
The impact of competition and technology on telecommunications regulation: call for further research on regulatory procedures and the convergence of wireless, wireline, and cable

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Keywords

Telecommunications, Regulation, Consumers, Cable television

Abstract

Discussions between the Federal Communications Commission (FCC) and communications policy makers and regulators in other countries have gleaned several clusters of issues where further research would directly benefit them. Recently, there have been two notable shifts. First, as the acceptance of the competition model over the monopoly model for telecommunications markets takes deep effect in regulators all over the world, questions regarding process and procedure for regulation are becoming ever more urgent. This paper discusses current questions regarding decision making, enforcement, and understanding consumer issues that arise often in the FCC's discussions with other regulators. Second, technological change is potentially shifting market definitions. In the FCC's discussion with other regulators over the last two years, the overlap of wireline telecom, wireless telecom and cable television has become more pronounced.

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At the Federal Communications Commission (FCC), we frequently correspond with communications policy makers and regulators in other countries. During a typical year, the International Bureau staff meets informally with over 500 visitors from more than 100 countries, in addition to the several dozen formal government-to-government talks which take place regularly. The majority of meetings are with regulators and policy makers from developing countries who seek insight in how to better manage policy issues at home. From these discussions, we have gleaned several clusters of issues where further research would directly benefit policy makers and regulators. While this paper does not reflect the official view of the FCC or the other countries discussed, it is offered as an informal set of notes from the field on pressing questions that regulators are discussing today. Recently, there have been two notable shifts. First, as the acceptance of the competition model over the monopoly model for telecommunications markets takes deep effect in regulators all over the world, questions regarding process and procedure for regulation are becoming ever more urgent. The first section of this paper discusses current questions regarding decision making, enforcement and understanding consumer issues that arise often in the FCC's discussions with other regulators. Second, technological change is causing market definitions to shift. In the FCC's discussion with other regulators over the last two years, the overlap of wireline telecom, wireless telecom and cable television has become more pronounced. This paper first discusses the impact of wireless developments in telecommunications, and then the impact of cable television on telecom.

A decade ago there were very few telecommunications regulatory authorities in either developed or developing countries. In fact, in 1990 there were only 13. Since that time, the number has roughly doubled every four to five years[1]. Today there are no less than 123 regulatory authorities. While there is a lot of literature on the importance of an independent regulator (see, for example, Majone, 1996; Levy and Spiller, 1994; Guasch and Spiller, 1999;

This paper only represents the personal views of the authors and does not reflect the position of the FCC, nor of the countries that are discussed. The authors thank Doug Webbink and Patricia Cooper for their comments on this paper. This paper was presented at the Policy Research Conference on Communication, Information, and Internet Policy, September 2001, Arlington, Virginia, USA.

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Cowhey, 1994; Cave and Stern, 1998), there has been relatively little work on what techniques regulators can use to achieve their objectives. Further, there is a bias in the literature that favors the study of large markets in high-income countries. This is natural, as the information from these kinds of markets and countries is more voluminous and easily available.

In a recent meeting of countries from eastern and southern Africa, for example, regulators highlighted the lack of basic data on the telecommunications industry for the entire region. They also emphasized the need for reliable information to support of their efforts to liberalize their telecom markets[2]. Regulators in countries with a highly developed regulatory structure often complain about information asymmetry, where regulators have less information than they need or only imperfect information about the firms they are regulating. Regulators in developing countries have to tackle an even more fundamental problem. In many cases they not only have imperfect information about the firms being regulated, but also have no reliable data on the industry and the economy as a whole.

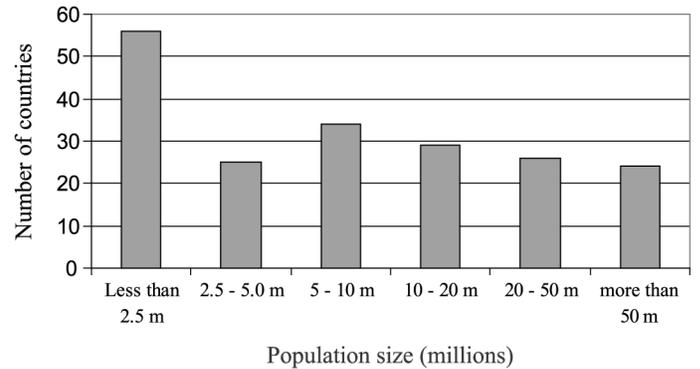
By examining the effects of rules that were adopted earlier in other countries with similar demographic and economic profiles, regulators can assess the potential effects that proposed regulation might have in their own country. Moreover, regulations that have international implications, such as the accounting rate for international calls, could be set more effectively if calling patterns and economic and demographic variables, including immigration, were clearly understood by regulators in all affected countries. However, this requires cross-sectional data from other similarly situated countries that contain firm-level, industry and broad socio-economic data to establish benchmarks.

