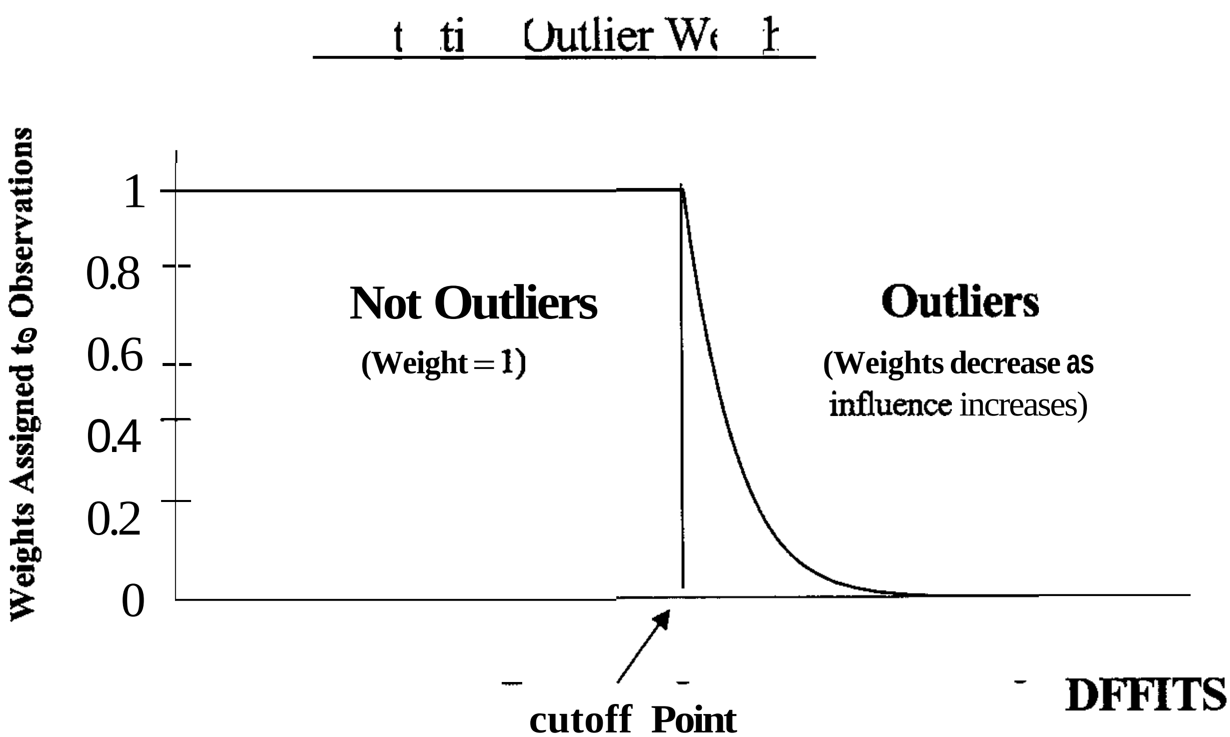
EXHIBIT 4.2


Weights Assigned to Observations
1
0.8
0.6
0.4
0.2
0
Not Outliers
(Weight = 1)
Outliers
(Weights decrease as influence increases)
cutoff Point
DFFITS

2. Outlier Accommodation Method for Ratio Estimates

a. Identification of Outliers for Ratio Estimates

For ratio estimates, the influence of each observation on the ratio can be calculated directly by excluding each point from the ratio one at a time. This is technically parallel to the DFFITS method adopted in regression models in identifying influential points.

$$Ratio = \frac{\sum (sample\ Weight_i \times Y_i)}{\sum (SampleWeight_i \times X_i)}$$

$$Influence_j = Ratio - \frac{\sum (Sample\ Weight_i \times Y_i) - Sample\ Weight_j \times Y_j}{\sum (SampleWeight_i \times X_i) - Sample\ Weight_j \times X_j}$$

The cutoff point of variance weights for ratio estimates is determined by testing various scaled standard deviations of influence to produce the same proportion of influence points as in regression cases.

$$C = 2.33 \times Std\ Deviation\ (Influence_i)$$

Study areas with influence exceeding cutoff point C are then accommodated.

b. Accommodation of Outliers for Ratio Estimates

In parallel to the method of calculating variance weights for regression models, variance weights for ratio estimates are assigned as:

$$\textit{If Influence}_i \leq C \text{ , Then Variance Weight}_i = 1$$

$$\textit{Else Variance Weight}_i = \left(\frac{C/2}{\textit{Influence}_i} \right)^2$$

The final ratio estimate would be calculated using both sample weights and variance weights. All ratio models in this filing use *this* method **of** outlier accommodation.

