

AN ACTUARIAL ANALYSIS OF
SERVICING CARRIER PROFIT MARGINS

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BIOGRAPHY:

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ABSTRACT:

Adequate servicing carrier allowances are critical to the success of residual market pooling mechanisms, as they help to attract and maintain a sufficient supply of servicing carrier capacity. Regulators, legislators, servicing and non-servicing pool members, and other interested parties need to understand the expenses and general operations of servicing carriers so that their experience can be properly evaluated.

The paper presents a methodology to evaluate a servicing carrier allowance, with particular emphasis on the profit provision. Based on the operations and reporting procedures of servicing carriers, a cash flow model is used to evaluate profit provisions within a rate of return context.

The paper focuses on servicing carrier operations for the workers compensation residual market. Two distinct roles of the servicing carrier emerge: 1) a service company, collecting a fee for insurance services performed and costs incurred, and 2) a collection and payment agent for the assigned risk reinsurance pool. The cash flow model is a useful tool to help understand and analyze the financial effects of each role. The model reveals a subtle, but real cost to servicing carriers of the second role, as they use their own funds to pre-pay the excess of losses and expenses over premiums on behalf of the pool.

PREFACE

This paper presents an approach to evaluate servicing carrier profit margins. The numerical values for the assumptions are entirely hypothetical. The results which are derived from the assumptions follow only due to arithmetic and actuarial calculations. The author and his employer do not advocate or endorse any specific values as appropriate.

A cash flow model is only one of several methods by which servicing carrier experience can be evaluated. Even within a cash flow model, estimates for key variables could be made using an average cost or marginal cost approach. Other approaches may focus on results using calendar year accounting principles.

BACKGROUND: WORKERS COMPENSATION RESIDUAL MARKETS

The workers compensation residual market is the insurance market segment consisting of employers who are required to secure insurance coverage but are unable to obtain it in the voluntary market.

Each state has its own method of handling the residual market. They are illustrated in Exhibit 1. In the six monopolistic fund states, all risks obtain coverage from a single source, the state fund. Nine states operate a competitive state fund, which is obligated by state law to provide coverage to all employers applying to it.

In the remaining thirty-six states, an assigned risk insurance plan is the mechanism by which coverage is provided. The plan provides coverage by "assigning" each risk to a designated insurance company. Each insurance company participates in the assigned risk plan, generally speaking, in proportion to its voluntary workers compensation market share.

In thirty of these states, there are two ways by which an insurer can fulfill its obligations to share in plan business. The insurer may accept direct assignments; that is, specific risks are assigned to the insurer, and the insurer provides coverage, collects premium, and retains the results which arise from the particular risks. Alternatively, an insurer may become a member of a reinsurance pool, whereby the aggregate results of the risks assigned to pool members are shared among the members. In other words, the members reinsure each other for losses arising from plan business reinsured by the pool. In this case, the member company does not receive direct assignments. Risks which would otherwise be assigned to that company are directed instead to one of several servicing carriers, designated to service assigned risks on behalf of pool members. In the remaining six states with assigned risk plans, the pooling arrangement is mandatory.

WORKERS COMPENSATION RESIDUAL MARKET MECHANISMS

State Fund		Assigned Risk Plan	
<u>Monopolistic</u>	<u>Competitive</u>	<u>2 Methods*</u>	<u>Mandatory Pool</u>
North Dakota	California	Alabama	Maine
Nevada	Colorado	Alaska	Michigan
Ohio	Idaho	Arizona	Minnesota
Washington	Maryland	Arkansas	New Mexico
West Virginia	Montana	Connecticut	Texas
Wyoming	New York	Delaware	Wisconsin
	Oklahoma	District of Columbia	
	Pennsylvania	Florida	
	Utah	Georgia	
		Hawaii	
		Illinois	
		Indiana	
		Iowa	
		Kansas	
		Kentucky	
		Louisiana	
		Massachusetts	
		Mississippi	
		Missouri	
		Nebraska	
		New Hampshire	
		New Jersey	
		North Carolina	
		Oregon	
		Rhode Island	
		South Carolina	
		South Dakota	
		Tennessee	
		Vermont	
		Virginia	

* Companies may accept direct assignments or become a pool member.

