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February 16, 2000

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445-12th Street, SW
Room TW-A325
Washington, DC 20554

RE: Ex Parte Presentation
CC Dockets No. 94-1, 96-262

Dear Ms. Roman Salas:

On February 16, 2000, Dr. Bill Taylor, National Economic Research Associates, and Dr. Frank Gollop, Professor of Economics, Boston College, representing the United States Telecom Association (USTA) met with Anthony Bush, Debra Weiner, Sonja Rifkin and Andrea Kearney of the Office of General Counsel, and Howard Shelanski, Chief Economist. Also in attendance were Bob McDonnell and Ed Shakin, Bell Atlantic, John Kure, US WEST, Anthony Alessi, SBC, Dennis Weller and Claudia Kotecki, GTE, Bob Caprye, Citizens, Whit Jordan, BellSouth, and the undersigned. In a separate meeting, Dr. Taylor and Dr. Gollop met with Jay Atkinson, Jennifer McKee, Noel Uri, Aaron Goldschmidt, Florence Setzer, Chris Barnekov and Rich Lerner of the Common Carrier Bureau. Also in attendance were Bob McDonnell, John Kure, Anthony Alessi, Dennis Weller, Bob Caprye, Whit Jordan, Claudia Kotecki and the undersigned. The discussion at both meetings centered on the new staff studies proposed in the Commission's November 15, 1999 Further Notice of Proposed Rulemaking in the above-referenced dockets for purposes of calculating the X Factor.

Dr. Taylor addressed the following economic issues regarding the determination of the X-Factor as listed in the attachment: that there is no such thing as interstate productivity growth; that the Commission's constant modification of the price cap formula has destroyed the incentives of price cap regulation; that the elimination of sharing requires no additional consumer productivity dividend and that lines is a more appropriate measure of local output than DEMs. Dr. Taylor also provided a written rebuttal of Ad Hoc's mischaracterizations of NERA's testimony regarding interstate-only productivity.

Dr. Gollop used the attached charts to demonstrate his point that the inappropriate application of the Moody's Baa bond rate as a proxy for LEC opportunity costs results in an upward-biased X-Factor. He also explained that the incorrect application of the external rate of return to the LECs' cost of capital results in an upward-biased X-Factor. Finally, he pointed out

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that the erroneous use of external rates of return that ignore the actual revenues, income taxes, material expenses and operating expenses of the LECs leads to an upward-biased X-Factor. He demonstrated that if these errors are corrected, a properly applied internal rate of return, an appropriate measure of external rates of return or a properly applied Baa Bond rate all produce consistent results well below the current 6.5 percent X-Factor. Dr. Gollop also explained other errors in the 1999 staff study, including the exclusion of labor severance payments, the use of DEMs to measure output, the use of an incorrect input price series and other data errors.

In accordance with Section 1.1206(b)(2) of the Commission's rules, an original and one copy of this notice and the written material are being submitted herewith. Please include this notice in the public record of these proceedings. If there are any questions regarding this submission, please contact the undersigned.

Respectfully submitted,

Linda L. Kent
Associate General Counsel

Attachment
cc: Howard Shelanski, w/o encl.
Anthony Bush, w/o encl.
Debra Weiner, w/o encl.
Sonja Rifkin, w/o encl.
Andrea Kearney, w/o encl.
Jay Atkinson, w/o encl.
Jennifer McKee, w/o encl.
Noel Uri, w/o encl.
Aaron Goldschmidt, w/o encl.
Chris Barnekov, w/o encl.
Rich Lerner, w/o encl.
Florence Setzer, w/o encl.

ECONOMIC ISSUES IN THE DETERMINATION OF THE X-FACTOR

A. There is no such thing as interstate productivity growth.

AT&T claims to have found a method to calculate X without having to allocate costs or revenues to the interstate jurisdiction. That claim is an illusion—first, because there is no interstate productivity growth to measure and second because the AT&T method is no longer based on TFP growth but rather on the growth of interstate revenue per minute.

