Recent Stock Price Weakness Creates Attractive Buying Opportunity; Reiterate 12-18 Month Price Objective Of $37

Teligent's stock price as well as other CLECs (competitive local exchange carriers) have come under a good deal of pressure over the past month and a half. We think this stock price weakness can be traced to two main issues: a) profit taking in a group that has shown significant stock price outperformance year-to-date; and, b) recent heightening of investor concerns regarding the soon-to-be announced (beginning 4/28) 1Q98 results. Although there isn't much we can say about the first point, we do feel strongly that the underlying growth trends (i.e., line growth, revenue per line, and progress towards positive EBITDA) and most importantly -- value creation -- in the CLEC group is still very much intact.

Teligent's Network Build-Out Remains On Track.

For Teligent, specifically, the company's efforts toward commencement of commercial service by mid-'98 appear to be very much on track. In fact, we expect management to make this point in emphatic fashion during the 1Q98 update call with investors tentatively scheduled for the week of May 11. Our expectations for Teligent's commercial deployment schedule remain unchanged with 3 wireless local telephone and data networks up and running by mid-year, 10 in total by year-end '98 and an additional 20 in service by year-end '99.

Recent Developments Bolster Confidence

In mid-March (3/18), the company announced that it had begun to take delivery of "commercially available" point-to-mulitipoint digital wireless equipment from its lead equipment supplier, Northern Telecom. In addition, this equipment is currently being used to carry voice and data traffic for beta customers in the Los Angeles market. Lastly, we understand that Teligent is nearing completion of its Virginia-based network operations center. The weight of these recent developments bolsters our confidence that management will meet the anticipated network deployment schedule.

Conclusion: Recent Price Weakness Creates Opportunity, Reiterate Intermediate Term Accumulate Opinion.

In our opinion, recent price weakness in Teligent shares has created an attractive buying opportunity. We reiterate our 12-18 month price objective of $37 or 23% upside based on our 10 year discounted cash flow (DCF) model, a 15% discount rate, a 9.0 multiple on terminal year EBITDA and no public market discount.

13 March 1998

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Teligent Inc.

All Systems Go For Mid-Year Commercial Service Kickoff

ACCUMULATE*

Reason for Report: 4Q Update

Long Term BUY

Price: **$31 1/16**
12 Month Price Objective: $37

Estimates (Dec)	1996A	1997E	1998E
EPS	NA	NA	d$3.47
P/E	NM	NM	NM
EPS Change (YoY):		NM	NM
Cash Flow/Share:	NA	NA	d$3.29
Price/Cash Flow:	NM	NM	NM
Dividend Rate:	Nil	Nil	Nil
Dividend Yield:	Nil	Nil	Nil

Opinion & Financial Data

Investment Opinion:	D-2-1-9
Mkt. Value / Shares Outstanding (mn):	$1,677.4 / 54
Price/Book Ratio:	NM
LT Liability % of Capital:	57.0%

Stock Data

52-Week Range:	$35 3/8-$22 1/4
Symbol / Exchange:	TGNT / OTC
Options:	None
Institutional Ownership-Spectrum:	NA

ML Industry Weightings & Ratings**

Strategy: Weighting Rel. to Mkt.:		
Income:	Overweight	(07-Mar-95)
Growth:	Underweight	(07-Mar-95)
Income & Growth:	Overweight	(07-Mar-95)
Capital Appreciation:	Overweight	(16-Jan-96)
Market Analysis: Technical Rating:	Above Average	(24-Dec-96)

*Intermediate term opinion last changed on 18-Dec-97.
**The views expressed are those of the macro department and do not necessarily coincide with those of the Fundamental analyst.
For full investment opinion definitions, see footnotes.

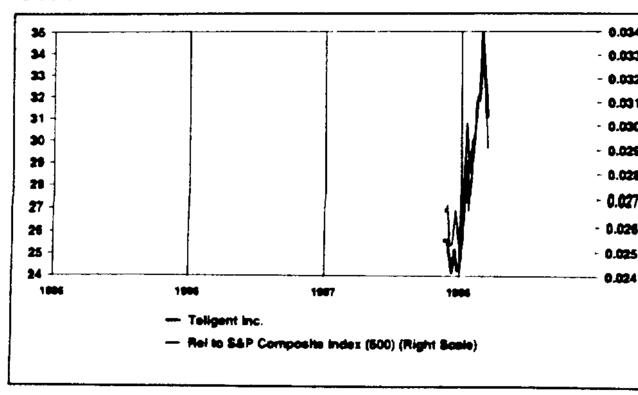
Investment Highlights:

- **Reiterating our intermediate term Accumulate and long term Buy opinion on Teligent.**
- **12 month private market value-based price objective remains at $37 or 19% upside from current prices. Our private market value estimate in based on our 10 year discounted cash flow (DCF) model, a 15% discount rate and 9.0 multiple on terminal year EBITDA, and no public market discount.**

Fundamental Highlights:

- **Management's 4Q97 conference call with investors confirmed that commercial rollout activities remain on track for 3 commercial networks to be in service by mid-year, with a total of 10 by year-end '98 and an additional 20 by year-end '99. Currently, network rollout activities are underway in 30 markets.**
- **Teligent has bowed out of the 28 GHz LMDS auctions but plans to be active in the 24 GHz auctions expected within 18 months in order to supplement its license holdings in 74 markets.**

Stock Performance



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RC#20107225

Teligent's 4Q Report & Analyst Call Confirms That Mid-Year Commercial Service Kickoff Is On Track; Reiterate Accumulate Opinion