SERVICING CARRIERS

Operations and Remuneration

Servicing carriers handle assigned risk policies on behalf of the pool membership. Services performed include policy rating and issuance, premium billing and collection, inspection, premium audit, and claim handling. A servicing carrier's expenses to provide these services, as well as any taxes or assessments which are incurred by the carrier, are remunerated by a servicing carrier allowance.¹ The allowance is generally approved by a governing body of the pool. The allowance should also include a profit provision for a return on the carrier's invested resources. The allowance is generally expressed as a percentage to net premium.

Commissions paid to agents on assigned policies by the servicing carrier are reimbursed directly by the pool.

Financial Reporting

Each servicing carrier must provide a financial reporting to the pool. Quarterly reports are generally due to the pool within 45 days after the close of the quarter. The submissions include state and policy year data for serviced business.

As part of the "paper" accounting, direct written premiums, incurred losses (claim payments and changes in case basis reserves), and paid commissions are ceded by the servicing carrier to the pool. On a cash basis, the carrier forwards the written premium to the pool, net of paid commissions, claim payments, and the servicing allowance. Depending on the overall result of

¹ Premium taxes are incurred by the servicing carrier, even though the premium is ceded to the pool, because premium taxes are based on direct premiums. Similarly, taxes and assessments based on losses (generally paid losses) are incurred by the carrier making the direct payments.

these transactions, the servicing carrier will send either a check or cash demand to the pool.

Components of the Servicing Carrier Allowance

The servicing carrier allowance includes provisions for:

- General & other acquisition expense
- Allocated loss adjustment expense
- Unallocated loss adjustment expense
- Premium taxes
- Loss-based taxes and assessments
- Profit

Since the focus of this paper is the profit factor, it is assumed that appropriate measures for general and other acquisition expense, allocated and unallocated loss adjustment expense, premium taxes, and loss-based taxes and assessments can be made. These expenses must be expressed as ratios to the net premium booked by the servicing carrier, as the servicing allowance percentage is applied to net premium booked.

The allowance's profit provision must provide a reasonable return on invested resources to the servicing carrier, considering also the contingencies and risks which the carrier assumes.² The provision must be large enough to attract and retain servicing carriers, but low enough to avoid excessive returns at the expense of the non-servicing carriers.³

² Risk arises from a remuneration based on premiums, whose volume and adequacy are uncertain, as manifested in an uncertain amount of claim activity, which affects claim department staffing and other loss adjustment expenses. (Note that loss adjustment expenses make up about 46% of total servicing expenses in the example presented later.) In addition, in states where loss-based assessments are significant and because such assessments are generally based on direct paid losses, the carrier also assumes risk regarding the level of future assessment rates.

³ It is important to note that the servicing allowance is fully paid by pool members (not assigned risk policyholders).

A cash flow model of a servicing carrier operation is a useful tool to evaluate servicing carrier profit margins. The model considers the timing of all of the various transactions associated with a single policy, from inception to final payment of losses.

SERVICING CARRIER CASH FLOW MODEL

Two Roles of the Servicing Carrier

As each of the transactions affecting cash flow were identified in the development of the model, two distinct roles of the servicing carrier emerged. Each role has its own and very different effect on the overall cash flow of the servicing operation. These roles are:

- 1) Servicing policies assigned to it on behalf of the pool, for which the carrier is paid an allowance to cover servicing expenses;
- 2) Acting as a collection and payment agent of the pool, whereby the carrier collects premiums and pays commissions and claims, before these items are remitted to and reimbursed by the pool and its membership.

In its first role, the carrier should recognize the servicing allowance into revenue as it is earned, while charging appropriate expenses against the revenue. Some expenses (general and other acquisition, premium taxes) are charged as they are paid, while others (loss-related expenses) are charged as they are incurred (paid plus changes in reserved amounts). It may be possible for the carrier to earn investment income on reserves. The allowance, expense, and investment income flows are combined to be the servicing cash

flow, the first of three basic cash flows required for the complete analysis.

In its second role, the carrier records direct written premiums on its books, and must send such amount of premium to the pool 45 days after the close of the calendar quarter. Furthermore, the carrier pays agent commissions and policyholder claims before they are reimbursed by the pool. Depending on the timing of all these items, the carrier may actually advance its own monies, waiting to be reimbursed by the pool during the next quarter. The overall "float" cash flow is the second of the three cash flows required for the complete analysis.