D. Part *36* Separations Factor Modeling

This section describes the use of cost company separations factor data to develop models of separations factors. Separations models were developed for certain categories of Central Office Equipment and Cable & Wire Facilities, and for each Class B account of investment, expense, reserve and tax account. The separations models rely on 2000 cost company demand data (defined in Section III.E), and cost study separations factors (defined in Section **IV.B.4).**

1. Model Forms

For each cost category, **NECA** developed a model of simplest structure with the least number of statistically significant variables, that explains the largest percentage of the variation of the separations fraction and that has correct signs for all regression coefficients.

Graphical displays and statistical regression diagnostic tools have been utilized to determine whether alternative forms and combinations of variables would lead to improved models. Simple weighted average ratios were chosen when data did not demonstrate statistically significant regression relationships between separations fractions and other variables.

Different model forms were tested to relate the separations percentage to various independent variables. The simplest of these related the separation percentage to a single independent variable. In each case, simple straight line (linear) forms were tested. The form that estimated the fraction of dollars in the account or category most accurately was chosen. These model forms are illustrated below.

$$P = \textit{Dependent Variable in the Model}$$

$$= \frac{\textit{Categorized Interstate Account}}{\textit{Unseparated Account}}$$

$$X = \textit{Independent Variable in the Model}$$

General Straight Line Model Form: $P = a + bX$

When the intercept is not statistically significant a proportional model results.

Proportional Model *Form:* $P = bX$

When the slope of the straight line is not statistically significant (for any or all prospective independent variables), a simple average ratio form results.

Simple Average Ratio Form: $P = a$

All **Part 36** models used one of two structures. In the following paragraphs, P represents the estimated value of P (the separations factor) obtained from the corresponding separations model.

When **no** statistically significant relationship with **an** independent variable could be found, a simple average ratio is employed. An example of this form is Category 2 C&WF. Where interstate Cat. 2 C&WF is not zero, then:

$$P = \frac{\textit{Interstate Cat. 2 C\&WF}}{\textit{Total C\&WF}}$$

$$= 0.002593$$

Whenever a statistically significant relationship could be found, NECA developed a regression model to estimate separations fractions. ***An*** independent variable is one used **as** a predictor of another variable in a regression model. **NECA** tested independent variables that logically related to the fraction to be estimated in each model. For example, the Category 4.13 COE (Exchange Line Circuit Excluding Wideband) fraction is logically related to the adjusted Special Access Revenues per line.

$$P = \frac{\textit{Interstate Cat. 4.13 COE}}{\textit{Total COE}}$$

$$= 0.072615 + 0.002334 \times \textit{Adj. Special Access Revenue Per Line}$$

This relationship is expected because the adjusted special access revenues per line variable is known to correlate strongly with the interstate fraction of COE category 4.13.

In some instances no statistically significant evidence that the intercept was different from zero was found. **A** simpler proportional model (P = b **X)** was utilized. ***An*** example of the proportional form for GSF Equipment is:

$$P = \frac{\textit{Interstate GSF}}{\textit{Total GSF Expense}}$$

$$= \%\textit{Interstate of } [COE + C\&WF + IOT]$$

$R^2 = 1.00$ $\quad F = 8{,}986{,}856$ $\quad t = 2{,}998$

The separation of GSF is very significantly related to the separation of COE, C&WF and IOT investment, **as** seen by **an** ***R-Square*** value of 1.00.

Similar evaluations of possible independent variables were made for all models. **A** variable was included in a model if a basis was found in separations rules or in economic relationships, if the ***t-statistic*** for inclusion of the variable was significant and if the sign of the coefficient **was** logically acceptable.

Variables were considered for inclusion in these models only if they could be obtained from both cost and average schedule companies. In some cases, logical variables were available for cost companies, but not for average schedule companies. For example, cost study areas that have Category 2 COE investment measure tandem switched minutes for separations studies. **This** variable could not be used to evaluate the separations model for average schedule companies, however, since average schedule companies do not measure tandem switched minutes.

For COE Category 3 Local Switching separation model, access minutes per line were grouped into categories of either normal volume or high volume using 350 minutes per line as the breakpoint. Normal volume and high volume minutes were defined **as:**

Normal Volume Minutes Per Line
= Minimum (Total Minutes Per Line, 350)

High Volume Minutes Per Line
= Total Minutes Per Line - Normal Volume Minutes Per Line

The breakpoint of 350 minutes per line separates study **areas** into groups of either high or normal COE3 separation fractions. In addition, the use of the 350 minutes per line break point is consistent with the development of high traffic volume coefficients for average schedule study areas.

Dial Equipment Minutes (DEM) weight was used only **in** the model for study areas with normal volume minutes per line, because study areas with high volume traffic generally have their separation factors capped at 0.85, reducing the relationship between DEM weight and high volume minutes per line. Using **this** specification more accurately allocates total COE to interstate Category **3** for study **areas** with high traffic volumes.

For C&WF Category **3** separation models, circuit miles per line were grouped into categories of either normal route or long route using 4.0 circuit miles per line as the breakpoint. This breakpoint was determined graphically by examining the relationship between the interstate percent of C&WF Category **3** and circuit miles per line. For the C&WF Category 4 (Host/Remote message) separations model, only normal circuit miles per line were used because host/remote facilities generally do not include long routes.

