
Chapter 2

Creating the “Right” Enabling Environment for ICT

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For ICTs to deliver on their promise of economic and social development, it is critical that countries adopt enabling legal and regulatory environments that support e-development. “Enabling environment” in this chapter means policy, legal, market, and social considerations that interact both at domestic and global levels to create fertile conditions for ICT-led growth. The importance of this enabling environment was recognized in the Declaration and Action Plan of the first phase of the World Summit on the Information Society (WSIS), which emphasized that a trustworthy, transparent, and non-discriminatory environment was essential for the use and growth of ICTs in the developing world.²

In most cases, creating the “right” environment is a daunting task for policymakers.³ While best practices are emerging from countries that have successfully crafted policies to facilitate digital opportunities, there is no single blueprint that can be followed in every case. Given the context of the convergence of telecommunications and in-

formation technologies, successful reforms must take into account the need for comprehensive changes that cut across traditional technological and commercial boundaries. In addition, the role of regulators and regulation itself must be re-evaluated. Some areas where regulatory reform will be important are the regulation of communications services and infrastructure, data privacy protection, security, intellectual property rights, public infrastructure, Internet governance (including domain name registration), and general principles of competition.⁴

Based on international experience, the ideal framework for maximizing the contribution of ICT to development consists of public policies that apply to different layers of the ICT market (infrastructure, applications, and consumer confidence). The basic goal of regulatory reform is to create a stable, open, and future-proof environment that encourages confidence in the ICT market.⁵ A major step towards this goal is to establish clear and transparent governance structures and respect for the rule of law. Basic prin-

ciples that support regulatory reform include encouraging market-based approaches and ease of market entry; promoting business confidence and clarity; enhancing transactional enforceability; ensuring interoperability (of systems, standards, networks, etc.); and protecting intellectual property and consumer rights. All regulatory policies should, moreover, be neutral regarding both the use and type of technology.

The policies undertaken by governments and the manner in which they are reflected in law will affect how ICT infrastructure and services develop and are used. Because of the global nature of the information and knowledge economy, minimum common international standards have long been recognized as important. Such common standards contribute to the interoperability of national legal regimes and develop truly global commerce.

Based on success stories from a wide range of countries (both developed and developing), this chapter provides pointers for policymakers on how to create the requisite environment for promoting ICT-led growth. Such an enabling environment requires not only ICT-specific considerations, but macro-level improvements in the business and political environment, among other factors. This chapter focuses primarily on the policy, legal, and regulatory conditions needed to advance the e-development agenda at the national level.⁶ The chapter follows a three-layered approach to the enabling environment, which emphasizes improving:

- access to ICT tools (the access layer)
- access to e-development applications (the application layer); and
- consumer confidence and trust (the trust layer).

At each of these layers, the sequencing of reform will vary from country to country. All successful reforms, however, share common ele-

ments of broad stakeholder consultation, transparency, and strong local ownership. Unfortunately, difficult policy choices that influence the reform process and its implementation are often not addressed early on, causing delays or unanticipated outcomes.

For developing countries, some of the issues covered in this chapter (e.g., digital signatures or the security of online transactions) may not appear immediately relevant to their concerns. However, these issues may be encountered much earlier than anticipated in the development process. For example, successful operation of telekiosks or Internet cafés—both cost-effective ways to provide access to the Internet and advanced ICT applications—requires a legal framework that addresses the protection of intellectual property rights and consumer privacy. Understandably, developing countries are likely to concentrate first on creating an enabling environment for private investment in their basic ICT infrastructure, a demanding task in and of itself. Yet as their ICT networks grow and begin to provide advanced applications that promote development (e.g., in the education and health sectors), these countries will soon need to expand their policy and regulatory frameworks to address the full spectrum of issues outlined in this chapter.

Part I. The Access Layer: Creating the Enabling Environment for Access to ICT Tools

Without adequate access to “the common essentials for plugging into the online age,” developing countries risk missing out on the promise of the information revolution.⁷ This section discusses the enabling environment needed to improve access to ICT infrastructure and IT hardware and software, a prerequisite for the propagation of ICT-for-development (ICT4D) applications.

Enabling Access to ICT Infrastructure

For most developing countries, lack of adequate ICT infrastructure remains a major obstacle to the uptake of ICT. Lack of investment in infrastructure and networks, coupled with inefficient provision of services, undermines the development of networked economies. The lessons accumulated in this sector indicate that success is principally market driven. However, creating a predictable legal and policy environment is crucial for attracting investors. A predictable and certain policy framework requires an overall investment climate that is friendly to domestic and foreign investors (the macro level) and ICT-specific policies to promote competition and market entry, expand networks and the boundaries of service provision, reduce prices, and improve service quality (the micro level).

Enabling Investment Climate: Increased foreign direct investment (FDI) holds a particular promise for ICT in developing countries. FDI allows developing countries not only to relax capital constraints to network build-out, but to channel technology transfer and know-how into their economies. Guaranteeing a proper investment climate and establishing investor confidence is undoubtedly the first step towards attracting FDI.

While a considerable amount of private capital is available for telecommunications projects, attracting such capital is an extremely competitive endeavor. When choosing where to invest, the degree of political stability in the host country and legal and regulatory regimes that guarantee foreign investment against specific risks (political interference, arbitrary regulation, or regulatory “capture” by a single enterprise, for example) are key considerations for investors.⁸ The basic legal environment should include clear contract and intellectual property dispute resolution mechanisms for commercial ventures.

Private participation in infrastructure development has grown tremendously in recent years in both developed and developing countries.⁹ Given that public sector financing has shrunk since the 1980s, the private sector, both domestic and foreign, has been called on to assume responsibility for funding infrastructure development. Despite a noticeable decline of overall North-South investment flows in the last few years (following the end of major privatization efforts and spectrum license auctions),¹⁰ continued rollout of physical infrastructure suggests that these flows have been replaced by a combination of South-South FDI flows, domestic private financing, and other sources (see Box 2.1). As the example of Vietnam makes clear, however, not all countries are initially open to establishing a legal environment conducive to foreign investment in the ICT sector (see Box 2.2).

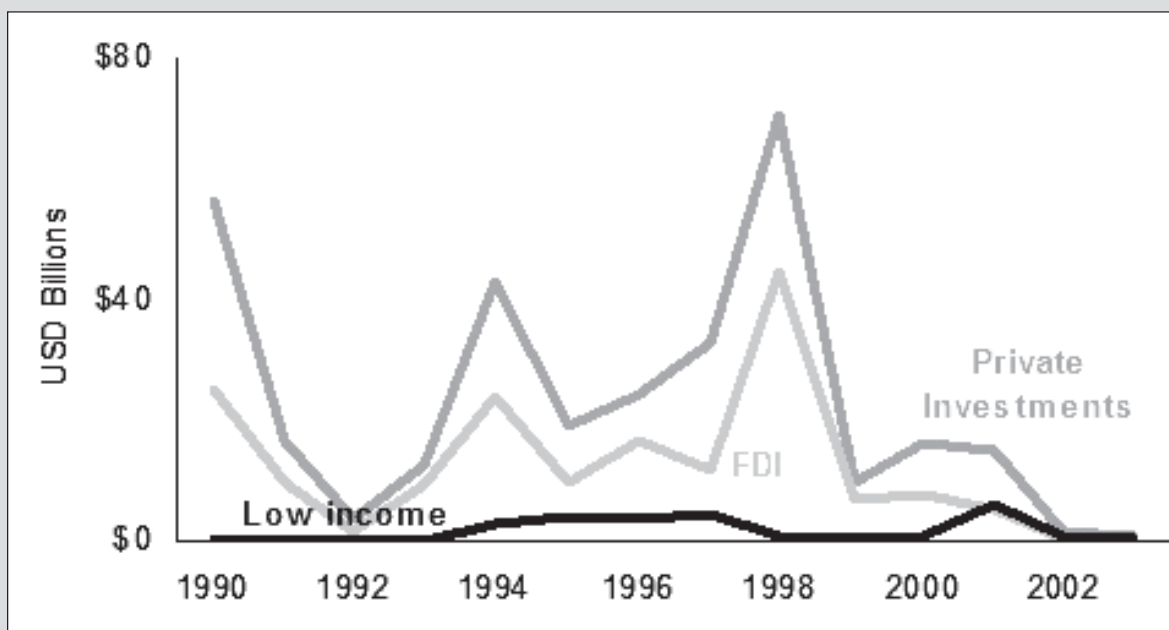
Many countries are now revising their regulations on foreign investment in telecommunications to facilitate capital expansion. These regulatory reforms are part of a global wave of telecommunications sector liberalization, driven by the World Trade Organization (WTO) Basic Telecommunications Agreement. Under a binding multilateral framework, liberalization can create a stable environment for investment that benefits both the foreign investor and the host country. Foreign investors are more confident when investing because host countries cannot withdraw or change their offers without referring to WTO rules. By the same token, host countries are better off because multilateral rules enhance reciprocity and reduce market distortions.