In a step toward filling this data gap, the FCC is developing a database that contains telecommunications industry data as well as a host of socio-economic data from the USA and many other countries. We believe that this database will be useful to regulators in the USA and in other countries to analyze proposed telecommunications regulations and policies. This database is being compiled now from various public and academic sources[3].

Another factor not often reflected in the literature on communications regulation is that most markets in the world have a population of less than 20 million and are at low or middle income levels of economic development, as shown in Figures 1 and 2.

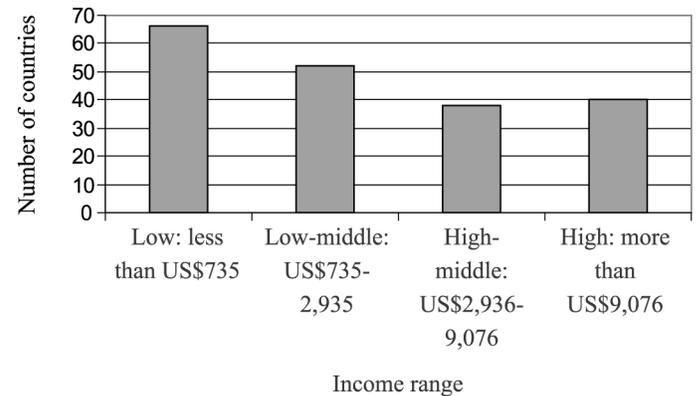
Very often, once regulatory objectives have been defined, it is necessary that they be implemented

Figure 1 Countries by population



Source: World Bank (2002)

Figure 2 Countries by per capita income



Source: World Bank (2002)

efficiently with a lean staff. In a recent survey of 18 markets, we found that half had fewer than 250 staff, including substantial numbers of support staff, to regulate both telecommunications and broadcast[4]. Ideally, policy and regulatory recommendations by researchers would not require dozens of professional staff to conduct analysis and make decisions.

Regulatory techniques: enforcement, decision-making procedures, and consumer information issues

This section discusses three aspects of regulatory techniques:

- (1) the decision-making procedures that help shape rules;
- (2) the problems faced in good enforcement of the rules; and
- (3) challenges in understanding consumer concerns in a competitive market.

Decision-making procedures

What kinds of steps can government organizations can take to enable open and transparent decision making? As one frustrated Costa Rican official commented recently, just organizing public meetings does not seem to result in an interested, participating, public[5]. About five years ago, when Japan's Ministry of Posts and Telecommunications (now the Ministry of Public Management, Home Affairs, Posts and Telecommunications, or MPHPT) first began issuing proposals for comment, very few parties commented. Now, there is an active community of operators and others who participate. Is this simply a question of regulatory persistence over time? Or are there other factors at work? A preliminary foray into this area is Wu and Xue's (2002) paper on decision-making procedures and ethics rules. However, simply describing the procedures of various regimes is not enough: more work needs to be done to examine what works effectively in engaging a previously unengaged public in regulatory decisions.

Enforcement

While there is substantial literature on how rules should be established to regulate firms in a competitive communications market, there is comparatively little literature on how to enforce such rules. A good starting point is a chapter in Baldwin and Cave's *Understanding Regulation* which describes how enforcement of regulation in general can be considered (Baldwin and Cave, 1999, pp. 96-117). More specific work from the communications world with examples of particular cases would be enlightening.

From our dialogue with other regulators, it appears to us that failure to consider enforcement during the drafting of rules can lead to the creation of meaningless rules that market players simply ignore. In recent years, callback services and Internet telephony are among the most remarkable international examples. While many regimes insist, for a variety of political and economic reasons, on tightly regulating these services, failure to consider the enforceability of such regulation has doomed such approaches to failure. In the cases of callback and Internet telephony, many interests other than enforceability of rules are at stake. Nevertheless, from the standpoint of operating an efficient regulatory agency, the expenditure of staff time and energy to create and implement a policy that cannot be enforced seems misguided, especially given the number of pressing problems inevitably facing the regulator of a competitive market.

Interconnection is another area rife with enforcement problems. For example, in a discussion with the Shaanxi Province

Telecommunications Administration in China, officials expressed concern about interconnection disputes they faced. Not only were there terms and pricing problems, but basic questions of how many minutes operators were exchanging were also in dispute[6]. Recently, Sri Lankan telecom operators complained that while interconnection was promised, it was not delivered by the incumbent. The regulator's ability to issue monetary fines was capped by law at a low level, and, indeed, appears never to have been exercised to enforce interconnection obligations[7]. Similarly in India, operators complain that while FLAG and Bharti submarine cable systems should be able to interconnect with domestic operators' networks, incumbent VSNL is able to prevent it[8].

To address this gap, the FCC and several other countries are involved in preparing best-practice guidelines for enforcing domestic telecommunications laws in the International Telecommunication Union (ITU) Development Sector and in Asia Pacific Economic Cooperation (APEC). In March 2003, APEC held a workshop on "Enforcing Pro-Competitive Policies". Singapore proposed establishing a drafting group to develop guidelines and best practices to assist APEC economies in developing and improving regulatory enforcement. Australia, Canada, The Philippines, Thailand and the USA are the other members of the drafting committee. The guide proposes to include:

- practical examples of enforcement procedures tools and other key success factors that lead to effective enforcement;
- explain the relationship between compliance and enforcement;
- introduce the environment today; and
- the need for effective enforcement[9].

Drafting has begun and the goal is a final paper by March 2004.

At the ITU 2002 World Telecommunications Development Conference in Istanbul, a study question on "Domestic Enforcement of Telecommunications Laws and Policies, Best Practice Guidelines" was adopted. The USA serves as Rapporteur for the project, with Vice Rapporteurs from Brazil, Sri Lanka and France. Additionally, 17 countries identify themselves as Active Collaborators. The objective of this exercise is to develop guidelines for national regulatory authorities (NRA) to effectively enforce their domestic telecommunications laws, with special emphasis on challenges faced by developing countries. However, since there are relatively new NRAs from both developed and developing countries, the conclusion will be a menu of guidelines for application in diverse circumstances.

Of the seven items covered in the ITU study question[10], one item in particular has little literature available on it – the specific methodologies for determining appropriate sanctions for common violations a NRA encounters when regulating the telecommunications sector. Thus far, the ITU group has recommended that when issuing a sanction, an NRA consider the severity of the harm, the cost of enforcement, the probability of detection, and the risk sensitivity of the offender. However, there is still no specific methodology available for quantifying each of these elements in the telecommunications context. In the case of radio interference, for example, what is an appropriate formula or methodology for quantifying the harm caused, and what elements should be taken into account when setting a fine? In other words, specifically in the telecom context, how does a NRA set a fault standard equal to the harm, and a fine at a level that achieves compliance with that standard? Are there economic models, for example, that could be developed for this purpose? The Rapporteur would welcome contributions in this vein[11]. Also, there are larger questions: are there perverse results from the lack of enforcement? Are contracts made less valuable, is investment dampened? Does the failure to enforce some rules mean that other rules are also more likely to be routinely violated?

Consumer issues

The possible role of the regulator in responding to consumer concerns is another area where there is little prior academic work. The overwhelming preponderance of literature on communications regulation focuses on the regulation of firms. Very few studies have been undertaken to examine consumer response to competition and to understand in greater detail the challenges consumers face in making the transition from a monopoly to competitive environment. Recently, when the United Kingdom's telecommunications regulator Oftel undertook a decision on mobile termination, it had data on consumer sensitivity to prices for calls to mobiles. Oftel had information that large enterprise users, small enterprise users and individual users were more, less, and even less sensitive, respectively, to price changes for calls to mobiles[12]. Oftel had this data because it regularly conducts consumer surveys on key topics. Do other regimes similarly make efforts to gather data on consumer behavior?

The relationship between gender and access to and use of communications services is one of the outstanding consumer issue areas where more research could be undertaken. There is a substantial development and economics literature

documenting the negative of effect of gender inequality on a country's educational level, income and economic growth, but little comparable investigation in the communications field (Klasen, 1999; Dollar and Gatti, 1999; Quisumbing and Maluccio, 1999)[13]. This is in contrast with the substantial literature on rural communications issues, even though women often constitute as large or often a larger percentage of a country's population than rural consumers. In the field of development economics, the failure to consider gender issues in implementing policy has been proved to have negative consequences for economic growth. Do women and men have different access to or responses to communications technology and change? If so, as the development literature would suggest, what would be the implications for regulatory decisions and the design of programs?

Finally, many regulatory agencies or their governments have established special mechanisms or created specific organizations to represent consumers' interests relative to those of firms. Australia has a Telecommunications Industry Ombudsman. Many media regulators, such as Hong Kong's Broadcast Authority and the Swedish Broadcast Commission, serve primarily as channels to handle audience complaints. India has a separate consumer courts system that covers communications issues. To date there have not been any cross-country comparisons of what kinds of mechanisms are most effective at assessing or improving consumers' ability to make satisfactory choices. Of course, ideally, in a competitive market, consumer satisfaction should not be a major problem because inefficient or bad service providers are eliminated. But, if there are information asymmetries, what techniques can usefully be employed to help consumers overcome them?

The changing relationship between wireline and wireless telephony

In many countries, wireless subscribership now exceeds or soon will exceed wireline subscribership (see Table I), fundamentally challenging market definitions that have been the basis for policy making. This is especially striking in developing countries where wireless may be primarily a complement to rather than a substitute for wireline telephony (for evidence from Africa, where this is a common phenomenon, see Hamilton, 2003). This significant change in the role of wireless in telecommunications development poses new questions for regulators, or at least old questions in new ways.

Table 1 Countries where cellular subscriptions exceed wireline subscriptions on a per capita basis

	Low income countries (2001)	Low-middle income countries (2001)	High-middle income countries (2001)
1996	0 out of 63	0 out of 53	0 out of 37
2002	38 out of 65	26 out of 52	24 out of 36

Note: Income categories based on World Bank classification

Source: International Telecommunications Union (n.d.)

Tension between goals of universal access and affordability

In many markets, a calling-party-pays regime that allows the wireless operator to generate most of its revenue from charging high rates to terminate calls on their mobile network has enabled the rapid popularization of wireless telephony services. In countries with extensive wireline networks, achieving a reasonable price for consumers to call mobile phones may be the major policy priority, often resulting in the regulation of mobile termination rates. This has especially been the trend in Europe in recent years. However, in countries with limited wireline development, the overwhelming public policy priority may be universal service. For example, in the case of El Salvador, the population of 6.5 million is served by nine fixed and four mobile operators. Some rural areas of El Salvador are exclusively served by wireless operators. Handsets are nearly free, and wireless operators generate revenue from termination rates charged to those who call to those handsets[14]. If universal service is the primary policy objective, then regulatory regimes may appropriately have a higher tolerance for high termination rates. At what point in a country's telecommunications development should the regulator's priority be universal access or reasonable pricing?

Emergence of limited mobility service via wireless local loop

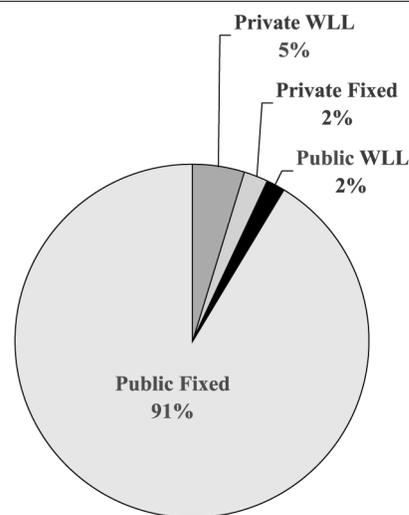
The lines separating wireless and wireline service are blurring as wireless local loop creates the opportunity for fixed-line operators to offer a near-cellular type of phone service. In China and India, such technologies have grown dramatically in the last few years. In both instances, the foundation for the service is a fixed-line network. In China, a version of Japan's personal handyphone system (PHS) seems to be the main technology used to provide wireless local loop. In India, an early-generation version of CDMA technology seems to be the main technology on offer. They both offer mobile service within a limited geographic range, such as a single city, or part of a large metropolitan area.

