

## THE ANALYSIS OF EXPENSES BY THE USE OF HOLLERITH CARDS

BY

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A great deal of effort is expended by casualty insurance companies each year in obtaining accurate pure premium data. The necessity of basing rates upon reliable information as to loss cost justifies this expense, heavy though it unquestionably is. Precise statistical plans promulgated by the various rating organizations contain detailed instructions for the coding of premiums, exposure and losses by classifications and territories and the general use of these plans has resulted in the preparation of pure premium data on a uniform basis.

Until recent years, comparatively little attention has been given to the analysis of underwriting expenses, although these constitute nearly as large a part of the premium dollar as the loss cost. There is little difficulty in making accurate allocations so far as commissions are concerned as these are invariably charged to the line of insurance involved but as to the other expenses each company is left to adopt the methods it deems best in determining the distribution of expenses to lines or groups of expense. Indeed, the organization of companies varies so greatly that uniformity of analysis must be sought through agreement upon general principles, the adoption in some cases of more precise definitions and the use of tested and approved methods of cost analysis rather than the establishment of precise formulae to be followed in all cases. Our *Proceedings* now contain several papers dealing with the proper analysis of expenses and many practical suggestions as to the bases upon which allocations can be made will be found therein. It is not our purpose in this paper to review the recommendations and suggestions already made but to consider from what viewpoint the analysis should be made and to indicate how punch cards can be used to facilitate the necessary collection of data.

The Disbursement page of the Annual Statement blank pro-

vides for the most part for a reporting of expenditures by *kind* rather than by *purpose*. It lists the various items of disbursements such as salaries, rent, printing and stationery, postage, etc., as though all payments of these kinds, regardless of purpose, should be reported thereunder. The immediate nature of the disbursement apparently determines the assignment rather than the ultimate aim. The tendency, however, is to classify expenditures first in accordance with purpose and secondarily by kind and in doing so casualty insurance is following the best commercial accounting practice.

Originally, "investigation and adjustment of claims" was intended to include only the direct expenses of investigating and adjusting individual claims. When the liability loss reserve laws were enacted, companies were required, so far as liability and workmen's compensation were concerned, to take cognizance of the overhead claims expense and the foot note to Schedule P now requires the inclusion with loss expense payments of "all payments for legal expenses, including attorney's and witness fees and court costs, salaries and expenses of investigators, adjusters and field men, rents, stationery, telegraph and telephone charges, postage, salaries and expenses of office employees, home office expense and all other payments under or on account of such injuries, whether the payments are allocated to specific claims or are unallocated." At the present time, it is the practice to include unallocated claims expense in reporting the disbursement for "investigation and adjustment of claims" for all lines although the above quoted language refers only to liability and compensation.

Since the adoption of the rules of the Conference on Acquisition and Field Supervision Cost, it has been the general custom to include in the item "Salaries, traveling and all other expenses of branch office employees and agents not paid by commission" all "production cost" expenses, other than commissions. Likewise, there is usually included under "Inspections" the entire cost of making inspections, although the salaries of the home office staff of the inspection department, it might be argued, should be reported as a part of item 29, "Salaries, fees, other compensation and traveling expenses of officers, directors, trustees and home office employees."

In the New York Casualty Experience Exhibit, a definite

separation of expenses in accordance with a few broad groups is required. These groups are:

- Investigation and Adjustment of Claims
- Acquisition and Field Supervision
- General Administration
- Inspection and Bureaus
- Taxes, Licenses and Fees

As the indications shown by the combined reports of companies filing this schedule are used by at least one rating organization in establishing expense loadings, it is a matter of real importance that the analysis of expenses be made in a uniform manner so so far as allocations to groups and lines are concerned. Probably the most valuable single contribution in the way of suggestions for the proper compilation of this exhibit is contained in the report on a "Uniform Method of Expense Distribution" prepared in 1925 by a Committee of the Association of Casualty and Surety Accountants and Statisticians.

