FINISHING THE JOB

OF TELECOMMUNICATIONS REFORM IN NEW ZEALAND

Comments on Commerce-Treasury's Discussion Paper

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November 1995

0. Summary of Argument

- The root cause for the persistent lack of progress toward competition in New Zealand telecommunications can be found in Telecom's origins: privatization and deregulation created a *de facto* monopoly;
- Telecom's monopoly is sustainable against competition despite the disappearance of natural monopoly conditions throughout telecommunications markets;
- Grants of monopoly are economically beneficial in some circumstances, but those conditions no longer prevail in telecommunications;
- The presence of network externalities and user switching costs, alone and in combination, can permit incumbents to exclude innovative entrants who are unable to achieve economies of scale;
- Due to network externalities and the rapid pace of technical change in telecommunications, dominance is especially detrimental to economic welfare;
- The portion of Telecom's economic profits derived from its *de facto* monopoly does not serve the purpose of promoting dynamic efficiency;
- A close analogy exists between intellectual property protection of computer software and monopoly provision of telecommunications bottleneck services, where in both cases a little monopoly power can be extremely harmful;
- What is needed is a "level playing field" that restores *ex ante* efficiency in the allocation of production, a situation approximating the formation of the cellular and cable industries in New Zealand;
- Legislation is needed that completes New Zealand's reform of telecommunications by de-monopolizing Telecom while preserving the "light handed" approach to regulation;

- The legislation should require: (i) delineation of bottleneck resources, (ii) opening of access to these resources to legitimate carriers, and (iii) access on reasonable and nondiscriminatory terms and conditions.
- As disputes inevitably arise, the courts should be responsible for delineating the bottleneck services while binding arbitration should be used to deal with disputes over the terms and conditions of access.

1. New Zealand Blazed a Trail in Telecommunications Reform

Demonstrating uncommon foresight and initiative, the New Zealand government blazed a trail in telecommunications reform, and only recently has the rest of the world begun to catch up. Making an about-face away from state ownership, it embraced market mechanisms to move the telecommunications sector toward efficiency and growth. The state-owned network was divested from the Post Office, denationalized, and eventually privatized. The resulting entity, the Telecom Corporation of New Zealand Limited (or "Telecom"), was stripped of any legal franchise. Statutory impediments to new entry including all licensing of service and equipment providers were removed. Refusing to install an industry-specific regulator, the government relied instead on general competition law to protect the interests of competitors and consumers. This unique brand of "light handed" regulation can best be summarized as private negotiations in the shadow of antitrust law.

The reform has produced many tangible benefits. Rates have fallen in real terms; service quality and reliability have shown marked improvements; substantial amounts of money have been invested in network modernization.[1] Nevertheless, rates remain among the highest of all the industrialized countries. As the country approaches 100% digital service, the penetration rates continue to fall. Furthermore, many of these improvements can be attributed to the entry of competitors.[2] And yet, while there is no lack of willing entrants, emergence of effective competition has been tortuously slow. This has been largely due to the inability of new carriers to achieve agreement with Telecom over terms and

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[1] TELECOM REFORM IN NEW ZEALAND: 1987-1994, Telecommunications Information Leaflet No. 5, Communications Division, Ministry of Commerce, Mar. 9, 1995.

[2] For instance, see TELECOM REFORM, op. cit., p.11 for examples where Telecom's service improvements were in direct response to Clear's innovations.

conditions of interconnection. Instead we have seen interminable negotiations often culminating in private or civil litigation.

Eight years after legislation first set in motion the present reform, the patience of Telecom's competitors, users, and government officials with the current arrangement has worn thin. It is against this backdrop that the Ministry of Commerce and The Treasury have undertaken a review of the options for facilitating progress toward a more efficient and competitive telecommunications industry.[3] They should be commended for their thoughtful framing of the policy issues and thorough analysis of the various alternatives.

In my comments I will argue that, if left unattended, the current problems will persist because their root cause remains intact. The source of these problems is the very origins of Telecom: the government grant of private monopoly power. Ironically, on the road to a competitive telecommunications industry, New Zealand chose to begin by creating a monopoly. This would not be a concern if the monopoly was short lived. In fact, conditions prevail in this industry that work to sustain Telecom's dominant position and greatly amplify the distortions created by it.

Following this reasoning, I conclude that the task of forming an efficient telecommunications industry is not complete. The missing final step of the reform is the "de-monopolization" of Telecom. This requires that Telecom's control of bottleneck resources be "neutralized" so as to prevent monopoly abuse and the accompanying welfare losses. Most likely, this can best be accomplished through legislation which stipulates that those resources that constitute a bottleneck be identified, and offered to competing carriers on reasonable and nondiscriminatory terms and conditions. Without such actions Telecom may be able to exercise monopoly power indefinitely, or at least long enough so that the New Zealand economy forfeits the substantial benefits that a dynamic telecommunications sector can deliver.

2. Privatization and Deregulation Transformed a State Monopoly into a Sustainable Private Monopoly

[3] REGULATION OF ACCESS TO VERTICALLY-INTEGRATED NATURAL MONOPOLIES: A DISCUSSION PAPER, Ministry of Commerce and The Treasury, August 1995.

Denationalization and privatization of Telecom in 1987 and 1990, respectively, created a monopoly over New Zealand telecommunications. Telecom acquired complete control over all final services including local transport and switching, and domestic long distance and international services. Vertical integration of Telecom's monopoly was also nearly complete as it extended into customer premise equipment and enhanced information services. Except for equipment manufacturing and research and development, Telecom had the pervasive reach enjoyed by another private monopoly, AT&T, before that company was divested in 1984. Importantly, Telecom gained control over resources essential for other carriers to compete in nearly every service market. These include network rights of way, conduits, ducts and utility poles, phone numbers and directory listings and services, customer billing information and specification of technical and service standards necessary for interconnection and interoperability.

At the same time that Telecom's monopoly was being formed, dramatic changes in the cost and technology were underway transforming telecommunications into a workably competitive industry. Steadily declining costs of factors of production—especially cost reductions and technical improvements in microelectronics and fiber optics—lowered barriers to new competition. Innovative delivery technologies were also being perfected (*e.g.*, fiber optics and digital wireless transmission) that opened up entirely new avenues for entry into telecommunications markets.

One might conclude from these events that any monopoly that Telecom inherited through privatization would be short lived; if Telecom remained dominant after the onslaught of competition, we would have to attribute its survival to its resourcefulness and industriousness. In fact, market conditions prevail that artificially sustain Telecom's dominant position. Several factors contribute to its sustainability.

Sunk Investment. First of all, an effective means of deterring entrants derives from the sunk investment in the facilities, equipment and software needed to provide telecommunications services. Telecom is prepared to battle fiercely to preserve its market against interlopers by cutting prices down to negligible avoidable costs, discouraging all but the most innovative entrant.[4]

[4] The advantages that Telecom enjoys as a result of its sunk investment is greatest when the services offered by entrants are undifferentiated.

Like any first mover, Telecom enjoys a competitive edge over late comers in terms of its name recognition, its knowledge about equipment suppliers and users' preferences, and so on. In competitive industries profits derived from such advantages are just rewards for the first mover's initiative and foresight. That is not the case for Telecom which inherited ownership of the national network by default.

Network Externalities. A prominent feature of telecommunications markets that helps secure Telecom's monopoly is "network externalities." The value that a user derives from being "connected" to a network increases in the number of other users that are connected.[5] Starting small, new entrants are unable to offer users the same value as would an incumbent's ubiquitous network—assuming the two networks are not interconnected. Individually, users face weak incentives to switch to a new entrant without assurance that their actions will be followed by a large number of other users.[6] For this reason interconnection with the incumbent's installed base of customers is essential to entrants' viability. Inferior access to the incumbent's customers, or outright refusal to interconnect, greatly raises the entry barriers facing competitors. Such exclusionary behavior might be justified if the monopoly position represented a reward for efficient behavior, but that is not the case for Telecom.

User Switching Costs. Another important source of entry barriers derives from real and intangible investments made by users related to provision of service by Telecom. Many of these "user switching costs" cannot be costlessly reused should the subscriber wish to switch to another provider. Perhaps the single most important source of switching costs is a user's phone number. Before switching to a new provider, a user must re-invest in disseminating the new number to others. Large business users may incur penalties for terminating long-term service contracts, and then face lump-sum connection fees for commencing service with a new provider. They may also have to purchase specialized equipment if their current equipment will not work (*e.g.*, analog cell phones).

Because users perceive a high price to purchase from an entrant relative to remaining with Telecom, switching is discouraged. Furthermore, joining a fledgling network will forgo large network externalities of Telecom's network if interconnection is not assured. Even with a clearly superior

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[5] The phone network is the quintessential example illustrating these external effects since phone service is useless if there is no one else to call. This phenomenon also appears in other network industries—*e.g.*, electric power, natural gas pipelines, and cable television—but to a much lesser degree because of the one-way nature of their networks.

[6] See the discussion of "excess inertia" in Joseph Farrell and Garth Saloner, "Standardization, Compatibility, and Innovation." RAND JOURNAL OF ECONOMICS, Spring 1985, 16 (1), pp. 70-83.

service, a new entrant may be unable to sign up enough new subscribers to rationalize the high fixed costs of entry.

In fact, Telecom has met with many entry attempts, and some of those remain viable today. Indeed, Clear currently holds a 20% share of the long distance market. We must remember, however, that the long distance market is a relatively small segment of the New Zealand telecommunications industry, given the high concentration of the population in a few cities. Contrast this with local telecommunications where years have passed without significant reduction in Telecom's dominance.

More important, however, the presence of entrants fails to prove that Telecom's dominance is unsustainable. It does not make good business sense for Telecom to fight each entry attempt in every one of its markets. To do so would require it to cut rates across its large customer base. Rather than suffer the corresponding large losses in revenue, it is preferable to permit entrants a small share of selected markets.

Besides, Telecom can extract much of the profit from entrants who introduce vertical services without bearing the expense and risk of additional network investments. A bottleneck monopolist may welcome entrants into the market.[7] By using access charges that discriminate against traffic that runs over the rival's network, a bottleneck monopolist is able to extract the lion's share of the profits created by the new service. Research shows that restrictions on the extent of the bottleneck monopolist's ability to price discriminate may lead it to refuse to interconnect at all.[8] It can also be demonstrated that the incumbent's incentive to foreclose is much greater when the entrant credibly threatens to completely bypass its network.[9] This helps explain why Telecom and Clear came to terms so quickly on interconnection for long distance services, whereas negotiations dragged on for years when Clear sought interconnection for local service, thereby threatening to completely bypass Telecom's network.

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[7] The motivations for this phenomenon are developed more fully in Nicholas Economides and Glenn Woroch, "The Benefits and Pitfalls of Network Interconnection," New York University Working Paper, June 1992.

[8] See Nicholas Economides and Glenn Woroch, "Interconnection and Foreclosure of Competing Networks," paper presented at the International Telecommunications Society Workshop on Interconnection and Interoperability, Wellington, NZ, October 1995.

[9] "Interconnection and Foreclosure," op. cit.

Attempts to exclude entrants into competitive segments of the telecommunications sector may involve an outright refusal to interconnect, or more subtle pricing arrangements that "squeeze" unintegrated rivals. Either way, the bottleneck monopolist is seen as "managing" the competition that it faces in potentially competitive markets. Telecom has demonstrated its willingness to abuse its dominant position. Aside from protracted negotiations over interconnection, Telecom was found guilty of s.36 violation in its delay to provide non-code access to Clear. And prices for Telecom services not facing competition rank among the highest in the world.

3. Grants of Monopoly Power Can Make Economic Sense, But Can Be Especially Harmful In Network Industries

In certain instances, governments deliberately create monopolies, and their actions are justified on economic grounds. Arguably the best example is the creation of monopoly rights over the use of intellectual property. Investors and authors are assigned rights to exclude others from using their works to stimulate them to invest time and money in creating them in the first place. Without such rights, imitation or outright duplication of innovative ideas would reduce returns to an invention down to the point where it is no longer worthwhile to develop and disseminate the ideas.

Governments willingly accept the tradeoff between increased incentives for innovation and the allocative distortions inflicted on the economy as a result of monopoly power. Besides the usual above-cost monopoly pricing that leads to limited dissemination of the works, rights holders may "squeeze" competitors by setting exorbitant license fees, or simply refuse to license at all. Without the prospect of technical advances leading to lower prices and improved services, occurring at a brisk pace, the social cost of the grant of monopoly power does not make economic sense. In the case of telecommunications, the creation of a private monopoly out of a nationalized firm fails to have the beneficial incentive effects that justifies the resulting allocative and dynamic inefficiencies.

It would be naive to expect that the telephone industry will be free of monopoly any time soon in New Zealand or any country. Economies of scale and scope ensure that a high level of concentration will continue to characterize this industry.[10] Nevertheless, the rapid pace of technical change offers

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[10] This does not imply that fully vertically-integrated carriers are inevitable, however, or that the boundaries of monopoly should extend to the national borders.

industrious, innovative entrepreneurs the opportunity to overcome the dominant position of an established incumbent.

Some of the same characteristics, however, that ensure the persistence of monopoly in telecommunications markets also greatly amplify its social costs. Network externalities again play an important role. In markets without these effects, high monopoly prices inflict a social loss on users who are unable to buy but who value the service more than the marginal cost of producing it. When network externalities are present, not only are these "rationed" users harmed, but all current and future users forfeit the benefits they would derive from a larger network if those sales had occurred.

We also know that such "dead weight triangles" tend to be much smaller than the "efficiency rectangles" that are lost when an innovative competitor is foreclosed through the exercise of monopoly power. Those social losses will add up quickly given the rapid pace of technical change in telecommunications. Furthermore, if innovation is cumulative—as it typically is in telecommunications—exclusion of innovative rivals breaks the chain of technical progress. In that case, the industry will realize cost declines and service improvements at a leisurely pace, if at all. Worse, the incumbent can lock into a technology that is inferior to available alternatives.

4. Intellectual Property Protection of Computer Software Offers an Instructive Analogy to Telecommunications Monopolies

It is instructive to return to the earlier discussion of intellectual property protection because of its similarities to monopoly in telecommunications services. In particular, control over such resources as access lines, phone numbers, directory services, and so on are similar to control over the interface specifications that allow files and programs to be exchanged between different software packages. Just as a patent or copyright can block competing software makers, control over these telecommunications resources can exclude entrants.

A lively debate has ensued among economists and legal scholars over whether certain types of computer software (in particular, "interface specifications") should be protected from imitation by

copyright or by patent or by no protection at all.[11] The concern is that, through its ability to foreclose products wishing to be technically compatible, the intellectual property holder is able to block competitors and extend its monopoly into adjacent markets.

As mentioned, every market confers some advantages on its first movers, and profits earned from this head start represent just reward for foresight and initiative. The difficulty arises when these rewards do not, in turn, stimulate efficient behavior because they are out of proportion with the contribution to social benefits. In those situations where the contribution of the first mover is very small (*e.g.*, design specifications are arbitrary or uninnovative, and would have been resolved with equal effectiveness in short order anyway), the intellectual property can easily be over protected, resulting in too few products that are too costly to develop.

How does this software analogy apply to New Zealand telecommunications? In both cases of software interfaces and telecommunications bottlenecks, owners control resources that are "essential" for a new entrant to establish itself in the industry.[12] In both, strong network externalities and large user switching costs combined with scale economies make it difficult for entrants to break into the market.[13] In addition, the cost of duplicating the protected resource is prohibitive, and incumbents' sunk investment makes them willing to engage in fierce price competition.[14] To sum up, in such markets it is easy for a little monopoly power to go too far.

The crucial difference between the software story and New Zealand telecommunications is that dominance over a software market is usually earned through competition, whereas Telecom inherited its monopoly by default. Experience also reveals that an incumbent monopolist can more easily be

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[11] Frederick Warren-Boulton, Kenneth Baseman and Glenn Woroch, "The Economics of Intellectual Property Protection for Software: The Proper Role for Copyright," STANDARDVIEW, June 1995; and in this same issue Joseph Farrell, "Arguments for Weaker Intellectual Property Protection in Network Industries."

[12] On one level the software analogy is perfect because the incumbent monopolist in telecommunications creates software or technical specifications with which any entrant must be compatible.

[13] Switching costs arise with software as users invest time and money in a program and complementary hardware, software and services. Network effects are also present because users wish to share files and expertise with a large base of users, and to select from a wide range of third-party complementary products and services.

