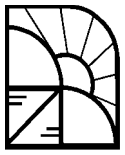


PHOENIX FOR ADVANCED LEGAL & ECONOMIC
CENTER PUBLIC POLICY STUDIES
www.phoenix-center.org

PHOENIX CENTER POLICY BULLETIN NO. 7

15 October 2003

THE POSITIVE EFFECTS OF COMPETITION ON EMPLOYMENT IN THE TELECOMMUNICATIONS INDUSTRY

Summary of Findings: Government data on employment in the telecommunications industry reveals a substantial increase in sector employment following passage of the Telecommunications Act of 1996. This increase in employment reversed the declining jobs trend prior to the Act. Econometric analysis indicates that competitors are the primary source of job growth in wireline communications. While employment has declined in the wake of a recession, the collapse of the internet bubble, and the near complete demise of the competitive telecoms segment, the residual competition resulting from the 1996 Act, based primary on unbundled elements, has allowed current employment levels in the wireline telecoms sector to remain 17% above historical trend, presently adding about 92,000 jobs to the wireline telecommunications segment of the industry. Because the Federal Communications Commission's recent *Triennial Review Order* raises substantial entry barriers in the form of fixed regulatory expenses and increased risk, one also can expect that employment in the telecommunications industry will decline as entry slows and the potential for exit rises.

I. Introduction

The goals of the 1996 Telecommunications Act were to "promote competition and reduce regulation" in communications industries.[1] Congress believed that these dual goals would "secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies."[2] Recent

---

1 Preamble, Telecommunications Act of 1996.

2 *Id.* The consequences of "increased competition" and "reduced regulation" – lower prices, higher quality, and deployment – are often and inaccurately substituted for the primary purposes of the Act. *See, e.g., Verizon v. FCC*, 122 S. Ct. 1646, 1661 (2002) (emphasis supplied). ("Congress passed a ratesetting statute with the aim not just to balance interests between sellers and buyers, *but to reorganize markets by rendering regulated utilities' monopolies vulnerable to interlopers, even if that meant swallowing the traditional federal reluctance to intrude into local telephone markets.*") As such, it would be wholly inconsistent with the 1996 Act, for example, to promote deployment using

(Footnote Continued….)

PHOENIX CENTER FOR ADVANCED LEGAL & ECONOMIC PUBLIC POLICY STUDIES
5335 Wisconsin Avenue, NW, Suite 440
Washington, D.C. 20015
Tel: (+1) (202) 274-0235 Fax: (+1) (202) 244-8257//9342 e-Fax: (+1) (240) 250-0879
www.phoenix-center.org

research shows the 1996 Act has led to sizeable increase in investment in the telecommunications sector, and competition is shown to stimulate both CLEC and ILEC investment. For example, PHOENIX CENTER POLICY BULLETIN NO. 4 shows – using publicly-available government statistics – that the 1996 Act led to an additional $267 billion in investment by telecommunications firms over the period 1996 through 2001.[3] As a result, capital stock in the telecommunications industry is nearly $200 billion above levels forecasted using pre-Act data. Following up on that study, PHOENIX CENTER POLICY BULLETINS NOS. 5 and 6 show that UNE-P competition has a direct and substantial effect on investment in telecommunications plant by incumbent local exchange carriers.[4] A number of other studies have confirmed a positive relationship between investment, unbundling, and competition in the telecommunications industry after the 1996 Act.[5]

Since telecommunications carriers combine both capital and labor to produce output, a natural extension to earlier research on investment is how labor has been affected by the 1996

---

increased monopoly. Nevertheless, the Federal Communications Commission has adopted such a flawed analytical approach, thus resulting in poorly reasoned and frequently contradictory policy proposals. *See, e.g., In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers Implementation of the Local Competition Provisions of the Telecommunications Act of 1996 Deployment of Wireline Services Offering Advanced Telecommunications Capability*, FCC 03-36, Report and Order and Order On Remand And Further Notice Of Proposed Rulemaking, __ FCC Rcd. ___ (rel. August 21, 2003) ("*Triennial Review Order*") at ¶ 109 ("A market power analysis might be appropriate if the only goal of the Act were to drive prices to cost, but that approach disregards the Act's other goals of encouraging the deployment of alternative facilities and new technologies and reducing regulation.").

