The Effect of Deregulation on Market Concentration: an Analysis of the Telecom Act of 1996 and the Industry Meltdown

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December, 2002

1. The Issue

For several decades, US policy in telecommunications and electronic mass media focused on the encouragement of competition. This policy, usually known as *deregulation* but more accurately described as *liberalization,* aimed at an opening of market to competitors and a reduction of market power. There were numerous elements and proceedings to this policy by the Federal Communications Commission, the states' Public Service Commissions and legislatures, the Courts, and Congress. Of these actions, none was more comprehensive than the Telecommunications Act of 1996.

What has been the impact of this policy? In this paper I will focus on one dimension: the impact of liberalization on competitive market structure.

This question has acquired some urgency in light of the recent meltdown in the telecom sector. It is hardly a secret that the telecommunications industry – old and new type network operators, equipment suppliers, and Internet service providers – is in the midst of an unprecedented and worldwide

meltdown. Since the beginning of the year 2000, the industry has shed worldwide hundreds of thousands of jobs, lost trillions of dollars in stock market capitalization, endured a continuous stream of bankruptcies, and got besmirched by scandals. The safest place to work in the entire telecom sector right now, it seems, is at the deregulating FCC.

According to the *Economist*, the telecom crash – ten times bigger than the better-known dotcom crash – may qualify as the largest bubble in history. Losses have been much greater than for the savings and loan debacle of the late 1980s. In the US, most of the new entrant firms are in various stages of bankruptcy. All long distance companies are on the ropes and probably for sale. Investment has come to a standstill. As network firms sought survival rather than expansion, the telecom equipment-manufacturing sector all but collapsed.

2. Industry Volatility and Industry Response

Maybe the present downturn is only temporary and the industry will recover, though no at the hyper level of the bubble years. That, however, is not the real problem for the industry. It is not a one-time recovery from a one-time boom and bust. The more fundamental problem is that the telecom industry is entering a pattern of chronic volatility, with boom-bust patterns becoming a common occurrence rather than an aberration. Thus the telecommunications network environment is leaving linearity and entering volatility, and maybe even cyclicality.

While business cycles are not new to many industries, in telecom they are a new phenomenon. In the past, the network industry progressed in only one direction: up. Telecom used to be less volatile than the economy as a whole. It grew steadily, with long planning horizons hardly ruffled by the business cycle. But today, in sharp contrast, the telecom sector may well have become more volatile than the economy, more like the construction business, less like water utilities.

It would be easy to blame the telecom firms for managerial mistakes. But the downturn happened around the world, and the causes are therefore deeper than a particular management team (or of a particularly creative team of accountants).

Perhaps the major reason for instability has been the fundamental economic characteristic of many network industries with high fixed costs and low marginal costs. The telecommunications industry is characterized, on the supply side, by huge investments followed by tiny costs of serving additional customers, plus positive network externalities on the demand side. This creates economies of scale, scope, and networking. Which provides incentives to be large and to expand early, which creates over-capacity, as it becomes firm strategy across an entire industry. Price competition then drives down prices to unprofitable levels. Price differentiation and asset redeployment are difficult, much harder than for airlines. Bust cycles follow. We have encountered the first of these cycles, but surely not the last, because the factors of instability will remain: low marginal, high fixed costs, inelastic demand positive network externalities, lags in supply,

disinvestment and regulation, and a Wall Street short term perspective that amplifies industry cycles.

If instability will be part of the environment, what will telecom companies do? The textbook responses are to cut costs, lower prices, and increase innovation. But these strategies will quickly be matched by competitors and will leave every supplier firm even worse off.

The other major strategy will therefore be to raise prices above competitive levels, to reduce competition and the commodification that lowers profitability and future investments. To do so requires market power by a single firm, or a tacit industry oligopoly. There is probably no other way to escape the industry's fundamental structural problem. In some cases, the creation of such market power can even be efficiency-enhancing, at least in the short run. The airline industry with its hub-and-spoke system is an example.