[14] The essential resource may or may not be vertically integrated with complementary products. This occurs in software when an operating system developer also markets applications that face competition from third party suppliers. For examples illustrating the parallels between telephone networks and computer and audio-video component systems see "Benefits and Pitfalls" op. cit.

dislodged from a software market than a telecommunications market. Finally, the incremental cost of joint use of the essential resource (*i.e.*, computer code) is nil for software, while the cost for network bottlenecks can be substantial (if near capacity). This raises all the issues of efficient prices for bottleneck services (an issue that arises if the software in question is licensed) and to which we now turn.

5. Alternative Scenarios for the Restructuring of New Zealand's Telecommunications Sector Help Define A "Level Playing Field"

The current situation of an entrenched monopolist was entirely avoidable. Imagine for the moment that, rather than privatizing the existing network, the New Zealand telephone system had to be rebuilt from "scratch." In that event, we would expect that several companies would enter each of the various service segments (CPE, local, long distance, cellular, international, pay phones, paging). This would be followed by a shake out and consolidation through divestiture, exit and merger. In the end a few carriers might provide nationwide long distance service and in all likelihood a single provider of landline residential service would prevail in each local area. We would expect several wireless carriers to serve these same areas and a number of suppliers of high-end business service in dense urban centers.

Building an industry from scratch is essentially what is happening in the cellular telephone and cable television industries in New Zealand. Of course, to rebuild the country's telephone system, however, would be terribly wasteful. Yet, while this conceptual exercise is pure fantasy, it does lead us to a benchmark that pricing policies should attempt to approximate.

As the Discussion Paper emphasized repeatedly, the goal of policy in this instance is to promote economic efficiency.[15] Efficiency would require: (i) competition among established firms should allocate each sale to the low-cost provider, and (ii) ensure that entry should occur when the entrant brings about a net increase in total welfare. Effectively we are attempting to achieve the much-sought-after "level playing field." The first principle requires some care to implement, especially when one of the firms has a first-mover advantage.[16] Specifically we seek to have the incremental transaction (*e.g.*,

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[15] Two other goals are timeliness and predictability. These should be subordinated to efficiency because they may be in conflict. For instance, deployment of a new technology can occur too quickly, and delay of interconnection negotiations may be due to the lack of gains to trade.

[16] See Michael Salinger and Glenn Woroch, "Symmetric/Asymmetric Regulation of Telecommunications," discussion paper presented at the Second Annual Boston University Telecommunications Policy Forum, May 1995.

the next call or next subscriber) served by the least-cost provider absent the sunk investment.[17] If not, then either because of regulatory policy or strategic behavior, firms are not being treated symmetrically.

6. It Is Necessary to "Neutralize" Telecom's Monopoly Control of Bottleneck Resources

Pricing of interconnection remains a stubborn obstacle on the road to a competitive telecommunications industry. Top priority is to neutralize Telecom's monopoly over essential facilities, allowing entrants to gain access to these resources on efficient terms. This requires:

(1) delineation of resources that constitute bottlenecks,
(2) open access to these resources requested by legitimate carriers, and
(3) assurances of access to these resources on reasonable and nondiscriminatory terms and conditions.

Each one of these three requirements needs careful explanation.[18]

Bottleneck Services. The question to be answered is What resources does Telecom control that, when made available to other carriers, would contribute to overall efficiency? The answer, in general terms, is those services which are essential for entry and which otherwise are subject to serious monopoly abuse. Services required by entrants may include scarce rights of way, ducts, poles and conduits; phone numbers and directory services; databases of customer names and addresses; technical specification of hardware and software interfaces; and possibly customer access lines.

Whether these various resources can be used anticompetitively by Telecom must also be verified. First and foremost, services which have strong tendencies toward monopoly because of network externalities or user switching costs should be singled out. For instance, phone numbers involve large user switching costs, and hence, control of them can be used to raise entry barriers. Interface

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[17] If services differ in quality, then the definition should be modified so that, in equilibrium, the service that offers the greatest surplus of value over cost should win the business.

[18] The Discussion Paper's coverage of related issues drew surprisingly little response from commenters. Perhaps they were exhausted by the time they reached the final three questions in the Paper's list. Or perhaps mention of a "gatekeeper" led them to dismiss these issues summarily.

specifications involve large network effects and so again control over their design can be used anticompetitively.

