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AT&T

295 North Maple Avenue
Basking Ridge, NJ 07920

November 29, 1994

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W. - Room 222
Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Re: Ex Parte Presentation
CC Docket 94-1

Dear Mr. Caton:

AT&T has revised its Direct model of RBOC productivity from 1Q91 to 2Q94 to include *all* Tier 1 price cap regulated LECs (roughly 97 to 98% of the entire price cap LEC universe). This expanded model demonstrates firmly that since 1991, the overall price cap LEC universe has achieved an average productivity of at least 5.54%. This figure is less than 10 basis points different from the RBOC-only value of "X" generated by this model and reported in AT&T's ex parte submission of October 28, 1994. As such, this modeling completely discredits the unsupported claims made by various LECs that inclusion of the nonRBOC price cap LECs would yield a substantially lower "X."

Attached to this submission are a written description of the expanded Tier 1 direct model and two diskettes. One of the diskettes contains a Lotus version of the model and its data, the other contains and Excel version.

Two copies of this Notice were submitted to the Secretary of the FCC in accordance with Section 1.1206(a)(1) of the Commission's rules.

Sincerely yours,

Richard N. Clarke

Richard N. Clarke

Attachments

cc: M. Uretsky
A. Bush

No. of Copies rec'd 0+1
List A B C D E

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Description of:

"DIRECT" MODEL FOR CALCULATING THE TIER 1 PRICE CAP LECS' PRODUCTIVITY LEVEL (1/1/91 TO 6/30/94)

1. Introduction

This model uses Tier 1 LEC revenue, cost and price cap index data from January 1991 through June 1994 to determine the productivity offset, X, that would have produced the same total revenues and prices that the LECs would have received had they earned revenue sufficient to produce only an 11.25% average rate of return over the same period.

The data used in this model come exclusively from public record quarterly ARMIS and annual Tariff Review Plan (TRP) filings made by the LECs to the Commission.[1] The validity of ARMIS and TRP data is attested to by the filing LEC, and these data are the basis for the Commission's interstate ratemaking process.

2. Methodology

The Direct model follows closely the methodology used in the Commission's "Frentrup-Uretsky" study used in Docket 87-313 to calculate historical LEC productivity,[2] and matches almost exactly the methodology used by the Commission in its simulation of LEC price performance under price caps provided to Chairman Markey of the House Subcommittee on Telecommunications and Finance.[3]

The process of this Direct model is as follows.[4] The model first assembles ARMIS financial data on LEC revenues, expenses, taxes and average net investment for each of the price cap filing periods (1/91 through 6/91, 7/91 through 6/92, 7/92

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[1] The Commission has recognized ARMIS data as indispensable for the price cap oversight process and prescribed their use for monitoring the effectiveness of its LEC price cap plan. *See*, CC Docket No. 87-313, *Second Report and Order*, adopted September 19, 1990, ¶ 367.

[2] *See*, CC Docket 87-313, *Second Report and Order*, adopted September 19, 1990, Appendix C (Frentrup-Uretsky Study).

[3] Letter dated October 18, 1990 to the Honorable Edward J. Markey, Chairman, Subcommittee on Telecommunications and Finance, U. S. House of Representatives, Washington, D.C. from Alfred C. Sikes, Chairman, Federal Communications Commission.

[4] Additional narrative description of the Direct model can be found in *Comments of AT&T*, CC Docket No. 94-1, Appendix B, filed May 9, 1994. A step-by-step demonstration of the Direct model's operation was included as Appendix B herein.

through 6/93 and 7/93 through 6/94),[5] and for each of the four price cap baskets (Common Line, Traffic Sensitive, Special Access and Interexchange).[6] A detailed description of the data used in the Direct model is provided in Appendix A.