NECA determines minimum and maximum values of separation factors fiom cost company sample data as shown in Exhibit **4.3.** These values are used to limit average schedule company separations factors obtained fiom separations models. If the average schedule company interstate portion calculated fiom a model was higher than the cost company maximum limit or lower than the cost company minimum limit, the corresponding limit was used as the average schedule company's separations factor. The test was not applied to regression models dependent upon **other** accounts' separations factors, which were already constrained within cost company limits.

2. Separation Factor Models

All separations factor models are displayed in Exhibit **4.3.** When a regression model was **used,** the associated ***t-statistic, R-Square statistic,*** and ***F-statistic*** values are shown.

EXHIBIT 4.3

PART 36 SEPARATION FACTOR MODELS

COE Category 1 - Operator Systems

If interstate Cat. 1 COE is not zero, then:

$$P = \frac{\text{Interstate Cat. 1 COE}}{\text{Total COE}}$$

$$= 0.000667$$

COE Category 2 - Tandem Switching

If interstate Cat. 2 COE is not zero, then:

$$P = \frac{\text{Interstate Cat 2 COE}}{\text{Total COE}}$$

$$= 0.020555$$

COE Category 3 - Local Switching

$$P = \frac{\text{Interstate Cat. 3 COE}}{\text{Total COE}}$$

$$= 0.169436 + 0.000212 \times \text{DEM Weight} \times \text{Normal Volume Minutes per Line} + 0.000316 \times \text{High Volume Minutes per Line}$$

Minimum = 0.046694
Maximum = 0.706796

$R^2 = 0.14$ $F = 16.28$ $t_1 = 4.32$ $t_2 = 1.45$

COE Category 4.11 Plus 4.12 - Wideband Exchange Line + Exchange Trunk

$$P = \frac{\text{Interstate COE Cat. 4.11 + Cat. 4.12}}{\text{Total COE}}$$

$$= 0.004247$$

EXHIBIT 4.3 (Continued)

PART 36 SEPARATION FACTOR MODELS

COE Category 4.13 - Exchange Line Circuit Excluding Wideband

If interstate Cat. 4.13 COE is not zero, then:

$$P = \frac{\text{Interstate Cat. 4.13 COE}}{\text{Total COE}}$$

$= 0.072615 + 0.002334 \times$ Adjusted Special Access Revenues per Line

Minimum = 0.003359
Maximum = 0.221448

R^2 = 0.01 F = 1.87 t = 1.37

COE Category 4.2 - Interexchange Circuit

If interstate Cat. 4.2 COE is not zero, then:

$$P = \frac{\text{Interstate Cat. 4.2 COE}}{\text{Total COE}}$$

$= 0.046672 + 0.005965 \times$ Adjusted Special Access Revenues per Line

Minimum = 0
Maximum = 0.430634

R^2 = 0.06 F = 12.12 t = 3.48

COE Category 4.3 - Host/Remote Message Circuit

If interstate Cat. 4.3 COE is not zero, then:

$$P = \frac{\text{Interstate Cat. 4.3 COE}}{\text{Total COE}}$$

$= 0.013696 + 0.002620 \times$ Circuit Miles per Line

Minimum = 0.000224
Maximum = 0.251410

R^2 = 0.07 F = 9.01 t = 3.00

EXHIBIT 4.3 (Continued)

PART 36 SEPARATION FACTOR MODELS

C&WF Categorv 1.2 - Interstate Private Line + Interstate WATS

If interstate Cat. 1.2 C&WF is not zero, then:

$$P = \frac{\text{Interstate Cat. 1.2 C\&WF}}{\text{Total C\&WF}}$$

$$= 0.004642 + 0.003511 \times \text{Adjusted Special Access Revenues per Line}$$

Minimum = 0.000152
Maximum = 0.096615

$R' = 0.33$ $F = 91.2$ $t = 9.55$

C&WF Categorv 1.3 - Subscriber Common Line - Joint Interstate/Intrastate Use

If interstate Cat. 1.3 C&WF is not zero, then:

$$P = \frac{\text{Interstate Cat. 1.3 C\&WF}}{\text{Total C\&WF}}$$

$$= 0.223319 - 0.003104 \times \text{Circuit Miles per Line}$$

Minimum = 0.034412
Maximum = 0.246739

$R' = 0.19$ $F = 55.95$ $t = -7.48$

C&WF Cateeorv 2 - Wideband Exchange Trunk

If interstate Cat. 2 C&WF is not zero, then:

$$P = \frac{\text{Interstate Cat. 2 C\&WF}}{\text{Total C\&WF}}$$

$$= 0.002593$$

PART 36 SEPARATION FACTOR MODELS

C&WF Category 3 - Interexchange

If interstate Cat. 3 C&WF is not zero, then:

$$P = \frac{\text{Interstate Cat. 3 C\&WF}}{\text{Total C\&WF}}$$

= 0.011501 + 0.015215 x Normal Route Circuit Miles per Line +
0.001708 x Long Route Circuit Miles per Line +
0.001672 x Adjusted Special Access Revenue per Line