[3] PHOENIX CENTER POLICY BULLETIN NO. 4: *The Truth About Telecommunications Investment* (24 June 2003) (available at http://www.phoenix-center.org/PolicyBulletin/PolicyBulletin4Final.pdf).

[4] PHOENIX CENTER POLICY BULLETIN NO. 5: *Competition and Bell Company Investment in Telecommunications Plant: The Effects of UNE-P* (Originally released 9 July 2003, updated 17 September 2003) (available at http://www.phoenix-center.org/PolicyBulletin/PolicyBulletin5.pdf); PHOENIX CENTER POLICY BULLETIN NO. 6: *UNE-P Drives Bell Investment - A Synthesis Model* (17 September 2003) (available at: http://www.phoenix-center.org/PolicyBulletin/PolicyBulletin6Final.pdf).

[5] *See* R. O. Beil, G. S. Ford, and J. D. Jackson, *On the Relationship between Telecommunications Investment and Economic Growth in the United States* (June 2003) (www.telepolicy.com); G. S. Ford and M. D. Pelcovits, *Unbundling and Facilities-Based Entry by CLECs: Two Empirical Tests* (July 2002): www.telepolicy.com; T. R. Beard, R. B. Ekelund Jr., and G.S. Ford, *Pursuing Competition in Local Telephony: The Law and Economics of Unbundling and Impairment* (November 2002): www.telepolicy.com; T. R. Beard, G. S. Ford, and T.M. Koutsky, *Mandated Access and the Make-or-Buy Decision: The Case of Local Telecommunications Competition* (December 2002): www.telepolicy.com; R. D. Willig, W. H. Lehr, J. P. Bigelow, and S. B. Levinson, *Stimulating Investment and the Telecommunications Act of 1996*, Unpublished Manuscript (October 2002); K A. Hassett and L. J. Kotlikoff, *The Role of Competition in Stimulating Telecom Investment,* AEI PUBLICATION (October 2, 2002) (www.aei.org/publications/pubID.14873/pub_detail.asp). Hassett *et al.* (2002) perform a simulation rather than using actual data. *See also, Does Unbundling Really Discourage Facilities-Based Entry? An Econometric Examination of the Unbundled Local Switching Restriction*, Z-Tel Policy Paper No. 4 (February 2002): www.telepolicy.com; *Competition at the Crossroads: Can Public Utility Commissions Save Local Telephone Competition*?, Consumer Federation of America (October 2003) (http://www.consumerfed.org/pr10.07.03.html).

Act. Again using publicly-available government data, this BULLETIN shows that employment in the wireline telecommunications sector increased dramatically following the 1996 Act, reversing its negative trend in the years preceding the Act. Indeed, for the five years prior to the 1996 Act, employment in the wireline telecommunications sector was falling by an average of 2.3% annually. In 1994, the Bureau of Labor Statistics predicted this declining employment trend would continue (at least) through year 2004.[6] In the six-plus years following the 1996 Act, employment in the wireline telecommunications industry reversed trend. Based on forecasted employment trends from the pre-Act period, we estimate that the 1996 Act produced an average of 105,000 wireline telecommunications jobs (on average) from February-96 through July-03. Total employment in the industry remains 17% above trend – about 92,000 jobs – despite recent declines in employment in the sector following the collapse of the facilities-based CLECs caused jointly by anticompetitive activity by incumbents, overly optimistic business projections by entrants often based on nearly free access to capital, and an economic recession.[7]

