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The Next Step for Telecom Regulation: ICT Convergence Regulation or Multisector Utilities Regulation?[1]

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Abstract

This paper critically examines the multiple rationales for telecom, IT, media (ICT) convergence regulation on the one hand, and multisector utility regulation on the other, and the practical questions of implementation they pose, with a view to contributing to informed policy and regulatory decisions that are now underway in many countries. The conditions that may affect the creation of convergence and multi-sector regulation, ranging from underlying commonality of inputs and the behaviour of regulated firms to considerations that are specific to the regulatory process such as scarcity of regulatory resources and safeguards for regulatory independence, are examined. The paper concludes that ICT and media convergence issues are primarily about improving the efficiency of market economies, and how changes in regulation can facilitate this process. It is likely to be of primary interest for countries that already have an established effective independent telecom regulator. Multisector regulation issues are primarily about establishing the efficiency and effectiveness of regulation so it can be a catalyst for network and economic development. It is likely to be of primary interest to countries that have not yet established effective telecom regulation. Each regulatory option arises from an initial diagnose of different problems, and represents different priorities and pathways to achieving a very similar set of development objectives.

Introduction

In a dynamic period of technological and market change in the ICT sector, telecom regulation must also be dynamic and responsive to changing conditions. As a result, many countries are considering various options for the next step in telecom regulation. This paper critically examines the multiple rationales for information and communication technology (ICT) and media convergence regulation and multi-sector utility regulation, and the practical questions of implementation that they pose, with a view to contributing to informed policy choices. Both options involve substantive as well as procedural issues, not necessarily separable. Policy design is affected by overall policy objectives, not necessarily limited to extant and accepted objectives such as increasing investment in a particular infrastructure sector. The design may be driven by explicit objectives such as enhancing a country's comparative advantage with regard to advanced service industries or implicit objectives such as minimizing the political or perceptual fallout of a change in regulatory regime or personnel. In the paper, the conditions that may affect the creation of convergence and multi-sector regulation, ranging from underlying commonality of inputs and the behaviour of regulated firms to considerations that are specific to the regulatory process such as scarcity of regulatory resources and safeguards for regulatory independence are examined.

[1] Thanks for research support and critical comment to Andrew Barendse, Morten Falch, Bruce Girard, Divakar Goswami, Wolter Lemstra, Amy Mahan, Markus Schneider, Knud Erik Skouby, Reza Tadayoni, and participants in *World Dialogue on Regulation for Network Economies (WDR)* project Conferences, Workshops and e-dialogue over the period January-September 2002. This paper builds on background papers published earlier on the project web site www.regulateonline.org. It is a review of issues examined in a longer project report now in preparation. Funding support for this project from *info*Dev (IBRD, World Bank Grant Agreement # 546-011501) is acknowledged.

Definitions of Industry, Sector and Multi-sector

An industry is defined in terms of substitution possibilities in consumption.[2] Conceptually, complete substitutability would be the test of an industry. In reality, a high degree of substitutability defines an industry. For purposes of regulation, it is more common to define the scope of regulatory agencies in terms of 'sectors', rather than single industries. A sector is a set of closely related industries, which have a degree of substitution possibilities or substantial economies of scope on the supply or demand sides. The higher the substitution possibilities, the more likely is it that the term "industry" will be used over "sector". As consumption or production conditions change, the definitions of industries and sectors will change. By definition, therefore, multi-sector regulation must involve industries/sectors that do not have significant substitutability or substantial complementarity.

The Convergence Perspective: ICT and Media Convergence/Divergence

The broad range of industries involved in ICT and media convergence is IT, telecom, broadcasting and other media dealing with information and entertainment. Figure 2 illustrates the industries involved and the levels of activities from equipment/hardware and transport/software to content/service provision. Each of the different industries can be conceived as encompassing all three levels although they are not entirely comparable. However, Figure 2 illustrates that there are many possibilities for convergence at a horizontal level between different industries as well as vertical integration between different levels. It also illustrates that divergence and disintegration are possible. Industries that formerly have witnessed (some degree of) vertical integration may experience new lines of divisions of labour between different actors in the field. Convergence / integration and divergences / disintegration go hand in hand.

Figure 2: Convergence/integration and divergence/disintegration

	IT	**Telecom**	**Broadcasting**	**Other media**
Content/ services	Software based content	Telecom based services and content	Broadcast programs	Film, music, newspapers, etc.
Transport/ software	Software	Network services	Transmission	Cinemas, video rentals, etc.
Equipment/ hardware	IT hardware	Telecom equipment	Broadcast equipment	Reproduction of films, printing, etc.