In India, this limited mobility service allows basic operators (i.e. those with licenses to operate fixed networks) to get new phone lines to

customers much more quickly and cheaply than laying copper cable. While still in its earliest stages, where WLL is deployed it is likely to be popular, since it is a more affordable service than traditional mobile. As Figure 3 shows, for the publicly-owned basic operators BSNL and MTNL, WLL is used by only a small fraction of their subscribers. For the private basic operators, nearly two-thirds of their subscribers are limited mobility service users.

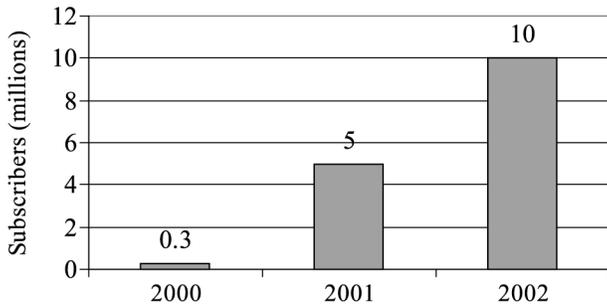
While a cheap wireless service is a boon to Indians who cannot afford cellular service, the manner in which the service was introduced has created a sense of regulatory uncertainty for investors in telecom. In addition, the well-organized incumbent cellular operators have fought fiercely against the prospect of new competition from fixed operators with WLL.

In China, in response to declining revenues from IP telephony and competition from mobile operators, China Telecom and China Netcom are providing a "Little Smart" (*Xiao Ling Tong*) limited mobility wireless service (Figure 4). While critics complain that the quality of the service is poorer than cell phones and the network is prone to congestion, the service in China also meets a

Figure 3 Basic operators' subscriber base, India 2003

Source: Telecom Regulatory Authority of India. "The Indian Telecommunication Industry Performance Indicators 2002-03." July 2003. Yahoo! India Finance, "Private Basic Telecom Firms have 3 Million Users." July 10, 2003

Figure 4 China's "Little Smart" subscribers



Source: AFX News. "China Netcom to Offer Xiaolington Service in Beijing Soon." June 21, 2002; Financial Times. "New Users of China's Little Smart Reaches 10 million." January 14, 2003

major need in the market – a type of mobile service at a lower, more affordable price.

The Little Smart began in 1997 as a service approved by the government only for rural areas. However, China Telecom was able to resist the Ministry's decisions limiting the service, and by the second quarter of 2003 the service was available nationwide, concentrated primarily in urban areas. As has been the case in India, the regulator's indecision over six years about how to regulate this service favored the interests of fixed operators over mobile operators. Figure 5 compares two common Little Smart packages with three common mobile packages. China's mobile operators historically used a mobile-party-pays regime, but the advent of Little Smart services with a calling-party-pays regime has increased pressure

on mobile operators to also shift to calling-party-pays (Xin, 2001).

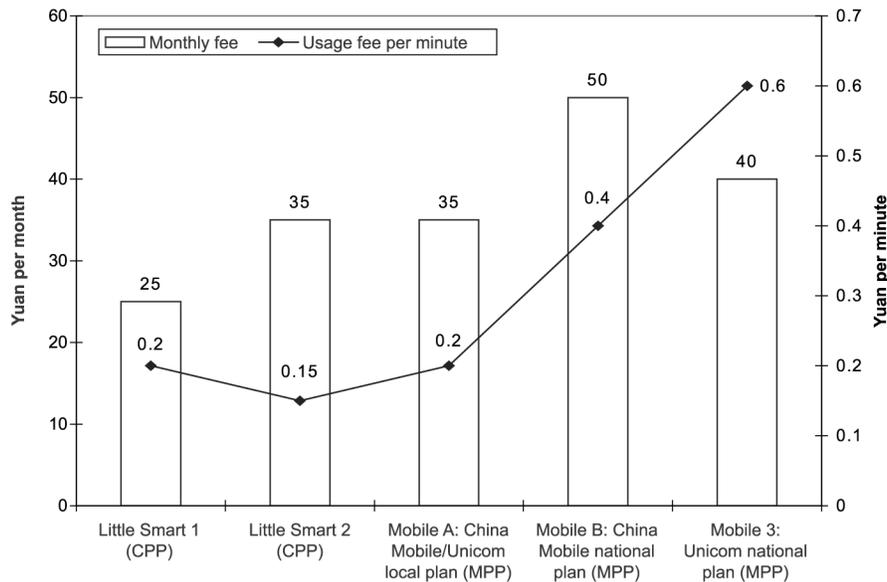
The growth of wireless local loop service in China and India is compelling because these markets have sufficient scale to foster technological innovations that meet the particular needs of developing economies. We are aware that other wireless local loop technologies, such as the cordless system, have systems deployed in Argentina, Brazil, Madagascar, Kenya, Nigeria, Angola, Tunisia, Yemen, Fiji and Iran [15].

Both the growing popularity of cell phone and limited mobility phone services raise some larger questions regarding regulation. For example, historically, regulations have been asymmetric, with more intense regulation of wireline operators as dominant, compared to wireless. Is such an approach now obsolete, and should wireless operators be regulated as dominant? What are the implications for universal service obligations, historically the burden of the wireline operator? What conceptions of universal service can replace the current ones, which rely on wireline network development? If such a change occurs, however, how will Internet service develop if much of a nation's network is connected by wireless but not wireline?

Growing significance of cable television

The advent of technology which enables cable networks to offer telecommunications, Internet,

Figure 5 Wireless telephony price packages



Note: Calling Party Pays (CPP); Mobile Party Pays (MPP)

and audiovisual services, is re-orienting telecom and broadcast regulation in many countries. However, unlike telecom networks, national cable networks have much more diverse histories. Whereas most telecom networks originated as state-owned monopolies, different countries have taken a variety of paths in cable development.

For example, there are some markets with state-owned cable networks. France's cable network is owned by the incumbent telecommunications operator, which is not an unusual pattern. In Korea, the state-owned telecom company and the state-owned electricity company for a few years were the only owners of cable television infrastructure in a regulatory effort to limit the influence of *chaebols*, Korea's large conglomerates, in television programming (Bae and Baldwin, 1998). In contrast, in Brazil, a variety of civil society forces banded together to ensure that the telecom company was not given the right to run the cable television network (Aufderheide, 1997). Further, other kinds of regimes, such as China's, consider cable networks a foundation of its state propaganda apparatus. In order to ensure key programs, such as the Central China Television (CCTV) evening news, reach as many people as possible, the government offices for television subsidize both cable network investment and household subscriptions. Somewhat like Brazil, but for different ideological reasons, these cable network operators are also resisting entry by the telecom operator into their industry [16].

Other markets have networks which consist of small community or neighborhood operators. Sometimes these are sponsored by local governments, such as in The Netherlands or the USA. In other cases, they are entrepreneurial ventures operating in response to audience demand for entertainment and news beyond the government monopoly broadcaster. This is the case in Taiwan and India, for example. Both these markets have undergone tremendous consolidation in the past years, and their respective governments have overhauled the applicable regulatory framework, although in India there is still considerable room for further consolidation. In Taiwan, the most notable challenge has been the inconsistent program offerings available to subscribers due to regular disputes between cable system operators and program providers (Yu, 2001). India is in the midst of a controversial transition to require subscribers to use set-top boxes. While instituting a set-top box system may improve opportunities for cable investment and technological upgrade, the political path to achieve such a transition is unclear.

While there are numerous articles on cable development in individual markets, little

cross-country work in this area is available. The major exception is recent Organization for Economic Cooperation and Development (OECD) studies of broadband Internet service, which include substantial discussion of cable industries (Organization for Economic Cooperation and Development, 2001, 2003). Cable markets with such diverse origins will have different structural, political, and cultural dynamics at play. What are the forces of change within a cable market? What is the impact of alternative video services, such as satellite television? Why do some cable markets attract the investment necessary to enable delivery of new services such as telephony and the Internet, while others do not?

In some markets, cable television subscribership is more widespread than telephone subscribership. India and China are both examples of this. Why this is the case? In other markets, cable network development is sparse. The OECD has already identified that if an incumbent telecommunications operator also owns major cable operations, broadband Internet service development is likely to take place more slowly compared to countries that have separate cable and telecom ownership. Does this also apply more generally to the development of cable networks, or are there other important factors?