Empirical analysis also indicates that CLECs are the primary source of growth in wireline telecommunications employment, with each additional CLEC in a state increasing telecommunications employment by nearly 200 jobs, other things constant. Thus, public policies that raise entry barriers by increasing the fixed and sunk costs of entry should be expected to reduce employment by shrinking the numbers of firms in the industry. The massive regulatory costs recently imposed on the industry by the FCC's *Triennial Review Order* and the potential fixed and sunk costs that may be imposed on entrants if state commissions reduce the availability of unbundled elements (primarily unbundled switching) are expected to reduce the number of competitive firms and, consequently, jobs in the wireline telecommunications industry (other things constant). Further, under the regime designed by the FCC, CLEC business plans are persistently at risk of eradication by the government as part of the regular reviews of unbundled element availability – proceedings that will be no doubt be initiated by the incumbents on a regular basis.[8]

---

[6] James C. Franklin, *Industry Output and Employment Projections to 2005,* MONTHLY LABOR REVIEW (November 1995) at 45.

[7] Unfortunately, one must also include in this litany a regulatory failure by the FCC over the past seven years to remove or at least mitigate significant barriers to entry for new firms. *See, e.g., Do the FCC Policies Promote or Deter Entry? That is the ONLY Question,* PHOENIX CENTER POLICY PAPER SERIES NO. 6 (October 1999) (http://www.phoenix-center.org/pcpp/pcpp6.doc); *Set It and Forget It? Market Power and the Consequences of Premature Deregulation in Telecommunications Markets,* PHOENIX CENTER POLICY PAPER SERIES NO. 18 (July 2003) (http://www.phoenix-center.org/pcpp/PCPP18.pdf).

[8] *See, e.g., Triennial Review Order*, *supra* n. 2 at ¶ 340, 526. These proceedings must be completed by the state commission within six months of the incumbent's filing.

PHOENIX CENTER FOR ADVANCED LEGAL & ECONOMIC PUBLIC POLICY STUDIES
5335 Wisconsin Avenue, NW, Suite 440
Washington, D.C. 20015
Tel: (+1) (202) 274-0235 Fax: (+1) (202) 244-8257//9342 e-Fax: (+1) (240) 250-0879
www.phoenix-center.org

II. Analysis

The Bureau of Labor Statistics ("BLS") collects and summarizes detailed employment data for the United States.[9] Employment data for the telecommunications industry are available on a monthly basis beginning January-90 and ending two to three months short of the current month (July was the last month available as of October-03). The Telecommunications Act was signed into law in early February-96, so it is possible to evaluate employment trends for the five years preceding and six–plus years after the Act. By comparing employment trends prior to and following the Act, the change between the pre- and post-Act periods can be used to infer the potential employment consequences of the pro-competitive legislation.[10]

For our analysis, we focus on employment in the wireline telecommunications sector. The 1996 Act's pro-competitive agenda – in particular the unbundling obligations that are so hotly contested – specifically targeted this sector of the industry. Given the paucity of data available at the state level, we use telecommunications industry-wide data for a state level analysis (for 34 states) of employment, but adjust the data to wireline levels using the aggregate data in order to avoid attributing too much to the pro-competitive agenda of the 1996 Act.[11] Our state level analysis considers differences between employment growth in the pre- and post-Act periods, and estimates, using econometric analysis, the relationship between CLEC entry and employment in telecommunications.

A. *Analysis of National Data*

Figure 1 is a graphical representation of the monthly data for wireline telecommunications employment provided by BLS, with data covering the period January-90 through July-03.[12] Prior to the 1996 Act, which is indicated by a labeled vertical line in the figure, the employment trend for wireline employment was distinctly negative. From January-90 to January-95, employment in the sector declined by an average of 2.3% annually (676,000 to 595,600 jobs), reducing employment by about 80,000 jobs over the period. The line labeled "Forecast Trend"

---

[9] Telecommunications industry employment data is found under the Information category of industries: www.bls.gov.