Technology Neutrality

There is thus both a horizontal and vertical aspect, and both aspects are subject to discussion in the paper. The horizontal level has hitherto been primarily concerned with convergence at the equipment / hardware and transport / software levels (in communications called infrastructure and associated services, in the terminology of the European Union[3]). Often countries have dealt differently - in terms of, for instance, licensing procedures and interconnection rules - with fixed telecom networks, mobile networks, and cable and terrestrial broadcast networks. At present, there is, however, a general shift in the rules and procedures in many countries towards an equal treatment (convergence) of different information and communication infrastructures. The EU is a case in point with its emphasis on technology neutral regulation.[4]

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[2] For discussion of industry (or market) definitions, including the principles developed in US anti-trust case law, see Scherer, F. M. and Ross, D. (1990). *Industrial market structure and economic performance*, 3rd edition.Boston: Houghton Mifflin: 73-79.

[3] See, for instance, European Commission (1999). *The 1999 Communications Review.* COM (1999) 539. Brussels.

[4] European Commission (1999). *The 1999 Communications Review.* COM(1999)539. Brussels.

Content Issues

The horizontal level also includes the possible implications of convergence at the content layer. Types of content that, formerly, were dedicated for specific industries can be conveyed on different infrastructures because of the common digital form. This presents new possibilities for end users and new market potentials for producers, but it also presents regulatory problems that have to be solved. One of the problems is related to the provisions for public service in the broadcast area. Should such provisions be extended to the Internet web, or should convergence on the content level lead to an abolition of public service rules? Another issue relates to the extended access to different kinds of illegal or harmful information, for instance racist propaganda, which the Internet facilitates. What are the possibilities of countries to retain control of this? Yet another problem is related to the provisions for media responsibility that exist today for print and broadcast media but do not apply to Internet.

Infrastructure and Content Together?

There is also a vertical aspect – not only in the sense that there are numerous examples of industries integrating or trying to integrate equipment and transport and content provision, but also in the sense that some countries integrate infrastructure regulation and content regulation. India is an example of this. The new Communications Commission of India (CCI), the Indian communications regulator, will integrate infrastructure and content regulation in one institution[5]. The UK is another example, in which the government is uniting five existing regulatory bodies dealing with communications into one regulator, OFCOM, with authority in both infrastructural and content questions[6]. Singapore and Malaysia are also examples of countries that have assembled the regulation of infrastructure and content. The InfoComm Development Authority of Singapore left the regulation of all forms of content to the Singapore Broadcast but it is envisaged that this too will be merged shortly.[7]
In the case of horizontal convergence, it is a matter of converging regulation and possibly converging regulators. In the case of vertical integration, it is mostly a matter of integrated regulators, as infrastructure and content regulation are two rather different fields, although integration of content and infrastructure provision may have implications not only for the industrial structure but also for the content itself. The EU, for instance, draws a sharp line between infrastructure (and associated services) and content. It is, however, a question whether this is possible without leaving aside important issues.

Convergence involves technological, market and policy/regulation dimensions.The main issue in the convergence discussion is, therefore, concerned with the possibilities for exploiting the industrial opportunities in creating a new dynamic ICT sector encompassing hitherto separate sectors.[8] Apart from the broad diffusion and use of the new media and communication (universal access) and the protection of consumers in new media markets, this is the overall issue for convergence policy: to establish a framework for the growth of a dynamic communication and information industry. It is in this perspective that most convergence policies are seen.

Convergence Technology Trends

This section provides a overview of the major technological aspects of the ICT and media convergence processes. The focus is on the role of technological changes and developments in the creation of new conditions for production, aggregation, delivery and consumption of communication services.

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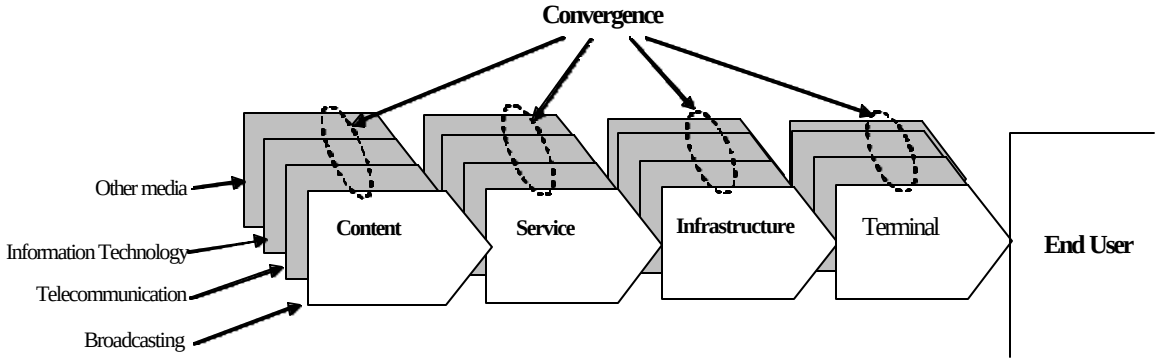
[5] *The Communication Convergence Bill, 2001*. At: http://indiantelevision.com/indianbroadcast/legalreso/ccb2k1.htm.
[6] See Department of Trade and Industry: *A New Future for Communications, 2001*, http://www.communicationswhitepaper.gov.uk
[7] Effective regulation case study: Singapore, at www.itu.int/itu-d/treg; see also presentation by Leong Keng Thai 2nd Global Symposium for Regulators. Geneva, 2-4 November 2001, at http://www.itu.int/ITU-D/treg/Events/Seminar/GSR/WebDocuments/Leong_SGP_Casestudy.pdf
[8] See e.g. the UK case, op.cit.

