DEDUCTIBLE AND EXCESS COVERAGES LIABILITY AND PROPERTY DAMAGE LINES, OTHER THAN AUTOMOBILE

BY

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Relatively few risks under the various Liability and Property Damage lines, other than Automobile, have been written in the past on either a deductible or an excess coverage basis. There is, however, a growing trend toward writing certain types of risks under these lines of insurance on a deductible basis. The reason why these forms of coverage have been given such scant consideration as underwriting tools is undoubtedly that most casualty insurance men are unfamiliar with them as applied to the miscellaneous Liability and Property Damage lines. The advantages of writing deductible or excess coverage in certain cases remain unappreciated because of a lack of knowledge of the mathematical derivation of the discounts, the method of applying the discounts to the basic rates, the method of experience rating such risks, etc. The purpose of this paper is to assemble the available data which may be published in order that there may be a more general understanding of the rate structure for deductible and excess coverages.

First, it would be well to define the coverage provided by policies written on a deductible or on an excess basis.

Deductible Coverage

The insurance company investigates, defends and settles all claims, paying total first aid medical, total allocated claim adjustment expense, and any indemnity in excess of the assured's retention of liability, subject to the limits of the policy.

The assured pays all indemnity up to the amount of his retention of liability per claim or per accident. In actual practice, the insurance company usually pays the total loss and subsequently secures reimbursement from the assured for his portion of the indemnity loss.

Excess Coverage

The assured investigates, defends and settles all claims not in excess of his retention of liability per claim or per accident.

The insurance company cooperates in the investigation, defense and settlement of such claims only as are necessary for the protection of its interests. The insurance company pays any allocated claim adjustment expense thus incurred by itself and any indemnity in excess of the assured's retention of liability, subject to the limits of the policy.

Deductible coverage is usually written for relatively small amounts of assured's retention of liability in connection with risks which experience a high claim frequency. This gives the assured a direct interest in controlling accidents and tends to make desirable risks which might be uninsurable on a full-coverage basis. On the other hand, excess coverage is usually written for high amounts of assured's retention of liability for risks which desire to self-insure all except the more costly claims or catastrophe losses. In Part I of this paper, deductible coverage will be discussed. Excess coverage will be treated in Part II.

PART I — DEDUCTIBLE COVERAGE

Distribution of Losses by Size of Claim

In order to calculate rates for deductible coverage, it is necessary to compile a distribution of incurred losses by size of claim, \$1-\$10, \$11-\$25, etc. The discounts currently in use were calculated from the following compilations of such data by line of insurance for claims settled in calendar years 1925 and 1926:

Line of Insurance (1)	Claims Settled in Calendar Years: (2)	Territorial Subdivisions (3)	Classification Groups (4)
Elevator P. L.	1925-26	Countrywide	Total
Elevator P. D.	1925-26	Countrywide	Total
Mfrs.' & Contrs.' P. L.	1925-26	Countrywide	(a) Manufacturing (b) Contracting (c) Public Utilities (d) All Other
Mfrs.' & Contrs.' P. D.	1925-26	Countrywide	Total
O. L. & T. P. L.	1925-26	Countrywide	Total
O. L. & T. P. D.	1925-26	Countrywide	Total
Teams' P. L.	1925-26	Countrywide	Total
Teams' P. D.	1925-26	Countrywide	Total

In 1935, the National Bureau of Casualty and Surety Underwriters called upon its member companies to file more recent data for the important Liability and Property Damage lines, other than Automobile, to serve as the basis for the calculation of revised discounts for these lines. The recent calls which have been compiled are as follows:

Line of Insurance (1)	Claims Settled in Calendar Years: (2)	Territorial Subdivisions (3)	Classification Groups (4)
Elevator P. L.	1934	(1) New York State	Total
		(2) Remainder of Country	Total
Mfrs.' & Contrs.' P. L.	1933	Countrywide	Total
Mfrs.' & Contrs.' P. D.	1933	Countrywide	Total
O. L. & T. P. L.	1934	(1) New York City	Apartments & Tenements
		(2) New York State	(a) Area & Frontage Classes excluding New York City Apartments & Tenements Classes.
			(b) Miscellaneous Classes.
		(3) Remainder of Country	(a) Area & Frontage Classes.
			(b) Miscellaneous Classes.
Product P. L.	1934	(1) New York State	(a) Bakeries.
			(b) All Other Foodstuffs—Stores & Mfg. Classes.
			(c) All Other Classes.
		(2) Remainder of Country	(a) Bakeries.
			(b) All Other Foodstuffs—Stores & Mfg. Classes.
			(c) All Other Classes.

It will be noted that these recent calls provide for a subdivision of the data by classification groups in certain instances and also between the state of New York and the remainder of the country for certain lines. The National Bureau has recognized the probability that a rather wide variation in the distribution of claims by size exists within classification groups and it is for this reason that the recent calls have included more subdivisions than the previous calls.

In these calls, the size of a claim was determined by the amount of incurred indemnity and medical combined, excluding allocated claim adjustment expense. The total allocated claim adjustment expense was recorded for all size groups combined. It might be pointed out that the medical losses should theoretically be handled in the same manner as the allocated claim expense rather than to be combined with the indemnity in determining the size of claim, since the insurance carrier is liable for both the medical and the allocated claim adjustment expense under deductible coverage. This is not a serious error, since for the various Liability lines, other than Automobile and Employers' Liability, the ratio of medical losses to total losses including allocated claim expense is less than 1%. It is recommended, however, that future calls provide for the determination of size of claim by the amount of indemnity alone, excluding all medical and allocated claim adjustment expense.