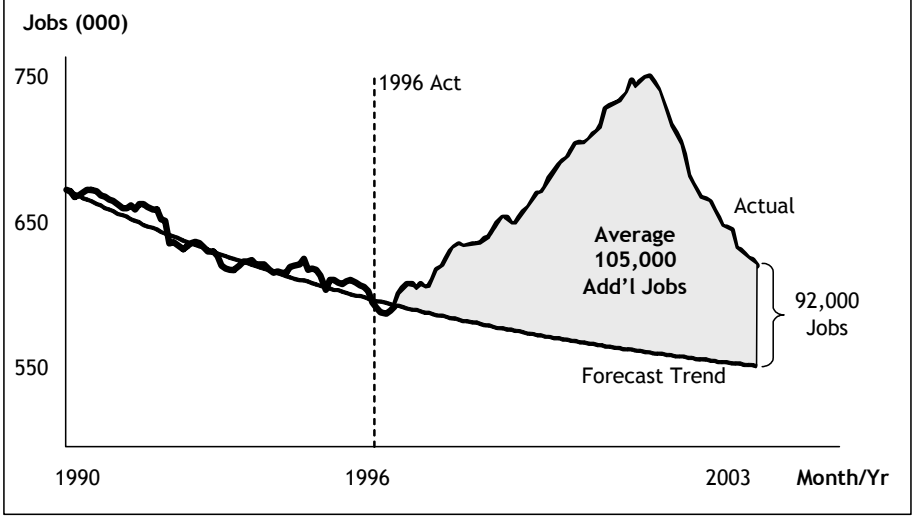
[10] While the Act is plainly pro-competitive, the FCC's clumsy implementation and non-existent enforcement have substantially reduced its effectiveness.

[11] State level wireline telecommunications employment is only available for nine states.

[12] The data is not seasonally adjusted. The observation for August-00 was considerably off trend, implying the loss of more than 83,000 jobs in that single month, all of which were gained back in September-00. Thus, we replace the August-00 observation with the simple average of July-00 and September-00.

extends this sixty-month trend out to July-03 (with a final forecasted employment of about 524,000).[13]

Figure 1. Wireline Employment 1990 through July 2003



As distinct as the negative employment trend prior to the Act is the strongly positive trend after the Act. From February-96 through April-01, employment skyrocketed by 159,000 jobs as firms scrambled to enter the wireline telecommunications business. Employment grew by 26% over the period, or a 5% annual growth rate. Most CLECs failed, however, and consequently much of the new labor introduced to the sector immediately following the Act emigrated to other sectors and industries. The FCC recently noted that of 300 facilities-based entrants, only about 30 remain (an 80% failure rate).[14] Such a dramatic failure rate of entrants will undoubtedly have a sizeable impact on employment and investment in the industry, as well as reduce the flow of capital into the industry for the remaining firms (*see* Section II.C infra).[15] Additionally, the peak in employment for the sector (April-01) coincided exactly with the

---

[13] The forecast is computed using $y_t = \alpha_0 + \alpha_1 y_{t-1}$ and $\ln y_t = \beta_0 + \beta_1 \ln PC_t + \beta_1 \ln A_t$, where PC is personal consumption expenditures for the economy and A is economy-wide (non-farm) employment. The coefficients are estimated by least squares using 73 observations. The R-squared of the regressions are 0.98 and 0.97, respectively. Personal Consumption data is from the Federal Reserve of St. Louis (http://research.stlouisfed.org/fred2/data/PCE.txt). Forecasted values are based on the average of the two regressions, which produce highly similar forecasts. Figure 1 is a representation of the forecast for illustrative purposes only.

[14] *Triennial Review Order*, *supra* n. 2 at ¶37.

[15] For many entrants, capital is required for labor expenses as well as capital expenditures.

beginning of a recession in the United States, with economic growth coming to a standstill.[16] The S&P 500 would fall 21% and the Dow Jones Industrial Average would fall (from its near peak) by 16% between April-01 to July-03.