The major technological changes that have facilitated the convergence processes are digitalisation and computerization. Digitalisation enables new possibilities for development and creation of services within and beyond the framework of traditional communication sectors. It is, for example, likely that services that go beyond the traditional broadcasting services, like Internet services, will have a certain weight on the broadcasting market in the future, as demand for these services is increasing with the penetration of the Internet. When transmission capacity for end-user sites reaches that needed for transmission of video services, the Internet can be one of the platforms for interactive TV services.

Emerging new infrastructures with more capacity, developments in the traditional networks enabling them to offer more capacity to end users, and developments in compression and coding technologies resulting in less bandwidth requirements for audio and video services all have diminished the technically based limitations for different networks to provide an increasing variety of different types of services. But there is still a long way to go before network capacity constraints are substantially eliminated.

The following analysis is structured around the value chain of communication networks depicted in Figure 3, so that different subsections deal with the technological aspects of convergence in different parts of the value chain.

Figure 3: Convergence in the value chain



The analysis aims at illustrating the technological drivers, but also barriers, for the convergence processes in different parts of the value chain.

None of the infrastructures available can integrate all the services in their current state. While integration of the back-bone parts of the networks have had better conditions to evolve, integration of the last mile coverage has shown to be dependent on many different parameters. However, some infrastructures have better potential to be upgraded to integrate more types services. Cable TV networks are examples of this. On cable networks, it is possible to offer several broadcasting services of acceptable quality and at the same time deliver Internet and basic communication services. Also new LAN types of networks in residential areas (and different wireless solutions on the market) can provide acceptable performances. However, when upgrading cable TV networks and establishing new networks, huge costs must be paid in one way or another.

There are, therefore, choice to be made between an integration model and a heterogeneous model. This choice depends partly on the characteristics of the types of communication in question and the characteristics of different kinds of networks and partly on the history of network developments in the different countries. There is a certain path dependency in the possible choices countries make, hinging on the former history of network development.

While in developed markets, the convergence process (both in integrated and heterogeneous network versions) mainly facilitates a platform where the same service is delivered through

different infrastructure, for developing countries it mainly facilitates increased penetration of services. In developed countries, convergence facilitates more competition, in developing markets it is more likely to facilitate complementarity.

For example, cable TV networks can be used to offer telephony and Internet services. However this possibility of reuse of infrastructure is only possible if a regulatory framework is established that facilitates the efficient utilization of available resources in different networks. This is often not the case.

Another important aspect concerns geographical regions where communication infrastructure is not available. This gives more freedom in the design of the future networks, because the demand for other services than telephony can be taken into account from the beginning, if policy and regulation permit it.

- Convergence in content production is related primarily to service convergence
- Convergence in distribution is related to network convergence
- Convergence in equipment production is related to terminal convergence.

This does not imply that the different platforms will be used for provision of the same services - a certain specialization is likely to remain. But the former boundaries between IT, telecom, broadcasting and other mass media companies are going to be redefined and less visible.

An important barrier to the development of cross-sectional content providers is that it is not enough to provide the same content on different platforms. In order to remain competitive, content must be designed in a way that takes the potentials and limitations of each platform into consideration. As long as the technical capabilities vary across platforms and networks, there will always be a scope for development of content designed for a particular platform.

Not all of these attempts have been successful. TDC, formally TeleDanmark, had to realize that broadcast and telecom are two quite different types of businesses and their TV channel was closed down due to lack of subscribers. It has also been questioned whether the strategy of Bell Canada Enterprises has paid off in terms of generation of revenues[9].

Summary of market trends

Convergence is shaping the present development of the ICT and media industries in ways that challenge the existing institutional set-up. The market trends can be describes as follows:

- Company and market structures are formed by other factors than convergence such as financial considerations and corporate strategies (conglomeration vs. focus on core competencies).
- A large number of mergers and alliances have been made. Most of these mergers and alliances have taken place between actors within the same market segment, and may rather be attributed to internationalisation than to convergence. Still, a number of cross-sectional and vertical mergers have taken place.
- Vertical integration has mainly taken place between content production and distribution. At the same time there has been a trend towards disintegration of service production and manufacturing particularly in the telecom sector. It is possible that a further disintegration in the telecom sector will take place through a separation of network provision and telecom service provision.
- Many companies have set up new activities in other sectors in order to complement their core business. Content providers such as newspapers and broadcasters are becoming multi-channel content providers, although they keep their main activities within one sector. Telecom companies are going into content provision (including broadcast) in order to ensure content to their networks.
- Convergence takes different forms in the different layers of the value chain. Convergence in content production includes all of the four sectors, while convergence

[9] Geoff Wheelwright: 'North American Convergence Plays - Canadian convergence in doubt', *Communications Week International*, 24 September 2001 http://www.totaltele.com.

in distribution is most prominent between telecom and broadcasting sectors. In equipment production it is the IT and telecom sectors that are converging (Figure 3).

- New ICT and media sectors are emerging. These sectors may in a certain phase be dominated by companies from other sectors but can develop to sectors that in spite of a deep integration with services from other sector may become dominated by independent companies. The most obvious candidate is the mobile industry. In spite of a considerable overlap between the markets for fixed and wireless services, operators tend to separate their mobile operations into independent activities, which later may be spun off as new independent companies.

Convergence Policy Issues

From a policy and regulatory point of view, convergence in the ICT and media areas raises a number of issues. There are issues that are related to all three levels (equipment/hardware, transport/software and content/services) in the convergence model (Figure 2). The ones that will be dealt with here take up the issues of the general societal importance of convergence policies, the balance between benefiting from industrial complementarities and the problems of media concentration, and access to networks and content. Other issues are related to the infrastructural levels (equipment/hardware and transport/software), where the overall question is to what extent it is possible to subject all infrastructures to the same regulation. At the content level, there are a large number of issues that have to be resolved, including the question of whether all content areas can be treated in similar ways regarding, for instance, what it means for public service provisions in the broadcast area and what it means for media responsibility rules.[10] Other questions deal with privacy protection, security, consumer protection, intellectual property rights, and illegal information.[11] Finally, there is the issue of the possibilities and problems regarding the separation of regulation of infrastructure and content.

There is today a political trend towards loosening the restrictions on media concentration, including cross media ownership provisions, in order to take advantage of complementarities between media and technology areas.

But with the convergence between these networks and the possibilities for conveying similar services over different networks, the foundation for differences in rules are beginning to be questioned.

Similarly, it is an open issue to what extent regulation in the different content areas should converge.

All these issues have existed for many years. They have not been created by the development of convergence in the media and Internet areas. However, convergence and the Internet create a new environment in which these known issues acquire new dimensions. Parts of the issues and the regulatory rules that they give rise to are, therefore, connected with the issue of media convergence, and rules taking account of this should be developed. However, this does not necessarily mean that these issues should be part of a united convergence regulation or that a single regulatory authority should deal them with.

To the extent that convergence between telecom, IT and broadcasting takes place technologically and in the market place, or to the extent that it is a political aim to promote such convergence tendencies, regulations of hitherto separate communication areas must also converge – or regulations must at least adapt to or accommodate a new convergence environment. Even though convergence developments have been known for many years, the main thrust in recent research on convergence has been that the degree and character of convergence developments are different today because of; (1)technology developments, first and foremost the digitalisation processes; and (2) the political liberalization, including more

[10] First raised in Pool, Ithiel de Sola (1983). *Technologies of Freedom*. Cambridge MA: Belknap.
[11] Samarajiva, R. (1997). Telecommunication regulation in the information age, in W. H. Melody, (ed). *Telecom reform: Principles, policies and regulatory practices.* , Lyngby, Denmark: Den Private Ingeniorfond: 421-39.

liberal policies in relation to market convergences[12]. There is, consequently, an increasing necessity of a closer relationship in the regulation of the different communication and media areas. It is not sufficient to have the different areas under the same roof. The synergies between the different regulatory areas must be developed more proactively, encompassing the regulatory 'contributions' of the different areas. Telecom contributes with infrastructure regulation and access issues; broadcasting with access and content issues; IT contributes with, e.g., privacy and security issues; and together the different areas contribute with new regulatory issues such as IPR (Intellectual Property Right) and e-commerce regulation.

The potential advantages would seem to be the following:

- To the extent that markets are converging, it is better to apply the same provisions across communication and media areas.
- In regulatory interventions, it is important to be able to build on a greater knowledge of corporations with activities in different communication and media areas and to understand the inter-relationships between areas.
- To take advantage of the economies of scope and scale, especially the economies of scope in the sense that some of the regulatory issues are the same across industry platforms, for example in the case of price cap regulation. This is important in any country trying to economise on the costs of regulation, but can be essential for countries with insufficient suitably trained staff for the different regulatory assignments.
- Possibilities for a greater political independence in relation to implementing policy decisions, with administrative relationships to more than one ministry.
- One-stop-shopping for users of the regulatory institutions, as complaints and applications only have to be filed with one organization.

The potential problems would seem to be the following:

- Unclear regulatory principles because of the unification of different regulatory rationales, for instance, the unification of the infrastructure regulation tradition from telecom and the content regulation tradition from broadcasting.
- More bureaucratic working procedures with the enlargement of the regulatory organizations.
- Danger of less scope for independent implementation of policies as more than one ministry will seek to influence regulatory decisions and procedures (in contrast to the above-mentioned possibilities for greater independence).
- Opaque structure for the users of regulatory organizations, as they may not be able to 'see through' the organizational maze in unified organizations (in contrast to the positive side of one-stop-shopping mentioned above).

From the advantages and problems described it seems clear that it cannot be determined in advance whether the primary overall outcome of an organizational unification will be positive or negative. It depends very much on the specific circumstances and the ways in which the unified organization is constructed and managed.

Furthermore, regulation of different communication and media areas cannot just be joined together organizationally, expecting synergies to develop from the mere organizational unification process. It must be clearly determined how the different functions relate to one another. A type of matrix structure may be necessary as a possible solution for reaping the 'scope advantages' and for avoiding the development of a disjunctive organization.

Regulations of communication and media areas may have many different forms, both in terms of the scope of regulation, i.e. the different kinds of communication and media areas included, and the depth or degree of regulation, meaning how strongly regulated an area is. If taking

[12] The whole discussion on convergence is based on the assumption that 'something new' has happened, see for instance the so-called 1999 Communications Review of the European Community, European Commission: 'Towards a New Framework for Electronic Communications Infrastructure and Associated Services', COM (1999) 539.

telecommunications as the point of departure, telecom may be regulated in the following different settings:

- Light specific telecom regulation, first and foremost regulation of scarce resources such as frequencies, rights of way, and names and numbers.
- Stronger specific telecom regulation, also encompassing interconnection and universal service/access regulation.
- Convergence regulation, encompassing telecom, IT and broadcasting.
- Multi-sector regulation, where telecom is joined together with other infrastructural utilities such as electricity, gas and railroads.
- Competition regulation of a broad range of different industries, where telecom is only a tiny fraction.

In this list of regulatory settings, the scope of regulated areas expands from the first mentioned to the last. However, there is also another dimension of categorization, namely the depth or degree of regulation. When crossing these two dimensions, scope and degree, different kinds of regulatory settings can be illustrated graphically, as in Figure 6.

The Multisectoral Utility Perspective: Bases of Multisector Regulation

The multisectoral utility perspective is based upon different priorities, assumptions and conditions than the ICT convergence perspectives. In common usage, multisector regulation is understood to be the functioning of a single regulatory agency that has responsibility for sectors such as telecom, energy, water and transportation. The classic multi-sector regulatory agencies are the State Public Utility Commissions (PUCs) in the United States. What is common in the objects of regulation, such as transport, telecom and energy, is the monopoly associated with essential rights of way. Common use of rights of way by different infrastructure sectors such as ICTs, energy, water and sewage is perhaps a justification for multi-sector regulation. Rights of way are scarce and many countries are bound to allocate them fairly because of their WTO commitments, among other things. If indeed there is substantial common use of conduits and rights of way, and those common elements constitute a major portion of the supply chain, one might argue that the multi-sectors have converged, and that what exists in fact is a sector – an infrastructure sector.

Common Assets: Rights of Way

Rights of way are a key asset for those who hold them, and access to them is essential for new entrants. Historically granted at minimal cost to encourage infrastructure development, they are becoming increasingly expensive and time consuming to acquire as more and more players vie for them.[13] In the US, for example, rights of way permits can account for 20% of the cost of a fibre build, and can take over a year to acquire.[14] And, of course, discriminatory access to rights of way is a barrier to market entry. Thus, in conjunction with legislation targeted at levelling infrastructure playing fields,[15] there are also incentives for achieving viable technological solutions, in particular for last mile distribution to the end-user.

The recently heightened importance of rights of way and conduit sharing (including power line telecom, which is perhaps the ultimate expression of common use) is a subject of legitimate interest to regulators, not only in telecom but also in other sectors. The question of whether rights of way and conduits constitute inputs so important that one must consider the possibility that the hitherto distinct sectors are in the process of converging is one that is currently under discussion.[16]

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[13] http://www.fhwa.dot.gov/realestate/rowutil1.htm

[14] Gerwig, Kate. "Can They Dig It?", *tele.com*. March 19, 2001. <www.teledotcom.com/article/TEL20010319S0026>. Previously, ROWs accounted for about 10% of a fiber build. The author notes that the rule of thumb for building a network is each mile requiring a separate ROW agreement.

[15] See US Telecom Act of 1996, noted above; and for example Directive 90/388/EEC, <http://europa.eu.int/ISPO/infosoc/legreg/docs/90388eec.html> as amended by Directive 96/19/EC <http://europa.eu.int/eur-lex/en/lif/dat/1996/en_396L0019.html> which requires that telecom network operators be granted ROWs on a nondiscriminatory basis.

[16] See, for example, the dialogue on "The next step in telecom reform: ICT convergence regulation or multi-sector utility regulation?" at http://www.regulateonline.org/theme2002.htm

One must, however exercise caution with the argument that common use of inputs or economies of scope on the production side justify common regulation. As commentators on the subject have pointed out,[17] the fact that SIM cards of GSM mobile terminals are being upgraded to function simultaneously as credit or debit cards does not necessarily justify a single regulatory authority for telecom and financial services.

The regulatory issues that are posed by these forms of common and joint uses of rights of way and conduits, include the prevention of anti-competitive behaviour (e.g., cross-subsidy) by firms with significant market power in their "home" markets and ensuring non-discriminatory access by new entrants to rights of way and conduits as well as consumer-protection issues such as energy disconnections caused by failures to pay telephone bills. These issues do not, by themselves, constitute a case for multi-sector regulation. However, they do make a strong case for increased cooperation and coordination among infrastructure regulators.