Enabling a pro-competitive ICT regulatory framework: For many developing countries, a poorly planned regulatory reform will scare away potential investors and exacerbate the digital divide. Effective frameworks ensure proper com-

Box 2.1 Growing Private Investment in Telecommunications Infrastructure

Private investments in telecommunications infrastructure projects in developing countries were valued at US\$372 billion during the period 1990–2003. Foreign direct investment represented roughly 60 percent of this sum (approximately US\$172 billion). Of the 130 developing countries that received private investments, 53 were low-income countries. The countries of Latin America and the Caribbean, Europe and Central Asia, and East Asia, and the Pacific regions collected the greatest share of capital flows: 48, 21 and 15 percent, respectively, of total FDI. Brazil, Mexico, and Argentina were the largest beneficiaries overall, receiving US\$76 billion, US\$38 billion and US\$24 billion, respectively.

Foreign investors acted both alone and in consortium arrangements with domestic private and public investors. The involvement of foreign investors spurred broader interest in the sector, prompting local investors to put money into telecom infrastructure development as well. As investment has slowed in recent years due to the downturn in the telecommunications market, private investors from the South have taken the place of foreign investors from developed countries. Mobile telephony has also become the leading growth sector, overshadowing traditional businesses in fixed and long-distance telephony.



Source: World Bank. 2005. Private Participation in Infrastructure (PPI) database; Qiang, Christine and Pierre Guislain. 2005. "Foreign Direct Investment in Telecommunications." *World Information and Communication for Development Report 2006*. World Bank: Washington, DC.

petition, guard against market abuse by dominant market players and balance the goals of market efficiency, flexibility and innovation.

Countries may adopt sector-specific rules or rely more heavily on a general competition law.¹¹ While a competition law may prove effective in

Box 2.2 Vietnam’s Business Corporation Contracts

Under Vietnam’s investment law of 1992, as amended in 2000, foreign companies are allowed to provide services to Vietnam’s telecommunications market only under a Business Corporation Contract (BCC). A BCC is, in essence, a partnership agreement between a foreign and a Vietnamese party in which private investors provide investment capital and receive a negotiated return on their investment for a prescribed number of years. Foreign investors are not allowed to own equity stakes in Vietnamese telecommunications companies and the Vietnamese party is the only party permitted to hire and manage a workforce. A foreign company must be present in Vietnam for at least two years before entering into BCC negotiations.

In most cases, such schemes discourage foreign investors because they have no operational control over their investments. Lack of ownership rights and limits on management control increase investor risk and consequently, increase the cost of capital, reduce its availability, and impede the transfer of management expertise to firms in the host country. Since a BBC arrangement de-links management from investment risks, the incentives for effective, profit-oriented management are also reduced.

Unsurprisingly, as the Vietnamese telecommunications market gradually opens, resistance among foreign investors to BBCs is growing.

Source: European Union, Asia IT&C Program. 2004. “Promoting Internet Policy and Regulatory Reform in Vietnam: Assessment Report 2004.” GIPI Vietnam.

some cases, certain specific rules (for example, those setting the parameters for interconnection) are likely to be needed, especially in telecommunications sectors where competition has not yet taken hold. Regulators and policymakers will also need to revisit the regulatory framework from time to time to respond to changes in market conditions.

A key determinant of an enabling environment for ICT is the elimination of barriers to entry and the introduction of competition in the ICT sector (see Box 2.3).

As mentioned earlier, the WTO has played a pivotal role in telecommunications liberalization and encouraging regulatory reform in developing countries. In addition to market access and na-

tional treatment commitments, WTO members have adopted a Reference Paper on regulatory principles. The paper is a set of common guidelines to guarantee effective market access and foreign investment. These guidelines represent the regulatory component of the WTO Basic Trade Agreement (BTA) and provide policymakers in developing countries a road map for establishing (or reforming) a regulatory framework. The reference paper compiles in one short document the experience of long years of regulatory practice.

Early evidence of the impact of liberalization under the BTA shows that growth in telecommunications revenues as a percentage of GDP is higher in countries that have made GATS commitments in telecommunications (see Figure 2.3).

Box 2.3 Lack of Competition Leads to High Prices

Competition in the ICT sector leads to lower prices, as well as improved quality and availability of services. Lower prices for international telephone calls, for example, are highly correlated with the level of competition. In Africa, one of the regions of the world where competition in long-distance telephony is lowest, prices for both international telephone calls and broadband services are much higher than in other regions of the world (see Figures 2.1 and 2.2 below).

Figure 2.1 Cost of international calls, selected regions of the world, 2003

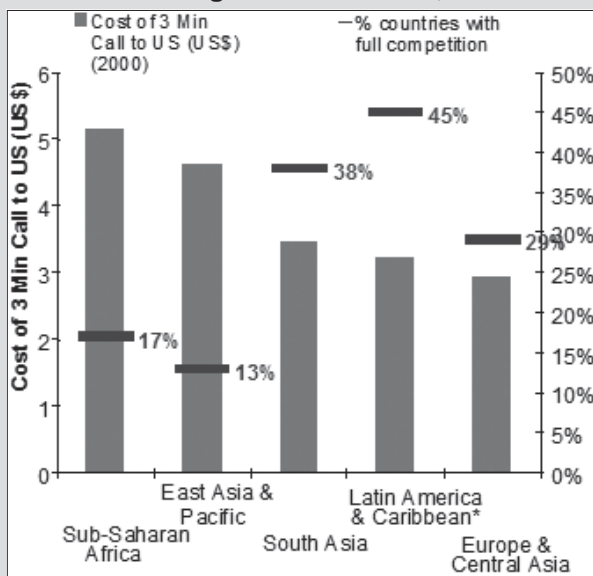
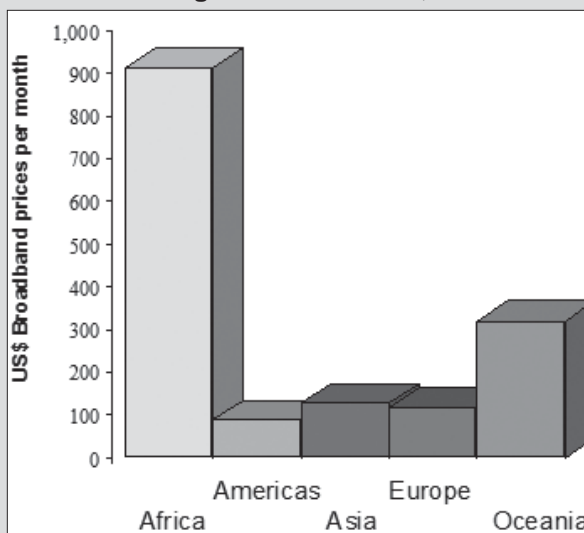


Figure 2.2 Cost of broadband services, selected regions of the world, 2003



Source: Global Information and Communication Technology (GICT) Department. 2005. "Connecting Sub-Saharan Africa: A World Bank Group Strategy for ICT Sector Development." World Bank Working Paper, no. 51. GICT, World Bank: Washington, DC.

Investors are thus likely to be more willing to commit capital and technology in countries with WTO telecommunications commitments, as they are likely to be rewarded with higher revenues. As expected, countries in sub-Saharan Africa without WTO basic telecom commitments initially earned higher telecommunications revenues (as a percentage of GDP), but were overtaken by countries that had made such commitments. Uganda, for example, reformed its telecommunications sector and enjoyed healthy revenue growth, while Ethiopia, which had not reformed

its own sector, experienced much lower revenue growth.

Building strong institutional capacity: In addition to substantive rules of the game, proper implementation of policies requires independent regulatory institutions that are empowered to enforce regulations (institutional capacity) and suitable processes by which regulatory decisions are adopted and enforced. (Table 1) A transparent, participatory regulatory process guards against the capture of regulatory agencies by stakehold-

ers and acts as an important guarantee for private investment. While there is no one-size-fits-all model for institutional organization, the credibility of regulatory institutions, including the independence with which they perform their regulatory roles, is supported through clearly defining their competencies and functional responsibilities *vis-à-vis* other sector stakeholders.

