

# Regulation and Poverty Reduction

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## **1. ICTs and Poverty Reduction**

Universal access<sup>1</sup> to or at least a more equitable distribution of access to ICTs is widely regarded as a means towards the reduction of poverty, especially in rural areas.<sup>2</sup> This belief is more usually asserted than demonstrated. Although it is not the remit of this paper to examine this particular aspect of universal access it is necessary to recognize that between the two sides of the correlation, access and poverty reduction, the path of causality is by no means certain. At the risk of stating the obvious, greater access to ICTs could aid in the reduction of poverty but may not be a necessary, let alone sufficient condition for doing so. Much more probable, on the other hand, is the idea that the reduction of poverty would generate demand for access. Why start with this point? Because at the core of good regulation, especially in developing countries, lies an economic problem. How to maximize good social outcomes with limited or scarce resources?

### **Allocating Scarce Resources**

Providing access involves the use of scarce resources, and providing access to uneconomic areas usually involves a higher use of scarce resources. The economic justification lies in demonstrating within reason that gains in social welfare, for example in terms of poverty reduction, can be achieved and that the social returns are sufficiently high to choose one particular project over others competing for the same resources. What constitutes sufficiently high? Traditional cost-benefit analysis imputes economic value to non-market variables, such as improved healthcare brought about through access to online medical information or improved literacy rates brought about through access to online education, but there are problems with this approach. First, it is rarely used in practice and other factors predominate, such as political lobbying, although international lending institutions such as the World Bank may employ consultants to justify the project finance. Second, if it is used it is difficult to assign very precise figures because so many assumptions have to be made. Change the assumptions and the forecasts

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<sup>1</sup> Universal access refers to access through any means as opposed to universal service that refers to access to a telephone at the customer's premises. Universal access is variously interpreted differently around the world. In Brazil it means a telephone within five kilometers, in South Africa a 30-minute walk, in China one telephone per administrative village in rural areas.

<sup>2</sup> There seems to be plenty of evidence that the key to poverty reduction in general is the reduction of poverty among women and their empowerment in terms of status and responsibilities within communities. This paper is not the place to discuss this in detail, but the project of Grameen Telecom in Bangladesh that provides loans to village women to buy mobile phones to make a business seems a very interesting example that seems to work. See <http://www.grameen-info.org/grameen/gtelecom/index.html>. For a paper that addresses the issue of regulation, ICTs and women, see Anand and Uppal (2002) at [http://www.un-instraw.org/docs/gender\\_and\\_ict/Amand.doc](http://www.un-instraw.org/docs/gender_and_ict/Amand.doc)

change. An alternative approach therefore seems more practical, and gets closer to the essentially important issue, how sustainable is the project?

### **Sustainability**

Sustainability refers to the ability of the project to generate income, or other material resources such as sponsorships and cross-subsidies from activities and organizations related to the projects, after the initial source of funding comes to an end. Stretching the point, sustainability could also refer to the original source of funding. For example, if a universal service fund is sustainable, then the projects it funds could be, or if a project is funded from general taxation on a long term basis then again it could be considered sustainable. The real test for sustainability comes during periods of economic recession, and projects that prove non-sustainable are written-off along with their resources, although not completely if there is some permanent benefit from them, such as enabling one person to learn how to read and write.<sup>3</sup>

Sustainability is most likely achieved if the provision of access either really does bring benefits that can be turned into tangible economic gains, such as access to market information and trade, or it reveals hitherto unknown purchasing power within a community, or existing local businesses and community organizations substitute telecommunications and online access to the Internet for more traditional modes of communication, such as travel and postal services.

Clearly many projects fail.<sup>4</sup> Telecentres are perhaps the most widely publicized examples of setting up facilities in rural areas in developing countries to provide local access to a telephone line, the Internet, a computer, a printer, a fax machine, a photocopier, a book binder, even to local entertainment, and so forth. Wellenius recaps the design of telecentres and reasons for their success and failure, distinguishing between small entrepreneurial ventures and larger community-based projects that may even extend connections to homes. Set-up costs of a standard telecentre are typically US\$8,000 – 18,000 with annual operating and maintenance costs around US\$12,000 – 21,000. Wellenius points out that ‘Telecenters in many developing countries have been plagued by delays in getting hooked up to the public telecommunications network, limited bandwidth, poor reliability, and high costs for Internet connections because of lack of local points of presence. Compounding these problems are prices well above cost for domestic and international calls and leased circuits – common under monopoly regimes and early in the transition to competition.’<sup>5</sup> But these problems are at least solvable, especially if the regulator or ministry responsible takes them seriously. Solving them, that is reducing costs and improving quality of service, may bring the telecentre into a phase of sustainable growth but only if there is sufficient demand.

