

Telecommunications Industry Overinvestment: Defying Rational Economics

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Abstract

The crash of the telecommunications market in 2000 seemed to have caught Wall Street analysts by surprise. This paper shows that a projection of the industry capital intensity should have raised the red flag long before the actual market crash. The authors examine the capital intensity of the telecommunications services industry before and after the 1996 Telecommunications Act. The industry could not produce the level of revenue it needed relative to its capital expenditures. That made the market crash inevitable. The authors also show that the industry should return to a stable level of capital expenditure by 2005, but it may not return to its pre-1996 capital intensity.

Keywords: Telecommunications Market Crash, Capital Intensity, Telecommunications Services, Telecommunications Capital Investment.

Introduction

The high-tech industry paid a heavy price for its “irrational exuberance” of booming growth in the late 1990’s. The telecom industry was the hardest hit when the axe of rationality came down in the year 2000. The industry lost close to ¾ million jobs in the following two years. The telecom equipment sector lost about a trillion dollars in market capitalization, close to 2/3 of its market value,

and new capital investment came to a grinding halt (Eisenach and Lenard, 2003). There have been many perspectives and speculations in the media and by the industry experts as to what happened, why the bubble burst, and when will the industry make a comeback (Atkinson, 2001; Blumenstein, 2002; Kalba, 2002; Prins, 2002; Rosenbush, et.al., 2002; Westerhold, 2003; Bajaj, 2003; Couper, et.al, 2003; Phoenix Centre, 2003).

This paper examines the telecom services industry from its capital intensity perspective. Using industry-level data, the authors examine the trend in capital intensity before and after 1996 to highlight the anomaly that emerged in the behavior of the industry, with the deregulation of telecommunications. This anomaly reached a breaking point in the year 2000. The paper illustrates that investors defied rational economics of the industry leading to a huge overinvestment that could not be sustained and caused the market crash. The paper also shows that it may take longer (how much longer) than analysts are currently predicting for the industry to return to a “normal” level of capital expenditure.

The Industry Environment After 1996

Many factors affected the growth of the telecom industry in late 1990's. Foremost among them was the passage of 1996 Telecommunications Act that set the stage for further deregulation of the industry. In particular, the Act would allow the Regional Bell Operating Companies (RBOCS), who were anxious to enter the long distance market, to do so when they allow competition to grow in their local exchange markets. Added to the optimism about the regulatory reform were rapid advances in technology, offering alternatives to the copper and coaxial cable. Fiber optics for short and long hauls, packet technology, Internet Protocol, and wireless media offered expectations about great opportunities for new services and applications in consumer and enterprise markets. Furthermore, the global market was moving into an information-based economy. Telecommunications became a critical element of the infrastructure to support the evolution of the

global market. No one can dispute the presence of real growth opportunities for the industry.

The problem was overinvestment by many who wanted their unreasonable share of the pie. In addition to investments by the existing players, a rash of Competing Local Exchange Carriers (CLEC's) entered into the market, fuelled with increasingly available venture capital dollars and leading to a hockey stick growth of capital expenditure in the industry.

Of course investment in any business is based on an optimistic view of expected return. No one wants to invest in a losing proposition. It is clear that the environment for investment in telecom industry got a strong boost after 1996. The question of how much optimism was justified based on the rational economics of the industry is examined in the next section.

Investment in the Telecom Services Sector

Figure 1 shows the capital intensity, the ratio of capital investment to the industry revenues, for 1991 through 2006. The profile for 1991 through 2001 is from actual data. The profile for 2002 through 2006 is from the industry estimates. (Source?)

