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Telecommunications Reform to Promote Efficiency and Private Sector Participation: The Cases of El Salvador and Guatemala

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According to the system of natural liberty, the sovereign has only three duties to attend to; three duties of great importance indeed, but plain and intelligible to common understandings: first, the duty of protecting society from the violence and invasion of other independent states; secondly, the duty of protecting, as far as possible, every member of society from the injustice or oppression of every other member of it, or the duty of establishing an exact administration of justice; and thirdly, the duty of erecting and maintaining certain publick works and publick institutions, which can never be for the interest of any individual or small number of individuals, to erect and maintain, because the profit could never repay the expense to any individual or small number of individuals, though it may frequently do much more than repay it to a great society."

- Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776)

Telecommunications Reform to Promote Efficiency and Private Sector Participation: The Cases of El Salvador and Guatemala

SUMMARY

This paper describes the very recent (1996-1997) and highly innovative telecommunications reform efforts undertaken in El Salvador and Guatemala with the goals of establishing cost effective systems of telecommunications regulation and in particular, of radio spectrum allocation management, in order to resolve the long-standing standard problem of "market failure" in the telecommunications sector. The paper is divided into five sections.

The first section gives the general policy reform background against which the telecommunication reform efforts were conceived and initiated in El Salvador and Guatemala.

The second section summarizes the widely accepted - and still largely valid - "market failure" rationale for government intervention in the telecommunications sector. It then reviews the unintended adverse consequences of the two standard interventionist solutions most commonly adopted to deal with market failure in the telecommunications sector, namely (1) outright government ownership and (2) private ownership with close supervision by the state, and comes to the conclusion that each of these two standard interventionist solutions has significant flaws. Government ownership is found to be generally inefficient, while traditional regulation of privately owned systems may not give private firms adequate incentives for efficiency, so that under both, telecommunications services are provided at greater cost than is necessary, and a new, innovative approach of the kind being pioneered in El Salvador, Guatemala and a number of other countries is needed.

The third section describes how, in recent years, technological changes and regulatory innovations have come to significantly affect the ways in which today a small but growing number of countries - among them El Salvador and Guatemala - are choosing to regulate their telecommunications sectors. The most important of these technical changes has been the commercial development of wireless telephony (i.e. radio signal-transmitted telephony), both mobile and fixed. Since wireless is a technology whose sunk costs are low and for which minimum average cost is reached at modest levels of service provision, its advent has significantly reduced the monopoly power previously enjoyed at the local loop level (i.e. in the local calls market) by incumbent copper wire-using providers of telephony services for most of the industry's history. Another important new source of effective competition at the local loop level is the provision of telephony services through television (TV) cable networks, which are able to provide telephony services at low unit cost thanks to the exploitation of economies of scope.

As the costs of wireless solutions continue to decline rapidly, it may be predicted that, even in the absence of regulatory changes, competition at the local loop level will increase considerably. However, there is more to the story. The enlarged range of technological choice also changes and/or influences regulatory choices and strategies. In particular, technological progress in the telecommunications services industry modifies the extent to which regulators need to "micro regulate" providers' activity, and also largely eliminates the extent to which regulators must limit entry to guard against the possibility of too many firms each operating on a suboptimally small scale. The technological changes which have reduced the sunk costs of entry and brought into play economies of scope between TV program broadcasting via cable and telephony greatly undermine the argument for regulatory barriers to entry in telephony. Wireless solutions can also increase competition as many providers can be accommodated provided the wavelength assignment problem is correctly managed, e.g. by auctions.

If regulatory changes are made that allow potential entrants to take full advantage of these cost-reducing technological developments, competition at the local level can be increased even further to the benefit of the consumer. Consumers can expect to benefit in terms of lower charges and/or higher quality of service and broader range of choice. Although technological change in the telecommunications industry increases the payoff to society from regulatory change, regulatory innovation has had its own dynamic: important advances in thinking about regulation - principally recognition of the feasibility of developing mechanisms to promote competition and the concept of contestability, have also had a profound impact on regulation in a number of countries, including the U.S., Chile, New Zealand and Australia.

Innovations in market access regulation promote competition for, and contestability of, previously fenced-off markets, by allowing newcomers to take advantage of the dramatic reductions in the sunk fixed costs they must incur to enter any given local loop market already being served by a copper-wire-network-utilizing incumbent provider, and by allowing firms to combine different lines of activity in order to lower costs by exploitation of economies of scope.

