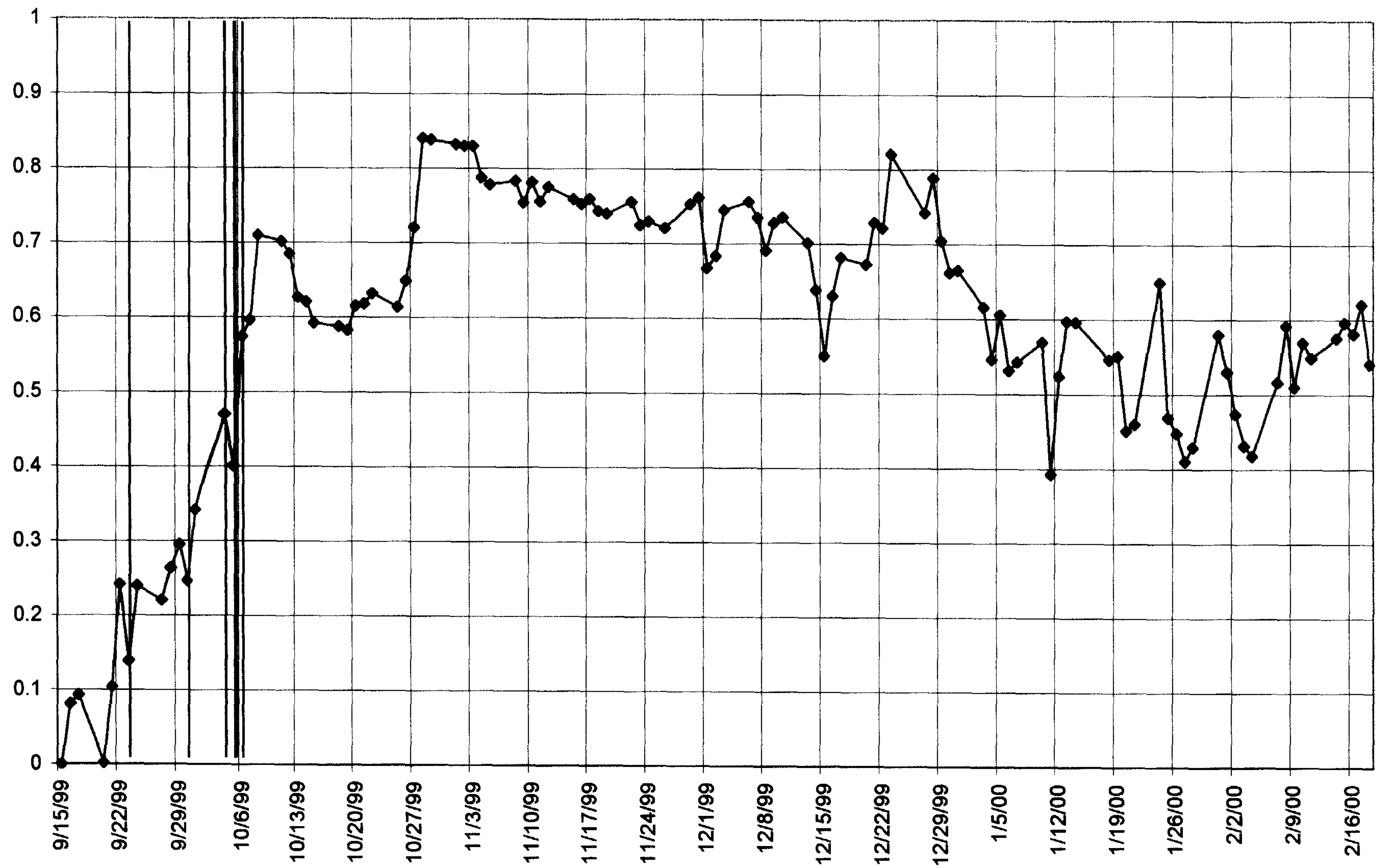
Figure 1: MCI/WCOM -Sprint Merger Probability



probability of the merger during the "event window" of October 5 and 6, relative to the changes in that probability over longer periods.[5] In addition, the changes during that window are not even in the same direction: the probability fell by 7 percentage points on the 5th and rose by 17 percentage points on the 6th. Thus, even if the probability had moved significantly during this period, these two days should not be lumped together in a single "event."[6]

The cumulative change in the probability of the merger during this event window is sufficiently small that any correlated abnormal return to rivals such as AT&T is unlikely to be due to an increase in the probability of the merger. In other words, if a correlation is observed, there is a high probability that the correlation is spurious. Statistically, given the very small change in probability of the merger, I should expect to see a point estimate for the predicted effect of the merger – positive or negative – that could be very large (even a small and statistically insignificant percentage effect on rival shares can become very large when divided by an even smaller percentage change in the probability of the merger) but which is likely to be both unstable and statistically insignificant.