Minimum = 0
Maximum = 0.533106

R^2 = 0.23 F = 22.71 t_1 = 5.80 t_2 = 1.85 t_3 = 1.12

C&WF Category 4 - Host/Remote Message

If interstate Cat. 4 C&WF is **not zero,** then:

$$P = \frac{\text{Interstate Cat. 4 C\&WF}}{\text{Total C\&WF}}$$

= 0.009785 + 0.003577 x Nod Route Circuit Miles per Line

Minimum = 0.000027
Maximum = 0.381731

R^2 = 0.06 F = 9.43 t = 3.07

IOT - Information Origination/Termination Equipment

$$P = \frac{\text{Interstate IOT}}{\text{Total IOT}}$$

= 0.248392

EXHIBIT 4 3 (Continued)

PART 36 SEPARATION FACTOR MODELS

GSF - General Support Facilities Equipment

$$P = \frac{\text{Interstate GSF}}{\text{Total GSF}}$$

$$= \text{\% Interstate of [COE + C\&WF + IOT]}$$

R^2 = 1.00 F = 8,986,856 t = 2,998

Tangibles - Account 2680

$$P = \frac{\text{Interstate Tangibles}}{\text{Total Tangibles}}$$

$$= 0.988247 \times \text{\% Interstate of Total [COE + C\&WF + IOT]}$$

R^2 = 0.99 F = 3,036 t = 55.1

Intangibles - Account 2690

$$P = \frac{\text{Interstate Intangibles}}{\text{Total Intangibles}}$$

$$= 1.001202 \times \text{\% Interstate of [COE+C\&WF+IOT+GSF]}$$

R^2 = 1.00 F = 6,507,373 t = 2,551

Telecommunications Plant - Other - Accounts 2002 + 2003 + 2005

$$P = \frac{\text{Interstate of Total 2002}}{\text{Total 2002}}$$

$$= \text{\% Interstate of Total 2002}$$

R^2 = 1.00 F = 1.586E7 t = 3,983

PART 36 SEPARATION FACTOR MODELS

Materials & Supplies - Account 1220

$$P = \frac{\text{Interstate of C\&WF}}{\text{Total C\&WF}}$$

= % Interstate of C&WF

R^2 = 1.00 F = 3.46E11 t = 588,632

RTB Stock - Account 1402

$$P = \frac{\text{Interstate RTB Stock}}{\text{Total RTB Stock}}$$

= % Interstate of Total 2002

R' = 1.00 F = 2.252E7 t = 4.745

Accumulated Deareciation - Accounts 3100 + 3200

$$P = \frac{\text{Interstate Accumulated Depreciation}}{\text{Total Accumulated Depreciation}}$$

= 1.008100 X % Interstate of Total 2002

R' = 1.00 F = 105.195 t = 324

Accumulated Amortization - Accounts 3400 + 3500 + 3600

$$P = \frac{\text{Interstate Accumulated Amortization}}{\text{Total Accumulated Amortization}}$$

= 1.000238 X % Interstate of Total 2001

R' = 1.00 F = 232.476 t = 482

Net Deferred Federal Income Taxes - Accounts 4100 + 4340 + 4370

$$P = \frac{\text{Interstate Net Deferred Federal Income Taxes}}{\text{Total Net Deferred Federal Income Taxes}}$$

= 0.331971

EXHIBIT 4.3 (Continued)

PART 36 SEPARATION FACTOR MODELS

Network Support Expense - Account 6110

$$P = \frac{\text{Interstate of Network Support Expense}}{\text{Total Network Support Expense}}$$

$$= \text{\% Interstate of [COE + C\&WF + IOT]}$$

R^2 = 1.00 F = 9,578,933 t = 3,095

General Support Expense - Account 6120

$$P = \frac{\text{Interstate of GSF Expense}}{\text{Total GSF Expense}}$$

$$= \text{\% Interstate of [COE + C\&WF + IOT]}$$

R^2 = 1.00 F = 8,986,856 t = 2,998

COE Expense - Account 6210

$$P = \frac{\text{Interstate of COE}}{\text{Total COE}}$$

$$= 1.002365 \times \text{\% Interstate of COE}$$

R^2 = 1.(F = 3,628,489 t = 1,905

C&WF Emense - Account 6410

$$P = \frac{\text{Interstate of C\&WF Expense}}{\text{Total C\&WF Expense}}$$

$$= \text{\% Interstate of C\&WF}$$

R^2 = 1.00 F = 530.709 t = 729

PART 36 SEPARATION FACTOR MODELS

IOT Expense - Account 6310

If interstate IOT Expense not zero then:

$$P = \frac{\text{Interstate IOT Expense}}{\text{Total IOT Expense}}$$

$$= 0.224934$$

Other Property, Plant & Equipment Expense - Account 6510

$$P = \frac{\text{Interstate of Account 6510}}{\text{Total Account 6510}}$$

$$= \text{\% Interstate of Total 2001}$$

R^2 = 1.00 F = 9,882,605 t = **3,144**

Network Overations Emense - Account 6530

$$P = \frac{\text{Interstate of Network Operations Expense}}{\text{Total Network Operations Expense}}$$

$$= \text{\% Interstate of [COE + C\&WF + IOT]}$$

R = 1.00 F = 6,933,360 t = 2,633

Devreciation and Amortization Exvense - Account 6560

$$P = \frac{\text{Interstate Depreciation and Amortization Expense}}{\text{Total Depreciation and Amortization Expense}}$$

$$= -0.028944 + 1.151349 \times \text{\% Interstate of Total 2001}$$

Minimum = 0.228546
Maximum = 0.722638

R^2 = 0.95 F = 4.782 t = 69.15

EXHIBIT 4 3 (Continued)

PART 36 SEPARATION FACTOR MODELS

Marketing Expense - Account 6610

$$P = \frac{\text{Interstate Marketing Expense}}{\text{Total Marketing Expense}}$$

$$= 0.887711 \times \%\ \text{Interstate of [COE + C\&WF + IOT]}$$

R^2 = 0.89 F = 1,472 t = 38.36

Services Expense - Account 6620

$$P = \frac{\text{Interstate Services Expense}}{\text{Total Services Expense}}$$

$$= 0.220631 + 0.244345 \times \%\ \text{Interstate of Total 2001}$$

Minimum = 0.040629
Maximum = 0.598676

R^2 = 0.04 F = 9.07 t = 3.01

Executive & Planning Expense - Account 6710

$$P = \frac{\text{Interstate Executive and Planning Expense}}{\text{Total Executive and Planning Expense}}$$

$$= \%\ \text{Interstate of Total Big Three Expenses}$$

R^2 = 1.00 F = 6,619,922 t = 2,573

General & Administrative Expense - Account 6720

$$P = \frac{\text{Interstate General and Administrative Expense}}{\text{Total General and Administrative Expense}}$$

$$= 1.128639 \times \%\ \text{Interstate of Total Big Three Expenses}$$

R^2 = 0.99 F = 25,461 t = 160

PART 36 SEPARATION FACTOR MODELS

Other Operating Taxes - Account 7200

$$P = \frac{\text{Interstate Account 7200}}{\text{Total Account 7200}}$$

$$= 0.040663 + 0.937042 \times \% \text{ Interstate of Total 2001}$$

Minimum = 0.083791
Maximum = 0.983471

R^2 = 0.73   F = 612   t = 24.74

Federal Income Tax Credit

If study area is subject to Federal Income Tax,

$$P = \frac{\text{Interstate of Income Tax Credit}}{\text{Total Investment Tax Credit}}$$

$$= 0.026894 + 0.941166 \times \% \text{ Interstate of Total Net Plant}$$

Minimum = 0.227365
Maximum = 0.673542

R^2 = 0.87   F = 567   t = 23.82

Non-Operating Income and Expense

$$P = \frac{\text{Interstate of Non-Operating Income and Expense}}{\text{Total Non-Operating Income and Expense}}$$

$$= \% \text{ Interstate of Total 2001}$$

R^2 = 0.99   F = 13,422 t = 116

Interest & Related Items - Account 7500

$$P = \frac{\text{Interstate of Total 2001}}{\text{Total 2001}}$$

$$= 0.988218 \times \% \text{ Interstate of Total 2001}$$

R^2 = 1.00 F = 75,116 t = 274

E. Part 69 Allocation Factor Modeling

This section describes the use of access allocation factor data to develop models relating access allocations to other variables.

1. Methods and Data

Most categories of cost are allocated according to Part 69 rules either by a 100 percent direct assignment rule or by a simple indirect allocation rule. Only a few cost categories have allocations complex enough to require a model to apportion them among access categories.”

As with the development of Part ***36*** models, **NECA** developed models of simplest form with statistically significant independent variables. These models explained the largest percentage of variation of allocation fractions and had coefficients with acceptable signs.

Using graphical displays and statistical regression analysis, alternative forms and combinations of variables were tested. Simple weighted average ratios were chosen when the data did not demonstrate any statistically significant relationship between the allocation fractions and the other variables.

---

12 Exhibit **4.1** shows the methods **used** in this average schedule study to allocate cost company accounts to access categories.