Rating Making Method

The method currently employed in determining the discounts for deductible coverage is as follows. The portion of the indemnity losses eliminated by the deductible feature is calculated from the distribution of incurred losses by size of claim. This percentage is deducted from 100% in order to determine the percentage of the indemnity losses which will be incurred by the insurance company. The product of this residual percentage and the permissible loss ratio excluding the provision for allocated claim expense determines the percentage of full-coverage rates which the insurance company may expect to incur in indemnity losses under the deductible form. To this percentage are added the provision for allocated claim expense and the full loadings in the manual rates for unallocated claim expense, Home Office administration, payroll audit and inspection. This total in terms of manual rates is then divided by .70 in order to load percentagewise for acquisition (25%), taxes (2½%) and profit (2½%). This calculation determines the indicated percentage of full-coverage rates which is necessary to give the proper allowances for losses and expenses under the deductible form. The indicated discount is calculated by deducting this percentage from 100%. In order to provide a safety margin, the indicated discount is multiplied by .90 and this discount is then rounded to the lower .025 interval.

The details of the calculation of the discount for $250 deductible coverage for the O. L. & T. Public Liability line are given in the following exhibit:

O. L. & T. PUBLIC LIABILITY
Calculation of Discount for \$250 Deductible

(1)	Incurred indemnity losses under \$250 per claim............	\$3,874,396
(2)	Number of claims over \$250 per claim....................	7,312
(3)	First \$250 of loss on claims over \$250 per claim (2) × \$250	\$1,828,000
(4)	Total first \$250 of loss (1) + (3)......................	\$5,702,396
(5)	Total indemnity losses (5/10 limits)....................	\$8,689,185
(6)	Portion of indemnity losses eliminated by \$250 deductible (4) ÷ (5)..	.656

	Full Coverage	\$250 Deductible
Losses (excl. allocated claim expense)..	.473	$.473 \times (1.000 - .656) = .163$
Allocated claim expense...............	.037	.037
Unallocated claim expense.............	.080	.080
Administration	.075	.075
Inspection	.035	.035
Sub-Total	.700	.390
Acquisition, Taxes and Profit..........	.300	$.30 \times \frac{.390}{.70} = .167$
Total	1.000	.557
Indicated discount for \$250 deductible........		$1.000 - .557 = .443$
Safety factor applied......................		$.443 \times .90 = .399$
Discount rounded to lower .025 interval......		.375

The actual calculation of the discounts for the various deductible amounts is simplified by the use of formulas. The rate for deductible coverage is calculated from the manual rate for full-coverage as follows:

$$R_d = R\ (1.00 - \text{Discount})$$

The formulas for calculating the discount for each of the important Liability and Property Damage lines, other than Automobile, are as follows, where k is the percentage reduction in indemnity losses by reason of the deductible feature:

Mfrs.' & Contrs.' P. L. & P. D.
O. L. & T. P. L. & P. D.
Product P. L. & P. D.
Theatre P. L. & P. D.

$$\text{Discount} = \frac{.90 \times k \times (.510 - .037)}{1.000 - (.250 + .025 + .025)}$$
$$= .6081k \text{ (Rounded to lower .025 interval)}$$

Teams' P. L. & P. D.

$$\text{Discount} = \frac{.90 \times k \times (.520 - .037)}{1.000 - (.250 + .025 + .025)}$$
$$= .6210k \text{ (Rounded to lower .025 interval)}$$

Elevator P. L.

$$\text{Discount} = \frac{.90 \times k \times (.545 - .037 - \text{Inspection cost ratio})}{1.000 - (.250 + .025 + .025)}$$

(NOTE: The inspection cost ratio is the inspection pure premium divided by the manual rate. This ratio varies by type of elevator and by territory.)

Elevator P. D.

$$\text{Discount} = \frac{.90 \times k \times (.245 - .037)}{1.000 - (.250 + .025 + .025)}$$
$$= .2674k \text{ (Rounded to lower .025 interval)}$$

Employers' Liability

The following table of discounts (taken from page 17 of the September, 1923 edition of the manual of Employers' Liability Insurance) is used in the calculation of rates for deductible per claim coverage for the respective amounts of assured's retention of liability shown. These discounts are applicable only to the indemnity portion of the rate.

Assured's Retention of Liability	Per cent Discount Deductible per Claim
$ 100	5.0%
150	10.0
250	20.0
500	25.0
1,000	30.0
2,000	45.0
2,500	50.0
3,000	52.5
3,500	55.0
4,000	57.5
4,500	60.0

In calculating the rate for deductible coverage for a policy written on an ex-medical basis, the full-coverage rate is first multiplied by unity minus the ex-medical ratio in order to obtain the ex-medical rate, and then the deductible discount specified in the table is applied to this ex-medical rate.

To obtain the rate for deductible coverage for a policy written on a full-medical basis, the discount specified in the table is applied to the ex-medical rate and to this result is added the medical portion of the rate in order to determine the final deductible rate.

Rate Filing with New York Insurance Department

The National Bureau's filing with the New York Insurance Department does not consist of a definite, complete schedule of discounts for the various amounts of assured's retention of liability for each line of insurance. The filing consists of the formulas previously given in this paper to be used in calculating the discounts for the smaller amounts of assured's retention, together with an explanation of a modification of these formulas to provide for the graduation of the discounts for the amounts of assured's retention above $1,000 per claim for the Public Liability lines and above $250 per accident for the Property Damage lines. The discounts for the higher amounts of assured's retention are established by judgment in order to graduate to a discount of .80 for $5,000 deductible coverage on a per claim basis on a standard limits Public Liability policy, or for an assured's retention of $1,000 per accident on a standard limits Property Damage policy.

The Product P. L. and P. D. lines are considered to be on an "*a*" rated basis for deductible coverage; that is, discounts are quoted which fit the characteristics of each risk.

Under the present filing, it would theoretically be possible to use the distribution of losses by size for a group of classifications or for an industry group rather than the totals for a line of insurance in establishing the proper discount for a given risk, if it were considered that this procedure would establish a more accurate rate for the risk.