For policy-makers evaluating an event study, a failure to use an event window long

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[5] For example, the probability rose by 70 percentage points between September 15, 1999 to October 27, 1999, and fell by 30 percentage points from October 27, 1999 to January 11. Over the entire period shown n Figure 1, the merger probability changed by more than ten percentage points on 13 days.

[6] Indeed, as is shown below in Table 1, when each of these two days is treated as a separate event, an increase in the probability of the merger is associated with a *reduction* in the share value of rivals, including AT&T (the negative coefficient is also statistically significant for Level 3 individually), as well as for both an unweighted and weighted portfolio of AT&T, Qwest, Global Crossing and Level 3. For the reasons discussed above, however, I am reluctant to take this as sufficient evidence to prove that the financial markets believe that the merger will cause long distance prices to fall.

enough that a reliable magnitude of the change can be ascertained is particularly dangerous. Even if the merger would have a large effect on the share price of rivals (either positive, implying that the merger would result in an increase in the price of long distance, or negative, implying that the merger would result in a decrease in the price of long distance) that effect could not be reliably discerned during an event window where, as with the event window used by Drs. Carlton and Sider, the change in that probability was very small. In other words, even if the merger would have had a large effect on the share price of rivals, using their event window would result in a high probability that the assumed effect would not be discerned.

In summary, because no significant "event" occurred during the event window Drs. Carlton and Sider chose, there is a substantial risk that if a correlation between the probability of the merger and the share prices of rivals did exist, it would not be identified, and a substantial risk that if a correlation between the probability of the merger and the share prices of rivals were identified, it would not be reliable. Therefore, no conclusion shall be drawn from their analysis as to the financial market's belief about this merger's likely effect on the price of long distance service.[7]

IV THE EFFECT OF THE MERGER ON THE SHARE VALUES OF RIVALS

The parties' principal rivals in the long-distance market are AT&T, Qwest, Global Crossing, and Level 3. AT&T earns 60% of its revenues from long distance, and the remainder from wireless, cable, and other operations. Qwest, Global Crossing and Level 3 are closer to

[7] Nevertheless, partly to allow comparability with Carlton and Sider's results, in the following sections I also estimate and report separately the effects on the share values of rivals and of the merging parties if I limit the event period to October 5 and 6.

"pure players" in the long distance market.[8]

Figure 2 shows the market's estimate of the probability of the MCI WorldCom merger (left axis) and the cumulative abnormal return to AT&T (right axis). No significant relationship between these two variables is immediately apparent. To provide a rigorous test of this relationship, and to allow for the effects of other, non-merger-related, events on rivals' prices, I regressed the daily abnormal returns to each company on the daily change in the probability of the merger. Specifically, for each company, I estimated the equation:

$$AR(t) = \delta + \theta\, \Delta\pi\, (t) + u(t)$$

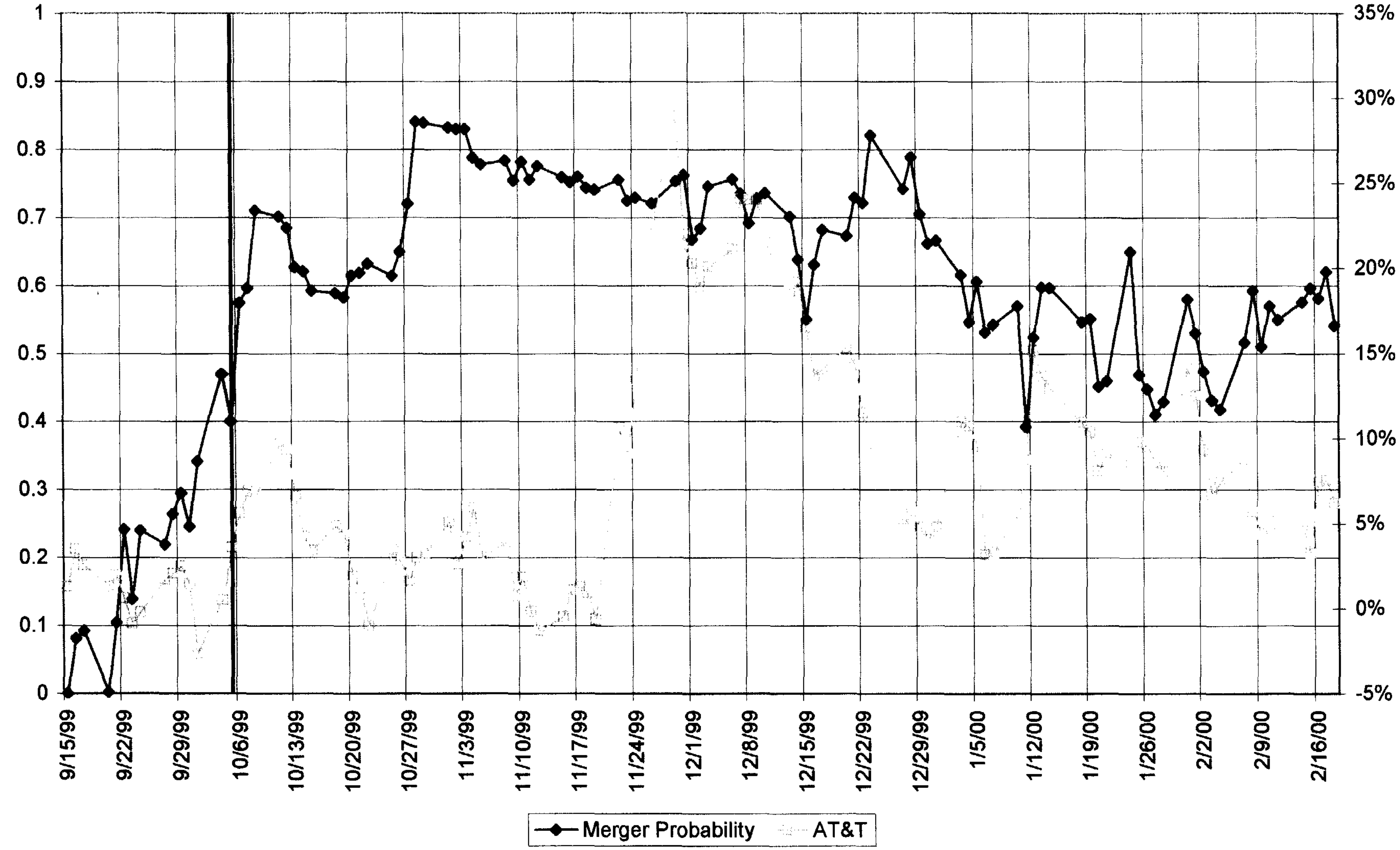
where: AR (t) is the rival's abnormal return on day t, $\Delta\pi$ is the change in probability of the MCI WorldCom - Sprint merger, and *u* is the error term.

During this period, a number of other events occurred that might be expected to affect the returns to each of these rivals. Changes in the probability of the proposed mergers between AT&T and MediaOne and between Qwest and U S West are accounted for.[9] In addition, since AT&T has significant interests in wireless and cable markets, I control for changes in the value of those assets by introducing the Dow Jones wireless industry and cable industry indices as

[8] Qwest's network, currently 20% operational, will encompass metropolitan areas that account for 95% of the call volume. Global Crossing recently acquired the fifth largest long-distance provider, Frontier Corp. The company's global fiber optic network now connects 92,700 route miles and 1.4 million fiber miles, offering bandwidth to 170 major cities in 24 countries. Level 3 Communications' network combines local, long distance, and undersea networks, connecting customers in the U.S. and internationally.

[9] I include the change in the AT&T-Media One merger probability in the equations for all long-distance carriers. I include the changes in the Qwest-U S West merger probability in the Qwest equation alone.

Figure 2: MCI-WCOM and Sprint Merger Probability (left axis) and Cumulative Abnormal Returns to AT&T (right axis)



additional independent variables when estimating the likely merger effect on AT&T.[10]

Table 1 presents the estimated effect of the merger on the rivals as a percent of their market values. The corresponding t-statistic is reported under each parameter, and coefficients significant at the 5% level or greater are in **bold**. Percentage changes are reported with and without controlling for exogenous events listed in Appendix 2 through event dummies. For each specification, I report the effect of the merger on rivals' value when estimated over (1) the day of the announcement and the day after (October 5 and 6), (2) the entire time period (September 15 to February 18), and (3) up to three subperiods within the time series.

