<table>
<thead>
<tr>
<th><strong>Title</strong></th>
<th>Restructuring the telecommunications sectors in developing countries : lessons from the Asian experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Author(s)</strong></td>
<td>Hudson, Heather E.</td>
</tr>
<tr>
<td><strong>Date</strong></td>
<td>1997</td>
</tr>
<tr>
<td><strong>URL</strong></td>
<td><a href="http://hdl.handle.net/10220/2871">http://hdl.handle.net/10220/2871</a></td>
</tr>
<tr>
<td><strong>Rights</strong></td>
<td></td>
</tr>
</tbody>
</table>
Restructuring the Telecommunications Sector in Developing Countries:
Lessons from the Asian Experience

Heather E. Hudson

"We have a saying: 'When the telephone rings, business is coming.'" --
Manager of a rural cooperative in China.

1. Introduction

The importance of telecommunications to economic development is becoming
widely recognized throughout the developing world. Less developed countries are
striving to provide access to basic communications to their citizens, and industrializing
economies face demands for new services and globally competitive prices. To
encourage investment in technology and a market-driven approach to providing
services, developing countries are adopting a variety of innovative policies and
strategies. While there are many paths to achieving universally accessible information
infrastructure, there are also numerous potential pitfalls.

This paper examines the telecommunications policies adopted by several
Southeast Asian nations and the issues they are confronting as they open their doors to
new technologies and services, and ultimately to new sources of information. It
attempts to draw lessons from these experiences that may be relevant to other
jurisdictions. Although these findings are likely to be most relevant to other developing
countries, many are also relevant for industrialized countries that are grappling with
strategies to encourage investment in telecommunications as a means to stimulate
economic development.

The restructuring process involves establishment of a regulatory authority in
countries which typically have no tradition of independent regulation. Thus the new
regulators often face conflicting mandates, as well as challenges in setting the rules for
competition and tariff reform. Recognizing the importance of telecommunications for
economic development, policy makers are looking for strategies to extend their
infrastructure, including designation of a carrier of last resort and incentives to
encourage investment. Yet there may be inherent conflicts in information infrastructure
policies because, despite encouraging investment, many governments seem wary of the
consequences of increased access to information.

2. Demand and Diversity

Two factors make Asia different from other parts of the world: its immense size
and its diversity, in terms of cultures, languages, and level of economic development.
The contrasts are striking between ultramodern Japan, Singapore, and Hong Kong with among the world's highest densities of lines and cellular phones; and countries such as Laos, Cambodia, Bangladesh and Papua New Guinea with less than one telephone per 100 residents, and no access to telecommunications in rural or isolated areas.

Table 1

<table>
<thead>
<tr>
<th>Telecommunications in Asia¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Teledensity</td>
</tr>
<tr>
<td>Teledensity: Largest City</td>
</tr>
<tr>
<td>Teledensity: Rest of Country</td>
</tr>
<tr>
<td>Pay phones per 1,000</td>
</tr>
<tr>
<td>Cellular subscribers per 100</td>
</tr>
<tr>
<td>TV sets per 100</td>
</tr>
<tr>
<td>Ratio of TV sets to Tel lines</td>
</tr>
<tr>
<td>Computers per 100</td>
</tr>
<tr>
<td>Internet Users per 10,000</td>
</tr>
</tbody>
</table>

Of course, these averages do not reflect the tremendous variation in access to telecommunications in Asia. Table 2 provides indicators on the largest developing economies, China and India, the “four tigers” or dragons, Hong Kong, Singapore, South Korea and Taiwan, and on the industrializing ASEAN nations of Indonesia, Malaysia, the Philippines and Thailand.

The Asian region has 59 percent of the world’s population, accounts for 29 percent of the world's economy, and has 256 percent of the telephone lines.² More than 90 percent of the population of the Asia Pacific live in lower income economies. China and India account for just 12 percent of the wealth and telephone lines, but have two-thirds of the region's population.³ Despite widespread poverty in poorer countries, the economic growth rate in Asia has surpassed other industrialized as well as developing regions. The Association of Southeast Asian Nations (ASEAN) has a higher per capita GNP and volume of exports than eastern Europe.⁴

The combination of an enormous market area (more than 3 billion inhabitants), considerable wealth (combined GDP of over US $6.9 billion or a quarter of the global total), and untapped potential (overall telephone density is less than 5 main lines per 100 population), makes the area very attractive to telecommunications suppliers. Main line growth has averaged 8 percent per year, and among the Dynamic Asian Economies or dragons (Hong Kong, Singapore, South Korea and Taiwan) recent main line growth has been twice this rate.⁵
Table 2:

Access to Telecommunications in Selected Asian Economies

<table>
<thead>
<tr>
<th></th>
<th>Tel Lines /100</th>
<th>Cellular /100</th>
<th>Pay phones /1000</th>
<th>TV Sets /100</th>
<th>Computers /100</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Giants:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>2.9</td>
<td>0.13</td>
<td>0.23</td>
<td>23.1</td>
<td>0.15</td>
</tr>
<tr>
<td>India</td>
<td>1.1</td>
<td>0.01</td>
<td>0.16</td>
<td>5.5</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>The Four Tigers:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>54.0</td>
<td>7.40</td>
<td>0.77</td>
<td>35.9</td>
<td>11.32</td>
</tr>
<tr>
<td>Rep. of Korea</td>
<td>39.7</td>
<td>2.16</td>
<td>6.87</td>
<td>32.4</td>
<td>11.25</td>
</tr>
<tr>
<td>Singapore</td>
<td>47.3</td>
<td>8.36</td>
<td>10.85</td>
<td>38.0</td>
<td>15.26</td>
</tr>
<tr>
<td>Taiwan</td>
<td>40.0</td>
<td>2.75</td>
<td>5.71</td>
<td>31.5</td>
<td>8.09</td>
</tr>
<tr>
<td><strong>Emerging Economies of Southeast Asia:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>1.3</td>
<td>0.04</td>
<td>0.41</td>
<td>14.7</td>
<td>0.28</td>
</tr>
<tr>
<td>Malaysia</td>
<td>14.7</td>
<td>2.93</td>
<td>3.28</td>
<td>23.1</td>
<td>3.28</td>
</tr>
<tr>
<td>Philippines</td>
<td>1.7</td>
<td>0.30</td>
<td>0.09</td>
<td>12.1</td>
<td>0.52</td>
</tr>
<tr>
<td>Thailand</td>
<td>4.7</td>
<td>1.10</td>
<td>0.72</td>
<td>24.7</td>
<td>1.16</td>
</tr>
</tbody>
</table>

Whereas it took the developed world 30 to 40 years to increase teledensity from 10 to 30 lines per 100 population, some Asian countries are making that transition in a decade. Telecommunications is a high priority in Malaysia, Thailand, Taiwan, Indonesia, and the Philippines. There is an enormous need for investment. For example, in Indonesia, while there are 2.5 million telephone lines, this represents only one line per 75 people. At least 7 million lines are needed just to meet current demand. In Malaysia, Syarikat Telecom Malaysia Bhd. invested $1.94 billion through 1995 to improve its system. Taiwan plans to spend $7.39 billion through 1996. Thailand plans to install 2 million new lines, in Bangkok alone it needs to triple the lines, which reached only about one out of six people in 1990.

The investment needed to maintain current levels of growth in Asia is at least $100 billion between 1993 and the end of the century. The investment required in lower income countries to reach a teledensity of 10 lines per 100 inhabitants would by almost $40 billion. Market analysts predict that beyond the year 2000, the Asian market will be comparable to what the European market is today.

3. Selected Structural Models
Several different structural models have been adopted for the telecommunications sector in Asian countries. For example, Singapore, Malaysia, and Vietnam are evolving from a PTT structure carried over from their colonial administration, in which telecommunications was a government-operated monopoly, under the same jurisdiction as the postal service. Hong Kong's telecommunications were provided by Cable and Wireless, the company that provided telecommunications services for Britain's colonies. The Philippines inherited a primarily American model, with a large dominant private company (PLDT, the Philippines Long Distance Company) and some services in rural areas provided by national and municipal governments. (See Table 3)

Table 3:
Structure of the Telecommunications Sector in Selected Southeast Asian Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Local</th>
<th>Trunk Int'l</th>
<th>Mobile</th>
<th>VAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>M-PP</td>
<td>M-PP</td>
<td>M-PP**</td>
<td>C</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>C</td>
<td>M-P</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Malaysia</td>
<td>M-PP</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Philippines</td>
<td>M-P</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Vietnam</td>
<td>M-G</td>
<td>M-G</td>
<td>M-G</td>
<td>M-G</td>
</tr>
</tbody>
</table>

M = monopoly
C = competitive
G = government owned
P = private
PP = partially privatized

* Domestic traffic is considered local within Singapore and Hong Kong.
** Limited competition introduced in 1997.

Hong Kong has taken the boldest steps to open telecommunications to competition. Regulation is the responsibility of the Office of the Telecommunications Authority (OFTA). Following the Hong Kong government's policy of "positive non-intervention", OFTA has liberalized the sector into one of the most competitive in the world. The extent of its future autonomy in telecommunications will depend on China's interpretation of the "one country, two systems" policy that will come into force with Hong Kong's reversion to China in July 1997.
Cable and Wireless subsidiary Hong Kong Telecom (HKT) remains the sole provider of all international service, having been granted a 25 year monopoly in 1981 (before OFTA) that will not expire until the year 2006. HKT's local monopoly expired in 1995, after which OFTA introduced local competition. Three operators have been licensed to compete with HKT in the provision of fixed-network service. By linking with callback operators, they have effectively introduced international competition, despite HKT's international monopoly.

Hong Kong has one of the highest concentrations of wireless communications in the world, with a cellular teledensity of 7.4 per 100 in 1994; there is also almost one pager for every four inhabitants. Services are provided by four cellular operators on seven networks covering five analog and digital technologies. There are also four telepoint cordless telephone (CT2) licensees and 36 paging service operators. Up to six operators are being licensed to provide Personal Communications Services (PCS).

Singapore Telecom was corporatized in 1992, taking over the former commercial functions of the Telecommunications Authority of Singapore (TAS), which is now the regulator. Privatization began in 1993; Singapore Telecom is now the largest company listed on the Stock Exchange of Singapore. However, unlike Hong Kong, the government has been reluctant to allow competition. The company was given a fifteen year monopoly by TAS in domestic and international telephone services and leased circuits. It was also given exclusive rights to provide cellular mobile service for five years, until 1997.

Among ASEAN nations, the Philippines is perhaps the most open market, with more than two dozen companies offering telecommunications services, but most are controlled by a small circle of ruling families. They form alliances with foreign companies for financial backing and technical expertise, but the alliances are volatile, with considerable turnover. The Philippine Long Distance Telephone Company (PLDT) is the dominant operator with 86 percent share of the market; the remaining 14 percent is the responsibility of some 50 other franchises. PLDT has been a fully private operator since 1928; its franchise extends until 2028.

Several private carriers have entered the market to provide local, long distance, and value-added services. In 1995, seven record carriers provided domestic telex, facsimile, and leased-line services; four provided international services. There are also several private carriers for paging and data communications. Five companies have been granted provisional authority to establish national cellular networks.

In 1990, Malaysia partially privatized its former government operator, Telekom.
Malaysia, which was corporatized in 1984. Jabatan Telekom Malaysia, under the Ministry of Energy, Telecommunications and Posts was converted to a regulator. Telekom retains a local monopoly and has responsibility for rural services. However, competition has been introduced in cellular services, pay phones, long distance and international services.

Vietnam has retained the PTT model, with telecommunications policy and operations still under government control. Telecommunications policies are set by the Directorate General of Posts and Telecommunications (DGPT) which was separated from the Ministry of Communications and Transport in 1992. A new entity, Vietnam National Posts and Telecommunications (VNPT), was established to operate the national network under the regulation of the DGPT. The VNPT established several subsidiaries including Vietnam Mobile Services (VMS), Vietnam Data Corporation (VDC), Vietnam Telecoms National (VTN), Vietnam Telecoms International (VTI) and the Vietnam Postal Service (VPS). VNPT is also responsible for transmission of radio and television.

4. Restructuring Challenges

4.1. Conflicting Mandates

Countries that are in transition from a PTT structure to a commercialized telecommunications sector often face difficulties in establishing an autonomous regulator. Typically, the regulatory staff is drawn from part of the operator that was responsible for tariffs, standards, and intergovernmental affairs. Thus, the regulators are really not at "arm's length" from the dominant carrier where they began their careers. Also, since the government generally remains a shareholder in the dominant carrier, it has a vested interest in ensuring that the carrier remains profitable. Thus, regulators have allegiances that conflict with their duties to serve the public interest and to set and enforce fair rules of competition.

The Telecommunications Authority of Singapore (TAS) interweaves regulation, operation, and policy making. Its function is not only to regulate but also to develop and promote the telecommunications industry in support of the National Information Technology 2000 (IT 2000) Plan to make Singapore an "intelligent island." TAS also receives about 60 percent of Singapore Telecom's surplus, and may receive revenue from licenses and administrative fees and may raise capital through stocks and bonds.

It would appear that TAS faces numerous potential conflicts of interest. However, one observer concludes:

"The close link between government, regulator and operator in Singapore must
be seen not in terms of conflict of interest as might be the case in other countries, but as a tripartite strategy for development opportunity.

As long as what is good for ST is good for the country, this may be true. But as more competition is introduced, and users develop a stronger voice, TAS may find it difficult to play several policy roles.

Although Malaysia has separated its regulatory agency, JTM, from its now partially privatized operator, JTM is not completely independent of either the government or STM. As in Singapore, many of its employees were formerly employees of the government-run operator. JTM only recommends decisions; it can be overruled by the Minister or by the Cabinet. Also, the government still sees Telekom as an important element of its industrial policy, and with its majority share, wants Telekom to be commercially successful.

4.2. Setting the Rules for Competition

As competition is introduced, regulators must resolve issues such as network quality, network standards and compatibility, revenue sharing and interconnection agreements. In the rush to open the sector, licenses may be issued before the "rules of the game" are established. The result may be bottlenecks if new carriers face barriers and delays in interconnecting with the dominant carrier. Also, policies must anticipate growth in demand. For example, dominant carriers must be required to supply additional trunks to carry traffic from new carriers, and numbering plans must allow for subscriber growth for new carriers and new services, particularly wireless networks. In some Asian countries, new carriers cite problems with interconnection, numbering plans, procedures for obtaining construction permits and rights of way, and a prohibition on resale.

Interconnection can raise major problems. For example, since the dominant carrier's network includes most of the installed lines, the other carriers can feel pressured to agree to that carrier's terms. The dominant carrier will probably not have designed its network for interconnection with numerous other carriers and had not budgeted for the transition. It may also act as a bottleneck in high demand areas where the new carriers depend on its network.

In the Philippines, Executive Order 59 issued by President Ramos in 1993 required compulsory interconnection of authorized public telecommunications carriers to create a nationalized integrated network and encourage greater private sector investment. This decision paved the way for other authorized carriers including small "mom-and-pop" operators to interconnect with the national backbone of large carriers. The Philippines was also divided into ten Local Exchange Carrier (LEC) service areas. The NTC has left PLDT and the local exchange carriers to negotiate among
themselves, intervening only if invited or if the parties cannot agree within 90 days. In mid-1996, the new carriers cited back orders for hundreds of trunks in Manila from PLDT. Other issues to be resolved included billing protocols and cost allocations among the carriers.

4.3. Tariff Reform

Tariff reform in many developing countries is a particularly sensitive issue. Policy makers have traditionally viewed profits, particularly from international traffic, as a source of funds to extend and upgrade their infrastructure. However, competition typically leads to lower rates, although it may create incentives for investment by new operators. Where governments have not yet authorized competition, international callback services have effectively created lower priced alternatives to the monopoly carrier. Callback is thus viewed with great consternation by administrations that have authorized high international rates to generate revenue to extend and upgrade their domestic networks, or to keep local rates low.

Vietnam has one of the world’s highest accounting rates, and perceives callback as illegal and apparently a significant threat to VNPT’s revenues. In contrast, OFTA in Hong Kong has effectively introduced international competition, in spite of HKT’s monopoly until 2006, by licensing competitive local companies which are offering callback access. In fact, the Hong Kong government encourages its departments to use callback to save money.

The Philippines and Malaysia have authorized competitive international gateways. Like Vietnam, Singapore has retained its monopoly, but ST’s tariffs are set to be competitive with a basket of tariffs from other countries. The strategy is apparently designed to protect ST’s monopoly while responding to demands of its information-intensive economy for competitive international pricing. However, Singaporeans are also increasingly resorting to callback to save on international calls.

Operators that retain a local monopoly may turn to their captive customers to make up for revenue lost through competition in domestic long distance (trunk) and international services. For example, in March 1996, Telekom Malaysia received approval from Jabatan Telekom to increase local rates significantly. There was no previous notification that such a change was under consideration, nor any mechanism for users to express their views. One group of users who were likely to be significantly affected were Internet users. In fact, the government-owned Internet service provider protested the increase, and a compromise was reached to introduce a new pricing structure for Internet access.

The Malaysian case illustrates the many conflicting goals of tariff policies. On the one hand, Telekom Malaysia, which is still partly government owned, was apparently
losing revenues to callback, and saw raising its local monopoly rates as an attractive solution. However, Malaysia is also wants to be a leader in introducing new information services, including the Internet. In addition, the government owns the largest Internet provider.

In the long term, competition is likely to force rate reductions for both domestic and international services. Other sources of funding for investment will likely come from growth in volume of use rather than excessively high usage charges, and from policies designed to encourage investment. Yet the lack of rules for fair competition and for participation in the policy process may penalize users in many countries for years to come.

5. Extending the Public Network

5.1. The Carrier of Last Resort

When competition is introduced, regulators face the problem of how to ensure that services are provided to less profitable regions. In developing countries, these are typically rural areas. One model adopted by major industrialized countries including the United Kingdom, Canada, and Australia, is the carrier of last resort. The dominant carrier is required to provide service to these areas, and may receive subsidies from the government or from a fund to which all carriers have contributed.

The dominant carrier may be required to provide service in less profitable rural areas, while competing with carriers which apparently can cream skim the most lucrative business and urban customers. Yet reserving a rural monopoly for the dominant carrier provides no incentive for the company to reduce costs for rural services.

Rural areas may be more attractive than conventional thinking would predict. With new wireless technologies and small digital switches, the investment required to provide rural services has decreased, while demand may be greater than for urban services. For example, in the U.S., rural exchanges put up for sale by large carriers have been bought by smaller more entrepreneurial operators. Also, some small towns now believe that they could support competing networks.

Given the potential profitability of rural networks, regulators could adopt a "serve it or lose it" policy giving operators a time limit within which to establish service; if the operator did not comply, the franchise could be reassigned.

The issue of exclusivity of franchises may also be raised with the availability of domestic and regional satellite systems and new LEO satellites. The most probable scenario is that the dominant carrier would lease capacity from these systems to
provide rural or remote services. Operators often prefer to own and depreciate their equipment rather than leasing from other carriers. Telecom Australia built its own microwave network across the Outback, rather than leasing capacity from Aussat. However, another option would be to allow the wireless or satellite operators to provide services directly to customers. For example, in Malaysia, could Binariang provide telephony services in Sarawak and Sabah, or would it have to least capacity to Telekom Malaysia, which would remain the service provider?

5.2. The Importance of Resale

In many Asian countries, resale is not authorized. Some national carriers have surplus capacity in backbone fiber and/or satellite networks. Without the option of obtaining capacity from the dominant network at wholesale prices, new carriers are choosing to build their own backbone networks, which are highly capital intensive. However, many countries are concerned about their balance of payments, and are seeking to reduce imports. A high percentage of telecommunications equipment is imported in most Asian countries. Authorization of resale could help to reduce trade imbalances by creating an incentive to use surplus fiber and satellite capacity.

5.3. Incentives for Investment

Another approach is to use incentives to encourage investment in rural areas. The Philippines has adopted an innovative strategy to create incentives to install telecommunications networks in unserved areas. Licenses for international gateways and domestic services now require that operators also undertake to install several hundred thousand lines in an unserved region. Executive Order 109 issued by President Ramos in 1993 requires a total of five million landlines from gateway and cellular telephone operators. Each Cellular Mobile Telephone Service (CMTS) operator is required to install a minimum of 400,000 local exchange lines. Similarly each International Gateway Facility (IGF) operator is required to install a minimum of 300 local exchange lines per international switch termination and a minimum of 300,000 local exchange lines, within three years from the date of authority to operate and maintain local exchange carrier service.15

The Philippines' policy of requiring licensees of international gateways and cellular systems to build networks in unserved parts of the country is a very innovative strategy to create incentives to invest in unserved areas. Although some observers have questioned the wisdom of this approach in that it may perpetuate internal cross subsidies, it shows promise as a model that may be emulated in other countries with large unserved territories. Some operators apparently see the new policy as a burden, while others welcome the opportunity, and anticipate profitable operations in their new franchise areas. Perhaps in a few years it will be possible to make a market in these rural franchise areas, so that rights to build and operate may be traded, with operators
interested in expanding their franchise areas buying the obligations from those who find them a burden.

Other strategies being used to encourage foreign investment are:

• joint ventures: partnerships of foreign companies with the operator to offer new services, or subsidiaries of the operator with overseas partners;

• revenue sharing: foreign investors receiving a share of the revenue in return for investing in the operator;

• build operate transfer (BOT): a form of investment offset: private investors build the facility, own and operate it for a negotiated period to earn back their investment, then turn it over to the carrier;

• build transfer operate (BTO) or revenue sharing: similar to BOT, but requires immediate transfer of the project to the carrier after it is built by private investors; the carrier will operate it, and share revenue with investors for a negotiated period.

• local alliances with international manufacturers to produce and sell telecommunications equipment.


In many Asian countries, television is often more accessible than telephone service. In some countries, this discrepancy reflects a deliberate policy to extend mass media for national unity or political cohesion; it may also reflect the comparative difficulty of extending access to interactive communications, which requires links to each customer and switching facilities, compared to broadcasting, which simply requires relaying and retransmitting the signal. (However, distribution of television is also difficult in isolated areas such as the interior of Vietnam and the Philippine archipelago, where satellite transmission may be the least cost solution.)

There are striking differences in access to television vs. telephones in Asia (see Table 4). In Hong Kong, South Korea, Singapore and Taiwan, there are apparently more telephone lines than TV sets. A probable explanation is that the economies of both of these city states are highly information-intensive, so that there is a higher proportion of business lines than would be found in other developed economies with greater land area. Also, the data on TV sets may underrepresent the actual number of sets per household. We can conclude that access to television and to telephone service is close to
universal in these countries.

Table 4: Access to Television vs. Telephone Service\textsuperscript{17}

<table>
<thead>
<tr>
<th>Country</th>
<th>Teledensity</th>
<th>TV Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TV Sets/Tel Lines</td>
<td>Density</td>
</tr>
<tr>
<td>China</td>
<td>2.9</td>
<td>23.1</td>
</tr>
<tr>
<td>India</td>
<td>1.1</td>
<td>5.5</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>54.0</td>
<td>35.9</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>39.7</td>
<td>32.4</td>
</tr>
<tr>
<td>Singapore</td>
<td>47.3</td>
<td>38.0</td>
</tr>
<tr>
<td>Taiwan</td>
<td>40.0</td>
<td>31.5</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1.3</td>
<td>14.7</td>
</tr>
<tr>
<td>Malaysia</td>
<td>14.7</td>
<td>23.1</td>
</tr>
<tr>
<td>Philippines</td>
<td>1.7</td>
<td>12.1</td>
</tr>
<tr>
<td>Thailand</td>
<td>4.7</td>
<td>12.1</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0.6</td>
<td>11.0</td>
</tr>
</tbody>
</table>

However, television is more accessible than telephone service in the other countries. Malaysia has 1.6 times as many television sets as telephone lines; it is likely that the disparity is more significant in rural areas. China, India and the Philippines have more than 7 times as many television sets as telephone lines, while Indonesia has more than 11 times as many, and Vietnam has more than 18 times as many TV sets as telephone lines.

In addition to reflecting policies that have ignored interactive telecommunications in the past, these data also indicate that a significant percentage of households in the China, India, Indonesia, the Philippines and Vietnam has sufficient disposable income to purchase a television set, despite the very low average annual incomes. Of course, some people may place a higher priority on television as an investment for the family. However, it appears safe to assume that households with television sets have members who would use a telephone if it were available, for example in a phone booth or at a kiosk, and that a significant percentage could afford to become individual subscribers.

7. Information Technologies: Access or Control?
Although committed to economic reform, Deng Xiaoping voiced his ambivalence about opening China's doors to the world: "When the door opens, some flies are bound to come in." Other Asian countries appear to share these concerns that information from outside will contaminate their country, even as they encourage investment in information infrastructure. Their attempts to control access include banning satellite antennas, blocking access to Internet sites, and impeding access to the Internet itself and to other means of electronic communication.

As cable entrepreneurs are well aware, the advantage of cable is that it allows the owner to control access to the television channels, which can be received only upon payment of a fee. Of course, cable distribution can also be monitored, so that the government will know what content is being transmitted. Thus cable TV (whether delivered via coaxial cable or optical fiber) may be considered a much safer way to satisfy demand for entertainment than uncontrollable access to satellite channels. Some countries are spurring investment in cable systems as a means of satisfying demand for more channels stimulated by satellite television, but monitoring content.

Satellite television is widely available throughout the region, most notably STAR TV on AsiaSat, but also other national and regional satellites such as Indonesia's Palapa, Thailand's Thaiicom, Malaysia's new Measat, and PanAmSat. Countries larger than Singapore are already unable to enforce bans on satellite antennas; controlling access will be more difficult as signals on new high powered satellites can be received with easy-to-hide wok-sized antennas.

An alternative solution is to precensor programs so that only those deemed suitable are delivered by satellite. Eager to reach Asian markets, satellite programmers are willing to comply. Ironically, video compression technology, which has been introduced for DBS services to deliver more channel choices than are typically available on cable, now provides a cost-effective means to limit choice by distributing precensored programming. Networks with regional uplinks, for example, can digitize programming, add subtitles or soundtracks in different languages, edit out material deemed offensive by various national governments, compress the channels, and transmit several versions of the same program on a single transponder. The decoders sold in each country will be programmed to allow reception of only those channels approved by its government.

Such policies would not be surprising, perhaps, among countries with less developed economies or less entrepreneurial citizens. Of course, it is virtually impossible to prevent electronic access to information. Yet their commitment to a policy of control seems directly at odds with industrial policies designed to upgrade their telecommunications infrastructure and attract more high tech and information-based industries.
8. Promises and Pitfalls

The Asian experiences reviewed in this paper point out both the promise of increasing access to telecommunications and the pitfalls of policies that may turn out to be inequitable to new competitors or to users, or may actually serve to limit access to information.

The lessons from these varying approaches to telecommunications policy reform may be relevant to both other developing countries and to many industrialized economies. Separating policy and regulation from operation must mean more than changing names and separating offices. Introducing competition requires setting and enforcing the rules of the game in interconnection, settlements, and standards. Extending service to rural areas will increasingly require incentives rather than subsidies.

Perhaps most significant is the need to acknowledge that the inevitable result of investing in information infrastructure is to increase access to information. Telecommunications planners and policy makers in both developing and industrialized countries must recognize that the sharing and utilization of information, and not the mere extension of networks, should be the ultimate purpose of telecommunications policy reform.
REFERENCES


Personal interviews with telecommunications industry and regulatory officials in Singapore, Malaysia, Hong Kong, the Philippines, and Vietnam, January to June, 1996.


Biography

Heather E. Hudson, Ph.D., J.D., is Director of the Telecommunications Management and Policy Program, McLaren School of Business, University of San Francisco, San Francisco, California 94117, USA (phone: 415/422-6642; fax: 415/422-2502; E-mail: hudson@usfca.edu). She has written and consulted widely on telecommunications and development issues, and was a special advisor to the Maitland Commission. She spent 5 months in Asia in 1996 on a Fulbright Distinguished Lectureship. Her most recent book is *Global Connections: International Telecommunications Infrastructure and Policy* (Van Nostrand Reinhold, 1997).


7. Budden, p. 3.


13. Interview with DGPT, Hanoi, April 1996.


SATELLITE BROADCASTING
AND MEDIA FUTURES IN ASIA

Dr. Hart Cohen
Dr. Brian Shoesmith
TOPIC: Satellite Broadcasting and Media Futures in Asia

* Results of scholars who have recently completed research in selected sites in Asia.

* Themes that dominate the analysis of this research are regionalisation, cultural and political autonomy and policy development.

BIODATAS:

Dr. Hart Cohen
Dr. Hart Cohen is a lecturer and researcher with the Research Centre in Intercommunal Studies, University of Western Sydney, Nepean, Australia. Dr. Cohen has published widely on media, culture and communications. His most recent research was conducted on the local consumption of satellite television in Indonesia which has formed the basis of policy advice on international broadcasting to the Australian government.

Dr. Brian Shoesmith
Dr. Brian Shoesmith is Director of the Centre for the Study of Asian Media, Culture, and Communication at Edith Cowan University, Perth. WA. Prof. Shoesmith is widely published on Indian Cinema and Satellite Technologies in Asia. His most recent research is on the local consumption of Television in China based on field work in Wuhan.