



## THE JOBS IMPACT OF A TELECOMMUNICATIONS MERGER

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This memo describes the jobs impact of a prototypical investment in wireless infrastructure.

The jobs estimate includes both direct jobs within the primary industries that meet the additional demand for goods and services and supplier jobs in the secondary industries that provide those primary industries with intermediate goods and services. Additionally, the estimate also includes “induced jobs” created as incomes earned by newly hired workers are spent back into the economy.

Our findings are based on the following process:

First, we used the Employment Requirements Matrix (ERM) from the Bureau of Labor Statistics (BLS) to translate a given amount of investment spending into the number of directly supported jobs in the primary industries that see final demand for their output rise as a result of the new investment. The ERM also allows an estimate of supplier jobs supported in the industries that supply the primary industries. For example, the construction industry (a primary industry) is a purchaser of commodities such as cement, steel, and heavy equipment as well as services such as accounting and legal assistance. These industries will need to expand to supply the construction industry when it expands.

See **Table 1** for how we allocated the likely wireless investments across primary industries—this allocation is the input we use for the employment requirements matrix.

Second, we use a macroeconomic multiplier for infrastructure investment of 1.5 to calculate the economic activity that is induced when income earned by newly hired workers and firms is re-spent throughout the economy. From this re-spending estimate we can then estimate the number of jobs associated with the new economic activity. Essentially, as construction workers are hired to help build the wireless infrastructure, they will have more money to spend. If they buy lunch at a neighborhood diner, this will support jobs for wait-staff. If the newly hired waiters and waitresses then buy clothes for their kids, this will support jobs in retail establishments.

A macroeconomic multiplier of 1.5 is consistent with a range of independent estimates of the net macroeconomic effects of government investments in infrastructure—including those supplied by the Congressional Budget Office and Moody’s Economy.com. This multiplier includes an implied “re-spending” multiplier of 0.5, which is consistent with estimates of private-sector re-spending surveyed by Bivens (2006). This multiplier is applied to the amount of upfront spending to calculate the total amount of new economic activity generated by the upfront spending. We then use the historical relationship that prevails between GDP growth and employment growth to infer that each 1% increase in GDP corresponds to 1.2 million new jobs. This relationship between GDP growth and employment growth is also relatively constant across many macroeconomic forecasters (see CBO 2011 for the latest example).

TABLE 1

### Job model input for \$1 billion investment in wireless network infrastructure

Sector code	Sector description	Allocation	Investment (\$millions)
79	Communications equipment manufacturing	50%	\$500
110	Warehousing and storage	5	50
115	Telecommunications	25	250
125	Commercial and industrial machinery and equipment rental and leasing	5	50
129	Architectural, engineering, and related services	7.5	75
166	Electronic and precision equipment repair and maintenance	7.5	75
	<b>Total</b>	<b>100%</b>	<b>\$1,000</b>

SOURCE: Author's analysis.

Third, we add the numbers of direct, supplier, and induced jobs derived from the above calculations to estimate the total number of jobs supported by this spending.

Fourth, we use the information from the macroeconomic multiplier and employment requirements matrix to estimate the number of jobs supported directly by the first-round of spending (i.e., in both direct “receiving” industries as well as in indirect “supplier” industries). We know that two-thirds (i.e., 1/1.5) of the total jobs are created or retained by the first round of spending. The employment requirements matrix then allows us to apportion this two-thirds of total jobs into the appropriate direct versus supplier industry splits.

Fifth, we estimate the jobs that are induced through re-spending of income by using the macroeconomic multiplier that tells us that the remaining one-third of jobs (i.e., 0.5/1.5) are jobs that are induced through re-spending.

Using this methodology, we find that \$1 billion invested in a year would create approximately 12,000 jobs in that year; or, alternatively, that a \$1 billion investment would create 12,000 job-years’ worth of employment. This includes 3,500 direct jobs, 4,500 supplier jobs, and 4,000 induced jobs. Note that the estimates are in “job-years,” which refer to a job held for a single year; for example, five jobs performed for a single year is the equivalent to one job retained for five years. This figure also assumes an economy that is operating below full potential, with elevated levels of unemployment.

## Note on AT&T and T-Mobile

AT&T recently reached an agreement to purchase T-Mobile from its parent company, Deutsche Telekom. The companies have claimed in a press release that this purchase will result in an \$8 billion net increase in AT&T’s investment in its domestic wireless infrastructure over seven years.<sup>1</sup>

Given the job impact analysis noted above, a plausible range of impact would be between 55,000 and 96,000 job-years. To reiterate, the jobs estimate includes both direct jobs within the primary industries that meet the additional demand for goods and services and supplier jobs in the secondary industries that supply those primary industries with intermediate goods and services. The estimate also includes “induced jobs” created as incomes earned by newly hired workers are spent back into the economy. The figures are again listed as job-years, which refer to a job held for a single year.

Our estimate assumes that the \$8 billion in investment is spread equally over the seven-year horizon. We present a range of estimates to capture the fact that the overall economy will be different over these seven years—for example the CBO forecasts that we will have a declining unemployment rate over the horizon. The macroeconomic multipliers cited

earlier are most applicable during periods in which there is slack in the labor market. For years when the economy has a tighter market, the applicable multiplier will likely be lower, all else equal.

Given this, we estimate a range in which the upper bound incorporates the full effect of the multiplier over the entire seven years and the lower bound assumes zero net job creation in the last three years—when unemployment begins to approach a stable rate under CBO assumptions. Neither of these extremes is particularly likely, but this analysis presents a plausible range of impact.

In particular, net job creation during the last three years of this investment could well be greater than zero, especially given our skepticism that the labor market will automatically reach full employment by 2016 as CBO projects. But it is also likely that the net job creation per billion dollars of investment will fall if labor becomes scarcer. See the full results for each of the different tranches of jobs (direct, supplier, and induced) in **Table 2**.

**TABLE 2**

**Jobs impact from \$8 billion investment over seven years in wireless network infrastructure**

	<b>Direct jobs</b>	<b>Supplier jobs</b>	<b>Induced jobs</b>	<b>Total jobs impact</b>
<i>High-end</i>	27,297	36,676	31,986	95,959
<i>Low-end</i>	15,598	20,958	18,278	54,834

**SOURCE:** Author's analysis.

We should note that this is not a full job-impact estimate of the entire purchase of T-Mobile by AT&T. There are myriad other factors that would impact jobs. This memo only considers the effects of the capital investment in the wireless infrastructure and not the overall economic impacts of broadband more generally.

## Endnotes

1. See the press release at <http://investmentwatchblog.com/att-to-buy-t-mobile-us-cnbc-bulletin/>

## References

Bivens, Josh. 2006. *Updated employment multipliers for the U.S. economy*. EPI Technical Paper.

Congressional Budget Office. 2011. *Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output From January 2011 Through March 2011*.