After the market close on March 11, Teligent released 4Q results and hosted a call with analysts for the purpose of providing an update on activities related to the commercial rollout of the company's wireless CLEC (competitive local exchange carrier) services. The most important announcement in the quarterly release was confirmation that service rollout is indeed on track (i.e., 3 networks with commercial service by "mid-year", with a total of 10 networks commercial by year-end '98). To this end, management stated that "[b]y the end of 1998, we plan to have resources deployed in the thirty top markets, with AT LEAST (our emphasis) ten of those markets fully commercial." Additional key highlights of the quarter and the analyst call were as follows:

1. Construction/market development update: Activities designed to prepare for commercial service rollout are currently underway in 30 markets, in line with our expectations of 30 markets under commercial operation by year-end '99. Hub sites in the first 10 markets have been identified and efforts are currently underway to secure the necessary roof rights. 12 Nortel DMS-500 switches have been ordered, including those slated for the initial 10 markets. Five of these switches are currently in the process of installation. Lastly, construction of Teligent's network operations center (NOC) has begun in Northern Virginia.
2. Equipment update: The company expects to receive its first shipment of "commercial" point-to-multipoint wireless equipment from Nortel, its lead equipment vendor, within the next few weeks.
3. Staffing up: Year-end head count totaled 221 with approximately 200 staff members added so far in '98, the bulk of which comprise staff, operations and network deployment personnel. Management indicated that during 2Q98, hiring will begin to focus on sales and sales support personnel immediately in advance of commercial service rollout. By year-end '98, it is expected that Teligent will have 200 direct salespeople on staff.
4. Teligent bows out of 28 GHz LMDS auctions: Although the company had participated in the early phases of the LMDS auction, management disclosed that prices for the market licenses it targeted on an "opportunistic basis" had risen to a level that exceeded the value to Teligent. Thus, all bidding activity by the company has ceased. Management did indicate, however, that the company plans to participate in the anticipated spectrum auctions of additional 24 GHz spectrum which is expected to transpire within the next 18 months.
5. 4Q97 financial results: Teligent reported quarterly revenue of $397,000, of which approximately only $33,000 represented recurring revenues (related to Teligent's license perfection activities). The balance of the reported revenues — $364,000 — relate to spectrum management fees paid to Teligent by its partners in that portion of the 4Q prior to the completion of its IPO. We point out that neither of these two activities are directly related to Teligent's core business — wireless CLEC telecommunications services. Reported net loss for the quarter of $59 million included a $32 million non-cash expense for stock-based compensation.
6. Conclusion: Teligent's commercial service rollout activities appear to be on track for 3 commercial networks to be in service by mid-year, with at least an additional 7 in operation by year-end '98 and at least an additional 20 in operation by year-end '99. We reiterate both our intermediate term Accumulate and long term Buy opinion as well as our $37 private market value-based price objective or 19% upside. Our price objective is based on our 10 year discounted cash flow (DCF) model, a 15% discount rate and a 9.0 multiple on terminal year EBITDA, and no public market discount.

11 June 1998

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USN Communications Inc

New Initiatives Delayed, Lowering Estimates and Opinion

NEUTRAL

Reason for Report: Lowering Estimates & Opinion

Long Term ACCUMULATE

Price: $9 3/8

Estimates (Dec)	1997A	1998E	1999E
EPS:	d$15.55	d$9.00	d$4.73
P/E:	NM	NM	NM
EPS Change (YoY):		NM	NM
Consensus EPS: (First Call: 29-May-98)		d$8.56	d$4.29
Q2 EPS (Jun):		D$1.99	
Cash Flow/Share:	d$15.06	d$8.24	d$4.01
Price/Cash Flow:	NM	NM	NM
Dividend Rate:	Nil	Nil	Nil
Dividend Yield:	Nil	Nil	Nil

Opinion & Financial Data

Investment Opinion:	D-2-1-9 to D-3-2-9
Mkt. Value / Shares Outstanding (mn):	$266.8 / 22
Book Value/Share (Sep-97):	d$1.94
Price/Book Ratio:	NM

Stock Data

52-Week Range:	$23-$10
Symbol / Exchange:	USNC / OTC
Options:	None
Institutional Ownership-Spectrum:	37.3%
Brokers Covering (First Call):	2

ML Industry Weightings & Ratings**

Strategy: Weighting Rel. to Mkt.:		
Income:	Overweight	(07-Mar-95)
Growth:	Underweight	(07-Mar-95)
Income & Growth:	Overweight	(07-Mar-95)
Capital Appreciation:	Overweight	(16-Jan-96)
Market Analysis: Technical Rating:	Above Average	(24-Dec-96)

**The views expressed are those of the macro department and do not necessarily coincide with those of the Fundamental analyst.
For full investment opinion definitions, see footnotes.

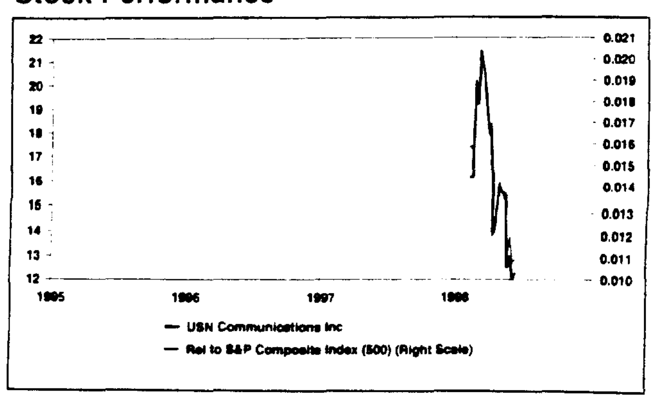
Investment Highlights:

- **We have reduced our 12 month private market based price objective from $24 to $18 due to slower than anticipated ramp up of important new initiatives.**
- **We have lowered our intermediate term opinion from Accumulate to Neutral and our long term opinion from Buy to Accumulate.**

Fundamental Highlights:

- **Due to delays in growth initiatives and lower than anticipated direct salesforce productivity, we are lowering full-year revenue estimates for 1998 from $301M to $238M and for 1999 from $572M to $449M.**
- **We are widening full-year EBITDA loss estimates for 1998 from $124M to $132M and for 1999 from $41M to $48M.**
- **We are decreasing our estimate of 2Q access line additions from 64,000 to 50,000 due to lower than expected direct salesforce productivity and delays in telemarketing sales rollout. In addition, we are lowering our full-year 1998 access line forecast from 540,000 to 426,000.**

Stock Performance



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Global Securities Research & Economics Group
Global Fundamental Equity Research Department

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RC#20116233

Due to slower than anticipated ramp up of telemarketing and direct sales productivity and enhanced services initiatives, we are lowering our 1998 and 1999 forecasts. As a result, we are reducing our private market value based price objective from $24 to $18 and lowering our intermediate term opinion from Accumulate to Neutral and our long term opinion from Buy to Accumulate. Revisions to our estimates are as follows:

1. **Access Lines:** Lower salesforce productivity (44 lines per month per salesperson vs. our estimate of 64 lines) has led us to decrease our est. of 2Q access line adds from 64,000 to 50,000. In addition, we are lowering our full-year '98 access line est. from 540,000 to 426,000.
2. **Churn:** We est. churn levels for 2Q to be 2.6%, a decrease from the 2.9% level seen in 1Q, but higher than our est. of 2.0%. We attribute the higher than anticipated churn to residual impact from previously announced billing issues during 1Q, and expect it to taper down to approx. 2.0% by year-end '98.
3. **Telemarketing Revenues:** As expected USN will have 90 telemarketing "chairs" in full service by the end of 2Q, however, the chairs will come into service much later in the quarter than anticipated due to time lags from training. In addition, lower than anticipated productivity per chair (e.g., 3 access lines sold per day per chair vs. the anticipated 5) will affect telemarketing revenue during 3Q and 4Q98, although we anticipate this will improve in 1999 with continued training.
4. **Enhanced Services Revenues:** Slower than anticipated enhanced services sales has resulted from: delays in rolling out cellular resale services to states outside of the Connecticut Telephone territory (CT, MA & RI); and lower than anticipated cross sales of voice features (i.e. caller ID, voice mail, fax and data lines) to existing customers.

Positive Trends

Despite the revisions to our forecast as detailed in Table 1, we do detect some positive trends including:

1. **Monthly Revenue Per Line:** A 6% increase in monthly revenue per line from an average of $49 during 1Q to $52 during 2Q.
2. **Geographic Expansion:** Deployment of 45 new salespeople in Maryland and Virginia which is estimated to grow to 75 by year-end 1998.
3. **Conservative Assumptions:** We have been purposefully conservative in our 10 year DCF model. We believe our assumptions for 2007 including: 25 lines sold per month per direct salesperson vs. 44 for 1998, 5 lines sold per telemarketing chair per day vs. 3 for 1998, and 11.5% EBITDA margin provide significant upside potential.

Conclusion

Although the stock remains attractive from a statistical standpoint as our private market value of $18 has a 92% upside potential, we believe the stock will mark time at current levels until positive impacts from new initiatives are reflected in the reported results. Our revised private market based price objective of $18 assumes a 15% discount rate, a 9x multiple on terminal year EBITDA growth and implies a 5.2% growth rate of perpetual free cash flow. We have lowered our intermediate term opinion from Accumulate to Neutral and our long term opinion from Buy to Accumulate.

Table 1: 1998 Revised Quarterly Forecast

	1Q98A	2Q98E	3Q98E	4Q98E	1998E
Revenues					
Direct Sales	27.5	37.0	50.0	65.0	179.5
Telemarketing	-	-	2.0	7.5	9.5
Agents	-	-	-	-	-
Enhanced	0.3	0.6	0.7	1.0	2.6
Core Revenues	27.8	37.6	52.7	73.5	191.6
CONTEL Revenues*	4.5	12.4	14.0	15.9	46.8
Total Revenues	32.3	50.0	66.7	89.4	238.4
EBITDA	(36.7)	(34.1)	(32.0)	(29.5)	(132.3)

* Includes 1 1/2 mos. of revenue for 1Q98 as CONTEL acquisition closed on 2/23
Source: Merril Lynch estimates

