CHAPTER 3

The Emerging Cyclicality of the Telecom Industry

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Abstract. This chapter analyzes the long-term lessons of the recent upturn and downturn in the telecommunications industry. It concludes that cyclicality will be an inherent part of the telecom sector in the future. To deal with such instabilities, the most effective responses by companies and investors is to seek consolidation and cooperation. Hence, an oligopoly is likely to be the equilibrium market structure. This means that government, if seeking stabilization, will need to reassess its basic policy approach that has long been focused on the enabling of competition. And this, in turn, means that the structure of the future network industry will look a lot more like the old telecom industry and less like the new Internet.

1 THE NEW CYCLICALITY

The telecommunication industry is in deep crisis in the United States, Europe, and other regions. Quite likely, the present downturn is only temporary and the industry will recover, though not 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 main problem is that the telecom industry is entering a chronic pattern of volatility and instability, with boom-bust patterns becoming a common occurrence rather than an aberration. Thus the telecommunications network environment is leaving linearity and entering volatility. A pattern of ups and downs may be emerging, a cycle.

Yet many participants and observers of the industry miss or deny the emergence of cyclicality, sometimes interpreting the term too literally and needlessly implying it to mean a regularity of ups and downs. Most observers believe that the present downturn is merely a one-time accident, that things will return to their past stability because we have learned from past mistakes, and that we will not repeat them. This view is one of denial. True, we do not have much experience with volatility in telecom to make long-term predictions. And true, we are learning from the recent past. But if we analyze the drivers of the recent volatility, we must conclude that they will be with us into the foreseeable future, and cyclicality with them, just as they are in some other industries unless, that is, we take steps that are at variance with telecom strategy and policy of two decades.

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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. (The only time the industry declined in volume was in the Great Depression, when subscribers dropped temporarily by 16%). One company, AT&T, accounted for 80% of network activity and equipment manufacturing, and provided stability, planning, and an industry-wide umbrella. Its stocks with their steady dividends were treated like bonds by investors. The equipment industry, being also globally diversified, was almost as stable as the carriers. 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.

2 WHY CYCLICALITY?

This question is important, because if we do not know why something happened we cannot predict, prevent, or encourage recurrence.²

There are many competing explanations for economic cyclicality, from sunspots to the alignment of the planets, and to the political election cycle. Over more than a century and a half, many distinguished economists have contributed their views³. I will discuss six main approaches and relate them to the telecom industry.

2.1 The Monetarist View

According to that theory, associated especially with Friedrich von Hayek (1933, 1950) and Milton Friedman (1982), cycles are caused by flawed monetary policy that causes instability. For example, if a central bank changes interest rates incorrectly, consumers and businesses get wrong signals and their expectations lead to reactions that set off instabilities. (Fischer 1997). Whether this theory is correct or not for the aggregate economy, it is probably not applicable to the telecom industry. Interest rates were moderated, and maybe contributed to the bubble; were low but they were much lower in the bust, and yet did not turn the industry around.

2.2 The Keynesian Perspective

Aggregate demand is affected by the mood swings of market participants that often become self-fulfilling. (Keynes 1936, Hicks 1950, Tobin 1975). The key trigger is psychological and on the demand side. Keynes called it the “animal spirits” of entrepreneurs. More recently Allan Greenspan described it as an “irrational exuberance” (Shiller, 2001).

² It is necessary to differentiate telecom from the internet sector. The latter, though interrelated, operates under its own dynamics. Most internet projects were uncertain and unproven due to their novelty, and one should expect exuberance and failures. In contrast, in telecommunications the basic business was well established and stable. The internet’s inherent riskiness was clearer understood than that of the telecom sector.

³ Some of them will be listed as part of the subsequent discussion. Others include, chronologically, Marx (1867), Malthus(1820), Mitchell (1913), Kuznets (1926), Pigou (1927), Kondratieff (1935), Schumpeter (1939), Kaldor (1940), Burns (1946), Abramovitz (1950), Hicks (1950), Lundberg (1955), Duesenberry (1958), Moore (1961), Tobin (1975), Nordhaus (1975), Kindelberger (1978), Blinder (1983). For a review of the earlier literature, see Zarnowitz (1985).
The demand orientation of the Keynesian approach leads Wall Street analysts to look closely at data for consumer spending as leading indicators. But for telecom and the Internet, one cannot really blame a drop in consumer demand on the downturn. True, the growth rate in the Internet subscribership is not as torrid as before – it was “only” 30-40% in 2001 – and Internet minutes per user and day have dropped a bit, as one would expect as more marginal subscribers are signed up. Internet connections increased in America by about 20 million in 2001. Broadband Internet subscribership is up and with it the aggregate bit flow for the Internet. Similarly, the usage of long-distance minutes, data communications, and wireless minutes keeps rising. With double-digit growth rates in actual consumption, it is hard to blame the downturn on insufficient demand.

2.3 Real Business Cycles Theory (RBC)

This theory is a supply side story, going back to Prescott (1983) and others. For RBC advocates, cycles are caused by random shocks and their impact on total factor productivity. The internet was a positive shock. September 11 was a negative shock. Random positive shocks lead to higher productivity, higher output, higher real wages, consumption, etc. For RBC advocates, causality does not run from consumption to output but the other way around. (Espinosa-Vega and Guo, 2001). The theory therefore rejects explanations based on consumer psychology such as “exuberant irrationality.” RBC proponents believe that there is really nothing that governments can do about a cycle since it is based on random shocks.

How does this perspective fit telecommunications? Empirical studies show that single shocks do rarely trigger downturns. But a shock can topple an already weak structure. In telecommunications, several shocks occurred in the same period and added their impact cumulatively. Local competition failed; long distance competition, on the other hand, worked only too well, lowering prices and profits; Wall Street became irrationally depressed when stocks declined from their unrealistic heights; governments extracted future expected profits by auctioning access to a vital resource, spectrum; regulators, often beholden to incumbents’ well-being, held back competitors; etc. But note that most of these events are not the kind of exogenous, technology-oriented shocks that affect productivity, as hypothesized by RBC advocates. They are endogenous financial and institutional variables of the sector itself. They are thus not truly random but systemic.

There is, however, one important factor that can be interpreted as a technologically-based shock, if we take a generous definition of the term. It is the re-emergence of economies of scale through network technologies such as fiber-optic transmission cables and of wireless distribution systems. On the supply side, the fixed costs of networks are rising and the marginal costs are dropping – strengthening the classic attributes of “natural” monopoly. Scale effects are compounded by “indivisibilities” or “lumpiness” in investment, which leads to short-term excess capacity (Darby, 2002). Hence, the advantages of being large are greater than before. As a result, for example, the market share of mobile wireless telecom providers (i.e., relative size) has been a predictor of profitability (Waverman, 2002). And the cost characteristics of wireless firms are inversely related to the absolute and relative size of wireless companies. (Katz et al, 2002).

Similar effects have long been identified for the telecom long distance market (see, for example, Denny, Fuss, and Waverman (1981), Nadiri and Schankerman (1981), Alleman (1983)), as well as for cable TV (Noam 1983,1985). They generally show cost elasticities with
respect to size of 5-15 %). In addition, the technological expansion in capacity has not only increased but accelerated (Noll, 2002).

For a long time, these size advantages in telecom were submerged under the accumulated inefficiencies of the incumbents. But having had to shape up under the pressure of real or threatened competition, they reduced their inefficiencies sufficiently for their scale to overcome the efficiency of small entrants. This is not the classic RBC story, but it is inspired by it.

2.4 Lag and Accelerator Models

These models go back to Samuelson (1939). Small changes in desired capacity levels lead to large differences in capacity expansion, which drives investment. Where there is a delivery lag, unanticipated shifts in desired capacity can generate cycles of investment spending. The key here is the adjustment lag. These lags induce oscillation in the same way that a slowly reacting bathroom shower induces cycles of hot and cold water. The famous "cobweb" cycle is a model of such overshooting. Industry examples are cattle, airline services, and office space — and now telecommunications. Here, investments take a long time to get on line, and disinvestments may take even longer (it took more than a decade for the excess supply of 1980s Texas office space to dissipate.) The lumpiness of investments in telecommunications, coupled with an even slower regulatory and court system, makes the feedback loop very slow. On top of this is the "chicken and egg" problem of applications development depending on networked buildouts and vice versa. Since it is difficult to synchronize the two, developments often progress in spurts. The build-out of networks for broadband-internet capability is a recent example.

2.5 The "Austrian" Theory

This view is associated with Mises (1928), Hayek (1933, 1990), Haberler (1937), Böhm-Bawerk (1895), Wicksell (1936), and Schumpeter (1939). It is focused on overcapacity. Such overcapacity has been created for some reason — whether due to exuberance, excessive bank lending, monetary policy, or other factors. After an adjustment lag there is eventually a downturn. The pattern is one of boom, overcapacity, price war, bust, shakeout. A young industry tends to start off with small firms, and once their product fetches a high price it attracts entry, which expands output and lowers price. This goes on for a while. Industry growth rate slows below that of individual firms, and a shakeout occurs. For example, there used to be 275 tire manufacturers in the US in 1922. Today, less than a dozen survive, even though the tire production as a whole is vastly larger. This view is common-sensical, with numerous examples such as snowmobiles, pocket calculators, bowling alleys, PCs, or movie theaters.

The Austrian view seems to be a fitting description of the telecom industry, in which the various network companies over-optimistically projected long distance market shares that added up to over twice the actual market. Everybody built capacity to overwhelm competitors and gain size. Capital expenditures grew by an annual rate of 29% from 1996-2001. The incremental cost of bandwidth fell by about 54% annually. Overcapacity was assisted by the lumpiness and irreversibilities of telecom investments such as oceanic cables. It was further assisted by the tendency of Wall Street analysts to value a firm’s progress by physical measures of its infrastructure, such as cell-sites and fiber-miles. As the result of these factors, some carriers had over 90% of their fiber “dark” and prices dropped dramatically.
The Austrian theory has its detractors. Paul Krugman, the Princeton economist and New York Times columnist, has called it a "hangover theory" and "about as worthy of serious study as the phlogiston theory of fire" (Krugman 1998), largely because it places the blame for a downturn on the boom itself, and does not explain why each company systematically overestimates its market. Krugman's critique is focused on the macro-economy rather than specific industries, where he accepts the notion of over-expansion. For telecommunications, then, one would need to understand why so many companies were so wrong about their prospects, and why none engaged in a meaningful counter-cyclical strategy.

Paul Samuelson indirectly addressed this criticism by observing that economists have no theory to predict when a bubble in asset prices will burst. It is therefore not "irrationally exuberant" but rather economically logical for an individual to participate in a bubble. An individual's micro behavior may be efficient even if the system is macro-inefficient.

2.6 Externalities

The RBC theory discussed earlier assumes constant returns to scale. That is, if one increases the capital and labor inputs of the firms proportionately, their outputs would grow by the same proportion. But for network industries this ignores the network effects, also known as positive network externalities (Farmer and Guo, 1994) or the Metcalfe effect. An increase in usage leads to greater utility of the product and to increased demand. This increases productivity and real wages and enables further consumption. Growth of other network participants is factored in as part of the value of the product, and leads to still further growth. At some point, however, the expectations of further growth decline, for example as saturation occurs. This leads consumers to reassess the value of the service, and to adjust their consumption to the new value. This reduces demand or at least its growth, which creates negative network effects. And thus, the dynamics that had led the system to go up now take it down faster, too. Network externalities strengthen the oscillations of market demand rather than dampen it\(^4\). If the firms could coordinate their action they could jointly reduce these externality effects, but in a competitive environment they cannot easily or legally do so. This story fits well with the telecom and internet markets of the '90s and beyond.

2.7 Adding up the Theories of Cyclicality

Like the proverbial six blind observers of an elephant, each of these theories gets something right in its views of the drivers of cyclicality. Demand growth has slowed. Investment and regulatory lags prevented adjustment. Network externalities and lumpiness in investments amplified the swings. Economies of scale and network externalities created strong incentives for growth strategies, at the expense of profitability. Financial markets encouraged this strategy. Managers benefited from it in the short run. Yet while expansion made sense for each firm individually, it created a major oversupply in the aggregate.

In telecommunications, technological and economic obsolescence will gradually take capacity out of circulation. Satellites, for example, eventually leave their orbit or burn up. But disinvestment takes time. For Texas office space, it took over a decade in the 1980s to dissipate the excess supply. For railroads, it took many decades. Thus, the capacity overhang in telecom will remain for a long time if it is reduced merely by obsolescence. The key for a

\(^4\) This idea originated with Kenneth Carter.
recovery is a substantial growth in demand, probably from mass-media uses of the internet such as video. When demand has caught up with supply, prices will rise, supply will expand, new entrants will emerge, and every firm will aim at increasing its market share. A new cycle emerges.

3 THE IMPLICATIONS OF CYCLICALITY

Given this emerging cyclicality in the telecom market, what should be the response? I will discuss three types of participants: telecom companies, investors, and governments. The conclusion will be that for the private sector participants the strongest strategy is to deal with cyclicality by seeking (or financing) an oligopolistic market structure. This, in turn, has implications for government policy.

3.1 Telecom Companies

There is, of course, no shortage of potential actions for telecom companies to take. They must start with an intense self-analysis. Firms, managers and owners need to disentangle their firm’s performance from that of their industry, their customers and suppliers; and the regional, national, and global economies. This is not easy. But it is necessary in order to judge management’s performance. Following such analysis, several strategic options exist.

- **Cut cost and contract.** A downturn puts pressures on the firm and makes cost-cutting more acceptable. Similarly, a downturn provides an opportunity to change the internal structure and shed marginal operations. It may also include the deferral of innovation due to its riskiness. This strategy works best if competitors, too, follow it and slow the rate of their own investment in innovation.

- **Expand in the downturn.** The opposite strategy from contraction may also make sense. The prices to acquire other firms through mergers or to expand by internal investment drop in a downturn, and it is a good time to get ready for the upturn, especially where lag times for investments are long. However, in many countries the dominant telecom incumbent cannot easily be contrarian, because it may account for 80% or more of the market. This strategy might work better for a small firm—assuming it can raise the capital in a downturn, which is a fundamental dilemma. One conclusion is that a strategy of expansion of capacity by internal growth makes less sense than the acquisition of a competitor’s capacity. Such a merger does not add to overall industry capacity (which would lower prices and profitability) but instead eliminates a competitor, which may result in higher returns.

- **Design the firm for downward (and upward) flexibility.** Firms need to operate with built-in adjustments for the cycle. They need to implement scalable technology and flexible labor costs, for example, through profit sharing, commissions, and outsourcing. However, the labor component is becoming smaller as capital-labor ratios increase in the economy, and is therefore becoming less of a factor than it was in more labor intensive days. Similarly, firms need to engage in financial hedging. And in their capital structure, firms need to substitute corporate debt for convertible debt or preferred equity because this enables them to reduce a debt load in a downturn. In contrast, the capital structure of large telecom firms has become weighed by debt: it was 325% of
market capitalization of France Telecom in 2001/2; 163% of Deutsche Telekom; 60% of BT; 66% of Telefonica.

- **Diversify in product markets and geography.** Diversification reduces risk in some ways, but may also get a firm to move outside its core area of competence, which raises risk again. Expansion into other countries creates exposure to political vagaries. Vertical expansion into related elements of the value-chain may create synergies (economics of scope) but may tie one part of the firm to others within the same corporate family, even if their inputs are costlier and less desirable. It can also lead to competition with one's own customers. And, any expansion into multiple product lines inevitably creates and requires changes in the firm's corporate culture, which may entail significant and mostly hidden costs.