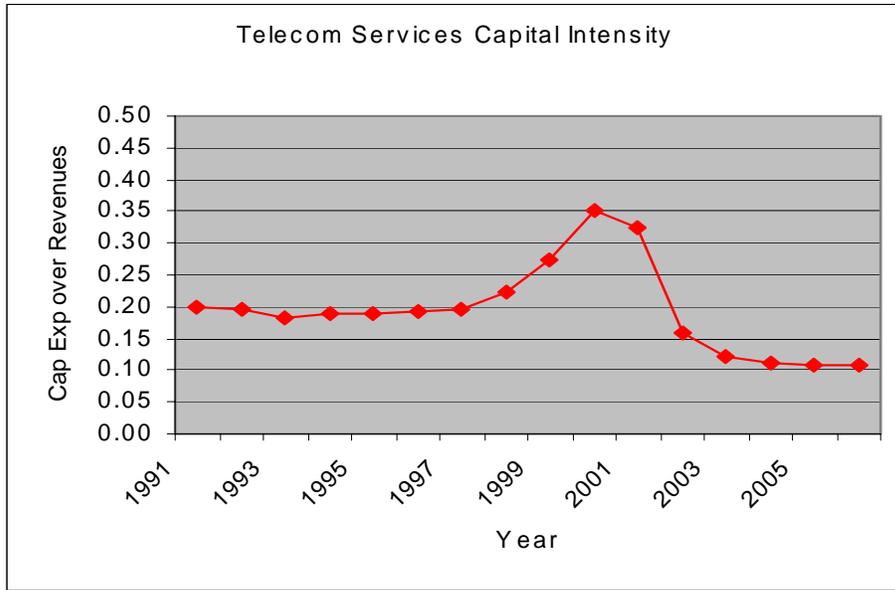


Figure 1. Telecom Services Capital Intensity for 1991 through 2006

Figure 1 shows that up to 1997, capital investment by the industry averaged about 19% of the revenues. In this period, the industry experienced significant growth. Long distance and advanced services were deregulated. Competitive pressure forced the long distance service providers to invest in technology and upgrade their networks. The Regional Bell Operating Companies were under price cap regulation that encouraged investment in technology by allowing them to benefit from the increased productivity gains. Industry revenues continued to grow with the introduction of new technology and services such as wireless and broadband. New growth required new and additional investment. The industry however pursued a rational level of investment. The capital intensity stayed around 20%.

After 1997, the growth in capital investment significantly outpaced the revenue growth. The capital intensity of the industry climbed to over 30%. There is no rational economic justification for this increased capital intensity given the environment of the industry:

- a. The services were under increased downward price pressure due to deregulation.

- b. Investors and Wall Street had become accustomed to increasingly higher returns from the high-tech sectors.
- c. Payback period for the industry had shrunken compared to that of the Bell System.
- d. There was no evidence that the industry avoided any desired investment in infrastructure prior to 1996.

Hence, it is reasonable to assume that 20% was a good number for network and facilities in the telecom services industry and that the industry and investors should have stuck with it. Recent projections show that the capital intensity has dropped to around 10%. Some major players are even under 10%. Although there is a new sense of optimism in the economic recovery and new projections by the Telecommunications Industry Association (TIA), it is not clear when and if the capital intensity will go back to its historic levels. It is expected that investment in infrastructure for traditional services will continue to drop while investment in wireless, broadband and internet based services will grow (TIA's 2004 Telecom Market Review and Forecast).

In the late 1990's, investors and market analysts apparently did not pay attention to the economics of the telecom services industry. From 1997 to 2001, the capital intensity increased dramatically. The revenue growth fell significantly short of what was necessary to provide the desired returns on those investments. Then came the market crash and a wave of bankruptcies. While the bankruptcies of WorldCom and Global Crossing are hard to pin down just on over-investment in the infrastructure, a number of smaller CLECs were the victims of over-optimism¹ this 1 seems to be referenced from another paper, check for verbalism.

Over-investment or Under-recovery?

Figure 2, compares the actual and projected (source) (2002-2006) industry capital investment to a recoverable level of investment based on the industry average capital intensity of 19%. The area between the actual and recoverable

investments represents the industry's over-investment between 1997 and 2001, and the industry's under-investment (holdback) from 2002 projected to 2006. The cumulative value of the over-investments through 2001 is about \$110B (see Figure 3).