3. The Changing Industry Structure

We have, so far, concluded that industry concentration is the response to competition. Let us now turn to the empirical evidence for such concentration in telecommunications and related industries. Obviously, all parts of the information sector are subject to structural change due to technology, convergence, and other factors. Hence, we will refine our question:

How has liberalization policy affected market structure?

What has been the trend of concentration in the regulated segments of the telecom industry (and of other regulated media industries), in comparison to unregulated parts of the information sector? Based on our analysis, one would expect industries whose competitive equilibrium was changed by policy action to adjust through increased concentration. Has this indeed been the case?

Of course, everybody knows about various large mergers. But those anecdotes are not conclusive. There have been new industries such as mobile wireless, backbones, broadband, and more. All of those have different patterns of growth, entry, and concentration. So we need to look at the data. In this area, strong opinions are plentiful but data is scarce.

To provide an empirical answer, I looked at the market concentration trends in the American information sector, for 72 separate industries. Examples for such industries are long distance telecommunications, cellular mobile, broadcast TV, cable TV, film distribution, daily newspapers, Internet service providers, and many more. For each of these industries, I tracked and calculated individual firms' market shares (and revenues) in this particular industry, using a variety of sources, for a period of 20 years. The resultant database is unprecedented in its scope.

These market shares were then used to calculate concentration indices and to track them over time. The major concentration index used was the Herfindahl-Hirschman Index ("HHI"), of the US Department of Justice. [1]

$$HHI = \sum_{i=1}^{f} S_i^2$$

Where f = number of firms participating in an industry, Si = each firm's market share, i = firm in a given industry

The US government's Antitrust enforcement guidelines classify market concentrations according to their HHI score:

HHI < 1,000 Unconcentrated Market

1,000 < HHI, Moderately Concentrated Market

1,800 < HHI, Highly Concentrated Market

The study tracked these indices of concentration over time, from the years 1983 and 1984, both just before and just after the AT&T Divestiture. 1984 was also a major liberalizing milestone year for the cable TV industry, which experienced a significant deregulatory law.[2]

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[1] A second index is also used primarily to cross check the HHI. The "C4" index is the combined share of the top four firms in a market.

$$C4_j = \sum_{i}^{4} s_{ij}$$

Where: S_i = firm's i market share of a given industry j, where firms are ordered by size of market share.

[2] Where the industries do not go back for 20 years, a shorter time series is used.

We then proceed to aggregate the industries along the dimensions of broader sectoral categories such as telecommunications, and along the dimensions of regulated industries, such as whether they are regulated telecom industries or not. The weighted aggregate HHI is defined as

$$WAHHI = \sum_{j=1}^{n} \frac{m_j}{\sum m_j} \sum_{i=1}^{f} S_{ij}^2$$

Where j = an industry
m_j = total revenue of an industry
S_i = each firm's market share of an industry
n = number of industries in a specific subset of the information sector
f = number of firms in an industry.[3]

For this analysis, we look at the three major information industry sub-sectors

1. Telecom
2. Mass Media
3. Internet

For each of those sectors, we define three categories of industries

A. Regulated

Examples: local telecommunications; TV stations

B. Unregulated but closely affected by regulation

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[3] The formula for the C4 aggregation is alternative

$$WC4_k = \sum_{j=1}^{n} \frac{m_j}{\sum m_j} \sum_{i=1}^{4} S_{ij}$$

Where j = a industry *j* within a larger segment
m_j =total revenue of an industry *j*.
M = total revenue for the segment industries k
i = firm in an industry
S_i = market share of firm in a given industry
k = segment of industries
n = number of industries

Examples: fiber optic cables; Cable TV channels

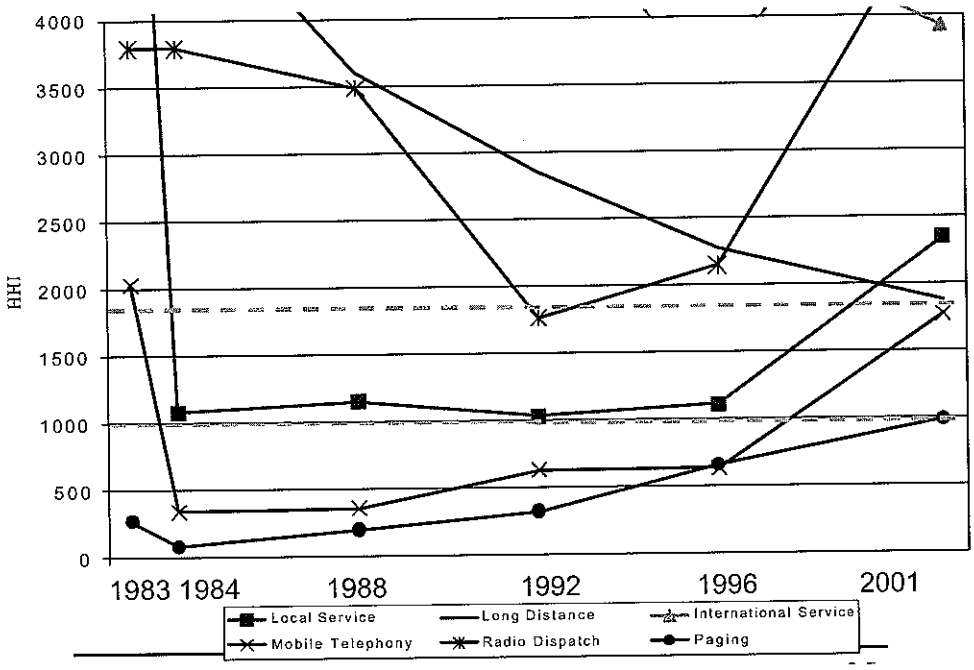
C. Unregulated

Examples: film distribution; fax machines

4. Empirical Findings

Graph 1 is an illustration of the HHI concentration trends of several telecom service industries.[4]

Graph 1. Concentration Trends in Telecom Services



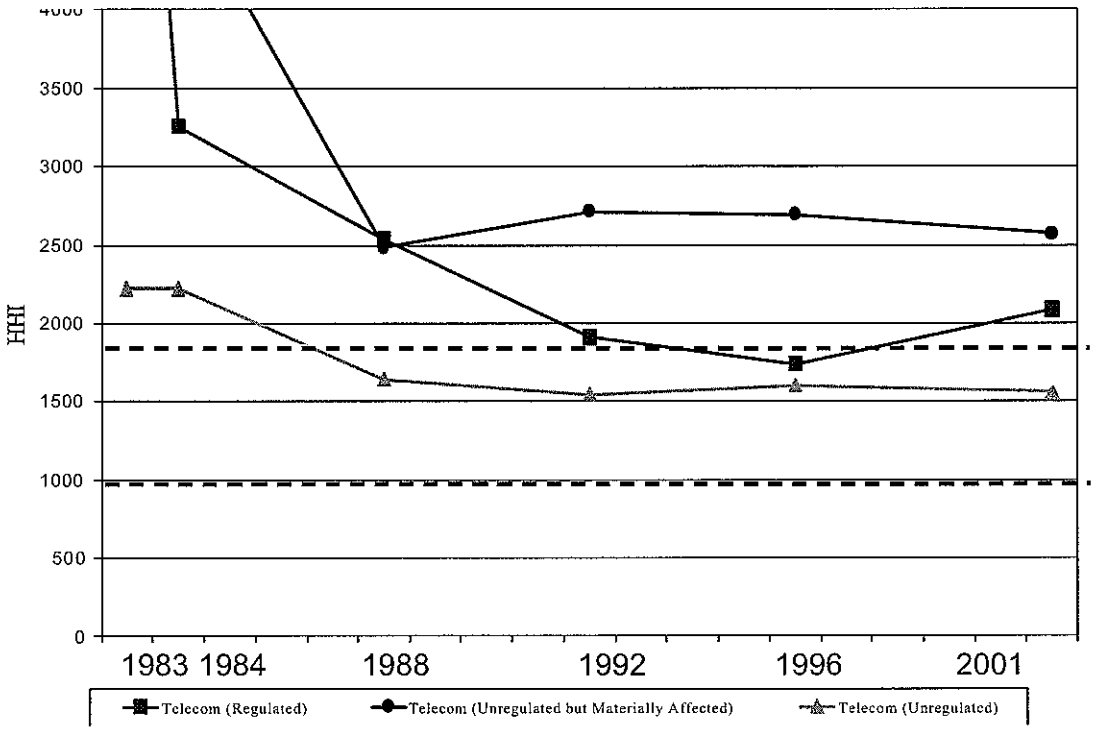
Points below the lower horizontal line are below HHI of 1000, ie, in the range of unconcentrated industries. HHI points above the upper horizontal

[4] Similar graphs would show trends of the other 66 industries.

line are in the concentrated range of >1,800. We then aggregate telecom industries according to whether they are regulated.[5]

The results can be seen in Graph 2.

Graph 2. HHI Concentration of All Telecommunications Industries



Unregulated telecom industries decline in concentration in the 1980s, and are flat in the 1990s. Their concentration is intermediate in size. Unregulated industries that are materially affected, mostly in equipment markets like fiber optics and wireless infrastructure, show roughly the same trends, except that their concentration level is much higher, they drop rapidly

[5] **Regulated telecom industries are: Local Service; Lower Distance Service; International Service; Mobile Telephony; Radio Dispatch; Paging; Backbones; Broadband Providers. Unregulated telecom industries are: Handsets; Fax Machines; and Mobile Handsets. Industries unregulated but materially affected by regulation are: PBX; Central Office Switches; Multiplexers; Fiber Optical Cable; Copper Wire & Cable; Microwave Equipment; Cellular Infrastructure; and IP Telephony Providers.**

after 1984, due to the AT&T divestiture that opened the equipment market. Most of these industries are providing telecom equipment, and they are dominated by a handful of vendors.

But most interesting is the concentration trend of early regulated telecom industries: from highly concentrated in the early 1980s, concentration levels decline especially with the 1983/4 AT&T Divestiture, until 1996, – the year of the deregulatory Telecommunications Act. In that year, the concentration level is at its lowest, though barely touching the bottom range of high concentration, and it thereafter abruptly turns back to higher concentration levels.

To put these telecom concentration trends in context, we now conduct similar calculations for the Mass Media industries (Graph 3)[6].

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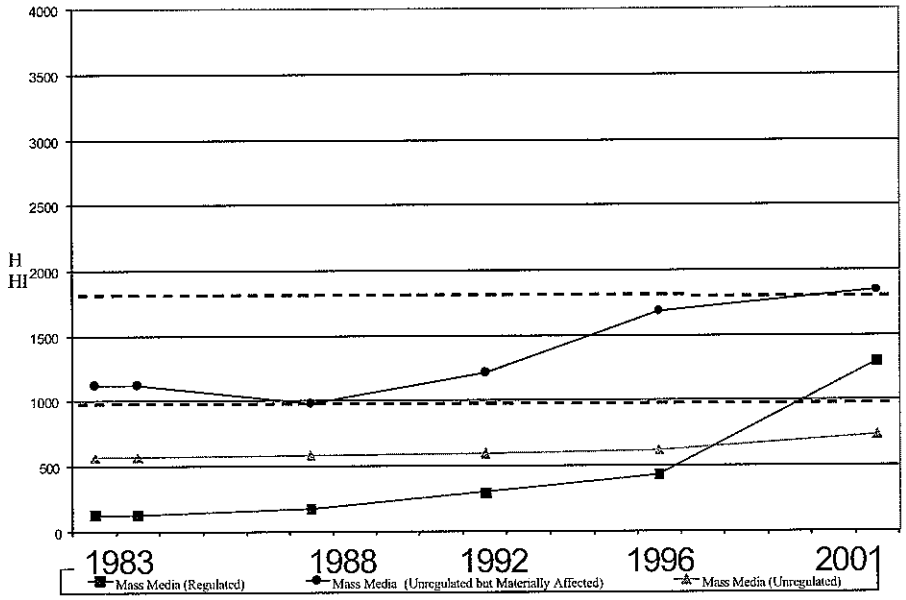
[6] **The category 'regulated' entails the following industries: TV Prime Time Production; Radio Stations, TV Stations, DBS Providers, Cable TV Operators, TV Networks. 'Unregulated but materially affected industries' consists of: DBS Equipment, Cable TV Set Top Converters, Radio Networks, TV Syndication, Cable TV Channels, Pay TV Channels, Music Cable Channels. The category 'unregulated' consists of: Video Game Hardware, PC Entertainment Software, Games Software, Television Sets, VCR Players, DVD Players, PVR Players, Camcorders, CD Players, Audio Systems & Radio, Movie Production & Distribution, Movie Theater Chains, Home Video, Video Rental, Music Publishing, Performance Rights, Record Labels/Distributors, Music Retailers, Daily Newspapers, Educational Books, Trade and Paperback Books, Other Books, Books Retailing, Magazines, Academic Journals, Printing Services, MP3 Players, Media Player Software, Online Book Retailing, and Online Information Services.**