For AT&T, the resulting estimates are often negative and always insignificant, both for the entire period and for all subperiods.[11] I conclude that any effect of the merger on AT&T stock price is not statistically distinguishable from zero.

Both Qwest and (to a lesser extent) Global Crossing were reported to be possible

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[10] AT&T not only has a large share of its assets in cable, but is also in the process of merging with another cable company, MediaOne. The effect of events in the cable industry on the value of AT&T's existing cable assets are isolated using the abnormal returns to the Dow Jones cable industry index as an explanatory variable in the AT&T equation. In addition, I interact the cable-industry returns with the change in the AT&T--MediaOne merger probability. Since an increase in the cable index would increase the value to AT&T of the MediaOne transaction, I expect to see a positive coefficient between this interaction variable and AT&T's abnormal returns. My results confirm this intuition.

[11] It has been widely reported that AT&T's stock price enjoyed a surge in mid-November from expectations that AT&T would issue a separate wireless tracking stock. Based on this, I defined Period 1 for AT&T as the pre-announcement period (up to October 4), Period 2 as the period from the announcement to mid-November (October 7 - November 14) and Period 3 as post mid-November.

Table 1: Implied percentage change in market value upon successful completion of merger*
Parameter estimates and t-ratio statistics
Controlling for wireless and cable index in the AT&T and portfolio equations

	w/ event dummies					w/o event dummies				
	Oct5-6	Full	Period 1	Period 2	Period 3	Oct5-6	Full	Period 1	Period 2	Period 3
ATT	-0.418	0.034	-0.064	0.026	-0.009	-0.421	0.012	0.030	0.059	0.007
	-1.266	*0.751*	*-0.424*	*0.220*	*-0.129*	*-1.122*	*0.313*	*0.332*	*0.740*	*0.120*
QWST	-0.103	0.037	---	0.143	-0.050	-0.132	0.061	---	**0.136**	0.026
	-0.263	*0.800*	---	*1.873*	*-0.841*	*-0.319*	*1.528*	---	***2.042***	*0.505*
GBLX	0.427	0.160	---	0.125	0.169	0.479	**0.174**	---	0.177	**0.204**
	0.600	*1.755*	---	*0.680*	*1.423*	*0.676*	***2.554***	---	*1.299*	***2.518***
LVLT	**-1.348**	0.026	---	-0.750	0.083	**-1.338**	0.069	---	-0.005	0.117
	-2.362	*0.382*	---	*-0.567*	*0.947*	***-2.385***	*1.243*	---	*-0.052*	*1.637*
T+Q+G+L (W)	-0.342	0.023	(a)	(a)	-0.026	-0.376	0.040	0.034	0.097	0.045
	-1.560	*0.624*			*-0.390*	*-1.371*	*1.463*	*0.454*	*1.318*	*1.141*
T+Q+G+L (U)	-0.513	-0.010	(a)	(a)	-0.064	-0.533	**0.064**	0.037	0.103	**0.087**
	-1.769	*-0.188*			*-0.600*	*-1.645*	***2.006***	*0.672*	*0.854*	***2.015***

Note: **bold** typeface indicates statistical significance at the 5% level.
(a) Insufficient degrees of freedom

***Sample periods**

<table>
<tr><td>Period</td><td>Oct5-6</td><td>Full</td><td>Period 1</td><td>Period 2</td><td>Period 3</td></tr>
<tr><td>ATT</td><td rowspan="5">Oct. 5, 1999 and Oct. 6, 1999</td><td rowspan="5">Sep. 15, 1999 to Feb. 18, 2000</td><td>Sep. 15 - Oct. 4</td><td>Oct. 7 - Nov 14</td><td>Nov. 15 - Feb. 18</td></tr>
<tr><td>QWST</td><td rowspan="3">---</td><td rowspan="3">Sep. 15 - Nov. 2</td><td rowspan="3">Nov. 3 - Feb 18</td></tr>
<tr><td>GBLX</td></tr>
<tr><td>LVLT</td></tr>
<tr><td>T+Q+G+L</td><td>Sep. 15 - Oct. 4</td><td>Oct. 7 - Nov 14</td><td>Nov. 15 - Feb. 18</td></tr>
</table>