Consideration of Capital

The model includes a simple consideration of a carrier's capital (or equity) investment to support the servicing operation. This concept is similar to that of a premium to surplus ratio for insurance as a measure of the capital (surplus) "supporting" the business. For purposes of the base case analysis, the amount of equity supporting the servicing operation is established as that needed to produce a (selected) 2:1 "sales" to equity ratio.⁴ "Sales" corresponds to servicing carrier allowance revenue.

To illustrate, if the servicing allowance is 30% and serviced premiums total \$100, then the servicing "sales" are \$30. In order to satisfy a 2:1 sales to equity ratio, \$15 of equity (1) is invested at the beginning of the year, (2) is not available to the "owner" until the end of the year, but (3) investment income can be earned in the equity during the year. The equity cash flow is the third of the three cash flows which produce the overall cash flow of the servicing operation.

⁴ Sales and equity figures for Standard Industrial Classification (SIC) code 641, Insurance Agents, Brokers, and Services were reviewed as found in *Ward's Business Directory of Largest U. S. Companies*.

Cash Flow Model Assumptions

The cash flow model requires the selection of many assumptions. The model's assumptions, calculations, and results for the "base case" are presented in Exhibit 2-1 through Exhibit 2-8. The reader is reminded that all assumptions are hypothetical and are used as a basis for discussion of the cash flow model approach.

<u>Page Heading</u>	<u>Focus</u>
Assumptions	Displays components of the allowance and other "single value" assumptions.
Patterns	Displays the assumptions for various patterns.
Servicing Revenue	Develops "earned" servicing carrier revenue.
Servicing Expenses	Develops servicing carrier expenses.
Servicing Investment Income	Develops the reserves held by the servicing carrier on which investment income can be earned.
Servicing Cash Flow	Adds FIT to the "underwriting" and investment income results from the servicing operation.
Float Cash Flow	Develops the cash flow resulting from the second role of the servicing carrier, that of collection and payment agent for the assigned risk reinsurance pool.
Equity & Total Cash Flow	A simple consideration of equity is presented, and is combined with the servicing and float cash flows to produce the total cash flow. Present value factors are applied to determine the discounted cash flow and internal rate of return.

ASSUMPTIONS

Exhibit 2-1

Item	Contribution to the Servicing Carrier Allowance (SCA) (% Prem)	
Gen & Oth Acq	10.0% of Premium	10.0%
ALAE	4.0% of Losses	4.4%
ULAE	8.0% of Losses	8.8%
Prem Tax	3.0% of Premium	3.0%
Loss Tax	2.0% of Losses	2.2%
Profit	4.0% of Premium	4.0%
		Indicated SCA 32.4%
		Actual SCA 32.4%

Loss Ratio 110.0%
 Net Premium 100,000
 Commission 5.0%
 Audit % 15% % of total premium discovered at audit.

Loss Pay Patt 2 1: Slow (avg 10 qtrs); 2: Medium (avg 8 qtrs); 3: Fast (avg 6 qtrs)
 G&OA Pattern 50% % of G&OA paid per Bk Prem; balance paid during 1st year.
 ULAE Pattern 50% % of ULAE paid with losses; balance paid during 1st year.

Inv Inc % 8.5% Annual Yield % at which Investment Income is earned.
 FIT % 34.0% Federal Income Tax rate.

Sales/Equity 2.0 Capitalization standard
 (Sales defined as servicing allowance revenue)

All expenses are assumed to be accurate.
 Premium booked is the same as premium billed and received.

All assumptions are for illustrative purposes only.

PATTERNS

Exhibit 2-2

Quarter	Premium Booking Pattern (1)	Unearned SCA Pattern (2)	Gen & Oth Acq Exp Payout Pattern (3)	LAE & Loss Tax Incur Pattern (4)	Loss Payout Pattern (5)	ALAE Payout Pattern (6)	ULAE Payout Pattern (7)
1	45.1%	75%	35.1%	25%	2%	2%	13.5%
2	12.2%	50%	18.6%	25%	4%	4%	14.5%
3	15.4%	25%	20.2%	25%	6%	6%	15.5%
4	12.2%	0%	18.6%	25%	8%	8%	16.5%
5	7.5%		3.8%		10%	10%	5.0%
6	7.5%		3.8%		12%	12%	6.0%
7					10%	10%	5.0%
8					8%	8%	4.0%
9					8%	8%	4.0%
10					6%	6%	3.0%
11					6%	6%	3.0%
12					4%	4%	2.0%
13					4%	4%	2.0%
14					4%	4%	2.0%
15					2%	2%	1.0%
16					2%	2%	1.0%
17					2%	2%	1.0%
18					2%	2%	1.0%
19					0%	0%	0.0%
20					0%	0%	0.0%
21							
Total	100%		100%	100%	100%	100%	100%

(1) Based on selected mix of installment plan use:

Full Up-Front	10%
75% Down plus 1 Semi-Annual	15%
50% Down plus 3 Quarterly	25%
25% Down plus 11 Monthly	50%

(2) % of cumulative booked SCA which is not earned by quarter's end.