In many developing countries, the creation of an independent telecommunications regulatory agency has brought about a sea change in the relationship between business and government. However, mechanisms such as consultations have not yet become part of these governments’

regulatory efforts. Greater consultation on the part of regulators can impart greater stability to the sector and generate confidence in the ability of regulators to regulate fairly and predictably. In addition, efficient dispute resolution mechanisms are another important element for promoting growth and creating a favorable investment climate for prospective investors.¹²

Emerging regulatory approaches for broadband deployment and converged services: A regulatory emphasis on improving access solely to traditional telephony would be out of tune with the development potential of modern information and communications technologies. The risk

Box 2.4 WTO Reference Paper on Regulatory Principles

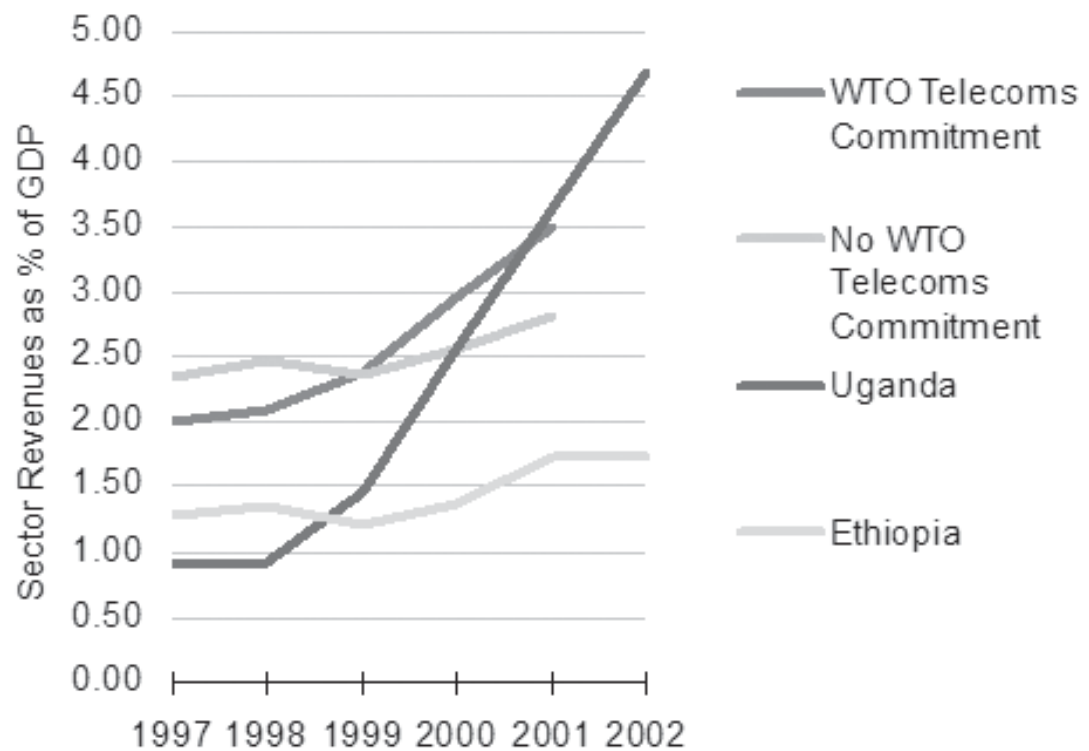
Under Article XVIII of the General Agreement on Trade in Services (GATS) of the WTO, parties are allowed to schedule “additional commitments” in addition to market access and national treatment commitments.^a In principle, these additional commitments are binding on the countries that make them and enforceable through WTO dispute procedures. The drafting of the Reference Paper on regulatory topics was driven by a need to guarantee effective competition in the basic telecommunications sector, especially the need to prevent major suppliers from abusing their dominant market positions. WTO member countries that adopt the Reference Paper commit to:

- establish a regulatory authority that is independent of all suppliers of telecommunications services and networks;
- adopt measures that prevent and safeguard against anti-competitive practices by major suppliers;
- require major suppliers to interconnect with other suppliers at any technically feasible point on a non-discriminatory, cost-oriented basis following transparent procedures and subject to dispute settlement by an independent body;
- administer universal service programs in a transparent, non-discriminatory, and competitively neutral manner; and
- allocate and assign the use of scarce resources, including the radio spectrum, numbering blocks, and rights of way, in an objective, timely, transparent and non-discriminatory manner.

^a The article allows WTO members to negotiate commitments with respect to trade in services that are not subject to scheduling under Articles XVI (market access) or XVII (national treatment) of GATS, including commitments regarding qualifications, standards and licensing. These commitments are then inscribed in a member’s schedule.

Source: WTO. 1996. “Reference Paper.” WTO Negotiating Group on Basic Telecommunications, Geneva.

Figure 2.3 Telecommunications revenues and WTO telecommunications commitments in Sub-Saharan Africa, 1997–2002



Source: Analysys, Harris Wiltshire & Grannis LLP. 2004. Telecommunications Trade Liberalization and the WTO, Final Report for the GICT Department. World Bank.

inherent in a narrow, traditional regulatory approach is that it could inadvertently widen the digital divide. While the basic tenets of an enabling environment in the pre-broadband era remain valid for today's environment, countries need to adapt their legal and regulatory frameworks to make them better suited to support broadband services, given that most e-applications require higher bandwidth and permanent Internet connections.

There is a growing consensus that broadband¹³ is "[of] strategic importance to all countries because of its ability to accelerate the contribution of ICT to economic growth, and facilitate inno-

vation."¹⁴ Broadband not only satisfies communication needs between individuals, it provides a needed platform for many applications and offers a wide range of positive externalities which have the potential to support and accelerate development (e.g., in health, education and commerce).

In parallel with the emergence of broadband services, the convergence of communications, computing, and media brought about by digital technologies has revolutionized not only the telecommunications sector, but has also blurred lines between technology and the economic sectors and industries built around them. Converged li-

Box 2.5 Morocco: Effective Regulation Attracts Investment

The case of Morocco demonstrates the importance of an effective regulatory framework for attracting foreign investors and improving connectivity. Because of the confidence of foreign investors, the auction of a second GSM license in 1999 stimulated the country’s mobile market and acted as a catalyst for neighboring countries (Algeria, Tunisia, Mali, Mauritania), which followed Morocco’s lead in awarding competitive GSM licenses. The National Agency of Telecommunications Regulation (ANRT), the new Moroccan regulatory agency, emerged as a world-class regulator, setting the standard in the Middle East and North Africa region for transparency and appropriate design and auction of GSM licenses.

Morocco’s mobile sector has since achieved spectacular development. From being the country with the lowest teledensity in the region, Morocco has become the country with the highest teledensity. (The number of mobile subscribers grew from 150,000 in 1999 to over 8 million by year-end 2004.) The ANRT is now being encouraged by the World Bank to build on this success and ensure continuous, effective regulation of the sector in the context of improved competition and new technologies.

Sources: ITU. 2002. “The Role of Effective Regulation: Morocco Case Study.” ITU: Geneva.; and B. Wellenius, C. Rosotto and A. Lewin. 2004. “Morocco: Developing Competition in Telecommunications.” CITPO Working Paper, GICT Department, World Bank: Washington, DC.

censing, for example, encourages market entry by a full range of operators, including small-scale and medium entrepreneurs, and gives these operators sufficient flexibility to embrace technological developments and tailor their services to market demand.

Regulators and policy makers should seek only that level of regulation necessary to promote the rapid growth of new services and applications and to minimize barriers to entry. Globally, the trend is to minimize licensing hurdles (by establishing general authorization regimes) and to adopt technological neutrality—allowing for greater competition between different delivery platforms and greater end-user access. Many countries are accordingly moving away from service-specific licensing regimes to embrace converged licensing approaches, relieving investors from restrictive and burdensome licensing rules.¹⁵

New regulatory approaches, for example, need to be crafted to harness the power of radio technologies, including new approaches to spectrum management. To cite one possibility, allowing unlicensed utilization of 2.4 MHz spectrum for locations with low-density traffic, especially in rural and/or remote areas, could facilitate the growth of school and rural community networks. The most appropriate regulatory approach may differ from country to country. In countries where the infrastructure is already in place, one of the challenges for policy makers and regulators is to deal with legacy regulation and existing access platforms and established models when designing policies to encourage competition and encourage the use of alternative infrastructures. One area of growing concern for both regulators and policy makers is how to deal with technologies like Voice over Internet Protocol (VoIP), which challenge existing business models. Early attempts to ban the service have largely been in-

Table 1.1 List of Possible Impediments to Regulatory Effectiveness

Issues	Impediments
<i>Relationship between policy maker and regulator</i>	<ul style="list-style-type: none"> ■ Political interference in running of regulator ■ Function ambiguity between regulator and policy maker ■ Function ambiguity between regulator and competition authority ■ Function ambiguity between regulator and universal service agency ■ Lack of political commitment ■ Interventions in regulatory decisions by policy maker overly-influenced by its relationship with operators
<i>Accountability of regulator</i>	<ul style="list-style-type: none"> ■ Inadequate mechanisms for holding regulatory members accountable for their decisions
<i>Autonomy of regulator</i>	<ul style="list-style-type: none"> ■ Over-reliance on government/external bodies for funding ■ Political interference in remuneration, appointment and dismissal of regulator's members ■ Regulatory capture or excessive influence by a particular group
<i>Participation in decision-making processes</i>	<ul style="list-style-type: none"> ■ Inadequate consultation mechanisms for involvement of external parties in processes ■ Over-reliance on informal (non-orthodox) lobbying of regulator
<i>Transparency of decision-making processes</i>	<ul style="list-style-type: none"> ■ Lack of explanations provided in public and to operators for decisions
<i>Predictability of decision-making processes</i>	<ul style="list-style-type: none"> ■ Poor enforcement of license conditions and/or legislation ■ Lack of consistency in decision-making
<i>Effectiveness of regulatory policy tools in key areas</i>	<ul style="list-style-type: none"> ■ Policy tools do not achieve their objectives (e.g. ineffective price caps, universal service targets, licensing procedures, ineffective dispute resolution procedures etc)
<i>Regulator's organizational structure and resource requirements (human, financial)</i>	<ul style="list-style-type: none"> ■ Inappropriate organizational structure ■ Inadequate financial resources ■ Inadequate regulatory/administrative/business management skills of key staff

effective, with a gray market flourishing in many developing countries. There is even a growing recognition on the part of policymakers that this application offers the benefit of cheaper access (see Box 2.6).

Addressing Access Gaps: Going Beyond the Market: Evidence across the world demonstrates that the market has been the main driver for improved access to ICT. In many areas, however, the upfront investment needed may be too high to be justified on purely commercial grounds.

Box 2.6 VOIP in Call Centers

Togo recently overcame the “bifocal” approach to VOIP and became the first African country to establish a VOIP call center. The innovative call center allows entrepreneurs to tap into the rapidly growing, lucrative trend of call center outsourcing. The driving forces behind such outsourcing are low labor costs, better-quality Internet services and government support. Given the potential for growth in outsourcing and adequate access to ICT, call centers could potentially be a new business for developing countries.

Source: Jacques Rostenne. 2005. “Togo: First VOIP Call Center in Africa.” *Balancing Act*, no. 47. Available at <http://www.balancingact-africa.com/news/back/balancing-act47.html>.

Table 2.2 Minimum subsidy auctions for public rural telephones, selected countries, 2004

	Chile	Columbia	Dominican Republic	Peru	Nepal
Projects	200	6	1	7	1
Bidders	numerous	2 to 7	2	2 to 5	2
Average subsidy per locality	US\$3600	US\$4600	US\$6800	US\$9500	US\$11200
Localities served	6509	7415	500	4420	1064
Population served (millions)	2.2	3.7	1.0	1.6	4.0

Source: Navas, Juan. 2005. “Universal Access and Output-Based Aid in Telecommunications and ICT.” GICT, World Bank: Washington, DC.

Especially in areas that require significant investment, incur high operating costs and feature limited or uncertain demand, there may be a role for complementary government initiatives that fill the access gap.¹⁶

Some form of incentives or funding support may need to be considered for more remote, unserved locations with low-income populations. One approach is to have coverage requirements linked to license obligations. Another approach is to offer explicit financial incentives for servicing locations that are “beyond the market.” Such areas need to be carefully identified, so that limited subsidy or incentive programs do not crowd out private investment in areas where greater policy and regulatory flexibility could enable market forces to provide increased access on their own.

Among the possible approaches to funding investments in remote and poorer areas is a universal access fund. The purpose of such funds is to collect potential subsidy resources (whether from within the sector, the government or outside sources) into a central, independent account that is managed on a non-discriminatory, transparent basis and distributed according to clear criteria and procedures. Allocation of the funds can be achieved through minimum-subsidy auctions (see Table 2.2 and Box 2.7 for examples). This approach has many advantages in terms of flexibility and avoids unwarranted favoritism toward incumbent players.

An access gap also exists between dial-up and broadband users of the Internet. The question of whether similar approaches would be justified to

Box 2.7 Output-Based Subsidies in Chile

The impact of public support can be maximized by leveraging competitive private investment through minimal, well-targeted (“smart”) subsidies allocated under an output-based aid (OBA) scheme. Such an OBA system has been used in Chile to finance rural universal service obligations. Chile first created a rural universal service fund in 1994 to provide subsidies to private investors to provide rural pay phones. Chile is now a leading example of how cost-effective solutions can reduce access gaps in basic telecommunications in developing countries: the fund reduced the proportion of the population without access to a telephone from 15 to 1 percent in five short years.

Subsidies were allocated through competitive tenders and financed by the national budget. In the period 1995–2000, the telecom regulator Subsecretaria de Telecomunicaciones (SUBTEL) held auctions for 7,850 localities, specifying a maximum amount of subsidy for each locality. Operators and service providers were invited to bid for the amount of subsidy they needed to build pay phones in these localities, provided that the subsidy did not exceed the maximum specified amount. Based on lessons learned from this program, the government is now applying the same scheme to bring Internet access to 750 towns in rural Chile. An estimated investment of US\$38.7 million will require a government subsidy of US\$9.0 million, meaning that the private sector will provide US\$2.6 dollars for every US\$1 dollar of government funding. The towns slated to receive Internet access have been selected based on their poverty level and lack of current service.

Source: Bjorn Wellenius. 2001. “Closing the Gap in Access to Rural Communications: Chile, 1995–2002.” *infoDev Working Paper*, World Bank: Washington, DC.

fund encourage broadband deployment is a hot subject in policy discussions today. Some argue that it is too early, and that countries should wait for the normal uptake of technology. Some countries, however, are considering direct intervention in the broadband market and devising Public Private Partnership (PPP) schemes to speed up the roll out of the broadband networks.

Different rationales are presented to defend the role of public funding. Some argue that direct funding is needed to correct market failure resulting from the fact that investment in backbone infrastructure requires high sunken cost. Others argue that broadband enjoys the fastest take up rate of all communications services and that a delay in the availability of broadband for rural users should not be taken to be an auto-

matic sign of market failure.¹⁷ Rather, public funding is needed because of the strategic nature of broadband for economic development and the need to speed up deployment rather than wait for the market to fully mature. It should be noted that while direct funding of broadband deployment has been provided in many cases, alternatives include demand aggregation and ensuring that a government will be a principal user of broadband services (e.g., via e-government applications).

A key lesson emerging from different initiatives being attempted today is that public support for the expansion of coverage and use of broadband services should not pre-empt private sector initiatives or hinder competition. Promoting access to rural and underserved areas by extending back-

bone infrastructure is, of course, contingent on the existence of a proper regulatory and policy framework. One of the challenges of governments is to prevent monopoly control over the telecommunications backbone network. Some countries have opted to transfer management of this network to a third company in order to promote open access. In most cases, such companies provide only wholesale services and are prevented from offering retail services to end-users.¹⁸

If a government opts for third-party management, the award of a management contract should be based on open, transparent procedures. The third party should, moreover, be required to meet specified operating requirements and provide open access to the network. Public-private partnerships that involve community investment in and ownership of local infrastructure that is managed by professional private-sector partners have proven effective in developing rural telecommunications infrastructure in a number of countries