Table 2: USN Communications Detailed Financial Forecast

	1997A	1Q98A	2Q98E	3Q98E	4Q98E	1998E	1999E	2000E	2001E	2002E	2003E	2004E	2005E	2006E	2007E
Revenues															
Direct Sales	47.2	27.5	37.0	50.0	65.0	179.5	328.8	451.9	553.9	641.1	726.7	811.6	893.4	975.1	1,057.8
Telemarketing	-	-	-	2.0	7.5	9.5	37.9	79.8	105.6	120.6	143.1	166.4	190.5	215.6	241.6
Agents	-	-	-	-	-	-	6.2	17.4	26.7	35.6	44.9	54.5	64.5	74.9	85.7
Enhanced	-	0.3	0.6	0.7	1.0	2.6	13.2	22.6	33.2	44.9	54.5	64.9	75.9	87.8	100.5
Core Revenues	47.2	27.8	37.6	52.7	73.5	191.6	386.0	571.7	719.5	842.2	969.2	1,097.4	1,224.4	1,353.4	1,485.6
CONTEL Revenues	-	4.5	12.4	14.0	15.9	46.8	63.2	76.7	87.7	98.7	110.3	122.5	136.2	151.3	168.3
Total Revenues	47.2	32.3	50.0	66.7	89.4	238.4	449.2	648.4	807.2	940.9	1,079.5	1,220.0	1,360.5	1,504.7	1,653.9
Expenses															
Cost of Sales	41.3	26.6	39.6	50.7	65.2	182.2	320.2	446.2	548.9	631.5	724.8	819.4	901.3	996.8	1,095.5
Sales & Marketing	100.4	42.3	44.5	48.1	53.6	188.5	177.4	193.9	217.1	239.0	261.2	286.7	312.9	340.1	368.8
Dep. & Amort.	3.5	2.2	2.1	2.5	2.7	9.5	11.2	14.9	17.8	18.8	19.4	19.5	19.4	20.4	24.3
Operating Profit	(97.9)	(38.9)	(36.2)	(34.5)	(32.2)	(141.8)	(59.6)	(6.6)	23.4	51.6	74.0	94.4	126.9	147.4	165.2
Interest Exp. net	11.9	5.5	9.6	12.1	14.5	41.7	59.3	53.1	41.4	30.0	18.3	2.0	-	-	-
Pretax Profit	(109.9)	(44.3)	(45.9)	(46.6)	(46.7)	(183.5)	(118.9)	(59.7)	(18.0)	21.6	55.7	92.4	126.9	147.4	165.2
Accum Preferred Div.	2.2	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Profit (loss)	(112.1)	(44.9)	(45.9)	(46.6)	(46.7)	(184.0)	(118.9)	(59.7)	(18.0)	21.6	55.7	92.4	126.9	147.4	165.2
EPS	$ (15.55)	$ (3.13)	$ (1.99)	$ (1.97)	$ (1.91)	$ (9.00)	$ (4.73)	$ (2.31)	$ (0.67)	$ 0.79	$ 1.97	$ 3.17	$ 4.23	$ 4.77	$ 5.19
Shares O/S	7.2	14.4	23.0	23.7	24.4	21.4	25.1	25.9	26.7	27.5	28.3	29.1	30.0	30.9	31.8
EBITDA	(94.4)	(36.7)	(34.1)	(32.0)	(29.5)	(132.3)	(48.4)	8.3	41.2	70.4	93.4	113.9	146.3	167.8	189.6
Cap Exp	15.0	5.4	5.0	7.5	7.5	25.4	21.0	22.1	23.2	24.3	25.5	26.8	28.1	29.5	31.0
Free Cash Flow	(111.7)	*NM*	*NM*	*NM*	*NM*	(120.2)	(64.2)	(25.8)	5.9	33.7	54.9	73.6	104.5	124.2	142.9
Access Lines (000s)	172	226	276	346	426	426	717	941	1,094	1,261	1,432	1,595	1,756	1,918	2,080
Margins															
Cost of Sales	*87.4%*	*82.5%*	*79.2%*	*76.0%*	*73.0%*	*76.4%*	*71.3%*	*68.8%*	*68.0%*	*67.1%*	*67.1%*	*67.2%*	*66.2%*	*66.2%*	*66.2%*
Sales & Marketing	*212.7%*	*131.0%*	*89.0%*	*72.0%*	*60.0%*	*79.1%*	*39.5%*	*29.9%*	*26.9%*	*25.4%*	*24.2%*	*23.5%*	*23.0%*	*22.6%*	*22.3%*
Depreciation Amort	*7.4%*	*6.8%*	*2.1%*	*1.7%*	*1.6%*	*4.0%*	*2.5%*	*2.3%*	*2.2%*	*2.0%*	*1.8%*	*1.6%*	*1.4%*	*1.4%*	*1.5%*
Interest Exp. net	*25.2%*	*17.0%*	*15.6%*	*13.5%*	*11.4%*	*17.5%*	*10.1%*	*6.4%*	*4.0%*	*2.5%*	*1.3%*	*0.1%*	*0.0%*	*0.0%*	*0.0%*
Net Profit (loss)	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*2.3%*	*5.2%*	*7.6%*	*9.3%*	*9.8%*	*10.0%*
EBITDA	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*1.3%*	*5.1%*	*7.5%*	*8.7%*	*9.3%*	*10.8%*	*11.2%*	*11.5%*
Y/Y Change															
Core Revenues															
Direct Sales	*NA*	*NA*	*NA*	*NA*	*221.8%*	*280.3%*	*83.2%*	*37.4%*	*22.6%*	*15.7%*	*13.4%*	*11.7%*	*10.1%*	*9.1%*	*8.5%*
Telemarketing	*NA*	*NA*	*NA*	*NA*	*NM*	*NM*	*298.5%*	*110.8%*	*32.3%*	*14.2%*	*18.6%*	*16.3%*	*14.5%*	*13.2%*	*12.1%*
Agents	*NA*	*NA*	*NA*	*NA*	*NM*	*NM*	*NM*	*180.6%*	*53.6%*	*33.5%*	*26.1%*	*21.5%*	*18.4%*	*16.1%*	*14.4%*
Enhanced	*NA*	*NA*	*NA*	*NA*	*NM*	*NM*	*405.8%*	*71.8%*	*47.1%*	*35.0%*	*21.5%*	*19.1%*	*17.0%*	*15.6%*	*14.5%*
Core Revenues	*NA*	*NA*	*NA*	*NA*	*263.8%*	*305.9%*	*101.5%*	*48.1%*	*25.9%*	*17.1%*	*15.1%*	*13.2%*	*11.6%*	*10.5%*	*9.8%*
CONTEL Revenues	*NA*	*NA*	*NA*	*NA*	*NM*	*NM*	*34.9%*	*21.4%*	*14.4%*	*12.5%*	*11.8%*	*11.1%*	*11.1%*	*11.2%*	*11.2%*
Total Revenues	*NA*	*NA*	*NA*	*NA*	*NM*	*NM*	*88.4%*	*44.3%*	*24.5%*	*16.6%*	*14.7%*	*13.0%*	*11.5%*	*10.6%*	*9.9%*
Operating Profit	*NA*	*NA*	*NA*	*NA*	*NM*	*NM*	*NM*	*NM*	*NM*	*120.3%*	*43.5%*	*27.6%*	*34.4%*	*16.1%*	*12.1%*
Net Profit	*NA*	*NA*	*NA*	*NA*	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*158.2%*	*65.9%*	*37.3%*	*16.1%*	*12.1%*
EPS	*NA*	*NA*	*NA*	*NA*	*NM*	*NM*	*NM*	*NM*	*NM*	*NM*	*150.6%*	*61.1%*	*33.3%*	*12.8%*	*8.8%*
EBITDA	*NA*	*NA*	*NA*	*NA*	*NM*	*NM*	*NM*	*NM*	*NM*	*71.0%*	*32.7%*	*21.9%*	*28.4%*	*14.7%*	*12.9%*