If the assured's retention of liability is in excess of standard limits, the rate is determined by applying the following multiplier to the manual rate:

$$M - .80N$$

Where $M =$ Table multiplier for limits desired

$N =$ Table multiplier for limits of assured's retention

Comments on Present Deductible Rate Making Method

Under the present method of determining the discounts for deductible coverage, the provision for allocated claim expense is .037 of the full coverage rate for all lines of insurance. This ratio was derived from the claim expense data compiled in the Supplement to the 1928 New York Casualty Experience Exhibit for the Owners', Landlords' and Tenants', the Manufacturers' and Contractors', the Elevator, and the Teams' Public Liability lines combined. The ratio of allocated and unallocated claim expenses combined to earned premiums was .117. Since the loading in the manual rates for unallocated claim expense is .080, the difference between .117 and .080, or .037, was assumed to represent the ratio of allocated claim expense to earned premium.

A review of the allocated claim expense ratios reported in the 1935 Casualty Experience Exhibit indicates that this ratio of .037 is only approximately half the average allocated claim expense ratio actually being incurred in connection with the Liability lines, other than Automobile. There is also considerable variation in the indicated allocated claim expense ratio by line of insurance. For all stock companies combined, the allocated claim expense ratios shown in the Supplement to the 1935 Casualty Experience Exhibit are as follows:

CASUALTY EXPERIENCE EXHIBIT—CALENDAR YEAR 1935

Line of Insurance	Allocated Claim Expense Ratio
Elevator P. L.	2.3%
Mfrs.' & Contrs.' P. L.	7.9
O. L. & T. P. L.	7.3
Teams' P. L.	8.4
Employers' Liability	6.2
Product P. L.	8.4
All other Liability lines, other than Auto	11.7
Total Liability other than Automobile	7.2

It is quite likely that the allocated claim expense ratio incurred on risks written on a deductible basis is higher on the average than that incurred on risks written on a full coverage basis because assured's whose coverage is on a deductible basis frequently endeavor to influence the insurance company to contest more cases than normal. Giving consideration to this point and also to the fact that the ratio of .037 is seriously out of line with the indications of the latest data on actual allocated claim expense ratios, it is the opinion of the writer that the present rate making method for deductible coverage does not include an adequate provision for allocated claim expense.

The foregoing table indicates that the provision for allocated claim expense on deductible risks should vary by line of insurance. It is the writer's recommendation that the allocated claim expense ratio to be used in the determination of the discounts for deductible coverage be determined in the following manner. In conjunction with the loss data reported by size of claim, the allocated claim expense incurred on the claims included in the report is shown in total as a separate amount. The ratio of the total allocated claim expense to the total of the standard limits indemnity losses and the allocated claim expense combined could be determined. Applying this ratio to the permissible loss ratio for the line of insurance would develop the indicated necessary provision for allocated claim expense on the basis of the assumption that the total loss experience incurred for the line of insurance would equal the permissible.

If it should be considered undesirable to use the data reported in connection with the call for experience by size of claim as the basis for this calculation, the data reported in the regular call for loss ratio experience by line of insurance could be substituted.

It would be preferable to determine the allocated claim expense ratio by the recommended method rather than to adopt a ratio based on the indications of the Casualty Experience Exhibit. The latter ratios are apt to be unreliable for some of the less important lines of insurance and, furthermore, the actual allocated claim expense ratio varies considerably with the character of the general loss experience, reflecting the effect of a favorable or an unfavorable loss ratio.

The present method of graduating the discounts for the higher amounts of assured's retention to produce a discount of .800 for

$5,000 deductible coverage apparently does not give an adequate provision for the expenses incurred in servicing such risks. The breakdown of the .200 of the full coverage rate which is charged for servicing a $5,000 deductible risk may be assumed to be as follows:

PRESENT METHOD

Expense Item	Ratio to Full Coverage Rate
Acquisition, Taxes and Profit (30% × .200)	.060
Unallocated Claim Expense	.080
Allocated Claim Expense	.037
Available for H. O. Admin., Insp., and Payroll Audit	.023
Total	.200

It will be noted that even with a provision of only .037 for allocated claim expense, the residue available for Home Office administration, inspection and payroll audit is .023 as compared with the provision of .110 in the manual rates for the important lines of insurance. If the provision for allocated claim expense indicated by the tabulation previously given were allowed, there would be nothing specifically available for Home Office administration, inspection and payroll audit. The above analysis assumes, of course, that the same number of claims would be incurred under deductible coverage as under full coverage. It seems quite likely, however, that some beneficial effect on the number of claims would normally result from writing the coverage on a deductible basis rather than on a full coverage basis, similar to that which has actually been experienced when Workmen's Compensation risks have been written under the Retrospective Rating Plan instead of on a guaranteed cost basis. Such a tendency for deductible coverage to reduce the number of claims would offset, to some extent, the apparent inadequacy in the expense provision.

If consideration is given to the theory underlying deductible coverage, it is apparent that there should be the same provision for company expenses in the deductible rate that there is in the full coverage rate. If the discount for $5,000 deductible coverage is calculated in accordance with this theory, the discount indicated for the important lines of insurance is .676 as compared with the discount of .800 allowed at present. The discount of .676 is calculated as follows:

PROPOSED METHOD

Expense Item	Ratio to Full Coverage Rate
Acquisition, Taxes and Profit (30% × .324)	.097
Unallocated Claim Expense	.080
Allocated Claim Expense	.037
H. O. Admin., Insp., and Payroll Audit	.110
Total	.324

If the indicated necessary provision for allocated claim expense were included, the discount calculated would be somewhat less than .676.

Under the present rate making method, it is questionable whether an insurance company could actually afford to insure a risk on a deductible basis with the assured's retention of liability approximating $5,000 per claim because of the apparently inadequate expense allowance which would be received. Consideration should be given to the desirability of revising the present method of graduating the discounts for the higher amounts of assured's retention so that a larger expense allowance will be provided. In the writer's opinion, the discount allowed for an assured's retention of $5,000 per claim should be considerably less than .800 as at present.

