

## WORLD DIALOGUE ON REGULATION

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# DESIGNING NEXT GENERATION TELECOM REGULATION: ICT CONVERGENCE OR MULTISECTOR UTILITY?\*

## EXECUTIVE SUMMARY

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The **World Dialogue on Regulation for Network Economies (WDR)** facilitates an international dialogue to generate and disseminate new knowledge on frontier issues in regulation and governance to support the development of network economies. The Dialogue Theme for 2002 is: *The Next Step in Telecom Reform: ICT Convergence Regulation or Multisector Utility Regulation?* WDR research teams have produced a series of discussion papers and reports on the theme to support the ongoing dialogue. **This is the final paper in the series.**

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## **1. Introduction**

Continuously expanding applications of information and communication technologies (ICT) are transforming local, national, regional and international economies throughout the world. Just as electricity, the telephone, railroad and automobile each provided a major stimulus to economic growth and a significant restructuring of economies and societies during the 20th century, so the ICT revolution is in the process of creating another “paradigm shift” for 21st century economies and societies. The points of entry to participation in information societies are the communication networks that provide both access to services and information, and opportunities for participation. It is the network characteristics of economic activity that will be changing quite dramatically, and it is the capability for exploiting the potential benefits of these new networks that will drive economic growth and productivity improvements. The networks determine the boundaries of participation and opportunity.

In its early stages, the pace of information infrastructure development has been unacceptably slow, at least with reference to the expectations of many analysts, policymakers and potential users. It is apparent that national telecom policy and regulation - both the regulations and the regulators - will play a major role in implementing structural reforms. The distinctive network and public interest characteristics of the information infrastructure will require a continuing proactive role for regulation if network development objectives are to be met, and the foundations prepared for the next generation Internet services that will support new network economies.

What is unclear at the moment is how direct regulation by independent regulators can best facilitate the achievement of these objectives. Should industry specific telecom regulatory authorities be redesigned as ICT convergence regulators so they can more comprehensively and systematically address the full range of next generation Internet issues? Or should they be redesigned as multisector utility regulators so they can leverage synergies across infrastructures to promote a rapid and efficient rollout of information infrastructure networks. This paper examines these issues.

The paper critically examines the multiple rationales for information and communication technology (ICT) and media convergence regulation on the one hand, and multisector utility regulation on the other, and the practical questions of implementation that they pose, with a view to contributing to informed policy and regulatory decisions. Both options involve substantive as well as procedural issues, not necessarily separable. Both are affected by overall policy objectives, not necessarily limited to extant and accepted objectives such as increasing investment in a particular infrastructure sector. The design of policy and regulatory structures may be driven by explicit objectives such as enhancing a country’s comparative advantage with regard to advanced services industries, or implicit objectives such as minimizing the political fallout of a change in regulatory regime or personnel. In the paper, the conditions that may affect the creation of convergence and multisector 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.

## **2. Convergence Perspectives: ICT and Media Convergence/Divergence**

The broad range of industries involved in ICT and media convergence are IT, telecom, broadcasting and other media dealing with information and entertainment. Figure 1 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 1 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 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 1: 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.

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. 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 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 for 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.

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. 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. Singapore and Malaysia are also examples of countries that have assembled the regulation of infrastructure and content.

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.

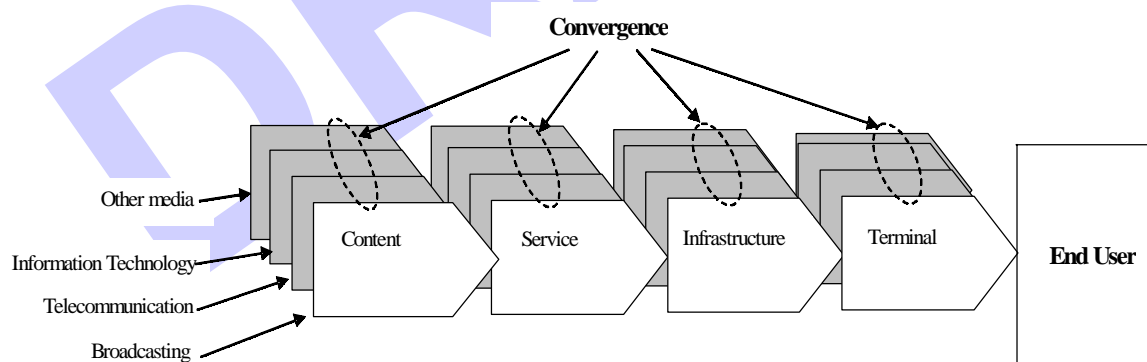
The main issue in the convergence discussion is concerned with the possibilities for exploiting the industrial opportunities in creating a new dynamic ICT sector encompassing hitherto separate sectors. Apart from the broad diffusion and use of the new media and communication (universal access) and the 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.

### **3. Convergence Technology Trends**

This section provides a summary overview, or layman’s guide to 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. The major technological changes that have facilitated the convergence processes are digitalization and computerization. Digitalization 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.