Table 2.3. Alternatives for Supporting the Deployment of Broadband Services

Models of Intervention	Characteristics	Issues
<i>Infrastructure provision</i>	Public sector subsidizes investment in or procures the network or network elements for use by both public and private sectors.	<ul style="list-style-type: none"> ■ Uncertainty regarding the rules of state funding ■ Deploying current-generation versus next-generation broadband in rural areas
<i>Demand aggregation</i>	Procurement by the public sector provides a demand stimulus for private sector provision.	<ul style="list-style-type: none"> ■ Potential for anti-competitive, exclusive supply agreements ■ Impact on current initiatives ■ Procurement at regional level may reduce local partnering opportunities
<i>Public-private partnerships</i>	Multiple partners from both the public and private sector cooperate to share network investment and operational risks. These projects often combine supply-side initiatives with demand stimulation.	<ul style="list-style-type: none"> ■ See “Demand aggregation” issues ■ Spreads risk between public and private partners ■ Relationship with demand aggregation schemes
<i>Subsidized broadband pilots</i>	Demand subsidies used to pilot broadband technology; supply subsidies provided to community broadband networks to trial new technologies.	<ul style="list-style-type: none"> ■ Need rules on the use of public sector networks to deliver commercial services ■ Long-term viability of public-sector backhaul for community networks
<i>Promotion and content commissioning</i>	Demand registration schemes; marketing and promotion events; public broadband centers; commissioning of content.	<ul style="list-style-type: none"> ■ Persistent lack of awareness of (i) benefits of broadband services and (ii) available technologies
<i>Community network projects</i>	Delivered through “grassroots” community action; receive minimal or no public sector assistance.	<ul style="list-style-type: none"> ■ Long-term viability in the absence of strategic approach to broadband technologies and business models

Source: Ecorys Research and Consulting, 2005. *Best Practice Options for Improving and Extending Access to Electronic Communications in Lithuania, a publication for GICT*. p.41. Available at <http://www.worldbank.org/ict>.

Box 2.8 Locally Owned Broadband Networks

Andhra Pradesh is the first state government of India to finance a statewide broadband project. The fiber optic network will link 23 districts, 210,000 villages and 40,000 government offices. The project promises to provide effective e-government services to rural areas, increase the capacity of the private sector and provide the lowest broadband tariffs in India. Total estimated cost of the network is about US\$90 million and will be funded by a public-private partnership.

The consortium includes entities with complementary strengths, including a broadband provider, the Railway Corporation and cable network providers. The state government is a key player in the project, providing an equity investment of US\$5.5 million, right-of-way permissions, and serving as the anchor client (with a fixed annual usage fee). In this case, the network operator is expected to provide both wholesale and retail services.

Source: Fiber Optics Weekly update. "Andha Pradesh to be connected with fiber this year." January 7, 2005. Available at http://www.findarticles.com/p/articles/mi_m0NVN/is_1_25/ai_n8699107. Accessed July 2005.

(e.g., the NTCA experience in the US) and can also be used in areas with regional autonomy.

Enabling Other "Access Tools"

Adequate access to ICT infrastructure, although a major first step, does not guarantee a country's capacity to participate fully in the global digital economy. In Africa, for instance, Internet growth in the near future could be limited by the market penetration of personal computers (there are only 1.05 PCs per 100 inhabitants in Africa).¹⁹ Currently, computers remain unaffordable to most households in developing countries. In the case of India, the cost of a PC is equivalent to two years of the average per capita income.

While an enabling legal and regulatory environment cannot guarantee a computer in every home, general taxation laws and import duties can help control end-user costs. Many countries still maintain tax structures that inhibit growth of the IT sector. Vietnam, for instance, requires hardware manufacturers to pay a VAT tax larger than the price they can charge buyers for components.²⁰ For many countries, import duties on

IT-related products can be very high (see Table 2.4), constituting an impediment to the development of e-business.

On a global level, many countries are considering joining the WTO Information Technology Agreement (ITA) negotiated during the Singapore Ministerial Meeting in 1997. The ITA seeks to move to zero duties on IT products such as computers and telecommunications equipment.

In addition to reducing customs duties on computers, countries can also implement fiscal incentives to encourage wider ownership of PCs. Korea, for instance, launched a subsidy scheme that enabled one million households to buy a PC for under US\$900. The economic rationales for such initiatives remain questionable and the implications of such subsidy schemes remain to be tested. Other countries especially in the North African and Middle East region have encouraged public-private initiatives involving local banks, PC vendors, and telecom operators to increase PC ownership amongst households (see Box 2.8).²¹

Table 2.4. Tariffs and Taxes on Computer Hardware and Software, Selected African Countries, 2003

	Tariff on computer hardware	Tariff on computer parts	Tariff on computer software	Other taxes
Cameroon	5–30%	5–30%	5–30% (U)	18.7% VAT applied on CIF value + duty; 25% excise tax (indirect tax on consumption goods covers specific categories of goods defined by ministerial ordinance) is applied on the CIF value.
Cape Verde	5–50%	5–50%	5–50% (U)	7% fixed rate (wholesale value of exporting plus CIF charges); 5–60% consumption tax (non priority goods)
Eritrea	25%	25–30%	2% (U)	3%, 5% and 12% sales tax on CIF + duty (on most goods)
Guinea	20-60%	20-60%	20-60% (U)	18% turnover tax; 15% combined customs charges applied on CIF value; 2% processing fee; 20–60% surtax on some luxury items

In many cases, in order to enable access, governments have opted to support community rather than individual PC access. Multi-purpose telecenters, for instance, offer consumers access to numerous ICT applications, including public telephony, fax, Internet, tele-education, and telemedicine. International organizations, including UNESCO, the World Bank and the ITU, have initiated pilot telecenter projects in a number of countries, providing both facilities and technical support. The sustainability and scalability of such initiatives can, however, prove to be an issue.

Part II. The Applications Layer: Creating the Enabling Environment for Improved e-Development Applications

E-business has changed the way business is conducted at the international level and is becoming a driving force of the global economy.²² E-business also offers the potential for economic development, promising increased productivity and

increased access to the global market.²³ E-commerce generates many important opportunities, including better availability of information, global distribution and customer service, reduced transactions costs, lower barriers to entry, and new sources of revenue.

Electronic commerce can also have important impacts on individual economic sectors, such as finance and tourism, as well as on macroeconomic performance and policies. According to one recent study, e-commerce can cut distribution costs by 5 percent; companies using e-commerce in the study achieved efficiency gains valued at 0.75 percent of GDP.²⁴ The projected growth of business conducted over the Internet is impressive. According to the United Nations Conference on Trade and Development (UNCTAD), the number of websites using secure socket layer protocol (SSL, a protocol used mostly for e-commerce, e-payments and e-banking transactions) grew more than 55 percent between 2003 and 2004.²⁵

Box 2.9 The Family Computer Initiative of Tunisia

A “one-computer-per-family initiative” was launched in Tunisia by presidential decision in November 2000. The initiative aimed to enable low-income families to purchase computers at reasonable prices (less than 1,000 Tunisian Dinars, or US\$750) via loans provided by the national solidarity bank. The bank offers soft loans (supported by the Ministry of Finance) at an interest rate of 5 percent; terms include a possible grace period of over 3 months. The local press reports that Phase I of the initiative has largely met its initial target of connecting 10,000 families per year. Additional elements could expand the current initiative by:

- opening the computer supply to an international competitive bidding process, thus procuring cheaper computers. (The initiative began by trying to link two policy goals: improving PC penetration and supporting the nascent local IT industry. Roughly 48 percent of computers sold in Tunisia are made and/or assembled locally.)
- giving end-users a choice of ISP (In most cases the PCs came bundled with a pre-determined Internet service package.).

A decision of the Council of Ministers of December 2004 initiated Phase II of the initiative, which intends to provide 20,000 PCs per year. This phase will use an open competitive process and hopes to offer consumers a product that is 10 to 15 percent cheaper.

Sources: Babnet Tunisie. 2005. “Ordinateur familial: Rude et...douloureuse sera la concurrence.” Available at <http://www.babnet.net/cadredetail.asp?id=2549>. Accessed July 2005.; and Serene Zawaydeh. 2003. “Tunisia Internet & Datacomm Landscape Report.” Arab Advisors Group, Strategic Research Service: Amman, Jordan.

The lack of an enabling framework to support e-business is a significant roadblock to a country’s fuller participation in the global economy. Many countries have not yet adapted their legal frameworks (designed for physical, paper-based commercial transactions) to an environment where transactions are conducted over electronic platforms. Electronic transactions raise a number of legal issues unique to the “virtual” world, ranging from acceptance of digital signatures to contract formation to the admissibility of electronic evidence to jurisdiction, to name a few.²⁶ The emerging legal framework is based on a mix of industry standard-setting, voluntary accreditation of certificate authorities, and possibly some government approval of technologies that will have a presumption of legal validity. But these ap-

proaches are sometimes subject to the overriding principles that parties may choose their own technological methods, and that no electronic signature can be denied effect solely on the grounds that it is not supported by a cryptographic system or does not comply with an accredited or otherwise favored scheme. This flexible framework is reflected in the EU Directive on Electronic Signatures, for example.²⁷

Model laws, conventions, and regional laws from a variety of sources contribute to the emerging body of international best practices available to developing countries. Too often, however, there is a tendency to adopt international precedent (whether a model law, directive, or other precedent) wholesale, without adapting it to local dy-

namics. Certainly there is value in learning from the experience of others, but adopting model laws verbatim, without a holistic approach to regulatory reform, can be as ineffective to the growth of ICT4D as reform that does not take the international dimension into account at all.