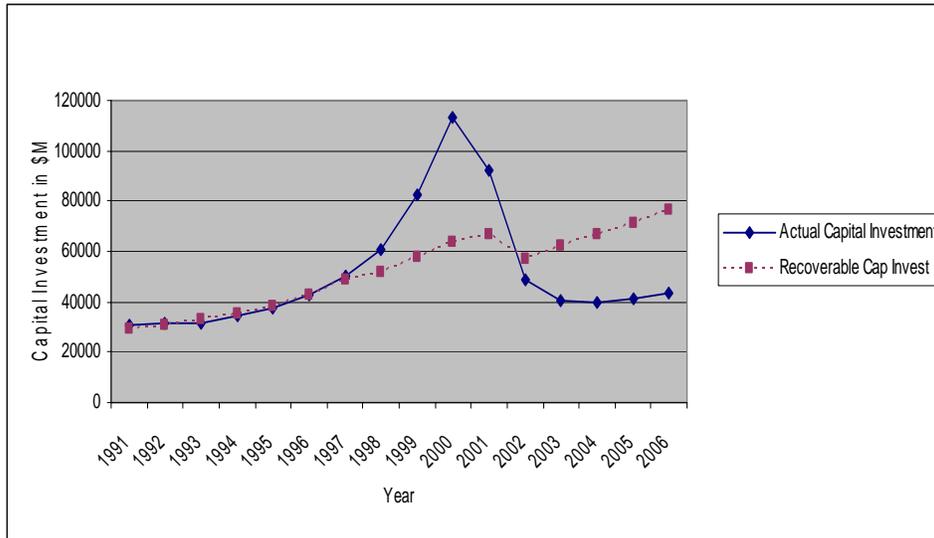


Figure 2. Capital Investment vs. A Recoverable Level of Investment

¹ Adelphia Communications, NTL Inc., XO Communications Group, Williams Communications, McLeod, USA Inc., Comdisco Inc., 360Networks, PSINet Inc., Winstar Communications, Exodus Communications, Global TeleSystems, Arch Wireless Inc.

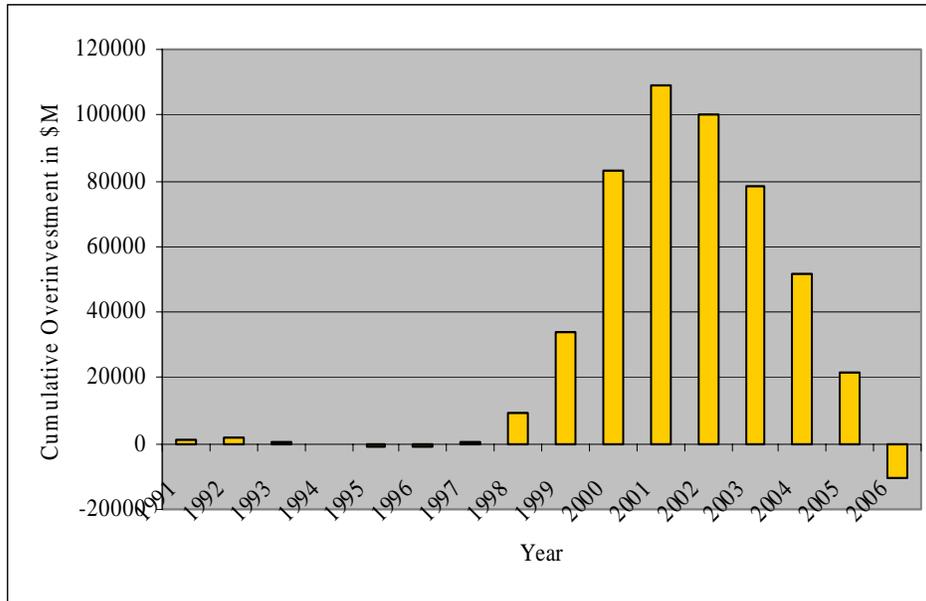


Figure 3. Cumulative Overinvestment Relative to Industry Revenues

Although the capital market paid heavily for this over-investment through the bankruptcies that followed, much of the physical assets, in terms of network equipment and facilities that were built through these investments, remain in the network and will be utilized by those who took over those assets. The extra investments created an over-capacity. It will take a while for the extra capacity to be utilized as demand slowly increases. This drag on investment is illustrated in Figure 3. As shown, the cumulative over-investment as a proxy for over-capacity will diminish and be eliminated by 2005. If one considers that some of those physical assets, such as switches, in-building wirings, or older technologies are unusable, the over-capacity represented by the over-investment in Figure 3 should disappear earlier than shown. This view is consistent with the current optimism of the industry for 2004 through 2007 (TIA's 2004 Telecom Market Review and Forecast).

The earlier discussion focused on over-investment by the industry. What about the other side of the coin (What is the benefit of doing so)? Did the industry under-recover for the investments in the 1997-2001 timeframe? To answer this question, this time, the authors applied the capital intensity factor to the capital investment profile to calculate what the industry might have expected

in revenues. Figure 4 compares the actual revenue through 2002 and industry projection (source) through 2006 against the expected revenue based on the capital investment.

Figure 4 clearly shows the growing gap between the realized industry revenue and investment expectation based on the industry established capital intensity. The area between the actual revenue curve and the needed revenue based on capital investment represents the unrealized revenues. The cumulative value of the unrealized revenues between 1997 and 2001 is about \$570B. Similar to Figure 3, one can argue that the extra capacity will slowly get utilized generating the unrealized revenue and the industry will reach a stable state by 2005.

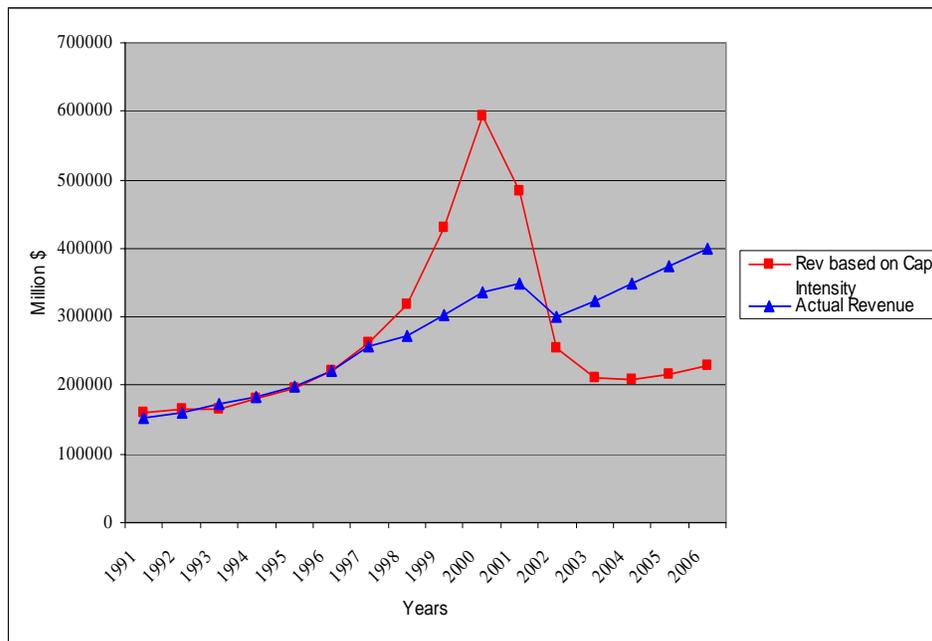


Figure 4. Revenue based on Capital Intensity vs. Actual and Projected Revenues

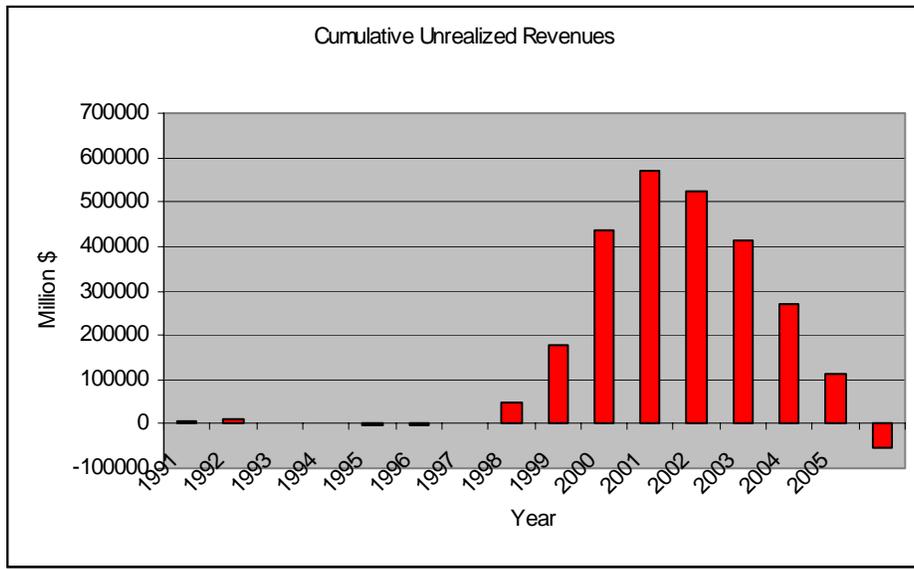


Figure 5. Cumulative Unrealized Revenues Relative to Industry Investment

For the two curves in Figure 4 to converge, the capital intensity must go up to the 19% level, which means significantly more investment than currently envisioned for the next few years (You need to expand on this point, I personally am not sure things work that way). It is not clear that the industry will ever go back to pre-1996 capital intensity levels, since much of the remaining “rate of return” regulation that protected the industry return on investment has disappeared.

Conclusion:

The crash of the telecommunications market in 2000 seemed to have caught Wall Street analysts by surprise. This paper showed that a projection of the industry capital intensity should have raised the red flag (I don’t think the Industry capital intensity as defined above is what should have raised the red flag, the four a,b,c,d, justifications are what you want to focus on), In other words how can a person looking at Figure 1, have predicted or acted differently long before the actual market crash. Perhaps it did. But the “irrational exuberance” of the investment market ignored the rational economics of the industry. The

authors showed that the market crash was inevitable, as the industry could not produce the return on investment the market was expecting. The authors also showed that the industry should return to a stable level of capital expenditure by 2005, but it may not return to its pre-1996 capital intensity.

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