We would want to exclude services provided through Telecom's initiative and not using assets and property rights that it inherited through privatization. Services that are competitively inspired and not protected by legal entry barriers are best left to private control. There may also be services that Telecom is technically capable of providing but chooses not produce—neither for its own use nor for use by competitors—could be considered a bottleneck resource.[19] This might reflect an attempt to foreclose competition, and in that event the unavailable services should be classified as a bottleneck service.

Open Access. The next issue is: To what extent should bottleneck services be made available? Any service provided by bottleneck resources is a candidate for open access. Access should be extended to all competitors whether they are in the business of supplying telecommunications services or are in some other line of business but are consumers of telecommunications. However, providing access to different purchasers will incur different transaction costs, and these need to be considered when mandating open access. It is possible that the cost of providing access to some customers could outweigh the economic benefits from this transaction.

Reasonable and Nondiscriminatory Rates. Once the bottleneck services have been determined and the range of access established, it is necessary to settle on the terms and conditions for access. Efficiency should again be the guiding principle. Here it should be adapted to ensure that *ex ante* efficiency prevails. Terms for the bottleneck services should not permit Telecom (or subsequent owners) to exploit ownership rights it inherited. At a minimum, rates should lie between long-run average incremental cost and the average standalone costs of production. Each of the two bounds should be computed using the best available technology, which may not necessarily be the technology used by Telecom.

Furthermore, rates for bottleneck services should not pass through that portion of monopoly rents that Telecom earns on final services as a result of its control of the bottleneck resource. For this reason, the "efficient components pricing rule" as it is usually expressed is unacceptable.

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[19] A service like this is analogous to a "sleeping patent" in intellectual property protection.

Rates should be nondiscriminatory so as to preclude the "squeezing" of competitors that is possible with access prices. This needs to be interpreted in a limited sense, however: all carriers should be able to purchase off the same fee schedule, although that schedule can offer great variation in rates depending on, *inter alia*, the size of purchase. However, nothing should prevent Telecom from varying per-unit charges across carriers reflecting, for example, the reduced production and transaction costs of serving large business or government users.

7. These Measures Preserve New Zealand's Commitment to "Light Handed" Regulation

It is necessary to take legislative action to ensure these measures are carried out with the full force of law. While I certainly lack the knowledge of the New Zealand legal system to prescribe the appropriate means to implement these requirements, amendments to either the Telecommunications Act or the Commerce Act would seem to be logical possibilities. Whatever way is chosen, it is imperative that New Zealand's "light handed" approach to telecommunications regulation be preserved. Accordingly, disputes over the exact delineation of bottleneck resources would be effectively handled by the courts since they are adept at making such fine distinctions. They are not, however, proficient at settling complex pricing disputes (as we have witnessed), and for that reason, binding arbitration would be a more effective means of ensuring the pricing principles are satisfied.

It is important to stress that these actions do not represent a "taking" of private property.. On the contrary, for several years now Telecom earned supranormal returns on its investments. Of course, Telecom is entitled to an above-normal return on investments when it achieves more efficient operation or it deploys advanced technologies. Much of the productivity improvement it experienced was achieved, however, by merely reversing the excesses of years of state monopoly, by cutting bloated employment rolls, automating operations, and deploying the latest network technologies. How to separate unearned returns from earned returns is a delicate question that will eventually have to be addressed. Again, a skilled arbiter is better equipped to settle such financial issues than a court of law.

Nor does this approach result in asymmetric regulation. Telecom would not be punishment for the achievement of dominance; rather this policy involves a one-time withdrawal of unearned monopoly power. Moreover, we should not expect that future incentives to invest will be impaired in the process since demonopolization is a one-time event. Nevertheless, concern over how legislative action will affect expectations governing future investment decisions is legitimate. Would such a change undermine

government's credibility, raising investment risk to the point where incentives are significantly reduced? In fact, the option for revising the Act was well known and anticipated, and therefore, no investment disincentives should result from policy changes. It must be clear that no further changes along these lines will be tolerated. In addition, the implementation of the scheme must be tightly worded or else interpretation by the courts and arbiters could introduce additional investment risk.

I view these measures as an essential part of the process of placing public assets into the private sector in a way that promotes competition and without resort to heavy handed regulation. Ideally, assigning the special bottleneck status to Telecom's assets should have been done at the time of privatization. At that time many of the obstacles to efficient utilization of these resources were not foreseeable. It is not too late to finish the job.