In the East Asia and Pacific region, research on 23 countries shows that harmonization of legal frameworks to ensure cross-border interoperability is necessary for applications associated with the Internet (i.e., e-commerce); isolated activities of individual countries were ineffective in addressing this challenge.²⁸ Even with regulatory reform, if the financial system is not sophisticated enough to support electronic transactions such as inter-bank electronic payments and bank credit cards, a country will find it difficult to reap the benefits of e-business. In the Middle East, for example, only 18 percent of banks (most of which are foreign) offer e-bank-

ing services. The absence of digital certification laws and the low level of credit card penetration in Arab countries are major factors that discourage banks from going online. In the case of Jordan, the total transaction volume of Visa credit cards in 2004 was estimated at US\$258 million, of which online payments accounted for only US\$2.5 million, not even 1 percent of the total.²⁹

Part III. The Trust Layer: Creating the Enabling Environment for Improved Consumer Confidence and Trust

The development of a digital environment is predicated on the security of electronic networks and communications. In the converged world of ICT infrastructure, digitization of information into bits of data has given rise to new online applications and efficiencies, whether these transactions are

Box 2.10 Cybercafes in Algeria

Given the scarce diffusion of personal computers in Algeria (less than 1 percent of the population owns a PC)^a and the high relative costs of Internet subscriptions,^b people predominantly access the Internet at cybercafés. In 1999, the Government of Algeria launched an initiative to create 100 cybercafés in the capital. Three years later, the number of cybercafés had jumped to 4,000. The rapid growth of cybercafés between 1998 and 2000 resulted from the gradual liberalization of the telecommunications sector. Reforms simplified the licensing process and made it extremely affordable (US\$13) to obtain authorization to provide Internet service.

The telecommunications reform has generated more than 120,000 Internet-related jobs in the last four years, many of which are in cybercafés, multi-service kiosks, and sales points. As of December 2004, Algeria had 29 active ISPs and more than 500,000 estimated Internet users, of which 50,000 were ADSL subscribers. Broadband Internet access has been available since November 2003.

^a In 1999, the number of PCs in Algeria reached 180,000, a penetration rate of 0.60 percent. Between 1999 and 2001, this number increased by 20,000 PCs annually and is expected to reach 650,000 by 2008, a penetration rate of 1.89 percent.

^b The cost of a full-day Internet connection can reach US\$463 per month.

Source: Serene Zawaydeh. 2004. “Algeria Internet & Datacomm Landscape Report.” Arab Advisors Group, Strategic Research Service: Amman, Jordan.

Box 2.11 Chile Moves from a Paper-Based to Online Tax System

In 1998, Chile's Internal Taxation Service (SII) launched an online taxation system. Its aims were to (a) reduce the cost and increase the accuracy of tax collection; (b) equip Chile's tax authority with the resources it needed for the foreseeable future; and (c) offer taxpayers throughout the country better service, along with swift and easy access to vital tax information.

Three years after project launch, the online taxation system has racked up impressive statistics. Over 400,000 taxpayers have checked their assessments online, some 183,548 sworn returns and 89,355 income tax returns have been received, and the Chilean exchequer has collected US\$1.943 billion in taxes. Managers at SII are now preparing the online system to process a potential 1.8 million tax returns per annum, plus 950,000 VAT returns every month.

E-government applications often require changes in the legal code in order to fully utilize their potential. In Chile, the popularity of the online tax system spurred citizen demand for legal changes that would facilitate the transfer of information between SII and taxpayers. The government responded by speeding an amendment to the tax code through parliament; the change authorizes taxpayers to present their annual reports, accounts and tax returns on media other than paper.

Source: World Bank. 2005. "Chilean Tax System Online," abstract, E*Government. GSPR net (Governance and Public Sector Reform Sites). Washington, D.C., n.d. Available at http://www1.worldbank.org/publicsector/egov/chile_taxcs.htm. Accessed at July 2005.

commercial (traditional e-commerce) or between citizens and a government (e-government). However, data in digital format, as well as the networks and storage devices that use this data, are increasingly vulnerable to theft and unauthorized use. Securing the integrity of data and infrastructure is thus imperative to build user confidence.³⁰ During any activity carried out over the Internet, a user "opens a window on his privacy." Lack of privacy protection means that the online market will not reach its full potential.

Promoting confidence in the online world (e.g., by protecting consumer privacy and preventing unsolicited e-mail) is needed to create trust and increase the use of digital networks. Research indicates, for example, that many people are still reluctant to conduct business online.³¹ Identity

thieves steal personal and financial data from data brokers, banks and retailers and use the stolen data to engage in illicit activities. It is not only the consumer who loses from "breaches" of personal privacy on the Internet; according to e-Marketer, companies lost US\$5.5 billion in online sales in 2001 due to poor security and could lose more than US\$24 billion by 2006.³²

In April, 2005, the UNDP Asia Pacific Development Information Programme (APDIP) published a summary analysis of a recent regional survey on Internet governance priorities for the Asia Pacific region. Survey results revealed an overwhelming, near universal, concern over virus attacks, online fraud, cyber-crime, and spam.³³ More than 90 percent of respondents from all stakeholder groups and from almost all

countries surveyed regarded the solution to these problems as somewhat important, important, or very important. These issues by far evoked the strongest sense of concern among those surveyed.

The following subsections will examine six major issues that affect the trust and confidence of digital networks: network security, consumer protection, privacy, cyber-crime, protection of intellectual property rights, and dispute resolution.

Protecting Critical Infrastructure

In an environment where more and more “public” services are provided over networks that are privately owned and operated, governments must address how best to protect critical information infrastructures.³⁴ Many countries are developing cybersecurity policies and programs, including the creation of national Computer Emergency Response Teams (CERT). These programs are part of multi-stakeholder information-sharing efforts aimed at creating the capacity to assess

and manage cybersecurity risks. Such programs are generally a combination of bottom-up, industry-led programs, and top-down, government-led initiatives. All such initiatives focus on the process of sharing information on security issues among various actors and stakeholders; they do not, however, focus on the institutional arrangements for this process. One key issue that public policy makers must consider is how information about potential threats should be escalated and addressed. Thus, the establishment of a well-functioning collaborative information-sharing framework is essential to infrastructure security at both national and international levels.³⁵

Implementation of a national CERT and related Computer Incident Response Teams (CISRT) in key government agencies not only includes training and emergency alert and response services, it also provides risk analysis to ensure continuity of critical government systems and applications. Responsibility for critical information infrastructure protection (CIIP) programs should

Box 2.12 Tunisia Launches E-commerce without Credit Cards

A recent study of the ICT sector in Tunisia revealed that while the financial system is no longer a major roadblock to the effective use of ICT, there is still important room for improvement. An early success was the introduction of the e-dinar, a rechargeable pre-paid card available for purchase at most post offices in denominations of 20 to 500 dinars. This innovative mechanism allowed Tunisia to initiate e-commerce without the use of regular credit cards. Only recently did the Tunisian Agency for the Internet launch an SSL-based secure-payment server called e-Tijara for users of MasterCard and VISA credit cards (the server is operated by Agence Tunisienne de l’Internet ATI in cooperation with major Tunisian banks).

Tunisia now needs to exploit existing global network externalities. Currently, international financial transactions are made more costly and more difficult by relying solely on the government’s own certification agency. In addition, the e-dinar initiative, which proved to be a very beneficial first step, needs to be phased out in favor of a wider use of credit cards (which yield superior outcomes for the retail market).

Source: Catherine L. Mann. 2004. “Information Technology and e-Commerce in Tunisia: Domestic and International Challenges and the Role of the Financial System.” Available at http://tunis.usembassy.gov/wwwftunisia_report.pdf. Accessed July 2005.

be given to government agencies or other bodies that will give this issue the attention and the priority it requires. Any CIIP program should identify critical infrastructures, assess the vulnerabilities of key systems and raise awareness of security concerns. A permanent structure should then be created to coordinate program development and implementation, a process that should involve the government and the private sector. A complementary approach to reduce cybersecurity risks is to develop corporate risk management capabilities in both public and private institutions.