(3) 50% of G&OA paid as Premium is booked;
balance is paid uniformly during first 4 quarters.

(4) LAE & Loss-Based Taxes incurred uniformly during year.

(5) Sample loss payout pattern.

(6) Assumes ALAE is paid in same pattern as losses.

(7) 50% of ULAE paid as losses are paid; balance during year 1.

SERVICING REVENUE

Exhibit 2-3

Quarter	Premium Booked (8)	SCA Booked (9)	Unearned SCA Reserve (10)	"Earned" Allowance (11)
1	45,135	14,624	10,968	3,656
2	12,240	3,966	9,295	5,639
3	15,385	4,985	5,894	8,386
4	12,240	3,966	0	9,859
5	7,500	2,430	0	2,430
6	7,500	2,430	0	2,430
7	0	0	0	0
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
Total	100,000	32,400	26,156	32,400

(8) 100,000 x Premium Booking Pattern.

(9) SCA % x Premium Booked.

(10) Unearned SCA Pattern x Cumulative SCA Booked.

(11) SCA Booked - Change in Unearned SCA Reserve.

SERVICING EXPENSES

Exhibit 2-4

Quarter	Gen & Oth Acq Exp Paid (12)	Prem Taxes Paid (13)	Incurred ALAE (14)	Incurred ULAE (15)	Incurred Loss Taxes (16)	Total Incurred SC Expenses (17)
1	3,507	1,354	1,100	2,200	550	8,711
2	1,862	367	1,100	2,200	550	6,079
3	2,019	462	1,100	2,200	550	6,331
4	1,862	367	1,100	2,200	550	6,079
5	375	225	0	0	0	600
6	375	225	0	0	0	600
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
11	0	0	0	0	0	0
12	0	0	0	0	0	0
13	0	0	0	0	0	0
14	0	0	0	0	0	0
15	0	0	0	0	0	0
16	0	0	0	0	0	0
17	0	0	0	0	0	0
18	0	0	0	0	0	0
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21						0
Total	10,000	3,000	4,400	8,800	2,200	28,400

(12) 100,000 x G&OA % x G&OA Pattern.

(13) Premium Booked x Premium Tax %.

(14) 100,000 x Loss Ratio x ALAE % x LAE Inc Pattern.

(15) 100,000 x Loss Ratio x ULAE % x LAE Inc Pattern.

(16) 100,000 x Loss Ratio x Loss Tax % x Inc Pattern.

(17) Sum of Columns 12 through 16.

SERVICING INVESTMENT INCOME

Exhibit 2-5

Quarter	ALAE Paid (18)	ULAE Paid (19)	Loss-Based Taxes Paid (20)	ALAE Reserve @ Qtr End (21)	ULAE Reserve @ Qtr End (22)	Loss Tax Reserve @ Qtr End (23)	USCA, Loss Tax, LAE Rsrvs (24)	Inv Inc on Reserves (25)
1	88	1,188	44	1,012	1,012	506	13,498	139
2	176	1,276	88	1,936	1,936	968	14,135	285
3	264	1,364	132	2,772	2,772	1,386	12,824	278
4	352	1,452	176	3,520	3,520	1,760	8,800	223
5	440	440	220	3,080	3,080	1,540	7,700	170
6	528	528	264	2,552	2,552	1,276	6,380	145
7	440	440	220	2,112	2,112	1,056	5,280	120
8	352	352	176	1,760	1,760	880	4,400	100
9	352	352	176	1,408	1,408	704	3,520	82
10	264	264	132	1,144	1,144	572	2,860	66
11	264	264	132	880	880	440	2,200	52
12	176	176	88	704	704	352	1,760	41
13	176	176	88	528	528	264	1,320	32
14	176	176	88	352	352	176	880	23
15	88	88	44	264	264	132	660	16
16	88	88	44	176	176	88	440	11
17	88	88	44	88	88	44	220	7
18	88	88	44	0	0	0	0	2
19	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0
Total	4,400	8,800	2,200					1,790

(18) 100,000 x Loss Ratio x ALAE % x ALAE Payment Pattern.