There are other functions, however, of expense analysis besides serving as a means of obtaining dependable data for rate making purposes. An adequate system will furnish much other valuable information to the individual company. It should show, among other things, the cost of each branch office and of each department of the home office and branch office and the component parts of which each of these is made up and this information should be available in such form that further detailed analysis can readily be made.

The company with which I am connected has since organization used Hollerith cards as a means of obtaining a complete analysis of its expenses and this method has been found to afford a very simple, flexible and dependable method of obtaining the desired information.

The punch card used for this purpose contains the following fields:

*Date of Transaction.* The month and year that the entry appears on the books is shown here. An additional field could be added for the day of the month and two columns instead of one used for indicating the month, if desired.

*Voucher Number.* As all entries are substantiated by vouchers, the voucher number is entered on the card in each case.



*Source.* All entries affecting expenses originate in four books of account, the Cash Disbursements Book, the Cash Receipts Book, the Sundry Journal and the General Journal and the initials of these books are entered in Column 26 of the card, to permit identification of the source of entry.

*Office Paying.* All payments made at the home office are assigned the "home office" code and likewise all entries which first appear on the books of the branch office are coded as payments of that branch office.

*Office Charged.* Disbursements on behalf of a branch office whether made at that office or at the home office are all recorded as charged to the office for whose benefit the payment is made.

*Department.* This classification is established so that the cost of each department of the home office as well as each department of the individual branch offices may be determined. The underwriting departments are all classified hereunder simply as "Code 1—Underwriting Department" and the distinction between various underwriting departments is expressed by means of the line code. The claim departments are similarly all shown as "Code 2—Claim Department" and the Automobile Claims Department, for instance, will only be charged with such expenses as are coded for automobile lines.

*Kind.* By "Kind" is meant the classification in accordance with the immediate nature of the disbursement such as salaries, rent, printing and stationery, etc. A set of code numbers provides for a complete analysis of all expenses and taxes.

*Group.* Seven groups of expenses are established. These harmonize with the groups established in the Casualty Experience Exhibit, the payroll auditing expense being treated, however, as a separate group and "Inspections and Bureau" expenses as shown in the Exhibit being subdivided into the two component elements. A description of the items composing each group follows:

1. Sundry (Unallocated) Claim Expenses.

To this group is charged all claim expenses of every kind that are not chargeable to any specific claim. These will include the salaries, rent and all other expenses of claim departments at the home office and in the field.

2. Acquisition and Field Supervision.

The expenses to be charged to this group are those set forth in the conference "Rules Regarding Acquisition and Field Supervision Cost for Casualty Insurance." In determining the expenses of a branch office to be charged hereunder, the portion applicable to the investigation and adjustment of claims, the making of inspections and the making of payroll audits should be excluded as well as such administrative or other expenses as are clearly of a home office character and are such expenses as a general agent would not incur.

3. General Administration.

The greater portion of the home office expenses will be charged to this group. Ordinarily the entire expense of such departments as underwriting, accounting, cashier, filing, statistical, stenographic and supply will be treated as general administration. While a large portion of the general executive salaries, rent, etc., is chargeable to general administration, a part may be properly chargeable to sundry claim expenses or other group.

4. Payroll Audit.

The salaries, rent, traveling and all other expenses of the payroll audit department at the home office, as well as similar expenses at branch offices, are charged to this group.

5. Inspections.

The entire expenses of the home office and branch office inspection departments, as well as the salaries and expenses of all inspectors, are charged to this group.

6. Bureaus and Associations.

Membership dues and assessments paid to all rating bureaus and company organizations are included herein.

7. Taxes, Licenses and Fees.

All taxes, licenses and fees that are considered to be a proper charge against underwriting are charged to this group.

*Line.* Codes have been provided not only for the separate lines of insurance but also for certain combinations of lines, such as "Accident and Health," "Liability and Compensation," "Liability Auto and All Other." These codes permit the charging to a whole department or group of lines those expenses which are incurred for the benefit of the entire group. At the end of the month, quarter or year, the total of such expenses can be apportioned to the individual lines on the basis of premiums written, losses paid, inspections made or number of transactions as the case may be.