B. Changing the rules reduces the incentives.

Only if the regulated firm actually perceives credible rewards for success and credible penalties for failure will it have a greater incentive to invest in risky projects that have some palpable probability of increasing the likelihood of success or decreasing the likelihood of failure. The incentive regulation literature examines this premise and shows, in general, that the more likely success is to be rewarded and failure punished, the sooner the firm reaps its rewards or punishments and the longer the period over which the firm must live with the consequences of its behavior, the closer its behavior becomes to that of unregulated firms in competitive markets.[1] In theory, X should be set at the beginning of the price cap plan, using the best information available regarding historical changes in unit costs, and then left alone.[2] In contrast, the FCC has proposed or adopted five different methods for calculating X since 1990,

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[1] See, for example, M. Weitzman, "The Ratchet Principle and Performance Incentives," *The Bell Journal of Economics and Management Science*, Vol. 11 (1980) at 302-308; D. Baron and D. Besanko, "Commitment and Fairness in a Dynamic Regulatory Relationship," *Review of Economic Studies*, Vol. 54 (1987) at 413-436; and J-J. Laffont and J. Tirole, "The Dynamics of Incentive Contracts," *Econometrica* Vol. 56 (1988) at 1153-1176.

[2] While most studies measure an achieved X over a particular historical period by separately calculating rates of growth of total factor productivity and input prices, the price cap formula (the inflation less X) actually measures the historical reduction in costs per unit of output. To see this, note that the change in cost per unit of output is given by the difference between the change in costs and the change in output. The change in costs can be expressed as the sum of the change in input prices and the change in input quantities. Recombining, the change in cost per unit of output is equal to the difference in the rate of change of output and input quantities (i.e., TFP growth) plus the change in input prices.

with values that differ by nearly a factor of 4. Even ignoring the inference a price-cap LEC might draw from the consistent increase in the proposed values of X, no LEC could safely assume that its current earnings were irrelevant to the determination of future values of X, given the Commission's history of past revisions.[3]

C. Eliminating sharing requires no additional CPD.

As a factual matter, consumers have already benefited from the increased efficiency resulting from the elimination of the sharing requirements.[4] Continuing to include a CPD would effectively double-count the benefits of the elimination of sharing and, as a result, defeat the original purpose for eliminating sharing in the first place. Notwithstanding this point, AT&T and Ad Hoc misuse an SPR study to exaggerate the effect on productivity growth of eliminating sharing from a price cap plan. AT&T and Ad Hoc commit two basic errors:

- they equate a change in incentives with a change in productivity. For example, a running back in professional football gained 1000 yards last year and received a bonus of $1000 per yard. If his bonus were increased to $4000 per yard this season, his incentive would increase by a factor of 4, but we would not necessarily expect him to run for 4000 yards.

- they ignore the consequences of potential unsuccessful ventures. For example, suppose the firm is regulated by a 50/50 sharing plan and expects to be in the sharing range. Under these circumstances, its potential payoff if an investment is successful is half that of a firm under pure price cap regulation but so is its expected loss if the investment proves to be unsuccessful. Under 50/50 sharing, both incremental gains and losses are received and paid for in 50-cent dollars. Thus, the net effect of these changes in incentives on the amount of investment is ambiguous. For example, suppose a firm in the sharing range were contemplating an investment that would return $10 of incremental profit if successful and $10 of incremental loss if unsuccessful. If success and failure were equally likely, the expected gain to the firm from the investment would

[3] For example, in its recent Access Reform Order, the Commission cited high and increasing earnings as a reason for reducing the traffic sensitive PCI: see *Fifth Report and Order and Further Notice of Proposed Rulemaking*, CC Docket Nos. 96-262, 94-1, 98-157 and CCB/CPD File No. 98-63, released August 27, 1999 at ¶ 222.