Wireless telephony reduces the both the total cost of investment required to enter any given local loop market (local calls), and the "sunk costs component" of that required investment making "hit and run" entry possible. With such entry becoming possible, what had been a closed preserve of existing, copper wire-based providers of local service, and of access to long distance, service becomes a fairly to highly "contestable" market. Even if the number of players serving the market is small, and collusion among them easy, these incumbents are still deterred from raising prices by the prospect of now nearly costless "hit and run" entry by outside firms, so incumbent firms will tend to keep their prices low and provide services on an efficient, least total unit cost, scale. This should happen provided that regulations imposing legal barriers to entry against wireless providers are scrapped or not adopted. In addition to this, economies of scope constitute a supplemental source of competitive pressures on incumbents. The possibility of providing telephony services through TV cable networks brings into play "economies of scope" to provide new players (cable TV network owners) to contest local loop telephone markets. The new players use a common input - TV cable - to provide both TV programming and telephony services, spreading overhead over two products.

The fourth section discusses the regulatory frameworks for telecommunications that have been established in El Salvador and Guatemala in 1996 and outlines the beneficial effects their implementation are having or may

be anticipated to have. In the design of those mechanisms lessons learned from other countries were used and the respective USAID Missions in each of the two countries provided significant support to the reform efforts. The regulatory frameworks are characterized by four critically important elements: 1) the top objective of the regulator has been made to be promotion of competition (#1); 2) key aspects of regulation, such as dispute resolution and the management of the radio wavelength spectrum, have essentially been privatized; c) the regulator has been given only very limited discretionary power, since limiting such power enhances the regulatory system's credibility, and; d) innovative mechanisms to provide direct subsidies from the government budget have been developed to replace the previously existing system of cross subsidies.

Provision of wireless (i.e. radio-transmitted) telephony services is of especially critical importance for making local-loop telephony services markets more competitive. However, it inevitably runs up against the technical need, with present technology, for the State, or some authorized agency of the State, to allocate, to individuals and individual business entities, exclusive rights to utilize specific parts of the radio spectrum. This allocative function must be performed to overcome the external diseconomies inherent in broadcasting on the radio waves spectrum. Because of the problem of interference that will arise if multiple users try to broadcast or send messages over the same bandwidth of the radio spectrum, use of the radio spectrum must be regulated and private ownership rights in it should be established. To achieve optimal utilization of the radio spectrum, exclusive and relatively long-term private property usage rights have to be established. In this key area, of spectrum management, El Salvador and Guatemala may have the most modern regulatory frameworks in the world, which involve the periodic auctioning and reauctioning of spectrum rights, and their alternate dispute resolution mechanisms (final offer arbitration, i.e. "the baseball rule") are highly innovative.

While it is too early to evaluate the reforms in El Salvador and Guatemala, there are indications that they are having a positive effect. Spectrum auctions have proceeded very well, a new network is already been established in El Salvador in an unserved community, several interconnection agreements with the leading carriers have been reached in both countries, and major international companies are showing marked interest in purchasing the public telecommunications operators of El Salvador and Guatemala.

I. BACKGROUND: COUNTRY SITUATIONS

Both El Salvador and Guatemala implemented important economic reforms during the 1980s and 1990s. During this period, macroeconomic stabilization programs succeeded in reducing inflation markedly, and much greater emphasis was given to free market solutions to economic policy problems and to reducing state intervention in markets. Structural reforms included, accordingly, the liberalization of exchange rates, comprehensive tax reforms, almost total elimination of non-tariff barriers and reduction of average tariff rates on imports, and of effective protection, elimination of price controls, and liberalization of interest rates.

As a result of these economic reforms, the "rules of the game" faced by private sector economic agents in both countries were transformed in a major way for the better. However, comparatively very little progress had been made, in either Guatemala or El Salvador, in reforming the state to make it more effective and efficient. To address this remaining problem, more recently a second stage of reforms, designed to increase the efficiency and effectiveness of the public sector, has gotten underway, and there has been progress in some areas, such as evidenced by an innovative education program in El Salvador, now also being carried out in Guatemala, putting control over primary schools into the hands of the communities in which the schools are located. Other measures to increase the effectiveness and efficiency of government programs are being implemented with support from the Inter-American Development Bank, the World Bank and USAID. In the energy and telecommunications sector, where services up to now have been provided almost exclusively by state-owned monopolies, USAID support has been crucial in supporting reform programs designed to increase efficiency and private sector participation.

II. MARKET FAILURES AND GOVERNMENT FAILURES

The telecommunications sector has often been viewed as a natural monopoly, as it exhibits economies of scale and scope, network externalities, and economies of density in the wired local loop, all of which are thought to naturally lead to monopoly and to make properly regulated monopoly the most efficient way of organizing economic activity in the sector. The sector has also been characterized by large sector specific sunk investments, i.e. investment with a minimum value in alternative uses even within the sector and virtually none if re-deployed outside the sector - hence largely irrecoverable once made. Additionally, telecommunications services are consumed directly by a large proportion of the population, which has a relatively inelastic demand for those services. As a result of these characteristics, it is generally concluded that here there is a case of "market failure" - the market left to its own devices results in excessively high prices, excessive investment in the sector and operation of facilities at sub-optimally low scales of output, and that to avoid these outcomes there should be some type of government intervention in the telecommunications sector.

Two common solutions to the monopoly problem have usually been offered: that monopolies be state owned and managed, or that they be privately owned and managed but regulated by the state. SOEs are sometimes managed by private concerns on contract to the government. Often, the analysis underlying these two proposed alternative solutions is simplistic, and has not stood the test of time, as each one compares a market failure with an only ideally achievable, (given the inherently inescapable limitations of administrative capacity) state action. These two long-standing standard prescriptions are based on the premise that politicians and government employees have as an objective function the maximization of social welfare, an assumption which is strongly questioned by the public choice school of economists. Without entering deeply into this debate, it may be noted that a more realistic assumption may be that politicians and public servants try to maximize their own welfare.

Government ownership of telecommunications companies has been fairly common in Latin America for much of the last half century. A basic question about this is whether, and if so, to what extent, government ownership adversely affects internal efficiency i.e. performance in providing given levels and mixes of output at minimum possible cost. Several studies indicate that state-owned enterprises are significantly less efficient than private enterprises. Some studies that corroborate that assertion are summarized below.

Denis Mueller (*Public Choice II*) analyzed a series of studies that compared unit costs of state-owned enterprises with the unit costs of similar, privately owned firms. Of 50 comparisons, only in two cases could it be concluded that the state-owned enterprise was more efficient than the equivalent private enterprise, and in forty cases the state-owned enterprises were significantly less efficient than the private firms. In eight cases there was no difference between the state-owned firms and the private firms.

Sumita Kikeri, John Nellis and Mary Shirley, of the World Bank, summarize in *Privatization: Eight Lessons of Experience*, (July 1992) two studies carried out by the Bank on the effects of privatization on the efficiency of the firms. Their conclusions are:

a) A study of 12 privatizations in four countries demonstrates that in all cases, except one, productivity and coverage increased. For example, a telecommunications firm in Chile doubled the number of lines in the four years that followed- and the Mexican telecommunications company reduced its labor costs by 50% after privatization.

b) Another World bank study of 41 enterprises privatized in 15 countries concludes that the privatized firms improved all financial indicators, increased their internal efficiency, and increased their investment in fixed assets. Additionally, in general, they increased employment.

An alternative to state ownership is private ownership with government regulation of telecommunications enterprise operations. This has typically also involved the government regulatory authority's restricting entry into the industry so that the incumbent enterprise has *de facto* monopoly power that needs to be regulated. Since regulation alters the manner in which markets operate, it can thus contribute to an increase in social welfare, if it can provide incentives to monopolies to behave in a manner similar to firms subject to free competition, that is, encouraging them to produce volumes of output just large enough (i.e. provide telecommunications services in just the a large enough volume) that the rates customers are willing to pay are just equal to, no more, no less, than the marginal cost of the outputs, and trying to ensure that the monopolies charge just these rates, and get a normal, appropriately risk adjusted rate of return to their capital investments.

To contribute to improved economic performance, a regulatory framework for monopolies should have two primary objectives. First, it should protect society from the monopoly power of firms, and second, it should protect private firms from capricious and, sometimes, confiscatory behavior of the state. If this last objective is not met, investment incentives could be reduced or even eliminated. Indeed, the net result could be to provide an incentive to disinvest - to let equipment wear out without making adequate provision for replacement.

To give incentives to a private firm to invest in an industry regulated by the state, a guarantee must be given that once the investment is made, the government will not expropriate any proportion of the firm either overtly, or indirectly through a reduction in real rates of return allowed on investment (that is, at least, if sector-specific sunk fixed costs are involved in making the investment, as in general they are). This guarantee could face the problem of time inconsistency of economic policy. In the case where there is discretionary regulation by the state, before a private firm invests, the best strategy for the government would be to agree on rates that the firm can charge high enough give a strong incentive for investment. The optimal policy, however, could change after the investment is made, as the politicians may wish to reduce the rates charged consumers (or let them be eroded by inflation). By reducing the real (i.e. price-level-deflated) charges for the services provided by the industry, politicians increase their popularity with consumers, who are always more numerous than investors, and increase the probability of being re-elected, something that a politician may value more highly than social welfare in the longer run. It is important, therefore, to design a regulatory framework with credibility.

A credible regulatory framework can affect significantly investment decisions. For example, in Argentina a tender for sale of the telephone company was made before an adequate regulatory framework was in place, and in response to it only three offers were received. Perhaps more significant than the number of offers received is the fact that these offers were considered by most observers to be quite low. By contrast, in Venezuela, the tender to sell was made only after a well-designed regulatory framework was in place, and seven, relatively high, offers were received. Looking at things the other way around, after the telephone company was sold in Argentina, the regulatory framework was improved, and the value of the firm increased markedly, thus giving a windfall profit to two foreign firms which had purchased at the low price (Pablo Spiller, *Institutions and Regulatory Commitment*, Institute for Policy Reform Working Paper 51, 1992 and Sebastian Edwards, *Latin America and the Caribbean--A Decade After the Debt Crisis*, World Bank, 1993).

We can consider two extremes in the approaches to regulation. In the first, there is strong involvement and/or discretion by the state, while in the second there is greater reliance on pre-established rules; and market forces are allowed, or even required, to play a greater role in firms' rate schedule setting, entry into the industry and so on. In either case, the framework can involve and be based on regulation either by a government ministry or some agency thereof which ultimately must answer to the national parliament or state legislature that created them.

The problems of regulation with a strong role for the state can be analyzed in the context of principal-agent (PA) theory. PA theory deals with the problem of designing incentive systems so that they encourage the agent or agents to protect the interests of the principals (or owners) when there is asymmetry in information, that is, when the principals have less information (or less detailed information) than do the agents. In the case of a monopoly, when there is an attempt to protect the interests of the citizens (principals), there are numerous agents, each with its own objective function and interests, which may not coincide with the interests of the society as a whole - and indeed almost certainly will not. These agents may be, for example, members of the executive and legislative branches, who name the regulators, who themselves are also agents, and those regulators have to assure that the managers of the regulated firm work assiduously and competently to maximize the net benefits of the citizens, i.e. the principals. Under a scheme where there is so much "distance" between principal(s) and the last agent(s) (the manager(s) of the firm(s)), it is very likely, or even certain, that the interests of the citizens will not be protected fully.

Many things - quite unintended by the principals - can happen with such a scheme. Although ostensibly designed to safeguard the interest of the principals, it may not necessarily do so. First, it is possible that the regulators will not seek primarily the public good and instead would pursue their own welfare, or follow the dictates of politicians, who may not have as an objective function maximization of the general welfare. In such cases, there could be incentives, for example, not to adjust prices to reflect increases in costs, even though a policy of failing to adjust prices, by reducing investment incentives, could result in diminished welfare in the long run. Agents might choose this course just because it is the easier thing to do, even though they know that investment will be reduced, and welfare in the long run reduced, or they might regard the immediate satisfaction of the public more important than its longer run welfare, or they might not know that failing to adjust prices will have any future adverse consequences (but then the principals would not have done a very good job of choosing them).

Second, even if regulators attempt to protect the interests of society, it is possible that the regulators do not have sufficient information to determine what kind of actions they should demand from the regulated firms. Fairly commonly, regulators adjust rates to reflect full costs of production, but it is difficult for them to determine if the costs reflect the maximum level of internal efficiency possible, i.e. if the costs are as low as they could be if management were doing its job properly. Rate of return regulation can result in excessive employment by the firm, or to a bias towards capital intensive production, as was demonstrated in the seminal article of Averch and Johnson (H. Averch and L. Johnson, "Behavior of the Firm under Regulatory Constraint", *American Economic Review*, 1962).

Third, as has been amply discussed by George Stigler, (in "The Theory of Economic Regulation", *Bell Journal of Economics* 1971, among other publications), often regulators are captured by the regulated enterprises, and end up promoting the interests of the firms instead of, and at the expense of, the common good.

In summary, the regulators most likely have neither the information nor the proper incentives to promote efficiency. If, in addition, the regulators are captured by the those they are regulating, consumers may pay much higher prices than necessary. More commonly, however, in Latin America, government opportunism has prevailed, and there has been a tendency to "expropriate" the assets of the telecommunications companies (probably regardless of whether publicly or privately owned) through a reduction in real rates which often resulted in a decapitalization of the firms and a reduction in the quality of services. Once this deterioration occurred, the companies, if not already publicly owned, were often nationalized. Now that many countries are embarking on programs to give incentives for private sector participation in the sector, it is necessary to devise regulatory mechanisms that would make it more difficult for government opportunism to prevail.

Another possibility is that the government makes one category of users (e.g. makers of long distance overseas calls) cross subsidize another (local trunk callers), to the detriment of the public good - e.g. in this case the economy is made less open and *ipso facto* less efficient, and economic growth is disfavored.

In summary, one may conclude that the traditional, longtime orthodox solutions to the problem of market failure, government ownership of a monopoly Post and Telecommunications Organization (PTO), or private ownership accompanied by traditional regulation, also have significant problems. To avoid these problems, some countries have devised regulatory frameworks that minimize state intervention and give much greater emphasis to measures to encourage competition, for markets and market share.

III. TECHNOLOGY CHANGES AND MODERN TELECOMMUNICATIONS REGULATION

A good regulatory framework should achieve the following objectives: it should be credible with investors yet flexible; protect the consumer from monopoly power; have a low cost for the government to administer and for the regulated firms to comply with; and it should give adequate incentives for allocative and internal efficiency. Important technology changes as well as regulatory innovation have permitted some countries to implement very modern regulatory frameworks that minimize some of the problems associated with the traditional forms of regulation.

The main technological change affecting regulatory schemes has been the development of technologies for the provision of local telephone service. Television cable can be upgraded to provide telephone service, and there are now several options for mobile and fixed wireless telephony. The costs of wireless solutions are declining rapidly so that they are now cheaper than wired solutions at densities of less than 250 subscribers per square kilometer, and the unit costs of wireless are declining steadily (see Peter Smith, "End of the Line for the Local Loop Monopoly?", World Bank, December 1995 and (Peter W. Huber, Michael K. Kellogg and John Throne, *The Geodesic Network II: 1993 Report on Competition in the Telephone Industry*). In Mexico, as of the time of drafting of this paper (1997), for example, one could see a private company (Grupo Iusacell) selling a \$400 handset with a 20 cm. radio type antenna that uses the 450 MHz band. These sets are sold from the backs of vans and billing is done by credit card. Other modalities where the phone includes a number of minutes of talk time, and then can be recharged when they are expended, will also be marketed. These phones were being sold in 1996 at a rate of 8,000 per month, as fast as the equipment could be imported in the country (Pablo Spiller, *A Competitive Telecommunications Sector in El Salvador*, Law and Economics Consulting Group, August 9, 1996), and represented a strong facilities-based competition to the leading carriers.

Technological change and regulatory innovation make possible the establishment of regulatory frameworks designed to minimize regulatory discretion by giving a greater role to competition. Today in the telephone sector, both forces are at work leading to establishment of such frameworks. These frameworks have been implemented in the telecommunications as well as in the energy sectors of a number of countries.

NEW, COMPETITION-PROMOTING REGULATORY FRAMEWORKS

The new regulatory frameworks promote competition in the market by reducing barriers to entry by enough to permit several firms to enter and they increase contestability (by reducing "sunk cost" entry and exit costs); they promote competition for the market through concessions for the provision of services which are naturally monopolistic, or franchises to enter where resources are fixed such as a specific band of the radio spectrum); they employ "yardstick competition" (comparison with costs and quality of similar firms in other markets); and competitive joint ventures or clubs (joint ownership of segment(s) of sector with monopoly characteristics, such as the joint ownership of transmission facilities by energy distribution companies in the U.K.).

SOME PIONEERS AND CAUTIONARY LESSONS LEARNED IN ESTABLISHING NEW, COMPETITION-PROMOTING, REGULATORY FRAMEWORKS FOR THE TELECOMMUNICATIONS SECTOR

Countries that have implemented more modern regulatory frameworks include the United States, Chile, New Zealand and Australia. The United States, with the breakup of AT&T in 1982, encouraged competition in long distance, and the Telecommunications Act of 1996 is trying to foment competition in local telephony, with so far quite limited success. Chile totally deregulated its telecommunications sector but this resulted in years of interconnection related lawsuits. A second set of reforms required disputes to be resolved through arbitration rather than litigation, and the regulator now establishes interconnection charges based on long run incremental average costs. As a result of these later reforms, there is now competition for local telephony, and a very competitive market for long distance services has evolved. As a result, Chile now has long distance rates that are probably the lowest in the world (roughly equivalent to U.S. rates). New Zealand eliminated all telecommunications regulation, relying instead on generic anti-trust legislation. Here too, Interconnection

disputes arose, and these have delayed the development of competition. Australia, having apparently learned from the New Zealand experience, explicitly established the right to interconnection in the Telecommunications Act of 1991.

IV. TELECOMMUNICATIONS REGULATORY REFORM IN EL SALVADOR AND GUATEMALA

El Salvador and Guatemala enacted almost identical legislation in October 1996, establishing very modern regulatory frameworks for electricity and telecommunications. These frameworks reflect the lessons learned from the reforms in the United States, Chile, New Zealand and Australia. Reform efforts in El Salvador and Guatemala received USAID support.

