

Telecom Demand: A Macroeconomic Analysis

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Last month, we made the case for a demand-driven recovery for the telecom industry (see *BCR*, April 2003, pp.14–15). If we focus on the demand side, a good place to start is by reviewing macroeconomic trends for the U.S. telecom service provider industry. The results are startling: The industry is a lot stronger than many people think—aggregate value-added has not fallen off, it's actually been growing.

But if the industry is to keep growing, it needs to keep coming up with innovative products. If the industry limits itself to POTS, the result isn't pretty.

Aggregate U.S. Telecom GDP Share Trends

In 2001, the telecom service-provider industry accounted for 2.89 percent of U.S. GDP (Figure 1). This share has been growing for a long time; indeed, far from being the stuff of depressions, 2001 was an all-time high! Even during the downturn from 1983 to 1989 (measured by GDP percentage), overall telecom GDP dollars continued to grow (Figure 2), albeit at a slower rate. Looking at Figure 2, it's amazing how consistent the trend line has been.

The reason for the long-term secular growth? Advanced economies need increasing levels of communication, as they move from agriculture to manufacturing to services. Look at the clear-cut relationship between wireline and mobile telephone density in different countries, as a function of income per GDP (Figure 3). The wealthier the country, the higher the tele-density.

If these trends continue, they have important implications for long-term demand growth. For one thing, since

Editor's Note: This is the second of what we hope will be many analyses of how the industry can turn itself around (hopefully, the turn-around will begin soon!). We invite readers' manuscripts, comments and critiques.

-FSK

nominal GDP grows at around 6 percent per year, simply keeping telecom's share of GDP flat at 2.9 percent means that the telecom service sector of the economy will grow 6 percent per year.

In addition, if telecom's share of GDP continues to grow at long-term trend-line rates (say from 2.9 percent of GDP in 2001 to 3.25 percent in 2011), this will add 1.25 percentage points of annual growth in the telecom sector, for a total 7.25 percent annual growth rate. That

may not be the 30 percent annual growth we came to expect during the boom years, but 7.25 percent growth is hardly the sign of a declining or even maturing industry. Lots of opportunity will remain for double-digit growth in key segments.

From the perspective of equipment vendors, the picture is even better. Before the advent of TCP/IP and the Internet, telecom technology was relatively static, with telco plants depreciating over a 15-year period (by 2001, the rate had