Like the faltering economy and bankruptcy frenzy in telecommunications, wireline telecommunications employment fell 17% from its peak in April-01 (through July-03).[17] But this decline was not necessarily limited only to telecommunications. Employment in some other sectors declined as well over this period, including, for example, manufacturing (-12%) and Transportation (-7%).[18] Despite the decline, employment in the wireline telecommunications sector remains above trend, amounting to about 92,000 additional jobs as of July-03.[19]

B. *Analysis of State Data*

State level data on the telecommunications sector as a whole tells a similar story. In order to summarize the data while considering factors that may affect employment, we define an employment index as

$$\text{Employment Index} = E = \frac{T_1 \div T_0}{A_1 \div A_0}$$

where E is the employment index, T is telecommunications employment at time t (either 1 or 0 in this case), and A is Non-Farm Employment at time t. The properties of the index are as follows. If $E > 1$, then employment in the telecommunications sector changes more than proportionately than employment in the economy as a whole. Alternately, if $E < 1$, then employment in the telecommunications sector changes less than proportionately than employment in the economy as a whole. Of course, if employment in telecommunications rose by the same proportion as economy-wide employment, then $E = 1$. If increased employment in the wireline telecommunications is a policy goal, then larger values of E are desirable, whether employment is rising or falling. We caution the reader, however, not to infer that higher employment is necessary better than lower employment. It is not possible to say how

---

16 BUS. CYCLE DATING COMM., NAT'L BUREAU OF ECON. RESEARCH, NBER'S BUSINESS-CYCLE DATING PROCEDURE, Feb. 12, 2003, *available at* http://www.nber.org/cycles/recessions.html. *See also* quarterly GDP figures at http://research.stlouisfed.org/.

17 Employment in other sectors declined as well, including manufacturing (-12% over the same period).

18 BLS national series for "Manufacturing" and "Transportation and Warehousing" (www.bls.gov).

19 The forecasted level of employment is 524,000 jobs in July-03 versus about 616,000 actual jobs.

employment implicates economic performance without a richer analysis that considers the capital-labor ratio, the prices of these inputs, and the total output produced.[20]

The employment index is computed using annual data for two periods: (i) the pre-Act period from year 1990 to year 1995; and (ii) the post-Act period from year 1995 to 2002.[21] This index is computed using annual data for the 34 states for which data is available. Because the state-level data is industry-wide, we multiply total employment by the share of wireline employment as a percent of total telecommunications employment for the relevant time period.[22] Indexes for both total and wireline telecommunications are computed. The results are summarized in Table 1 below.[23]

---

[20] Providing the same or increased level of output with fewer inputs is desirable (assuming the optimal capital to labor ratio).

[21] We use annual data for two reasons. First, the data is not seasonally adjusted, so monthly data may reflect routine seasonal changes in employment that may be incorrectly interpreted as persistent changes in employment levels. Second, even without normal seasonal fluctuations, temporary changes in the monthly series could greatly impact our analysis given that we are evaluating changes using only three points in time. *See also* n. 12 *supra* regarding the potential for errors in the data.

[22] The respective shares for 1990, 1995, and 2002 are 0.686, 0.626, and 0.552. For a discussion of such adjustments in the context of regression analysis, *see* D. N. Gujarati, BASIC ECONOMETRICS (1995), at 340-341.

[23] For the nine states with wireline employment data, six states had an increase in the employment index in the post-Act period. For state-level wireline employment data, the pre-Act employment index is 0.80 and the post-Act index is 0.94, or a 17% increase in the employment index.

