

## Summary and Conclusions

(with Donald Abelson)

Here we offer a preliminary blueprint for future ICT governance policies. Specific suggestions show how to begin the process of reformulating domestic and international governance to meet the challenges presented at the inflection point. Most of our proposals begin with a test of political economic feasibility in the United States, because for the foreseeable future America will continue to have the most influence on global arrangements. We also employ our theory of how global governance changes to connect shifts in US policy to global policy decisions.

We address several important questions, including these:

- Which policy choices should shape ICT's governance at the inflection point?
- How will changes to the environment and future political economic struggles over ICT influence governance rules?
- How can governance rules benefit from the technological opportunities that they seek to advance?
- What kinds of principles might enhance market transactions in a modular supply environment with blurred jurisdictional geography?

The technological potential for innovation through 2025 is enormous. Broadband networks can deliver services (including such advanced services as ad networks) built with modular architectures that allow networked data applications to break out of their traditional geographic areas and standard business models. These modular, ubiquitous networks and services facilitate innovation at the low end (cheap mash-up experiments) and at the high end (giant research networks working at unprecedented scales). How can politics and markets unlock this potential? Overall, we argue that using the metaphor of "trading rights" (as defined on p. 16) is the right direction for governance because it emphasizes the principle of modularity; this principle will best enable governments to enhance consumer welfare and

foster innovation.<sup>1</sup> A system based on trading rights will perform more efficiently as it supplants poorly specified property rights and inefficient market exchange mechanisms.<sup>2</sup>

Although major governance shifts typically begin in the largest domestic markets, the governance challenge is global because the reach of modular networks is ubiquitous. Thus, national borders and market segments blur, and it becomes impractical to regulate solely on a national basis. For example, websites that offer multi-media audio-visual content cannot be regulated as if they were traditional broadcast or cable television networks. Although physical assets (such as cell phone towers and fiber-optic cables) remain geographically fixed, the services they deliver are combined and recombined in ways that defy geography.<sup>3</sup> National policy choices thus have an inevitable international component.

These policy choices will be grounded in the political economy analysis that we explored in chapter 5. This analysis can be summarized in five political guidelines for designing new policies. First, the fragmented goals of the hardware and software industries for networked ICT policies makes broad policy initiatives difficult. The narrower agenda of large corporate users for network issues further reinforces the shrinking of options for future policy initiatives. At the inflection point pressure increases on all pricing structures, further undermining old political economy bargains concerning cross-subsidies in prices for services. Second, changing politics and technological opportunities mean that winning policies will rely on interventions that attempt pinpoint accuracy. Narrower interventions can identify common denominators that do not broadly shift advantages among different classes of stakeholders. Third, the “sweet spot” for bipartisan policy in the United States favors approaches that facilitate open entry for networks, suppliers, and applications. The preference is to ease the way towards interoperability (modularity). An additional preference is to enhance property rights and make it easier to exchange those rights (by building on such precedents as spectrum auctions). The domestic political economy in other countries’ markets may work against this approach, but international bargaining will focus on finding a common denominator about elements of the open entry agenda. Fourth, there is potential political support for entrepreneurs who facilitate new avenues of innovation (e.g., co-ownership of Grids) or new classes of networked services (such as research tools that advance wireless sensor networks). Fifth, the growing sophistication of networked ICT services creates a new set of issues involving privacy, content rights, and control of data that are ripe for policy entrepreneurship. Modularity in services means that entrepreneurial politi-

cal leaders can benefit from making broadcast and content policies more flexible and attuned to the full possibilities of digital markets.

In light of these political economic guidelines, we propose four basic principles (and compare them to three alternative ones). These principles are high-level theories about cause and effect that organize problem solving through governance. Next, we highlight ten norms that implement the principles and advance “trading rights” as an approach to problem solving through specific policies and delegations of authority. Although the norms cover a variety of specific challenges concerning the inflection point, they share some underlying concerns that are specified here.<sup>4</sup>

- How can new approaches to delegating governance authority make decision making more flexible, specialized, and timely while also meeting political demands for accountability?
- How can past policy approaches be modified to advance modularity in the supply chain? For example, how can lessons learned from earlier efforts to foster the Internet be applied today?
- At the inflection point, is there an optimal way to encourage the emergence of competitive, ubiquitous broadband networks that respond to market demand? Furthermore, how should network build-out challenges and net-neutrality issues be resolved?
- How should regulations be adapted to new services that break the traditional categories and geographic boundaries for markets, especially on digital content and broadcast?
- How should property rights and market mechanisms be reorganized to account for inputs from networked applications, especially those involved in the Personal Network Platform (PNP)? (PNPs will thrive only if issues underlying data-management issues such as digital rights management, personal information, and data ownership are addressed.)

## Principles for Governance at the Inflection Point

### Four Guiding Principles

As with all good platforms, ours has a central guiding principle. Principle 1 is “*Enable profitable transactions among modular ICT building blocks using a flexible mix of public, private, and non-profit agents.*” This should be done without regard to geographic boundaries or technologies (e.g., broadcast, data, and voice). This broad principle suggests three complementary principles.

Principle 2 is “*Governance should facilitate the interconnection of modular capabilities at every stage in the supply and distribution chain.*” (Recall that we

follow Farrell and Weiser in defining modularity as a means of organizing complements—products that work with one another—to interoperate through public, nondiscriminatory, well-understood interfaces.) Governance should accelerate ubiquitous broadband deployment, which should itself feature modularity.

Featuring modularity as the central component of the future ICT infrastructure is both a narrower and a more generally applicable approach than that used since the 1980s. It is a narrower approach because it does not lock policy into supporting any particular network architecture. This will matter in the future as the Internet continues to evolve.<sup>5</sup> But modularity also is a more generally applicable approach because it allows any number of architectures while reducing risks to innovation and consumer welfare. The point is not to explicitly or presumptively oppose vertical or horizontal integration or tiering, but rather to look especially closely at developments that promote or inhibit the growth of modular alternatives. For example, online advertising networks are increasingly part of the networked applications and should be examined in light of modularity. Do individual ad networks permit customers to mix and match their ad services with a variety of services from other providers? If they do not, this would hinder modularity and deserve careful scrutiny. Promoting modularity also highlights the importance of public investments in building research tools and network protocols for advanced networked ICT applications.

Principle 3 is *“Governance should facilitate ‘mix-and-match’ efficiencies at every stage in the supply chain by reducing transaction costs.”* New applications will mix and match ICT capabilities. Their variety should elicit a range of specialized governance structures. The current regulatory environment resembles periods of great financial innovation when a variety of stock and commodity exchanges, each with somewhat different disclosure and trading rules, emerged. All of these exchanges were ultimately accountable to government, but the variety in exchanges was crucial to maximizing transactional efficiencies. In addition, these exchanges only were possible because governance had evolved useful frameworks for specifying property rights. Similarly, spectrum management and digital rights management both could benefit from changes in the way that government regulators treat property rights and transactional markets. The application of this principle should also apply to new areas not traditionally treated as part of the network, including ad networks and personal data.

Principle 4 is *“Major market leaders should reform their domestic governance to set the stage for reorganizing global governance.”* A clear message is that international diplomacy should follow domestic market reform. In the first

two eras, new domestic market-governance structures in the United States were mirrored by energetic US diplomatic initiatives. Conversely, Washington demonstrated its seriousness in these new initiatives by making powerful changes in US governance regimes. The diplomacy was reinforced by the impact of changes in the US market on the self-interests of stakeholders in other major markets. Today the US is still the most important market for setting the direction of global governance, but domestic inertia could squander this pivotal position. In contrast, the European Union crafts reforms inside Europe in light of goals for regional and global governance. By advancing the goal of a single integrated European market, it also gains experience in crafting governance rules while it enhances its global bargaining position. India, Japan, Korea, China, and Brazil will influence decisions considerably, but they do not yet combine the market muscle and policy leadership globally to lead major transformations.

Politics make any transition in global governance quirky. No country will easily abandon its domestic constituents or blithely cede special market advantages. Which country leads, and how, always matters for global outcomes, because international negotiations are based on the strength of the participants' starting positions and the forcefulness of their commitment to succeed. For example, there will be tremendous political ramifications stemming from the significant changes in the intellectual property rights of content industries that are inevitable as modularity makes possible the personalization of content. As with trademark policy at ICANN, US leadership of future discussions probably will lead to more protection of the intellectual property rights of content holders than other countries might prefer. Conversely, if Washington allows governance at the inflection point to drift, the changes will be less supportive of content property owners. Similarly, Washington's leadership also will weaken industrial policies globally because the US has a long bipartisan history of rejecting government interference in its private-sector industrial base.