(19) 100,000 x Loss Ratio x ULAE % x ULAE Payment Pattern.

(20) 100,000 x Loss Ratio x Loss Tax % x Loss Payment Pattern.
(Assumes loss taxes are paid as losses are paid.)

(21) Cumulative Incurred ALAE - Cumulative Paid ALAE.

(22) Cumulative Incurred ULAE - Cumulative Paid ULAE.

(23) Cumulative Incurred Loss Taxes - Cumulative Paid Loss Taxes.

(24) Sum of Unearned SCA, ALAE, ULAE, and Loss Tax Reserves.

(25) Average reserve during quarter x Quarterly Interest Rate.

SERVICING CASH FLOW

Exhibit 2-6

Quarter	SC "Under- writing" Result (26)	Inv Inc on SC Income (27)	Inv Inc on Reserves (28)	Servicing Operating Income BFIT (29)	Servicing FIT (30)	Servicing Cash Flow (31)
1	-5,055	-52	139	-4,968	-1,689	-3,279
2	-440	-5	285	-160	-54	-106
3	2,055	21	278	2,354	800	1,554
4	3,780	39	223	4,042	1,374	2,668
5	1,830	19	170	2,019	686	1,332
6	1,830	19	145	1,994	678	1,316
7	0	0	120	120	41	79
8	0	0	100	100	34	66
9	0	0	82	82	28	54
10	0	0	66	66	22	43
11	0	0	52	52	18	34
12	0	0	41	41	14	27
13	0	0	32	32	11	21
14	0	0	23	23	8	15
15	0	0	16	16	5	10
16	0	0	11	11	4	7
17	0	0	7	7	2	4
18	0	0	2	2	1	1
19	0	0	0	0	0	0
20	0	0	0	0	0	0
21	0	0	0	0	0	0
Total	4,000	41	1,790	5,831	1,983	3,849

(26) Earned SCA Revenue - Total Incurred SC Expenses.

(27) Half-a-quarter's interest on SC Underwriting Results.

(28) Carried forward from Column 25.

(29) Sum of "Underwriting" Result and its Investment Income and Investment Income on Reserves.

(30) FIT % x Servicing Operating Income BFIT

(31) Operating Income BFIT - FIT

FLOAT CASH FLOW

Exhibit 2-7

Quarter	Prem Booked (32)	SCA Booked (33)	Losses Paid (34)	Comm Paid (35)	Cash Settlements to Pool (36)	Free-standing Float (37)	Cumulative Float (38)	Interest Earned on Float (39)	Float Cash Flow (40)
1	45,135	14,624	2,200	2,257		26,055	26,055	177	26,232
2	12,240	3,966	4,400	612	26,055	-22,792	3,262	199	-22,593
3	15,385	4,985	6,600	769	3,262	-231	3,031	43	-188
4	12,240	3,966	8,800	612	3,031	-4,169	-1,138	13	-4,156
5	7,500	2,430	11,000	375	-1,138	-5,167	-6,305	-51	-5,218
6	7,500	2,430	13,200	375	-6,305	-2,200	-8,505	-101	-2,301
7	0	0	11,000	0	-8,505	-2,495	-11,000	-133	-2,628
8	0	0	8,800	0	-11,000	2,200	-8,800	-135	2,065
9	0	0	8,800	0	-8,800	0	-8,800	-120	-120
10	0	0	6,600	0	-8,800	2,200	-6,600	-105	2,095
11	0	0	6,600	0	-6,600	0	-6,600	-90	-90
12	0	0	4,400	0	-6,600	2,200	-4,400	-75	2,125
13	0	0	4,400	0	-4,400	0	-4,400	-60	-60
14	0	0	4,400	0	-4,400	0	-4,400	-60	-60
15	0	0	2,200	0	-4,400	2,200	-2,200	-45	2,155
16	0	0	2,200	0	-2,200	0	-2,200	-30	-30
17	0	0	2,200	0	-2,200	0	-2,200	-30	-30
18	0	0	2,200	0	-2,200	0	-2,200	-30	-30
19	0	0	0	0	-2,200	2,200	0	-15	2,185
20	0	0	0	0	0	0	0	0	0
21					0	0	0	0	0
Total	100,000	32,400	110,000	5,000	-47,400	0	-47,400	-645	-645

(32) Carried forward from Column 8.

