

Wireless Mergers and Employment: A Look at the Evidence

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May 10, 2011

Deutsche Telecom has been looking for a buyer for its U.S.-based T-Mobile operation for at least six years.¹ In April 2011, it finally found one in AT&T, which has proposed to acquire T-Mobile for \$39 billion.² Not surprisingly, responses to this proposed transaction have been mixed. In its initial filing, AT&T and T-Mobile make a vigorous case for the benefits of the merger, citing, among other things, the need to rapidly acquire additional spectrum to avoid spectrum exhaust. But as others point out, the wireless industry is already moderately concentrated, so the threat to competition posed by the deal should be carefully studied.³

As with all communications mergers, a portion of the attendant scrutiny will occur in the political sphere, rather than technically addressing the actual competitive and efficiency effects of the merger.⁴ Most notably, at a time when federal and state policymakers are focused on job creation, those opposing the merger will attempt to label the merger as a “job killer.” Indeed, they already have.⁵ “Merger efficiencies,” some claim, is code for the elimination of thousands of jobs.⁶

In this PERSPECTIVE, we evaluate the merger-employment relationship by looking at employment trends in the wireless sector, and their relationship to the largest wireless merger to date—the AT&T-Cingular merger in 2004. We conclude that the evidence does not support a simplistic argument that wireless sector employment is diminished by wireless carrier

mergers. If anything, the data suggest that mergers may have a beneficial impact on employment. This is a complex issue that warrants further analysis.⁷

As explored in more detail below, in the years prior to the AT&T-Cingular merger, wireless sector employment was declining at an annual rate of about 2.4%. After the merger, however, sectoral job growth rebounded, turning positive (4.6%) and exceeding the growth rate of economy-wide employment. While such evidence does not establish a causal link between the merger and employment, this turnaround does not appear to be related to broad economic trends, as income growth in the broader economy was stable in the periods prior to and after the merger, and relatively small changes in a broad, service-sector employment measure are observed.⁸ Significantly, wireless equipment manufacturing employment experienced a similar and significant turnaround about the time of the merger, a fact consistent with an investment-driven recovery in the sector.

Background

The *net* effect of a merger on employment is a complex issue, and depends on the nature and intent of the merger. No doubt, some mergers permit the merged entity to reduce duplications in human resources (e.g., two CEOs become one), thereby reducing firm-level employment and potentially increasing the output-to-labor ratio. While employment may be reduced, this

increase in productivity is widely held by economists to be beneficial to the economy and society. Put simply, it is not efficient to have two people do what one can do effectively. As the DOJ Merger Guidelines spell out quite clearly:

[M]ergers have the potential to generate significant efficiencies by permitting a better utilization of existing assets, enabling the combined firm to achieve lower costs in producing a given quantity and quality than either firm could have achieved without the proposed transaction. Indeed, the primary benefit of mergers to the economy is their potential to generate such efficiencies.⁹

Reducing labor duplication is only one possible effect of a merger, however. Generally, a merger may be expected to affect, either positively or negatively, the employment levels of: (1) the merging firms; (2) competitors and input suppliers in the affected sector; (3) firms otherwise related to the affected sector; and (4) the broad economy (i.e., indirect effects). Presumably, these effects will follow the merger at different intervals, and the responses will vary by merger. For example, a merger that generates significant efficiencies leads to lower costs and expanded output in the affected sector, which may, in turn, have meaningful indirect effects on the economy. These indirect effects may be large for a general purpose technology like voice and data communications. Thus, the potential for such “difficult to measure” impacts may be large in this sector.

Logically, therefore, the blanket labeling of mergers as automatic “job killers” is invalid. There are numerous and opposing mechanisms operating at the micro-level (within and across affected firms) and the macro-level (across the economy generally). The relationship between mergers and jobs is therefore an empirical question, and some effort to evaluate the data, even if limited in scope, is worthwhile.

... in the two years preceding the AT&T-Cingular merger, wireless sector employment was in decline, falling 4.7% over the two-year interval. In contrast, sector employment rose 9.4% over the two-year period following the merger.

Wireless Mergers and Employment

One approach to quantifying the employment effects of a merger is to ground expectations in past events, examining, for example, employment before and after a large merger, with some due consideration for other potential influences on employments level such as general economic trends. Among wireless mergers, by far the most significant in recent times was the combination of AT&T and Cingular, a transaction completed in October 2004.¹⁰ This merger also has the benefit of involving the same entity as the proposed AT&T and T-Mobile transaction.