General experience suggests that demand is there because the desire to communicate is as strong if not stronger than the need to communicate. The practical question becomes one of effective demand, and this is often lacking. The next question then becomes whether sufficient social

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<sup>3</sup> For an emphasis on non-financial aspects of sustainability, see Klaus Stoll (2003) ‘Telecentres Sustainability: What Does it Mean?’ GD Paper <http://www.developmentgateway.org/node/133831/sdm/docview?docid=442773>

<sup>4</sup> For a useful set of papers discussing these problems see Development Gateway at <http://www.developmentgateway.org/node/133831/sdm/docview?docid=441647>

<sup>5</sup> Bjorn Wellenius (2003) ‘Sustainable Telecenters’ *Public Policy for the Private Sector: Paper # 251*, World Bank Rapid Response Unit (Knowledge Services for Developing Countries) p.3 at <http://rru.worldbank.org/viewpoint/HTMLNotes/251/251Welle-121302.pdf>

capital is being created through the use of the telecentre to enrich the local community in the longer run. This is a difficult judgment to make, but if the answer is positive there are various ways in which the regulator can assist the process. The distinction here is between access and usage. Wellenius estimates that one-time subsidies for telecentres close to telecommunication networks is around US\$9,000 for single computer facilities and US\$30,000 for facilities with between 3-12 computers. This is for access, but there are also ways to fund usage. These include arrangements for reverse call charging, for example where the telephone company arranges for a pre-determined list of friends or relatives in urban areas to receive low-rated call charges for calls from registered users in designated rural areas. Registered telephones or pre-paid debit cards can also be used to offer low-rated usage charges for registered users in poor areas, or for poor people in urban areas. Off-peak special low calling rates and direct subsidies can also be used for limited calling periods.

## **2. Regulation and Poverty Reduction**

Regulation is clearly important in promoting poverty reduction by promoting and facilitating first, universal access to networks and second, bridging the digital divide. These two terms are often used in parallel, but here it is assumed universal access refers to access to a telecommunications network, and the digital divide refers to access to online computers and the Internet.<sup>6</sup>

### **Universal Access**

From a regulatory viewpoint, universal access is promoted through a number of mechanisms, including a universal service obligation (USO) on the incumbent network operator, a universal service fund (USF) where there are multiple operators, the auctioning of the USO in areas where demand is likely to be strong, the licensing of street telephone booths and kiosks to small entrepreneurs, other similar measures, and also the regulation of interconnection charges and long-distance revenue-sharing between national carriers and local networks service providers to prevent the gouging of the weak by the strong. This is a particularly important measure if small entrepreneurial ventures providing local network services to remote areas are to make a financial return.

The challenge facing regulators worldwide is the decline in revenues to finance the USO from traditional sources such as IDD and trunk call charges. By-pass of the tariff structures by use of arbitrage options such as callback and international traffic refile, technologically assisted by voice-over IP (VoIP) and by the more recent advent of next generation networks (NGNs) employing Internet Telephony, is irresistible. How far should the net of a universal service fund be spread? Should it include mobile cellular service providers and ISPs? Should it include cable TV networks that offer Internet access? If the issue is the digital divide then why not? Should it include all new telecom networks or just those above a revenue floor? There are other options, such as requiring all new telecom entrants, including foreign investors to take responsibility for

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<sup>6</sup> Scott Wallsten (2002) 'Regulation and Internet Use in Developing Countries' for The World Bank, citing Dasgupta, et al. (2001) in a *World Bank Research Paper*, suggests 'the digital divide is better characterized as a lack of telecommunications access than a lack of access to ICTs, per se.' Online at: [http://econ.worldbank.org/files/24461\\_wps2979.pdf](http://econ.worldbank.org/files/24461_wps2979.pdf)

some rural areas in addition to the urban and metropolitan districts covered by their licences where these tend to be exclusive franchises.<sup>7</sup>

Technology gives as well as taketh away. The rise of wireless solutions such as microwave and wireless access offer additional cost-effective opportunities to serve universal access, although the economics of wireless access has taken a long time to extend beyond highly populated areas.<sup>8</sup> Part of the regulator's job is to ensure that spectrum is available for these solutions at reasonable cost. Whatever the technologies involved the cost of providing services to rural areas can be reduced through facilities sharing, such as ducts and transmission towers. Regulators can encourage this where the savings are likely to act as an incentive to competing operators to offer services. The indications are that competition does drive demand for both access and usage.<sup>9</sup>

### **Digital Divide**

The telecom regulator's direct responsibilities towards bridging the digital divide may not be all that many, besides a general responsibility for promoting the telecommunications part of a national information infrastructure, or NII. Other regulators or ministries may have responsibilities for different networks such as cable TV and satellite broadcasting and there may be no department of government promoting the IT part of ICT. Policy towards the digital divide is likely to be spread across many different ministries, such as health, education, trade and industry, development and economic planning, or partly outsourced to NGOs. In these cases strong intra-government and inter-agency co-ordination is necessary, and raises the case for some level of consolidation of regulatory agencies to handle issues of convergence. This is discussed later in this paper.

The remaining issue is the size of the bridge to reduce the digital divide. What should be the scope of the effort, given a scarcity of resources on the one hand, and the prospect that social capital can be created on the other? For example, should it aim to place every school or public library online, or run broadband connections to every hospital? Does the scope have implications for the regulator? It may do in at least two ways. First, the regulator has to advise on what telecommunication resources are available. Second, a regulator could play a pro-active role in convincing private companies to make their own donations of equipment or network capacity during off-peak hours. But is the regulator motivated to undertake such pro-active tasks? The answer depends upon the culture of government and its level of commitment to economic and social development.

### **3. Regulation Policy**

The rest of this paper focuses upon the principles of regulatory reform on the grounds that without an efficient and well-grounded regulatory process efforts to use ICTs for poverty reduction are less likely to be successful. This is because the key to getting right polices for poverty reduction using access to telecommunication networks involves achieving a stable and

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<sup>7</sup> The Philippines, Indonesia, India and Thailand have all experimented with versions of this approach.