Per Claim vs. Per Accident Deductible Coverage

The formulas given for the Public Liability lines apply only when the deductible coverage is written on a per claim basis. No statistics of the distribution of losses by size on a per accident basis are available. It would be very difficult for the insurance companies to respond to a call for the distribution of losses by size on a per accident basis because of the manner in which their statistical records are maintained. When deductible coverage on a Public Liability policy is written on a per accident basis, the discount allowed is .05 less than the discount calculated on a per claim basis for all lines except Elevator P. L., for which .025 is deducted from the discount applicable on a per claim basis.

For the Property Damage lines, the formulas given are for a per accident basis since Property Damage deductible coverage is always written on a per accident basis and never on a per claim basis. This procedure is necessary in view of the difficulty of defining a claim under Property Damage coverage. This difficulty is not experienced with the Public Liability lines since the number of claims is a function of the number of persons injured in each accident.

Minimum Premiums

The deductible discounts are also applicable to the minimum premium for individual locations or operations on specific risks where the minimum premium is the controlling premium. In no event, however, may the deductible discount operate to reduce the premium charge per policy below the minimum premium charge (if not in excess of $10.00) which would apply if the policy were canceled by the assured.

Excess Limits

When excess limits coverage is provided on a policy written on a deductible basis with an assured's retention of less than standard limits, the premium charge for the excess limits portion of the coverage must be the same as would be made on a risk written on a full-coverage basis. The liability of the insurance company with regard to the excess limits portion of the coverage is not affected by the deductible provision applicable to the standard limits portion of the coverage. For example, if a $6,000 indemnity loss were incurred on a policy written for 50/100 limits and on a $250 deductible basis, the assured would be liable for $250 and the insurance company for $4,750 under the standard limits portion of the coverage and for $1,000 under the excess limits portion of the coverage. Under a full-coverage policy, the portion of the loss chargeable against the excess limits coverage would likewise be $1,000.

To illustrate the manner in which the final rate is calculated for a risk written on a deductible basis, with excess limits coverage, the following example is included:

Example—O. L. & T. P. L. risk subject to Table B

50/100 limits factor = 1.320
$250 deductible discount = .375

Factor applicable to 5/10 manual rate:

$1.00 \times (1.000 - .375) = .625$
$.32 \times 1.000 = .320$

Total........ .945

If the 5/10 manual rate were $.50, the rate for 50/100 limits, $250 deductible, would be .945 × $.50, which equals $.473.

If experience rating modifications are applicable, the final adjusted rate for the above example would be calculated as follows. Assume a standard limits experience modification of .700 and an excess limits experience modification of .800.

$.625 \times .700 = .4375$
$.320 \times .800 = .2560$

Total .6935

.6935 × $.50 = $.347 Final adjusted rate

Aggregate Limits

For certain lines of insurance, an aggregate limit as well as the usual per person and per accident limits applies. All of the specified limits of liability—whether per person, per accident or the aggregate liability under the policy—apply to the gross indemnity cost of the claims incurred regardless of the portion of such costs which may be retained by the policyholder under the deductible form of coverage. It is therefore necessary that the insurance company maintain a record of the gross indemnity cost of all claims on each policy written on a deductible basis under those lines which are subject to an aggregate limit, in order to determine when the aggregate policy limit has been exhausted.

Classification Experience

The experience of risks written on a deductible basis is excluded from the classification experience reported for rate making. The experience of all risks written on a deductible basis is reported in total under a specified code number for each line of insurance.

No attempt is made to compile a record by deductible amount, because the volume of business which has been written to date on a deductible basis has not been sufficiently large to be of any value for rate making purposes.

Experience Rating

The Public Liability Experience Rating Plan is applicable on an intra-state basis in three states: Minnesota, New York and Wisconsin. A Public Liability risk written on a deductible basis qualifies for experience rating if it has developed an exposure during either the latest year or the latest two years of the experience period such that the application thereto of the manual rates for full coverage (standard limits only) produces a premium of the same amount as required for a full coverage risk to qualify for experience rating.

The experience rating of Public Liability risks is in accordance with the coverage to be provided on renewal. Full coverage experience is adjusted to the deductible basis if the risk is to be written on the deductible form on renewal and, vice versa, any deductible experience is built up to a full coverage basis before using in the experience rating calculation if the risk is to be afforded full coverage on renewal. In conformance with the rule that there should be only one experience rating modification outstanding for a risk at one time, it would be desirable to provide that if a portion of the coverage is to be written on a full coverage basis and the remainder on a deductible basis on renewal, the experience rating calculation should be based on the combined data compiled accordingly. For a risk written in such a manner, it is the writer's opinion that there should not be separate experience rating calculations based in the one case with all of the experience adjusted to a deductible basis and in the other case with all of the experience built up to a full coverage basis.

In developing the experience rating modification for a risk which is to be written on a deductible basis on renewal, the following changes in the Public Liability experience rating plan are necessary:

Actual Losses

The actual losses experienced under full coverage are reduced to an equivalent deductible amount by subtracting the deductible amount from the indemnity payments. Allocated loss expense and medical losses are included in full. The adjusted indemnity loss is combined with the allocated loss expense and the medical losses before separating any loss into normal and excess. In dividing actual losses between normal and excess, the deductible amount is first subtracted from the normal loss amount of Table A and the remainder is used as the normal amount for the deductible coverage.

Expected Losses

(1) The total expected losses on the deductible basis are obtained by multiplying the full coverage premium subject at standard limits by the ratio given below for each line of insurance, where r is the ratio of the manual rate for the deductible coverage to the manual rate for full coverage $\left(r = \frac{R_d}{R} \right)$:

Line of Insurance	Ratio Applicable to Full Coverage Premium Subject
General Formula	$.70\,r$ — (Unallocated Cl. Exp. + H. O. Admin. + Insp. + P. A.)
Mfrs.' & Contrs.' P. L. O. L. & T. P. L. Product P. L. Theatre P. L.	$.70\,r - .19$
Teams' P. L.	$.70\,r - .18$
Elevator P. L.	$.70\,r$ — (.155 + Inspection cost ratio)

For example, for the O. L. & T. Public Liability line, the total expected losses for a risk written on a $250 deductible basis for which the discount is .375 would be equal to .2475 times the full coverage premium subject ($.70 \times .625 - .19 = .2475$).