Source: Merrill Lynch estimates

B

Proper Recovery of Incremental Overheads For Local Number Portability

by
Dr. Debra J. Aron

I. QUALIFICATIONS

My name is Debra J. Aron. I am the Director of the Evanston, Illinois offices of LECG, Inc. My business address is 1603 Orrington Avenue, Suite 2000, Evanston, IL 60201. LECG, Inc. is an economics and finance consulting firm, providing economic expertise for litigation, regulatory proceedings, and business strategy. Our firm comprises more than 200 economists from academe and business, and has 13 offices in six countries. LECG's practice areas include antitrust analysis, intellectual property, and securities litigation, in addition to specialties in the telecommunications, gas, electric, and health care industries.

I received a Ph.D. in economics from the University of Chicago in 1985, where my honors included a Milton Friedman Fund fellowship, a Pew Foundation teaching fellowship, and a Center for the Study of the Economy and the State dissertation fellowship. I was an Assistant Professor of Managerial Economics and Decision Sciences from 1985 to 1992 at the J. L. Kellogg Graduate School of Management, Northwestern University, and a Visiting Assistant Professor of Managerial Economics and Decision Sciences at the Kellogg School from 1993-1995. I was named a National Fellow of the Hoover Institution, a think tank at Stanford University, for the academic year 1992-1993, where I studied innovation and product proliferation in multiproduct firms. Concurrent with my position at Northwestern University, I also held the position of Faculty Research Fellow with the National Bureau of Economic Research from 1987-1990. At the Kellogg School, I have taught M.B.A. and Ph.D. courses in managerial economics, information economics, and the economics and strategy of pricing. I am a member of the American Economic Association and the Econometric Society. My research focuses on multiproduct firms, innovation, incentives, and pricing, and I have

III. IN A LARGE MULTIPRODUCT ORGANIZATION, MOST OVERHEAD COSTS ARE NOT COMMON COSTS

Economic theory classifies the different kinds of costs in multiproduct firms into the following categories:

Incremental costs of a new service, product, or functionality are costs that are incurred only on behalf of that service, are justified by that service alone, and would not be incurred had the service not been introduced. Incremental costs can comprise usage-sensitive costs, such as the costs of making a particular database query, as well as non-usage-sensitive or fixed costs. The switch software upgrades necessary to provide LNP are an example of non-usage-sensitive investment that is incremental to LNP. Because the incremental costs of a service would be entirely avoided if the service had not been introduced, and are justified by that service alone, all incremental costs are directly attributable to the service. This includes costs that are incurred to operationalize the service at the functional level, as well as incremental costs that are typically classified as overhead for accounting purposes. As an example of the latter category, if the addition of LNP functionality requires additional human resources personnel to support the additional functional personnel employed to implement LNP, those human resources costs would be directly attributable (incremental) overhead costs of LNP.

In a multiproduct firm, there are typically synergies or scope economies at many levels in the provision of the different services or products the firm offers. In order to account for these synergies, economic theory defines two other types of costs:

Shared costs of a multiproduct firm are fixed costs that the company incurs in order to provide a subset of (more than one) products, but that do not support the production of *all* services offered by the firm. These costs would be completely avoided if the entire set of services these costs support had not been developed or were no longer offered, but would have to be incurred if any one (or a subset of these) were offered. An example of a shared cost would be a generic upgrade to software for digital switching, which supports an array of vertical features of the switch. This investment does not support all services of the firm; for example, it does not support the local network access service.

The **common costs** of a multiproduct firm are fixed costs incurred on behalf of *all* services offered by the firm. These costs would be avoided only if the company shuts down entirely. The elimination of any one service or subset of services would not eliminate the truly common costs. Truly common costs would be avoided only if the firm stopped operating.[3]

Neither shared nor common costs, by definition, are volume sensitive. Any volume-sensitive cost would be avoided if the service were not offered. Therefore, by definition, volume-sensitive costs would be incremental, not shared or common. Moreover, common costs, by definition, do not vary with the scope of the firm. That is, true common costs will not be affected by the number of services the firm produces. Common costs must be incurred in order to produce the first unit of any service produced by the firm, and will not increase as the firm increases in scale or scope.