The Direct model then computes the tariff period individual basket revenues that would have been required to provide an 11.25% rate of return for each basket in each tariff period. The model's calculation of revenue at 11.25% ROR is performed in the same manner as the equivalent calculation is performed in the Frentrup-Uretsky study.[7] First, using reported figures for average net investment, return dollars at 11.25% ROR are calculated. The difference between these return dollars at 11.25% ROR and the LEC's actual return is then converted into an equivalent difference in revenue dollars by "grossing up" the difference in return dollars for the altered level of tax liability that would exist at an 11.25% ROR.[8] Subtracting this difference in required revenue dollars from the LECs' actual revenue yields the revenue that would have just allowed the LECs to earn an 11.25% ROR.[9]

The next step is to calculate the X factor that, if inserted into the LEC's PCI formulas, would have reduced LEC revenues to the revenues which would have produced an aggregate 11.25% ROR for all baskets for all tariff periods[10]. While this methodology for computing X differs from the Frentrup-Uretsky methodology which calculated an average level of LEC price growth as a surrogate for X, it simulates more accurately the actual operation of the Commission's price cap mechanisms, and it matches the calculation methodology advocated by USTA and their consultants, NERA, in Docket 87-313.[11]

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[5] Data from the second quarter of 1994 was added to this direct study when the LECs' ARMIS data for this quarter became available on October 1, 1994.

[6] The Frentrup-Uretsky study of switched access productivity examined only the Common Line and Traffic Sensitive baskets.

[7] An analogous calculation using the same methodology is performed by the price cap LECs in calculating the dollar value of their "sharing" obligation in their annual TRPs.

[8] The tax rate used for this gross-up is the one indicated by the tax to gross return ratio reported by the LEC in its ARMIS filing. Alternatively, as described, *infra*, an arbitrary tax factor can be chosen manually to model the effects of different hypothetical tax rates.

[9] The calculated percentage reduction in LEC revenues required to reduce earnings to 11.25% ROR actually *under*estimates the percentage reduction in prices necessary to achieve the same effect. This is because the reduction in LEC prices necessary to generate the lower level of revenue would stimulate increased demand for access services. Because the cost of providing access services, Common Line especially, does not rise in direct proportion to traffic volumes, LEC profitability would rise above 11.25% as a result of this stimulated traffic. Thus, to actually reduce LEC profitability to 11.25%, a percentage price reduction in excess of the required percentage revenue reduction is necessary.

[10] Alternatively, instead of seeking an X that would cause capped LEC revenues to equal revenues at 11.25% ROR, one could instead seek the X that equalizes the capped test return and the return at 11.25% ROR. The mathematical differences in these procedures are negligible.

[11] *See, Comments of the United States Telephone Association,* CC Docket 87-313, May 7, 1990, Attachment B (NERA), at p. 7. "From our perspective, X should be calculated as the parameter in the price cap adjustment formula which would have produced the price changes actually observed ..."

The Direct model first collects information filed by the LECs in their TRPs concerning levels of GNP-PI, X (3.3% or 4.3%), w, g, delta Zs, delta Y, and R, and uses these data to reconstruct the actual levels of LEC PCIs (also reported in the TRPs). The level of PCI required to ensure a ROR of 11.25% is then calculated by using the ratio of LEC at-cap revenues to LEC revenues at 11.25% ROR.[12] This same ratio is then applied to the LEC's actual PCI to compute the PCI level that would have generated the revenues necessary to earn the LEC an 11.25% ROR. The equation for this PCI level at 11.25% ROR may then be inverted to solve for the X necessary to provide that LEC's basket with revenues just sufficient to support an 11.25% ROR over the tariff period. A schematic example of this process for one basket and no time period is attached as Appendix B.

Because Commission practice is to apply a single X to all baskets of all price cap LECs, it is insufficient to use the Direct model to compute separately the Xs that would have equated a single LEC's, a single basket's, or a single tariff period's revenues to produce 11.25% ROR. But, rather, the model must calculate the unitary X that, if applied to all price cap LECs, for all their baskets, for all of their four filings since 1/91, would produce the same *total* revenue as would have been earned by these LECs if they had averaged an 11.25% ROR over the entire study period. The solution process to this problem may be described mathematically as follows. Let:

$T1Rev@\,11.25\%_{bt}$	the Total Revenue of Tier 1 LECs' basket *b* in tariff period *t* at an 11.25% ROR
b	indexes the 4 price cap baskets (CL, TS, Special, IX)
t	indexes the 4 tariff periods (1/91-6/91, 7/91-6/92, 7/92-6/93, 7/93-6/94)
$T1Rev_{bt}(X)$	the Total Revenue of Tier 1 LECs' basket *b* in tariff period *t* that would be generated by the Commission's price cap formulas using an X value of *X*.