NECA selected model variables based on relationships designated in Part **69** rules or correlations with other variables designated in the Part **69** rules. The dependent variable in each model is the ratio of cost in an individual access category to total interstate cost. For example, the following variables were used to develop the model for Common Line Accumulated Amortization:

$$\%\ CL\ of\ Accumulated\ Amortization = \frac{Common\ Line\ Accumulated\ Amortization}{Interstate\ Accumulated\ Amortization}$$

$$\%\ CL\ of\ Interstate\ 2001 = \frac{Common\ Line\ Account\ 2001}{Interstate\ Account\ 2001}$$

Exhibit **4.4** lists all variables tested as independent variables in these allocation factor models. Results **are** shown in Exhibits **4.5**, 4.6, and **4.7.**

Some models used independent variables designated by Part **69** rules. The Depreciation Expense models are examples **of** such models. According to Part **69** rules, Depreciation Expense is apportioned to access categories in proportion to related components of Telecommunications Plant in Service, the total of which is the independent variable in these models.

Other models use variables correlated with variables designated by Part **69** rules. The Category **3** Cable & Wire Facilities model is an example of such a model. The ratio of adjusted special access revenues to access minutes is correlated with the usage-based assignment prescribed by Part 69.

EXHIBIT 4.4

INDEPENDENT VARIABLES TESTED IN MODEL DEVELOPMENT

% Access of Interstate 2001	=	Access Categorv Telecommunications Plant in Service Total Interstate Telecommunications Plant in S[illegible] i
% Access of Interstate Other Plant	=	Access Categorv Telecommunications Plant – Other Total Interstate Telecommunications Plant – Other
% Access of Interstate Big **3** Expenses	=	Access Category **Big 3** Expenses Total Interstate Big **3** Expenses
% Access of Interstate Big **3** Expenses **Less** Services Expense	=	Access Cateeorv Big **3** Expenses Minus Services Total Interstate Big **3** Expenses **Minus** Services
% Access of Plant Specific Expense	=	Access Categorv Plant Specific Expense Total Interstate Plant Specific Expense
% Access of Plant Non-Specific Expense	=	Access Category Plant Non-Specific Expense Total Interstate Plant Non-Specific Expense
% Access of Customer Operations Expense	=	Access Category Customer Operations Expense Total Interstate Customer Operations Expense
Access Lines	=	Access Lines Reported to NECA
Number of Exchanges	=	Count of Exchanges Served by the Study Area
Minutes per Line	=	Access Minutes Access Lines
Adjusted Special Access Revenues per Line	=	Adiusted Special Access Revenues Access Lines
Adjusted Special Access Revenues per Minute	=	Adiusted Special Access Revenues Access Minutes
Normal Route Circuit Miles Per Line	=	Normal Route Circuit Miles Access Lines
Long Route Circuit Miles Per Line	=	Long Route Circuit Miles Access Lines
Normal Volume Minutes Per Line	=	Normal Volume Minutes Access Lines
High Volume Minutes Per Line	=	High Volume Minutes Access Lines

2. Part 69 Allocation Models

a. Expense and Reserve Models

Structured according to Part 69 allocation rules, these models related the percentage of interstate access category expenses or reserves to the respective percentage of interstate Telecommunications Plant in Service. The strength of these Part 69 models, as evidenced by the high ***R-Square, F-statistic*** and ***t-statistic*** values, is attributed to the very close relationship between the variables used in the model and the factors defined in the rules.

Exhibit 4.5 displays models developed for certain expense and reserve accounts.

EXHIBIT 4.5

PART 69 – EXPENSE. RESERVE AND IOT EOUIPMENT ALLOCATION MODELS

Accumulated Depreciation

%CL	=	0.985436	x	% CL of Interstate 2001
%CO	=	1.033375	x	% CO of Interstate 2001
%SA	=	0.981053	x	% SA of Interstate 2001
%TR	=	0.984963	x	% TR of Interstate 2001

	R^2	F	t	Minimum	Maximum
%CL Model	0.99	21,223	146	0.054104	0.830846
%CO Model	0.96	6,394	80	0.014493	0.834756
%SA Model	0.99	26,193	162	0.000143	0.348520
%TR Model	0.99	22,662	151	0.000000	0.882762

Net Deferred Income Taxes

%CL	=	0.493666
%CO	=	0.304327
%SA	=	0.082047
%TR	=	0.097717

Accumulated Amortization

%CL	=	0.998767	x	% CL of Interstate 2001
%CO	=	1.003539	x	% CO of Interstate 2001
%SA	=	0.999304	x	%SA of Interstate 2001
%TR	=	0.999368	x	% TR of Interstate 2001

	R^2	F	t	Minimum	Maximum
%CL Model	1.00	965,465	983	0.048079	0.715418
%CO Model	1.00	571,503	756	0.023200	0.907388
%SA Model	1.00	4,549,280	2,133	0.000873	0.367281
%TR Model	1.00	1,444,584	1,202	0.003435	0.872369

Depreciation and Amortization Expense

%CL	=	-0.046062	+	0.949297	x	% CL of Interstate 2001
%CO	=	0.067267	+	1.034804	x	% CO of Interstate 2001
%SA	=	0.952520	x	% SA of Interstate 2001		
%TR	=	0.967579	x	% TR of Interstate 2001		

