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New technologies, domestic regulation and telecommunications liberalization

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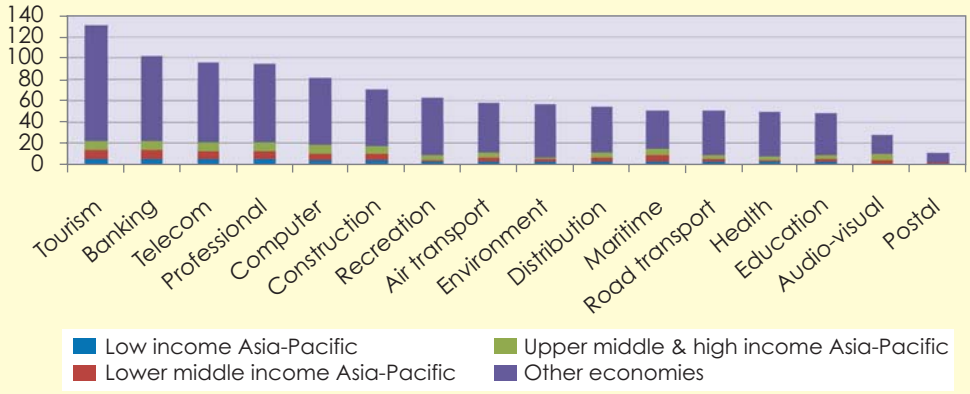
If the outcome of the Signalling Conference in July 2008 is any indication, it is that many governments have now embraced competition in a broad range of services sectors. In the telecommunications sector, in particular, a significant number of the 31 World Trade Organization (WTO) member countries that participated in the conference expressed willingness to either improve their existing systems or to undertake new commitments in both basic and value-added services. Some members revealed their intention to (a) remove all access restrictions on modes 1 and 3, (b) relax or eliminate foreign equity caps and (c) adopt the regulatory disciplines embodied in the reference paper.[1] That members recognize the need to review and upgrade their commitments in telecommunications is remarkable considering that there are already more liberalization schedules logged for this sector than for most other services sectors (see figure below).

Moreover, a recent review of some 38 preferential trade agreements (PTAs) involving Asian and Pacific economies found that a majority of these agreements contained more liberal commitments for telecoms than those contained in the General Agreement on Trade in Services (GATS) (Tuthill and Sherman, 2008).

In 1995, less than a dozen economies allowed competition in local services. By the end of the post-Uruguay round negotiations in 1997, when the telecommunications service was purely public voice telephony, only 69 economies were willing to sign up on commitments in telecommunications. Now that telecommunications is perceived as a diversified, multi-service market that includes voice, data and video, more than two-thirds of the world's economies have introduced competition in local and international services, 150 economies have independent regulators and 108 WTO members have made commitments to facilitate trade in telecommunications.[2]

Number of WTO member economies with scheduled commitments in selected service sectors



Source: Based on the Services Database of the World Trade Organization (accessible at www.wto.org).

Note: The income grouping of the World Bank is used here. Low-income economies in the Asia-Pacific region include Afghanistan, Bangladesh, Cambodia, Democratic People's Republic of Korea, Lao People's Democratic Republic, Myanmar, Nepal, Pakistan, Papua New Guinea, Solomon Islands and Viet Nam. Lower middle income economies are Bhutan, China, India, Indonesia, Islamic Republic of Iran, Kiribati, Maldives, Marshall Islands, Micronesia, Mongolia, Philippines, Samoa, Sri Lanka, Thailand, Tonga, Tuvalu and Vanuatu. Upper-middle income economies are Fiji, Malaysia and Nauru. High-income economies include Australia, Brunei Darussalam, Japan, Republic of Korea, New Zealand and Singapore as well as Hong Kong, China and Macao, China.

[1] "Services Signalling Conference: Report by the Chairman of the TNC," JOB(08)/93, 30 July 2008.

[2] Of the 49 additional members who made post-1997 telecommunications commitments, 35 are newly acceded; thus, the commitments of 14 others are autonomous.

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Most governments lower services trade barriers in response to the demands of their constituencies for production inputs (this includes services) that are cost-effective and internationally competitive (Adlung, 2009). The impetus for telecommunications liberalization arose from the same socio-political pressure. However, in this sector, technological changes are pushing reform further and much more strongly than users' demand while also reshaping the latter in ways that increases the pressure for reform even more.

This policy brief probes the dynamics of interrelationships among technology, market and policy in telecommunications. It is often claimed that this ICT revolution has changed markets and regulation, and induced even mercantilist regimes to consider opening up their markets. The key point is that the policy and regulatory changes demanded by the new technologies are far more fundamental than most economies are prepared to undertake. Yet these changes are crucial to the extent that removing trade and investment restrictions, when unaccompanied by pro-competitive policies and regulation, is not sufficient to guarantee the full benefits of new technologies. As such, the new ICT technologies demand that policy and regulatory regimes not only shed conventional market access barriers but, equally importantly, that they get domestic regulation right.

1. ICT revolution: Market and regulatory implications

In the past two decades, the telecommunications sector has been redefined and has become part of a more expansive and complex sector known as information and communication technology (ICT). Technological advances permitted the transmission of information technology (IT), telecom and broadcasting services on the same network and caused the blurring of traditional boundaries between these sectors. It is perceived as having entered a third phase of technological development where the advances in the earlier phases have the potential of pervading other sectors.

While it is difficult to define a time frame for the evolution of the ICT sector, a mapping of technologies allows one to distinguish three waves of technological development. The first wave was characterized by digitalization, i.e., the conversion of telecommunication networks from analog to digital, the deployment of computers in almost all facets of network operation and a shift from circuit-switched to packet-switched technologies that allowed more efficient use of network resources. This ushered in the second wave, which witnessed the emergence of the Internet, the development of mobile communications and next generation networks, and the convergence of technologies and services that allowed different services to be delivered in a single network as well as different network platforms to carry similar kinds of services. As the second-wave technologies took root, it became viable to deploy ICT network infrastructure and services in a wide-range of sectors. The third wave was thus marked by the proliferation of ICT-based application technologies to create new products and processes as well as to redesign or rationalize existing transactions.

What emerged, as a consequence of these technological developments, was a sector offering diversified services including voice, data, video, fixed and mobile services over several types of infrastructure – copper line, cable, mobile, fixed wireless, power-line cable, optical fibre and satellite. The Internet provides a common platform for an expanding set of services, allowing mobile services to penetrate the market faster and more effectively than fixed services. Continuous innovation permits the costs of network infrastructure and prices of services to fall unabated.

The implications of new technologies on the market and on regulation are as radical and sweeping as their potential impact on the economy. The fundamental technologies are noted below.[3]

First, the natural monopoly paradigm that provided information on policies and regulation up until the early 1990s had been written off by the viability of having many service providers in the market. Even as scale and scope economies still matter, the emergence of new services and the substantial cost reduction in network deployment permit the entry of many new suppliers plus the co-existence of small and large as well as single- and multi-service providers. This undermines any justification for policy and regulatory biases favouring a particular network (e.g., narrowband versus broadband), technology (fixed versus mobile), service (voice versus data), or provider (incumbent versus new; large versus small). It also invites rejection of discriminatory treatment against foreign or prospective suppliers, and eschews the need for regulators to decide on the number of service suppliers that the market can support.

Therefore, among countries in the Asian and Pacific region (see table below), few continue to preserve a monopolistic structure – often only in local services and prompted by the size of their economies (e.g., Brunei Darussalam, Nauru, Maldives and other Pacific Island economies). Furthermore, the desire to remove foreign equity restrictions and relax licensing and foreign authorization requirements in multilateral and bilateral trade negotiations is more evident among diverse economies.[4]

Second, new technologies facilitate vertical unbundling, or the separation of infrastructure network and service provision. A good example is the Internet, where the network operator and service provider do not have to be the same organization. Since a service provider does not technically need to have its own infrastructure to be viable in the market, entry barriers for service provisioning are much lower than before. However, this trend underscores the importance of access regulation to ensure that service providers are able to utilize existing networks.

[3] For an exhaustive discussion, see International Telecommunication Union, 2007, "Module 7: New technologies and their impacts on regulation," in ICT Regulation Toolkit, prepared by the Technical University of Denmark.

[4] In the Asian and Pacific region, the economies that have no ceiling on foreign equity belong to different income groups, namely: Afghanistan, Cambodia and Pakistan (low-income); Tonga (lower-middle); and Japan, New Zealand and Singapore (high-income).

Telecommunications market and regulation profile of economies in the Asian and Pacific region

Category	Low income	Lower-middle income	Upper-middle and high income
Fixed lines per 100 inhabitants	4.8	11.2	36.2
Average growth rate (2002-2007)	11.7	7.8	-1.6
Mobile phones per 100 inhabitants	16.7	39.1	106.7
Average growth rate (2002-2007)	91.9	56.2	15.0
Internet users per 100 inhabitants	4.1	11.6	57.2
Average growth rate (2002-2007)	30.1	24.8	9.5
Bits per second per Internet user	1 323.2	4 080.6	10 865.4
Average growth rate (2002-2007)	32.7	46.5	46.9
Fixed broadband Internet subscribers per 100 inhabitants	0.5	1.4	17.4
Average growth rate (2002-2007)	174.3	96.9	46.0
Proportion of households with Internet access at home	2.1	8.1	71.7
Average growth rate (2002-2007)	63.7	32.2	12.1
Total number of economies	**11**	**17**	**11**
Number of economies that have monopoly markets in:			
Local services	4	7	2
Mobile services	2	0	2
Internet services	0	1	1
Number of economies without regulatory authority separate from major operator	2	2	1
Number of economies that require publication of interconnection agreements	4	5	3
Number of economies that do not allow voice over IP (VoIP)	5	5	0

Sources: Author's calculation, using statistics in Annex 3 of *Information Society Statistical Profiles 2009, Asia and the Pacific*, published by the International Telecommunication Union, and the International Telecommunication Union's regulatory database, available at www.itu.int.

Third, the so-called next generation network, an Internet-based infrastructure, is restructuring the sector into four separate horizontal markets. The bottom layer comprises the market for network infrastructure facilities, which involves the provision of capacity to enable connections such as cable, wire, microwave tower, mobile cells and satellites. The second layer consists of network management, which provides standards and protocols for routing communications across networks and determining service quality. The third layer comprises the provision of all types of communication services for the delivery of voice, data and video. Finally, the topmost layer consists of a market for information services that are accessible on an Internet-based network.

Each horizontal layer is vertically separated, i.e., the participant in one layer need not be active in another. Each layer courts the participation of new players, and market competition is being redefined at each of these layers. Where the regulatory environment permits this restructuring, an incumbent supplier who remains vertically integrated would have to face competition from new players on various fronts and thus revise its business model accordingly.

The new market structure also calls on regulators to change their licensing framework. A traditional licensing scheme is based on specific technology or type of service. Where it is feasible to deliver multiple services over the same network, a supplier would require as many licences as the services it provides, an often cumbersome process. Therefore, retaining the traditional scheme diminishes the opportunities for market entry and competition that the new technologies create. Some regulatory regimes, such as those in Malaysia and Singapore, have redesigned their licensing schemes according to the four horizontal market layers emerging from the new network.

In addition to licensing, the legal and regulatory framework should be able to accommodate the convergence of networks and services. It is often the case that telecoms, IT and broadcasting are under regulatory oversight by different institutions. For a supplier able to offer multiple services over multiple platforms, it is more limiting to deal with different institutions than to obtain multiple licences.

2. Regulatory conundrum

The new technologies require major changes in regulatory framework and rules design. Regulation is needed to promote market competition by facilitating the provision of different services over different platforms. The rules that support this framework could be radically different from those inherited under the old technologies, creating unique challenges for regulators.

Take price regulation as an example. Two fundamental principles have always guided price regulation. In competitive markets, there should be no need for price regulation. In other markets, regulation is needed to emulate competitive outcomes by aligning prices with their underlying costs while preserving the market incentives to suppliers. In the ICT sector, multiple services and platforms create broad scope for competition. Thus price regulation at the retail level is often superfluous; however, at the wholesale level, price regulation may be necessary to mitigate the bargaining edge that access providers usually possess over access seekers. In mobile

markets, for example, many countries have found it expedient to regulate termination and roaming charges because of the market power of terminal operators.

However, determining the underlying costs to align price regulation is not a trivial task when multiple services are transmitted over the same network. Even though some of these services are close substitutes, their underlying cost structures could be very different. Regulators are thus often hard put in observing technology neutrality while sustaining competition. In addition, problems arise when new service applications are outside regulatory oversight but are close substitutes to traditional services. This is the case with voice over Internet protocol (VoIP), which poses problems for traditionally-regulated fixed-voice telephony.

Regulating access is inherently exacting, but more daunting in the ICT than in the traditional telecom environment. The vertical unbundling of the sector and the emergence of new types of network infrastructure have created a host of access products. It is incumbent upon the regulator to ensure that the rules do not discriminate against any type of infrastructure; for example, mandating copper-based telecom networks to unbundle and provide access to Internet service providers, but exempting broadcast networks from similar obligations.

In reality, it is difficult to apply the principle of technology neutrality. Moreover, if regulation is deemed too heavy, incentives for long-term investment in network facilities are at risk of being dampened. On the other hand, the convergence of networks and services could not be realized without a credible regulation to enforce access. Resolving these and other issues present major challenges to regulators.

When regulation is ill-adapted to the demands of new technologies, no amount of trade and investment liberalization will allow new technologies to take root. Nor is easy entry for new service providers a guarantee to having market competition. This would lower market concentration, but only temporarily. In no time, market concentration will begin to rise as the new suppliers exit the market and incumbents remain dominant. The market position of the former becomes untenable because the latter refuses, delays or encumbers access by competitors to their networks. Too often, the presence of a large number of suppliers is mistaken for market competition, and regulatory oversight is withdrawn prematurely as a consequence.

3. Moving forward

Market liberalization is often confused with deregulation, and regulation with trade barriers in the ICT sector. It is not a contradiction to argue that market liberalization must be accompanied by appropriate regulation, and that deregulation could be a potent trade barrier. Forbearance, or reliance on competitive market forces in order to achieve social objectives is not the absence of regulation; this approach is consistent with market intervention when competition is ineffective. Better regulation means more proactive measures, but not necessarily fewer rules.

As recent events have suggested, the challenge in telecommunications trade negotiations is not the removal of existing trade barriers in all modes of supply, or the inducement of more economies to make commitments to liberalize, as it appears that more countries than expected are willing to accept commitments either autonomously or in the context of preferential trade negotiations. Surely, relaxing foreign equity restrictions and logging more trade commitments represent progress; however, they are not enough. The bigger hurdle is that of ensuring that domestic regulations are in step with the waves of technological development that continue to transform the sector.

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