Graph 3. HHI Concentration in All Mass Media Industries



Here, we can observe the following. The concentration of unregulated mass media industries is almost constant over time, with low levels throughout. Much higher concentration exists for those unregulated industries that are materially affected by regulation. Here, concentration levels have increased steadily throughout the 1990s, from unconcentrated to highly concentrated levels. Finally, regulated mass media industries concentration increased steadily, from low levels in the 1980s and early 1990s – maintained low mostly by regulation – and rose rapidly after 1996 into an intermediate level of concentration.

We conduct the same analysis for the Internet sector (Graph 4).[7]

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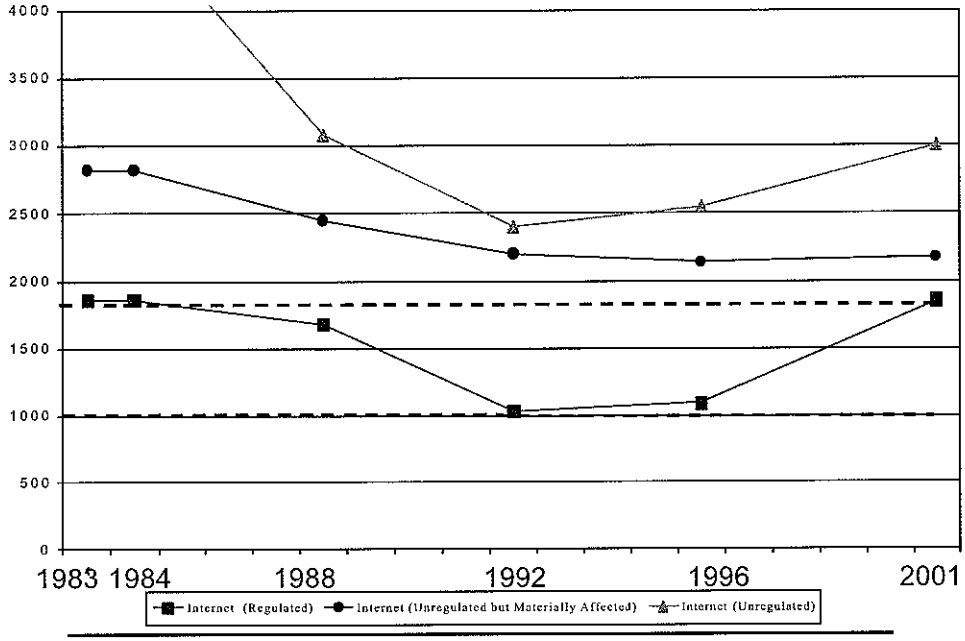
[7] **Regulated industries include Backbones and Broadband providers. Unregulated industries are: Media Player Software; Internet Search Engines; Portals; Browser Software. Industries that are unregulated but materially affected by regulation consists of: ISPs; IP Telephony Providers; and Internetworking Equipment.**

Graph 4. HHI Concentration of All Internet Industries

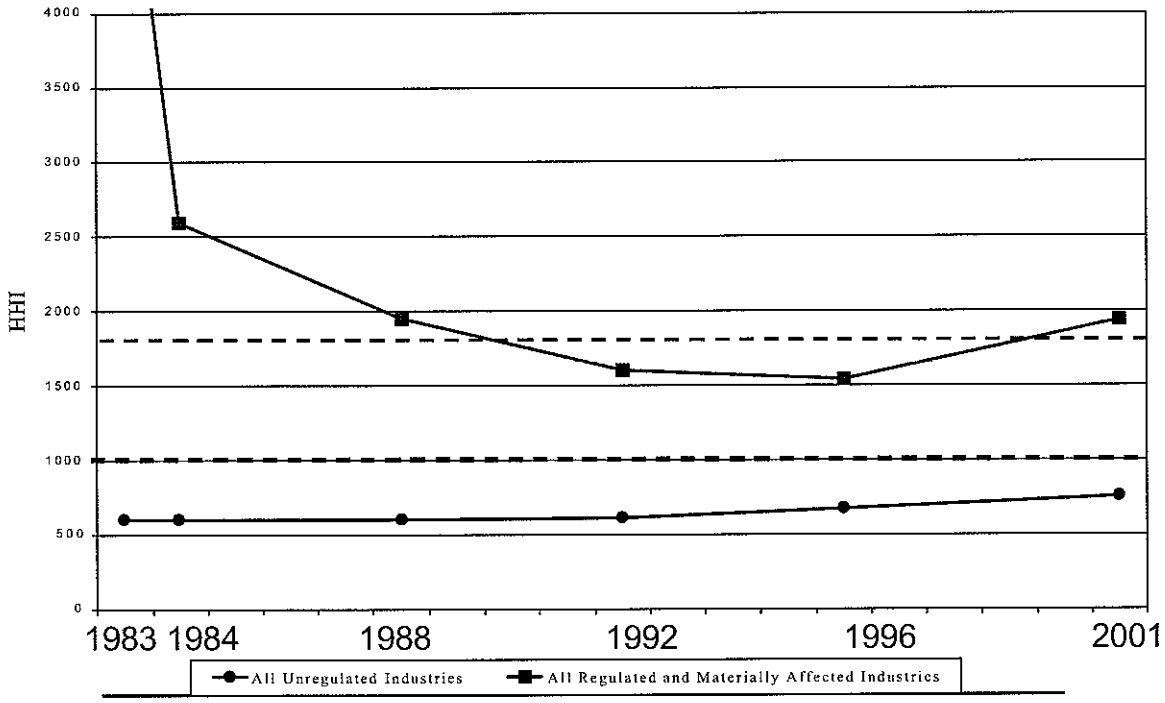


Here, unregulated industries decline in concentration, while industries that are regulated or affected by regulation increase in concentration after 1996.

Next, we aggregate the concentration trends for *all* regulated information industries from all three sectors, and compare them with the unregulated information industries. In doing so, we assign the intermediate category of "unregulated but materially affected" industries in two alternative ways: The first assignment groups it with other unregulated industries, and the second with other regulated industries, the first assignments follows a "black letter" legal definition and includes only these industries that are directly regulated in the regulated category. The second assignment follows a more *economic* definition in which the actual regulatory incidence is considered. It groups the intermediate category of industries together with those that are directly regulated. The results of the two alternatives are almost identical,

except as to the level of concentration of unregulated industries, which is a bit higher in the first – legally oriented – definition. Due to the similarity, we will show the second graph.

