

Buying and Banking on Prospective Returns in Telecommunications

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1. Introduction

Josh Billings believed that "it iz better tew know nothing than tew know what ain't so."¹ Investors in telecommunications should remind themselves of this wisdom every day. Anyone who thinks he or she knows for sure how telecommunications markets will evolve is naive. Rather than trying to predict the future perfectly, investors in telecommunications must try to understand all of the possible development scenarios for the telecommunications markets and construct portfolios that diversify each scenario's risks as effectively as possible. Of course, not all risk is diversifiable. Even investors who diversify well will have to understand what risks remain in their investment portfolio and decide whether those risks are acceptable.

Telecommunications markets contain many sources of risk for investors. Consumers, for example, may not demand the sorts of new services that telecommunications companies will provide. The price of such services or even whether they can be provided at all are questions that depend on how various technologies evolve, and these technological developments are uncertain. At the time this chapter was written, pending telecommunications legislation was a major source of uncertainty facing the telecommunications sector. Despite the passage of the Telecommunications Act of 1996, much uncertainty about the legal and regulatory environment remains. Both the resolution of regulatory issues created by the bill² as well as the antitrust treatment of mergers that have been proposed in the wake of the Act³ are major sources of risk.

Most of my analysis in this essay concerns the risks associated with the competitiveness of local telecommunications markets. I must therefore offer some justification for focusing exclusively on one type of risk and, moreover, one that is most relevant for local as opposed to long distance or international networks. First, despite the fact that important investments are currently being made to provide international telecommunications services,⁴ over the next decade much of the investment in telecommunications networks both in the United States and the rest of the world will be in local networks. Second, the degree of competition in local networks will have an important effect on the evolution of long distance and international telecommunications markets as well as markets for content.⁵

Local telecommunications networks are of particular interest in an analysis of risks in telecommunications because local markets in the United States have two telecommunications monopolists: the local exchange company (LEC) and the cable television company. Because both of the local telecommunications monopolies potentially face competition, one of the great sources of risk in telecommunications investment is the loss of monopoly.⁶

Both the LECs and the cable operators face potential competition from many sources. An important issue in the debate over a new national telecommunications bill in the Antitrust Division of the Department of Justice as well as in state regulatory proceedings is whether and under what conditions long distance companies can provide local telephone service. So-called alternative access providers or competitive access providers, like Teleport and MFS, compete with the LECs to provide access to long distance networks. In addition, local telephone companies already face some competition from cellular telephone companies. Moreover, the FCC recently completed its auction of radio licenses for personal communications services (PCS), so the entry of more companies providing wireless telephone services is on the horizon. (These two sources of competition are related, since AT&T has already purchased McCaw, a provider of cellular telephone service, and Sprint and AT&T/McCaw were the two largest buyers of the PCS licenses.) Cable companies have in principle faced competition from satellite dishes for years, although both the expense and size of satellite dishes have tended to make them unattractive to people who have access to cable service. Since early 1995, however, so-called Direct Broadcast Satellite (DBS) service, which uses a much smaller dish, has been available, and early demand has exceeded expectations. Overbuilds of cable systems and wireless cable, discussed below, also provide competition to cable in some areas.

Despite these many sources of competition,⁷ LECs and cable companies are probably each other's biggest competitive threats insofar as each has a network in place that can be the foundation for competing with the other.⁸ Indeed, both types of companies have been actively seeking ways to enter each other's markets. U.S. West has taken a 25 percent stake in Time-Warner Entertainment (TWE), which includes all of the cable systems previously owned by Time Warner. The express intent of U.S. West's involvement is to upgrade a substantial fraction of TWE's cable systems in order to offer telephone service as well as new telecommunications services. (U.S. West has also announced plans to upgrade its telephone networks in its service territories to provide video programming.) TWE has been acquiring additional cable systems, including all of Cablevision Industries, in order to have clusters of systems on which telephone service can be provided. Telecommunications, Inc. (TCI), the largest cable operator in the United States, was a major bidder, along with Sprint and other cable companies, in the PCS auctions. All of the Baby Bells have sought permission to offer video programming and have announced plans to upgrade their networks in order to do so. In addition, TCI was nearly acquired by Bell Atlantic in 1994, and the motivation for that combination may well have been to have Bell Atlantic help upgrade TCI's networks -- much as U.S. West will do with TWE's. Moreover, the interest of U.S. telephone and cable companies in each other's markets is reflected by their overseas investments. For example, NYNEX offers cable television service (as well as telephone service) in England, and Time-Warner and U.S. West have a joint venture with Toshiba and Itochu to build advanced telecommunications networks in Japan.

In the remainder of this essay, I will discuss different scenarios for the evolution of competition in local telecommunications networks and the appropriate investment approaches for dealing with such risks. In the next section, I discuss the prospect that both cable companies and LECs will lay such networks and compete against each other in all aspects of local telecommunications. I argue that such an outcome is possible but relatively unlikely. If such competition does not emerge, the interesting question becomes which type of company will build such a network first, which I consider in section 3. The general framework I use to

analyze this problem reveals sources of uncertainty for investors. The fourth section of this essay discusses different diversification strategies for dealing with that uncertainty, and in section 5 I offer some concluding thoughts.

2. Will There Be Competing Information Superhighways?

Based on the announced plans of both U.S. cable television and telephone companies, one might expect the emergence of competing networks that offer conventional telephone service, video programming, and perhaps new interactive services as well. Given the apparent profitability of at least some cable and telephone markets, such competition might seem inevitable. However, the profitability of markets depends crucially on pricing in the market, and one of the most basic principles of entering a new market is that preentry prices are irrelevant or at least nearly so. What matters is what prices will be *after* entry. With all of the advances in telecommunications technology, the basic cost structure that has made telecommunications markets monopolies has endured. Telecommunications networks entail high fixed costs and low marginal costs. Moreover, the transmission of information, as distinct from the information itself, is a relatively homogeneous commodity. As a result, before choosing to compete with an entrenched monopolist, any telecommunications company must have a clear answer to the following question: "What is going to prevent prices from gravitating toward marginal cost?" If it cannot answer that question satisfactorily, it must expect entry to be unprofitable.⁹

To be sure, there are some plausible answers to that question. One is simply that the companies will manage to collude (tacitly). Doing so will generally be difficult unless companies find ways to differentiate their offerings. In cable television, for example, an obvious differentiation strategy is to offer different programming. Whether that will be possible will depend critically on antitrust enforcement. Cable operators have been major investors in cable networks. Congress, the Department of Justice, the Federal Trade Commission, and the Federal Communications Commission (FCC) seem determined that cable operators will not be able to use those investments to foreclose competing distributors. If all programming is available on equal terms to all distributors, it will be difficult to differentiate the distribution itself.

This skepticism about the prospects for competition in cable are borne out by the history of the industry. In a relatively small number of communities there are competing cable television systems known as overbuilds. Overbuilds tend to result in a substantial reduction in prices. Indeed, they tend to result in price wars. When overbuilds occur, it is common for the two systems to merge once it becomes clear that one of the firms cannot survive the competition.¹⁰

Effective differentiation does not necessarily have to rely on physical characteristics. As long as consumers believe there are differences, then the incentive to cut prices can be controlled. For example, competition has survived in the U.S. long distance market. One interesting feature of that market is that AT&T has maintained 60 percent of the market despite having slightly higher prices than Sprint or MCI. This outcome suggests that consumers perceive some differentiation in the market, and this perception can be sufficient to restrain price competition. In local telephone markets, the LECs may turn out to have similar advantages.

Whether or not competition emerges will not depend on actual price competition but rather on what companies expect from competition. Even if they expect to be able to maintain sufficiently high prices for investment to be profitable, their guess might turn out to be wrong. If both cable companies and telephone companies enter each other's markets, the risk of price wars will be enormous. Indeed, they are so great that it is possible that competition in both markets will not emerge in the first place -- a possibility I address in the following section.

3. Who Will Provide the Information Superhighway?

If we are not going to have competing information superhighways, then what factors determine which type of company will provide the network that eventually develops? If the LEC provides it, it will retain its monopoly over local telephone service but will face competition in video programming from an existing cable network. If the cable company provides it, it will retain its monopoly on the distribution of video programming but will face competition in telephone service.

Gilbert and Newbery¹¹ have already analyzed the relative incentives to innovate of an entrenched monopolist and an entrant. Unless the innovation allows the entrant to replace the incumbent as a monopolist, the incumbent has a greater incentive to innovate. An entrant's incentives to innovate are dulled because the postinnovation competition from the incumbent reduces its profits. The competition between LECs and cable companies does not fit this model exactly because each is an incumbent in one of the markets and an entrant in the other. The basic analysis can be extended, however, and it yields some very interesting results.¹²

Let C_C be the costs of upgrading cable networks to offer switched communications services and C_T be the cost of upgrading telephone networks to offer video signals. For expositional simplicity, assume (1) that an upgraded telephone network would be identical to an upgraded cable network in terms of the services it could offer and (2) that these services would be enhanced versions of existing telephone and cable service.

If the telephone company upgrades, it will retain its telephone monopoly. It will also be able to deliver video programming, but it will face competition from cable networks. Even if the LEC could offer video on demand, incumbent cable operators would likely continue to offer video programming.

Let:

T_M = the value of the telephone service monopoly after the LEC upgrades its network.

V_{DT} = the value to the telephone company of its video services given that it is in a duopoly

V_{DC} = the value to the cable company of its existing network after the telephone company upgrades its network

V_M = the value of the video programming monopoly after the cable company upgrades its network

T_{DC} = the value to the cable company of its telephone services given that it is in a duopoly

T_{DT} = the value to the telephone company of its existing network once the cable company upgrades.

If the telephone company upgrades, it incurs cost C_T and obtains value $T_M + V_{DT}$. If it allows cable companies to upgrade first, it is left with value T_{DT} . Its incentive to upgrade (I_T) is the difference between the two:

$$I_T = T_M + V_{DT} - C_T - T_{DT} . \quad (18.1)$$

Similarly, a cable company's incentive to upgrade (I_C) is given by:

$$I_C = V_M + T_{DC} - C_C - V_{DC} . \quad (18.2)$$

Economic theory predicts that the telephone company will upgrade if:

$$I_T > I_C . \quad (18.3)$$

This condition can be rewritten as:

$$(T_M - T_{DT} - T_{DC}) - (V_M - V_{DC} - V_{DT}) > C_T - C_C . \quad (18.4)$$

Whether equation (18.4) holds determines whether telephone companies are likely to maintain their monopoly and encroach on that of the cable company or vice versa. The first set of parentheses is the difference between the value of a telephone monopoly and the combined industry value under duopoly. Unless the two firms collude perfectly, the value under duopoly is less than the monopoly value, and the expression is positive. By the same token, the value in the second set of parentheses is positive because the value of the video monopoly exceeds the combined industry value under duopoly.

The right-hand side of equation (18.4) can be broken out into two components. The first is $T_M - V_M$, which might be termed the difference in the amount of potential destruction. These values are the present values of the cash flows generated by the two types of networks (excluding the investment cost of upgrading the networks). Since the telephone market is, of course, much larger than the cable market, there is more potential value to be destroyed by entry into telephones. T_M is likely to be much larger than V_M .

The second component is the fraction of that potential destruction that is actually destroyed. This will depend in part on the potential of the competitors to differentiate their offerings and in part on their ability to resist price-cutting pressures. Thus, the mere fact that telephone companies have more to defend is not sufficient to ensure that they have the biggest incentive to innovate. If, for example, customers are sufficiently loyal to the LECs so that the cable companies could not encroach much on their existing business and the LECs could immediately compete on virtually equal terms with cable operators, then cable operators would have the stronger incentive to invest.

The collapse of the proposed Bell Atlantic/TCI and Southwest Bell/Cox Cable mergers suggests that the incentives for each company might now be nearly even. Before the mergers were consummated, the FCC announced a second round of price restrictions on cable operators that were substantially more stringent than the first. Within days, the Bell Atlantic/TCI merger fell apart. A few weeks later, the Southwestern Bell/Cox Cable Bell merger collapsed as well. In public, the companies blamed the collapse on the regulations, which reduced the amount that the telephone company was willing to pay. This explanation is incomplete, however, because the regulations also lowered the amount that the cable companies would rationally accept.

The above analysis suggests a more complete albeit speculative explanation for why the mergers fell through. The motive for, say, the Bell Atlantic/TCI merger may have been to

have Bell Atlantic help TCI upgrade its networks in its service territories. Perhaps Bell Atlantic has information (on operating switches, for example) that TCI needs, or perhaps it simply has better access to funds. Whatever Bell Atlantic offered TCI, the value was premised on TCI upgrading its networks. The effect of the regulations was to lower the value of the cable networks under monopoly (V_M). Since part of TCI's incentive to upgrade would be to defend the value of its monopoly, the regulations could have tilted the balance to give telephone companies more of an incentive than cable companies to upgrade their networks.

4. Investment Implications

The previous two sections have laid out several scenarios about how competition in local markets will evolve. One possibility is that competition will emerge in both telephone and video markets. Another is that telephone companies will enter cable markets, but cable companies will not enter the telephone business. The third is that the reverse will occur.

If telephone companies enter cable markets and cable companies find it unprofitable to enter telephone markets in return, then the value of cable companies will drop dramatically. Similarly, if cable companies successfully enter the telephone business and telephone companies find it unprofitable to enter cable markets in return, then telephone companies will drop substantially in value. If the change in cable regulations was indeed the reason that the Bell Atlantic/TCI and Southwestern Bell/Cox mergers fell through, then the edge that one type of company has over the other is probably a very delicate and tenuous one. Betting heavily one way or the other on the outcome entails large risks. There is no reason to bear these risks because they are relatively easy to diversify. The natural strategy is to hold both cable companies and telephone companies.

There is, however, a risk inherent in that strategy as well. As I discussed above, it is possible that competition will emerge in both markets. If it does, there will be persistent risks of price wars. Because competition necessarily lowers the combined industry value, a portfolio of cable and telephone stocks will necessarily lose value if they both end up competing against each other.

There are two primary investment implications arising from the uncertainty over how competition in the industry will evolve. The first is that some of the risks can be hedged, either by holding both telephone and cable companies or by holding companies, such as U.S. West, with significant positions in both. This strategy does not, however, protect investors against the possibility of too much competition. Some hedges against this possibility do exist. The consequence of increased competition would be even deeper reductions in the price of distributing information than will otherwise occur. In general, the hedge against such a price reduction is to invest in a good or service that is complementary to distribution. In the context of cable, the obvious hedge is programming. Telephones are in some sense complementary to everything. Indeed, following the conventional wisdom that "content is golden," investors might consider staying out of distribution altogether. This strategy is not, however, without risks of its own. If competition does not emerge, then programming and information services will still depend on gaining access to customers through a single distributor. Content may not be golden under such a scenario. The appropriate hedge against increased competition in telephone service is less obvious. One possible hedge is equipment producers, who would benefit from the construction of two local networks everywhere instead of one.

Given that the risks in telecommunications investments cannot be hedged perfectly, investors will have to make a decision about how much to invest in that sector. Since market prices change daily, there is no permanent answer to that question. To make this decision, though, investors should take a macro view of the industry. They should assess what the total value of the sector is and evaluate what the total value would be under the persistence of monopoly and under the advent of competition. If the sector as a whole is overvalued, then investors should be reluctant to take large positions in telecommunications even if they are confident of their forecasts of the winners and losers. Such confidence is likely misplaced.

5. Conclusion

The basic point of introductory finance courses is that choosing investments to maximize actual returns is not a practical objective. Rather, investors should choose portfolios that maximize the expected returns for a given level of risk. A key to doing this successfully is to diversify. All of the usual sources of uncertainty are present in abundance in the telecommunications industry. There is uncertainty about technology, uncertainty about consumer demand for new telecommunications services, and uncertainty about government policy. Not all of this risk is diversifiable, but much of it is. Ex post, some investors who place big bets on particular outcomes will make huge amounts of money and will be judged to be farsighted geniuses. Others who bet heavily the other way will while away their penury thinking about what might have been. Both will have taken huge risks without compensatory expected rewards.

References

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Endnotes

1. Josh Billings.

2. Among the key regulatory issues are how Local Exchange Carriers (LEC's) will have to unbundle their services, the prices they will be allowed to charge for the separate components, the prices that they will be allowed to charge competitors who want to resell their services, and what constitutes satisfaction of the check list for the Regional Bell Operating Companies (RBOC's) to enter long distance markets.
3. Mergers of Bell Atlantic with NYNEX and of SBC with Pacific Telesis have been proposed but have not yet received antitrust clearance. Time Warner's acquisition of Turner Broadcasting, which was proposed prior to the passage of the Act, still awaits antitrust clearance.
4. For example, the Federal Communications Commission has granted radio licenses to Iridium, Globalstar, and TRW to use for satellite systems that will provide cellular telecommunications service anywhere in the world. In addition, there are several consortia of large telecommunications companies in different countries that are intended to provide international telecommunications services for multinational corporations.
5. There is, of course, a third reason, which is that economic analysis can shed some light on the development of competition whereas it has relatively little to contribute on the subjects of the development of technology or consumer demand for services.
6. In most other countries, the cable television industry is not as completely developed as it is in the United States. However, competition between an incumbent telephone monopolist and companies offering the combination of video programming and telephone service is an important feature of telecommunications markets in most countries and certainly in most developed countries.
7. There are important limitations to some of these competitive threats, particularly in cable. Despite its surprisingly high popularity, the dishes for DBS are expensive, and the monthly payments are similar to monthly cable bills. As a result, it is not surprising that most of the demand for DBS has been outside areas with cable. As I discuss in the next section, overbuilds to cable systems are rare.
8. The various sources of potential competition are not really separate from each other. For example, Sprint's bids for PCS licenses were made in conjunction with the large cable operators TCI, Comcast, and Cox. Thus, a joint effort by long distance companies and cable companies to enter local telecommunications markets as wireless carriers combines all three of the most important sources of competition.
9. There have been many provocative recent discussions about whether competition in local telecommunications markets will emerge. For arguments that it will, see Baumol and Sidak (1994) and Huber, Kellogg, and Thorne (1993). In contrast, Greenwald and Sharkey (1989) and Economics and Technology, Inc. and Hatfield Associates, Inc. (1994) suggest it will not.
10. See Hazlett (1990).
11. Gilbert and Newbery (1982).
12. Riordan (1992) presents a dynamic analysis that is similar to the one presented below.