Examples of true common costs are the top management of a firm, such as (some of the costs of) the CEO. The costs of a minimal level of top management exist independent of the scale and scope of the company, because in order to produce the first unit of output of the first service offered, a company needs a CEO. The common costs of the CEO will only be avoided if the company stops producing *all* of its services.

It is critical to distinguish, however, between common or shared costs on the one hand, and what are, in reality, incremental costs. As I have stated, common costs, such as a minimal level of top management, must be incurred independent of the scope and size of the firm. However, even the costs associated with the CEO are not entirely common. Management functions have to grow as the company grows in scale or scope. The fact is that the CEO of a relatively small company, such as Advanced Micro Devices (AMD), which produces microprocessors, does not earn the same amount as does the CEO of Intel. The CEO of a large multiproduct company will likely have greater responsibilities

[3] For further explanation see William J. Baumol and J. Gregory Sidak, *Toward Competition in Local Telephony* (Cambridge: MIT Press), 1994, pages 69-70.

and typically has more extensive experience and expertise. Consequently, CEO compensation varies with the scale and scope of the company. The growth in compensation costs that are associated with the growth in the scale and scope of the firm are not "common costs," but rather incremental costs to the new services offered. Hence, even what is typically treated as a common cost for accounting purposes is largely, in fact, an incremental cost. Indeed, in a large and complex organization, most overhead costs are properly incremental, and truly common (and shared) costs are typically small. This is because truly common costs are limited to those that would be incurred by a single-product firm to produce a minimal level of output. Truly shared costs are only those that would be incurred by a subset of all the firm's products, at their minimal level of output. All other costs are incremental to either the scale of production or to additional products.

Empirical studies have measured the effect of the scale of the firm on the growth of certain costs, such as the compensation of the CEO. For instance, economic research indicates that the elasticity of CEO compensation with respect to firm size tends to be around 0.25-0.3.[4] This means that for each 1% increase in firm size (measured by revenues or number of employees), CEO compensation increases by .25 to .3 percent. Conversely, if the firm size declines by 1%, the CEO's compensation would decline by only .25 to .3 percent. While the specific numerical estimates are not critical here, the point is that statistical analysis does demonstrate a positive relationship between this overhead cost and firm size. This positive relationship is likely to hold for many centralized services and functions.

[4] Rose, N. and Shepard, A. "Firm Diversification and CEO Compensation: Managerial Ability or Executive Entrenchment?," *RAND Journal of Economics*, Vol. 28, No. 3, Autumn 1997.

Roberts, D.R. "A General Theory of Executive Compensation Based on Statistically Tested Propositions," *Quarterly Journal of Economics*, Vol. 70, May 1956.

IV. AMERITECH'S LNP COST STUDY DOES NOT AND CANNOT IDENTIFY ALL OF THE GENUINELY INCREMENTAL OVERHEAD COSTS OF LNP

The implementation of LNP by Ameritech is a huge undertaking. Regio: implementation will involve several business units, dozens of different wo roups, hundreds of employees, and hundreds of different job functions, and will ultimately cost hundreds of millions of dollars. More specifically, LNP required Ameritech to install brand new hardware and software throughout its network. LNP also required Ameritech to substantially upgrade existing network hardware, software, and databases as well as the systems that support the network. One example of such a support system involves the Signal Transfer Points (STPs) within Ameritech's network that process and route all SS7 signaling messages, including LNP queries. The introduction of LNP and the query service necessitated a more complex number screening process involving all of the dialed digits rather than just the NPA and NXX to determine the proper call routing. In order to create adequate capacity to perform this function, Ameritech had to increase memory (software and hardware) within its STPs to handle the additional instructions required to route calls correctly. In addition, the STP translation provisioning system (an operational support system) required new hardware and software to accommodate the additional digits. New and upgraded hardware and software must be integrated and tested. Once installed and tested, the hardware, software and support systems must also be maintained.

In addition to these activities that enable and maintain the network functionality required to provide LNP, there is also a wide variety of incremental administrative "overhead" activities performed by Ameritech that specifically support LNP. Examples include the development and maintenance of billing systems, ordering systems, and provisioning systems; the development and maintenance of field methods and procedures; network planning and engineering; developing and delivering training; product management; budget development and tracking; technical and regulatory support; and coordination with external industry participants (e.g., equipment vendors, Bellcore, CLECs, IXCs).

I have reviewed Ameritech's LNP cost study. The study specifically identifies all of the hardware, software and operational support system costs required to provide LNP. It also specifically identifies all of the incremental administrative "overhead" costs discussed above. However, it does not, and reasonably could not, specifically identify many of the other incremental administrative (overhead) costs that Ameritech will incur in providing LNP. For example, the administrative overhead costs specifically identified in the Ameritech study were calculated by estimating the employee hours required to perform the various tasks and multiplying those hours by the appropriate directly assigned labor rate. The study estimated that 1,856 productive hours of salary grade 4 (SG4) time would be required in 1997, 1998, and 1999 to accomplish the external industry coordination function. A directly assigned labor rate includes operational wages, benefits, paid absence, wage loadings for administrative clerical personnel, and if applicable, motor vehicles, tools and miscellaneous expenses. However, directly assigned labor rates do not include the salary costs of general supervision (supervision above the local level), general supervision benefits, or general supervision support costs. Under Ameritech's incremental cost methodology, costs of the general supervision incremental to a service were not specifically identified for each and every service because higher levels of management are responsible for such a wide variety of products, services, and activities. This fact does not mean that a portion of general supervision cost is not directly incremental to LNP, however. Adding a significant new service or functionality will require additional general supervision. These additional costs are directly caused by (i.e., are incremental to) the new service or functionality.