(2) Under *any* of the following conditions, the total standard limits expected losses (deductible basis) shall be considered to be composed entirely of excess standard limits expected losses (deductible basis) and in such cases it will not be necessary to split either the expected losses or the actual losses into the usual normal and excess divisions:

(a) When the deductible amount is equal to or greater than the normal loss amount of Table A.

(b) When the ratio of the manual rate for the deductible coverage to the manual rate for full coverage is equal to or less than the ratio given for each line of insurance in the following table:

Line of Insurance	Ratio of Deductible Rate to Full Coverage Rate
General Formula	$.70r -$ (Unallocated Cl. Exp. + H. O. Admin. + Insp. + P. A.) $= .40$ * (Full Cov. Perm. L. R.)
Mfrs.' & Contrs.' P. L. O. L. & T. P. L. Product P. L. Theatre P. L.	$.70r - .19 = .40 \times .51$ $r = .56$ or less
Teams' P. L.	$.70r - .18 = .40 \times .52$ $r = .55$ or less
Elevator P. L.	$.70r -$ (.155 + Insp. Cost Ratio) $= .40 \times$ (.545 − Insp. Cost Ratio) $r = .53 + .86$ Insp. Cost Ratio, or less.

(c) When the normal credibility in all other cases calculated as provided for in Rule (5) below is less than the excess credibility determined in accordance with Rule (4).

(3) In cases other than those described under Rules (2a) and (2b), the normal and excess expected losses are determined by the following formulas:

(a) The normal expected losses (deductible basis) are equal to the product of the ratio given in the following table and the premium subject (full coverage).

Line of Insurance	Ratio Applicable to Full Coverage Premium Subject
General Formula	$.70r -$ (.40 × Full Cov. Perm. L. R. + Unalloc. Cl. Exp. + H. O. Admin. + Insp. + P. A.)
Mfrs.' & Contrs.' P. L. O. L. & T. P. L. Product P. L. Theatre P. L.	$.70r - (.40 \times .51 + .19)$ $= .70r - .394$
Teams' P. L.	$.70r - (.40 \times .52 + .18)$ $= .70r - .388$
Elevator P. L.	$.70r -$ [.40 (.545 − Insp. Cost Ratio) + .155 + Insp. Cost Ratio] $= .70r - .373 - .60$ Insp. Cost Ratio

(b) The excess expected losses (deductible basis) are obtained by applying the ratio shown in the following table to the premium subject (full coverage).

Line of Insurance	Ratio Applicable to Full Coverage Premium Subject
General Formula	.40 (Full Cov. Permissible L. R.)
Mfrs.' & Contrs.' P. L. O. L. & T. P. L. Product P. L. Theatre P. L.	$.40 \times .51 = .204$
Teams' P. L.	$.40 \times .52 = .208$
Elevator P. L.	.40 (.545 − Insp. Cost Ratio) = .218 − .40 Insp. Cost Ratio.

*NOTE: In the Public Liability Experience Rating Plan, the excess standard limits premium subject is equal to .40 of the total standard limits premium subject.

Credibility

(4) In all cases the excess credibility factor shall be the same as for full coverage and, therefore, shall be read from Table B using excess expected losses calculated in accordance with rule (3b).

(5) The normal credibility factor shall be determined from Table B by using the normal expected losses (deductible basis) as calculated in accordance with Rule (3a). In the event that the normal credibility factor so determined is less than the excess credibility factor as determined by Rule (4), the excess credibility factor shall be substituted and used for normal.

The derivation of the various ratios specified to be used in experience rating Public Liability risks written on a deductible basis can be reproduced by referring to the Public Liability Experience Rating Plan and to the data given in this paper showing the methods employed in calculating the discounts for deductible coverage.

Underwriting Considerations

From an underwriting standpoint, the risks which it is preferable to write on a deductible rather than on a full coverage basis are those with high accident frequency. Through writing such risks on a deductible basis, the assured is directly impressed with the necessity for introducing accident prevention measures in order to reduce his own share of the incurred losses. Many risks of this nature which would produce very unfavorable experience for the insurance company if written on a full coverage basis prove to be satisfactory when written on a deductible coverage basis. Deductible coverage for an assured's retention of such amounts as \$100 or \$250 is most frequently written on Product Public Liability risks, department stores for O. L. & T. Public Liability coverage, and Theatre Public Liability risks. Many risks of these types would be almost uninsurable on a full coverage basis but the loss experience can be controlled when the risks are written on a deductible basis because of the cooperation which is received from the assured through his realization of the monetary loss which he will directly suffer if accidents occur.

As a sales argument, it might be well to recommend deductible rather than full coverage for any fairly large risks with a tendency to produce almost no losses. Concerns of this type should be willing to carry their risk up to a nominal amount provided that the insurance company continues to furnish the necessary service and protection against severe losses. On risks of this type, a review of the past experience will indicate whether it is likely that the discount received by reason of the deductible coverage will more than offset the assured's share of the probable incurred losses.

It should be emphasized that the insurance company must retain control over the settlement of all losses, regardless of amount, and not obligate itself to consult an assured as to whether a claim should be settled or contested. Some assureds with their coverage written on a deductible basis would want every claim, regardless of merit, fought in order to avoid payment under their retention of liability, if possible. Whereas the insurance company might decide that certain claims should be settled in order to avoid the legal expense of court actions, the assured might object to making any payments under his retention unless forced to through legal judgments. Unless the insurance company retains full control of the settlement of all claims, it will be found that the cost of allocated claim expense will be increased substantially over the average experienced on risks written on a full coverage basis. In addition to incurring unusually high allocated claim expense through permitting the adoption of a policy of contesting all claims, the insurance company might find its portion of the indemnity losses increased because of substantial judgments in the case of certain claims which would have been settled out of court if the decision had been entirely in the hands of the insurance company and had not been affected by the assured's judgment.