Then, *X* is the value of X such that:

$$\sum_{t=1}^{4}\sum_{b=1}^{4} T1Rev@\,11.25\%_{bt} = \sum_{t=1}^{4}\sum_{b=1}^{4} T1Rev_{bt}(X).$$

[12] At-cap LEC revenues are used because these are the revenues that would have resulted had the LEC priced precisely at its PCI cap (*e.g.* API = PCI). If a LEC's actual revenues reflected under-cap pricing, that LEC's at-cap revenues were computed by grossing up the LEC's actual revenues by the ratio of the LEC's PCI to its API (also as reported in the TRP).

In the Direct model, this calculation is done by solving (through the use of the "Goal Seek" function in Excel or the "Backsolve" function in Lotus) for the X factor that would set these two revenue sums equal.

3. Results

As stated by AT&T in its *ex parte submission* on October 27 (filed October 28), the Direct model computed an overall composite X of, roughly 5.62% for just the RBOCs over the period from 1/91 to 6/94 - assuming the "Balanced 50-50" plan for capping Common Line. Computed values for X were about 55 basis points lower assuming use of the "Per Line" plan for capping Common Line.[13]

Since that time, AT&T has expanded the Direct model to include data not just from the RBOCs, but from all of the Tier 1 LECs under price cap regulation in each tariff period. The result of this refinement is to reduce very slightly the calculated values of the Balanced 50-50 plan X to 5.54%. Similarly minor alterations occur in the calculated value of the Per Line plan X. This X now becomes 4.88%.

Two other enhancements have been made to the current version of the Direct model. The model now allows for the use of a manually selected marginal tax factor to derive the change in taxes associated with changes in returns.[14] The model also permits the calculation of Xs associated with equalizing discounted (present value) flows of revenues (or returns).

4. Concluding Remarks

The Direct model represents the level of productivity that the price cap LECs have achieved since 1/1/91. It draws on the modeling framework originally established by the Commission's Frentrup-Uretsky study, and it improves on this study by incorporating several enhancements suggested by USTA four years ago in its Comments on Docket 87-313. Furthermore, a large source of the possible imprecision in the Frentrup-Uretsky study is now moot: specifically, the value of exogenous cost changes and other price cap parameters. Because the Direct model uses the precise values of these exogenous costs, and other price cap parameters, as filed by the LECs

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[13] AT&T has argued that the Per Line plan is a superior methodology for capping Common Line costs because it tracks more accurately the lines growth process that generates these costs. *See, Comments of AT&T,* CC Docket 94-1, May 9, 1994, pp. 26-28.

[14] The recommended gross-up factor for use with the model would be the actual tax rate (As Paid), i.e., actual taxes as a percentage of revenue less expenses. Alternatively, actual taxes could be adjusted by multiplying incremental revenue times a combination of a 34% Federal tax rate (the rate for most of the period under study although increased to 35% for 1994, and a composite 6% State and Local Tax rate, which computes to a composite marginal rate of about 38% (((1.00-.06)*.34)+.06=.3796). This rate is consistent with those used by price cap LECs in their calculations of sharing amounts. *See, e.g., Ameritech Price Cap Annual Filing, April 2, 1994, Exhibit 6, Page 1 of 1 (composite tax rate of .380995), and Bell Atlantic Price Cap Annual filing, April 2, 1994, Workpaper 8-53-3 (composite tax rate of .379).*

in their TRPs, there can be no serious question but that the Direct model's methodology for calculating X records the achieved level of RBOC productivity *as that productivity is measured by the Commission's price cap mechanisms.*

In their reply comments, several LECs noted that AT&T's Direct model based its results only on RBOC data, and suggested (without providing any supporting data as requested by AT&T) that inclusion of GTE or other non-RBOC price cap LECs into the analysis might lower significantly the calculated X.[15]. This assertion (which was not accompanied by any rigorous analysis) is completely disposed of by this enhanced version of the Direct model. By now including all Tier 1 price cap LECs, over 97% of price cap regulated revenues are covered by the model - with a resulting X that differs from the RBOC-only X by less than 10 basis points.[16]

If anything, the Direct model underestimates Tier 1 LEC productivity because of the effects of demand stimulation that would have resulted from LEC access prices being lowered to reflect an earnings level of 11.25% are not incorporated into its calculation of X. While the extent of this underestimate is limited by the Direct model's similar non-incorporation of the non-productivity-related demand stimulation effects that resulted from Commission-ordered exogenous cost changes over this period, the net effect is still an underestimate of X because the total value of these Commission-ordered exogenous cost reductions (roughly $991 M for this period) is exceeded by the RBOC revenue reductions that would have been required to reduce earnings to 11.25% (over $2559 M for the period).