Graph 5. HHI Concentrations of Regulated vs. Unregulated Information Industries



What the results show is that the concentration level in unregulated information industries is (a) low, and (b) almost flat. For regulated industries, on the other hand, concentration is (a) high, and (b) declining in the 1980s and early 1990s, and rising after 1996.

6. Interpretation of Results

Thus, we find that regulated communications industries are substantially more concentrated than unregulated ones, and increasing in concentration after 1996.

Why is that so? In general, regulated industries are often concentrated, which is the reason, after all, that they are regulated, to protect the public from the negative results of market power. But the causality flows both ways. Regulation has traditionally also protected firms from competitive entry, especially in telecommunications and television. The process of regulation, often captured, has been used to stabilize industries.

But the data also shows that concentration is not merely high, but that it has increased after the deregulatory 1996 Telecommunications Act. This was certainly not the intended effect.

There are two non-rival explanations for this trend:

(a) The Act enabled expanded ownership by relaxing restrictions.

(b) The 1996 Act and its FCC implementations, by encouraging entry created pressures on companies to merge in order to re-establish stability in their markets.

There is little in the 1996 Act supporting explanation (a). The law eliminated the national cap on concentration by radio stations, and raised it somewhat for TV stations. But that was all in terms of relaxation of horizontal merger restrictions. The 1996 Act, on its face, was not so much

pro-concentration as pro-competition. However, the effects of such competition was to drive companies to defensive moves along the lines of explanation (b), and concentration became a paramount strategy.

This tendency is amplified in the telecom industry's downturn. That downturn is exactly of the kind brought about by competition: pressures to invest, expand, and innovate, all coupled with declining prices, and difficulties to prevent price arbitrage. This has led to volatility and instability. The business response, as was observed in this paper, is to reduce competition and enlist government in its stabilization. This is accomplished, among other ways, by mergers.

But why does government acquiesce? First, due to a laissez-faire attitude to leave it to the dynamics of market place to deal with market power. And second, because a volatile market is not something that can be easily accepted by the political process. Volatility raises uncertainty, and therefore raises the cost of producing telecom services, which is an essential and universal input. It has also some distributional implications such as fluctuations in employment. And through network effects, everybody is negatively affected. Those most directly affected, investors, and unions, then pressure to government for stabilization.

All of this and more are reasons for government to fear volatility and to engage in counterveiling stabilization policies, even though government policy may also be a contributing cause, for example through regulatory delay. If such involvement is likely, for better or for worse, the potential tools of government for stabilizing the telecommunications industry range

from tax policy to industrial policy, and from regulatory price setting to spectrum allocations. But the simplest and major policy tool is *competition policy*. That policy does not usually require positive action, only greater acquiescence to mergers, especially in the downturn of the business cycle.

There is a conflict between pro-competition and pro-stabilization policies. The latter may increase price and reduce consumer protection, content diversity, and innovation. Given the realities of the policy process, and the undesirability of essential industries with a high failure rate, the result of this policy choice is clear: stability will win. And if we look at the concentration trends from our data, this choice has already been made. This is not a recommendation, merely air empirical observation.

We can see some elements of this approach in Europe, too. Earlier in 2002, the European Commission published the commissioned recommendations of McKinsey and Co., which advocate a reduction of competition in the wireless field, in order to increase profitability through higher prices.

7. Conclusion

For governments to moderate competition in favor of stability would require a fairly radical departure in regulatory philosophy. For a generation now, liberalization, deregulation and competition have been the keystones of telecom policy.

One business cycle later, competition is giving way to consolidation. Thus, the traditional system of regulated market power and concentration will

return to some new equilibrium level which is not the hoped-for competition but some market power. Maybe a "natural oligopoly" instead of a "natural monopoly". And with it, inevitably, some regulation, of the negative effects of oligopoly at least on the consumers level. Such a regulation of oligopoly is much harder to conceptualize or implement. This scenario will look more like the old telecom than the new, but we must face reality rather than engage in denial.

Thus, the 1996 Telecommunications Act might end up more of a stimulus to concentration than to competition.