Prior to the AT&T-Cingular merger, by some measures, Cingular possessed just over a 16% subscriber share, while AT&T a 15% share.¹¹ Consequently, subsequent to the merger, the market share of the combined entity would be expected (naively) to be about 31%, and the transaction represented approximately a 500-point rise in the Hirschman-Herfindahl Index (“HHI”).¹² In any case, this change in the HHI is significant by Merger Guidelines standards (>100).¹³ As such, an examination of employment trends pre- and post-merger of the wireless sector is a useful exercise: if the merger had a large employment effect, for good or ill, then one would expect to observe it in the data. Of course, it is possible that other, confounding effects could “mask” the merger-employment effect, but this would require a rather fortuitous

alignment of these confounding forces. Thus, the simple experiment is worth performing.

Data on wireless sector employment is provided by the Bureau of Labor Statistics (“BLS”).¹⁴ Monthly employment data is collected for the two years (24 months) preceding and following the merger. (We collect similar data on service employment broadly and income as detailed below.) A six-month window around the merger is employed (three months before and after), so the monthly data runs from July 2002 through June 2004 in the before period, and February 2004 through January 2007 for the after period. The employment series are seasonally-adjusted using the Census Bureau’s X12 method.¹⁵

Wireless equipment employment had negative growth pre-merger (-11.8%) and positive growth after the merger (4.6%) – a huge turnaround.

Our interest is in the employment growth rates before and after the AT&T-Cingular merger. A straightforward empirical approach to evaluate this is a switching growth model of the form:

$$\ln y_t = \beta_0 + \beta_1 t + \beta_2 D + \Delta D t + e_t \quad (1)$$

where y_t is relevant sector employment at time t (with a natural log transformation), t is time (for example, wireless sector employment), D is a dummy variable equal to 1.0 in the post-merger period, and e is the disturbance term.¹⁶ The growth rate in the pre-merger period is β_1 and in the post-merger period is $(\beta_1 + \Delta)$. The hypothesis of equal growth rates across periods can be implemented using a t-test on the coefficient Δ . Initial estimation of Equation (1) indicated serial correlation, so we use Newey-West standard errors.¹⁷

Using data on wireless sector employment, the estimates of Equation (1) imply a pre-merger *annual* growth rate of -2.3% and a post-merger *annual* growth rate of 4.6% – an increase of 7.1 percentage points.¹⁸ The null hypothesis of equal growth rates across the two periods ($\Delta = 0$) is rejected at better than the 1% level.¹⁹ These estimates indicate that in the two years preceding the AT&T-Cingular merger, wireless sector employment was in decline, falling 4.7% over the two-year interval.²⁰ In contrast, sector employment rose 9.4% over the two-year period following the merger. Plainly, about the time of the merger, the employment situation in the wireless industry experienced a dramatic turnaround.

Table 1. Annual Growth Rates

	Pre-Merger	Post-Merger	Δ
Wireless Sector Jobs	-2.4%*	4.6%*	7.1%*
Service Sector Jobs	0.9%*	1.9%*	1.1%*
U.S. Disposable Income	3.4%*	3.8%*	0.4%
Wireless Equip. Jobs	-11.8%*	4.6%*	16.4%*

* Significant at the 5% level or better.

While these results do not constitute a test for a causal relationship between the merger and employment, this reversal of the employment trend is difficult to attribute to a general economic recovery. Table 1 summarizes the growth rates for broad macroeconomic indicators including private service sector employment and U.S. disposable income.²¹ Service employment had positive growth both before and after the merger with a relatively small 1 percentage point rise in the growth rate after the merger (versus a 7.1 point rise in the wireless sector). We observe no material change in income in the post-merger period.

Further insight into the employment question can be found by considering pre- and post-merger growth of employment in wireless equipment manufacturing. As shown in Table 1, wireless equipment manufacturing exhibits a similar pattern in employment to the

wireless sector. Wireless equipment employment had negative growth pre-merger (-11.8%) and positive growth after the merger (4.6%)—a huge turnaround.²² While we cannot make strong claims about causal connections, these results are at least consistent with the view the employment growth in the wireless sector was in part investment driven, given the contemporaneous and dramatic turnaround in wireless equipment jobs.

Other Mergers

There were two other potentially-relevant mergers of note in recent times. About one-year after the completion of the AT&T-Cingular merger, in August 2005, Sprint merged with Nextel.²³ This transaction combined firms with approximately 10.5% and 8.5% market shares, respectively, increasing the HHI by about 200 points.²⁴ This merger was in the wake of larger AT&T-Cingular merger and thus arguably presents no new information from that discussed above (that is, the two-year event windows largely overlap). However, wireless sector growth rates are estimated to be 0.5% before and 2.2% after the merger, with the difference (Δ) being statistically significant at the 10% level.