<sup>8</sup> Melody (2003) 'Stimulating Investment in Network Development: Roles for Telecom Regulation' WDR Paper 0301, suggests that 'For the future, mobile is the vehicle for achieving universal access to voice-related services.' (p.3) online at: <http://www.regulateonline.org/pdf/wdr0301.pdf>

<sup>9</sup> See Fink, Mattoo and Rathindran (2002) 'An Assessment of Telecommunications Reform in Developing Countries' World Bank Research Working Paper # 2909 at: [http://econ.worldbank.org/files/20745\\_wps2909.pdf](http://econ.worldbank.org/files/20745_wps2909.pdf)

coherent regulatory framework that works within a developing economy where resources are particularly scarce.

The regulation of telecommunications has traditionally been aimed at one or more of three objectives: first, to regulate the activities of the incumbent monopolist or dominant network operator; second, to facilitate the development of and access to a national information infrastructure; and third, to promote national strategic interests.

### **Dominance Regulation**

First, where the incumbent is a monopolist or a dominant player regulation aims to constrain the incumbent's possible abuse of market power, even when using incentives to encourage its activities. For example, left to its own devices the incumbent has little incentive to serve uneconomic areas and it has every incentive to gouge profits through excessive pricing rather than by reducing its costs. The universal service obligation (USO) serves as a social obligation, as a way to bring economic development to poorer areas of a country, and as a political tool to win support for the Government. But an incumbent run along purely commercial lines would have no particular reason to serve these aims. That fact alone raises a problem. If the incumbent is not run along commercial lines, then the process of opening the market to competition is doomed to failure or at least severe distortion. For this reason the process of market liberalization through licensing new entrants needs to be accompanied by reforms in the corporate governance of the incumbent, and that in turn may call for a shift in the focus and methods of regulation.

### **National Information Infrastructure**

Second, regulation has been used to promote construction of the national information infrastructure. Sometimes this is straightforward encouragement of the incumbent to speed up the building of the telecommunications network. But it can also include other measures such as the licensing of a cable TV network to carry telecommunications and Internet services, the encouragement of Internet service providers, and the licensing of cellular mobile networks. The measures adopted can either bolster the dominance of the incumbent or subject it to competition. For example, the regulator may restrict the number of licensed ISPs allowed to operate, or may offer the first and perhaps the only mobile cellular licence to the incumbent, ostensibly on the grounds that monopoly rents will assist the financing of further network development. On the other hand, competitive licensing is more likely to drive the incumbent into investment in facilities and services expansion. At the centre of these alternative approaches is the model that is most likely to address the issue of greater access to telecommunication services in both town and countryside, and in richer and poorer areas.<sup>10</sup> What is clear is that the old model of monopoly – which in reality never succeeded in delivering universal service – is no longer workable because the major source of monopoly rent, namely long distance and international calling tariffs, is being eroded through by-pass technologies and arbitrage arrangements that are by and large beyond the control of the incumbent and the regulator.

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<sup>10</sup> Petrazzini (1997) points out that according to the OECD (1995) serving the universal service obligation was the most common reason cited for justifying the maintenance of monopolies. See 'Regulating Communication Services in Developing Countries' Chapter 24 in Melody ed. (1997) *Telecom Reform: Principles, Policies and Regulatory Practices*, Technical University of Denmark, online at <http://www.lirne.net/resources/tr/chapter24.pdf>

### **Strategic National Interests**

Third, regulation is sometimes used to promote national industrial policy and national strategic and security interests. Industrial policy is usually only an option for larger economies that can support economies of scale in the home market for local telecommunications equipment standards, such as the current effort by China to develop TD-SCDMA as a standard for 3G cellular mobile telephony, or Japan's iMode and FOMA standards. On the other hand, national strategic and security interests are often cited as reasons to resist foreign ownership of domestic telecommunication carriers. These concerns may be genuine or a smokescreen put up by governments or local vested business interests to protect local companies. But nationalist policies come at a cost. First, foreign telecom investors can bring with them valuable experience in running the business and technological know-how. This can be particularly beneficial when government wants to privatize a national carrier or save a local network from bankruptcy. Second, foreign investment can add to the funds available for meeting the needs of universal service or universal access. Third, WTO obligations usually require foreign access to local markets and other treaty obligations may also be involved.

## **4. Regulatory Principles**

The Reference Paper to the WTO's Basic Agreement on Telecommunications spells out some basic principles for regulation centred on transparency, reasonable cost, and national treatment.

### **Transparency**

Transparency has economic implications because without it there is the cost of regulatory risk, the risk that regulations will change direction without due process. Any risk pushes up the cost of capital in efficient markets. That is a real cost because it results in less investment in facilities and less growth. Besides that, a lack of transparency leads to inequitable outcomes or the fear of inequitable outcomes. But to avoid these pitfalls, for example the cancer of corruption, transparency on its own is insufficient. Accountability is also necessary, but this is dependent upon the political culture of a country. One useful guide to judge today's best practice is by observing the use by regulators of websites and how much information they make available.

### **Reasonable Cost**

Reasonable cost is an important principle based upon cost accountability. The first step lies in knowing what the real costs actually are. For example, what are the real costs involved of serving the universal service obligation, and how much of these costs can be passed onto existing network operators and service providers? The costs of regulation itself need to be measured. For example, what is a reasonable cost to pay for a licence that is issued on a purely administrative basis as opposed to a licence that is issued through a bidding process? In developing countries the costs of regulation may be much higher than they should be for several reasons. First, the regulator's office may be stacked with people who are there because of patronage or because they were inherited from an earlier regime, such as the incumbent's own staff before the company was incorporated and privatized. Second, the resources available to the regulator may be insufficient. Here high licensing fees may be one option to raise funds, but if fees are higher than they should be, then at least their structure should be market neutral, even though a high level of fees risks squeezing out smaller entrants. This is an important issue if social equity

requires making licences available to small family businesses, for example a licence to run a telephone and Internet kiosk.

### **National Treatment**

National treatment requires regulators to treat foreign players under the same terms and conditions as local players, including for example access to scarce resources such as radio spectrum and rights of way and telephone numbers. Notwithstanding equity ownership ceilings and other restrictions that may be placed upon foreign direct investment, national treatment becomes a litmus test for a government's sincerity in opening its markets and the basis of future agreements in trade and investment with other nations. Having said that, trade and investment are intensely political issues, not least as bargaining chips in international negotiations. Recent efforts to extend the areas of WTO negotiations to include related areas of convergence such as multimedia content and infotainment services (the so-called Singapore Issues) present a challenge to many existing regulatory regimes that currently have no clear-cut legislation or principles to guide them in how to embrace these issues.

## **5. Regulatory Structural Reform**

Structural reform of regulation first involves people and their skills within the organization so that information can be expertly and professionally processed leading to good policy making. Second, it involves access to industry data and information and ways to verify its authenticity and accuracy. Information is power, and the incumbent starts with a virtual monopoly of information which, under certain circumstances, can lead to the 'capture' of the regulator, thereby bringing into question the regulator's independence. Third, because the resources available to regulators in developing economies are usually scarce, there is a need for an efficient and cost effective use of those scarce resources. Good management is required, but some experts advocate multi-sector regulation that uses the skills of professional accountants, economists and lawyers across several utility sectors that share similar regulatory issues. Fourth, and separate from multi-sector regulation, is the very real need to bring regulation up-to-date in light of the convergence of information and communications technologies (ICTs) or what is sometimes also known as telecommunications and multimedia technologies (TMT).

### **Human Resources**

Perhaps the biggest challenge facing regulators in developing economies is the lack of human resources and the availability of professionals with skills in accounting, economics and law who also have sufficient technical knowledge or understanding of telecommunications. In wealthy economies regulators have no problem in raising sufficient funds from the industry itself, usually through fees levied on the use of spectrum and the issuing of licences, and they can afford to employ professionals or engage consultants. In developing economies the availability of trained professionals may itself be a problem even if the money is there to employ them.<sup>11</sup>

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<sup>11</sup> A related problem for publicly listed operators in developing economies is finding sufficiently qualified accountants to audit their books to meet the exacting disclosure rules of overseas bourses. For example, PT Telkom in Indonesia has recently faced this problem.

## **Information and ‘Capture’**

Even with professionals available there remains a need for information from the network operators. The operators may be reluctant to hand over such information or may not even have the information. Cost accounting that identifies and attributes costs to different categories of expenditure such as overheads, shared costs, the costs of separate network elements, traffic-sensitive and non-traffic-sensitive costs, costs attributed to individual services,<sup>12</sup> and so forth, is itself a costly and time-consuming exercise, especially the first time around.<sup>13</sup> Under monopoly conditions the incumbent never needs to know such details, so long as costs are fully distributed across the range of service tariffs so that total revenues cover total costs, including the cost of capital. Ignorance or the willful withholding of information or deliberately providing misinformation renders the role of the regulator ineffective. Making the life of the regulator easier by providing just sufficient information to allow decisions to be made can also be a means of manipulation of the regulator by the incumbent. This is especially the case if there is a close identification between the incumbent and the staff of the regulator who may have been previously employed by the incumbent. This is the theory of regulatory ‘capture’ and for example, is often cited as a danger at the level of the Public Utility Commissions (PUBs) at the state level in the USA. So whether by information deficit or by design, undue influence by the industry over the regulator can be a serious problem, both at the expense of the consumer who wants higher quality services at lower prices, and of government policy designed to promote effective competition, for example through the introduction of cost-based interconnection network charges.

## **Independence**

The concept of an independent regulator in this regard is not to be confused with being independent of government.<sup>14</sup> Independent of government can only mean independent of ministerial interference to carry out government policy in a fair and cost-effective way. The regulator is appointed by government and is dependent upon government for the way in which it raises resources. Therefore it can never be independent of government in the same way as being independent of industry. Nevertheless, being quasi-autonomous of government is an important step towards cost effective and equitable regulation that can win the confidence of the operators and investors. It also opens the door to more easily redressing mistakes that in some instances partly the result of lack of due process where this is thought to be necessary. For example, a judicial review of a regulator’s decision where it can be demonstrated that the regulator failed to follow due process or misinterpreted the law will be considered less threatening to authority than a direct challenge to a minister’s decision. But the process of allowing challenges and reviews may be counter productive if the system of jurisprudence is itself a problem. For example, the Constitution of the Philippines follows that of the United States and very much facilitates litigation, which is a lengthy and expensive process. Although it has its critics, it works in the USA because the society is rich, plaintiffs can pay for expert layers and the process is

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<sup>12</sup> Where the standalone costs of producing a service are lower than the costs of producing the same service as part of a wider range of services (economies of scope) the market solution would give rise to competitive entry.