- **Avoid a heavy debt load.** In the downturn, cash is king. It reduces payment obligations and enables acquisitions. In the recent past, even established telecom firms have loaded up on debt in dramatic ways, and the result is that they are hurting in the downturn. Some of the reasons for such debt load was that the resource requirements of global and product expansion are huge, for example for the move to next generation wireless. Add to that the expense of firms engaging in empire building and the shortening of product cycles of technology, and the debt begins to balloon. Deutsche Telekom paid over $40 billion for the second-tier mobile carrier Voicestream; France Telecom paid $30 billion for Orange; and Vodafone paid $180 billion for Mannesmann. After the 1996 Telecom Act a huge investment boom took place in the industry, in the order of $1.3 trillion. Between 1999-2001 alone, US telecom firms borrowed over $320 billion from banks. Credit was not difficult to obtain, and banks often accepted a subordinated creditor status without much collateral. But the revenues per investment dollar dropped. In 1996, according to Lehman Brothers, it was $5.08. But in 2001 it had fallen to $2.84 (Darby, 2002). Merrill Lynch estimates that return on equity for the telecom industry declined from 13.8% in 1996 to 5.9% in 2001. In consequence, investments are expected to decline by an annual average rate of -14%. Verizon alone invested 33.7 billion over the period 1999-2002 with limited impact (Stern, 2002). Qwest's debt load in 2002 was $25 billion. Around the world, the same story can be told. Deutsche Telekom's debt is $64 billion, France Télécom's $68 billion, and Telefonica's $20 billion. As a percentage of revenues, France Télécom's debt is 141%, Deutsche Telekom's 140%, Telefonica's 92%, BT's 75%, and Telecom Italia's 67%. Even these mountains of debt are being understated by various accounting practices. The cumulative debt of the seven largest European telecom firms exceeded $210 billion in 2002, greater than GDP of Belgium. It required some firms, on a daily basis, to commit over $10 million for debt service. In theory, firms without leverage will do better in downturn. But economy-wide studies also show that some highly leveraged firms have been helped in downturn by banks which cancelled payments rather than foreclosed. (Field, 1985, in Mascarenhas and Aaker 1989). Similarly, governments may be helpful in the downturn when it affects several firms in an essential industry. Given such a safety net, big telecom firms had fewer reasons to be prudent. But they had an incentive to be too big and were not permitted to fail, and this, encouraged expansion.
- Engage in price-cutting. This strategy has drawbacks when price-cuts are matched by competitors. Hence, there are incentives to oligopolistic cooperation entailing the mutual reduction of capacity rather than engaging in price wars.

To conclude: many of the strategies in a downturn have common elements that make them successful: expansion and consolidation of surviving firms within the industry, and collaboration, to the extent possible, with one's competitors.

3.2 Investors

In the past, the underlying assumption for government policy in telecommunications policy had been that if one gets a competitive structure in place, investment will follow efficiently and plentifully (Darby, 2002). The present downturn negates this assumption in the short run (which is tolerable) and possibly in the long-run (which is much less tolerable).

For better or for worse, there have been increasingly close linkages between financial markets and the real economy, with the links forged through such instruments as securitization, derivatives, and leveraged investments. Financial markets are also becoming increasingly volatile, as risk taking becomes easier but risk assessment harder. These trends, taken together, mean that financial turbulence makes industries more vulnerable to financial shocks.

Wall Street has thus been part of the problem, though it has also paid dearly for it, in money as well as credibility. Risk and market power should have been factored in, as should have been the price deflation due to competition and over-capacity. Share prices seem to move in ways that seem unrelated to the underlying discounted value of cash flows. In fairness, it is hard to value companies in volatile industries, both conceptually and institutionally. “Consensus” earnings forecasts have been useless for investors in cyclical industries, especially for startup firms in high-growth, high-risk industries. Forecasts tend to be rosy and asymmetrical. According to a McKinsey study, for volatile industries the forecasts are generally upbeat, and “the forecasts don’t acknowledge even the existence of a cycle” (de Heer and Koller, 2000). Why this positive bias? Maybe it is the pressure of the investment banking part of the firms to avoid unfavorable evaluations of companies which would lose them as clients. Maybe it is the opaque accounting practices, and proliferating derivative securities and stock options that make assessments difficult.