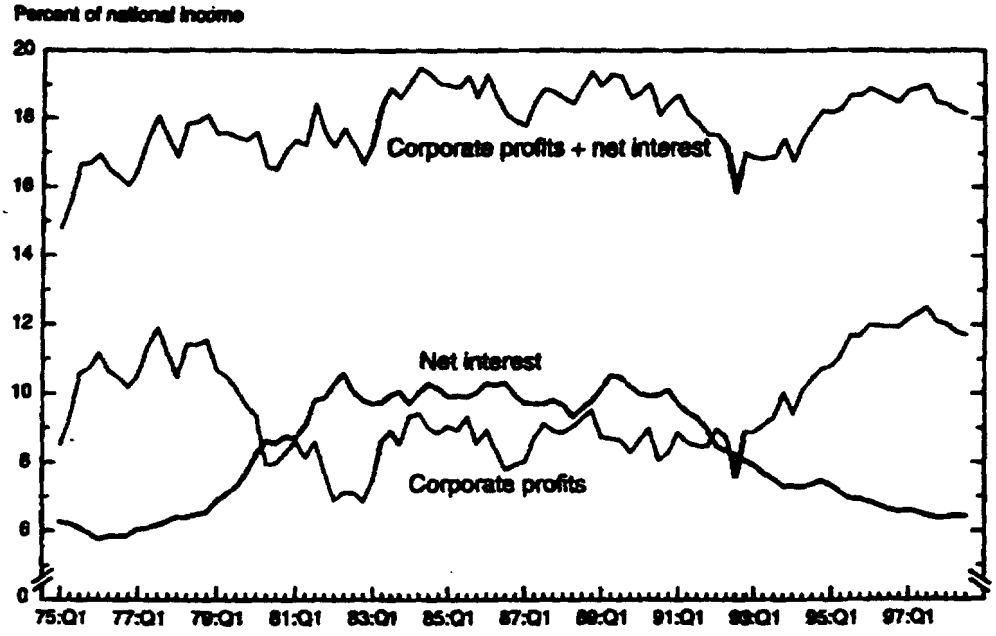
[4] As described in my initial comments [at 28], in the original 1990 LEC Price Cap Order the Commission provided various options for price cap LECs to choose higher X-factors in return for less stringent earnings requirements. In 1995 the Commission permitted the price cap LECs to choose an option that provided for no earnings sharing and the vast majority of price cap LECs selected this option. Ultimately in 1997, the Commission eliminated sharing altogether. As a result, the price cap LECs have experienced at least some of the incentives benefits from elimination or reduction of sharing since as early as 1991.

be exactly the same under 50/50 sharing and pure price cap regulation. In contrast, the SPR model used by AT&T and Ad Hoc would show twice the incentive to invest under pure price cap regulation compared with 50/50 sharing.

D. If a single physical measure of output is to be used in a TFP study, it should be lines, not minutes.

The correct measure of output in a TFP study is a revenue-weighted average of the growth rates of each of the physical measures of output of the firm. It is only that measure of output that equates the change in the price cap (inflation – X) in the price cap formula to the change in unit costs of the regulated firm. Thus, if a single measure of physical output is to be used in the TFP study, it should be lines—the output whose revenue weight is largest—because the resulting output growth rate will be closest to that of the correct measure of output. For example, the explosive growth of local exchange minutes associated with internet traffic should have no effect on TFP growth to the extent that they carry no revenue weight.