(33) SCA % x Premium Booked.

(34) 100,000 x Loss Ratio x Loss Payout Pattern.

(35) Commission % x Premium Booked.

(36) Prem Booked - SCA Booked - Losses Paid - Comm Paid (lagged 1 qtr).

(37) Prem Booked - SCA Booked - Losses Paid
- Comm Paid - Cash Settlement.

(38) Cumulative sum of Column 37.

(39) Average Cumulative Float x Quarterly Interest Rate x (1 - FIT %).

(40) Freestanding Float + Interest Earned on Float.

EQUITY & TOTAL CASH FLOW

Exhibit 2-8

Quarter	Invested Equity (41)	AFIT Invest		Equity Cash Flow (43)	Servicing Cash Flow (44)	Float Cash Flow (45)	Total Cash Flow (46)	14.3% PV Factor (47)	Discounted Cash Flow (48)
		Income on Equity (42)							
	16,200			-16,200			-16,200	1.000	-16,200
1	16,200	220	220	-3,279	26,232	23,173	0.967	22,412	
2	16,200	220	220	-106	-22,593	-22,478	0.935	-21,026	
3	16,200	220	220	1,554	-188	1,586	0.905	1,434	
4	16,200	220	220	2,668	-4,156	-1,268	0.875	-1,109	
5			16,200	1,332	-5,218	12,315	0.846	10,420	
6				1,316	-2,301	-985	0.818	-806	
7				79	-2,628	-2,548	0.792	-2,017	
8				66	2,065	2,131	0.766	1,631	
9				54	-120	-66	0.740	-49	
10				43	2,095	2,139	0.716	1,531	
11				34	-90	-55	0.693	-38	
12				27	2,125	2,152	0.670	1,441	
13				21	-60	-39	0.648	-25	
14				15	-60	-45	0.626	-28	
15				10	2,155	2,166	0.606	1,312	
16				7	-30	-22	0.586	-13	
17				4	-30	-25	0.567	-14	
18				1	-30	-28	0.548	-16	
19				0	2,185	2,185	0.530	1,158	
20				0	0	0	0.513	0	
21				0	0	0	0.496	0	
Total		881		3,849	-645	4,085		0	

(41) $100,000 \times \text{SCA \%} / \text{"Sales to Equity" Ratio}$.

Equity is invested at "end of quarter 0,"
until its "release" to the "owner" at expiration of the year.

(42) $\text{Average Equity during Quarter} \times \text{Quarterly Interest Rate} \times (1 - \text{FIT \%})$.

(43) $\text{Investment Income on Equity} + \text{Change in Invested Equity}$.

(44) Carried forward from Column 31.

(45) Carried forward from Column 40.

(46) $\text{Equity Cash Flow} + \text{Servicing Cash Flow} + \text{Float Cash Flow}$.

(47) Present Value Discount Factors (end of quarter).

(48) $\text{Total Cash Flow} \times \text{Present Value Factors}$. Since its sum is 0,
the interest rate used for discount factors is the internal rate of return.

Base Case Results

The nominal results to the servicing carrier arising from the "base case" assumptions are summarized below. The figures assume the servicing of a \$100,000 policy.

	<u>\$</u>	<u>Source</u>
"Underwriting" Result	4,000	Col 26
+ Investment Income	1,832	Col 27 + 28
- Federal Income Tax	1,983	Col 30
= Servicing Sub-Total	3,849	Col 31
- Cost of Float ⁵	645	Col 40
+ Investment Income from Equity	881	Col 42
Servicing Carrier Result	4,085	Col 46

Therefore, the servicing carrier's nominal operating result is a profit of 4.1% of direct premium serviced. The investment of equity to support the operation totals 16,200, which, considering the time value of money, yields an internal rate of return of 14.3% (see Columns 47 and 48). This rate of return is merely the arithmetic result of calculations using the hypothetical assumptions. This paper does not endorse or advocate any single value as the appropriate rate of return for servicing carriers.

Exhibit 3 presents a graph of the "base case" total cash flow.

⁵ The cost of float may be interpreted as investment income lost due to the advance of the carrier's own funds to prepay the excess of losses and expenses over premiums.