According to Joseph Stiglitz (2002), deregulations are always associated with periods of frenzied activity that tend to go wrong. And indeed, after the 1996 Telecommunications Act, financial markets gave the wrong signals to firms by raising stock values enormously. They evaluated unprofitable startup firms by proxies such as fiber miles and cell sites. This led telecom firms to over-invest in such physical elements, and to an over-investment in such firms. The bubble was further fed by the ability to borrow against the rising value of the stock; later, when stock values dropped, this necessitated sell-offs and led to further price declines. Traditional theory has it that investors look at total risk - market risk plus financial risk. If they are additive, then high market risk in this sector should have been offset by investor unwillingness to support highly leveraged capital structures. But, it seems just the opposite happened. Eventually, rapid changes in market expectations led to rapid reassessment of asset prices. This caused massive reductions in asset-holder’s wealth, which lowered expectations further. As that happened, zooming share prices ceased to be a motivation for investments, and the new entrants rapidly fell out of favor since they could not offer any earnings or service their debt. Confidence was further shaken by questionable accounting practices.
Studies show that the inability of lenders like banks to discover the relevant characteristics of borrowers’ projects, e.g., when information is asymmetrical, leads to poor projects driving out good projects. This is Akerlof’s “lemon” principle (1970). In the new media and telecom sectors, lenders’ and investors’ ability to evaluate projects has declined, and with it the quality of loans. When this became obvious even to the investment bankers, they raised the threshold, cutting off in the process projects they could evaluate before.

Investors now favored incumbent telecom firms, which looked much better than before when they had been derided as “dinosaurs” by the financial community. In contrast, the financing of new entrants largely dried up. If anything, further stability was desired. The incumbents’ traditional shareholders seek a utility-style stock with predictably steady dividends. When the industry becomes volatile, such investors leave. Market power, on the other hand, lowers risk, and raises prices and cash flows. One can see how market power benefits market valuations. In America, rural LECs, facing little prospect of competition, maintained their value much better than other telecom firms. In other countries, Telmex did better than most large incumbents, mostly because of its hold over the Mexican market. Its stock rose 28% in the first four months of 2002.

3.3 Government

The wisest thing for government would be to ride out the cycle, but a hands-off policy might not be easy to maintain. Cyclicality is undesirable to government. When it comes to Schumpeterian dynamics of “creative destruction”, governments dislike destruction even more than they fear creativity. Clearly, too much stability is also undesirable. See the example of Japan. What is the proper level of stability? Too little of it reduces innovation, but too much stability does the same. An optimum instability might exist, but it is difficult to agree on that level. Entire political philosophies hinge on the different views on the acceptable societal risk.

To the extent that volatility raises uncertainty it also raises the cost of producing telecom services, which is an essential and universal input. This also has some distributional implications such as fluctuations in employment. And through network effects, everybody is negatively affected. The losses from cyclicality can be substantial. Estimates of the economic losses from the oversupply in US of office space in the 1980s are $130 billion, in lost rents only, without counting the secondary effects of reduced tax receipts and negative multiplier impacts on the rest of the economy.

Imagine the impact of a telecom downturn on smaller countries where a telecom firm has a large presence and is affected by shocks originating from the outside. In Finland, Nokia accounts for 35% of exports and 14% of GNP. Similarly, the telecom sectors of less developed countries have become more volatile as they have opened up to the rest of the world and become engulfed in external instabilities over which they have no control.

All of this and more are reasons for government to fear cyclicality and to engage in countervailing policies, even though government policy may also be a contributing cause to cyclicality, for example through regulatory delay. If such involvement is likely, for better or for worse, what are the potential tools of government for dampening the cycles of the telecommunications industry? Some such tools are discussed in the following and they should be read as a list of potential actions rather than as recommendations.

- **Flexibility in taxes and other payments.** The US telecom industry is subject to telecom taxes beyond the regular business taxes. Those taxes could be automatically adjusted through the cycle if the tax rates were levied on earnings rather than on revenues.
Similarly, spectrum license auctions could be structured in a way that would collect payments over the life of the license, with annual collections based on earnings, and would thus become an automatic stabilizer.

- **Flexibility of retail price regulation.** Retail prices, if regulated, could be adjusted through the cycle, again by automatic adjustments such as the inclusion of a growth rate factor in the price-cap formula.

- **Flexibility of wholesale prices.** If one can pick a single variable that is potentially most effective in influencing telecom prices and the relation of incumbent and competitors, it is the wholesale price of interconnection.