In El Salvador, the establishment of a regulatory framework to promote competition and private sector participation was an item of conditionality of the USAID ESF Program for 1994 ("Modernization of the State"). Also, the USAID Mission organized several seminars to promote the idea of improved regulation and privatization, as well as a study tour to Chile in which the Vice-President of the Republic, key ministers, and heads of the main state-owned enterprises, participated, together with legislators from the three main political parties (ARENA, FMLN and Christian democrats), labor union leaders and representatives of the private sector. USAID also organized two courses on regulation and privatization in El Salvador. The consultant who helped draft the legislation taught at one of the courses, and also made a presentation at two of the seminars.

In Guatemala, at the end of 1995, USAID financed a trip to Berkeley, California, by a legislator to permit him to meet with the same consultant who was helping draft the telecommunications legislation of El Salvador. In early 1996, after the national elections, the legislator took a leave of absence from the parliament and became the head of the state-owned telecommunications company, as well as the leading advocate for regulatory reform and privatization. USAID financed the services of the consultant, who worked in a team composed of members of his firm, a local think-tank (CIEN), the telecommunications company, a local law firm, and key members of the Telecommunications Commission of the parliament, principally the President of the Commission.

The laws of El Salvador and Guatemala follow the same principles: the regulatory framework's main focus is on the promotion of competition; the different aspects of regulation, such as dispute resolution and management of the spectrum, are largely "privatized"; the regulatory body has very limited discretionary authority; and mechanisms were, or are to be, established to provide direct subsidies, thus eliminating cross subsidies, as cross subsidies would be incompatible with the competitive model being implemented.

The promotion of competition is achieved through permanent and transitory measures. The permanent measures are access to essential facilities, equal access to interconnected networks, and an alternate dispute resolution mechanism. Temporary measures, lasting a maximum of three years, include unbundling, a presubscription prohibition and transitory price caps to final users and for interconnection charges (only in El Salvador).

The laws in both El Salvador and Guatemala clearly state that, with one exception - access to essential facilities - prices will be determined freely - i.e. not subject to any regulation. For example, the Guatemala law states: "Freedom to Compete. The prices and terms of commercial telecommunications services contracted by different enterprises, entities or persons involved in telecommunications, as well as prices to the general public, will be freely negotiated and will not be subject to any regulation, except those related to the access to essential facilities, as stipulated by this law". The legislation in El Salvador contains similar language, but the corresponding article in its regulatory framework legislation is now being modified because of a constitutional issue. Essential facilities include: the right to terminate a call in another network; signaling; automatic caller identification; billing data; number portability; right to publish user data in the white pages of any telephone directory; and access to data bases to permit publication in the white pages of any telephone directory.

The right of a commercial network to interconnect to another commercial network to route a call to its recipient/terminate calls or to get a call from a customer is absolutely necessary to permit facilities-based competition in telecommunications.

Because of the presence of positive network externalities, the government is justified in promoting interconnections between networks. The connection must be offered at all feasible levels, and at costs representing the long run average incremental cost (LRAIC). If disputes arise on interconnection, or concerning access to other essential facilities, an alternative mechanism for dispute resolution has been devised, and is discussed below. Connection charges have to be registered with the regulator, and become the equivalent of "unbundleable" tariffs. That is, the rates are made public, and available to any other party on the same basis. Other essential facilities include signaling, (technical information needed for connection of different networks), automatic caller identification (necessary for billing calls from another network), access to telephone listing data as well as the right to include listings in the white pages of another network.

Interconnection alone merely allows a customer in a network to route traffic to another network but does not go far enough to give customers the right to choose a particular network or service. Equal access is another key element. For example, a network may demand that one of their clients dial 20 digits before they can access another long distance carrier. Dialing parity, i.e. that all networks can be accessed under similar terms, is an important aspect of the promotion of competition. Similarly, number portability, the ability of a client changing networks to keep the same number, something which is mandated in El Salvador and Guatemala, is another important provision to encourage competition. The numbering plan will be administered by the regulator in Guatemala and El Salvador, thus helping to ensure a more level playing field. A temporary measure was included in Guatemala and El Salvador prohibiting presubscription to long distance services for a period of two years in order to foment competition.

The laws of Guatemala and El Salvador contain an innovative alternate dispute resolution mechanism, something that was devised after the experience of Chile and New Zealand, where litigation through the justice system related to access to essential facilities delayed the onset of competition in those countries.

In Guatemala, the alternative dispute resolution mechanism is as follows:

When an operator requires access to essential resources/facilities of another network, it will send a request with copy to the Superintendency. Parties have the duty to negotiate and have a period of 40 working days to reach an agreement; but the period for negotiations can be extended by mutual agreement of the parties. If no agreement can be reached, the parties would submit to the Superintendency an analysis of the points of divergence, and a best and final offer on each point. If one of the parties does not present a final offer on any point of dispute, the Superintendency would be obliged to resolve it in favor of the other party.