Any cybersecurity program must take a multifaceted approach to information security. In addition to setting standards and building the capacity of government agencies, adequate policies and regulation should be devised to promote a safe and trusted environment for electronic transactions.

Consumer Protection

Many countries are in the process of crafting guidelines for protecting consumers who participate in online transactions. At a global level, many

countries use the EU consumer protection guidelines as the basis for their own consumer protection legislation.³⁶ The approach to consumer protection varies among countries. In the United States, for example, the government relies on a hands-off approach that focuses on industry self-regulation, while countries of the European Union have adopted laws and regulations that limit the purposes for which companies can use personal data. Data collection in Europe, for example, cannot proceed unless the data subject has unambiguously given his or her consent (with certain exceptions).³⁷ Current variations in laws among countries is prompting policy makers to contemplate harmonizing such standards.

Data Privacy Protection

Creating trust and confidence is not only about protecting consumer privacy, it also extends to protecting the privacy of individuals against unreasonable government intrusions. The online environment poses particular issues with respect to unauthorized use and manipulation of data. Moreover, legitimate public order, security and related government concerns require investiga-

Box 2.13 Ghana Banned from E-commerce: The Cost of Late Reform

An FBI investigation of global credit card internet fraud revealed that over 5 million of online shopping fraud was detected to have generated from Ghana. The report shows that even if credit card usage is not very common in Ghana, the offenders managed to hack into credit cards account in Ghana to conduct online transactions. Ghana is yet to update its legal environment to respond to such fraudulent activities. The lack of laws protecting against cyber fraud simply means that perpetrators of such crimes can still get away. The implications for the lack of reform can be very costly for Ghana. First as a result of the FBI report, Internet shopping was banned for Ghana, credit card holders in Ghana can no longer use their cards to buy online. The implications for the banks can also be onerous as the combination of lack of an adequate regime for compliance with security procedure and for deterrence of cyber fraud threatens to scare away potential business with wider economic implications for the country.

Source: "GISP calls on Ghanaian Govt to help reserve Internet shopping ban Balancing Act." Balancing Act's News Update 247 of 3 March 2005. Available at http://www.balancingact-africa.com/news/back/balancing-act_247.html. Accessed July 2005.

tion and disclosure of such data. In many jurisdictions, privacy protection has been assured as a basic right, with the need or wish of an online user to maintain anonymous communications respected. The legal framework thus needs to strike a delicate balance between protecting privacy and preserving a government’s right to protect the public interest against illegal and criminal use of cyberspace.

Since the mid-1990s, the EU has used a general directive on personal data privacy protection.³⁸ More recently, it adopted special privacy rules applicable to electronic communications.³⁹ As is the case with the EU directive, data privacy protection frameworks often require the establishment of institutional mechanisms to regulate compliance with privacy statutes.

Cyber-crimes

Laws establishing penalties for unauthorized use of data, computers, and networks are often referred to as “cybercrime” laws.⁴⁰ While some aspects of these legal frameworks deal with crime, others deal with tort or civil law issues. Collectively, legal frameworks and laws provide a range of civil and criminal penalties and enforcement procedures. In civil or tort law, penalties are applied in a range of situations, including liability for copyright and trademark infringement, financial loss, compromise of data, violation of network integrity, content violations, and false or misleading advertising. In the criminal area, penalties are levied for such transgressions as unauthorized access to or interference with systems (computers or networks), unauthorized interception of or interference with data, misuse of devices (e.g., unauthorized eavesdropping), fraud, forgery, and conspiracy. On the procedural side, “cyberlaws” generally include provisions for the discovery or production of electronic evidence.

Protection of Intellectual Property Rights

It is axiomatic that the protection of intellectual property rights (IPRs) is part of an enabling legal and regulatory framework.⁴¹ The Working Group on Internet Governance has noted that the Internet poses new possibilities for low-cost, global dissemination of information, but also makes protected property more vulnerable to unauthorized use.

There is no dispute that protection of IPRs can provide incentives for growth and development. What has emerged in the development debate over the last decade is how property rights can be exploited, by whom and for whose benefit.⁴² This debate revolves around whether the protection of IPRs should benefit a few rights holders (primarily from developing countries), or whether a balance can be struck that both provides necessary incentives (i.e., protecting intellectual property) for innovation while at the same time not excluding potential users in less developed countries (i.e., granting access). To some extent, the debate has centered around the use of free and/or Open Source software, which some development specialists see as a tool to promote development while avoiding transfer payments (via software copyright license and royalty payments) to existing rights holders.

Alternative Dispute Resolution⁴³

Competitive markets inevitably produce disputes, and competitive telecommunications markets are no exception. These disputes may involve failures to fulfill contractual obligations, non-compliance with regulatory requirements or a wide range of other issues. Successful dispute resolution is increasingly important to attract investment, spur competition and develop the global ICT sector. Dispute resolution mechanisms, moreover, need to be as speedy as the networks and technologies that they serve.

Disputes in which service providers have enough power in the market to resist liberalization, or even abuse their power, are particularly relevant for regulators, especially when such disputes distort the functioning of competitive markets. Interconnection provides many examples of this type of dispute, such as when a service provider with exclusive control over essential infrastructure facilities fails to reach a reasonable agreement to interconnect with competitors or to provide access to its network facilities.

In the Internet's early years, the ethos behind dispute resolution, including domain name disputes, was based on informal procedures and community consensus. These informal procedures have since evolved into more formal (if still alternative) processes, including the referral of domain dispute resolution and related intellectual property rights issues to the World Intellectual Property Organization (WIPO).⁴⁴ New domain name dispute resolution rules and procedures have also been established by the Internet Corporation for Assigned Names and Numbers (ICANN).⁴⁵ The Internet itself has spawned new technological approaches to resolving disputes, including so-called "online dispute resolution" (ODR), for use in both the online and physical worlds.

Policy makers and regulators should use minimal but well-focused regulatory intervention to create an environment where industry players have incentives to resolve disputes constructively. This framework should also recognize that dispute prevention is as important as dispute resolution. Reducing contentiousness and reliance on destructive dispute processes enhances prospects for investment and growth. Use of consensus-building measures by policy makers and regulators can engage parties in the sector and identify mutually beneficial commercial opportunities.

Ultimately, the test of successful dispute resolution, as of regulation in general, is its impact on investment, growth, and development in the sector. Successful dispute resolution is important for all countries that seek to facilitate the rapid diffusion of new communications infrastructure and ICT services. It is particularly crucial for countries that have historically not experienced high ICT investment and growth, as rapid and effective dispute resolution helps such countries bridge the digital divide.

Conclusion

Given the interdependent nature of the global information society, cross-national common standards are needed to achieve interoperability, both of legal frameworks and physical ICT networks. This chapter focused primarily on the role of governments and the actions they can take to create appropriate policy, legal, and regulatory conditions to advance the e-development agenda. While many of the issues explored in the chapter may appear more relevant to highly developed countries, which rely on highly evolved and sophisticated communications networks, services, and broadband applications to provide economic and social services, contemporary technology makes it possible for developing nations to rapidly deploy sophisticated ICT networks and applications. This chapter therefore attempted to present the full spectrum of policy, legal and regulatory issues that enable ICT-led growth, giving policy makers an idea of the progression of issues that they will eventually address as their ICT networks and capabilities grow.

Footnotes

¹ The authors wish to thank Juan Manuel Galarza Tohen, Zed Safdar, Rachele Gianfranchi and Isabel Neto for their research input.

² See World Summit on the Information Society (WSIS). 2003. “Declaration of Principles” and “Plan of Action.” WSIS, International Telecommunications Union: Geneva, Switzerland.

³ Indeed, the World Bank has acknowledged that “policy reform is hard work.” World Bank. 2004. “Operations Evaluation Department Report 2003.” World Bank: Washington, DC.

⁴ Depending on the context of a given country, the use of competition policy or the exercise of regulatory forbearance in the presence of active market forces may be appropriate to spur competition.

⁵ “Future-proofed” implies an environment that makes it easy to introduce new technologies and services. Laws drafted today, if based solely on today’s technology, may prove inadequate for new technological innovations.