That price, charged by carriers to each other, is regulated, and is usually set by some result-oriented economic methodology such as TELRIC or ECPR (Noam 2001). Such a price could be made variable and dependent on the state of the telecom market. If the entrants falter as a group, the interconnection prices could be lowered. If incumbents weaken as a group, on the other hand, one would raise interconnection prices. Some formula might be established in advance to deal with those situations. Or, the regulatory agency could vary the price to affect the sector in the same way that a central bank uses the discount rate.

Such variability of prices may seem to create uncertainty. But certainty does not mean a fixed stability. It can also mean a dynamic regulation that adjusts predictably over the cycle. In practical terms, it means that counter-cyclical government policies need to be as automatic as possible, and indexed to defined variables. Even then, such measures increase the complexity and extent of government involvement.

- **Industrial Policy.** Government could support the creation of demand in order to increase utilization of networks, or support new entry. Examples might be the creation or distribution of content such as distance education or health delivery, and the release of spectrum to new service providers.

- **Competition Policy.** Perhaps most important is the government's policy in permitting or preventing market power. The process of consolidation is far from over. Where competition exists, especially in long-distance and wireless, the number of carriers is likely to decline. The challenge is therefore to deal with an environment of potential oligopoly. On the one hand, oligopolies help generate greater profitability and lower volatility. The downside, of course, is that the users pay for this greater profitability in higher prices, potentially lower service quality, and slower innovation. Several of these problems might be dealt with onside of the market structure, by regulation such as price caps or minimum service level requirements, triggered by high levels of market concentration. Similarly, rules that keep the market open to potential entrants might establish a “contestability” that can be an effective dampener on oligopolistic behavior.

### 4 CONCLUSION

Overexpansion, by itself, is a hallmark of health, not weakness. At one time or another, there were hundreds of companies making automobiles, motorcycles, airplanes, tires, and micro-
computers. One of the functions of slowdown is consolidation. That is, to reduce competition, to reduce the commodification that lowers profitability and future investments. This must be a telecom firm’s overriding strategy (together with designing the firm for downward flexibility and avoiding excessive debt, to deal with the next cycle if they survive the present one). The present contraction will therefore inevitably raise industry concentration, slow innovation, reduce capacity expansion, and raise prices. (This strategy will, of course, be publicly denied by the survivors.) Regrettably but realistically, what will turn the telecom industry around will not be more competition but more of an oligopolistic market structure, coupled with increasing demand. (A positive technology shock might also do the job, but one cannot base the future of essential infrastructure industries on unexpected events.)

For public policy, this suggests several alternatives. The first alternative is to let nature take its course through the business cycle, relying on natural contractions and expansion cycles. This approach recognizes realistically the difficulty in identifying problems and creating timely and workable solutions to them. However, this policy is less likely to be chosen by politically sensitive regulators when the downturn persists, when essential service providers falter, and when service quality deteriorates.

The second option is for government to take an activist, almost macro-economic, approach to the sector and try to raise it from recession. This would involve significant and ongoing intervention. A related but less intrusive strategy would be to automatically adjust existing rules and requirements over the business cycle, as discussed in the section above.

The third option is to permit industry to stabilize the market by creating oligopolies, and to deal with the inevitable negative fall out by regulations that protect consumers and others. This would require a fairly radical departure from the regulatory philosophy of the past 20 years. For a generation now, liberalization, deregulation, and competition have been the keystones of telecom policy and strategy. Now, one business cycle later, and facing future volatility, we may have to get used to the idea of living with a regulated oligopoly in telecom rather than the hoped-for unregulated competition.

The volatility of the telecom sector thus points to a scenario of market power and regulation, not of competition and of the withering away of governmental intervention. Government policy, investor behavior, and telecom management will all have to become responsive to periodic volatility and vary across it. The cyclicality of the industry will thus lead to a cyclicality of behavior within and towards the industry. And the effect of such volatility on the telecom market structure will lead to a new model of regulatory policy.

5 REFERENCES

Abramovitz, Moses (1950), Inventories and Business Cycles, with Special Reference to Manufacturers’ Inventories, NY: NBER.


Burns, Arthur F. and Wesley C. Mitchell (1946), Measuring Business Cycles. NY: NBER.


Kuznets, Simon Smith (1925), *Cyclical Fluctuations; Retail and Whole-Sale Trade, United States, 1919-1925*, New York: Adelphi.