In the LNP query cost study, Ameritech accounted for these additional incremental administrative overhead costs by applying a standard overhead factor derived from ARMIS data as it has done, and which the Commission has permitted,[5] for virtually all interstate services. In the LNP monthly charge cost study, the overhead factor that Ameritech intends to use was derived from a rigorous analysis of total company shared and common costs performed by the Arthur Andersen firm, which I discuss in more

[5] See, *Open Network Architecture Tariffs of Bell Operating Companies*, CC Docket No. 92-91, Order, released, December 15, 1993 ¶ 50 n.93.

Federal Communications Commission, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996. Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers. First Report and Order.* CC Docket No. 96-98, August 8, 1996, ¶ 696.

detail below. This approach is consistent with the Commission's previous conclusion in the context of unbundled network elements: "Certain common costs are incurred in the provision of network elements. As discussed above, some of these costs are common to only a subset of the elements or services provided by incumbent LECs. Such costs shall be allocated to that subset, and should then be allocated among the individual elements or services in that subset, to the greatest possible extent."[6] These standard overhead factors are also designed to account for other incremental overhead expenses such as human resources and other support expenses like furniture and desktop computers.

In theory, the ideal way to recover incremental overheads would be to measure them all specifically. However, it is inherently infeasible and uneconomical to attempt to specifically identify and measure many types of incremental overheads. For this reason, I divide incremental overheads into three categories.

First, some incremental overheads can be readily identified, such as additional product managers, service managers and planners specifically assigned to the new product or service. These types of incremental overheads have been specifically identified in Ameritech's LNP cost study. For example, these overheads would include the development and maintenance of billing systems, and the network planning and engineering, among the other overheads discussed previously.

Second, some incremental overheads are inherently difficult to specifically identify, such as the previously discussed general supervision costs, as well as other incremental overheads arising from legal and regulatory activities, and administrative building space requirements. For example, it is inherently difficult to specifically determine which incremental general supervision and legal and regulatory resources have already been expended and will be required in the future because of LNP implementation. Several lawyers and regulatory personnel may spend dozens of hours working on this pleading this week but may be engaged in totally different issues involving other services next week. Although legal and regulatory costs are clearly incremental to LNP

[6] Federal Communications Commission, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996. Interconnection between Local Exchange*

implementation, specific time requirements are driven in large part by unpredictable filing requirements beyond Ameritech's control. Moreover, there are literally thousands of administrative and overhead-type functions that may be impacted by LNP. It is simply not economically feasible to specifically study each such function.

Third, other incremental overheads are inherently impossible to specifically identify, and can only be identified statistically. Costs such as CEO salary clearly increase with firm size and scope on average, a fact which is verified by empirical studies such as those previously cited. However, there is no way to examine any books of account or engage in any study of functional units at Ameritech to determine how much of Mr. Notebaert's salary is responsive to an increase in the overall scale and scope of Ameritech. The only way to estimate these incremental costs would be to perform a statistical study of similarly situated executives, or a time-series study of Ameritech executive compensation, that relates firm size and scope to compensation. Other costs, such as general accounting, general counsel, government relations, and administrative facilities fall into this category as well.

In addition to the inherent infeasibility of specifically identifying all incremental overheads as prescribed by the Commission, the fact that the provision of local number portability is a brand new functionality would render an attempt to specifically identify and quantify all incremental overhead costs speculative, at best. Such a study would involve considerable uncertainty as to what the incremental overhead costs will be in the future. For these reasons, as an alternative to performing an expensive, detailed, and yet still speculative cost study, Ameritech instead relied on standard loading factors to account for some of the incremental overhead costs attributable to LNP. This approach is a common industry practice and is routinely used as a practical method to assign a reasonable portion of overhead costs to individual services.

The alternative to this approach is to undertake a detailed study of the costs associated with the provision of a service or functionality. I have been a close observer of detailed

Carriers and Commercial Mobile Radio Service Providers. First Report and Order. CC Docket No. 96-98, August 8, 1996, ¶ 694.

studies of overhead costs, such as a study of shared and common costs performed for Ameritech by Arthur Andersen. The experience made quite clear that requiring a carrier to specifically account for all incremental overheads directly caused by a specific service or functionality would be a ludicrously massive undertaking. The purpose of the Andersen study was to examine forward-looking shared and common costs incurred in the provision of unbundled network elements ("UNEs") and identify which were actually incremental to specific products or services. This study required significant resources and was extremely complicated, but it did not even attempt to identify all incremental overheads. The first version of the Andersen study, which addressed only the four Ameritech organizations involved in the wholesale provision of UNEs, took 2,200 person-hours to perform over a period of 3 months. In addition, because of time and data constraints, the study did not identify all capital-related overheads and only attributed incremental shared and common costs to UNEs in aggregate, rather than to individual UNEs. Moreover, the Andersen study still relied in part on standard allocators to attribute incremental overhead costs to UNEs.