### **Three Paths Not Taken**

Expert opinion is divided about the best principles for guiding networked ICT. Although we believe that our principles and norms are politically feasible and offer the best potential for continued innovation and economic growth, it is easier to understand the tradeoffs embodied in these principles by comparing them to some major alternatives. (We understand that a brief characterization of these alternatives invites caricature, and we acknowledge that our critiques of three possible alternatives do not give them their full due.)

Alternative 1 would be to anchor governance around the promotion of the “commons.” This would strongly swing policy to narrow property rights, and it would limit networked ICT built around exclusive property rights. Well-known examples of this approach include the promotion of unlicensed wireless spectrum “common” for wireless networks and government procurement policies that tilt toward “open-source” software in the ICT applications. To some extent, the advocates of more expansive forms of net neutrality also fall into in this camp, because they view the Internet as an architecture for the commons. We believe that the inflection point will expand innovation from unconventional models of supply and distribution. Critics of property rights make powerful cases that the precise balance in property rights in several areas, including content, deserves scrutiny. Nonetheless, we have two reservations about this governance principle. First, distinctions based on proprietary versus non-proprietary modes of production are of secondary import.<sup>6</sup> What is important is how to reinforce the modularity of networked ICT so that capabilities can be mixed and matched, not whether inputs are open-source or proprietary. Second, as explained in chapter 5, we doubt that the US political economy will ever support a sweeping victory for advocates of the commons.

Alternative 2 would embrace the most vigorous critiques of conservative analysts of managed market entry. This would lead to a narrow definition and role for competition policy. It is built on strong presumptions that it is difficult to show harm to consumers but quite easy to demonstrate the costs of government intervention. Decontrolling prices, removing supply-side impediments to new infrastructure (strengthening rights of way for fiber or releasing more spectrum), and strengthening of property rights would substitute for current government policies. These free market critiques have some merit. Many forms of government management of the market produce undesirable consequences, such as burdensome controls on pricing. The inflection point also raises doubt about the kinds of vertical leveraging that previously provoked concern that they could cause grave damage. Moreover, the implicit goal of many countries, to foster managed competition among a few licensees and technologies, is no longer an acceptable compromise at home and therefore is less likely to be sustained. Yet the conservative critique does not resolve three problems. First, powerful market players may not “play nicely” and actually may “do harm” even though economic models suggest that this is a suboptimal strategy.<sup>7</sup> The fluidity at the inflection point invites strategic gamesmanship because although modularity has grown, it has not perfectly arrived. This is true in important aspects of the network, including deployment of infrastruc-

ture (broadband) and some new areas created by “Web 2.0.” Second, governments can constructively address problems where self-interests are misunderstood, transaction costs are high, and societal welfare impacts are at stake. These problems, by their nature, extend beyond the immediate costs and benefits of individual market participants. Moreover, these problems are likely to have global dimensions. Third, governments intervene because the political and economic stakes of networked infrastructures are visible and important to their citizens. These interventions create conditions that require continuing government attention, as will arise in resolving the legacy of national broadcast policies for multi-media audio-visual content delivered over the Internet. Reforms will not perfectly recast government rules. There will be messy compromises.

Alternative 3 might be described as “Continental engineering.” The Continental European legal and administrative tradition placed a premium on a consistent rationale and code for administrative domains. The European Commission still is engaged in a daunting effort to find an intellectually consistent and integrated framework of rules and programs for the information and communications sector.<sup>8</sup> The goal is to balance more competition with broader social values and to achieve effective interoperability, increased competition, more entrepreneurship, accelerated technological progress, and protection of common European values. Commitments to “openness, interoperability and end to end architectures” with an emphasis on “neutrality” on information access create rationales for governments to mandate technical standards, intervene to make complex applications fit into consistent classification schemes, and invest in shared resources, such as a European Digital Library that will balance market choices on information searching.<sup>9</sup> This principle is smart, explicitly addresses tradeoffs for society, and carefully draws connections between domestic and global governance choices. It underscores the need for private and non-profit arrangements for governance to have international accountability. Our recommendations partly converge with the “Continental” principle, but we worry that overarching schemes are likely to stumble over the messiness of a transition that makes even new regulatory boxes difficult to fit. Its political economy can easily swerve toward negotiated common schemes for managing complex market schemes to achieve European values, including a tacit industrial policy. Its effort to guard against market power may discourage experimentation.

Less consistency in governance has its virtues. The potential for innovations in business and technology models make chaotic and decentralized governance mechanisms valuable because they can uncover efficiencies

rather than impose them. One prominent success in governance in the 1990s was the decision to largely abstain from detailed governance rules for the new turbulent space of the Web and its commercial frontiers while promoting a series of targeted national and global responses to specific problems (e.g., assignment of domain names, treatment of trademarks, and cybercrime).

### Ten Norms Needed to Implement the Principles

We now can suggest ten norms needed to implement the principles that were just explained. Norms are not detailed blueprints, but they test the appropriateness of policies. We propose ten norms that should be embraced at the inflection point, and we illustrate these norms with examples of policies and delegated authority at the national, regional, and international levels. This is not a comprehensive package, because not all of the policy ideas will emerge as the best choices. It is a starting point.

#### Norm 1: Institutional Design

Norm 1 is *“When delegating authority globally, emphasize flexible, sometimes experimental, choices of agents, including mixed authority structures.”* This norm addresses the challenges of institutional design that accompany all policy guidelines. At the same time, we recognize that any arrangements at the global level to delegate authority must be accompanied by mechanisms for global accountability.

Chapters 7–9 showed that global delegations of authority for ICT shifted substantially since the 1950s. Sometimes authority was split between the International Telecommunication Union and the World Trade Organization. At other times new decision-making prototypes were developed (e.g., ICANN and the rise of alternative forums for setting standards). These shifts adjusted a system rooted in support of monopoly and national control to a more global and dynamic market. What is next?

No decisive trend toward any single mix of authority is evident. Most decisions with binding consequences for international trade and global security will require a larger direct government role. Often the choice will be between informal trans-governmental arrangements operating among national bureaucracies and formal international organizations. The choice of appropriate venue is critical because each organization has its own logic of decision making that shapes outcomes.

If the Internet did not curtail the authority of national governments, it did chart new ways to exercise shared authority. There are significant

opportunities for innovations in delegated authority because networked ICT (e.g., websites and email lists) allows for more flexible, and yet readily monitored, decision-making networks that mix private and public authority in new ways. Processes can be quicker and more expert.

There is considerable potential in two venues. The WTO bargaining process has produced greater harmonization of regulatory codes for markets than anyone imagined was possible in 1980. In addition, parallel synchronization of national rules through specialized global forums or exclusionary regional groups also has proven useful.

Four guidelines for implementing norm 1 follow: (1) Rely on private and non-profit leadership whenever possible, because inter-governmental forums typically are less flexible and slower.<sup>10</sup> In addition, embrace non-discriminatory membership rules for non-governmental organizations that set influential rules for markets. There may be qualifications for membership in private/non-governmental authority structures such as standards setting, but these restrictions should be tied to expertise and funding of reasonable expenses. For example, expensive fees for documents (such as the old ITU standards system required) would be suspect under this guideline. Similarly, transparent decision making and public comment are essential, even to the extent of mandating Web posting to ensure transparency. (2) Emphasize mixed government and non-governmental fact finding to build credible information for policy coordination in both the public and non-profit sectors. As we explained in chapter 6, a principal task of global governance is to improve the credibility of information in order to make coordination easier in a world of decentralized public authority. (3) Promote limited harmonization of national rules. Specifically, introduce flexibility in governance mechanisms while encouraging global coordination by agreeing on minimum international practices (so-called core essential requirements) that will be honored by all national or regional schemes. These techniques were honed through much experience in global financial markets (e.g., the Basel accords for banking) and EU market integration. They allow experimentation while benefiting from global coordination on the elements that ensure a maximum amount of unrestricted competition and market openness. The WTO telecommunications agreement, particularly the “pro-competitive regulatory principles,” shows considerable promise as a precedent for other ICT exercises. (4) Use accountability mechanisms to blend national initiatives with global infrastructure needs. The US created a global collective resource, the Internet name and numbering system, and tried to cement certain national preferences (greater openness, competition, and accountability) through its contract with ICANN.<sup>11</sup>

When an individual government creates a collective global resource, it should make strong efforts to consult and collaborate with other governments on these governance mechanisms. Governments should not escape their WTO commitments and other international obligations regarding authority delegated to non-governmental organizations, such as ICAAN.

In short, innovations in governance are necessary. We endorse a more flexible mix of agents while maintaining public accountability. Some purely private innovations may be needed, as in the case of digital rights management, but governments still will have to consent to their frameworks. Other innovations may require a mixture of public and private authority, as in the case of spectrum management.

### **Norms 2 and 3: Enabling the Modular Supply Chain**

In chapter 5 we argued that a revolution in the supply chain was critical to the emergence of the inflection point. Norms 2 and 3 reinforce the supply chain's competitiveness and potential for accelerating modularity. Norm 2 reinforces existing policies, and norm 3 relates to trends in competition policy in some countries.

Norm 2 is "*Invest heavily in the creation of virtual common capabilities for the Internet, and its successors, in a competitively neutral manner.*" (Common capabilities include security and numbering.) The Internet helped to transform online services, programs, and rules. Similarly, implementing norm 2 will grow out of existing R&D undertakings. Internet 2, a global innovation consortium anchored in the United States, is pioneering application tools for networked ICT. But ensuring competitive neutrality also requires adherence to rules aimed at preventing the creation of unnecessary trade barriers, such as requirements to rely on "least burdensome" regulations when commercializing new application tools. The temptation always exists for governments to seize on the tools of research as an excuse for industrial policy.

The modular networked ICT requires further specialized innovations on a global scale. The growth of peer-to-peer "numbering" schemes for VoIP (the Electronic Number Mapping System, or ENUM) that can bypass public network databases and allow universal flexible connectivity across all user terminals is a new Internet resource.<sup>12</sup> The creation of improved common capabilities for security and coordination of the "wireless sensor grid" may lead to similar protocols.<sup>13</sup> Large markets prompt sufficient interest to make funding these innovation projects feasible. The challenge is to move the effort far enough upstream away from commercial applications to make certain that innovations in application tools are not closely tied to the

narrow interests of any single company. Still, make no mistake; new capabilities affect larger balances in the same way that the Internet changed the organization of telecom markets and regulations.

New coordinating agents capable of balancing commercial interests and maintaining a pro-competitive environment often are necessary to advance new capabilities. ICANN is one such new agent, as it handles some Internet resources outside traditional international organizations. Other functional tasks may stimulate additional institutional innovation, such as proposals to reorganize coordination of the Internet's root zone management system to make it more secure and robust.<sup>14</sup> Whatever the faults of Internet governance, emphasizing non-governmental leadership helped achieve common capabilities built on principles that are more competitively neutral than if left in traditional governmental processes.

Norm 3 is "*Partially refocus competition policy to reinforce the increasing competitiveness of the supply chain.*" Two policies are as relevant today as in the past. First, reaffirm the right to attach terminal equipment and terminal software freely to all networks (fixed, mobile, nomadic, and hybrid) as long as it does not harm the network. Second, strongly question the desirability of government mandated technology standards. Several international agreements already discourage mandatory technical regulations and encourage the use of private, voluntary, market-based technical standards, but this idea needs constant reinforcement.<sup>15</sup> In addition, if modularity is increasing, then presumptions about competitive risks should change. The inappropriate application of past policies could hinder progress.

The United States' technological competitors recognized that the resurgence of the US in the 1990s derived in part from the rise of companies with powerful ICT platforms. These platforms featured strong patents, interfaces that were proprietary, and strategies to nurture supply and user communities built around the platform. Like many of their American counterparts, competing non-American companies complained of anti-competitive behavior in ICT markets.<sup>16</sup> In response, many countries repeatedly are scrutinizing US "platform cones" in ways similar to American antitrust policy in the 1990s.<sup>17</sup> In addition, some countries use domestic government procurement policies to bolster "open-source" solutions that will reduce the influence of proprietary platforms.

We support strong competition policies, but they should be retooled because the inflection point reduces the likelihood that platform firms can exercise market power that harms consumers.<sup>18</sup> Indeed, competition policy attacking platforms may unwittingly reduce innovation possibilities. For example, concern should be directed more at dangers that a competitor

will block “plug and play” add-ons and their substitutes than on the dangers of bundling. Moreover, favoring open-source in procurement may be reminiscent of other preferential purchasing policies, such as those favoring small business. These policies have mixed records.

Indeed, the worries about bundling on proprietary platforms may blind officials to the risks created by gigantic system solutions or new forms of “platforms.” One implication of norm 3 pertains to public funding for many ICT projects, such as smart transportation infrastructures, which in effect can become “new platforms” tied to new forms of data and related information services. By defining the risks associated with these new platforms in the context of “offline” markets (for example, “transportation services” in the case of smart roads) or by ignoring central elements of business activities that limit modularity, governments may miss the ability to enhance modularity in a way that creates consumer welfare. Put differently, these projects boast high payoffs but also raise significant competition risks. To begin, there is the familiar and substantial challenge of inducing competitive behavior by suppliers of large government projects. In addition, there is a risk of a high degree of infrastructure lock-in. The original suppliers of major hardware and component systems in the project are hard to replace because of their deep knowledge of the application. They also have the opportunity for vendors to price at marginal cost (zero) for new services that evolve from the original “platform investment.” The prospect for anti-competitive lock-in of solution applications increases when the speed of turnover in expensive hardware and software systems lags behind that for typical consumer and enterprise equipment. It becomes even more acute when many stakeholders have to approve new applications (as is common for public-sector applications). It will be a challenge to keep these complex, large-scale, public system applications in the flow of innovative processes and competitive opportunities. The task is harder because significant stakeholders may profit from slower innovation and stronger lock-in.

Competition authorities now consult internationally, but formal harmonization of major rules on platforms seems unlikely. Differences in philosophy and the huge commercial stakes work against agreement. Disagreements exist within countries (many aggrieved parties filing in EU cases are American) and between countries. Leadership by positive example and by veto will be important. If the US disagrees with the policy strategy on competition elsewhere, it should articulate and enforce a clearer alternative at home. If US competition policy choices generally are viewed internationally as right and appropriate, the US choices should tee up reas-

assessments elsewhere. In the meantime, it will be essential to use “negative agenda control,” politely saying No to any efforts to codify international principles on these competition questions for the time being.

#### **Norms 4 and 5: Norms to Strengthen the Network Infrastructure**

The build-out and deployment of the ICT infrastructure, especially ubiquitous competitive broadband, is critical. Norms 4 and 5 lay out, in considerable detail, a policy approach to achieving these capabilities as efficiently and rapidly as possible.

Norm 4 is “*Spur the build-out of ubiquitous, competitive broadband networks by using a light regulatory touch regarding pricing, investment, and assets crucial to providing ICT networks and services.*” This norm supports new business models, financial engineering, and technological opportunities. The inflection point permits new ways to create value and to finance it. Government policies should be conducive to these types of innovative arrangements. Indeed, once created, competitive infrastructures will reduce even further the need for heavy-handed government regulation. Infrastructures organized around new business plans also would encourage innovative deal making between companies, thereby further supporting and encouraging the growth of novel ICT applications. What can be done?

First, some existing pricing and investment measures should become more prevalent. Greater freedom for telecommunications pricing, to take advantage of the economics of multi-sided platforms, is desirable. Although politically tricky, allowing flexibility improves price signals for efficient investment and consumption. Greater pricing freedom would also remove perverse incentives that cause major suppliers to restrict competition because they cannot price flexibly to earn profits efficiently. But pricing is inextricably tied to legacies of domestic political bargains and cannot be unwound quickly or by international compact. Although more freedom for pricing does not negate the responsibility of governments concerning competition policy, including their WTO obligations, the primary international needs are for better information sharing and for global consensus on the best regulatory practices. This consensus could be reached at the International Telecommunication Union (if it were to restore its credibility with major government, industry, and civil society interests) or at the Organization for Economic Cooperation and Development, Asia-Pacific Economic Community, or other international consultative organizations focusing on economic policy.

Second, restrictions on ownership and trading of investment assets (except for legitimate competition and security concerns) and on providing

services across borders make little sense in the highly mobile world of communications. The World Trade Organization already is a venue of action for removing foreign ownership and cross-border restrictions. An expansion of WTO commitments permitting all types of cross-border services and foreign ownership of all aspects of communications networks would introduce stronger property rights and more liquid global markets.<sup>19</sup> There are two big questions here: Can rights of foreign investors be enforced when countries seem willing to invoke vague security rationales to protect domestic investors?<sup>20</sup> Can investment rights be generalized from telecom assets to broadcast assets, for which most countries have taken limited commitments under the WTO?

Release of more radio spectrum for flexible uses on a technology-neutral basis also would promote modularity.<sup>21</sup> The deployment of RFIDs and other sensors may lead to novel network infrastructures requiring considerable spectrum flexibility.

In general, it is desirable to use auctions to assign spectrum when there is scarcity. Conversely, when spectrum is abundant it also is desirable to provide unlicensed uses of spectrum.<sup>22</sup> The holder of the spectrum should have more complete property rights, such as the right to lease or resell licensed spectrum, as long as there is continued adherence to terms and conditions of the original license.<sup>23</sup> This right would provide more liquidity for network assets and more flexible responses to demand.

The spectrum-management regime of today is ill suited for the realities of tomorrow's modular environment: National governments manage spectrum within the confines of their geographical borders, and most spectrum-management regimes are only fitfully evolving away from old-style command-and-control policies. The World Radio Conference, a global exercise in spectrum coordination, is organized on the basis of national representation. It is a spectacle that mixes naked politics and engineering objectives while teetering between absurdity and inspired kludges. As the European Union experiments with regionalization of spectrum management suggest, entirely new mechanisms for cross-national spectrum deployment could emerge. Cross-national, regional band managers might evolve, as was discussed in chapter 5. If so, this could foster a more market-oriented form of management that would enhance consumer welfare. This might substitute private contract negotiation and dispute resolution among the participants in the band-management plan for many traditional regulatory processes. It is worth speculating: How would the world spectrum talks evolve if largely left in the hands of these international band managers?

In the case of band managers, credible domestic or regional experiments in the European Union and elsewhere would have to precede action on a broader international stage. In view of its unique “confederal” structure for economic policy, the EU might be the pioneer in forging such precedents. The United States could adopt a formal approach with Canada and Mexico to allocate and assign selected spectrum on a regional basis. This would be particularly valuable within 100 miles of the borders, as these North American economies and populations are increasingly integrated and could benefit from more flexible spectrum rules to enable the greatest possible use of new modular networks and services. These regional experiments could provide detailed information sharing and fact finding that could be used to establish principles and procedures that might be embraced at the international level. For example, these regional groups might develop general principles for good spectrum management that could later be used to augment WTO market access commitments for spectrum-related networks and services. Although current WTO commitments are ambiguous, future WTO commitments on good spectrum-management practices could lend credibility to market reforms. Global and regional economic groupings also might foster domestic institutional innovations.<sup>24</sup>

More creative options exist. One idea is the experiment with business models featuring “shared user systems” that build on modularity. The advocates of spectrum commons have envisioned these possibilities. The earliest (circa 2001) model of shared investment in the consumer market was the growth of WiFi, which allowed users to invest in equipment to share a broadband connection over an extended space (the home residence) or user base (Starbucks).<sup>25</sup>

The success of WiFi suggested the possibility of expanded user co-investments in networking. Examples were efforts to “daisy chain” WiFi connectivity for a neighborhood and efforts to develop a business model for urban WiFi coverage. So far these have met with limited success. Charging for WiFi access has attracted few customers (perhaps because of rival 3G services). Entities that provide free service have yet to find alternate revenue sources.<sup>26</sup>

Other models loom for shared user financing. For example, Google or Microsoft might finance municipal WiFi networks to win “eyeballs” for their ad services. The idea would be to substitute an intermediary user, the Web service, for household consumers in the co-financing model. In a similar spirit, there are proposals for “underlay” networks that allow smart radio terminals to use idle spectrum within spectrum bands designated for other purposes. The Frontline proposal described in chapter 5 adapted this

model by advocating shared use networks between public service and private users.

Another possibility is emerging for fiber networks; high bandwidth may be a sufficiently distinctive benefit to entice co-investment by upper end small and medium-size users and by still-underserved larger users. Advocates envision metropolitan governments providing limited incentives such as favorable zoning rules for fiber co-location facilities and aggressive policies to make municipal ducts and rights of way conveniently and inexpensively open for fiber deployment. "Power households" and institutional users such as schools and medium-size businesses then purchase one or more dark fiber pairs on a cable that terminates into a local co-location center. The users are responsible for the electronics on their own strand. (The cost of coarse wavelength division multiplexing electronics for less "dense" utilization of fiber capacity has plummeted.) The users can negotiate aggressively as a "club" or individually with regional and national carriers for backbone connectivity from the co-location center. The users obtain a 100 megabits per second to 1 gigabit per second pipe that enables essentially free video, Internet, phone, and data services. Early experiments in Canada suggest that the investment should pay for itself in 2–3 years.

Other commercial providers, such as electric utilities (which could add energy-management services to buildings on the pipe) or information services or content providers might co-finance such schemes to bundle their services. In addition, if necessary, local or national governments could offer tax incentives for builders and operators of co-location facilities meeting certain functional requirements tied to enhancing ubiquitous broadband and co-ownership of the "last mile" with end users.<sup>27</sup> Although these experiments may be less salient to the United States, where the fiber network boom of the 1990s and the efforts by cable companies to rival the Bells have created substantial local fiber, many countries lack a local fiber infrastructure, especially one that is competitively supplied. Modularity tied to new business models is one possible remedy.

New business models also pertain to high-end ultra-broadband development. For example, a research consortium, an industry association, or some other global community could jointly finance Grids. Carlos Casaus, head of Internet 2 in Mexico, notes that an association could set caps on the total use by any individual user of a shared Grid, perhaps on a dynamic time-of-day or traffic-flow basis.<sup>28</sup> The individual user co-financing the Grid would be no worse off (if it draws on its financed share of the total capacity), and almost always better off (by freely tapping idle capacity).<sup>29</sup> This

kind of Grid can operate as a form of peer-to-peer network within the larger Internet complex.

Two items relevant to global governance might arise from the ferment around new business models. First, detailed information sharing in the major international forums that address ICT policy will be needed. This began around 2000, but it was lost in the debate over the merits of the “commons,” a subset of a larger range of innovative possibilities. Information sharing is extremely valuable at these windows of opportunity. Second, and more surprisingly, new business models upset existing stakeholders. Policy can make innovation easier by clarifying the rights to invest and take risks with novel business plans. In this case, the major innovation is “shared use” of a network. Instead of renting the network, users co-invest in it.

Although the details are arcane, most major markets have WTO commitments that cover both shared use networks (for communications within the group of users, such as in the Grid) and the right to deploy competitive infrastructure networks. These commitments open the way to ensuring the right of foreign investors and cross-border service suppliers to create these networks and to removing local regulations that would prevent them from doing so. The WTO commitments for this innovation can be clarified to provide even greater assurance.

The other implication of modularity and financial innovation pertains to the perennial struggles tied to funding “universal service.” It is difficult to make such schemes economically efficient; many of them cross-subsidize rural or other groups of middle-class users. These measures are not targeted to serve the poor. In general, politicians prefer price manipulation of services to make them “affordable” rather than providing outright subsidies for purchasing services. Cross-subsidies among rate payers to lower prices do not appear in the public budget.

At the inflection point, the cost of networking is lower because there are more options for developing networks. The expanded ICT applications now emerging outside urban business and service centers also increase the returns from expanding broadband in rural areas. Therefore, building out networks to serve the incremental, low-income or low-volume rural market grows more attractive.

The International Telecommunication Union is the proper institution for setting a positive goal for making consumer broadband at a specified target speed available, even in poor regions. The terminal revolution should make this goal feasible. For example, Vocera Communications, a provider of hands-free wireless platform in a networked building or campus, promotes

a \$5 IP walkie-talkie for low-end users. Handling broadband at low price is on the horizon.

Regulators could help lower the networking costs by, for example, releasing more spectrum. They also could put universal service funds up for bid, using competitive bidding by service providers for the subsidy to target specified populations. The more users served by the bid, the more likely it is to win. (Chile's pioneering work in this respect now is spreading to other countries.) Creative dual-use network solutions for public-service infrastructures can range from emergency and public safety services in wealthy countries to highway and rail authorities in rural regions of poor countries. ("Smart" transport infrastructures can deliver far more capacity per kilometer of infrastructure, thereby justifying co-investment in data networks in rural areas.)

Norm 5 is "*Narrow and reset network competition policy.*" The inflection point lowers the risk of anti-competitive leverage, promotes active innovation, and unleashes strong downward pressures on prices. Unless government policies reinforce them explicitly or implicitly, distortions in the ICT supply chain are less sustainable than in the past. Thus, competition policy should focus on the most stubborn telecom and IT competition problems.<sup>30</sup>

Risks of anti-competitive conduct or inefficient governance of transactions also remain for market entry and interconnection. The vogue in academic literature and in reform proposals coming from countries with parliamentary governments (such as the EU) is for "light touch" regulation that emphasizes swift "ex post" responses to competition problems as they arise and makes only minimal use of ex ante regulation.<sup>31</sup> However, in the United States and in other countries with divided political authorities, regulatory agencies rarely have enough authority to rely solely on ex post judgments. In such countries, the mix will have to be different. The substance of the policy is clarified by exploring three "corollaries" to the fifth norm.<sup>32</sup>

A first corollary on interconnection might include an obligation to require that all networks accept all traffic from other networks.<sup>33</sup> Corollary 5.1 is "*Leave interconnection to the marketplace when there is no individual or collective dominant network supplier.*" Ex post enforcement should be used to deal with any ad hoc problems. Regulators could concentrate on whether interconnection is denied formally or informally by making extreme demands that effectively preclude interconnection. Countries with commitments to the WTO's pro-competitive regulatory principles on basic telecom services already impose an obligation to ensure interconnection

by carriers with market power. Negotiation could determine whether to strengthen this obligation to cover all carriers through expanded national commitments. Beyond the absolute obligation to interconnect is the issue of network neutrality. This debate matters because the choices shape how networked ICT will be organized. We favor selective safeguards.

To date, net neutrality has been less salient in Europe or Japan than in the United States mainly because Europe and Japan enforced strong network unbundling (network sharing) rules for broadband. But unbundling is representative of the era of managed market access. Now, the ability of carriers to exploit market power in pricing consumer services is declining. Moreover, pricing freedom and flexible service design are two desirable developments. Thus, unbundling schemes are less desirable, especially because infrastructure competition is becoming easier. That said, most countries have either a dominant single supplier of local broadband connectivity or a duopoly. So the complete absence of regulatory tools is risky. Our approach may allow a stable political deal on network neutrality while skirting extensive unbundling rules. To this end, Corollary 5.2 is *“Adopt a narrow scope for rules designed to ensure network neutrality.”* To explain this corollary we start from the Annenberg Center Principles, hammered out in a private meeting of many types of stakeholders, and then adapt them to address the global and wireless contexts.<sup>34</sup>

We suggest five principles:

*Operators and customers both should win.* Thus, network infrastructure investment should be encouraged by enabling operators to benefit from their investments. At the same time, customers’ unrestricted access to services and content on the global public Internet should be ensured.

*Use light touch regulation when there is significant market power.* Any regulation should be defined and administered on a nationally uniform basis with a light touch. Regulations should be aimed primarily at markets in which it has been demonstrated that operators possess significant market power. The emphasis should be on prompt enforcement of general principles of competition policy, not on detailed regulation of conduct in telecommunications markets.

*Guarantee “basic access broadband.”* Broadband network operators can avoid more intrusive regulation by providing “basic access broadband,” a meaningful, neutral Internet connectivity service.<sup>35</sup> Beyond providing this level of service, operators would be free to determine all service parameters, including performance, pricing, and the prioritization of

third-party traffic.<sup>36</sup> Global best practices can inform the discussions about the proper parameters of the access service.

*Users should have freedom of choice of terminal and software applications.*

The right of users to choose terminals as long as they do not harm the network has been an anchor of wired network policy. This right should be extended to wireless, mobile, nomadic, and hybrid networks, as has already occurred in many countries, and could be added to WTO commitments. The right of the user to freely choose software and Web applications is more difficult to formulate, because some premium services might choose to “manage” acceptable services. However, if there is an adequate “basic access service” (as described above) or a commitment to resell network capacity on wholesale terms to others, carriers will not be able to restrict access to end Web services.

*Provide transparency.* Customers should receive clear, understandable terms and conditions of service that explain how any network operator, Internet service provider, or Internet content provider will use their personal information and how it will prioritize or otherwise control content that reaches them.

This approach treads lightly because modularity makes many forms of regulatory controls counter-productive. Still, it recognizes the risks of duopoly while also acknowledging the fragmented politics of net neutrality. The split of the old corporate competition coalition makes it difficult to sustain traditional unbundling or detailed price-control rules. The basic access service for consumer and small business broadband addresses the biggest worry of the software and technology research community while also addressing some of the worries of consumer group. Major carriers oppose compulsory service offerings, but they care more about their freedom to offer other services without micromanagement through burdensome regulation. Freedom of terminal and software choices for mobile devices and services should win support from corporate customers and consumer groups. Transparency requirements also appeal to advocates of consumer rights. With appropriate tweaking, either American political party could adapt this package.

Globalizing this platform for net neutrality requires reversing the policies on unbundling that dominate the telecom regulatory environment outside the United States. The US must craft a coherent policy at home that other governments can observe in practice before the US policy can become a credible basis for reforms of global governance.<sup>37</sup>

Eventually, the success of measures to increase the number of infrastructure providers and the variety of business models will result in a decline

of the significance of network neutrality rules. However, the evolution of broadband networks also creates new challenges tied to next-generation interconnection that require some oversight by governments. Although often conflated with network neutrality, these issues are conceptually distinct and politically more tractable than network neutrality. This problem arises from the desirability of allowing carriers and users flexibility to explore the best ways to provide value-added features that enhance network security, robustness, quality of service (e.g., prioritization of traffic to reduce latency), and network management (e.g., segmentation by type of traffic).<sup>38</sup> These capabilities raise two important questions: (1) Who should qualify as a peer for exchanging traffic between networks? (As was explained in chapter 9, peers are eligible for traffic exchanges without a fee.) If one network provider decides that another network does not match up on quality of service and security features, should it be treated as a peer? (2) Who gets to provide value added in network functionality? Value-added functions are prone to manipulation for anti-competitive purposes because they are central to competing visions of how to design architectures at the inflection point and to profit from them. This might occur as result of strategic bargaining by entrenched carriers or as an offshoot of national industrial policy (for example, China's experiments with mandatory security standards for Web traffic).

Fortunately, there is an incipient consensus on how to address these challenges that is reflected in the wide endorsement by diverse business groups of the "Four Freedoms" put forward by former FCC Chairman Michael Powell. This leads directly to Corollary 5.3: *"Separate decisions about peering from decisions about interconnection when dealing with the provision of value-added network functions."*

A starting framework for policy might begin with three thoughts:

- All value-added functions, including quality of service, security, and filtering, should be treated as separate issues from network interconnection. Users should always be able to choose who supplies these functions. Networks should not insist on providing these functions as a condition for interconnection with another network.
- Governments should not impose mandatory technical regulations for these functions. Instead, governments ought to define functional requirements at the application and network layer interfaces.
- To qualify technically for peering "least burdensome" distinctions should be used. For example, imagine one network denies a peering relationship (reciprocal free access) to another network that does not perform "deep packet inspection" because of legitimate security concerns. In this situation

regulators might set out a series of broad functional requirements (not technical specifications) necessary to qualify as a peer network with respect to interconnection.<sup>39</sup> Those meeting the requirements would enjoy rights not extended to others.

The security elements of next-generation interconnection mean that governments will play a large role. Global consultation, at the International Telecommunication Union or another international technical institution, will be necessary before forging approaches at the national or regional levels. International discussions might produce recommended technical functional requirements. There could be a separate international discussion, perhaps at the World Trade Organization, about the impact of these technical requirements on competition. For instance, at the WTO governments could consider expanding the pro-competitive regulatory principles already contained in the Fourth protocol to include next-generation interconnection.<sup>40</sup>

Countries must resolve whether WTO commitments to provide market access and full national treatment cover the situations where peering is denied for security or other quality of service reasons. The WTO Services Agreement contains provisions that permit governments to maintain legitimate domestic measures, as long as they are “least burdensome.” In other words, a government has to show that it is in reasonable conformity with an approach that has the least burdensome impact on international trade. Alternatively, the authority to monitor whether peering rules are fair and impartial could be delegated to a forum involving carriers, other suppliers, and users. This forum might issue certificates attesting to the fact that peering rules comply with agreed norms. Privately managed quality certifications now are a major feature in international commerce. Research shows that environmental standards, for example, adopted by firms in major markets, such as the United States, diffuse to their suppliers in other countries.<sup>41</sup> An internationally accountable process for network certification could be developed in a non-governmental venue and could set off a diffusion process that could supplant or reinforce inter-governmental discussions.

### **Norms 6–10: Norms for Consumer Services**

The inflection point more likely will lead to advances if the regulatory conventions for end services allow the potential for innovation, convergence (including mash-ups), and competition. Convergence should not lead to more restrictions on innovations. For example, a few national regu-

latory schemes, after ignoring VoIP, are becoming hostile to the convergence of broadband and voice.

Norm 6 is *“Government policies generally should promote experiments with new applications.”* In general governments should not restrict experimentation by using regulatory limits on the mixing and matching of services (including on cross-border supply) or through rules on pricing that limit experiments with multi-sided platform packages. There will be exceptions to this norm on security and other grounds, but exceptions should be narrowly defined and should aim to be competitively neutral. The increase in multi-sided platforms for ICT services (see chapter 3) will challenge the instincts of regulators concerning pricing policy. Regulators may have to redefine the relevant definition of the market to encompass these multi-dimensional service products.

The next norm relates to content markets. Norm 7 is *“Create rules for the globalization of multimedia audio-visual content that balance the goals of encouraging trade in services and fostering legitimate domestic media policies.”* For example, governments should promote localism, pluralism, and diversity of content.

Until now, national media rules were based on over-the-air, terrestrial broadcast technologies, which were limited geographically and restrained politically. Governments manipulated the broadcasting rules to achieve laudable objectives, but also less liberal goals. In some countries, broadcast services are explicitly used to subsidize the production of audio-visual content. Many governments have rules intended to influence or control the editorial content of news programs, and elected officials everywhere have a vested interest in attracting media coverage to their campaigns. The United States built its broadcast regulatory regime on the basic principles of localism, pluralism, and diversity. It also incorporated into its regulatory system certain advertising restrictions, such as bans on alcohol and tobacco ads for children’s programming. The US regime includes often-challenged rules on obscenity and pornography (such as the Janet Jackson–Justin Timberlake Super Bowl “wardrobe malfunction”). Finally, the US regime contains limits on the ownership of broadcast station licenses, both for domestic entities and foreigners (i.e., no more than 20 percent of direct foreign ownership, and 25 percent indirect ownership). Predictably, other countries’ regimes contain similar provisions. Indeed, the goals of promoting localism, pluralism, and diversity are nearly universally shared by governments.

The inflection point requires a wholesale revision in the way that regulatory authorities and officials responsible for cultural and trade matters treat

the trade of multimedia audio-visual services. The Internet is becoming the largest means for distributing movies, songs, video clips, and other digitized content directly to consumers. The policy options available to authorities and officials are limited because of the inherently destabilizing effect of the Internet on traditional media rules. Thus, although it may be tempting for some governments to impose rules on the broadcast of content delivered over the Internet, we believe that this approach always will fail in time (witness the recent struggles of music industry).<sup>42</sup>

To date, there are no examples of successful attempts at the international level to tackle this issue, largely because government officials believe that it runs directly into delicate issues related to the cultural identity of nations and the measures they have taken to preserve their cultures. Thus, no commitments exist on encouraging cross-border trade in broadcast services in the WTO, in the bilateral "free-trade agreements" (FTAs) reached by the United States, or in most regional organizations, including the OECD and APEC. Indeed, greater success was achieved in restricting trade in multimedia audio-visual content. The European Union developed rules intended to protect national production by restricting the flow of trade from outside European member states. Similarly, the United Nations Educational, Scientific and Cultural Organization recently developed guidelines designed to protect domestic content, and the World Intellectual Property Organization held meetings to prevent unauthorized uses of broadcast signals.<sup>43</sup>

The inflection point creates the perfect conditions for renewing efforts to establish global guidelines for the international trade of audio-visual multimedia content over the Internet. The sheer magnitude of the current and expected flow of digitized content forces a global discussion. The modularization of the delivery system, which leads to the creation of Personal Network Platforms, undermines the ability of governments to impose rules. Yet governments continue to believe in the validity of national policies such as localism, pluralism, and diversity, as well as providing subsidies for the creation of domestic content. International negotiations, perhaps at the WTO, could lead to global validation of these national policies, as long as they are balanced with the goal of minimizing the impact on international trade. The WTO has yet to resolve the wider issue of domestic subsidy programs for services. Thus, it should be possible to temporarily leave these programs untouched by trade rules so long as they are minimally burdensome on cross-border trade. One way to obtain funds for these subsidies might be through a "bit tax" (a tax on the electronic bits on the network). The subsidies could be used to finance domestic content production and to help provide universal broadband service.

Existing trade rules separate the treatment provided to broadcast services from that provided to telecom services and computer-related services. In its revised rules on electronic communications, the European Union integrated all communications services under one heading, while providing separate regulatory treatment to “linear” and “non-linear” services. These categories are comparable to services “pushed” out to consumers (such as broadcasting or cable) and to services that are “pulled” in by consumers (such as IPTV or downloading video clips from YouTube). International negotiations might embrace similar distinctions, if the former category is limited in scope to traditional “television-like” services that are delivered as pre-packaged programs over a set number of channels and the latter category is open to all new and emerging technologies (such as search-engine-facilitated delivery of multimedia audio-visual content).<sup>44</sup>

Eli Noam argues that the regime developed to regulate the telecom infrastructure could be altered to handle these new services. It would create a more unified regulatory approach and would allow for content gateway regulation that resembled common carrier rules.<sup>45</sup> Furthermore, the WTO could easily accommodate this distinction by allowing countries to schedule unlimited (fully open) market access and national treatment commitments in one subsector (Internet-delivered content) and limited (restricted) commitments in the other subsector (television-like services). Countries could decide to make no commitment at all for television-like services, and perhaps by doing so placate the protectionists who want to maintain the fiction that cultural content is not subject to international trade rules. We believe, however, that most governments have an interest in setting realistic liberal ground rules for use of the Internet to distribute multimedia audiovisual content as a way of providing a framework for this large and growing segment of international trade.

The blending of the large institutional enterprises and consumer markets will also create significant opportunities for policy innovation. Individual users will be the center of this merged universe, and a Personal Network Platform will negotiate how they intersect with the IT systems of their firms and online friends (think of Facebook and the rapidly blooming world of social networking).<sup>46</sup> Firms also will intersect with other firms, with their employees, and with their customers, with the PNP serving as a major mediating force. For example, employees may receive an allowance for IT equipment and services and be contractually bound to abide by certain protocols and practices when dealing with their “corporate identity.” But they will manage their own personal hardware, software, and services platform?

The PNP will make it much easier to accomplish transactions in the networked world. Three issues that already are contentious are digital rights management (DRM), privacy, and data lock-in.

The prevailing framework for DRM is too rigid for new realities. DRM tries to write contracts and controls in advance of market conditions. The erosion of market segmentation and the implosion of traditional content pricing make traditional means of achieving DRM (selling exclusive rights to a piece of content for a set time or use) less efficient because they no longer provide a predictable business model for a large share of copyrighted content. Meanwhile, there is evidence that eBay and other online markets are becoming more efficient at clearing markets of goods that were not traditionally traded. Intellectual property rights will remain important, but the economics and politics at the inflection point severely hamper the technological fixes that might uphold current business models through a strict DRM system.<sup>47</sup>

Outside the United States the situation is even more in flux. For example, in Europe the legal challenges to iTunes argue that the DRM system for the iPod is so rigid that it violates competition laws by locking iPod tunes out from other devices thus inhibiting consumer switching to other devices. In Belgium a ruling on Google caching found that Google was impinging on the intellectual property rights of Belgian newspapers. Similarly, as YouTube becomes more global, the struggles between content owners and YouTube over unauthorized use of copyrighted materials will escalate.

It would require another volume to fully discuss international IPR and DRM issues. Here we merely suggest how the inflection point could change the governance options. To focus on this challenge, norm 8 suggests *“Use networked ICT techniques and changes in policies to tip practices toward new markets for trading and transacting digital rights.”* Digital modularity is rapidly undermining traditional business models for DRM. The same technological forces, if encouraged by policy, might allow for a smoother transition to a more flexible system of intellectual property rights.

We believe that the forces undermining the status quo for DRM produce changes even if there is no official revision of intellectual property rights for content. But selectively pruning and modifying these rights for content might further spur growth and innovation. Bruce Abramson argues provocatively that companies should be able to use either copyright or trademark, but not both.<sup>48</sup> Many critics deplore the prolonged copyright extensions approved in the Sonny Bono Copyright Term Extension Act of 1998 as a monopoly that produces no added incentive for innovation.<sup>49</sup> As we argued in chapter 5, there is no political basis for thinking that

intellectual property rights will be legislatively drastically curtailed, but some selective reforms would advance a more realistic system.

The goal should be to “tip” the market toward new practices. This approach is in the spirit of Sunstein and Thaler’s “liberal paternalism.” They suggest that “In many domains people lack clear, stable, or well-ordered preferences. What they choose is a product of framing effects, starting points, and default rules. . . . We argue for self-conscious efforts, by private and public institutions, to steer people’s choices in directions that will improve their own welfare.”<sup>50</sup> At the same time, the policy interventions should present choices that are not compulsory, so that anyone may opt out. Applied to DRM, this approach might argue for two policy innovations.

First, government could, as a condition for copyright protection on new applications or on extensions, require the registration of owner/agent contact information to make it easier to find someone to negotiate with in regard to DRM. As a condition for maintaining the copyright, the information would have to be updated, perhaps within 180 days after the copyright office received notice that the contact information was no longer operative.<sup>51</sup> This compulsory information would place only a minor burden on the rights holder, but would make market transactions easier.

Second, applicants could be required to respond to a set of standard contract options and terms that define the content and the use of the protected material. This contract would have options for standard terms (e.g., length of right granted and price) and a standard structure (entire content, sub-sections, audio or video components, geographic breakdowns, etc.) to define differentiated rights that could be split off. We believe this standard contract approach could yield vastly more profitable exchanges of content for “lower-value-added” content than are currently taking place. For example, regional sporting events—the Five Nations Rugby Tournament, local football games, or the final round of a pay-per-view fight—are “untraded goods” that might be opened up by standard contract terms to ease the costs of legal management of these assets. These separable rights might include replay and versioning rights as well as the ability to choose “open-source” styles of contract options (such as the “Creative Commons” license).<sup>52</sup> The applicant could opt out and decline to accept the terms of the contract, or could substitute one of the other license packages now sprouting on the Web.

The standard contracts would bring forth a wave of websites with advice on how to select among the contract terms; these sites alone might suffice for most applicants. Copyright holders could revise their offer terms

periodically, but they could not void existing contracts. All revisions to the standard contract would be posted on the government website. This kind of standard contract does not compel particular terms of use. Rather it creates a market exchange or tipping mechanism in favor of standard reference terms, to ease transactions. This is important because there will be a cascade of material created by individual creators and users. Inevitably they will remix materials from the large digital content companies in their offerings. For that reason, standard contracts for buying and selling rights that go beyond fair use are desirable.

As new market mechanisms arise, more sophisticated contracting options, such as futures contracts and trading for digital rights, will appear. These will allow rights holders to more imaginatively unlock the value of the content they own. It also will give new options to users while allowing better market mechanisms to discipline pricing and terms of contracts for suppliers.

Imagine the growth of more sophisticated trading exchanges involving buying and selling the rights to use DRMs and even the development of futures options on those rights. How would one value the future rights to music of the Beatles or Eminem? Politically, private mechanisms to enhance the trading of rights also require accountability rules and methods for enforcing them. Wall Street has the Securities and Exchange Commission, for example. If futures markets in digital rights emerge, how can they be overseen?<sup>53</sup>

The first market center to create viable exchange mechanisms that operate under a framework of public principles will wield enormous international influence. The United States, as the dominant content center, could play this role. Its political leadership could transform a problem into a political opportunity. But if the US does not innovate institutionally, alternative formats will arise that may be less favorable for US holders of intellectual property rights.

It makes sense to hold international discussions on guidelines for minimum government obligations in regard to the conduct and accountability of such exchanges. A major strategic choice will involve the negotiating venue, because venues embed policies in broader frameworks. In this instance, an ad hoc group of national competition and securities exchange authorities might be the optimal starting point. Governments will first have to carefully consider their own domestic organization of authority. They will be less concerned about writing general international rules for these new exchanges than with "testing" their consistency with existing national and global rules for intellectual property rights.

The content issue is critical on its own, but it is also part of the larger issues related to the control of data in the Personal Network Platform. Who owns data, and how should data privacy be insured? The precise answers are not clear, but those debating the options might consider how better-defined property rights to data could address both challenges. This leads to norms 9 and 10.

Norm 9 is *“Enhance property rights for personal data and create mechanisms to allow commercial exchanges involving those rights on standard terms.”* The modularity at the inflection point allows mash-ups and functionalities that will reach across a person’s life in the large enterprise or institutional world and in the person’s private realm. As more applications and more interactions are conducted online a consumer adds to his or her “click-stream profile” every day. The applications and the flexibility afforded by the Web are extremely appealing, but they raise significant privacy issues. For example, recent efforts by Google and Microsoft to become providers of physicians’ services promise to make sharing data among scattered physicians’ offices easier for consumers, but they raise serious privacy challenges to the extent that the physicians are not covered by HIPAA rules.<sup>54</sup>

One way to move forward is to set different default rules about privacy. Crudely put, Europe represents the notion of “opt in,” requiring an explicit permission from the individual to access personal data. The United States tilts toward “opt out”: the individual must request that his or her data not be released. Both regions treat this issue primarily as a legal, not a market, transaction. This misses an opportunity.

Over time, the Personal Network Platform will induce individuals to develop personal data profiles of greater complexity. Individuals will sign contracts with their employers that specify how to share these profiles. The same contractual situation will arise with providers of health care. Facebook entries show that some individuals already have adopted this practice. Since commercial enterprises prize personal data, why not introduce incentives for creative data sharing that elicit the real value of the data (and by implication of privacy) and the real value of the acquisition of private data to the parties involved? Well-functioning markets could help to price individual data better and more accurately, could yield more optimal exchanges between consumers and products, and could lead to a new set of innovative exchanges and business models based on them.

A plausible technological challenge is to develop the equivalent of eBay markets for personal data. Companies already sell or share large amounts of private data, and individuals’ social network connections and e-commerce ratings are readily searchable through Web services such as

UpScoop and Rapleaf. The question is whether firms should be able to use personal data without compensating the individual. This frames the question of privacy as a typical cost-benefit issue: How valuable is privacy about certain types of information to the individual, and how valuable are certain pieces of personal data to suppliers? If suppliers of privacy information were obligated to pay people for the data, would they be as interested in using as much of that “input” to produce their data services? A simple analogy is the social networking market, where more social networks are limiting entry for some purposes to people with similar levels of cachet. These people want to share information with people of similar standing, not with the average user.<sup>55</sup>

Privacy data markets would develop standard contracts for certain packages of personal information, and individuals could make those packages available to anyone they consider to be a qualified buyer. Different profiles could be open to sale to different purchasers. Anonymous profiles involving buying preferences and spending patterns might be put on offer to all interested purchasers in an automated, continuous auction. (See the discussion of RFID data in chapter 4.) Medical profiles might be organized for one-time “exchanges”—for example, a health insurer might offer individuals a larger discount on their policies if they agreed to more extensive profiles of their daily habits. On the other hand, a patient might pay a larger premium to a health-care provider in return for the provider’s agreeing to provide real-time access to the patient’s medical records. The point of these “one-off” cases is that the information system will help to automate the assembly and customization of the profiles on both the “buy” and the “sell” of the deal. This makes transactions easier and opens the possibility for innovation in the exchanges.

Defining clearer property rights to personal information and forging new exchange mechanisms will not resolve all privacy issues. Some kinds of mandatory privacy protection will remain unless an individual explicitly waives them.<sup>56</sup> But compromises to launch new applications will be easier if people can value and package their personal data in a market environment.

We envision something like the regulatory harmonization process for product regulation that took place in the European Union leading up to implementation of the “single European market” in 1992. The focus was on harmonization of a few requirements in each product that became mandatory for each member state. So long as these basic requirements were not undermined, other requirements were left to the individual member states. The OECD might serve as the starting point for testing the feasibility

of this undertaking because it has deep expertise on consulting on new market-governance challenges and encompasses all the major markets except China, India, Brazil, and Russia.

Personal data are only a subset of larger issues involving data in the new information environment. Many, including the real estate valuation service offered by Zillow, combine multiple sources of public data with information that is voluntarily submitted by homeowners. Zillow develops formulas that yield convincing appraisals automatically. It allows viewers to review the values of all properties in the geographic region, and it enables transaction options, such as listing a standing offer to sell at a certain price. Another way to think about Zillow, however, is that it is creating the most accurate set of data—collected from both public databases and via individual submission—on US property values. These data could provide the basis for as yet unimagined incremental new services that would be of great interest to insurance companies and industries providing services to homeowners that now rely on data sources that do not include individuals' personal data. In short, third parties in real estate are likely to build additional functions and services offerings on the Zillow data that use this personal data in novel ways.

Zillow is a striking example of a focused application of "Web 2.0" logic. But the giant search engines routinely collect personal data and combine them with other sources of information. Most search engines place an anonymous "cookie" on a user's computer hard drive that allows the search engine to track what websites the individual has visited or what searches were performed on that computer. For users who log in to specific services including email and personalized home pages, this level of data collection is more robust because search engines can track what any user login does across multiple computers or devices. By tracking the behavior of end users, the search engines can more effectively target ads and therefore be more effective (and more profitable) targeters for advertisers. This greatly extends the personalized suggestions generated by Amazon and Netflix on the basis of individuals' ordering histories. For example, most search engines price on a "click-through basis" for ad results placed in the context of search results. Better targeting yields improved selection of ad alternatives, which in turn yields greater "click-through" rates and more profits.

An intense debate is raging about who should control the information generated by individuals' online behavior. This dispute extends to the scope of the data that the search engines and other websites are allowed to capture and maintain in user profiles. Google maintains a remarkably

extensive set of user data. Traditionally, it was reluctant to curb its efforts to track all user behavior on Google servers. In addition to search data, many privacy experts believe that Google scans user emails for keywords to more effectively target ads on its Gmail service. Microsoft, Yahoo, and Ask.com have been keener to focus on user privacy in order to differentiate them on this point.<sup>57</sup> More recently, Google called for international standards on the use and retention of end-user data in the industry. This followed a Privacy International report that ranked Google last in end-user privacy.<sup>58</sup>

As in the case of content, we believe the focus on privacy misses the opportunity for policy innovation and also misses the important challenge that “closed data archives” raise (i.e., the possibility of consumer lock-in in specific services can deter modularity and stifle innovation). If you cannot “take your Zillow profile with you,” are you likely to switch services? In short, elements of information services intended to make them “sticky” also open the possibility of lock-in. One reason for encouraging the Personal Network Platform with ownership rights to personal data is that it will tend to promote co-ownership of the data in cases like that of Zillow. (Zillow and the individual would have a right to the data.) For policy, governments should carefully examine the possibility of data lock-ins. Hence, norm 10 is “*Users may take their information with them when they depart from specific applications and experiences and own their ‘click streams.’*” This is like the principle in telecommunications competition policy that a regulator should enforce the right to “number portability”—that is, a user’s ability to switch networks and still keep his or her present phone number. Thus, number portability undermines customer lock-in.

Table S.1 reprises our four principles and the ten norms that could help with their implementation.

### **The Way Forward**

We have emphasized the variety of venues for action and subjects for initiatives in order to adapt governance to the concept of “trading rights.” The advantage of this diversity is that meaningful initiatives can develop on the most opportune front for substance and policy deliberation. We also have emphasized some advantages of trade agreements as an anchor for harmonizing significant elements of national policies. We will close by examining initiatives on trade to illustrate how these principles and norms could be pulled together. Of course, if trade venues stall, other avenues will emerge.

**Table S.1**

Four guiding principles and ten norms to help implement them.

---

**Principles**

1. Enable transactions among modular ICT building blocks.
2. Facilitate interconnection of modular capabilities.
3. Facilitate supply chain efficiency, reduce transaction costs.
4. Reform domestically to help reorganize global governance.

**Norms**

1. Delegate authority flexibly.
  2. Invest in virtual common capabilities; be competitively neutral.
  3. Use competition policy to reinforce competitive supply chains.
  4. Intervene lightly to promote broadband networks.
  5. Narrow and reset network competition policy. All networks must accept all traffic from other networks. Narrow scope of rules to assure network neutrality. Separate peering and interconnection for provision of VANs.
  6. Government should allow experiments with new applications.
  7. Create rules for globalization of multimedia audiovisual content services that encourage international trade and foster localism, pluralism, and diversity.
  8. Tip practices toward new markets for digital rights.
  9. Promote commercial exchanges that enhance property rights for personal data and mechanisms to do so.
  10. Users own their information and may freely transfer it.
- 

Using the WTO as a venue for advancing governance change will be a challenge for the foreseeable future. The Doha Round of trade talks (named for the city in Qatar in the Arabian Gulf where the negotiations began) have been deadlocked almost from the moment they were launched. The talks reached a stalemate in July 2008, and we do not expect a conclusion to the negotiations until well into the new U.S. administration. This is an opportunity, not a tragedy. The Doha Round's ICT agenda has focused on solving the trade problems of the past; the current agenda merely attempts to improve commitments obtained in the WTO basic telecom agreement in the mid 1990s. That agreement was rooted in the realities of the demopolization, deregulation, and divestiture movement of the late 1980s. The goal was to open formerly closed monopoly wireline networks to competition. The agreement included commitments on other technologies, including wireless and satellite, but was intellectually grounded in the communications network invented in the late nineteenth century. Thus, although the Doha Round will likely take additional months (or years) to conclude, this is not a bad thing. The time can be used to create an ICT

**Table S.2**

An agenda.

---

**Encouraging build-out of competitive broadband infrastructure**

Promote business models that allow user cooperatives to build out competitive infrastructure: Governments could commit to permit network sharing among users and to permit shared user networks to interconnect to backbone networks on non-discriminatory terms.

Encourage flexible use of spectrum for new broadband networks and flexible services and architectures: A country can commit to service and technology neutrality for spectrum licensing and use and commit to commercial resale of spectrum.

**Encouraging technological innovation while dealing with the challenges of the next generation of interconnection policy**

Allow networks to establish legitimate security requirements for networks with which they peer while restricting the use of illegitimate security requirements for anti-competitive purposes: Governments could commit to set functional security requirements for networks, but be technology neutral on how they are fulfilled. In addition, governments could commit to the rule that functional requirements will be transparent and least burdensome for trade.

Foster competition in the provision of security functions: Governments could allow third party suppliers (i.e., value added service suppliers) to provide security functions for networks.

Encourage innovation on mobile broadband networks: Governments could commit to freedom of terminal attachment and terminal software for mobile broadband networks.

**Encouraging liberalization and globalization of audio-visual content markets while allowing national rules to encourage localism, pluralism, and diversity of content**

Recognize the need to respect the societal and cultural aspects of media: Governments could commit to limiting domestic regulation to rules that encourage localism, pluralism, and diversity of content.

Establish the principle that content rules should not unnecessarily restrict Internet delivery of audio-visual content: Governments could make commitments that distinguish between push (i.e., broadcast) and pull (i.e., Internet audio-visual downloads) technologies for audio-visual services by accepting market liberalization commitments for audiovisual services delivered through pull technologies.

Provide transparent means of subsidy for the production and distribution of content: Governments could commit to ensure that subsidy regimes are least burdensome for trade (e.g., a bit tax on data flows that supports national content producers subject to rules of national treatment)

**Encouraging harmonization of core national policies on personal data**

Recognize the vital importance of privacy policies: Governments could commit to transparent rule making and rules on binding consumer rights regarding control of their personal data.

Establish the right for consumers to move their personal data from a website operated by a telecom carrier to a third-party web portal (e.g. from NTT to Google): Governments could commit to assure a consumer's right to portability of his/her personal data that is equivalent to number portability for telecommunications services.

---

negotiating agenda that responds to the demands of the changing ICT technological and innovation landscape. This new agenda can serve as a blueprint for the future.

The advent of the Internet and of modularity demands the establishment of a new framework for global ICT governance and a WTO deal on ICT that points the way forward. We favor a more aggressive agenda that takes into account the evolving modularity of ICT and is based on the principles and norms promoted in this chapter. Table S.2 illustrates how trade agreements could advance the policy framework advocated here. It employs specific language from existing trade commitments to show how new agreements could be written. Even if avenues other than trade agreements end up as the most immediate vehicles for reorganizing global market governance of ICT, these initiatives could ultimately relate to a trade agenda. Moreover, the language of trade obligations pervades agreements in other international forums.

We believe that the agenda laid out in table S.2 is attainable in future trade negotiations because governments have a strong interest in trying to harness the destabilizing impact of technological change rather than inheriting a set of rules that have little relevance in political or economic terms to the emerging marketplace. Government policy makers and regulators would rather enter into difficult trade talks than accept that technological change circumvents their choice of regulatory actions or policy options. There are strong political and economic motives to act, and so governments will influence the ICT infrastructure in some important ways. The challenge of the \$4 trillion market for global communications and information industries is that political economy will stall policy change or push policies down unproductive paths. We began this book by arguing that the goal of governments should be “pretty good” governance. Achieving this outcome in a rapidly changing marketplace with high commercial stakes will require astute risk taking by policy makers.