The patterns of employment in the wireless and wireless equipment sectors belie simplistic claims about wireless mergers being “job killers.” ... The data appear more consistent with an investment-driven recovery in the wireless sector.

As for the service employment series, no statistically significant change is observed, with a steady growth rate of about 1.8% annually (the Δ coefficient is negative, however). Income grew steadily at about 2.5% in both periods. For the wireless equipment sector, we observe

negative growth before the merger (-8.6%) and positive growth after the merger (+2.9%), with the difference (11.5 percentage points) being statistically significant at better than the 5% level.²⁵ These findings are similar to those for the AT&T-Cingular merger, but this similarity is arguably due to the overlap of the sample periods.

Another recent and sizeable merger in the wireless industry is the Verizon-AllTel merger completed in January 2009.²⁶ This deal united a 27% market share with a 5% market share, for an HHI increase of about 270 points.²⁷ This merger occurred in the midst of a dramatic collapse of the global economy and domestic employment. Simple methods are unlikely to shed much light on employment dynamics during this time, as there were much more profound events occurring than this merger. Not surprisingly, the Δ coefficient is negative for the wireless sector and income, but positive (a 0.1 percentage point increase) for the service sector. For wireless equipment employment, the Δ coefficient is positive (implying a 6.8 percentage point change) and statistically different from zero. While equipment employment growth was negative in the prior period, we cannot reject growth was zero in the post-merger period.²⁸ Even so, one cannot infer causal linkage due to the simple models we employ, particularly during this volatile economic period.

Conclusion

The patterns of employment in the wireless and wireless equipment sectors belie simplistic claims about wireless mergers being “job killers.” Indeed, prior to the AT&T-Cingular merger, wireless sector employment was declining at a rate of 2.4% annually. After the merger, job growth for both the wireless service and equipment sector turned positive (4.6%), more than doubling the job growth rate in the service sector. This turnaround does not appear to be the simple result of general economic

trends, as job and income growth in the broader economy does not follow the same pattern. The data appear more consistent with an investment-driven recovery in the wireless sector. That said, we stress that we cannot and do not attribute a causal interpretation to this reversal in job growth. Nevertheless, given this analysis, we conclude that the claim that the pending merger will automatically reduce sector employment appears implausible.

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¹ Deutsche Telekom “May Sell T-Mobile USA” or Face Huge Upgrade Bill, THE REGISTER (July 4, 2005) (available at: http://www.theregister.co.uk/2005/07/04/deutsche_telecom_mulls_tmobile_usa_sale); Deutsche Telekom To Sell T-Mobile USA, Reports Say, SOFTPEDIA (July 4, 2005) (<http://news.softpedia.com/news/Deutsche-Telekom-To-Sell-T-Mobile-USA-Reports-Say-4229.shtml>); Deutsche Telekom may sell T-Mobile USA, REUTERS (July 4, 2005) (<http://www.mail-archive.com/t-mobile-us@yahoogroups.com/msg01059.html>); see also Declaration of T. Langheim, in *Acquisition of T-Mobile USA, Inc. by AT&T Inc., Description of Transaction, Public Interest Showing and Related Demonstrations Filed with the Federal Communications Commission*, FCC Docket No. 11-65 (April 21, 2011) at ¶¶ 11, 18 (available at: <http://fjallfoss.fcc.gov/ecfs/document/view?id=7021240426>) (“T-Mobile USA has been struggling to remain a strong competitor in the wireless marketplace. Despite marketing efforts to improve its standing, T-Mobile USA has steadily lost market share—both nationally and across major markets—over the past two years. The U.S. is an extremely competitive market and T-Mobile USA has struggled to compete with both larger competitors such as Verizon, AT&T and Sprint, aggressively growing competitors such as MetroPCS and Leap, as well as a whole host of mobile virtual network operators (“MVNOs”) popular with consumers. While other competitors are quickly moving to build out and develop their LTE networks, T-Mobile USA lacks a clear path to deployment of LTE that is necessary for it to compete robustly in the U.S. longer term. Exponentially increasing demands for bandwidth to meet the demands of T-Mobile USA’s growing number of smartphone and Internet capable device users will require movement to LTE if T-Mobile USA is to remain competitive. *** Deutsche Telekom’s sale of T-Mobile USA to AT&T advances Deutsche Telekom’s business strategy to address its struggling assets, like T-Mobile USA.”); C. Kang, *AT&T, T-Mobile File Merger Application; Q&A with James Cicconi*, WASHINGTON POST (April 12, 2011) (According to AT&T Executive Vice President of External Affairs James Cicconi, “The important thing to remember is that T-Mobile was going to leave the market anyway. It had no path toward LTE and had reportedly been in talks with Sprint Nextel before us. They came to us, and after much analysis and number crunching it made a lot of sense to us.”) (available at: http://www.washingtonpost.com/blogs/post-tech/post/atandt-t-mobile-file-merger-application-qanda-with-james-cicconi/2011/04/11/AFhzCTQD_blog.html).