In the settlement of losses incurred under a deductible policy, it is customary, as previously stated, for the insurance company to pay each loss in full and then to secure reimbursement from the assured for the portion of the loss for which he is liable because of his retention. The usual procedure for securing reimbursement is to bill the assured for his portion of each claim immediately after the loss is paid. Since some of the losses on a Public Liability policy may not be paid until several years after the policy has expired, the claim adjuster should always be certain that it will be possible to secure the reimbursement from the assured if the loss is paid in full. Otherwise, the insurance company should pay only its share of the incurred loss. This problem should not arise in the case of any risk for which the insurance company is still writing the current coverage.

Recommended Alternative Method of Writing Deductible Coverage

Sometimes, the criticism is expressed by risks written on a deductible basis that the insurance company is settling too many cases, regardless of liability, and that a considerable portion of the indemnity payments made must be borne by the assured because of the deductible coverage feature. In these cases, the assured undoubtedly feels that the insurance company is paying out his money in order to decrease the possibility of loss under the insurance coverage. In order to meet this criticism, the suggestion is advanced that deductible coverage might be more satisfactory and salable if it were written to provide that the insurance company and the assured would share equally the portion of any loss lower than a specified amount. For instance, instead of writing $250 deductible coverage on a particular risk, it could be provided that the insurance company and the assured would share equally the first $500 of any indemnity loss and the insurance company would pay in full the portion of any loss in excess of $500, subject to the policy limits. The maximum amount of loss which the assured would have to pay on any one claim not exceeding the policy limits would still be $250. Since the insurance company would be obligated to pay at least an equal amount with the assured in the settlement of every claim, it could no longer be accused of needlessly settling claims for amounts within the assured's retention in order to avoid incurring any loss under its portion of the coverage.

The discount for this co-insurance coverage would be 50% of the usual discount for deductible coverage equal to the total amount of loss for which the insurance company and the assured are jointly liable. For purposes of comparison, the discount for $250 deductible coverage for O. L. & T. Public Liability insurance is 37.5% whereas one-half the discount for $500 deductible coverage would be 23.8%.

It is the writer's opinion that this suggestion of writing co-insurance coverage instead of deductible coverage under certain circumstances possesses sufficient merit to justify thorough study of this proposal on the part of the committees which deal with the rate making problems for deductible coverage. It may be found that this form of coverage contains sufficient advantages to warrant its addition to the plans which are now available on an optional basis.

Part II — Excess Coverage

Rate Making Method

In calculating the rates for excess coverage when the assured's retention is less than standard limits, the same distribution of incurred losses by size of claim is employed as in calculating the rates for deductible coverage. The expense loading is treated differently, however, reflecting the difference in the degree of service which the insurance company gives under these two forms of coverage. Under excess coverage, only the provision for payroll audit expense and two-thirds of the provision for Home Office administration expense are treated as fixed. Unallocated claim expense, inspection, acquisition, taxes, profit, and one-third of the Home Office administration expense vary with the premium. Reflecting the manner in which losses are adjusted and defended under this coverage, the allocated claim expense is necessarily treated in the same manner as the indemnity cost.

The rate for excess coverage is calculated from the rate for full-coverage in this manner:

$$R_e = R\ (1.00 - \text{Discount})$$

The discount for each line of insurance is calculated by means of the following formula, where k is the percentage reduction in indemnity losses by reason of writing the coverage on an excess basis:

$$\text{Discount} = \frac{.90 \times k \times (\text{Indemnity} + \text{Allocated Claim Expense})}{1.00 - (\text{Acquisition} + \text{Taxes} + \text{Profit} + \text{Inspection} + \text{Unallocated Claim Expense} + \tfrac{1}{3}\text{ H. O. Admin.})}$$

The formulas employed in calculating the discounts for excess coverage for the important lines of insurance are:

Mfrs.' & Contrs.' P. L. & P. D.

$$\text{Discount} = \frac{.90 \times k \times .510}{1.00 - (.25 + .025 + .025 + .015 + .08 + .025)}$$
$$= .7914k \text{ (Rounded to lower .025 interval)}$$

O. L. & T. P. L. & P. D.
Theatre P. L. & P. D.

$$\text{Discount} = \frac{.90 \times k \times .510}{1.00 - (.25 + .025 + .025 + .035 + .08 + .025)}$$
$$= .8196k \text{ (Rounded to lower .025 interval)}$$

Teams' P. L. & P. D.

$$\text{Discount} = \frac{.90 \times k \times .520}{1.00 - (.25 + .025 + .025 + .005 + .08 + .025)}$$
$$= .7932k \text{ (Rounded to lower .025 interval)}$$

The formulas for calculating the discounts for excess coverage for the Product P. L. & P. D. and the Elevator P. L. & P. D. lines are on an "*a*" rated basis.

Rate Filing with New York Insurance Department

The National Bureau's filing with the New York Insurance Department for excess coverage is similar to that for deductible coverage. The filing does not consist of a complete schedule of discounts for the various amounts of assured's retention for each line of insurance but only of the formulas to be used in calculating the discounts for the lower amounts of assured's retention, together with an explanation of a modification of these formulas to provide for the graduation of the discounts for the higher amounts of assured's retention. The discounts for the higher amounts of assured's retention are graduated by judgment to produce a discount of 100% for a $5,000 retention per claim on a standard limits Public Liability policy, or for an assured's retention of $1,000 per accident on a standard limits Property Damage policy. The graduation applies to the amounts of assured's retention above $1,000 per claim for the Public Liability lines and above $250 per accident for the Property Damage lines.

When the assured's retention is in excess of standard limits, as is frequently the situation, the rate is determined by taking the difference between the excess limits table multipliers for the upper limits desired and for the limits of the assured's retention.