	R^2	F	t	Minimum	Maximum
%CL Model	0.91	2,452	50	0.054761	0.835081
%CO Model	0.85	1,310	36	0.029685	0.872423
%SA Model	0.99	16,007	127	0.000147	0.348132
%TR Model	0.98	11,798	109	0.000000	0.866441

EXHIBIT 4.5 (Continued)

PART 69 – EXPENSE, RESERVE AND IOT EQUIPMENT ALLOCATION MODELS

Services Expenses

%CL	=	0.219770				
%CO	=	0.226295				
%SA	=	0.001047	+	0.599929	x	% SA of Interstate 2001
%TR	=	0.001929	+	0.705744	x	% TR of Interstate 2001

	R^2	F	t	Minimum	Maximum
%CL Model	-		-	-	
%CO Model				-	
%SA Model	0.61	353	18.79	0.000080	0.441693
%TR Model	0.65	424	20.59	0.000000	0.556698

IOT Equipment

%CL	=	0.999029
%CO	=	0.00
%SA	=	0.000971
%TR	=	0.00

b. Central Office Esuiument Models

Exhibit 4.6 lists those categories of Central Office Equipment that require models. Direct assignment rules used for other categories are summarized in Exhibit 6.5.

For combined COE Categories 4.11 and 4.12, NECA developed weighted average allocation fractions because the data did not display significant correlations with other variables. For COE Category 2 - Tandem Switching Equipment, the allocation was 100 percent transport. For COE 4.13, Exchange Line Circuit Equipment (excluding Wideband) and for COE Category 4.2, Interexchange Circuit Equipment, **NECA** developed models to estimate the percentage of investment in the various access categories as a function of adjusted special access revenues per line.

EXHIBIT 4.6

PART 69 – CENTRAL OF'FICE EOUIPMENT ALLOCATION MODELS

COE Cateeorv 1 - Operator Systems

%CL = 0.00
%CO = 0.959378
%SA = **0.00**
%TR = 0.00

Cateeorv *2* - Tandem Switching Eauipment

%CL = 0.00
%CO = 0.00
%SA = 0.00
%TR = 1.00

Cateeorv 4.11 and 4.12 - Exchange Circuit

If Adjusted Special Access Revenues are not equal to **zero:**

%CL = 0.00
%CO = 0.00
%SA = 0.990275
%TR = 0.009725

If Adjusted Special Access Revenues equal zero:

%CL = 0.00
%CO = 0.00
%SA = 0.00
%TR = 1.00

Cateeorv 4.13 - Exchange Line Circuit Equipment Excluding Wideband	R^2	F	t

If Adjusted Special Access Revenues are not equal to **zero:**

							R^2	F	t
%CL	=	0.978600	-	0.015532	x	Adjusted SA Revenues per Line	0.33	92.65	-9.63
%CO	=	**0.00**							
%SA	=	0.021400	+	0.015532	x	Adjusted SA Revenues per Line	0.33	92.65	9.63
%TR	=	**0.00**							

If Adjusted Special Access Revenues equal zero:

%CL = 1.00
%CO = **0.00**
%SA = 0.00
%TR = 0.00

EXHIBIT 4.6

PART 69 – CENTRAL OFFICE EQUIPMENT ALLOCATION MODELS

Categorv 4.2 - Interexchange Circuit Equipment						R^2	F	t

If **Adjusted Special Access Revenues are not equal to zero:**

%CL	=	0.00						
%CO	=	0.00						
%SA	=	**0.221956**	+	**0.047105**	**x**	**Adjusted SA Revenues per Line**	**0.09**	**18.12**	**4.26**
%TR	=	**0.778044**	-	**0.047105**	X	Adjusted SA Revenues per Line	**0.09**	**18.12**	**-4.26**

If **Adjusted Special Access Revenues** equal **zero:**

%CL	=	0.00
%CO	=	**0.00**
%SA	=	**0.00**
%TR	=	1.00

C Cable & Wire Facilities Models

Exhibit 4.7 lists all categories of Cable & Wire Facilities that require models. Categories not displayed are directly assigned by Part 69 rules as summarized in Exhibit 6.5.

For Category 2 - Wideband and Exchange Trunk, and Category 4 - Host/Remote Message, NECA used weighted averages because the data did not demonstrate any significant correlations.

For Category 3 - Interexchange, NECA developed models to estimate the percentage of special access and transport investment to total interstate investment as a function of adjusted special access revenues per minute.

The separations and allocation models defined in this section were used to develop the Part 36 and Part 69 costs for sample average schedule companies, as described in Section VI.