⁶ The WSIS Declaration of Principles and Action Plan deals with an enabling environment at both the national and international level. At the international level, these documents address Internet governance. Although not the focus of this paper, clearly Internet governance will involve both an international and national level. To the extent that such governance deals with national-level concerns (e.g., building consultative mechanisms to ensure management of core Internet resources and developing national capacity to participate in national and international governance mechanisms), this chapter addresses the topic. For a broader discussion of Internet governance, see “Working Papers” prepared by the Working Group on Internet Governance (WGIG) in preparation for the WSIS Summit in 2005, available at <http://www.wgig.org/working-papers.html>. (July 2005).

⁷ ITU. 2002. *World Telecommunications Development Report: Reinventing Telecoms*. Geneva: ITU, p.20.

⁸ See H. Singh and K.W. Jun. 1995. “Some New Evidence on Determinants of Foreign Direct Investment in Developing Countries.” Policy Research Working Paper, No. 1531. World Bank: Washington, DC.

⁹ Global Information and Communication Technologies Department (GICT). 2005. “Financing Information and Communication Infrastructure Needs in the Developing World: Public and Private Roles.” GICT, World Bank: Washington, DC.

¹⁰ Qiang, C. and Guislain P. 2005. “Foreign Direct Investment in Telecommunications.” *World Information and Communication for Development Report 2006*. World Bank: Washington, DC.

¹¹ Different countries have chosen different models, with varying degrees of success. See D. Geradin and M. Kerf. 2003. *Controlling Market Power in Telecommunications: Striking the Right Balance Between Antitrust and Sector-Specific Rules and Institutions*. New York: Oxford University Press.

¹² See, World Bank, ITU. 2005. *Dispute Settlement in Telecommunications: Current Practices and Future Directions*. Washington, DC.

¹³ There is no single definition of broadband. The notion is a moving target and differs from country to country. At a minimum, broadband means a permanent connection and transmission capacity with sufficient bandwidth to permit combined provision of voice, data and video.

¹⁴ OECD. 2003. “Broadband Driving Growth: Policy Responses.” DSTI/CCP92003, Final. OECD: Paris. Also see ITU. 2002. *The Birth of Broadband*.

¹⁵ Examples include member states of the European Union, India, South Africa, Tanzania and Zambia.

¹⁶ Navas-Sabater, J., Dymond, A., and Juntunen, N. 2002. *Telecommunications and Information Services for the Poor: Toward a Strategy for Universal Access*. World Bank: Washington, D.C.

¹⁷ Wayne A. Leighton. 2001. *Broadband Deployment and the Digital Divide, A Primer*. OECD Policy Analysis.

¹⁸ The city of Amsterdam, for example, has taken the responsibility for setting up an independent legal entity, Citynet Amsterdam, that will own the city network. Private partners have been invited to supply the infrastructure equipment and operate the network. Peter Smith and Hien Tu Thiu, Summary of selected Municipal Backbone initiative, a GICT mimeo August 2004.

¹⁹ ITU database. 2005.

²⁰ Laurel Elmer. 2002. “Vietnam’s ICT Enabling Environment: Policy, Infrastructure and Applications.” USAID: Washington, DC.

²¹ In cases like Egypt, Algeria and Tunisia local banks offer soft consumer loans for the purchase of home computers. Algeria had introduced “Ostratic,” a family PC initiative in July 2005. See Abderrafic Khanifsa. 2005. “Ordi-densite.” *IT-mag*. July 2005. Available at “http://www.itmag-dz.com/article.php3?id_article=248&.” Accessed July 2005.

- ²² E-business refers to e-commerce, e-banking, e-insurance and any other economic activity conducted over the Internet.
- ²³ There is a vast growing literature on the development dimension of e-commerce. See, for example, A. Goldstein and D. O'Connor. 2002. "E-commerce for Development: Prospects and Policy Issues." Development Centre Studies, OECD Development Center, OECD: Paris.; and OECD. 1999. *The Economic and Social Impact of Electronic Commerce: Preliminary Findings and Research Agenda*. Paris: OECD.
- ²⁴ Cisco Systems and University of Texas. 2001. "Measuring the Internet Economy." University of Texas, Austin. Available at http://www.smartecon.com/articles/internet_economy.pdf. Accessed July 2005.
- ²⁵ UNCTAD. 2004. *E-Commerce and Development Report 2004*. New York and Geneva: UNCTAD.
- ²⁶ Digital signatures is used to refer to generic electronic, digital means of authenticating the identity of a party to an electronic transaction. While it is recognized that the term "digital signature" is most commonly associated with key public-private infrastructure, it is intended to be technology neutral in this text.
- ²⁷ Directive 1999/93/EC of 13 December 1999 on Electronic Signatures.
- ²⁸ The study also showed that e-commerce laws adopted by a number of countries in the region, based on the UNCITRAL model law of 1996, did not enable cross-border interoperability. (Satola, D., Sreenivasan, R. and Pavlasova, L. 2004. "Benchmarking Regional e-Commerce in Asia and the Pacific and Assessment of Related Regional Activities." in *Harmonization of Legal and Regulatory Systems for E-Commerce in Asia and the Pacific: Current Challenges and Capacity Building Needs*. United Nations: New York.
- ²⁹ Arab Advisor Group. 2005. "An Analysis of e-Commerce Adoption in Jordan and the Gulf Region based on Reported Figures from Visa International." Arab Advisor Group: Amman, Jordan.
- ³⁰ This fact was explicitly recognized in the WSIS Declaration of Principles, which states that, "Strengthening the trust framework, including information security and network security, authentication, privacy and consumer protection, is a prerequisite for the development of the Information Society and for building confidence among users of ICTs." (WSIS. 2003. "Declaration of Principles.")
- ³¹ According to the U.S. Federal Trade Commission, for example, identity theft has ranked as the top consumer fraud complaint for the past five years. The cost of identity theft including its impact on business, is estimated to exceed US\$52 billion. Christopher Caldwell. 2005. "The price of privacy is high." *Financial Times*. April 16/17 p. 7.
- ³² Op.cit
- ³³ Summary Analysis of the ORDIG Survey on Internet Governance Priorities in Asia-Pacific Available at <http://igov.apdip.net/ORDIG.Survey.Report.pdf>. Accessed July 2005.
- ³⁴ See M. Dunn and I. Wigert. 2004. *International CIIP Handbook 2004: An Inventory and Analysis of Protection Policies in Fourteen Countries*. edited by Andreas Wenger and Jan Metzger. Swiss Federal Institute of Technology, Zurich.
- ³⁵ T. Glaessner, T. Kellerman, and V. McNevin. 2004. "Electronic Safety and Soundness: Securing Finance in a New Age." World Bank Working Paper, no. 26. The World Bank: Washington, DC.
- ³⁶ See OECD. 1980. "Guidelines on the Protection of Privacy and Transborder Flows of Personal Data (Privacy Guidelines)." OECD: Paris.; and OECD. 2003. "Privacy Online: Policy and Practical Guidance." OECD: Paris.
- ³⁷ See "Working Papers" prepared by the Working Group on Internet Governance (WGIG) in preparation for the WSIS Summit in 2005, <http://www.wgig.org/working-papers.html>; and Dispute Resolution in the Telecommunications Sector: Current Practices and Future Directions; A Joint Study Undertaken with the International Telecommunication Union, *infra* note 12.
- ³⁸ EU. 1995. "Directive 1995/46/EC of 24 October 1995 on Personal Data Privacy Protection." *Official Journal of the European Communities*. Brussels.
- ³⁹ EU. 2002. "Directive 2002/58/EC of 12 July 2002 on Privacy and Electronic Communications." *Official Journal of the European Communities*. Brussels.
- ⁴⁰ See, for example, G. Sadowsky et al. 2004. *Information Technology Security Handbook*. Washington, DC: infoDev, World Bank and Global Internet Policy Initiative.; and Dunn and Wigert. 2004. *International CIIP Handbook*.
- ⁴¹ IPR law distinguishes between three types of intellectual property: trademark, copyright and patent.
- ⁴² See "Working Papers" prepared by the Working Group on Internet Governance (WGIG) in preparation for the WSIS Summit in 2005, <http://www.wgig.org/working-papers.html>. Accessed July 2005.
- ⁴³ This section is adapted from Dispute Resolution in the Telecommunications Sector, *infra* note 12.
- ⁴⁴ See, for example, the alternative dispute resolution procedures of the WIPO Arbitration and Mediation Center, Geneva Switzerland, n.d., <http://arbitrator.wipo.int/center/index.html>. Accessed July 2005.
- ⁴⁵ See ICANN. 2005. "Domain Name Dispute Resolution Policies." ICANN: Marian Del Rey, California. Available at <http://www.icann.org/udrp#udrp>. Accessed July 2005.