The "Expense Distribution" form of punch card in use is shown herewith as well as a Cash Disbursement Voucher containing the various columns needed to code the payment. We have found it convenient to assemble on one sheet all the various kinds of codes used in connection with the coding of expense vouchers and a copy of this sheet is likewise reproduced.

Every expense item is allocated to group, kind, department and office at the time of coding. So far as determining the "kind" of disbursement there is ordinarily no difficulty. The assignment to department and office is also rather easily made, assuming that full information as to the particular disbursement is available, but there are frequent cases arising where the proper allocation to group may be in doubt. It is better, however, to charge the entire item to the group which evidently should bear the greater portion and arrange for necessary adjustments of all such items at one time by a single transfer entry.

It should be clearly understood that there are many cases where it is not possible to allocate an expenditure to any definite *line* of insurance. Many expenses, such as the cost of a central typing department, a supply department, a mailing department, or subscriptions to insurance papers and other items of general office expense cannot readily be apportioned at the time individual payments are made to each line of insurance benefitted. Such procedure would result in breaking up many amounts, some of them of very small size, into as many as a dozen or more small parts. The labor of such refined analysis of each individual disbursement would be prohibitive. It is entirely feasible, however, to accumulate in one total the items to which the same pro rata percentages apply and obtain the amounts chargeable to each line monthly, quarterly or yearly as need for the information arises.

The system herein outlined is used for all underwriting expenses other than commissions and "allocated" claim expenses. All commission payments are recorded on a special "Premiums Collected and Commissions Paid" form of punch card and the entries affecting expenses in connection with specific claims are punched on our regular form of loss payment card.

As checks are drawn for expenses, they are all charged to a single account "General Expenses." All these vouchers are coded by competent persons in the Accounting Department and then passed to the Statistical Department for the punching of Hollerith cards. When all vouchers for the month have been received, the cards are totalled and balanced with the control account of "General Expenses." Tabulations of these cards are then run to furnish the totals by kind, by department, by group and by office. Ledger accounts are maintained for the various groups and kinds of expenses and auxiliary summary records are maintained to which are posted the monthly totals of departments and offices. The trial balance is so designed as to show at all times the total expenditures under each group and the analysis of each group by kind.

It goes without saying that all coding of expense vouchers should be done by experienced clerks who will exercise the same care that a bookkeeper would in making entries to be posted to his ledger. As the coding system is quite simple, however, it does not take long to memorize the various code numbers and remarkably few errors due to incorrect interpretation of codes have arisen.

The system described herein has been in use for over three years. The method adopted is believed to be sound in principle and is sufficiently elastic to permit of as refined analysis as may be desired. The use of Hollerith cards as a means of assembling data has unquestioned advantages because of its flexibility and while no system of records will of itself furnish accurate statistics, the great number of problems incident to the proper determination of costs in casualty insurance will, we believe, be made easier of solution by the use of this modern device.