Table 1. Pre-Act and Post-Act Employment Index

State	Wireline Pre-Act	Wireline Post-Act	Telecom Pre-Act	Telecom Pre-Act	State	Wireline Pre-Act	Wireline Post-Act	Telecom Pre-Act	Telecom Pre-Act
AL	0.78	0.91	0.85	1.03	NV	0.73	1.04	0.79	1.17
AZ	0.77	1.07	0.83	1.20	NJ	0.91	0.69	0.99	0.78
AR	0.79	1.05	0.86	1.18	NM	0.87	1.29	0.94	1.45
CA	0.85	0.89	0.92	1.00	NY	0.78	0.90	0.85	1.02
CO	0.94	1.05	1.02	1.18	NC	0.87	0.96	0.94	1.08
CT	0.85	0.88	0.93	0.99	OH	0.78	0.94	0.85	1.06
FL	0.83	0.98	0.90	1.10	OK	0.83	1.29	0.90	1.45
GA	1.13	0.91	1.22	1.03	OR	0.78	0.95	0.85	1.07
ID	0.65	1.14	0.71	1.28	PA	1.01	0.99	1.10	1.12
IL	0.97	0.92	1.05	1.04	SC	0.92	1.02	1.00	1.15
IN	0.68	0.88	0.74	0.99	TN	0.75	0.98	0.81	1.10
KS	0.82	1.90	0.89	2.14	TX	0.93	1.04	1.01	1.17
LA	0.65	1.11	0.71	1.25	UT	0.94	0.93	1.02	1.05
MD	0.88	0.86	0.95	0.97	VA	0.78	1.13	0.85	1.28
MA	0.73	0.98	0.79	1.11	WA	0.92	1.11	1.00	1.25
MN	0.78	0.97	0.85	1.10	WV	0.77	0.99	0.84	1.12
MS	0.83	1.17	0.90	1.32	Avg.	0.83	1.03	0.90	1.17
MO	0.75	0.88	0.82	0.99	S. Dev.	0.11	0.20	0.12	0.22

Source. www.bls.gov, State and Local Employment, Information, Telecommunications

Consider first the wireline employment figures. For 32 of the 34 states, pre-1996 Act employment in the wireline telecommunications sector rose much less than employment in the economy as a whole ($E < 1$).[24] The average employment index in the pre-1996 Act period is 0.83, implying telecommunications employment rose less than economy-wide employment during this period. In the post-1996 Act period, the average employment index is 1.02, implying telecommunications employment slightly outpaced general employment. This "above the economy average" growth in telecom employment occurred in 14 of 34 states. Employment growth between the periods, relative to the economy as a whole, increased in 28 of the 34 states (82%).[25] The difference in the employment index between periods is 0.25, which is statistically different from zero at better than the 1% level.

The total telecommunications employment figures are similar, but growth in the total industry is more substantial than that in wireline alone. For 26 of the 34 states, pre-Act employment in the telecommunications sector rose much less than employment in the rest of

[24] Georgia (1.13) and Pennsylvania (1.01) were the exceptions.

[25] That is, the employment index increased ($E_{POST} > E_{PRE}$).

PHOENIX CENTER FOR ADVANCED LEGAL & ECONOMIC PUBLIC POLICY STUDIES
5335 Wisconsin Avenue, NW, Suite 440
Washington, D.C. 20015
Tel: (+1) (202) 274-0235 Fax: (+1) (202) 244-8257//9342 e-Fax: (+1) (240) 250-0879
www.phoenix-center.org

the economy ($E < 1$). The average employment index in the pre-Act period is 0.90. In the post-Act period, the average employment index is 1.15, implying telecommunications employment outpaced general employment by a significant amount. This "above the economy average" growth in telecom employment occurred in 28 of 34 states (or 82% of states). Employment growth between the periods, relative to the economy as a whole, increased in 31 of the 34 states (91%).[26] The difference in the employment index between periods is 0.27, which is statistically different from zero at better than the 1% level.