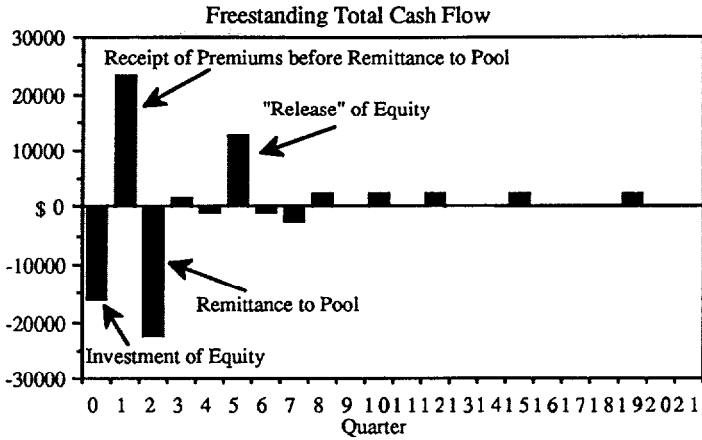
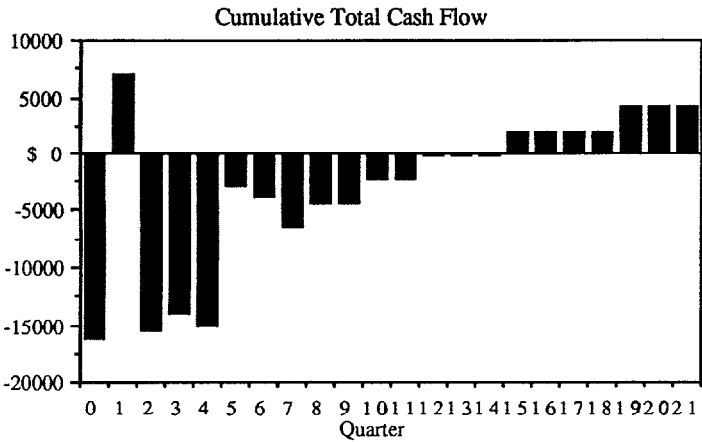


Exhibit 4 displays a graph of the cumulative total cash flow (in other words, a servicing carrier's "bank account" at the end of each quarter, as a result of the freestanding cash transactions from Exhibit 3).

Exhibit 4



After the initial positive cash flow to the servicing carrier, the cumulative

total cash flow is not positive until the fifteenth quarter from policy inception. The use of a servicing carrier's own funds to pre-pay the excess of losses and expenses over premium on behalf of the pool is a subtle, but real cost of acting as a servicing carrier. A cash flow model can help measure this cost.⁶ The internal rate of return implicitly evaluates the ability of the profit provision to compensate the carrier for its entire investment in a servicing operation.

Sensitivity Analysis

An analysis of the sensitivity of the results to changes in key assumptions is not only interesting, but useful to determine their relative effects. Unless shown otherwise, all other assumptions are as in the base case.

Sensitivity to Loss Payout Pattern

<u>Value</u>	<u>Return</u>
Slow (avg 10 qtrs)	16.7%
BASE = Medium (avg 8 qtrs)	14.3%
Fast (avg 6 qtrs)	12.3%

This item affects the return not so much through the changing pattern of loss payments, but primarily through its effect on the payout of allocated loss adjustment expenses (which are assumed to follow the loss payments). This affects the amount of investment income which can be earned on the ALAE portion of the allowance from its receipt to full payment.

⁶ If the float cash flow is excluded from the total cash flow, under the base case assumptions, the internal rate of return increases to 20.7%. In order to maintain the rate of return at 14.3%, the profit provision should be 1.74%. In other words, of the total 4.0% profit provision in the allowance for the base case, the portion which implicitly covers the cost of float is 2.26%.

Sensitivity to General & Other Acquisition Expense Pattern

<u>Value</u>	<u>Return</u>
0%*	14.3%
BASE = 50%*	14.3%
100%*	14.3%

* Percentage of total G & OA paid as premium is booked; balance is paid uniformly during the first four quarters.

Sensitivity to Use of Premium Installments

<u>Value</u>	<u>Return</u>
All Prepaid	16.1%
BASE*	14.3%
All Monthly	13.8%

* 10% of Premium billed Prepaid; 15% as 75% down plus 1 semi-annual payment; 25% as 50% down plus 3 quarterly payments; 50% as 25% down with 11 monthly payments.