<sup>13</sup> The usual procedure is for the regulator to commission a consultant accountancy firm to build a table of accounts that becomes a spreadsheet model that can be updated periodically. The incumbent is then required to make quarterly or six-monthly or annual returns for as long as it is deemed to be a dominant carrier. Requirements on non-dominant carriers are fewer or none at all.

<sup>14</sup> See Melody (1997) ‘On the meaning and importance of “independence” in telecom reform’ *Telecommunications Policy*, v.22.3, April, p.195

transparent. In many Asian economies it may be that none of these conditions holds true.<sup>15</sup> This point illustrates a wider issue, that the design of the regulatory system should also take into account the ability of other systems of government, law and civil organization to support the regulatory process. Where these institutions are lacking the regulator has to assume responsibility for leading the way and acting as a model for others.

### **Multi-sector Regulation**

Setting up multi-sector regulators that cut across several utility sectors that share certain features in common is one possible way to conserve scarce resources and make them go further as Schwartz and Satola<sup>16</sup> for the World Bank argue. Utilities, such as water supply, roads and rail, electricity, gas and telecommunications, incur large sunk capital costs, very much lower incremental costs of distribution, peak and off-peak demands, interconnecting networks, rights-of-way across land, often price or profit control regulation, and so forth. It is argued that where the principles of regulation are very similar the same set of skilled professional accountants, economists and lawyers could be employed to advise a regulator on all aspects of these sectors. It is also suggested that a super-regulatory agency would be less easily influenced by politically motivated ministers or captured by commercially motivated businesses.

But Henten, Samarajiva and Melody (2003) see practical problems with the argument. Unless set up from scratch, a multi-sector regulator could simply inherit and multiply the inefficiencies of the existing authorities. Furthermore, the minutiae of detail for each utility can be so great that the professional staff is likely to end up as the specialists as they were before the merger of the agencies. The real savings are likely to be in the non-regulatory areas such as building costs and the common use of amenities such as libraries and canteens and maybe in training facilities and courses. In very large regulatory agencies where commissioners at the top may review cases across all sectors there could be savings of time and personnel, but less likely lower down in the specialist departments.

### **Convergence**

A multi-sector regulatory agency is not to be confused with consolidation of regulation across sectors that are converging, such as telecommunications, computers and IT, cable TV, broadcasting, Internet and mobile cellular sectors. Here the issues and sectors are different. For example, the investment profile in the telecommunications sector is very different from the broadcast or cable TV or Internet sectors. Telecommunications requires large-scale up-front sunk-cost investment in the core network, in the backbone and especially in the local loop, followed periodically by lumpy investment as the network expands to serve new areas or upgrades to provide new value-added services. Thereafter, the cost of adding lines is incremental, while the traffic-sensitive costs of connecting and maintaining calls are minimal, and revenues are fairly continuous. Broadcasting also has up-front sunk-costs in studio facilities and point-to-multi-point transmission systems, but not as large-scale as telecommunications either in the core (the studios) or in the local loop (transmission). But broadcasting requires

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<sup>15</sup> In another scenario, during the 1990s New Zealand had done away with a separate telecommunications regulator. Matters of dispute such as interconnection charges had to be handled directly by the companies involved using the procedures of commercial law. The result was many years of delayed decision-making.

<sup>16</sup> Schwartz and Satola (2000) 'Telecommunications legislation in transition and developing economies' *The World Bank Technical Paper # 489*, Washington DC. Not online.

continuous large-scale investment in programming and other content, either self-produced or bought-in, while revenues are more high risk depending as they do upon advertising and/or pay-per-view, both of which are a function of ratings, the percentage of the available audience actually viewing the programme. The capital investment costs of cable TV are closer to those of telecommunications insofar as a physical local network has to be built, but the incremental costs are closer to those of broadcasting because of programming and content costs. But cable TV can offer far more channels than broadcasting and a greater variety of services, including broadband Internet. Internet service providers enjoy much lower costs. They may decide to buy long-distance capacity but their local needs can be met by leasing circuits, while the additional costs of adding on Web and mail servers and possibly Web-hosting facilities and even data warehousing facilities are relatively low. However, low entry costs also imply intense competition, low prices and if the leasing costs or revenue-sharing agreements with networks are unfavourable then also profits-squeeze. In the mobile cellular sector the hardware costs are principally in the network itself, including the cost of cell sites in privately owned buildings, shopping malls and tunnels, and in leasing backhaul capacity. In theory a wireless mobile operator can build out a cellular network of base stations incrementally according to demand, but in reality service quality and coverage are important marketing assets. Because competition tends to be intense in this sector the need to differentiate each service drives mobile service providers to load more and more software-driven content and applications onto the network. This is not an easy process because new software programming code can easily conflict with the existing software in use, and in the IT world and in the world of mobile handset devices standards are far from being universal or harmonized. The greater use of software also gives rise to security issues, as it does in fixed line telecommunications, and solving these problems is time consuming and expensive.

Examining each of these sectors by their cost and investment profiles the dissimilarities are apparent. Examining them from other aspects, such as their characteristic business processes, even greater dissimilarities emerge. For example the business culture of the world of entertainment in which movies and episodes of popular TV shows are bargained and packaged<sup>17</sup> is entirely different from the telecommunications world in which engineers and accountants negotiate conventional interconnection arrangements and capacity leasing deals. The technologies may be convergent with different types of traffic being multiplexed down the same wires and cables, but business synergies are not so easily reached. Yet convergence is slowly happening across all sectors, enabled by the technology but driven by business models: by the search for economies of scope on the supply side and on the demand side by the greater 'stickiness' of customers and lower churn rates when products and services are sold in bundles. Each of these sectors begins to offer the services of the others, telecommunications by cable TV, Web-casting over the Internet, pay-TV over telecommunication lines, digital terrestrial transmission (DTT) by broadcasters or 'multicasters' offering broadband Internet, Internet and video over mobile cellular networks, and so forth.

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<sup>17</sup> Sometimes this is done in innovative ways as the nature of markets and the technologies involved change. For example, the standard practice of the Hollywood major studios is to require hefty up-front payments and forbid Webcasting to prevent piracy. The advent of pay-TV over telephone lines connected to Web-servers is pressing both sides to explore new business models, such as revenue-sharing secured by digital rights management (DRM).

The relevant regulators are then faced with a series of questions. Should each sector be regulated in a similar way? If not, will asymmetric regulation privilege one sector over another? On the other hand, does that matter too much? Is it not a fact of commercial history that as new technologies come along new business models replace old ones and new lines of business replace traditional ones? Is that not simply a part of commercial reality as technologies shift the balance of the market? For example, multicasting over the Internet may replace the broadcasting model, just as peer-to-peer music downloads may destroy the traditional recording business.<sup>18</sup> There are three issues here for regulators. First, should existing copyright laws and IPRs be simply extended into the digital arena, or should a new set of rules apply? Second, should the new technologies and businesses based upon them be forced into the same licensing regime as traditional technologies and the businesses based upon them, or should the existing licensing regime be revised? In other words, should the playing field be leveled upwards or downwards or left to tilt? If the answer is 'left to tilt' should regulators withdraw from the fray altogether and leave everything to the market? Third, how should all these different issues be dealt with? By converging all the different regulatory authorities, or by converging just some of them and leaving others such as those dealing with legal, copyright, IPR and data protection issues as separate entities? Should these issues be enshrined in detailed laws or decided through regulatory and administrative procedures? Laws are clear-cut and transparent, but they can also get dated quite quickly and the legislative process can be long and convoluted. If the regulator determines the issues, do they still need approval from a higher authority? Would this not politicize the process or delay it? On the other hand, should there be an appeal process against the decisions of the regulator?

Convergence may not have created all these problematic issues but it certainly adds to them and to the complexity of the regulatory process. The question is, does convergence of regulatory functions, the merging of agencies dealing with telecommunications, media and IT, help in any substantial way to answer or solve the issues and simplify regulation? On the one hand, there are dangers that merging the three will extend regulation to areas previously unregulated, such as IT, for no very good reason, or bring political and social concerns over media content into the regulation of telecommunications. On the other hand, convergence raises new issues that may require regulation, such as legislation governing computer security and encryption for e-commerce, data protection, copyright laws and intellectual property rights issues. Is one agency any more efficient than three or four in coming to recommendations and good decisions? One benefit could be a 'one-stop' agency for licensing or information and inquiries.

As Henten, Samarajiva and Melody argue the 'synergies between the different regulatory authorities must be developed more proactively, encompassing the regulatory "contributions" of the different areas.'<sup>19</sup> The question to ask therefore is what are the contributions each agency brings to a converged agency? In this case, it is not a simple matter of cutting the costs of

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<sup>18</sup> The regulator is then faced with a series of complaints, special pleading and powerful lobbying from business for protection against technologically-enabled threats to their commercial interests. For example, should decoders that break cable TV encryption programmes be illegal to make, sell or use? Should Internet TV and video Web-casting be brought under the same licensing conditions as broadcast and cable TV? Should off-line copyright and IPRs be extended to online materials? Over the Internet, can these be regulated at all? And who determines the relevant legal jurisdictions?

<sup>19</sup> Henten, Samarajiva and Melody (2003) 'Designing the Next Generation Telecom Regulation: ICT Convergence or Multisector Utility?' WDR Dialogue Theme 2003 (p.33) at: <http://www.regulateonline.org/pdf/wdr0206.pdf>

duplicated effort because the sectors are clearly so different, but that without convergence of regulatory functions the alternative has to be closer co-ordination between separate regulatory bodies. This may be a problem in some economies, especially if different ministries are involved. So the provisional answer would seem to be that some degree of consolidation of regulatory functions is warranted, but only insofar as it results in a simplification and improved co-ordination of the regulatory process.<sup>20</sup>

## **6. Regulation and Liberalization**<sup>21</sup>

The principle challenge facing regulators over the past decade has been the transition from monopoly and dominance to new entry and effective competition. This has required getting right both the structure of the regulatory process and the regulations. Most of the econometric and non-econometric studies agree that heavy-handed regulation is counter-productive to efficient outcomes measured in terms of investment, network construction and prices. Unless regulation is to be abandoned altogether,<sup>22</sup> the trick is to achieve a transition to light-handed regulation as the dominance of the incumbent is gradually eroded which means that clear criteria and signals need to be offered to the market. The usual trajectory has been to corporatize and privatize the state-owned telecommunications enterprise (SOTE), to deregulate sectors such as the customer premises equipment (CPE) markets, to liberalize the so-called value-added services sectors, including cellular mobile telephony, then to liberalize the fixed-line sector.

### **Privatization**

The term privatization can mean anything from the transfer of ownership of a SOTE to the private sector to policies that allow the entry of private capital into the sphere of the SOTE, for example through Build-Transfer-Operate (BTO) and Build-Operate-Transfer (BOT) schemes to joint ventures to outsourcing, or to new entrants leasing circuits from the SOTE. In this wider sense privatization is a key issue to addressing the issues of universal access and bridging the digital divide because the entry of new capital, especially local entrepreneurial capital in rural areas is stifled without it. But as we noted above, regulation needs to be strengthened to ensure that new entrants are not strangled at birth by the dominant carriers.

### **Competition**

Privatization is probably less important than competition in achieving increases in output, labour productivity, profitability and price restraint. According to Boylaud and Nicoletti<sup>23</sup> in their 2002 study of 24 OECD countries 1991-1997 'no clear evidence could be found concerning the effects on performance of the ownership structure of the industry' but the 'prospect of competition (as proxied by the number of years remaining before liberalization) generally has a strong positive effect on the productivity and the quality of services and a strong negative effect on prices.' The

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<sup>20</sup> The Malaysian Communications and Multimedia Commission (MCMC) may be cited as a successful example.

<sup>21</sup> The next two parts of the paper are discussed in greater detail in Ure (2003) 'Regulatory Issues and Privatization' at [http://www.trp.hku.hk/papers/2003/apdip\\_031017-1.PDF](http://www.trp.hku.hk/papers/2003/apdip_031017-1.PDF) and 'Telecommunications Privatization: evidence and some lessons' at [http://www.trp.hku.hk/papers/2003/apdip\\_031017-2.PDF](http://www.trp.hku.hk/papers/2003/apdip_031017-2.PDF), where references to the literature may be found.

<sup>22</sup> Australia and in particular New Zealand moved in this direction during the 1990s with mixed results, but both are developed economies.

<sup>23</sup> Boylaud and Nicoletti (2000) 'Regulation, Market Structure and Performance in Telecommunications' *Economics Department Working Papers No.237*, OECD, Paris. p.7 at: <http://www.oecd.org/dataoecd/13/26/1884238.pdf>

period 1980s-2000 has seen exponential growth in telecommunications demand for both fixed and mobile connections. Privatization may be responsible for making the supply side more responsive but equally responsible are the effects of regulation and liberalization leading to greater competition.<sup>24</sup>

### **Regulation**

Clearly regulation affects market behaviour as well as market structure, although Doove et al<sup>25</sup> find separating out the effects ‘virtually impossible.’ Examples of regulation affecting behaviour are incentive ‘price capping’ which encourages output and efficiency; monopoly rent ‘profits capping’ which if the rate base is capital investment as opposed to shareholder funds can lead to the inefficiency of ‘gold plating’<sup>26</sup>; heavy-handed dominance regulation which if it is prolonged will reduce the incumbent’s motive to innovate; light-handed ‘threshold’ regulation which encourages market-led development till a case for regulatory intervention becomes clear-cut. In a post-privatization period, the regulatory environment by default has to be important.<sup>27</sup> The market structure is influenced by regulation even though the market remains influenced also by other factors, such as size of market, ease of entry, availability of technology, capital and staff, and so on.

## **7. Some Concluding Observations**

In designing regulations and regulatory structures to address any issues, including those of universal access and the digital divide, it is useful to conceptualize the triggers and motivators of policy. What conditions are necessary or sufficient to achieve the aims and objectives set? The following pages list four approaches, each of which bring insights into how to regulate.

### **Reformist Approach**

The World Bank, the ITU, the OECD, the APT, APEC, PECC and many similar international and regional organizations focus upon the practicalities of reform, ways how to do it and global best practices. For example, the importance of getting the price structure right, bringing prices more into line with costs and a timetable for tariff rebalancing is stressed by Wellenius et al.<sup>28</sup> (1993). Are these the right priorities? Raising local tariffs and lowering IDD and trunk call charges (tariff rebalancing) may seem counter-intuitive to the aims of making telephony

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<sup>24</sup> The standard method used in studies is to examine the three years pre-privatization and the three years post-privatization because panel data - that is data across countries - beyond three years is often not available, but realistically this is too short a timeframe in which to analyze factors such as economic growth and the effects of competition policy.

<sup>25</sup> Doove, Gabbitas, Duc and Owen (2001) ‘Price Effects of Regulation: International Air Passenger Transport, Telecommunications and Electricity Supply’ *Staff Research Paper, Productivity Commission, Commonwealth of Australia*, p.44, at: <http://www.pc.gov.au/research/staffres/peor/poer.pdf>

<sup>26</sup> If the rate base is capital expenditure regulated companies have an incentive to boost their capital expenditure beyond commercial justification. A rate base of shareholder funds removes this incentive.