The rationales for participation by energy utility companies in telecom are varied. The primary reasons given for penetrating telecom markets range from the need to improve operational efficiencies to the overall strategic objectives of the company. It is generally assumed that improved efficiencies include economies of scale and scope, eliminating redundant or overlapping activities, efficiencies in procurement, production, marketing, and administration. Strategic objectives include remaining competitive in a rapidly changing environment, building core competencies, acquiring additional managerial and technical expertise, etc. When energy utility executives were questioned on the actual reasons for entering into the telecom market, however, the three reasons provided were "sharing of infrastructure, bundling of opportunities and gaining experienced people."[18]

Regulatory practice has long rested on ring-fencing specific regulated activities and the associated costs and revenues. Holding company legislation and requirements for separate subsidiaries and accounting separation have been among the regulatory instruments used to ensure the proper application of regulatory rules and the prevention of undue cross subsidy.[19] The contemporary efforts of utilities, in particular energy operators, to cross industry boundaries therefore pose a problem for regulators. Both obvious responses are unattractive. The conventional response of insisting upon separate subsidiaries is likely to generate criticism on the ground that regulatory convenience is preventing innovation and the realization of economies of scope. The other alternative of following the regulated company could create jurisdictional overlap, unless a multi-sector regulatory agency is created.

Resources and Skills

The basic argument is that regulatory skills and the money needed to obtain the skills are in short supply in developing countries (and were possibly in short supply in the US states where multi-sector regulation first emerged in the 20th century). In light of this scarcity of regulatory resources, Schwartz and Satola see the necessity for multi-sector regulatory agencies. Multi-sector regulation may also prove useful for developed country governments seeking to economize on regulatory resources.

The market for regulatory skills is no different from other markets; the price is set by the interaction of supply and demand. Given the explosion of regulatory activities across the world in the last decade of the 20th century, it is reasonable to expect that

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[17] Arnbak, Jens C. (2002). Multi-utility regulation: Yet another convergence, in *Networking Knowledge for Information Societies: Institutions and Intervention*, Robin Mansell, Rohan Samarajiva & Amy Mahan (eds.), p. 144. Delft: DUP Science.

[18] Woods, Bob. "Most Energy, telecom firms converging – KPMG", April 2001, http://www.opticallynetworked.com/features/article/0,,10516_745781,00.html.

[19] Rosenberg, E. A., Borrows, J. D., Hunt, C. E., Samarajiva, R. & Pollard, W. E. (1993). *Regional Telephone Holding Companies: Structures, Affiliate Transactions, and Regulatory Options*. NRRI 93-05. Columbus OH: National Regulatory Research Institute; Bonbright, J. C. and Means, G. C. (1932). *The Holding Company: Its Public Significance and Its Regulation*. New York: McGraw Hill.

- Persons with the necessary regulatory skills are in short supply worldwide, the educational system not having geared up for increased production in the short term; and
- The prices for the persons with skills have been bid up by increased demand.

They have sought to purchase these skills at local market rates rather than at international rates. When the market for regulatory skills is conceptualised as a series of insulated national markets, the mismatch between supply and demand becomes exacerbated, especially in developing countries where the educational systems are slower to respond and human resources are shallower than in developed countries.

Liberalized infrastructure markets can result in dramatically higher levels of investments and can generate enormous amounts of revenues both for the investors and for the governments. It could be argued that a small proportion of the investments and/or revenues can be set apart for regulatory outlays, which are after all what makes the investment feasible, without burdening the general treasury funds. The favoured method of funding regulatory agencies worldwide, a levy on operator revenues and/or license fees, reflects this thinking. If this method of funding is adopted, the regulatory agency will have the resources to purchase the necessary skills, through direct recruitment, training combined with adequate salaries, and short-term outsourcing.

While many regulatory agencies have the revenues, there are barriers to spending the funds as described above. Most governments constrain the levels of government salaries with the good intentions of reducing expenditures on unproductive sectors of the economy and preventing inflationary wage spirals. Regulatory agencies being seen as part of government, the wages they can offer are also constrained. Except in the West European core and North America, procedures intended to prevent corruption as well as the generally archaic systems of public administration hinder the use of outsourcing. In most developing countries, outsourcing is possible only in cases where multilateral or bilateral technical assistance funds are available.

In sum, the scarcity of regulatory resources in developing countries is real, but it can be caused by government procedures and policies that prevent relatively straight forward market-based solutions from being applied. In the absence of a short-term solution to the problem of ineffective government, designers of regulatory instruments for developing countries must take scarcity of regulatory resources as a given.