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[15] *See, e.g., Reply Comments of United States Telephone Association,* CC Docket 94-1, filed June 29, 1994, fn. 194; *GTE's Reply Comments,* CC Docket 94-1, filed June 29, 1994, at p. 24; *Reply Comments of US West,* CC Docket 94-1, filed June 29, 1994, at p. 24.

[16] The several Tier 2 study areas operated by price cap LECs are not required to report ARMIS financial data, thus it is impossible to incorporate them into this analysis.

APPENDIX A
DOCUMENTATION OF DATA SOURCES

The data used in the Direct model were obtained from ARMIS (43-01 and 43-03) filings by Tier 1 LECs, and the electronic Tariff Review Plan (TRP) data filed by price cap LECs with their annual access tariff updates. This Appendix describes in detail the sources of these data, and the methodology employed to combine them into a total Tier 1 price cap view which conforms with the four tariff filing periods (1/91-6/91, 7/91-6/92, 7/92-6/93, 7/93-6/94) included in the Direct model.

ARMIS 43-01 Rollups

Financial data from ARMIS 43-01 reports filed by each LEC under price cap regulation in the relevant periods were "rolled up" into a total Tier 1 price cap view. Each file of rolled up 43-01 data used corresponds to the appropriate list of price cap COSAs associated with that tariff filing period. These four COSA lists are displayed as Attachment 1 to this Appendix.

Data from the 43-01 rollups were used by the Direct model to calculate return and rate of return, as follows: return was calculated to be the sum of Lines 1090 (Net Revenue) and 1290 (Other Income/Loss); less Lines 1190 (Total Operating Expenses), 1390 (Non-Operating Items), 1490 (Other Taxes) and 1590 (Net Federal Income Taxes). Rate of return was calculated to be return as derived above divided by Lines 1690 (Total Plant) plus 1790 (Other Investment) less Line 1890 (Total Reserves). This information was extracted from the ARMIS columns corresponding to the Common Line basket (Column M), Traffic Sensitive basket (Column R), Special Access basket (Column S) and Interexchange basket (Column V). All of these data have been placed in a file entitled T1TR3.XLS. The various 43-01 rollups, their corresponding COSA list and their locations in the T1TR3.XLS file are described in Attachment 2 to this Appendix. Finally, the formulas used to convert the various 43-01 rollups into data corresponding to the tariff filing periods are described in Attachment 3 to this Appendix.

TARIFF REVIEW PLAN (TRP) DATA

Four separate TRP files are included, one for each of the four tariff filing periods (NOV90.WK3, 91TRP.WK3, 92TRP.WK2, and 93TRP.WK3). Data for each price cap tariff filing entity during the relevant period is included in the file and summed as necessary to calculate a composite PCI for all Price Cap LECs. Summed data items include Delta Y, Delta Z, R(t-1) and sharing in the 7/92 and 7/93 periods.

It was necessary to treat sharing separately so as not to include it inappropriately in deriving PCIs for the Test X scenarios.

Composite "g" and productivity offset "X" factors were derived by weighting the COSA-specific values of these variables by R(t-1) and revenue, respectively. Since some filing entities chose an "X" of 4.3% in certain periods, the composite "X" is slightly higher than 3.3% (or 3.0% for the IX basket)..

Revenue for each price cap filing entity was extracted from the ARMIS 43-01 reports (the sum of Lines 1090 (Net Revenue) and 1290 (Other Income/Loss)). It was necessary to map the ARMIS 43-01 reporting entities to the Price Cap filing entities. This mapping is described on Attachment 4 to this Appendix.

Also shown in the TRP data files are the PCI and API for each Price Cap basket for each filing entity. This information was used with the corresponding revenues to derive under cap amounts, as follows:

*Under Cap amounts = (PCI/API)*Revenue - Revenue*

Individual filing entity amounts are then summed to produce a total Tier 1 under cap amount for each Price Cap basket for each tariff filing period.