² G. Bensinger, *AT&T to acquire Deutsche Telekom's T-Mobile USA for \$39 Billion*, WASHINGTON POST (March 20, 2011) (available at: <http://www.washingtonpost.com/wp-dyn/content/article/2011/03/20/AR2011032002554.html>).

³ In the 2010 Merger Guidelines, a moderately concentrated industry is defined as one with a Hirschman-Herfindahl Index between 1500 and 2500. HORIZONTAL MERGER GUIDELINES (August 19, 2010) (available at: <http://www.justice.gov/atr/public/guidelines/hmg-2010.html>). According to the *Fourteenth CRMS Competition Report*, the HHI in the U.S. wireless industry is somewhere near the upper part of this range. *In re Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, FOURTEENTH REPORT, FCC 10-81, 25 FCC Rcd 11407 (rel. May 20, 2010) (available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-81A1.pdf) at Table 8 (HHI = 2848) and Table 41 (HHI = 2220). See, e.g., R. May, *The AT&T and T-Mobile Merger: Thinking Things Through* (March 29, 2011) (“At the time AT&T’s acquisition of T-Mobile was announced, I had no hesitancy in stating: ‘Like all mergers of this size, the proposed AT&T-T-Mobile combination will get close scrutiny, and it should.’”) (available at: <http://freestatefoundation.blogspot.com/2011/03/at-t-mobile-merger-thinking-things.html>); J. Bliss, *AT&T’s Purchase of T-Mobile Questioned on Prices by FCC Official*, BLOOMBERG NEWS (April 12, 2011) (available at: <http://www.bloomberg.com/news/2011-04-12/at-t-s-t-mobile-usa-takeover-questioned-by-fcc-official-over-price-impact.html>); E. Wyatt, *Sharp Scrutiny for Merger of AT&T and T-Mobile*, NEW YORK TIMES (March 21, 2011) (available at: <http://www.nytimes.com/2011/03/22/technology/22regulate.html>).

⁴ For a full exegesis of the appropriate scope of the FCC’s “public interest” merger standard, see T.M. Koutsky and L.J. Spiwak, *Separating Politics From Policy in FCC Merger Reviews: A Basic Legal Primer of the “Public Interest” Standard*, 18 COMM.LAW CONSP. 329 (2010). Indeed, the universal requirement to consider competitive effects under the public interest standard stands in direct contrast to other, more politically-charged topics, like employee job concerns, which may only be considered when the statute provides specific language ordering the administrative agency to do so. See *NAACP v. Fed. Power Comm’n*, 425 U.S. 662, 670 (1976). The Supreme Court noted that employee job concerns did not fall within the

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scope of the Federal Power Commission's "public interest" inquiry to ensure "just and reasonable rates," because "the use of the words 'public interest' in a regulatory statute is not a broad license to promote the general public welfare." *Id.* at 669-70.

⁵ S. Jerome, *Groups Say AT&T Merger is Job Killer*, THE HILL (March 23, 2011) (available at: <http://thehill.com/blogs/hillicon-valley/technology/151587-atat-merger-job-killer>); T. Catan and A. Schatz, *AT&T, Opponents, Face Off on the Hill*, WALL STREET JOURNAL (May 9, 2011) (According to a Sprint spokesman, "We see it as a job killer...")

⁶ S. Jerome, *id.*

⁷ See statement of Jeffrey Silva, Medley Global Advisors, *id.* ("Layoffs tend to be inherent in mergers in order to gain efficiencies," Silva said. "But you can't make any blanket statements, because you have the potential, on the other hand, to create jobs with investments in infrastructure.")

⁸ Suppose that employment y is determined by two factors x and z , where $dy/dx < 0$ and $dy/dz > 0$. If both x and z change simultaneously, then we cannot attribute a change in y to x or z individually unless the statistical tests are designed to do so. See, e.g., G. S. Ford, *Finding the Bottom: A Review of Free Press's Analysis of Network Neutrality and Investment*, PHOENIX CENTER PERSPECTIVE No. 09-04 (October 29, 2009) (available at: <http://www.phoenix-center.org/perspectives/Perspective09-04Final.pdf>).