Sensitivity to Audit %

<u>Value</u>	<u>Return</u>
10%	14.7%
BASE = 15%	14.3%
20%	13.9%

Sensitivity to Investment Income Interest Rate

<u>Value</u>	<u>Return</u>
6.5%	12.8%
7.5%	13.5%
BASE = 8.5%	14.3%
9.5%	15.1%
10.5%	15.9%

Sensitivity to Loss Ratio

<u>Value</u>	<u>Allowance</u>	<u>Return</u>
90%	29.6%	19.9%
100%	31.0%	16.6%
BASE = 110%	32.4%	14.3%
120%	33.8%	12.5%
130%	35.2%	11.1%

As the loss ratio increases, driving up loss-related expenses, the indicated and actual servicing allowance increase. With a constant ratio of "sales" to equity, an increased allowance increases the required equity. Furthermore, the cost of float increases, as more servicing carrier funds are advanced on behalf of the pool. With no change in the profit provision (4.0%), the rate of return decreases.

Sensitivity to "Sales to Equity" Ratio

(Constant 4.0% Profit)

<u>Value</u>	<u>Return</u>
1.0	10.0%
1.5	12.3%
BASE = 2.0	14.3%
2.5	16.2%
3.0	18.0%
4.0	21.4%

As the ratio (leverage) increases, requiring decreasing amounts of invested equity, the rate of return increases.

Alternatively, sensitivity to varying equity standards can be tested, holding the rate of return constant, and solving for the profit load.

Sensitivity to "Sales to Equity" Ratio

(Constant 14.3% Return)

<u>Value</u>	<u>Allowance</u>	<u>Profit</u>
1.0	36.0%	7.6%
1.5	33.5%	5.1%
BASE = 2.0	32.4%	4.0%
2.5	31.8%	3.4%
3.0	31.3%	2.9%
4.0	30.8%	2.4%

As the leverage increases, the profit provision decreases to maintain the return on equity.

Sensitivity to Actual Allowance (or Profit Provision)

<u>Indicated SCA</u>	<u>Actual SCA</u>	<u>"Actual"</u> <u>Profit</u>	<u>Return</u>
32.4%	BASE = 32.4%	4.0%	14.3%
32.4%	31.4%	3.0%	11.9%
32.4%	30.4%	2.0%	9.5%
32.4%	29.4%	1.0%	7.0%
32.4%	28.4%	0.0%	4.6%

Decreasing profit provisions significantly affect the rate of return to the servicing carrier on its investment of resources.

ENHANCEMENTS TO THE MODEL

The capitalization standard plays a major role in the evaluation of the profit provision for the servicing carrier allowance. The current cash flow model reflects a simple approach to its incorporation in pricing. Questions which might warrant research include: How much equity is required? What should be the pattern of the equity cash flow? Should it extend beyond policy expiration? If so, how long, and in what pattern?

Apart from the above "theoretical" enhancement, the basic model could be enhanced operationally to reflect a wide variety of items. If premium collection lags premium booking and billing, cash flow will suffer. Any uncollectible premium could have a negative effect on servicing carrier cash flow. Loss-based taxes and assessments might be included as lagging loss payments by several quarters, since assessments are generally made based on the prior calendar year's paid losses. The ALAE payment pattern may be different than the loss payment pattern. Investigation into the ULAE, as well as general and other acquisition expense, payment pattern may also be

warranted.

Alternate reimbursement methods could also be explored with the model. What if ALAE were reimbursed directly to the servicing carrier by the pool? This partial "unbundling" of the allowance would reduce the "up-front" allowance; the ALAE-related cash flow would move from the servicing cash flow to the float cash flow, thereby reducing the investment income available.

APPLICATION TO OTHER LINES OF INSURANCE

This paper has focused on general servicing carrier operations for the workers compensation reinsurance pools. This type of analysis could be applied to the servicing carrier operations for other lines of insurance. The specific features of the automobile residual market, for example, either private passenger or commercial, would need to be reflected. ALAE may be coded as loss, and therefore ceded to the pool, so that the allowance does not need to include it.

CONCLUDING REMARKS

A servicing carrier's cash flow is very delicate, and is easily disturbed by variances in actual allowance and expense levels from their "true" values. A cash flow model is a useful tool to help understand the various roles of the servicing carrier and their financial effects. Such understanding adds valuable insight to an analysis of servicing carrier profit margins.