Summary

The growth of competition and the convergence of technologies affect regulation today in very practical ways in countries at every level of economic development and market size. From the FCC's interaction with regulators from other countries in the last two years, several questions have emerged that would benefit from further examination by the research community. Studies encompassing several countries that can enable generalizations are especially valuable. While some of these questions have been explored extensively for wealthy nations, research that investigates these questions for low-income countries with small populations is especially lacking.

Regulatory procedures

- How can the quantity and quality of market data available to regulators be improved?
- How can policy and regulatory recommendations be crafted so they can be should be implemented by a limited number of staff?
- How can regulators make decision making more open and transparent? What techniques can encourage the public to participate?

- How can enforceable rules be created? What are the best ways to enforce rules? What methodologies are available to determine appropriate sanctions when rules are violated?
- How can a regulator better understand consumer concerns in a competitive market? What techniques work best to redress consumer concerns? Are there better methods for balancing consumer information asymmetries?
- Given that gender inequality has a major impact on economic development, what impact does it have on communications development? How should this affect regulation and policy of the market?

Convergence of wireline, wireless, and cable technologies

- How can regulators balance the competing goals of universal access and affordability for wireless technologies?
- Should wireless and wireline telephony be regulated as a single market? If so, what should be done with historically asymmetric regulation of dominant, wireline carriers?
- If state-ownership had an effect on telecommunications development, what effect might it have on cable television development?
- Are there lessons that can be drawn about the development of cable markets that are consolidating from a large number of small, privately run operations?

Notes

- 1 *World Telecommunication Development Report 2002*, International Telecommunication Union, p. 51, as cited in "Domestic Enforcement of Telecom Laws, Best Practice Guidelines," ITU-D Question 18/1, Rapporteur's Draft No. 2, July 2003, p. 3.
- 2 Common Market for Southern and Eastern Africa Meeting, Cairo, Egypt, July 2003.
- 3 For more information on this database, contact Kiran Duwadi (Kiran.Duwadi@fcc.gov).
- 4 For more information, contact Irene Wu (Irene.Wu@fcc.gov). Study results will be released in the second quarter of 2004.
- 5 Meeting with Autoridad Reguladora de los Servicios Públicos, Dirección de Telecomunicaciones, Washington, DC, August 8, 2003.
- 6 Meeting with Shaanxi Province Telecommunications Administration, People's Republic of China. Xian, China, January 2002.
- 7 Meeting with Sri Lanka industry representatives, Colombo, Sri Lanka, August 2003.
- 8 Meetings with Indian company representatives, Chennai, India, and Washington, DC, August 2003.
- 9 For the USA, the main representative for this project is Anita Dey (Anita.Dey@fcc.gov). The Chair of the group is Colin Tan Thong Tee, Manager/International, Infocomm Development Authority of Singapore (tan_thong_tee@ida.gov.sg).

- 10 Seven sub-elements are covered: (1) source of enforcement power; (2) process; (3) sanctions and penalties; (4) organization and resources; (5) independent decision making; (6) barriers/challenges; and (7) gender. Guidelines for common violations of specific areas (e.g. interconnection, radio interference) will also be addressed.
- 11 The Rapporteur is Roxanne McElvane (Roxanne.McElvane@fcc.gov).
- 12 See Office of Telecommunications (OfTel), "Consumers' use of fixed and mobile telephony", Quarterly Survey of Consumers, available at: www.oftel.gov.uk/publications/research/index.htm
- 13 See, for example, the World Bank's Policy Research Report Working Paper Series at www.worldbank.org/gender/prtr/wp.htm, and the World Bank's Gender and the Digital Divide Seminar Series at www.worldbank.org/gender/digitaldivide/index.htm
- 14 Presentation by Superintendencia General de Electricidad y Telecomunicaciones (SIGET) de El Salvador, Washington, DC, August 8, 2003.
- 15 Meeting with Dr Ashok Jhunjhunwala, Indian Institute of Technology, Madras, Chennai, India, August 2003.
- 16 Sino-International Cable TV Executive Management Conference, Beijing, China, March 2003.

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