SUBSCRIBER LINE CHARGE (SLC) REVENUE

Subscriber Line Charge (SLC) revenue used in the Direct model is derived from ARMIS 43-03 reports and contained in T1TR3.XLS beginning at Cell EA1. Data for each price cap filing entity are summed to produce a single price cap Tier 1 SLC revenue amount for each tariff filing period.

ARMIS ROLLUPS

ENTITIES INCLUDED IN EACH TARIFF PERIOD

1/1/91 COSAS	7/1/91 COSAS	7/1/92 COSAS	7/1/93 COSAS
CDDC	CDDC	CDDC	CDDC
CMMD	CMMD	CMMD	CMMD
		COAZ	COAZ
COCA	COCA	COCA	COCA
			COCM
			COEM
			COIA
			COID
COIL	COIL	COIL	COIL
			COIN
COMO	COMO	COMO	COMO
			CONM
		CONV	CONV
CONY	CONY		
			COOR
		CORH	CORH
			COQS
			COSI
COTX	COTX	COTX	
		COUP	COUP
			COUT
			COWA
		COWC	COWC
COVA	COVA	COVA	
			COWZ
			COPA
CVVA	CVVA	CVVA	CVVA
CWWV	CWWV	CWWV	CWWV
DSDE	DSDE	DSDE	DSDE
GNCA	GNCA	GNCA	GNCA
GTAL	GTAL	GTAL	GTAL
GTAR	GTAR	GTAR	GTAR
GTCA	GTCA	GTCA	GTCA
GTFL	GTFL	GTFL	GTFL
GTGA	GTGA	GTGA	GTGA
GTHI	GTHI	GTHI	GTHI
GTIA	GTIA	GTIA	GTIA
GTID	GTID	GTID	GTID
GTIL	GTIL	GTIL	GTIL
GTIN	GTIN	GTIN	GTIN
GTKY	GTKY	GTKY	GTKY
GTMI	GTMI	GTMI	GTMI
GTMN	GTMN	GTMN	GTMN
GTMO	GTMO	GTMO	GTMO
GTMT	GTMT	GTMT	GTMT
GTNC	GTNC	GTNC	GTNC
GTNE	GTNE	GTNE	GTNE
GTNM	GTNM	GTNM	GTNM
GTOH	GTOH	GTOH	GTOH

ARMIS ROLLUPS

ENTITIES INCLUDED IN EACH TARIFF PERIOD

1/1/91 COSAS	7/1/91 COSAS	7/1/92 COSAS	7/1/93 COSAS
GTOK	GTOK	GTOK	GTOK
GTOR	GTOR	GTOR	GTOR
GTPA	GTPA	GTPA	GTPA
GTSC	GTSC	GTSC	GTSC
GTTN	GTTN	GTTN	GTTN
GTTX	GTTX	GTTX	GTTX
GTVA	GTVA	GTVA	GTVA
GTWA	GTWA	GTWA	GTWA
GTWI	GTWI	GTWI	GTWI
GTWV	GTWV	GTWV	GTWV
LBIL	LBIL	LBIL	LBIL
MBMI	MBMI	MBMI	MBMI
MSAZ	MSAZ	MSAZ	MSAZ
MSCO	MSCO	MSCO	MSCO
MSID	MSID	MSID	MSID
MSMT	MSMT	MSMT	MSMT
MSNM	MSNM	MSNM	MSNM
MSUT	MSUT	MSUT	MSUT
MSWY	MSWY	MSWY	MSWY
NBIN	NBIN	NBIN	NBIN
NEMA	NEMA	NEMA	NEMA
NEME	NEME	NEME	NEME
NENH	NENH	NENH	NENH
NERI	NERI	NERI	NERI
NEVT	NEVT	NEVT	NEVT
NJNJ	NJNJ	NJNJ	NJNJ
NWIA	NWIA	NWIA	NWIA
NWMN	NWMN	NWMN	NWMN
NWND	NWND	NWND	NWND
NWNE	NWNE	NWNE	NWNE
NWSD	NWSD	NWSD	NWSD
NYNY	NYNY	NYNY	NYNY
OBOH	OBOH	OBOH	OBOH
PAPA	PAPA	PAPA	PAPA
PNID	PNID	PNID	PNID
PNOR	PNOR	PNOR	PNOR
PNWA	PNWA	PNWA	PNWA
PTCA	PTCA	PTCA	PTCA
PTNV	PTNV	PTNV	PTNV
	RTNY	RTNY	RTNY
SBFL	SBFL	SBFL	SBFL
SBGA	SBGA	SBGA	SBGA
SBNC	SBNC	SBNC	SBNC
SBSC	SBSC	SBSC	SBSC
SCAL	SCAL	SCAL	SCAL
SCKY	SCKY	SCKY	SCKY
SCLA	SCLA	SCLA	SCLA
SCMS	SCMS	SCMS	SCMS
SCTN	SCTN	SCTN	SCTN
	SNCT	SNCT	SNCT