Table 2: Implied percentage change in market value upon successful completion of merger*
Parameter estimates and t-ratio statistics
Not controlling for wireless or cable index in the AT&T and portfolio equations

	w/ event dummies					w/o event dummies				
	Oct5-6	Full	Period 1	Period 2	Period 3	Oct5-6	Full	Period 1	Period 2	Period 3
ATT	-0.374	0.034	0.032	0.108	-0.006	-0.333	0.025	0.041	0.079	0.027
	-1.145	*0.789*	*0.263*	*1.132*	*-0.092*	*-0.836*	*0.673*	*0.517*	*0.963*	*0.508*
QWST	-0.103	0.037	---	0.143	-0.050	-0.132	0.061	---	**0.136**	0.026
	-0.263	*0.800*	---	*1.873*	*-0.841*	*-0.319*	*1.528*	---	***2.042***	*0.505*
GBLX	0.427	0.160	---	0.125	0.169	0.479	**0.174**	---	0.177	**0.204**
	0.600	*1.755*	---	*0.680*	*1.423*	*0.676*	***2.554***	---	*1.299*	***2.518***
LVLT	**-1.348**	0.026	---	-0.750	0.083	**-1.338**	0.069	---	-0.005	0.117
	-2.362	*0.382*	---	*-0.567*	*0.947*	***-2.385***	*1.243*	---	*-0.052*	*1.637*
T+Q+G+L (W)	-0.385	0.033	0.034	(a)	0.010	-0.398	0.053	0.038	0.111	0.062
	-1.759	*0.844*	*0.297*		*0.167*	*-1.428*	*1.936*	*0.603*	*1.517*	*1.661*
T+Q+G+L (U)	-0.551	0.007	-0.002	(a)	-0.004	-0.553	**0.074**	0.033	0.109	**0.100**
	-1.918	*0.133*	*-0.025*		*-0.039*	*-1.707*	***2.369***	*0.713*	*0.997*	***2.457***

Note: **bold** typeface indicates statistical significance at the 5% level.
(a) Insufficient degrees of freedom

***Sample periods**

<table>
<tr><td>Period</td><td>Oct5-6</td><td>Full</td><td>Period 1</td><td>Period 2</td><td>Period 3</td></tr>
<tr><td>ATT</td><td rowspan="5">Oct. 5, 1999 and Oct. 6, 1999</td><td rowspan="5">Sep. 15, 1999 to Feb. 18, 2000</td><td>Sep. 15 - Oct. 4</td><td>Oct. 7 - Nov 14</td><td>Nov. 15 - Feb. 18</td></tr>
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<tr><td>T+Q+G+L</td><td>Sep. 15 - Oct. 4</td><td>Oct. 7 - Nov 14</td><td>Nov. 15 - Feb. 18</td></tr>
</table>

acquisition targets by BellSouth once its bid for Sprint had been rejected. Any decrease in the probability of the MCI-WorldCom-Sprint merger would then imply an increase in the probability that Qwest (or Global Crossing, as a second choice) would be acquired by BellSouth. The media also reported, however, that BellSouth would have to make its bid for Qwest before November 2nd, when Qwest shareholders were to vote on the Qwest-U S West merger. These events provided an excellent opportunity to test whether the changes in Qwest's market value were due to the "acquisition hypothesis" against the "anti-competitive expectations hypothesis."

According to the "acquisition hypothesis," one would expect to see the price of Qwest shares reacting positively to the MCI WorldCom merger before November 2nd (designated as Period 2 for Qwest in Table 1), and negatively and/or insignificantly after that date (Period 3 for Qwest). Since Global Crossing was seen as a "residual target" that BellSouth might buy if it could not buy Qwest, Global's price should react in exactly the opposite way. In contrast, the "anti-competitive expectations hypothesis" implies a positive and significant price effect from the merger for both Qwest and Global Crossing in both periods.

Consistent with the acquisition hypothesis, the estimates for Qwest before November 2nd are both positive, and are significantly different from zero for the specification without event dummies; after November 2nd they are both negative and/or not significantly different from zero. Also, as predicted by the acquisition hypothesis, the estimates for Global Crossing show exactly the opposite pattern: not significantly different from zero in the earlier period, while positive and highly significant in the later period. As summarized in the table below, for both Qwest and Global Crossing, the evidence is consistent with the "acquisition hypothesis" and inconsistent with the "anti-competitive expectations hypothesis."