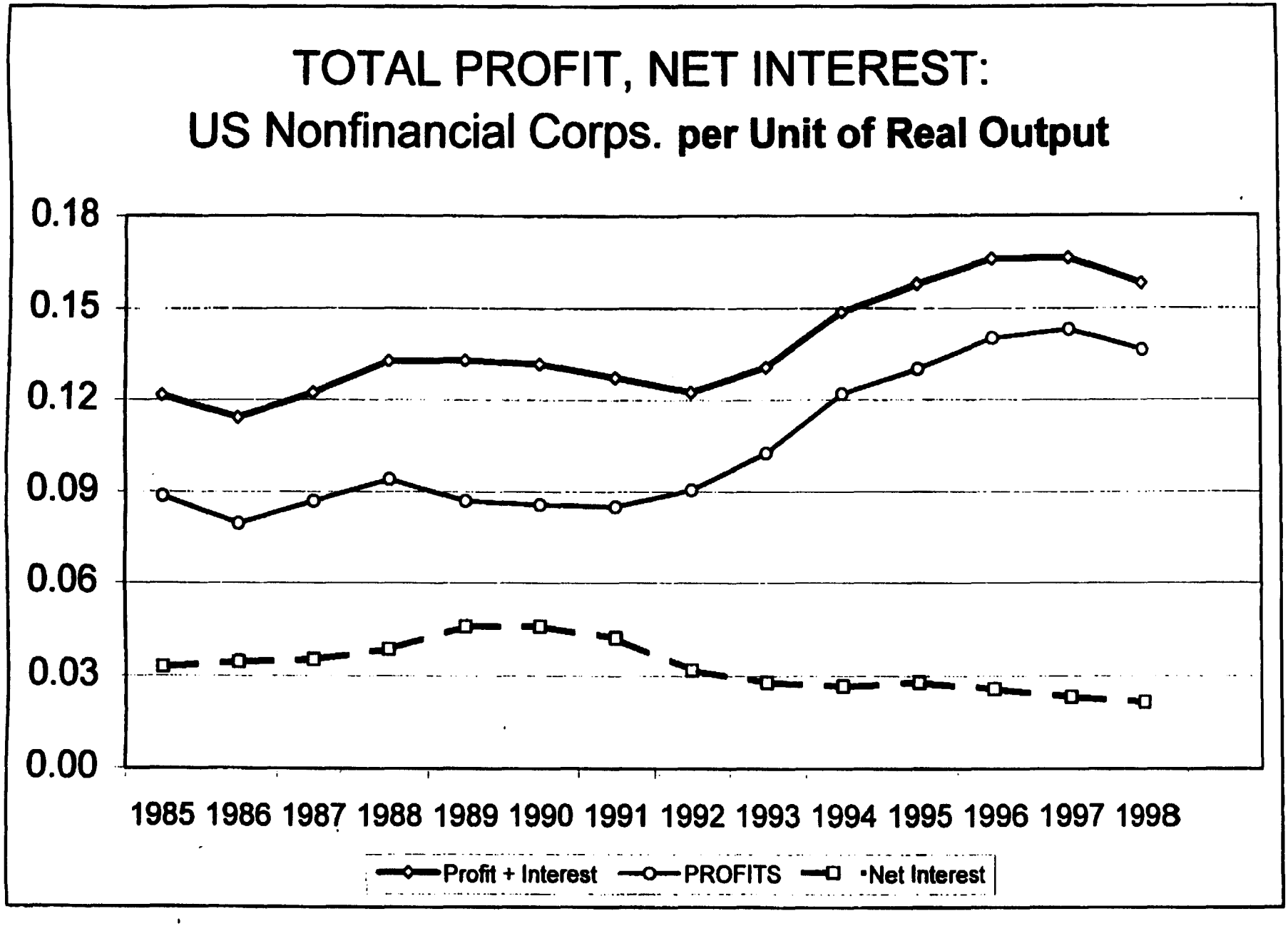
Chart 2-8 Corporate Profits and Net Interest Payments
The corporate profit share of national income has risen recently while the net interest share has fallen. The sum of these pieces of capital income has varied less.



Note: Corporate profits includes inventory valuation and capital consumption adjustments.
Source: Department of Commerce (Bureau of Economic Analysis).