After the Superintendency has received the positions of the parties in dispute, the use of a private sector expert arbitrator ("*perito*") would be mandated. The party denying access will receive from the Superintendency a list of all qualified arbitrators, and will choose three names from that list. The list with three names would then be submitted to the party requesting access, and it would then choose one "arbitrator" to provide expert analysis to assist in the resolution of the dispute.

Arbitration of conflicts relating to fees for use of essential resources and the LRAIC payment rule for use of a network

The law establishes well-defined standards for arbitration that must be used by the arbitrators in the resolution of disputes. In conflicts related to fees for the use of essential resources the arbitrator must ensure that the requestor pay for the use of the network the long run average incremental cost (LRAIC) of an efficient firm. The law specifies the costs that can be included in the calculations as well as a detailed methodology to estimate the cost of capital. The arbitrator follows final rule arbitration and must base his decision on which offer is closer to the LRAIC. In the case of technical disputes, the arbitrator must adhere to the standards of the International Telecommunications Union, the standards of regional telecommunications organizations, and the standards of regional telecommunications professional associations.

Unbundled access at reasonable rates is a temporary measure, with a duration of three years. It requires the incumbent to offer entrants basic network elements separately, and at cost (including a return to capital). This is an important provision to increase the contestability of the market, as it converts fixed entry costs into variable costs, thus also reducing or even eliminating exit costs. With unbundling, a firm that is trying to enter the service provision market in a given area and compete for the business of some of the residents in this area, can lease facilities from the incumbent instead of having to make new investments. For example, a TV cable company could lease use of switches and ports from the incumbent, and provide dial tone to a client using its own TV cable network - the incumbent could not tie in the service of providing the dial tone or sell the provision of use of its switching equipment only as part of a bundle of services. The rates it could charge for provision of switching and other services, in addition to being unbundled, would have to be "reasonable." Similarly, a firm with switching equipment, but without local loops in the targeted area, and not wishing to duplicate those of the incumbent there, could use the local loops of the incumbent. As both Guatemala and El Salvador want to give incentives for network expansion, unbundling *will only last for the three years* following the enactment of the laws (laws were enacted in October 1996). Some libertarians argue that this measure mandating unbundling, even though only temporary, is objectionable because it does not respect the property rights of the incumbent, which is made to lease the variously elements of its facilities separately and on an unbundled basis. As the two incumbent telephone companies are state-owned right now (although they are being privatized), bidders will of course discount, in formulating its best offering purchase price, an amount for the burden it estimates is imposed by unbundling. The alternate dispute resolution mechanism discussed above will be used to solve conflicts related to the unbundling requirement.

There may be a fixed sunk cost element in a lease of use of incumbent equipment. Such a lease would constitute fixed sunk costs for an entrant unless the lessee can sublease it. But if the prospective entrant can't

lease, the costs it would have to irrevocably "sink" in order to enter would be much greater - namely, the cost of building its own network element parallel to that of the incumbent. Exit costs would be eliminated only if the lessee could sublease, and get a good price for the sublease, and did not incur any sunk entry costs other than the sunk costs component of the cost of the lease.

RADIO SPECTRUM MANAGEMENT

Since wireless telephony involves use of the radio spectrum/ broadcasting spectrum, the rules of the game for allocation of usable spectrum segments are critical for making (local) telephony markets (more) contestable, that is, for ensuring adequate contestability of the local telephony markets.

With the new legislation, radio spectrum management has been privatized to a large extent, and it is here where the laws of Guatemala and El Salvador have been most innovative. The ideas for spectrum use management were developed by Guatemalan and Salvadoran professionals, with the assistance of a professor from the University of California at Davis. The laws establish negotiable rights for the use of the spectrum ("*derecho de usufructo*"). These negotiable titles constitute private property, and can be not only sold, but alternatively leased, and/or mortgaged. They can also be fragmented vertically (if new technology allows a more intensive use of a given band), geographically, and in time.

All transactions of "*derechos de usufructo*" (usufruct rights) have to be registered in the Telecommunications Registry, which forms part of the Superintendency. The law specifies the information that must be contained. In the case of Guatemala, such titles are granted for periods of 15 years, and can be renewed if a request is submitted within between 200 and 120 days of the expiration date. The only reason for not granting a renewal would be if it could be proven that the particular portion of the spectrum had not been used at all during the period of ownership of the title [i.e. that the holder had not even leased it]. In the case of El Salvador, the titles are for 20 years, but at that time they would be auctioned again; an owner of a band of the spectrum can initiate the auction process before the 20 years expire, and can then share in the proceeds of the auction on a present value basis.