<sup>27</sup> In his study of 30 African and Latin American countries, 1984-1997 Wallsten finds: ‘Privatization by itself does not appear to generate many benefits, and is negatively related with main line penetration. Privatization combined with a separate regulator, however, is correlated with increased connection capacity and payphones per capita.’ Wallsten (1999) ‘An Empirical Analysis of Competition, Privatization, and Regulation in Africa and Latin America’ *Working Paper, Stanford University and The World Bank*, p.15, at: <http://econ.worldbank.org/docs/553.pdf>

<sup>28</sup> Wellenius, Bjorn and others (1993) *Telecommunications: World Bank Experience and Strategy*, The World Bank, Washington, D.C.

affordable to all, yet the process is inevitable if IDD and long distance tariffs are being by-passed and if more investment is to be encouraged in customer access networks by new entrants. Rather than opposing the inevitable, good regulation has to look for ways to differentiate between the poor and the better-off to promote universal access.

### **Institutionalist Approach**

Petrazzini<sup>29</sup> offers the most focused analysis on reform cases in less developed countries (LDCs) and argues they are more likely to succeed where the relative autonomy of the state insulates it from outside pressure groups and where power is highly concentrated within, and more likely to fail where relative autonomy is weak and power widely dispersed. Is this an argument for limited consultation, and will lengthy consultation inevitably delay sector reform? Above, it was suggested that the role of the regulator in taking a pro-active approach to universal access and digital divide issues largely depends upon the political culture of the government and Ure<sup>30</sup> has elsewhere argued that Petrazzini's emphasis upon power is too much at the expense of the role of a commitment to development by the state. Both may be necessary, but neither is sufficient.

### **Neo-Institutionalist Approach**

Singh<sup>31</sup> gives pride of place to stakeholder interests and the role of incentives and property rights in the marketplace as a tool to explain the success or failure of reform. Noam in Noam et al.<sup>32</sup> suggests that special interest groups emerge as network development progresses from (i) underdevelopment to (ii) high revenue growth concentrated on urban areas to (iii) cross-subsidization of universal service to high cost areas. These special interest groups are people living in urban areas opposed to paying more than the incremental cost of a city telecommunications network. They lobby to have the right to use low cost networks catering for their specific business or residential needs. This has clear implications for funding universal access if middle class consumers vote against cross-subsidization of services, and places pressure on regulators to come up with alternative approaches.

### **Transaction Theory insights**

This approach distinguishes between information rich and information simple transactions. Transactions that involve long term assets and relationships and ongoing coordination between transactors who are information rich are best done *within* the firm. Those which do not have these characteristics and have only simple information requirements are well suited for transactions *between* firms. The implication is that information simple markets are more easily opened to competitive entry than information rich markets. Faulhaber<sup>33</sup> argues the liberalization

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<sup>29</sup> Petrazzini (1995) *The Political Economy of Telecommunications Reform in Developing Countries: Privatization and Liberalization in Perspective*, Praeger, Westport, Connecticut and London.

<sup>30</sup> Ure (1993) 'Corporatization and Privatization of Telecommunications in ASEAN Countries', *Pacific Telecommunications Review*, v.15.1: 3-13

<sup>31</sup> Singh. (1999) *Leapfrogging Development? The Political Economy of Telecommunications Restructuring*, State University of New York Press

<sup>32</sup> Noam, Komatsuzaki and Conn, eds. (1994) *Telecommunications in the Pacific Basin: An Evolutionary Approach*, New York and Oxford, Oxford University Press

<sup>33</sup> Faulhaber (2001) 'Policy-Induced Competition: The Telecommunications Experiments' Working Paper at: <http://rider.wharton.upenn.edu/~faulhaber/Policy-Induced%20Competition.pdf> (forthcoming *Information, Economics and Policy*, 2003)

and deregulation of customer premises equipment (CPE) was an early success because no long term relationships are involved and the information requirements of the transactions are simple. Basically, 'where do you want the phone and when do you want the phone?' In the United States experience, the opening of the long distance market was not very successful because the switch architecture of the old Bell system integrated many functions of both local and long distance and the complexity of the engineering and subscriber database and the billing system information required was immense. Also, long term customer relationships and interaction are important, so the regulatory costs of implementing interconnection, unbundling of network elements and so forth are very high. Is this a useful framework for designing and thinking about the costs and benefits of different approaches to structural reform and the opening of markets? How much information is required by the regulator or the service provider in serving rural communities? On the face of it local entrepreneurs are in the best position to judge local opportunities, but regulators may be better positioned in understanding the complexities of cross-subsidies and long-distance interconnection arrangements. This suggests that close liaison between local service providers and regulators is required, but are there sufficient regulatory resources to allow this to happen?

### **Conclusion**

There is no holy grail for poverty reduction, other perhaps than the empowerment of women in rural areas. The role that access to ICTs can play in poverty reduction is more often asserted than demonstrated, but clearly universal access to a telecommunications network lies at its core and well-designed and well-grounded regulation is absolutely necessary to promote and facilitate universal access. On its own regulation is not sufficient, and it needs a political culture and commitment to development within Government to become effective in the mobilization of scarce resources from both the public and private sectors. It also requires close liaison with the local communities involved, something that may be beyond the resources of the regulator.

Sustainability is a touch stone of universal access projects, and this may warrant long term public subsidies where social capital is clearly being created. The economic job of a regulator is to allocate scarce resources in the most cost effective manner, distinguishing between the real cost and the investment aspects of subsidies. Clear conceptual thinking is an essential part of the job of policy makers and regulators. The different approaches raised in the paper - reformist, Institutionalist, neo-Institutionalist and transaction theory approaches - each brings helpful insights into how to think through the issues involved.