The analysis in the paper is structured around the value chain of communication networks depicted in Figure 2. The analysis aims at illustrating the technological drivers, but also barriers, for the convergence processes in different parts of the value chain.

**Figure 2: Convergence in 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 has 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 of 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, choices to be made between an integration model and a heterogeneous model. These choices depend 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 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. 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 telephone can be taken into account from the beginning, if policy and regulation permit it.

Convergence can take place at all three horizontal levels depicted in Figure 1. Each level is related to one of the technical dimensions of convergence:

- Convergence in content production is related primarily to services 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.

#### **4. 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 summarized 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 internationalization 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 in distribution is most prominent between telecom and broadcasting sectors. In equipment production it is the IT and telecom sectors that are converging.
- New ICT and media sectors are emerging. These sectors may in a certain phase be dominated by companies from other sectors, but can develop into sectors that in spite of a deep integration with services from another 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.

## **5. Convergence Policy and Regulatory 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. 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. Other questions deal with privacy protection, security, consumer protection, intellectual property rights, and illegal information. 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 regulation are beginning to be questioned. 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 digitalization processes; and (2) the political liberalization, including more liberal policies in relation to market convergences. There is, consequently, an increasing necessity of a closer relationship in the regulation of the different communication and media areas. The synergies between the different regulatory areas must be developed more proactively, encompassing the regulatory ‘contributions’ of the different areas.

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 latter 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 economize on the costs of regulation, but can be essential for countries with too little properly educated manpower 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 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 one-stop-shopping).

From the advantages and problems described it seems clear that it cannot in advance be determined 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, regulations 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 disjunct 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 telecom 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, names and numbers.
- Stronger specific telecom regulation, also encompassing interconnection and universal service/access regulation.
- Convergence regulation, encompassing telecom, IT and broadcasting.
- Multisector regulation, where telecom is joined together with other infrastructural utilities such as electricity, gas, water 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 overall breadth of the regulated sectors is growing from the first mentioned to the last. However, there is also another dimension of categorization, namely the depth or degree of regulation. There may well be important trade-offs between the breadth and depth of regulation that can be effectively applied.

## **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 multisector 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 multisector 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 multisectors have converged, and that what exists in fact is a sector – an infrastructure sector.

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 players vie for them. In the US, rights of way permits can account for 20% of the cost of a fiber build, and can take over a year to acquire. And, discriminatory access to rights of way is a barrier to market entry. Thus, in conjunction with legislation targeted at leveling infrastructure playing fields, there are incentives for achieving viable technological solutions, in particular for last mile distribution to the end-user.

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, 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 multisector 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.”

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. 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 multisector regulatory agency is created.

The basic argument is that regulatory skills and the money needed to obtain the skills are in short supply in developing countries, as well as some developed countries. 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 20<sup>th</sup> century, it is reasonable to expect that:

- 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 conceptualized 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 the overall depth of human resources is shallower than in developed countries.

Liberalized infrastructure markets result in dramatically higher levels of investments and generate large 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 some regulatory agencies have the revenues, there are often barriers to spending the funds. 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. In sum, the scarcity of regulatory resources in developing countries is real, but it is caused by government procedures and policies that prevent relatively straightforward 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.

Examination of the actual organization of US state-level multisector 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. The US PUC experience shows that there may be economies in areas such as use of buildings, libraries, and training facilities in common. The Atkins report suggests that the UK regulatory agencies at least could use some new ideas in terms of saving on these types of non-regulatory costs in

the establishment of Ofcom. This does not, however, justify multisector regulation as such, only close collaboration and facility and service sharing among sectoral regulatory agencies. 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 multisector regulation, is claimed to be the shield it provides against capture, both by industry and by political forces. 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. The second is the ministry of finance or equivalent, which is engaged in the privatization of the incumbent operator or is the major shareholder of the partially privatized incumbent. The multisector 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. 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. 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. Unless proper safeguards are set in place, the multisector regulatory agency may be interfered with by other parts of government with vested interests in multiple incumbent infrastructure suppliers.

The decision to create a multisector 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 multisector agency there is no direct path from incumbent to regulatory agency. If a skills-based organization with interdisciplinary teams being constituted for various regulatory tasks can be established, it is more likely that an investor and customer friendly organization which enjoys economies of regulation will emerge.

## **7. Conclusions and Open Issues**

The paper examines both ICT and media convergence regulation and multisector 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 multisector infrastructure regulation with regulation of both infrastructure and content. However, close examination of the North American practice of convergence and multisector 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, 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 multisector 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. ICT and media convergence issues are primarily about improving the efficiency

of market economies, and how changes in regulation can facilitate this process. Multisector regulation issues are primarily about establishing the efficiency and effectiveness of regulation so it can be a catalyst for network and economic development. They arise from an initial diagnoses of different problems, and represent different priorities and pathways to achieving a very similar set of development objectives.

The paper does not provide definitive answers to the issues of next generation regulation. Each country will need to fashion a policy framework and a structure of regulation that is designed for its own specific conditions. If this paper achieves its objective, countries will be more informed about the issues, the options and the implications as they take up this challenge.

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