FIGURE 1 Telecom Share Of U.S. GDP

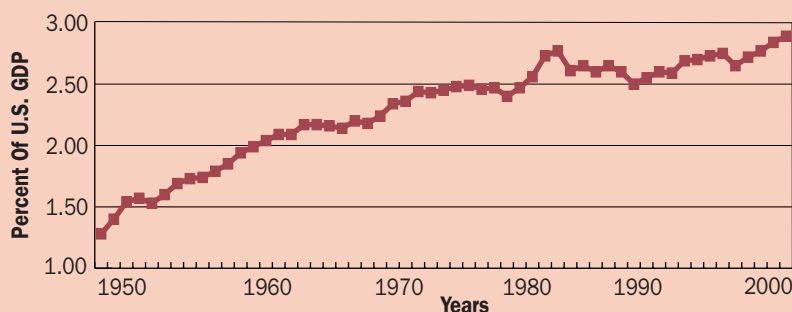


FIGURE 2 Total Telecom GDP \$

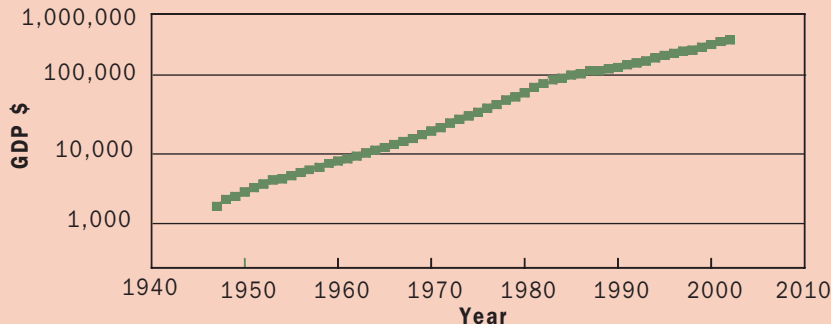


FIGURE 3 Telephone Subscribers As A Function Of GDP Per Capita

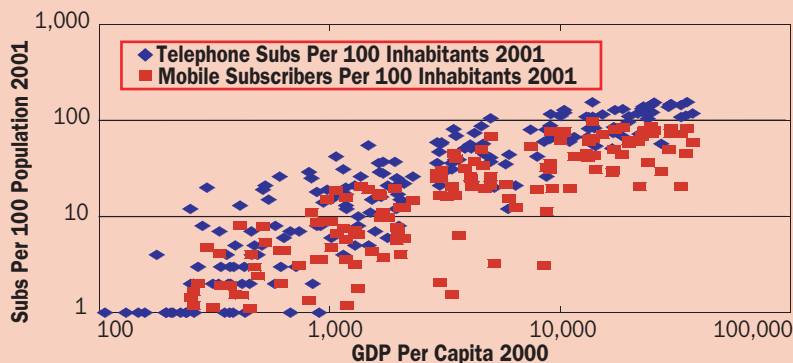
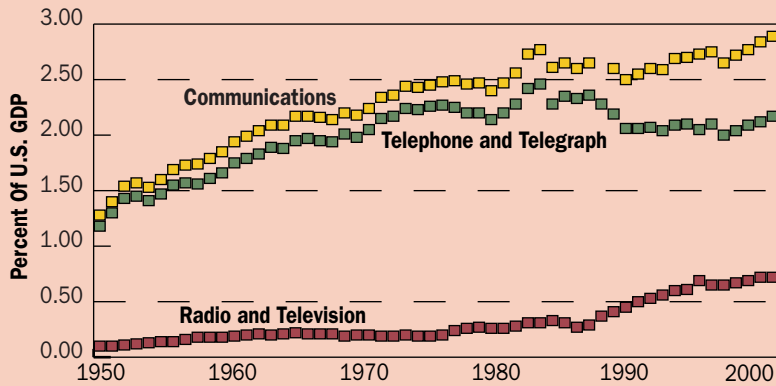
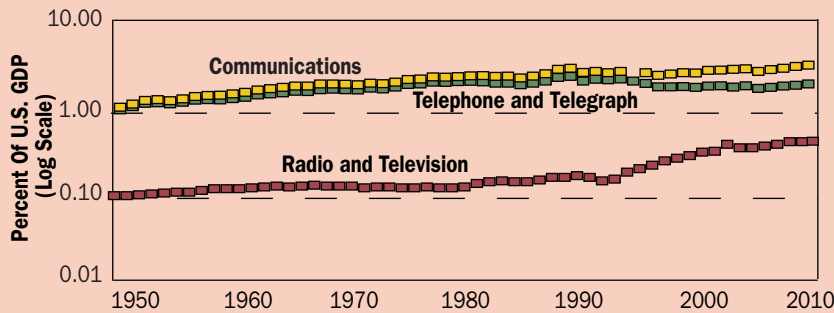


FIGURE 4 Telecom Share Of U.S. GDP



Source: Bureau of Economic Analysis

FIGURE 5 Telecom Share Of U.S. GDP



Source: Bureau of Economic Analysis

declined to 11 years). In the Internet environment, fueled by 18-month Moore's Law doubling cycles and nine-month optical doubling cycles, arguably we will see an accelerated capital replacement cycle going forward.

For example, if the telco capital replacement cycle drops from 11 years in 2001 to six years by 2011, the 7.25 percent annual increase in the overall telecom service sector translates into a 14 percent annual increase in equipment sales. Again, this isn't the 30+ percent growth rate that optical vendors were enjoying in the 1990s, but it's hardly the stuff of depressions, and certain segments will grow much faster than this.

Net-net, from a macroeconomic perspective, the prospects for the telecom industry are surprisingly good, particularly when compared to the pervasive doom and gloom in the industry. This is reinforced when one considers the prospects for telecom gaining future GDP share at the expense of other sectors. Some examples include: personal commuting to work, business travel and entertainment, health care on-site monitoring, as well as continued growth of the

service sector at the expense of physical goods (from 1991 to 2001, the U.S. service sector grew from 18.8 percent of GDP to 22.1 percent). At a macro level, there's plenty of room to afford new telecom services.

Now For The Bad News

Some things are wrong with this admittedly rosy picture. First, as we've already noted, from 1983 to 1989, telecom's share of GDP dropped from 2.77 percent to 2.50 percent before recovering. If it happened once, it can happen again.

Second, the nature and strength of the post-1989 recovery looks a lot less impressive if we deconstruct it into its piece parts. The U.S. government breaks out aggregate telecom GDP data into two primary segments:

- Telephone/Telegraph, which includes POTS, cellular, Internet ISPs, Internet hosting and email.
- Radio/TV, which includes cable and satellite TV services.