C. *CLEC Contribution to Employment*

Using the state-level data on telecommunications employment it is possible to specify an empirical model with the purpose of obtaining a crude estimate of the contribution, if any, to employment of CLEC activity in a state. Generally, we expect employment in telecommunications to be related primarily to the economic conditions in the state as a whole, which we measure in terms of statewide employment (A; which we specify to exclude wireline telecom employment).[27] The number of competitive firms operating in the state may also affect employment, and we include the number of CLECs operating in the state in the regression analysis (N_C).[28] The number of CLECs is measured as carriers reporting access line data to the FCC, so only those carriers that are providing meaningful levels of service in the state are included.[29] We interact the number of CLECs with A so that the employment effect is properly scaled to the state (*e.g.*, allowing the number of employees stimulated by competitive entry to be related to overall state employment).

The relationship between telecommunications employment (T) and the factors of interest is estimated using Ordinary Least Squares, and the results are:

$$\Delta T = 1542.7 + -0.01 \cdot \Delta A + 0.00055 \cdot \Delta N_C \cdot \Delta A + e \qquad (1)$$

where Δ indicates the difference between Years 2002 and 1995 employment levels and e is the econometric disturbance term.[30] The parameters are estimated using 34 observations, and the

---

26 That is, the employment index increased ($E_{POST} > E_{PRE}$).

27 Population data is for year 2002 and is provided by the U.S. Bureau of Economic Analysis, www.bea.gov.

28 Data are "as of" December 2002 and are provided by the FCC's Industry Analysis and Technology Division, *Local Telephone Competition: Status as of December 31, 2002*, at Table 12 (available at http://www.fcc.gov/wcb/iatd/comp.html).

29 This limitation is particularly important for CLECs. Using certified carriers, for example, would not be appropriate since certification does not require the CLEC actually be operating in the state.

30 For a general discussion of least squares regression, *see* Gujarati, *supra* n. 22 at Chs. 1-9. The use of annual levels in the estimation is not recommended because the employment data is non-stationary in the levels. *See id.* at

(Footnote Continued….)

coefficients on all three estimated coefficients are statistically different from zero at the 5% level or better.[31] The regression explains 32% of the variation in (the change in) telecommunications employment across states. The disturbance term is homoscedastic (White's test), so the estimated standard errors are efficient.[32] RESET, a general test of specification error, suggests the model does not suffer from specification error despite the parsimonious specification.[33] By sorting the data on the *SIZE* variable and computing the Durbin-Watson statistic, we can evaluate whether or not the regression equation sufficiently accounts for market size.[34] The DW-Statistic is 2.21, indicating that specification error with respect to market size is not an issue (d_U = 1.652). Thus, on statistical grounds, the model appears well specified.[35]

Equation (1) is interpreted as follows. Holding changes in the general state economy constant, each additional CLEC adds about 190 jobs to the state, on average, and the marginal CLEC adds 15% to total employment growth in the wireline sector.[36] The sample average of N_C is 11.4, implying that CLECs are, for the most part, responsible for all of the employment growth in the wireline sector.[37] This finding is consistent with the analysis of the aggregate data

---

Ch. 21 for a discussion of time series econometric analysis and the Augmented Dickey-Fuller test for stationarity (at 720).

31 The statistical significance levels are high whether or not the traditional or robust (either White or Newey-West) standard errors are employed.

32 Gujarati, *supra* n. 22 at 61-63 (homoscedasticity) and 379-380 (White Test).

33 The null of RESET is "no specification error," so we wish not to reject the null. *Id.* at 464-466. The RESET F-Statistic is 0.44, with probability level 0.64.

34 *Id.* at 462-463.

35 To further validate the model against spurious correlation, we estimated by least squares the regression $T_t = f(A_t, N_C \cdot A_t)$ for both years 1995 and 2002. If N_C or the interaction term is merely capturing market size in some way, we would expect $N_C \cdot A_t$ to be statistically significant in both periods. We would not expect the interaction to be significant in the 1995 period since CLECs were a product of the 1996 Act. We are encouraged by the fact that the interaction term is not statistically significant for the 1995 period but is for the 2002 period.

36 The calculation is 0.00055 ·345935.3, where the latter number is the sample mean of ΔA (sd = 413,215). Other sample means include ΔT (1254.1, sd = 3191.5) and ΔN_C (11.4, sd = 6.28). As examples of CLEC employment, consider that Z-Tel Communications employs about 1,200 employees; Birch Telecom employs about 1,450 persons; McLeod Telecom employs 3,710; and Allegiance Telecommunications employs about 3,800. *See* Z-Tel Communications Inc., Form 10-K, 2002, http://www.birch.com/about_birch/index.shtml; http://www.mcleodusa.com/html/ir/corpprofile.php3, and Allegiance Telecom Inc., Form 10-K, 2002.

37 The estimated coefficients from the regression measure the marginal effect of an additional CLEC at the sample mean. Thus, it is not possible to simply multiply 190 by the number of lost CLECs to get a total employment effect of CLEC exit (or total entry, for that matter). *See* William H. Greene, ECONOMETRIC ANALYSIS (1990) at 166. Nevertheless, the large employment effect strongly suggests that the bulk of the rise and the recent declines in employment are probably related to the rise and fall of the CLEC community. Assuming constant returns to CLEC

(Footnote Continued….)

illustrated in Figure 1, which illustrates a substantial annual decline in wireline employment prior to the 1996 Act.

This estimate of the effect of CLECs on telecommunications employment is important for two reasons. First, the decline in employment in the telecommunications sector since early 2001 can be readily explained by the collapse of the competitive component of the local exchange market, since CLECs are responsible for all wireline employment growth. Any effort to blame recent employment declines on unbundling, therefore, is contradicted by this empirical evidence. Second, the substantial increase in the fixed and sunk costs of operating as a CLEC imposed by the FCC's *Triennial Review Order* is expected to reduce employment in the telecommunications sector by discouraging competitive entry and, potentially, forcing exit. The fixed costs of defending the rights granted to CLECs by Congress could be substantial, and the fixed and sunk costs that will be imposed on CLECs if unbundling is limited by some states will certainly induce exit. The FCC's *Triennial Review Order* also institutionalizes the constant threat of eliminating unbundling requirements, and this increased risk will certainly deflect future entry and the expansion of service provision by existing firms. Obviously, the *Triennial Review Order* is not good for telecommunications employees, with the possible exception of those in the legal profession. Hopefully, and expectedly, the *Triennial Review Order* will not survive judicial review, though its negative effects will undoubtedly afflict the industry until, and perhaps after, a legal decision is rendered.

III. Policy Implications and Conclusions

Following the 1996 Act, substantial labor and capital resources entered the telecommunications industry, accompanying the surge of competitive entry induced by the unbundling obligations of the legislation. Analysis of government data suggests that after the Act more than 100,000 wireline telecommunications jobs were created in addition to the $267 billion of extra investment (in the entire telecom industry). Today, employment in the wireline sector is 17% above trend (about 92,000 jobs). The pro-competitive agenda of the Telecommunications Act has recovered about two times the number of jobs lost in the five year preceding the historic legislation. Econometric analysis indicates that CLEC-activity likely induced all of the employment gains, and that the rise and fall of employment in the sector parallels the rise and fall of CLECs. Equally as important, investment and employment are higher than would be expected if monopoly in local telecommunications had been allowed to persist. Accordingly, albeit an inappropriate measure of achievement, the 1996 Act is a clear success if measured in terms of labor and capital re-directed to the industry.

---

activity, CLEC-induced employment in the post-Act period is 83,000 jobs (computed as $\sum 0.00055 \cdot \Delta A_i / 0.895$, where the denominator is the share of total ΔA in the sample used for the regression analysis).

PHOENIX CENTER FOR ADVANCED LEGAL & ECONOMIC PUBLIC POLICY STUDIES
5335 Wisconsin Avenue, NW, Suite 440
Washington, D.C. 20015
Tel: (+1) (202) 274-0235 Fax: (+1) (202) 244-8257//9342 e-Fax: (+1) (240) 250-0879
www.phoenix-center.org