Assessing Experience

Examination of the actual organization of US state–level multi-sector regulatory agencies, the Public Utility Commissions (PUCs), does not provide much evidence of economies of regulation, except at the level of the decision-makers, or Commissioners. Generally, staff members specialize in a particular sector such as telecom or water and work within distinct divisions that are devoted to sector-specific regulation. Resources are shared at the levels of commissioners, who hear cases pertaining to all sectors, the senior staff who manage the agency as a whole, and the legal staff responsible for hearings and related procedural matters. Generally, the different divisions are located in common facilities and use common amenities such as libraries which may yield certain savings. It must also be noted that US PUCs do not have jurisdiction over frequency management, broadcasting, and cable. The former two areas are subject to federal jurisdiction, while municipal governments and the federal government share jurisdiction over cable.

The US PUC experience shows that there may be significant economies in areas such as use of buildings, libraries, and training facilities in common. The Atkins report cited above suggests that the UK regulatory agencies at least could use some new ideas in terms of saving on these types of non-regulatory costs. This does not, however, justify multi-sector regulation as such, only close collaboration and facility and service sharing among sectoral regulatory agencies.

Despite these qualifications, the multi-sector solution should not be rejected out of hand. Informed by the debate, it may be possible to devise innovative solutions such as keeping the

regulatory staff separate but sharing decision-making bodies; co-locating sector regulatory agencies and allowing and encouraging mutual learning and resource sharing; and creating a new category of regulatory organizations within government that would be subject to the most advanced forms of administrative controls and managerial incentives.

One of the main advantages of multi-sector regulation, according to Schwartz and Satola (2000), is the shield it provides against capture, both by industry and by political forces. The argument is that a multi-sector regulatory agency is more likely to be independent and, therefore, give greater certainty to investors through good governance.

Experience has shown that there are two major threats to the independence of sectoral regulatory agencies from the government side. One is the line ministry, which previously combined the functions of policy setting, regulation and operation, but following liberalization has been left with only the task of policy setting, if anything.[20] The second is the ministry of finance or equivalent, which is engaged in the privatisation of the incumbent operator or is the major shareholder of the partially privatised incumbent.[21] The multi-sector solution, by definition, takes the regulatory agency out of the control of one line ministry (because there will be more than one) and will give it a reporting relationship to either a ministry devoted to economic reforms of the overall subject of finance, or the president, or prime minister, or the legislature. An alternative solution to the problem of line ministries is to abolish them altogether, as Senegal has done.[22] Japan, which has yet to create a separate regulatory agency, has replaced the well known Ministry of Posts and Telecommunications with a new Ministry of Public Management, Home Affairs, Posts and Telecommunications.[23] Following liberalization, it is difficult to see the rationale for maintaining an entire ministry for policy setting in a single field like telecom. The Japanese reorganization suggests that a ministry is not justified, even where the regulatory function is retained.

However, the solution to the line ministry problem should not aggravate the finance ministry problem. Unless proper safeguards are set in place, the multi-sector regulatory agency may be interfered with by other parts of government with vested interests in multiple incumbent infrastructure suppliers.

Multisector Agency Potential

The decision to create a multi-sector agency improves the chances of creating a modern, competition-oriented agency that will not be beholden to incumbent operators. The possibility that the regulatory agency will be staffed more or less completely by people who have spent their entire careers in incumbent operators is a very real one, in the case of industry regulators. With a multi-sector agency there is no direct path from incumbent to regulatory agency. While some staff may be recruited from an incumbent, they will at least be balanced by staff from another incumbent. Hopefully, the new organization will recruit economists, lawyers and other professionals from the private sector who are not impaired by government monopoly mindsets and who will be capable of balancing the recruits from the restructured incumbents in the various industries. The key to this will of course be the early decisions taken on organizational structure. If an industry-based structure is adopted, not only will it be more likely that government-monopoly thinking will predominate, but also the desired economies of regulation will not be achieved. If a skills-based organization with interdisciplinary teams being constituted for various regulatory tasks can be established, it is

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[20] See for example the continuing struggle between the Moroccan telecom regulatory agency, ANRT, which has been recognized as one of the exemplary regulatory agencies in the world and the Ministry, SEPTI. Bouzerda, Ali. Head of Morocco telecoms watchdog resigns. *Totaltele.com*. 11 Jan 2002. http://www.totaltele.com/view.asp?ArticleID=47597&Pub=TT&CategoryID=627; and Bouzerda, Ali, Moroccan regulator signals resignation, *Totaltele.com*. O3 December 2001. http://www.totaltele.com/view.asp?ArticleID=46417&Pub=TT&CategoryID=627

[21] See for example, the tensions in Sri Lanka between the Public Enterprise Reform Commission of the Ministry of Finance and the Telecom Regulatory Commission after the partial privatization of the incumbent in 1997. Samarajiva, Rohan. The role of competition in institutional reform of telecommunications: Lessons from Sri Lanka, *Telecommunications Policy*, 24(8/9), 2000: 699-717. At: http://www.tpeditor.com/contents/2000/24-8+9.htm

[22] Pan African News Agency (May 24, 2001). "Workers in Communication Ministry ill at ease." At: http://allafrica.com/stories/200105140793.html

[23] http://www.soumu.go.jp/english/index.htm

more likely that an investor and customer friendly organization which enjoys economies of regulation will emerge.