Subsequently, Andersen analyzed retail shared and common costs for one Ameritech state. This study took roughly twice as long as the UNE shared and common cost study and again relied to a great extent on standard factors and allocators to reasonably account for all incremental overheads and assign them to retail services. More specifically, according to that study, an average loading factor of more than 58% would need to be applied to the direct product-specific costs identified by Ameritech in its cost studies to account for all overhead costs that were examined in the study. About 21% of the costs identified by Andersen were incremental product family shared costs, which are incremental overhead costs that could be directly identified and assigned to individual product families without using any allocation factors. The remaining 79% of the overhead costs could not be directly identified and quantified as incremental to a service or product family using Andersen's methods. Some of this cost pool is presumably truly common and would not be legitimately recoverable from the LNP monthly charge. However, as I have explained in Section III, the fraction of truly common costs is likely to be quite small; conversely, a large share of overhead costs that are categorized as shared and common are actually incremental. Denying recovery of the entire pool of costs would clearly result in under-recovery of incremental costs. Hence, assuming that the incremental overheads for LNP would be similar to those studied by Andersen, Ameritech would be denied recovery of up to 79% of its legitimate LNP incremental overhead costs. That 79% translates to around $40 million per year (before adjusting for truly common costs).

Attempting to do a study of this magnitude specifically for LNP similarly would be very costly in terms of time and money – and would still require extensive use of standard factors and allocators to account for all incremental overheads. The use of standard factors and allocators in telecommunications cost studies is virtually unavoidable because of the thousands of administrative and overhead functions and support assets involved, and the many synergies at many levels of the firm that come into play in the provision of all the different services telecommunications companies typically offer. The existence of synergies at a given level of the organization does not obviate the fact that a portion of the costs at that level are truly incremental to a new service, but it renders the specific identification of the costs genuinely complex. For example, Ameritech has about 68,000 employees. Clearly it would be impossible to interview each one to identify that individual's function and whether it relates to LNP. Those 68,000 employees fall under 35,000 responsibility codes. A responsibility code represents a functional activity in a business unit or legal entity. Again, it would not be economically feasible to examine each responsibility code to determine whether it is caused by LNP. Moreover, even if one were to attempt such an analysis, it would only address labor costs and none of the investments and expenses of the firm.

By studying functions at a higher-level of aggregation, the Anderson study pared the number of responsibility codes to 1,481. However, examining costs at that level and making inferences about which costs are incremental to what service ultimately required extensive use of allocation factors, as I stated earlier. Simply put, Ameritech (and any large-scale LEC) cannot practically identify and itemize all of the incremental overhead costs it will incur as a result of LNP implementation. Hence, it is not realistic or appropriate to prohibit the use of factors and allocations to account for at least some incremental overhead and instead require LECs to produce detailed studies that specifically identify all incremental overheads. Such a requirement will surely lead to significant under-recovery of these costs.

Finally, to the extent that the Commission intends to prohibit the use of all overhead allocation factors for LNP, the Commission's position in this case demonstrates a basic misunderstanding of how cost studies are performed, and makes no sense, especially in view of past practices. First, the use of overhead loading factors to recover overheads is an approximation to the specific identification of incremental overheads. Past Commission practice has permitted the use of such factors in cost studies for virtually all interstate services. These factors reflect averages, and telecommunications cost studies rely on averages to a great extent. For example, maintenance expenses are typically estimated by the application of a maintenance factor. The maintenance factor represents an estimate of the relationship between maintenance expenses and the investment dollars in each plant account. If Ameritech typically incurs, say, $5 million of digital switching maintenance expense for each $100 million of digital switching investment, the maintenance factor applied to investment in cost studies of services using digital switching is 5%. Extending the Commission's position on incremental overheads to incremental maintenance expenses would require LECs to attempt to identify, for each new service using digital switching, the incremental maintenance hours and materials that particular service imposed on a digital switching network providing hundreds of services. Such a study would be time consuming, expensive, and speculative at best. Similarly, incremental cost studies rely on the application of numerous other factors to estimate other incremental costs. These include factors for power, floorspace, installation, engineering, supporting structures (pole investment to aerial cable investment and conduit investment to underground cable investment), ad valorem taxes, supplies, etc. These factors all represent averages and are all designed to recover reasonable estimates of legitimate cost elements. However, if the Commission prohibited the use of these other standard factors in incremental cost studies, it would force Ameritech to attempt to measure with specificity the exact amount of incremental power consumed and floorspace occupied by each new service in order to recover power and floorspace costs. Eventually, the most significant cost of service would be the cost of performing the cost study.

If the Commission is concerned that the application of standard overhead factors will result in double-recovery, prohibiting the application of such factors and guaranteeing significant under-recovery of actual incremental costs is not the answer. Rather, the Commission should investigate the particular overhead factors used in the LNP studies and make a determination as to their reasonableness. Because the Commission and the industry have so much experience with the development and application of overhead loading factors, such a review could be accomplished in a reasonable time at a reasonable cost. Conversely, a review of the complex study required by the Commission's approach would be extremely time-consuming and expensive, and would not necessarily result in a better answer or outcome.

V. PROHIBITING THE USE OF OVERHEAD LOADING FACTORS IS NOT COMPETITIVELY NEUTRAL

By prohibiting the use of loading factors to approximate incremental overheads, the Commission effectively precludes recovery of a significant share of incremental overheads. All incremental costs of LNP, including incremental overheads, are specifically caused by implementing number portability. Hence, these costs are direct costs and pursuant to the Commission's LNP Cost Recovery Order may be recovered in the number portability monthly charge and query service prices. Moreover, to preclude recovery of some of the bona fide incremental costs of providing number portability would violate the Commission's definition of competitive neutrality. Indeed, it would violate both prongs of the Commission's "two-pronged test" for competitive neutrality.

The Commission interprets competitive neutrality as requiring that "the cost of number portability borne by each carrier does not affect significantly any carrier's ability to compete with other carriers for customers in the marketplace." The Commission specifies a two-part test to determine whether the cost allocation mechanism is competitively neutral. The first prong of the test is that the way carriers bear the costs of number portability "must not give one service provider an appreciable, incremental cost