ARMIS ROLLUPS

ENTITIES INCLUDED IN EACH TARIFF PERIOD

1/1/91 COSAS	7/1/91 COSAS	7/1/92 COSAS	7/1/93 COSAS
SWAR	SWAR	SWAR	SWAR
SWKS	SWKS	SWKS	SWKS
SWMO	SWMO	SWMO	SWMO
SWOK	SWOK	SWOK	SWOK
SWTX	SWTX	SWTX	SWTX
WTWI	WTWI	WTWI	WTWI
	UTFL	UTFL	UTFL
	UTIN	UTIN	UTIN
	UTMO	UTMO	UTMO
	UTNC	UTNC	UTNC
	UTOH	UTOH	UTOH
	UTPA	UTPA	UTPA
	UTTN	UTTN	UTTN
	UTVA	UTVA	UTVA
			LTNE
			CEFL
			CEIL
			CENC
			CENV
			CEVA

ARMIS ROLLUPS		
FILE NAME	COSA LIST	TITR3.XLS CELL #
2Q94	Jul-93	CA1
2Q93A	Jul-93	A1
2Q93B	Jul-92	A301
2A92A	Jul-92	A101
2Q92B	Jul-91	A401
2Q91A	Jul-91	A501
2Q91B	Jan-91	A201
4Q93A	Jul-93	AA1
4Q93B	Jul-92	BA101
4Q92A	Jul-92	CA101
4Q92B	Jul-91	BA201
4Q91	Jul-91	CA201

DERIVATION OF TARIFF FILLING PERIOD AMOUNTS

1/1/91

REV/EXP, TAX	INV/RES (FULL YR)	INV/RES (PARTIAL YR)
2Q91B	2Q91B	2Q91B

7/1/91

REV/EXP, TAX	INV/RES (FULL YR)	INV/RES (PARTIAL YR)
4Q91-2Q91A+2Q91B	(4Q91+4Q92B)/2	4Q91-2Q91A+2Q92B

7/1/92

REV/EXP, TAX	INV/RES (FULL YR)	INV/RES (PARTIAL YR)
4Q92A-2Q92A+2Q93B	(4Q92A+4Q93B)/2	((2*4Q92A-2Q92A)+2Q93B)/2

7/1/93

REV/EXP, TAX	INV/RES (FULL YR)	INV/RES (PARTIAL YR)
4Q93A-2Q93A+2Q94	NA	((2*4Q93A-2Q93A)+2Q94)/2

MAPPING OF PRICE CAP COSAS WITH ARMIS COSAS

PRICE CAP COSA	ARMIS COSA
BATR	CDDC
BATR	CHMD
COCT	COAZ
COCT	COCA
COCR	COCN
COEN	COEM
COCE	COIA
COWW	COID
COCE	COIL
COCE	COIN
COCE	COMO
COMN	COMN
COCT	CONV
CONY	CONY
COMW	COOR
CONY	CORN
COPA	COGS
COWW	COSI
COTX	COTX
CONY	COUP
COWW	COUT
COMW	COWA
CONY	COWC
COES	COVA
COWW	COWZ
COPA	COPA
BATR	CVVA
BATR	CWWV
BATR	DSDE
GTNA	GNCA