Predicted Signs for Coefficients for Qwest and Global Crossing under Acquisition Hypothesis and under Anticompetitive Hypothesis.

	Before/ after Nov 2nd	Acquisition hypothesis	Anticompetitive hypothesis	Result w/o dummies	Result w/ dummies
Qwest	before (period 2)	positive	positive	positive and significant	insignificant, >0
Qwest	after (period 3)	negative or insignificant	positive	insignificant, >0	insignificant, <0
Global Crossing	before (period 2)	negative or insignificant	positive	insignificant, >0	insignificant, >0
Global Crossing	after (period 3)	positive	positive	positive and significant	insignificant, >0

The behavior of Level 3 stock prices before and after November 2nd is similar to that of Global Crossing's stock prices. In addition, Level 3 estimates are significant and negative for October 5 - 6 (see footnote 4, supra), and insignificantly positive for the full sample.

I also estimated returns to weighted and unweighted portfolios of the rivals. The resulting estimates range from negative and insignificant to positive and insignificant, depending on the time period and specification. As is clear in Tables 1 and 2, whenever a portfolio estimate is significant for a particular time period and specification, it is because one stock in the portfolio is significant -- there is no consistent pattern across all four rivals.

The stock market evidence thus does not support Drs. Carlton and Sider's conclusion that "the proposed transaction is likely to adversely affect competition." Holding constant for movements in the market as a whole as well as for other non-merger related-events, there is no significant effect of the merger on the share prices of rivals such as AT&T. No significant effect on rival share prices is observed even when the relationship is estimated over the more recent period, after the market participants have had time to evaluate the likely effect of the merger on long distance prices. There is thus no support for any inference that the merger could be expected to result in higher prices for long distance.

V. THE EFFECT OF THE MERGER ON THE SHARE VALUES OF THE PARTIES

While mergers almost always result in gains to shareholders of the acquired firm, and sometimes result in gains (but more often in losses) to the shareholders of the acquiring firm, the effect on the combined market value of the merging parties is generally positive. If the effect were negative, the most reasonable inference would be that the financial community believes that the merger is simply a mistake. Moreover, when, as in this case, the effect is positive, the market value for the merging parties combined must (as a matter of economic theory) rise by an amount equal to or in excess of the market's estimate of the present value of synergies, regardless of the impact of the merger on competition. Thus CWA's assertion that a market premium in excess of the present value of synergies implies an increase in long distance prices is simply incorrect as a matter of economic theory and also contrary to the evidence from the event study we have discussed above. [12]

[12] Contrary to CWA's comments, no firm is "forced" to pass on cost decreases unless those cost decreases are industry-wide. Almost by definition, merger-related efficiencies are firm-specific. In short, if a firm chooses to pass on efficiencies by reducing its prices, it will do so only because its profits increase as a result. Thus, at the lower prices, the increase in profits due to the merger must be greater than the cost savings due to the merger.

Moreover, where, as in this case, it is reasonable to expect efficiencies and strategic gains to the merging parties (as well as to consumers) in markets other than for long distance, notably local exchange, a market premium well in excess of the efficiency gains in the long distance market should be expected. CWA completely ignores this significant additional source of increased value.

Appendix 1

CURRICULUM VITAE

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Grants

National Science Foundation. Grant title: "Income Maximizing in Choice and Rate Effects," 1988 - 1991.

National Science Foundation. Grant title: "Application of Economic Theory to Operant Schedule Effects," 1985 - 1987.

National Science Foundation. Grant title: "Income and Choice," 1983 - 1985.

Professional Activities

Referee, *American Economic Review, The Bell Journal of Economics/Rand Journal, Economic Inquiry, Industrial Organization Review, Journal of Industrial Economics, Journal of*

Law and Economics, Journal of Political Economy, Quarterly Journal of Economics, Southern Economic Journal.

Member, Editorial Board, *International Journal of the Economics of Business.*

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Languages

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Publications

"Market Definition and the Price Effects of Mergers: Staples- Office Depot (1997)," in *The Antitrust Revolution: Economics, Competition and Policy*, John E. Kwoka and Lawrence J. White, eds.; Oxford University Press, third edition, forthcoming October 1998, with Serdar Dalkir.

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