At this level of disaggregation, what becomes clear is the extent to which much of the overall growth in GDP share since 1989 came from radio/TV, due to

the growth of cable TV (Figure 4). Indeed, 70 percent of the overall telecom GDP share-point increase post-1989 came from radio/TV; its GDP share increased .27 share points, from .45 percent of GDP in 1989 to .72 percent in 2001. At the same time, telephone/telegraph increased only .11 share points, from 2.06 percent of GDP in 1989 to 2.17 percent in 2001.

Looked at another way, if we exclude radio/TV/cable and focus on core telephony, telephony—including mobile and Internet service—peaked in 1983 (at 2.46 percent of GDP) and never fully recovered; it dropped to 2.17 in 2001. So much for telephony being a growth industry!

Making matters worse, if we re-plot Figure 4 on a logarithmic scale, we see that the growth in radio/TV is largely played out (Figure 5) and, if that's so, cable TV won't be a major part of the "cure" to aggregate growth going forward. To be fair, cable TV output over the past five years did grow at 12.8 percent per year, but this was offset by radio/TV broadcasting only growing by 4.6 percent per year. (Note: industry output refers to the revenue side of the equation, and is related to, but distinct from, GDP, which measures value added.)

If we disaggregate the data one more level, we see core telephony's weakness even more starkly. The U.S. government breaks out Telephone/Telegraph industry output into three sub-segments:

- Radiotelephone Communications, i.e., mobile.
- Telephone Communications, Excluding Radiotelephone, i.e., wireline telephony, including Internet hosting and Internet service providers.
- Telegraph and Other Message Communications, and Communication Services Not Elsewhere Categorized, which includes email services.

The data from 1987 to 2001 (Table 1) shows that out of total telephone/telegraph industry output, mobile grew from 1 percent of the total to 23.8 percent, an annual CAGR of 35.5 percent.

Furthermore, the \$293 billion for total wireline telephony includes Internet services. We don't have good data on the size of Internet services, but if we start with the fact that in 1H02 there were 52-million switched, dialup Internet accounts at about \$20 per month, plus 16 million DSL/cable modem subscribers at around \$50 per month, residential ISP accounts for around \$22 billion a year.

TABLE 1 Telephone/Telegraph Industry Output By Total And By Segment

	2001 Industry Output \$000	CAGR 1987-2001	% of Total 1987	% of Total 2001
Telephone communications, excl Radiotelephone	293,625	5.6%	95.7%	72.9%
Telegraph and other message communications and communication services not elsewhere categorized	13,333	7.7%	3.3%	3.3%
Radiotelephone communications	95,832	35.5%	1.0%	23.8%
Total Telephone/Telegraph	402,790	7.7%	100.0%	100.0%

Source: Bureau of Economic Analysis

TABLE 2 Estimated Telecom Share of GDP for 1983 and 2001

	Percent Share of 1983 GDP	Percent Share of 2001 GDP	Ratio 2001/1983
Wireline-POTS	2.37	1.31	.55
Wireline-Internet	0.00	.27	High
Subtotal Wireline	2.37	1.58	.67
Mobile	.01	.52	52.00
Telegraph-Email-Not Elsewhere Categorized	.08	.07	.88
Total Telephone/Telegraph	2.46	2.17	.88
Radio/TV	.31	.72	2.32
Total Telecom	2.77	2.89	1.04

Source: Bureau of Economic Analysis, Signal Lake Analysis

Double that for business and hosting usage, and we don't have much trouble saying that perhaps \$50 billion out of the \$293 billion total comes from the Internet. WorldCom alone reported data and ISP revenues of \$12 billion in 2001.

If we subtract the mobile and Internet numbers out of telephony, the results are interesting. We previously noted that in 1983, telephone/telegraph represented 2.46 percent of GDP, with essentially no mobile or Internet services included. By 2001, the telephone/telegraph total dropped to 2.17 percent—with mobile and the Internet representing an increasingly large share. If we subtract Internet services, POTS is left with only 1.31 percent of GDP—just over half its 2.37 percent share in 1983 (Table 2).

Conclusion

All this makes clear the importance of new products for telecom services

growth. At a macro level, the U.S. economy has demonstrated its ability to pay more for telecom services. However, people will not pay more for mature products (unless extorted by monopoly power). The halving of GDP share for POTS telephony in an 18-year period makes that clear.

What people will pay for is new functionality that adds substantially to their lives and business operations. The GDP trends for CATV, mobile and the Internet make that abundantly clear.

So how do we go about developing new products? More on that in future articles. Stay tuned!□

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