PRICE CAP COSA	ARMIS COSA
GTSO	GTAL
GTSW	GTAR
GTCA	GTCA
GTFL	GTFL
GTSO	GTGA
GTIN	GTHI
GTIM	GTIA
GTNA	GTID
GTIL	GTIL
GTIN	GTIN
GTSO	GTKY
GTMI	GTMI
GTMI	GTMN
GTMW	GTMO
GTNA	GTMT
GTSO	GTNC
GTMW	GTNE
GTSW	GTNM
GTOH	GTOH
GTSW	GTOK
GTNB	GTOR
GTPA	GTPA
GTSO	GTSC
GTSO	GTTN
GTSW	GTTX
GTSO	GTVA
GTNB	GTWA
GTWI	GTWI
GTSO	GTWV
AMTR	LBIL

PRICE CAP COSA	ARMIS COSA
AMTR	MBMN
USTR	MSAZ
USTR	MSCO
USTR	MSID
USTR	MSMT
USTR	MSNM
USTR	MSUT
USTR	MSWY
AMTR	NONI
NXTR	NEMA
NXTR	NEME
NXTR	NENH
NXTR	NEMI
NXTR	NEVT
BATR	NJNJ
USTR	NWIA
USTR	NWMN
USTR	NWND
USTR	NWNE
USTR	NWSD
NXTR	NYNY
AMTR	OBOH
BATR	PAPA
USTR	PNID
USTR	PNOR
USTR	PNWA
PTCA	PTCA
PTNV	PTNV
RTNY	RTNY
BSTR	SBFL

PRICE CAP COSA	ARMIS COSA
BSTR	SBGA
BSTR	SBNC
BSTR	SBSC
BSTR	SCAL
BSTR	SCKY
BSTR	SCLA
BSTR	SCMS
BSTR	SCTN
SNCT	SNCT
SWTR	SWAR
SWTR	SWKS
SWTR	SWMO
SWTR	SWOK
SWTR	SWTX
AMTR	WTWI
UTFL	UTFL
UTIN	UTIN
UTMW	UTMO
UTNC	UTNC
UTOH	UTOH
UTEG	UTPA
UTSE	UTTN
UTVA	UTVA
LTNE	LTNE
CEFL	CEFL
CEIL	CEIL
CENC	CENC
CENV	CENV
CEVA	CEVA
UTEG	UTNJ
UTMW	UTTX

SIMPLIFIED EXAMPLE OF THE OPERATION OF THE DIRECT MODEL

Assumes one basket, one period, no Zs, no sharing, and no under-cap pricing

	Step #	Actual	Step #	@ Test X
Financial (ARMIS) Calculations				
Revenue	1	1000	18	960
Expenses	2	600	from 2	600
Taxes	3	150	19	135
Tax Rate	4	37.5%	from 4	37.5%
Return	5	250	20	225
Avg. Net Investment (ANI)	6	2000	from 6	2000
ROR	7	12.50%	21	11.26%
Return@11.25%	8	225		
Revenue@11.25%	9	960		
Price Cap (TRP) Calculations				
GNPPI	10	4.0%	from 10	4.0%
X	11	3.0%	15	7.0%
1 + GNPPI - X	12	1.01	16	0.97
Previous PCI	13	1.00	from 13	1.00
PCI	14	1.01	17	0.97

Explanation of Steps

1	Data from ARMIS	15	Introduce possible value for Test X
2	Data from ARMIS	16	= 1 + GNPPI - Test X
3	Data from ARMIS	17	= Previous PCI * (1 + GNPPI - Test X)
4	= Taxes / (Revenue-Expenses)	18	= (Test PCI / Actual PCI) * Actual Revenue
5	= Revenue - Expenses - Taxes	19	= Taxes / (Revenue-Expenses)
6	Data from ARMIS	20	= Revenue - Expenses - Taxes
7	= Return / ANI	21	= Return / ANI
8	= .1125 * ANI		
9	= (Return@11.25% / (1-Tax Rate)) + Expenses		
10	Data from TRP		
11	Data from TRP		
12	= 1 + GNPPI - Actual X		
13	Data from TRP (or initialized value)		
14	= Previous PCI * (1 + GNPPI - Actual X)		

Depending on whether Step 20 produces a Return that equals Return@11.25%, iterate back to Step 15 and choose another value for Test X. Continue until Step 20 produces a Return that equals Return@11.25%.

Achievement of this is verified when Step 21 produces a Test ROR equal to 11.25%.