⁹ 1997 MERGER GUIDELINES, Section 4: Efficiencies (available at: <http://www.justice.gov/atr/public/guidelines/hmg.htm#4>).

¹⁰ Y. Noguchi, *Cellular Merger Approved: Cingular-AT&T Wireless Union to Require Asset Sales*, Washington Post (available at: <http://www.washingtonpost.com/wp-dyn/articles/A62521-2004Oct25.html>); N. Victory, *FCC Approves Cingular/AT&T Merger to Create Largest U.S. Provider*, WIRELESS WATCH (Fall 2004) (available at: <http://www.wileyrein.com/publications.cfm?sp=articles&id=1541&newsletter=6>).

¹¹ *In re Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, TENTH REPORT, FCC 05-173, 20 FCC Rcd 15908 (rel. September 30, 2005) at Table 4 (using subscribers for year 2003) (available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-173A1.pdf).

¹² Computed as: $31^2 - (16^2 + 15^2) = 480$. The 10th CRMS Report showed a 370-point change in the HHI before and after the merger. *Id.*, comparing year 2003 and 2004 data. See also *Fourteenth CMRS Competition Report*, *supra* n. 3, at Table 8 (reporting a 550 point change in the HHI between 2003 and 2005).

¹³ 1997 MERGER GUIDELINES (Rev. April 8, 1997), at § 1.51 ("Where the post-merger HHI exceeds 1800, it will be presumed that mergers producing an increase in the HHI of more than 100 points are likely to create or enhance market power or facilitate its exercise.") (available at: <http://www.justice.gov/atr/public/guidelines/hmg.htm>). In the 2010 MERGER GUIDELINES, the threshold for high concentration is 2500, and an HHI increase of over 200 points is presumed to be likely to enhance market power. A moderately concentrated market is defined to have an HHI between 1500 and 2500, with a 100 point rise raising significant competitive concerns. See 2010 MERGER GUIDELINES, at § 5.3 (August 19, 2010) (available at: <http://www.justice.gov/atr/public/guidelines/hmg-2010.html>). In evaluating wireless mergers, the FCC has used a screen of 2,800 with a change of 100 as significant. *Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation For Consent to Transfer Control of Licenses and Authorizations*, FCC 04-255, MEMORANDUM OPINION & ORDER, 19 FCC Rcd 21522, 21568 at ¶ 108 (2004).

¹⁴ www.bls.gov.

¹⁵ D. Ladiray and B. Quenneville, *SEASONAL ADJUSTMENT WITH THE X-11 METHOD* (2001). We tried other methods to address differences in start and end periods, but none had a material effect on the conclusions.

¹⁶ D. Gujarati, *BASIC ECONOMETRICS* (1995), pp. 169-170; 512.

¹⁷ W. Newey and K. West, *A Simple, Positive Semi-definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix*, 55 *ECONOMETRICA* 703-708 (1987).

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- ¹⁸ The coefficients are monthly growth rates, which are annualized using $(1 + r)^{12} - 1$.
- ¹⁹ The t-statistic is 10.24.
- ²⁰ Computed using $(1 + r)^{24} - 1$.
- ²¹ All employment series are from the BLS and income data is from FRED (<http://research.stlouisfed.org/fred2/>). The data is monthly.
- ²² Manufacturing employment broadly had a pre-merger growth rate of -3.5% and a post-merger growth rate of -0.8% ($\Delta = 2.8$ percentage points), a much smaller change than that observed in wireless equipment employment.
- ²³ *Applications of Nextel Communications, Inc. and Sprint Corporation For Consent to Transfer Control of Licenses and Authorizations*, FCC 05-148, MEMORANDUM OPINION AND ORDER, 20 FCC Rcd 13967 (2005).
- ²⁴ *In re Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, ELEVENTH REPORT, FCC 06-142, 21 FCC Rcd 10947 (rel. September 29, 2006) at Table 4 (year 2004).
- ²⁵ Manufacturing employment broadly had a pre-merger growth rate of -0.6% and a post-merger growth rate of -1.9% ($\Delta = -1.3$ percentage points), a movement in the opposite direction of wireless equipment employment.
- ²⁶ Press Release: *Verizon Wireless Completes Purchase of Alltel; Creates Nation's Largest Wireless Carrier* (Jan. 9. 2009) (available at: <http://news.vzw.com/news/2009/01/pr2009-01-09.html>).
- ²⁷ *Fourteenth CMRS Competition Report*, *supra* n. 3 at Table 3 (author calculations).
- ²⁸ This same pattern is observed for manufacturing employment (pre-merger growth -2.6%, post-merger growth -0.5%).