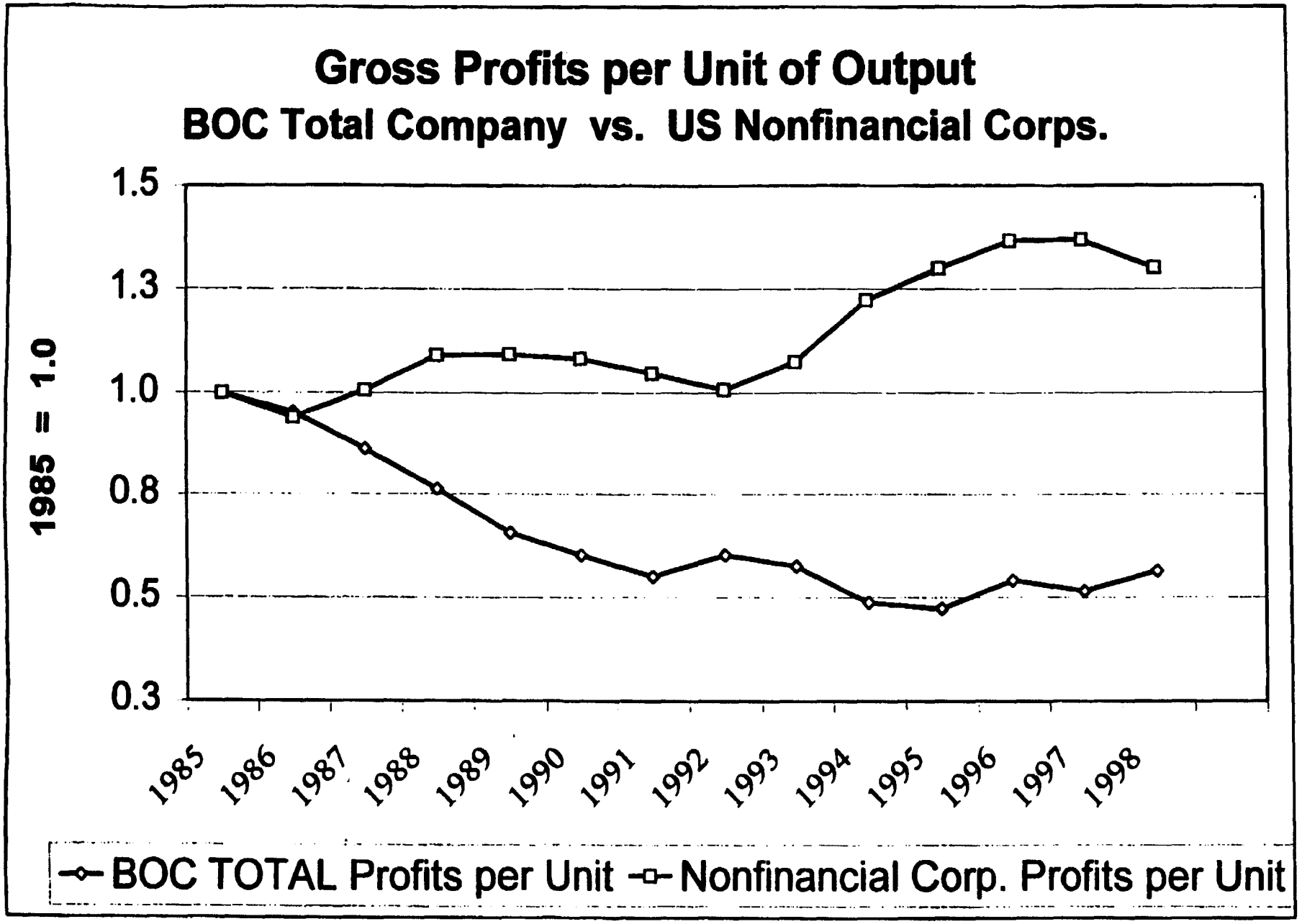
for investment—have also made up an unusually large share of national income in recent years.

Profits can affect investment in two ways. First, high returns to existing capital may help persuade firms that the return to new capital investment will be high as well. Second, high profits allow firms to purchase capital using internally generated funds, which are generally less expensive to the firm than external funds (the proceeds of borrowing or the sale of shares). This difference in cost arises because lenders know less about a firm's investment projects and financial condition than the firm itself does. Their informational disadvantage creates so-called agency problems, which include both moral hazard (firms may alter their behavior in ways that raise their lenders' risk without the lenders' knowledge or acquiescence) and adverse selection (firms that seek external funds will tend to be those with riskier projects). Thus, the information asymmetry between firms and potential lenders raises the cost—and sometimes restricts the quantity—of funds raised in financial markets.


TOTAL PROFIT, NET INTEREST:
US Nonfinancial Corps. per Unit of Real Output
0.18
0.15
0.12
0.09
0.06
0.03
0.00
1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998
Profit + Interest
PROFITS
Net Interest

X-Factors Under Alternative Cost of Capital Measures

	Internal Rates of Return	External Rates of Return					
		USTA (Gollop) Value Line Rates of Return				FCC Staff 1999 Model	
	USTA (Gollop) Update of FCC Model (Sept 99)	1991: 8.5% (Jan 00)	1991: 9.5% (Feb 00)	1991: 10.5% (Feb 00)	USTA (Vander Weide) A Bonds/S&P 500 (Jan 00)	Baa Rate (Feb 00)	All Staff Changes (Dec 99)
1990	8.99	8.48	8.48	8.48	8.48	8.48	4.87
1991	6.06	6.18	6.18	6.18	6.18	6.18	3.61
1992	3.08	1.68	3.82	6.00	4.29	5.78	8.45
1993	3.51	-0.30	-0.40	-0.50	4.34	4.67	8.49
1994	5.47	1.53	1.46	1.39	1.86	1.85	3.62
1995	6.20	2.98	2.92	2.86	6.04	5.64	6.52
1996	1.98	4.98	4.97	4.96	3.66	4.71	7.73
1997	3.62	3.55	3.55	3.55	3.93	5.03	6.71
1998	3.03	5.73	5.76	5.78	2.15	4.62	5.54
1991-98	4.12	3.29	3.53	3.78	4.06	4.81	6.33
1994-98	4.06	3.76	3.73	3.71	3.53	4.37	6.02