Suggested Rate Making Formula

In the present rate making formula for excess coverage, it is considered that the provisions for inspection, unallocated claim expense, and one-third of Home Office administration should vary with the premium. It is the writer's suggestion that this portion of the company expenses be considered instead to vary with the losses rather than with the premium. If this adjustment is made, the formula for calculating the discount for excess coverage would be as follows:

$$\text{Discount} = \frac{.90 \times k \times (\text{Ind.} + \text{Alloc. Cl. Exp.} + \text{Insp.} + \text{Unalloc. Cl. Exp.} + \frac{1}{3}\text{ H. O. Admin.})}{1.00 - (\text{Acq.} + \text{Taxes} + \text{Profit})}$$

This suggestion is made because the present formula for calculating the discount for excess coverage does not allow credit for the proportion of company expenses contemplated because the denominator used in this formula is higher than the corresponding denominator employed in calculating manual rates. The recommended formula would produce results more in line with those intended by the theory underlying the application of the expense loadings in the calculation of excess rates. The discounts produced by the suggested formula would be somewhat larger than those developed by the present formula.

Per Claim vs. Per Accident Excess Coverage

The formulas given in this paper produce the indicated discounts for excess coverage on a per claim basis for the Public Liability lines and on a per accident basis for the Property Damage lines. When excess coverage on a Public Liability policy is written on a per accident basis, the discount allowed is .05 less than the discount calculated on a per claim basis for all lines except Elevator Public Liability, for which .025 is deducted from the discount applicable on a per claim basis. For the Property Damage lines, excess coverage is always written on a per accident basis and never on a per claim basis.

Minimum Premiums

The discounts for excess coverage also apply to the minimum premium for individual locations or operations on specific risks where the minimum premium is the controlling premium. In no event, however, may the discount for excess coverage operate to reduce the premium charge per policy below the minimum premium charge (if not in excess of \$10.00) which would apply if the policy were canceled by the assured.

Excess Limits

The charge for excess limits coverage on a policy written on an excess basis is the same as that which would be made for the corresponding excess limits portion of the coverage on a risk written on a full coverage basis. To illustrate the manner in which the final rate is calculated for a risk written on an excess coverage basis with excess limits coverage the following example is given:

Example—O. L. & T. P. L. risk subject to Table B

50/100 limits factor = 1.320
\$250 excess discount = .525

Factor applicable to 5/10 manual rate:

$$1.00 \times (1.000 - .525) = .475$$
$$.32 \times 1.000 = .320$$

Total .795

If the 5/10 manual rate were \$.50, the rate for 50/100 limits, \$250 excess coverage, would be .795 × \$.50, which equals \$.398.

Aggregate Limits

Theoretically, the aggregate limit specified for certain lines of insurance should apply on the basis of the gross amount of incurred indemnity losses, including those incurred by the assured under his retention. As a practical matter, however, it would be impossible to treat the policy limits in this manner where the insurance is written on an excess coverage basis. The insurance company would obviously not be able to maintain a record of the losses settled within the assured's retention and, for this reason, it would be necessary to provide that the aggregate limit would apply instead on the basis of the net amount of losses incurred by the insurance company under the excess coverage. The premium charge for excess coverage should reflect the extension of coverage, of course, where the aggregate liability under the insurance policy applies on the basis of the net incurred losses rather than on the basis of the gross incurred losses.

For example, the calculation of the factor applicable to the standard limits manual rate for Contractors' P. D. where the assured's retention is $5,000 per accident and the insurance company is assuming liability in excess of this amount to the extent of $25,000 per accident, with an aggregate limit of $100,000 applying on the basis of the gross amount of losses, would be as follows:

Example—Contractors' P. D. risk subject to Table II	
$30,000/100,000 factor	= 1.68
$ 5,000/100,000 factor	= 1.42
Factor for $25,000 per accident coverage in excess of $5,000 per accident, with an aggregate limit of $100,000 applying on the basis of the gross incurred losses	.26

When, recognizing the impracticability of treating the aggregate policy limit in this manner, it is specified that the aggregate limit will apply instead on the basis of the net losses incurred by the insurance company, the factor calculated in the above manner should be increased somewhat to reflect the extension of coverage. This adjustment would be similar in character to that which is made in modifying the discounts calculated for deductible coverage on a per claim basis to reflect the increased insurance protection afforded when the deductible provision is to apply on a per accident basis instead.

Few risks under the lines of insurance involving aggregate limits have been written to date on an excess coverage basis. Because the whole question of aggregate limits for the casualty lines of insurance is still in the experimental stage, no definite procedure for determining the proper premium charge for risks written on an excess coverage basis has been worked out, but the method outlined above appears to offer a reasonable solution of the problem.

Classification Experience

The experience of risks written on an excess coverage basis is excluded from the classification experience employed in deriving manual rates. The experience of all risks written on an excess coverage basis is reported in total under a specified code number for each line of insurance. No attempt is made to compile a record by excess amount, because the volume of experience developed is too limited to justify such refinement for statistical purposes.

Experience Rating

The Public Liability Experience Rating Plan is applicable on an intra-state basis in three states: Minnesota, New York and Wisconsin. A Public Liability risk written on an excess coverage basis qualifies for experience rating if it has developed an exposure during either the latest year or the latest two years of the experience period such that the application thereto of the manual rates for full coverage (standard limits only) produces a premium of the same amount as required for a full coverage risk to qualify for experience rating.

The experience rating of Public Liability risks is in accordance with the coverage to be provided on renewal. Full coverage experience is adjusted to an excess coverage basis if the risk is to be written on the latter basis on renewal. Conversely, any experience developed on an excess coverage basis should theoretically be built up to a full coverage basis before using in the experience rating calculation if the risk is to be afforded full coverage on renewal. As a practical matter, this latter adjustment would be very difficult, if not impossible, because the insurance company would not have a record of the losses incurred by the assured under his retention.