In both countries, a title is assigned to any person that requests it, and the Superintendency is obliged to respond to requests within three days. The Superintendency is obliged to award use of the spectrum and a title unless it is impossible, for technical reasons, to define that portion of the spectrum. If other parties are interested in that portion of the spectrum, then a public auction for that portion of the spectrum must be carried out. These auctions are carried out by the Superintendency and are supervised by reputable firms of external auditors. The title is awarded to the highest bidder.

The competition model being implemented in El Salvador and Guatemala makes it very difficult if not impossible to continue with the system of cross subsidies. Therefore, in order to promote service in low-income areas, both countries established mechanisms to provide direct subsidies for telephone service expansion in those areas. The legislation in Guatemala establishes the Fund for Telecommunications Development. The purpose of the fund is to subsidize telecommunications services in low income areas, and to finance it, 70% of the proceeds of auctions of the spectrum, up to a maximum of US\$ 5 million, by law are earmarked to it. Firms wishing to use the resources from the fund would submit bids for covering an area, and the firm that can do it at the lowest cost wins. A similar fund was established in El Salvador, but it also covers rural electrification, and is financed from the national budget, as the Constitution of El Salvador does not permit the earmarking of revenues.

Both countries established regulatory agencies. In Guatemala, there are separate regulatory agencies for telecommunications and energy, while in El Salvador they were combined. The regulatory agency of Guatemala is the Superintendency of Telecommunications. The candidate for the office of Superintendent is proposed by the Economic Cabinet, and appointed by the President for an indefinite period, i.e. serves at the pleasure of the President. Expenditures of the Superintendency are financed mainly from a proportion of the proceeds of auctions of the spectrum. Originally, the plan was to make the Superintendency more independent of the Executive, but to create an independent agency it is necessary to have two thirds of the votes in the Legislative Assembly, and the administration was unable to muster this support.

In El Salvador, the General Superintendency of Energy and Telecommunications (SIGET) was created with more independence, as the Superintendent was named for a fixed term of seven years, and could not be removed from office except under very well defined circumstances. Unfortunately, as the Superintendent began to implement the law, and not did budge to pressure from rent seekers, the law was modified so that the Superintended could be removed from office without cause, and the Superintendent was dismissed (as they say, such is life in the tropics!).

The laws of Guatemala and El Salvador contain a provision termed "administrative silence". Basically, if a request made to the regulator is not resolved within prescribed periods of time, it is automatically resolved in favor of the requestor. The laws also establish well-defined time limits for many of the activities of the regulator.

V. MAIN RESULTS

As the laws were passed in October of 1996, it is too early to assess their effect. While the author of this paper admits a bias toward a favorable view of these laws, as he was involved at different stages with their development, other, uninvolved, observers have stated, most recently at a conference sponsored by the Cato Institute, that these are the most innovative telecommunications laws in the world, particularly because of the alternate dispute resolution mechanism as well as the approach to spectrum management.

Since the laws were passed, the authorities implemented a partial rebalancing of rates (more complete in Guatemala than in El Salvador) and passed legislation to privatize the telecommunications companies. Some progress in the privatization of the PTOs has been made, but privatization sales of the SOE telecommunications system have yet to be made, and bids submitted on a tender for Guatemala's system received awhile back were too disappointing for them to be accepted.

As of the time of writing of this paper, radio spectrum auctions were proceeding, and access numbers (for the long distance multi-carrier system) had also been auctioned. In El Salvador a private firm had begun construction of a 5,000 line network in a small city (Metapan), after having negotiated an interconnection contract with the PTO, and another interconnection agreement has been negotiated in Guatemala. INTERNET access providers have multiplied in both countries after the liberalization, and access rates have declined. Cellular companies in both countries have lowered their rates, as they prepare for competition from the second cellular band as well as from the PCS bands.

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Footnote

1. Promotion of market "contestability" might be the more appropriate description of this objective. By a "competitive" market has usually been meant one in which there are many providers competing with each other and in which no one firm or "small" group of firms has a "large" share of output. A market with a small number of firms, or in which a small number of firms account for most of the activity, is considered ipso facto noncompetitive. More recently, the concept of a "contestable" market has been developed. (A standard work on contestable markets is that of Baumol, Panzar and Willig, *Contestable Markets and the Theory of Industry Structure*, 1982; revised 1988.) This is a market which, even when so small as to be served by only one or two firms, may be such that quick entry and exit without incurring significant sunk costs can be undertaken by potential rivals involved in other, ongoing lines of business (some of which may possibly enjoy economies of scope with the product or set of products produced by the incumbent firm(s) which may utilize their apparent dominance in the market to raise prices unduly. Normally regulation should not impede such "hit and run" entry, and should even be structured so as to encourage it.

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