses very much more expeditiously than in the past, or if they have put into effect new procedures with a view to providing more accurate reserves, then some judgment adjustments would require to be made in the calculated CIBNR to compensate for these changes.

ASSURANCES

**Table I
PAID LOSSES**

Accident Year	Months of Development				
	12	24	36	48	60
1977	153,690	277,350	379,440	394,680	460,740
1978	176,880	309,000	437,010	577,410	
1979	203,640	356,250	565,890		
1980	232,350	409,740			
1981	268,470				

**Table II
CASE RESERVES**

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Accident Year	Months of Development				
	12	24	36	48	60
1977	94,200	197,400	124,740	124,740	57,000
1978	127,500	283,680	379,500	279,000	
1979	172,230	789,360	558,450		
1980	483,750	1,123,740			
1981	676,920				

**Table III
NUMBER OF OUTSTANDING CLAIMS**

Accident Year	Months of Development				
	12	24	36	48	60
1977	230	144	68	30	17
1978	280	176	91	60	
1979	339	225	117		
1980	410	277			
1981	500				

**Table IV
INCURRED LOSSES**

Accident Year	Months of Development				
	12	24	36	48	60
1977	247,890	474,750	504,180	519,420	517,740
1978	304,380	592,680	816,510	856,410	
1979	375,870	1,145,610	1,124,340		
1980	716,100	1,533,480			
1981	945,390				