In developing the experience rating modification for a risk which is to be written on an excess coverage basis on renewal, the following changes in the Public Liability experience rating plan are necessary:

Actual Losses

The actual losses experienced under full coverage are reduced to an equivalent excess coverage amount by subtracting the assured's retention from the indemnity payments. Allocated loss expense and medical losses are excluded, except where the allocated loss expense was incurred with the insurance actually written on an excess coverage basis. In dividing the adjusted actual losses between normal and excess, the assured's retention is first subtracted from the normal loss amount of Table A and the remainder is used as the normal amount for the excess coverage.

Expected Losses

(1) The total expected losses on the excess coverage basis are obtained by multiplying the full coverage premium subject at standard limits by the ratio given below for each line of insurance, where r is the ratio of the manual rate for excess coverage to the manual rate for full coverage $\left(r = \frac{R_e}{R}\right)$:

Line of Insurance	Ratio Applicable to Full Coverage Premium Subject
General Formula	r — [Full Coverage Expense Loading — $(1.000-r)$ × Expense Loading in Excess Discount]
Mfrs.' & Contrs.' P. L.	$r - [.490 - (1.000 - r)\ .420]$ $= .58r - .07$
O. L. & T. P. L. / Theatre P. L.	$r - [.490 - (1.000 - r)\ .440]$ $= .56r - .05$
Teams' P. L.	$r - [.480 - (1.000 - r)\ .410]$ $= .59r - .07$

For example, for the O. L. & T. Public Liability line, the total expected losses for a risk written on a $250 excess coverage basis for which the discount is .525 would be equal to .216 times the full coverage premium subject ($.56 \times .475 - .050 = .216$).

(2) Under *any* of the following conditions, the total standard limits expected losses (excess coverage basis) shall be considered to be composed entirely of excess standard limits expected losses (excess coverage basis) and in such cases it will not be necessary to split either the expected losses or the actual losses into the usual normal and excess divisions:

(a) When the assured's retention is equal to or greater than the normal loss amount of Table A.

(b) When the ratio of the manual rate for the excess coverage to the manual rate for full coverage is equal to or less than the ratio given for each line of insurance in the following table:

Line of Insurance	Ratio of Excess Rate to Full Coverage Rate
General Formula	r — [Full Cov. Expense Loading — $(1.000 - r)$ × Expense Loading in Excess Discount] = .40 (Full Cov. Perm. L. R.)
Mfrs.' & Contrs.' P. L.	$r - [.490 - (1.000 - r)\ .420] = .40 \times .51$ $.58r - .070 = .204$ $r = .47$ or less
O. L. & T. P. L. / Theatre P. L.	$r - [.490 - (1.000 - r)\ .440] = .40 \times .51$ $.56r - .050 = .204$ $r = .45$ or less
Teams' P. L.	$r - [.480 - (1.000 - r)\ .410] = .40 \times .52$ $.59r - .070 = .208$ $r = .47$ or less

(c) When the normal credibility in all other cases calculated as provided for in Rule (5) below is less than the excess credibility determined in accordance with Rule (4).

(3) In cases other than those described under Rules (2a) and (2b), the normal and excess expected losses are determined by the following formulas:

(a) The normal expected losses (excess coverage basis) are equal to the product of the ratio given in the following table and the premium subject (full coverage):

Line of Insurance	Ratio Applicable to Full Coverage Premium Subject
General Formula	r — [Full Cov. Expense Loading — $(1.000 - r)$ $\times$ Expense Loading in Excess Discount + .40 (Full Cov. Perm. L. R.)]
Mfrs.' & Contrs.' P. L.	$r - [.490 - (1.000 - r)\ .420 + .40 \times .51] = .58r - .274$
O. L. & T. P. L. Theatre P. L.	$r - [.490 - (1.000 - r)\ .440 + .40 \times .51] = .56r - .254$
Teams' P. L.	$r - [.480 - (1.000 - r)\ .410 + .40 \times .52] = .59r - .278$

(b) The excess expected losses (excess coverage basis) are obtained by applying the ratio shown in the following table to the premium subject (full coverage):

Line of Insurance	Ratio Applicable to Full Coverage Premium Subject
General Formula	.40 (Full Cov. Perm. L. R.)
Mfrs.' & Contrs.' P. L.	$.40 \times .51 = .204$
O. L. & T. P. L. Theatre P. L.	$.40 \times .51 = .204$
Teams' P. L.	$.40 \times .52 = .208$

Credibility

(4) In all cases the excess credibility factor shall be the same as for full coverage and, therefore, shall be read from Table B using excess expected losses calculated in accordance with Rule (3b).

(5) The normal credibility factor shall be determined from Table B by using the normal expected losses (excess coverage basis) as calculated in accordance with Rule (3a). In the event that the normal credibility factor so determined is less than the excess credibility factor as determined by Rule (4), the excess credibility factor will be substituted and used for normal.

The derivation of the various ratios specified to be used in experience rating Public Liability risks written on an excess coverage basis can be reproduced by referring to the Public Liability Experience Rating Plan and to the data given in this paper showing the methods employed in calculating the discounts for excess coverage.

Underwriting Considerations

Excess insurance is mainly written on very large risks which self-insure the smaller amounts of loss but wish to purchase insurance protection against an unusual or catastrophic loss, and on those risks which insure the primary portion of their coverage in one company and purchase the higher limits coverage from another. A large part of this excess coverage is written by London Lloyds, undoubtedly because the premium charge is less than that determined by the rating methods which have been established for this coverage by the Bureau companies.

Except for coverage which involves a severe catastrophe hazard, such as on oil refining operations or on theatres, it may be considered that business written on an excess coverage basis is desirable provided that the assured's retention is a fairly large amount.

Summary

As stated previously, the main purpose of this paper was to assemble the available data on rate making, etc. which may be published for deductible and excess coverages. In addition, certain observations and suggestions have been advanced by the writer with regard to the rating methods and insurance practices for these coverages. The information included in this paper may prove to be of help to underwriters and others in the writing of business under either of these forms of coverage. Undoubtedly, some important points may have been omitted unintentionally by the writer, but it is likely that any such matters will be treated in the written discussions of this paper.