OFFICE PAYING (OR CHARGED)		DEPARTMENT	KIND OF EXPENSE
1. Home Office	11. Hartford	01. Underwriting	20. Salaries—Home Office
2. Dallas	21. Columbus	02. Claim	21. Salaries—Special Agents
3. Atlanta	31. Havana,	03. General Executive	22. Salaries—Branch Office
4. Chicago	Cuba	04. Pay Roll Audit	30. Traveling—Home Office
5. San Francisco	41. Newark	05. Inspection	31. Traveling—Special Agents
6. Montreal	51. Phila. B. O.	06. Accounting	32. Traveling—Branch Office
7. Boston	61. Pittsburgh	07. Agency	40. Rent—Home Office
8. New York		08. Cashier	42. Rent—Branch Office
9. Syracuse		09. Filing	50. Allowance to Agents
GROUP		10. Statistical	51. Advertising
1. Sundry Claim Expenses		11. Stenographic	52. Auditing Fees
2. Acquisition & Field Supervision		12. Supply	53. Bureaus & Associations
3. General Administration		13. Printing	54. Confidential Reports
4. Pay Roll Audit		14. Mailing	55. Contingent Commissions
5. Inspections		15. Brokerage & Service	56. Directors' Fees
6. Bureaus & Associations		16. Cancellation & Reins.	57. Exchange
7. Taxes, Licenses & Fees		17. Abstract	58. Express
		18.                   19. Miscellaneous	59. Furniture & Fixtures
LINE OF INSURANCE			60. Sundry Expense
20. Accident & Health			61. Insurance
21. Accident			62. Legal
22. Health			63. Medical Examination Fees
30. Liability & Compensation			64. Postage
31. Liability (P. L. & P. D.) Auto & all Liab.			65. Printing & Stationery
32. Automobile P. L., P. D. & Coll.			66. Subscriptions & Publications
33. Automobile Public Liability			67. Surety Bonds
34. Automobile Property Damage			68. Telegrams
35. Automobile Collision			69. Telephone
36. Liability other than Auto (P. L., P. D. & E. L.)			70. Moving Expense 75.
37. Liability other than Auto (P. L. & E. L.)			71.                   76.
38. Property Damage other than Auto			72.                   77.
39. Workmen's Compensation			73.                   78.
40. Fidelity & Surety			74.                   79.
41. Fidelity			80. Agents Licenses & Fees
42. Surety			81. Capital Stock Tax
50. Plate Glass			82. City & County Fees & Taxes
60. Burglary & Theft			83. Examination Fees
70. Steam Boiler, Engine & Machinery			84. Income Tax (Federal)
71. Steam Boiler			85. Insurance Dept. Licenses & Fees
72. Engine & Machinery			86. Miscellaneous Fees & Taxes
80. Water Damage			87. Publication Fees
90. Aviation—All lines		97. Aviation—Public Liability	88. State Taxes on Premiums
96. Aviation—Passenger Liability		98. Aviation—Property Damage	

ANALYSIS OF EXPENSES

EXHIBIT 3



CONSTITUTION INDEMNITY COMPANY  
REQUISITION FOR CHECK

Check No. \_\_\_\_\_

To Cashier: Philadelphia, Pa. \_\_\_\_\_ 19\_\_  
 Draw Check to Order of \_\_\_\_\_  
 For \_\_\_\_\_

VOUCHERS MUST BE CHECKED, APPROVED  
AND COMPLETE IN EVERY DETAIL BE-  
FORE PRESENTING TO THE CASHIER.

Made by \_\_\_\_\_  
 Checked by \_\_\_\_\_  
 Approved by \_\_\_\_\_

Regulation Stub CONSTITUTION INDEMNITY COMPANY, Check No. \_\_\_\_\_  
 To Accounts Department Philadelphia, Pa. \_\_\_\_\_  
 Payable To \_\_\_\_\_ Amount, \$ \_\_\_\_\_

CODIFICATION OF GENERAL EXPENSE						OTHER DISBURSEMENTS (Cont'd)		
Other Charged	Dep't	Ledger Account	Comp	Line	Account	Premiums Debit		Debit/Credit
					Accident			
					Health			
					Auto Liability			
					Public Auto Liability			
					Auto-Property Damage			
					Public Auto Property Damage			
					Auto Collision			
					Employers' Liability			
					Other Liability			
					Other Property Damage and Collision			
					Workmen's Compensation			
					Fidelity			
					Fidelity Bonding, Blanket			
					Surety			
					Plate Glass			
					Burglary			
					Steam Boiler			
					Engines and Machinery			
					Debit, Premiums O/S			
					Credit-Cumulative Surplus			
					Agents-Sundry Balances			
TOTAL General Expense								
OTHER DISBURSEMENTS								
Losses and Loss Expenses								
Personal Balance								
TOTAL						TOTAL		

Use 1911 and 1912