Gross Profits per Unit of Output
BOC Total Company vs. US Nonfinancial Corps.
1985 = 1.0
1.5
1.3
1.0
0.8
0.5
0.3
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
BOC TOTAL Profits per Unit
Nonfinancial Corp. Profits per Unit

OUTLINE RESPONSE TO AD HOC ON THE NON-EXISTENCE OF INTERSTATE TOTAL FACTOR PRODUCTIVITY GROWTH

A. AD Hoc mischaracterizes NERA testimony regarding interstate-only productivity

AD Hoc claims that NERA testimony in 1996 in North Carolina is inconsistent with the position that interstate-only productivity does not exist for a multiproduct firm[1] and that Dr. Taylor has advocated the use of intrastate productivity studies for setting productivity offsets for intrastate price cap plans. Neither statement is correct.

- Contrary to Ad Hoc's claim, NERA **did not** advocate use of intrastate-only productivity before the North Carolina Commission. Taylor clearly stated "Local exchange carriers provide a variety of telecommunications services, **each** of which must be properly accounted for in the construction of an output index used in a Total Factor Productivity Study."[2] [emphasis added]. In Appendix B of Taylor's testimony, his recommendation to the North Carolina Commission was based upon, *inter alia*, a review of total factor productivity studies, not some measure of intrastate-only productivity. Thus, Dr. Selwyn is wrong on pp. 23-25 when he accuses Taylor of supporting intrastate productivity measures for intrastate price cap plans; all of Dr. Taylor's recommendations to state (and federal) regulators regarding productivity support for price cap plans are based on industry total factor productivity growth.

- Second, the specific passages quoted by Ad Hoc and Dr. Selwyn refuted intervenor claims that the FCC's X-factor of 5.3% should be used to set the X-factor in the state jurisdiction. In 1996, the FCC used the price method to set the X-factor for interstate services. TFP was not used as the basis for the interstate X of 5.3% .

- Third, the passages quoted by Ad Hoc and Dr. Selwyn rebut claims by intervenors that implicitly assume that the production process is separable (which it is not) so that there is such a thing as interstate-only productivity (which there is not). In that context, the quoted statements simply imply that, assuming the production function is separable and holding other factors constant, a service that is provided by inputs that are experiencing

[1] Amended Direct and Rebuttal Testimony of Dr. William E. Taylor, Before the North Carolina Utilities Commission, Docket No. P-7, Sub 825; P-10, Sub 479, February 9, 1996.

[2] *Ibid*,. at 41.

greater technological change contributes *proportionally* more to productivity than a service that is provided by inputs that are experiencing less technological change.

Dr. Taylor responded to this baseless criticism years ago:

> AT&T (at 18-19) asserts that in intrastate regulatory proceedings, LECs have "conced(ed) that LEC interstate-only productivity (*sic*) far exceeds LEC local, intrastate productivity." First, the only sense in which AT&T's citations contain such a concession is semantic: in using imprecise language to explain a technical concept, the cited economists and LECs talk about interstate productivity growth as if it existed as a separate and measurable entity. The positions taken in the cited state and federal price cap proceedings by these parties are entirely consistent: that TFP growth for the entire firm—not for a subset of services—should be the basis on which the productivity offset is determined in both interstate and intrastate jurisdictions.
>
> Second, the citations generally explain why the interstate X value originally determined by the FCC is inappropriate for use in a price cap plan for intrastate services. Recall that the interstate value of the productivity offset (the X-factor) initially set by the FCC was not determined by a direct TFP study based on either interstate or total output. Rather, the initial interstate X for the FCC's price cap plan was set using the price method, averaging together the long run rate of growth of real prices for all telecommunications services (the Spavins-Lande method) and the short run rate of growth of carrier access prices (the Frentrup-Uretsky method).[3] It is certainly correct that the factors cited by the LECs—rapid rate of growth of interstate carrier access output in the 1980s, reductions in switching and transport costs, the relatively high margin on access services, etc.—increased the value of X calculated by both the Spavins-Lande and the Frentrup-Uretsky methods. Thus, if the method used by the FCC in setting the interstate value of X were applied to the intrastate jurisdiction, the factors discussed by economists and LECs cited in Attachment B to AT&T's Comments would necessarily result in a lower measured productivity offset for intrastate services, as they claim.
>
> Third, AT&T mistakenly suggests that two facts frequently cited by economists in these proceedings, namely:
>
> - that growth in output leads to higher TFP growth for the firm, and
>
> - that growth in high markup services contributes more to TFP growth than growth in low markup services