Overall Assessment

This paper is based on the assumption that sector-specific ex-ante regulation of telecom and infrastructure utilities is necessary for the development of these industries, including broad public access. This does not mean that convergence and efficient development of infrastructure utilities will not be seen in countries that mostly rely on general competition regulation and other sets of general regulation. But it means that there generally are societal benefits to be gained by establishing a regulatory foundation for the development of these industries because of a broad range of market failures and the high degree of public interest to which they are subject.[24]

The point of departure is, therefore, that sector-specific ex-ante regulation is potentially beneficial. The open questions are how to combine them, on the one hand, in the ICT and media area (convergence), and across utilities (multi-sector regulation).

The paper deals with both ICT and media convergence regulation and multi-sector utility regulation, but does not preclude the possibility that both directions can be taken at the same time. Is it an 'and' or an 'or'? In principle, they are not mutually exclusive; however, in practice it may be difficult to combine multi-sector infrastructure regulation with regulation of both infrastructure and content. However, close examination of the North American practice of convergence and multi-sector regulation would suggest that it may be feasible to structure a regulatory agency that is converged at the top, but organized in separate divisions that correspond to the current separate regulatory agencies in Europe and elsewhere.

The focus generally, and in this paper too, in the ICT and media convergence area is on the object (substance) of regulation, i.e. the extent to which regulation of different areas should be combined, taking technical and market-based convergence developments into consideration. With respect to multi-sector regulation, the focus is mostly on the organizational aspect. In the former, the subject matter is convergence regulation; in the latter, it is regulatory convergence.

Even though the substance and the organizational aspects of regulation are not necessarily directly related – it is possible to regulate closely interrelated subjects in separate institutions just as well as it is possible to regulate relatively separate issues in crosscutting institutions – combinations of institutions are most often built upon combined issues. This also applies to multi-sector regulation. As documented in the paper, different kinds of utilities can make use of the same conduits, and mergers and acquisitions may also occur across sector boundaries. Thus it could be argued that a common basis exists for regulatory coordination, if not for joint regulatory organizations.

However, the main arguments for multi-sector regulatory organizations deal with institutional questions of resource allocation and independence from undue government interference. The first point taken up is the costs of obtaining the requisite expertise. There are two sides to this. The first is the existence of adequate expertise in a national labour market. The second is whether regulatory institutions can afford to, or are allowed to, hire existing experts. The problem is found in all countries, but is exacerbated in developing countries. Multi-sector regulatory agencies may, under certain conditions, allow for a least-worst solution for regulation using a limited pool of qualified persons. If not a fully-fledged multi-sector regulatory agency, some aspects of a multi-sector organizational structure may assist European regulatory agencies combat administrative bloat.

The second point relates to the potential of multi-sector regulatory agencies to allow for a greater degree of independence from line ministries, again a question that is of obvious importance in developing countries, but not irrelevant in European countries, particularly

[24] See Melody, W. (2002): *Building the Regulatory Foundations for Growth in Network Economies*. WDR Discussion Paper #1. http://www.regulateonline.org

those that have not yet let go of their incumbents. But the analysis contains a caution about the solution sometimes being worse than the original problem, in terms of making the regulatory agency vulnerable to the improper influence of finance ministries.

Third, the multi-sector option has the potential of preventing the wholesale transfer of government-monopoly mindsets through the staffing of the new agency by persons from the restructured incumbents. There is no guarantee that this outcome will be achieved, but a multi-sector agency organized on the basis of skills and interdisciplinary teams constituted for specific tasks is more likely to break free of incumbent mindsets than an industry regulatory agency.

Conclusion

With respect to ICT and media convergence, the main questions in the paper are to what extent different communication infrastructures can be regulated in the same manner and to what extent infrastructure and content can be regulated by one common set of regulations. The general trend around the world is to move towards common infrastructure regulation encompassing formerly more separate infrastructures, e.g. fixed telecom, mobile communications, cable and possibly terrestrial broadcasting. However, there are also some inchoate tendencies towards institutions with responsibility for joint infrastructure and content regulation.

The paper does not provide definite answers to these questions but seeks to raise the policy and regulatory issues of ICT and media convergence as precisely as possible. Indeed, the answers will be different in different countries. There is no one formula that can be used in all countries. Yet, countries will have to approach the issues of ICT and media convergence in a forward looking manner not only for determining new rules for interconnection, universal access and access to scarce resources, but also for building a regulatory framework for increasing the growth potentials in a networked economy.

ICT and media convergence issues are primarily about improving the efficiency of market economies, and how changes in regulation can facilitate this process. It is likely to be of primary interest for countries that already have an established effective independent telecom regulator. Multisector regulation issues are primarily about establishing the efficiency and effectiveness of regulation so it can be a catalyst for network and economic development. It is likely to be of primary interest to countries that have not yet established effective telecom regulation. Each regulatory option arises from an initial diagnose of different problems, and represents different priorities and pathways to achieving a very similar set of development objectives.

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