EXHIBIT 4.7

PART 69 - CABLE & WIRE FACILITIES ALLOCATION MODELS

Cateeorv 2 - Wideband and Exchange Trunk

If Adjusted Special Access Revenues are not equal to zero:

%CL	=	0.00
%CO	=	0.00
%SA	=	0.009987
%TR	=	0.990013

If Adjusted Special Access Revenues equal zero:

%CL	=	0.00
%CO	=	0.00
%SA	=	0.00
%TR	=	1.00

Category 3 - Interexchange

If Adjusted Special Access Revenues are not equal to zero:

							R^2	F	t
%CL	=	0.00							
%CO	=	0.00							
%SA	=	0.123362	+	21.868422	x	Adjusted SA Revenues per Minute	0.22	49.51	7.04
%TR	=	0.876638	-	21.868422	x	Adjusted SA Revenues per Minute	0.22	49.51	-7.04

If Adjusted Special Access Revenues equal zero:

%CL	=	0.00
%CO	=	0.00
%SA	=	0.00
%TR	=	1.00

Category 4 - Host/Remote Message

%CL	=	0.00
%CO	=	0.00
%SA	=	0.00
%TR	=	1.00

F. Additional Account Adjustments

NECA used cost study data to determine four account adjustment factors described below. These factors are used to develop average schedule revenue requirements as described in Section **V.B.2.**

1. Removal of Non-Operating Interest and Related Items

NECA developed a cost study factor of 0.992739 to identify the opera g portion of total Interest and Related Items. This factor was calculated as the ratio of the weighted sum of Operating Fixed Charges to the weighted sum of Total Fixed Charges.

2. Interest on Customer Deposits

The operating portion of total Interest and Related Items was further multiplied by a factor of 0.007261 to calculate Interest on Customer Deposits. Interest on Customer Deposits receives different treatment than other Interest expense in the Commission's rules governing revenue requirement calculation and hence must be derived for average schedule companies. The factor was calculated as the weighted average fraction of Interest on Customer Deposits to Interest and Related Items from sample 2000 cost study data. This factor is applied to Average Schedule Company Total Interest and Related Items.

3. Investment Tax Credits

The uniform system of accounts does not prescribe the reporting of Investment Tax Credit (ITC). Although ITC data are developed in reports of income tax liabilities, these amounts are not reported by Average Schedule study areas. Consequently, NECA used a factor based on sample cost companies to estimate Average Schedule amounts of ITC. The factor of 0.000529 was calculated as the ratio of weighted unseparated **ITC** over weighted unseparated Net Plant from **2000** Cost Study data. This factor is applied to Net Plant amounts.

4. Charitable Contributions

Similarly, not all sample average schedule companies separate **data** on amounts for Charitable Contributions. Since the charitable contribution data are available from cost companies, **a** factor based on sample cost companies was developed to estimate Average Schedule amounts of charitable contributions. The factor of **0.001782 was** calculated **as** the weighted ratio of unseparated charitable contributions over unseparated Expenses and ***Other* Taxes** (EOT) from 2000 Cost Study data. **This** factor is applied to **Net** Plant amounts **as** described in Section V.

G. Cost Studv Factors

Three cost study factors were used in Section VII.J to allocate SS7 costs to the interstate jurisdiction and to apply loading for maintenance and corporate operations expenses. These factors were developed from weighted sample cost company cost studies as **shown** in Exhibit **4.8.**

EXHIBIT 4.8

DEVELOPMENT OF SS7 COST STUDY FACTORS

$$\text{COE Switching Factor} = \frac{\Sigma[\text{(Sample Weight)} \times \text{(Interstate COE Cat. 3)}]}{\Sigma[\text{(Sample Weight)} \times \text{(Unseparated COE Cat. 3)}]}$$

$$= 0.516537$$

$$\text{COE Maint. Factor} = \frac{\Sigma[\text{(Sample Weight)} \times \text{(Central Office Expense)}]}{\Sigma[\text{(Sample Weight)} \times \text{(Central Office Investment)}]}$$

$$= 0.076197$$

$$\text{COE Corporate Operations Factor} = \frac{\Sigma[\text{(Sample Weight)} \times \text{(CO Corporate Operations Expense)}]}{\Sigma[\text{(Sample Weight)} \times \text{(CO Telecom. Plant In Service)}]}$$

$$= 0.064881$$

An additional cost study factor was developed to calculate the average effective Federal Income Tax rate. The effective tax rate is defined as the total tax payment over total income. To estimate the effective *tax* rate for average schedule companies, the 2000 cost study data of sample cost companies that are subject to federal income tax were used. The average effective tax rate was calculated as the mean of sample cost companies' effective tax rates weighted by both total average net investment and sample weight. The average effective tax rate is used to calculate Average Schedule Company Federal Income Tax in Section VI. F.

$$\text{Average Effective Tax Rate} = \frac{\Sigma[\text{(Tax rate)} \times \text{(Sample Weight)} \times \text{(Total Average Net Investment)}]}{\Sigma[\text{(Sample Weight)} \times \text{(Total Average Net Investment)}]}$$

$$= 0.328945$$