[3] *Fourth Report and Order in CC Docket No. 94-1 and Second Report and Order in CC Docket No. 96-262*, FCC 97-159, ¶¶137-141, Adopted May 7, 1997.

> support its view that an identifiable interstate TFP growth exists and should be used in a price cap plan for interstate services. As Dr. Christensen carefully points out in the passages cited by AT&T,[4] both of these facts imply that TFP growth for the firm will be higher, not that TFP growth somehow defined for a high-growth or high-margin service will be higher than TFP growth for a low-growth, low-margin service. As shown in the two examples above, the facts that LEC interstate services are growing more rapidly and carry a higher margin than intrastate services do not imply that TFP growth for interstate services—somehow defined—would be higher than for intrastate services, that unit costs for interstate services would be falling faster than for intrastate services or that the appropriate X in a price cap plan would be higher for interstate services than for intrastate services.

Taylor and the ILECs have consistently supported the use of total factor productivity growth as the productivity measure underlying the price adjustment formula in price cap plans.

B. Ad Hoc's attribution of productivity growth to jurisdictions has no basis in economics.

Taylor has consistently observed[5] that unless the production function is separable, interstate productivity growth is not defined. Moreover, for separability, it is not sufficient that inputs and outputs be meaningfully assigned to each jurisdiction; it is also necessary that growth in intrastate demand not change marginal rates of substitution among interstate inputs. Dr. Taylor gives examples in which growth in interstate usage reduces interstate and intrastate unit costs equally and would therefore reduce both interstate and intrastate prices.

Dr. Selwyn (at 34) disagrees and asserts that the service that is the driver for a productivity gain should benefit in the form of lower unit costs and lower prices:

> "Under this alternate "attribution" method, the entirety of the productivity gain is attributed to and is used to benefit the interstate usage service because, but for

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[4] AT&T Comments at 19 and Attachment B.

[5] Federal Communications Commission (CC Docket No. 94-1) on behalf of the United States Telephone Association, "Economic Evaluation of Selected Issues from the Fourth Further Notice of Proposed Rulemaking in the LEC Price Cap Performance Review," Attachment C to the United States Telephone Association "Comments," filed December 18, 1995 (with T. Tardiff and C. Zarkadas); Federal Communications Commission, (CC Docket Nos. 96-262, 94-1, 97-250 and RM 9210), "Access Reform Again: Market-Based Regulation, Pricing Flexibility and the Universal Service Fund," Attachment A to the Comments of the United States Telephone Association, filed October 26, 1998; "Productivity and Pricing Flexibility: Reply Comments," Attachment A to the Reply Comments of the United States Telephone Association, filed November 9, 1998; and Federal Communications Commission (Docket Nos. 94-1, 96-26), comments on behalf of the United States Telecom Association regarding the proposed represcription of the productivity offset in the FCC's price cap plan, January 7, 2000. Reply comments filed January 24, 2000.

> the growth in that service, there would not have been any productivity gain at all."

Ad Hoc is mistaken. For a multiproduct firm in competitive markets, the service that is responsible for the productivity gain does not necessarily receive any or all of the benefits in the form of price reductions. Even though in the example, interstate demand growth is assumed to be responsible for the reduction in unit costs, that reduction applies equally to interstate and intrastate services. In the example, it is cheaper to produce an additional unit of intrastate service at higher levels of interstate demand, and, in that case, intrastate prices would fall in competitive markets to reflect that reduction. Ad Hoc's ad hoc allocation method ignores what would happen to prices in competitive markets in this example, and thus using this, or any other arbitrary allocator, would produce bad regulatory outcomes.

In this example, even where costs and revenues (inputs and outputs) can be unambiguously assigned to jurisdictions, it is meaningless to speak of interstate total factor productivity growth, and setting prices as if there were such a thing results in prices that bear no resemblance to their level in competitive markets.