

Issues and Prospects in Asian Telecommunication Sector: Promise and Reality

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Abstract

This paper reviews deregulation, privatisation, market access, competition law and other issues in the telecommunication sector in Asian countries. While Asia as a whole appears to be a latecomer and laggard in telecommunication sector development, there are some very advanced telecommunication sectors in Japan and the Asian NIEs. Increasingly, globalisation has affected telecommunication sector as everywhere else. On the other hand, Asian developing economies can be as easily caught in a widening digital divides as national information infrastructure lags both due to inadequate capital and human resource development. Thus, telecommunication development in Asia is both a promise and a reality check. An almost instant graduation is witnessed as developing Asia can grasp the latest in technology if finessing that is somehow worked out. The promise is a window of opportunity to be leverage up quickly and be connected and integrated with the global economy. The threat on the other hand, is the worsening the digital divide because of the uneven levels of progress and complex technical and regulatory contexts. Asia has not quite caught up with many of the trends and developments. Yet, both billion-populated China and India are rich lodes both on the supply side of technology and production and on the demand side of consumer market. The market for telecommunication technology is certainly in developing countries and Asia is a formidable and challenging land mass by geography, gross domestic product (GDP), population and pent-up purchasing power.

The telecommunication industry is characterised by falling costs with technological advancements as in optic fibre, digital and satellite transmissions with quality or bandwidth determine prices rather than distance in the future, privatisation of state-owned monopolies, Internet and related technologies. The three major market segments in content (creating information), communication (moving information) and application (using information) are getting blurred. However, developing countries face incomplete infrastructure, scarce human resources, paucity of information, weak legal, regulatory and institutional framework and limited interest of foreign investors and banks.

Technology and consumer demand have driven reforms in industrial and developing countries in commercialising and separating operations from the government, increasing participation of private enterprise and capital, containing monopolies, diversifying supply of services, developing competition and shifting government responsibility from ownership and management to policy and regulation. The last ten miles to the consumer is a telecommunication landscape shaped by regulatory history, technological advance and commercial innovation. The march of technology overwhelms entrenched regulatory institutions and pries open protected. The convergence of wireless telecommunication, video distribution and computer technology have created opportunities for new suppliers to enter local communication services while at the same time broadening the markets in which the local exchange carriers operate. Access to the public switched telephone network by cellular radio, personal communication system, cable television network or competitive access provider's fibre optic ring in multimedia variation (voice, data, video), by volume (bandwidth or transmission speed) and type of user (residence, business, government, urban, rural) have created demand by market segments. The role of regulation has thus changed to facilitation, from franchise monopoly to a more competitive environment.

Market access and national treatment are the key issues in competition policy as nontariff barriers resulting as part of regulation. Three common types of market access limitations are on number of suppliers, restrictions on type of legal entity and on participation of foreign capital. Significant differences vary for developed and developing countries' commitments on market access issues. Emerging economies tend to maintain restrictions on number of suppliers and types of legal entity. Other restrictions include those on bypass of or requirements to use monopoly network facilities, restrictions on resale excess capacity of leased circuits or prohibitions against interconnection with other leased circuits by suppliers concerned. Limits on foreign equity participation are, however, not as frequent as in industrialised economies as for developing economies as being infrastructure-deficient, they would welcome foreign investment.

A clear policy preference for "managed competition" on many Asian countries is observed and the protection is more due to political economy reasons than economics. There are relatively larger welfare gains from increased competition than from a change in ownership. There are no convincing arguments for not introducing market competition from a technical standpoint or scale economies. As an exemplary lead, Japan and the Asian newly-industrialising economies (NIEs) could pave the way. On regulatory reform, competition and liberalisation, the NIEs should liberalise further by allowing competition in nonvoice services, foreign ownership rules relaxed for privatization. Many economies can learn from Thailand's build-operate-and transfer (BOT) arrangements and other modalities of public-private partnerships (PPPs) to bring in private investors. Parallel networks as a means of competing with the existing operator would need adequate regulatory structures which are still largely lacking in Asia. China is unique by its size and transition from a social market economy to a more market economy and it is clearly a case in its own rights. However, if China has difficulties or fails to fulfil its commitments to WTO and GATS in telecommunication services, the repercussion would have far-reaching implications for both the developed and developing countries.

Ultimately, there is no single best model for liberalization and competition. Be it in the area of regulation, competition or trade liberalisation as political economy differs. In the final analysis, Asia cannot be a laggard as a global information economy comes with free trade in telecommunication and information services, in turn, generating a global information society. Like globalisation, it is not so much a choice between it is desirable or not, but that the telecommunication revolution and deregulation have already arrived. It is best to get on with the issues and challenges as preparing the economy, labour force and society takes mindset changes as well as infrastructure and education and training.

1 Introduction

Telecommunication development in Asia is both a promise and a reality check. On one hand, the promise is a window of opportunity to be leveraged up quickly and be connected and integrated with the global economy. The threat on the other hand, is the worsening of the digital divide because of the uneven levels of progress and complex technical and regulatory contexts. The telecommunication industry is characterised by falling costs with technological advancements as in optic fibre, digital and satellite transmissions. Quality or bandwidth increasingly determines prices rather than distance with competition from privatisation of state-owned monopolies, deregulation and a spectrum of substitutes and complements from Internet and related technologies. The three major market segments in content (creating information), communication (moving information) and application (using information) are converging and getting blurred.

Most of developing and emerging Asia has not quite caught up with many of these trends and developments. Yet, both billion-populated China and India are rich lodes both on the supply side of technology and production and demand side of consumer market. The market for telecommunication technology is certainly in developing countries. Asia is a formidable and challenging land mass by geography, diversity, gross domestic product (GDP), population and pent-up purchasing power for information, knowledge and consumables deliverable by information, communication and technology. What stands between Asian telecommunication and the rest of the world is symptomatic of the frictionless new economy challenging the friction-impaired economy.

The consequences of regulation and deregulation is about right of freedom of movement, dimension of self-realisation, liberation of the spirit into the varied and abundant realms of human experience including entrepreneurship (Ellison, (2002, pp 1-2). In general, deregulation and privatisation of parts of the telecommunication industry outside the US have been taken in a series of small rather than big bangs. Japan has not deregulated to extent of the US or UK, but appears to be moving toward encouragement of alternatives, competition stimulated in provision of basic network services, shared use and freedom of routing in all international communication, resale of basic services allowed and new forms of international transmission facilities including satellites and transoceanic cable systems.

Yet, the emerging catalyst of third-generation (3G) wireless communication for voice and data transmission is making inroads to Japan and Korea. If Korea as the exemplary wired-up and online information economy and society is no longer the exception but the rule in the rest of Asia, the transformation in both hard and soft infrastructure in the rest of Asia will simply be stupendous. The experience will probably outmatch Anglo-Saxon experiences and give such telecommunication firms a cause for response and strategic action.

What was once conducive to a political bargain built around national telephone monopolies has morphed into an international cartel built around bilateral bargaining. The framework remains guided by multilateral commercial rules under the World Trade Organisation (WTO) and the General Agreement on Trade in Services (GATS). The 1997 WTO agreement on basic telecommunications services has 69 governments, including the US, European Union (EU), Japan, India, Pakistan, Korea and Malaysia, comprising more than 90% of global telecommunication revenues, make commitments to open up their respective telecommunication markets beginning in 1998. Commitments involved

three basic areas in market access, foreign investment and acceptance of certain regulatory principles intended to make market openings meaningful.

An epistemic community is opening the international telecommunication regime with the momentum of free trade facilitated by the microchip digital technology. Technical change affecting structural and price changes should shift incentives facing private and government actors. In turn, they would alter the developmental path of the telecommunication industry and the whole economy. A new mix of institutional jurisdiction and players have emerged, including bureaucratic and political entrepreneurs on one hand, and technology and business entrepreneurs, on the other. All of them perceive and act on the emerging opportunities which lead to creative destruction, displacements and convergence. In reality, neither the policing of natural monopolies nor the political economy rationale of public utility regulation have proceeded at the pace and extent as promised by technology.

Asia is caught in a developmental and technology sandwich, better than most other developing countries since its economic sprint in the 1980s though this was not quite a sustained marathon race foreclosed by the Asian crisis, but a ways from the Organisation of Economic Cooperation and Development (OECD). Whichever way Asia makes its entry, from the periphery or plunge straight into breakthrough technology including global positioning system (GPS) and second generation broadband Internet, it has to do so credibly. The laws of economics apply in cyberspace, the relentless winner-take-all contest apply to competition in the Internet economy. Contradictions, paradoxes and puzzles remain like two competing video format technology as VHS and Beta existing simultaneously in an imperfect market rather than information communication technology leading to perfect information and competition. Asia has yet to catch up in market competition and related institutional development. The GATS basic agreement refrains developed countries from imposing conditions on the access to, and use of networks and services except when universal service and technical integrity are affected. But developing Asia has to rise to the occasion with technical cooperation rather than resort to delaying tactics.

This paper aims first to identify telecommunication trends and developments in Asia in Section 2 before crystallising the issues concerning deregulation, privatisation, market access, competition law and others in the telecommunication sector in Section 3. Section 4 focuses on the prospects for these issues and impact on future development with a case-study of how Singapore is rising to the challenges before concluding with some policy implications and prognosis.

2 Overview of telecommunication developments in Asia

Telecommunication industry development across the region is characterised by the rapid pace of growth and change, the large number of participants and wide variations between the developed and less developed countries of the region. As in other regions, telecommunication is dominated by the involvement of the major transnational corporations (TNCs). However, the approach taken by these large companies tends to be determined by the national context and the degree to which individual governments are prepared to make special concessions toward TNCs to secure investment for telecommunication development. More often, TNC needs are being brokered and met

through the agreements reached with the WTO as the primary body overseeing the process of economic globalisation.

In the past decade, the telecommunication sector is one of the main drivers of industrial development. It is recognised that development of infrastructure in this sector is an essential precursor to economic liberalisation and movement into the global economy. This is especially true in Asia and it is as much a feature of industrialised countries as it is in the developing countries of this region. For developing Asian countries with low teledensity, the need to establish telecommunication infrastructure which will satisfy the needs of industry for high quality, high speed data and other value-added services must be balanced with national development objectives. More specifically is the need to provide basic universal telephone services, including the rural areas. For industrialised Asian nations, the priority is to respond to consumer demands for constantly upgraded services and facilities arising from the industrial and business sectors. In both cases, the need for investment capital which will provide the infrastructure for development in the telecommunication and information technology (IT) sector requires a holistic approach including financial sector sophistication .

The new telecommunication world is increasingly characterised as private, competitive, mobile and global. More than half the countries in the world had fully or partly privatised their incumbent operators and they accounted for 85% of the world market by revenue (International Telecommunications Union, Annual Regulatory Survey, 2002). Competition is the de facto norm in international telephony services and the majority of countries allow mobile and Internet competition, leading to a boom in network growth. Mobile communication has surpassed fixed lines. Currently, 97 countries have more mobile users than fixed-lines and almost 1 in 6 people on the planet have mobile telephones. The globalising nature of telecommunication is due to investment holdings in offshore telecommunication operators, regional and multilateral agreements and crossborder services such as mobile and calling cards. However, 75% of all regulators, including some of the oldest and most established regulators, lack sufficient staff resources. China has only 800 people to supervise telecommunication for the Ministry of Information Industries compared to over 3,000 in the US, the power is not in commensurate with implementation, monitoring and policing of operations (International Herald Tribune, 19 August 2002, p 1).

An overview of international telecommunication environment and the Asian setting shows the telecommunication market is indubitably robust and healthy with double-digit growth rates for mobile communication in particular (Law, 1994). Seemingly traditional and conservative, Asia is at the forefront of privatisation and liberalisation initiatives as the benefits from liberalisation and technology are overwhelming leading to immense infrastructure and loosening of tariff policies. Various segments for digital switching, transmission, customer premises equipment, optic fibre with emphasis on subsea cabling, satellite communication with rapidly growing penetration of very small aperture terminal (VSAT) systems, mobile or cellular communication , value-added services and private network hubs as in corporate hubs are all vigorous and dynamic. Urbanisation is an important consideration in telecommunication planning and marketing. Asia offers diversity and contrasts in geography and terrain from archipelagic to mountainous formations, demography from

dense urban to sparse rural, level of development and economic socio-political goals. China is certainly in a league of its own by sheer size, diversity and complexity.

But it is in Hong Kong where a roll-out of 3G services is a full year ahead of Singapore. Here is a matter of business savvy as Hutchison Whampoa remains an aggressive 3G player outside of Japan and Korea (Business Times, 26 August 2002). Hutchison will start 3G services in the UK and Italy in October 2002 and in Sweden, Denmark, Austria, Hong Kong and Australia in the first quarter of 2003. Investors elsewhere are more wary of 3G which aims to deliver Internet connections to mobile handsets to offer smooth audio, video and graphics.

As other telecommunication operators around the world write down their investments, delay or even cancel their rollouts, Li Ka-shing's faith in 3G has seemingly never wavered. Whether it will be a firstcomer advantage, the jury is still out on whether consumers want or need 3G technology as the price is hefty, a British consumer pay HK\$7,500 for a 3G handset while a Hong Kong consumer pay HK\$15,000. If Hutchison is practising some cross subsidy to capture market share or extend its footprint in Europe, there are concerns of what it has paid for licences, more to build the networks and impact on financial profile, creditworthiness and business risk in diversification outside Hong Kong.

Many Asian economies are in the Asia Pacific Economic Cooperation (APEC) which has pushed ardently for liberalising trade in telecommunication goods and services and has contributed much to both the WTO and GATS processes in telecommunication. The Asia-Pacific Telecommunity (APT) studies country policy and regulatory and at the multilateral level, Asian countries in the ITU inter alia, seek access on a competitive basis for all users, harmonization of networks to promote global interoperability and integration. National information infrastructure (NII) progressing to global information infrastructure (GII) would be the ultimate in telecommunication globalisation. The drive for infrastructure investment has, to a large extent, moved the policies of governments towards the full liberalisation of the telecommunication sector as much driven by both WTO and GATS and as part of a strategy towards economic globalisation.

Much criticism has been directed at these agreements which tend to focus on the interests of business for free competition, while failing to convincingly address the implications of telecommunication deregulation on the provision and costs of basic services, especially for rural consumers. The latter half of the 1990s saw the sharpest rise globally in the rate of telecommunication network growth since the 1950s, while investment in infrastructure exceeded \$200 billion in 2000. However, while the gap between developed and developing countries in telephone lines is closing, a divide is opening up in the availability and quality of Internet access.

Tables 1 to 6 provide some indicators of both the uneven and diverse levels of telecommunication development and Internet access across Asia.

Table 1 Quality of competition in telecommunication and ISP sectors (quality, price)

	Telecommunication sector		ISP sector	
	Rank	Score	Rank	Score
Japan	33	5.0	30	5.5
Korea	16	5.8	17	6.1
Taiwan	20	5.7	32	5.4

China	58	3.4	69	3.4
Hong Kong	6	6.4	7	6.4
Spore	12	6.0	21	5.9
Indonesia	48	4.1	49	4.6
Malaysia	38	4.7	53	4.4
Philippines	36	4.8	45	4.8
Thailand	44	4.5	50	4.6
Vietnam	67	2.7	73	3.1
Bangladesh	69	2.7	63	3.8
India	41	4.6	38	5.1
Sri Lanka	42	4.6	57	4.0

Source: Global Competitiveness Report, 2002.

Table 2 Cellular telephones (subscribers per 100 pop) and telephone lines (main lines per 100 pop)

	Cellular telephones		Telephone lines	
	Rank	Score	Rank	Score
Japan	23	52.6	8	65.3
Korea	19	56.7	23	46.4
Taiwan	1	80.3	13	56.8
China	53	6.6	54	11.1
Hong Kong	2	80.2	12	57.8
Spore	9	68.4	20	48.5
Indonesia	68	1.7	71	3.1
Malaysia	36	21.3	45	19.9
Philippines	52	8.2	68	3.9
Thailand	60	4.4	60	8.7
Vietnam	71	1.0	70	3.2
Bangladesh	74	0.1	75	0.3
India	73	0.4	69	3.2
Sri Lanka	65	2.4	67	4.1

Source: As in Table 1.

Table 3 Adequacy of communication (availability, reliability cost) and new IT

	Communication		IT	
	Rank	Score	Rank	Score
Japan	31	6.62	34	6.60
Korea	13	8.33	20	7.60
Taiwan	25	7.24	25	7.37
China	44	5.53	44	5.84
Hong Kong	7	8.74	11	8.37
Spore	5	8.81	4	8.81
Indonesia	49	4.48	47	5.56
Malaysia	23	7.68	21	7.58
Philippines	48	5.77	37	6.42

Thailand	35	6.35	39	6.30
Vietnam	Na	Na	Na	Na
Bangladesh	Na	Na	Na	Na
India	45	5.46	31	6.76
Sri Lanka	Na	Na	Na	Na

Source: World Competitiveness Yearbook, 2002.

Table 4 Internet users (no per 1,000 people), suitable Internet access (availability, speed, cost)

	Internet users		Internet access	
	Rank	No/1000	Rank	Score
Japan	17	383.95	35	6.75
Korea	8	510.04	9	8.98
Taiwan	18	351.53	24	7.64
China	45	26.27	43	6.19
Hong Kong	13	427.37	10	8.98
Spore	9	468.95	13	8.81
Indonesia	48	14.88	48	5.78
Malaysia	36	99.28	23	7.71
Philippines	47	17.46	38	6.48
Thailand	40	58.17	39	6.43
Vietnam	Na	Na	Na	Na
Bangladesh	Na	Na	Na	Na
India	49	9.83	41	6.29
Sri Lanka	Na	Na	Na	Na

Source: As in Table 5.

3 Issues

As alluded above, the issues identified and discussed in this order include deregulation, privatisation, competition, market access as in trade liberalisation, technology, impact of digital divide on equity, catching up with the rest of the world, labour issues and finally, the attainment of an information society alongside the information economy.

Deregulation, privatisation

Telecommunication reform is theory-poor with only descriptive and atheoretical case studies (Choo, 1998). Technology and consumer demand have driven reforms in industrial and developing countries. The resultant commercialisation and separation of operations from the government is witnessed in increasing participation of private enterprise and capital, containing monopolies, diversifying supply of services, developing competition and shifting government responsibility from ownership and management to policy and regulation (Wellenius and Stern, eds, 1996, p 3).

The complementarity between telecommunication development and the movement of persons as service providers as in presence of natural persons in GATS'

mode 4 has further to be considered (Ghosh, 1997, pp 67-9). Effective and efficient telecommunication for electronic transmission may replace some temporary visits by professionals, on-site consultation and contract negotiation. The converse may be true if some support professional service is supplied by the exporting country or through commercial presence under mode 3.

The last ten miles to the consumer in the telecommunication landscape is shaped by regulatory history, technological advance and commercial innovation (Vogelsang and Mitchell, 1997, p 4). The march of technology overwhelms entrenched regulatory institutions and pries open protected markets like the advent of microwave radio transmission enabled MCI to bypass AT&T infrastructure monopoly in the 1970s. The convergence of wireless telecommunication, video distribution and computer technology have created opportunities for new suppliers to enter local communication services while at the same time broadening the markets in which the local exchange carriers operate. Access to the public switched telephone network by cellular radio, personal communication system, cable television network or competitive access provider's fibre optic ring in multimedia variation (voice, data, video), by volume (bandwidth or transmission speed) and type of user (residence, business, government, urban, rural) have created demand by market segments.

The role of regulation has changed from franchise monopoly to facilitation in a more competitive environment. The natural monopoly is challenged by successful competitive entry in parts of telecommunication market. Regulation may still be justified in some bottlenecks for specific inputs and the global network externality has magnified the importance of bottlenecks where uncompensated spillover benefits are conveyed to all network customers by interconnection of such competitors. Interconnection will remain a major regulatory issue for local telecommunication markets as long as these are dominated by local exchange carriers whose prices and public service obligations require regulation after entry regulation is dismantled. Regulating competition should be directed at the competitive goal, reduce entry barriers and other restrictions facing competition rather than to prevent a monopoly in one market from competing with another. Regulation should ultimately retreat and be replaced by competition policy to be discussed shortly.

The wholesale market consists of two closely related segments, special access and switched areas. The retail market is more differentiated into local, long distance and wireless services. In the first stage of evolution of the telecommunication, both are monopolised with competition in the first retail markets, long distance and wireless services emerging in the second stage, but whole sale remains largely monopolised. The lag in wholesale market liberalisation has made retail market competition less than fully effective with local competition in particular suppressed and wholesale the target of regulatory action. In the third stage, competition in the wholesale market occurs by bypass and unbundling of wholesale services. Only a few miles remain in the next fourth stage with the retail and wholesale markets competitively structured. It is likely, but not certain that the wholesale telecommunication market will then behave like other competitive markets, provided the rapidly diminishing costs for retail subscribers of switching equipment are small.

A complex array of interrelated parameters make policy choice hard. What areas to open to competition and which to maintain for monopoly provision and regulatory

safeguards to guarantee competition and fair practices are political economy choices as well. However, it is clear all stakeholders benefited from the reforms, governments, operators and service providers, consumers and employees. In developing countries, the persistent pitfalls lie in state monopolies generally falling short of meeting service requirements with large unmet demand for connections, call traffic congestion, poor service, limited territorial coverage, user willingness to pay and user pressure to develop own facilities as public service fails. The main constraints include investment capital, organisation and management, sector policies as lacking freedom and incentives to perform efficiently.

Since WTO Agreement on Telecommunications Liberalisation 1997 and GATS Basic Agreement on Telecommunications 2000, the pressure for regulatory reform has spawned a number of modalities. The main problem in most jurisdictions is how to deal with the dominant incumbency (Scott, 2000). Effective regulatory reform includes a strong and independent judiciary, unified and credible government structure, “a culture of flexibility” with informal controls and state administrative capacity. The institutional design for telecommunication deregulation must marry some fundamental principles of regulatory effectiveness with local environmental conditions which determine effectiveness dealing with incumbency and new entrants.

Regulation can be mandated, but self-regulation or incentive regulation may work as effectively. Incentive regulation responds to market discipline as the implementation of rules which encourage a regulated firm to achieve desired goals by granting some, but not complete discretion to the firms is an alternative to rate-of-return regulation (Sappington and Weisman, 1996, p 2). Rate-of-return regulation is a form of cost-plus regulation which secure an adequate supply while limit divergence between what consumers pay service and what it cost the service they receive to produce. Its disadvantage is limited financial incentive for regulated firm to reduce production cost and develop and supply superior services. Without perfect information about demand and technology, incentive regulation may do better.

The approaches to telecommunication sector reform can be piecemeal as in the US, gradualist as in the UK, goal-oriented as in Argentina or strategic as in the EU to develop a single European market. Lessons from crosscountry experiences show ownership matters in privatization which is no panacea with complex facets and sequencing when introducing private capital and know-how. Essentially, competition and regulation are the twin intertwined pillars of reform, less political than selling state enterprises, but an inherently slower and more laborious process. The single most troubling regulatory shortfall lies in developing regulatory capabilities regarding prices, service obligations, technical interconnection, accounting standards and performance monitoring, competitive behaviour and access to public domain. With little or no regulatory tradition in any sector, privatised companies are in a regulatory vacuum with little or no competition faced. Again political will is imperative for committed and strong regulatory leadership, good and fair management to effect knowledge transfer and accessibility to occur.

American and Canadian models are decentralised industry-specific regulation with the establishment of an independent federal regulator while the state or provincial administration maintain regional jurisdiction with local authorities. UK is centralised industry-specific regulation administered via a national regulatory body. Germany,

Malaysia, Singapore, Japan and Korea have separation of operational and management functions of traditional carriers from regulatory functions with regulation maintained in governments. Taiwan and Vietnam maintain regulatory and operational power within government departments responsible for telecommunication. Different structural arrangements and different levels of competition thus result, from hands-off approach to regulation in the US meaning regulation is avoided simply by using Internet to regulatory asymmetry predicated on separate treatment of players and services (carriage and content) within and across ICT sectors much as symmetry and neutrality across ICT sectors is also advocated. Vertical integration leads to economies of scale and scope or concentration.

Control of distribution and content is through a combination of vertical and horizontal ownership regulation, restrictions of cross-media service provision by single firms and reliance on common carrier concept, obligated to accept all comers without prejudice. Public utility pricing regulation is driven by commitment to universal service policies and efficient use of resources, curb monopoly or have a price cap as a maximum ceiling fixed on a basket of services. Interconnection and access issues involve inefficient duplication of infrastructure and capital investment, incompatibility and diverse range of network and service standards. National information infrastructure strategy varies from competition in the US to less competitive approach as in Singapore and elsewhere in Asia which focus more on infrastructural development.

The global information infrastructure for a dynamic international environment for information communication technology necessitates a constructive dialogue and coordination, with private investment, competition, open access, flexible regulation and universal service to be achieved. Comparing different national approaches is truly a maze with diverse and varying roles for players and expectations of broad economic and social outcomes. Competition policy is an attempt to navigate and progress through the maze. Self-regulation by industry may retain industry flexibility and avoids expense and divines of imposing and policing regulation if market forces are relied upon with the right incentives. There is still no escape from formal regulation. At the heart of the maze is access to networks and services. As boundaries blur, driven by technology and service diversification of industry players, market interdependencies and balancing of economic and social objectives have to be appreciated in cross impact of regulations applied to different markets and players.

Privatisation has to be inserted into the political process, starting with the government clarify its position regarding tradeoffs among conflicting interests and sort out appropriate incentives to create a pro-competitive market structure and regulatory environment. Initial privatisation where governments have successfully sold to consortia led by experienced foreign operating operators with capable managers, specialised management tools and continued access to technology and good financial performance reflecting both tariff adjustments and lower costs, may face longer term concerns. Privatisation is perceived by investors in a number of countries as posing higher political risks or offering less attractive markets, posing raising post-privatisation capital as a problem and incentives and obligations by governments are not strong enough to secure their permanence for the long gestation periods of companies. When only five or six major operating companies will dominate the world market, cartel-like proposals feature in privatising exercises, not when 12 or 15 companies provide an alternative competition scenario.

In Asia, apart from telecommunication reforms as part of broader economic and industrial reforms, results in developing Asia are scattered and mixed. Reforms in Asia were initially slower and more limited in scope, privatisation has been uneven ranging from liberalisation in Japan in the 1980s, Australia and New Zealand since early 1990s to partial privatisation in the Asian newly-industrialising economies (NIEs) in the 1990s (Singapore, Hong Kong, Korea and Taiwan) and state-controlled competition in China since 1994 (Ure and Vivorakij, 1997, p 5). The pace is slow with corporatisation in Malaysia in 1987 and subsequent privatisation in 1990, even later corporatisation in Indonesia in 1990, each with its political economy even ethnic reasons. The pace accelerated as Thailand embarked on build-operate-transfer (BOT) ventures, the Philippines developed competition for international services, Indonesia established a partially state-owned competing international operator and Malaysia issues several international gateway licences, all in 1993.

Developing countries face incomplete infrastructure, scarce human resources, paucity of information, weak legal, regulatory and institutional framework and limited interest of foreign investors and banks. In contrast, more wide-ranging and faster reforms involving competition, regulation and state enterprises have occurred in Australia and New Zealand. Some early lessons from industrial countries show the process is complex and there is no single model or design because of multitude of factors, conflicting interests and interrelated events involved and the regulation structure after reform actually becomes more involved and complex with privatisation.

While the same considerations may drive privatisation, there is a distinctly local flavour throughout the region. Separating state and nonstate interests is not rigid and the politics of ethnic and nation-building can be overwhelming. A state-sponsored “consensus” is often the preferred approach. While a precondition for free telecommunication market in facilities and services as advocated by APEC, GATS and WTO, privatisation in Asia remains embedded in broader industrial, political and social aims. Innovative policies and strategies are needed to meet pent-up demand and entrepreneurship in the new technology and policy environments.

Between traditional monopolised public carriers and private networks of very large corporations, managed service mediate as providers by charging a premium on specialized services such as customised care of high-volume accounts, high-profile niches (Zita, 1996). Hubbing options have started in Japan, Hong Kong, Singapore, Australia, as also Malaysia and Taiwan joining the corporate network hub sites. Users have no clear choice for networking in Asia as firms outsource to carriers through managed network services to be cost effective, while others continue to manage own networks to maximise technological control and exploit falling circuit charges. Competition is intense, the real differentiating factors lie in international alliances, networking management and outsourcing capabilities, customer service and local.

Regulatory protocols determined in WTO negotiations have proved problematic in a number of settings and agreements to establish independent regulatory bodies have often failed to take account of community needs. This tends to suggest that the policy underlying their establishment has often been unduly influenced by the interest of business and the telcos that will be subject to their regulation in any given national context. Durable machinery for the protection of consumers outside the business-industry-government loop is not convincingly present. This often leads to a situation

where the incumbent operator, particularly in the case of a state-owned or privatised state enterprise which continues to hold the responsibility to provide universal service, is handicapped in relation to newcomers in the competition for high-profit services, by regulatory regimes that lean too far towards the interests of foreign capital investors.

The question of regulatory regimes which are independent while remaining responsive to the needs of ordinary consumers and the goal of universal service, inevitably leads to the issues associated with access to the advanced technological applications associated with the Internet. Developing countries with low teledensity remain highly disadvantaged by poor access to timely information which can cement current structural inequalities existing between the IT-haves and IT-have-nots. Access to IT, the internet and all possible implications of that outcome for developing countries is predicated upon the existence of the necessary telecommunications infrastructure. Increasingly, national development goals are associated with the need to establish not only a population with high levels of functional literacy in the national language and at least one other, but also a technologically literate population. The wholesale deregulation and privatisation of the telecom sector will not ensure that any such goals can be achieved unless there is representation of the interests of workers and consumers in the national policy planning for the telecommunication sector.

Competition, market access, trade liberalisation

Considering the spectrum of approaches in competition, New Zealand applies general competition and trade practice law while Australia regulates competition and access issues by generic competition regulator with regulation of technical, consumer and carrier licensing arrangements in a separate industry specific regulator (Northfield, 1999). Except for Japan, Korea and Taiwan which have been heavily influenced by the US, generic competition policy, anti-trust or commissions of monopoly and competition are generally not the rule in the rest of developing Asia. Singapore has sectoral liberalization and competition policies including financial, energy and telecommunication sectors. However, it is preparing itself for a generic competition law as it perceives WTO is going that way and its partners in bilateral trading arrangements, notably the US, Japan and EU are pressing it in that direction.

Market access and national treatment are the key issues in competition policy as nontariff barriers resulting as part of regulation. Three common types of market access limitations are on number of suppliers, restrictions on type of legal entity and on participation of foreign capital. Significant differences vary for developed and developing countries' commitments on market access issues. Emerging economies tend to maintain restrictions on number of suppliers and types of legal entity. Other restrictions include those on bypass of or requirements to use monopoly network facilities, restrictions on resale excess capacity of leased circuits or prohibitions against interconnection with other leased circuits by suppliers concerned. Limits on foreign equity participation are, however, not as frequent as in industrialised economies as for developing economies as being infrastructure-deficient, they would welcome foreign investment.

Trade and telecommunication are related and the pivotal role of telecommunication in the global economy has prompted liberalisation of monopolies and liberalised trade in telecommunication equipment (ITA) and services (basic

telecommunication agreement). Many of complexities of trade policy appropriated by politicians and popular commentary and lessons extracted from technical, theoretical writings passed into the realm of common wisdom as “unadulterated nonsense” (Cass and Harding, 1998, p 240). Unequivocal open markets in international trade in telecommunication equipment to secure maximum economic welfare depends on particular factual assumptions and it may well be more a selection of the best policy. Much needed empirical information as in economies of scale and scope to be sufficiently great in specific segments of telecommunication equipment market is difficult to ascertain.

Export licensing of telecommunication equipment for military purposes produced by a few nations may be justified as while none of the restraints is demonstrably beneficial, none can be conclusively proved to be inimical to national economic welfare. In part, empirical information is unavailable because it concerns human motivations and intentions which are difficult to plumb. Informed predictions about behaviour of policy-makers is not the same as knowing with certainty their reactions in particular circumstances, a common and benign problem. In part, the revolutionary and peculiar nature of the telecommunication industry makes for inaccessibility of empirical information. But the issue is definitely political and security related.

The US export-control regulations do more than regulate the export of high technology to China. There are some less known rules governing the hiring of Chinese research scientists to work for US conglomerates (Far Eastern Economic Review, 29 August 2002). To hire a Chinese engineer who does not have US permanent-resident status to work in a US company on controlled technology such as high-speed computers, it must apply for an export licence. The technical information the worker gets access to is deemed to be an export back to China even if the worker stays in the US. In 2001, US companies applied for about 900 "deemed export" licences involving people of all nationalities, of which the lion's share were for Chinese nationals. Only a handful were denied. But U.S. companies complain these licences waste valuable time, hinder technology transfers and make it more difficult to attract the best and the brightest. