Regulation, Investment and Innovation

A presentation by
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I am happy to be here and to have a chance to talk about a profoundly important, but generally ignored issue in telecommunications policy -- the impact of regulation on capital formation and innovation.

The topic is profoundly important because of the sheer size and growth of the sector, but even more so because of its pivotal place in the growth and development of the macroeconomy; to trade and competitiveness; to productivity of telecommunications intensive service sectors; and, more broadly to our general social, economic and political welfare.

While I have not reviewed the recent writings on the effect of telecoms and these dimensions of our national well-being, I am satisfied that little has changed in the five years of so since the Department of Commerce concluded in its comprehensive study of the US Telecommunications sector that encouraging growth and diversification of the telecoms infrastructure should be a key element of our broader macroeconomic policy to foster growth, stable prices, high employment and international competitiveness.

I had more than the usual difficulty preparing for today. I frequently talk on issues whose implications have been variously extolled and trashed by dozens of experts before me -- access charges, TELRIC, economic depreciation schedules, universal service provisions, the 1996 Telecom Act, etc. There the problem is to say something different or something entertaining.

The problem for me today is that my topic is something I have been thinking about for several years and am trying to write a book about; and, I have to choose allocate 25 minutes of air time to some of those notions -- many of which have not been given much attention by other students and experts. Frankly, I have been a little overwhelmed, but here goes.

I want to make 5 conclusions and 4 conjectures. I will make them quickly, categorically and pointedly, in order to both provoke and save time for discussion.

Conclusion 1. Telecommunications policy has always been sensitive to the relation between regulation and capital formation.

Universal Service, regulatory management of competitive forces and control of monopoly profit have been the principal, some might say sole, drivers of telecommunications policy for most of the past 50 or 60 years. Thus, making investment considerations an integral part of the policy making apparatus requires no departures from the past. There is ample precedent.
History gives us two models for boosting investment -- Universal service regulatory programs and the REA/RTB for subsidizing investment in rural areas.

Of the two, the REA model is much the cleaner and preferred to policies that systematically distort accounting costs (separations and settlements, depreciation) and rates in order to generate political, not economic prices.

The universal service goal has been and continues to be pursued in ways that sacrifice efficiency in several domains of interest to economists. Clearly universal service has been pursued with policies in violation of the requirements of allocative efficiency; scale and scope efficiency and Liebenstienian X-efficiency.

We could and should look to our experience for guidance to the future.

Conclusion 2. Relation between regulation and investment and innovation is poorly understood.

Let’s first distinguish between investment and innovation. They are obviously not the same, even though they overlap at important junctions. Investment involves capital formation -- driven by three related needs -- replacement, growth and modernization. Innovation is related to the introduction of new things -- on the production side (process innovation) or on the output side (new and improved services or products). It is important to keep the two conceptually separate in our search for promotional policies.

The lack of understanding of the relationship between regulation and investment/innovation is true for several reasons:

First, economists have not been very interested in the matter. Averch and Johnson developed some views as a byproduct of their interest in cross subsidy, but the model was never really very robust and did not explain real world data very well. Of course it has no relevance in a price cap world.

Second, our ability to predict investment behavior and identify its causes is not very good. Dale Jorgenson wrote a few years ago that:

"There is no greater gap between economic theory and econometric practice than that which characterizes the literature on business investment in fixed capital."
While Jorgenson and others have closed the gap we have only a general notion of the causes of investment. Given standard capital theory, the low level of importance of interest rates in empirical studies continues to be baffling. (Add, by the way that interest rate changes explain a declining share of the variation in telco stock prices and almost none of it since the Act was passed in February of last year.)

Third, the IO literature is not very definitive on the relationship between market structure and investment or market structure and innovation. Lots of complexity -- incentives vs. ability -- stand out. Issues get tied up in the three distinct components of technical change -- R&D, innovation or invention and diffusion. Literature gives no specific guidance on "optimal structure" and concludes that the matter is highly circumstantial with each case almost sui generis.

Given the ambiguities in our knowledge of the relation between market structure and performance on these scores, it should come as no surprise that there is almost no science on the bridges between regulation and investment/innovation.

Conclusion 3. In recent years, the state and federal regulators have done next to nothing to encourage investment and innovation in the sector and made little effort -- visible to outsiders -- to understand the necessary relationships.

The states have done a little better than the feds in this regard, but neither can boast.

In response to arguments that the form of earnings constraint has a material and substantial impact on capital formation in the sector, the FCC basically ignored them in the its price cap Order and set them aside for consideration at some future time.

I have gone over the trilogy with a pretty fine toothed analytical comb looking for hints that the FCC is sensitive to the relationships or even cares about them. Most references in those orders involve statements about what is intended or forecasts of the effects. There is almost no analysis of the how and what effects will come about. Substantive quotes from FCC documents on the relationship will not fill a page.

Conclusion 4. Indicators of capital formation in the sector since the Telecom Act is not good.
A casual observer reading the hype in Business Week about convergence, multimedia, cyberspace, super infobahns and all that might conclude that investment in the sector is exploding. While I have not collected exhaustive data, some anecdotal indications are not encouraging.

First, while many stock prices in the sector are up and some companies are trading at all time highs, the sector, after adjusting for changes in equity values in general, is doing rather poorly. Thus, the last time I calculated the numbers (in mid-May I think), a composite of telecom network stocks (Large LECs, the Big three IXCs, publicly traded wireless providers, and CATV systems were down about 30% against the S&P 500 since the beginning of 1994.

The large LECs and the IXCs were down 20% and 33% since the passage of the Act in February 1996. Now, much more than regulation is at play in these numbers and I do not want to overemphasize the relation. But, Given the importance of facilities and facilities based competition to consumer welfare these are not encouraging numbers. Financial markets give important, strong signals to management that cannot be ignored.

Any concern created by the market performance of the stocks is confirmed when we consider real investment, rather than financial investment. What about capital budgets in the sector? Is investment growing? The question is complex. But, there are important indications of some possible problems. The rate of fiber installation is down. Local exchange companies in many operating areas are committing less cash to new capital formation than they are accruing from depreciation allowances. While the tide is beginning to turn, the rate of investment in the cable industry has been stagnant in recent years. MCI misestimated by a factor of two -- over $400 million -- the costs of developing competitive alternatives. The development of wireless alternatives in the local markets has slowed down and in some important cases simply stalled. The new catch phrase on Wall Street and among corporate planners and capital budgeters is regulatory uncertainty.

Let me emphasize that more, much more, than regulation is at play here. However, if the political leadership can claim credit for growth in the number of jobs and other favorable economic developments in the sector, it is not unfair to raise the question of regulatory accountability for the questionable performance in new capital formation and the introduction of new services.

Conclusion 5. Competition policies and investment policies are incongruent.

The policy program that maximizes one set of objectives need not maximize, or even serve the other. There are important conflicts. It is not unfair I hope to categorize the Commission’s efforts to implement the act as confined to opening
entry – breaking the local bottlenecks, attempting to determine the "correct" prices for access and interconnection and implementing universal service. That is the trilogy. But, the impact of those decisions and the processes of reaching them, I would argue has at best unknown consequences on investment and at worst a negative impact. This observation is not intended to call to question the need for or wisdom of promoting competition. That is very important, but so is how we go about it. The means should sacrifice as little as possible progress toward other important goals.

The simplest model of capital formation and capital budgeting indicates that investment depends on expected earnings, growth and risk. While competition policies will redistribute earnings and growth, the major financial effect of the trilogy has been to increase regulatory uncertainty and thereby to increase risk of investing in the sector.

Unfortunately breaking the bottlenecks and making investment possible and enticing for new entrants is not a zero sum game, or even a known sum game. The problem of regulatory uncertainty for all parties is compounded by the incentive structure of the Commission’s competition policy rules. They do not clearly encourage facilities investment; to the contrary, they seem to foster instant gratification by encouraging entry based on resold or rebundled facilities of incumbents. If competition policy is encouraging non-facilities based competition, then, the Commission is actually discouraging investment on balance, by increasing risk and reducing investment incentives for incumbents -- with no offsetting real investment incentives for entrants.

Notwithstanding facile statements about cause and effect relationships between regulatory policies designed to increase competition and actual market performance, evidence of the results in the marketplace is spotty and contradictory. While I count myself among those who say it is too early to judge the effects of the 1996 Act its implementation, I find myself in sympathy with those who are less patient and cry -- "Where’s the beef?" Where are the new services; where are the new consumer options; where are the lower prices; where is exit strategy that will permit deregulation; where, is the new infrastructure and new capital formation?

Let me turn quickly to some conjectures.

Conjecture 1. The level of investment and and the rate of innovation as indicia of "dynamic" efficiency will prove in the long run to be far more important than static allocative efficiency.

The Commission has been very much preoccupied with increasing competition and getting the price structure "right", a set of goals very much like those of the
antitrust laws. Professor Scherer concluded a review of antitrust policy and economic efficiency as follows, and I quote:

We know that many discussions of antitrust policy and efficiency have violated the New Testament injunction against beholding the mote and ignoring the beam. X-efficiency is much more important quantitatively than allocative efficiency, and dynamic efficiency is almost surely even more important.

I think it is fair to say that regulatory policies have been directed toward improving allocative efficiency by working to get the rate structure right and by making sure there are no excessive monopoly profits in the local exchange. I have no problem with that goal. It is important. But, not if it discourages investment and innovation in the sector. Has the policy done so? We do not know and have not tried to find out.

Conjecture 2. Auctions will come to be understood by economic historians as slowing the rate of capital formation in new wireless technologies.

Auctions were adopted as a frequency assignment mechanism with, so far as I can determine, total disregard for their impact on capital formation and the rate at which new services would be introduced to the public. Widespread assertion that auctions will accelerate investment and innovation are unfounded. Period. And, there is mounting evidence that auctions to date have created problems that will continue to increase uncertainty in the investment community and lead to continued deferment of real capital formation in the sector. I have just finished reviewing a forthcoming article by a former managing director of a large Wall Street firm concluding that the C block auctions resulted in a transfer of capital from the private sector to the public sector that effectively reduced funds available for constructing systems on more or less a dollar for dollar basis.

Conjecture 3. The FCC will find it necessary to must develop new policy tools and instruments if they are successfully to encourage investment and innovation.

An important axiom of the policy sciences is that there must be as many policy instruments as policy goals. Having more goals than instruments means we have to trade off and optimize among conflicting objectives. The classic example of course is trying to foster high rates of employment, price stability and growth with fiscal policy alone and being faced with Phillips curve trade-offs between employment and inflation.
To the extent that the requirements of competition policies and infrastructure policies are in conflict, regulators can avoid the trades off only by "policy innovation".

Lessons from the past are more indicative of what not to do, than what should be done. We should not try to incent investment through regulatory interference with the structure of prices. My guess is we find solutions on the input side and by letting things happen -- pricing flexibility, removing all barriers to new service introduction, and generally deregulating on the output side. Special tax incentives for investment come to mind, but then so do visions of the futility of trying to get that through Congress.

Conjecture 4. Firms producing goods and services complementary to the provision of telecommunications network services have a stake in promoting investment policies.

The data show that productivity in the economy has not been as responsive to the computer revolution as might have been expected a priori. Several reasons have been adduced, one of which is the bandwidth bottleneck of local telecom networks. Constraints of twisted pair and the lack of cable modems have no doubt been a contributing factor to date, but more importantly will constrain the growth of demand for software, hardware and components that rely on transmission and distribution for much of their value. Economics 101 teaches that the demand for goods and services will be increased by increasing in supply and reducing the price of their complements. Thus, it seems to me that firms in the broadly construed computer and information sectors have a stake in encouraging policies to develop network infrastructures broadly, deeply and quickly.

I have covered a lot of ground and, frankly, have tried to be provoke your questions. I will be happy to try to answer them.

Dr. Larry F. Darby founded Darby Associates in 1988. He advises clients on a wide variety of telecommunications issues. He is also a lecturer in telecommunications finance at George Washington University, authors a bi-weekly column for Communications Business and Finance, and is senior economic advisor to CompassRose International. Prior to founding Darby Associates, he was a vice president in the Telecommunications Investment Banking Group at Lehman Brothers. He has also served as senior economist in the White House Office of Telecommunications Policy and chief economist and chief of the Federal Communications Commission’s Common Carrier Bureau.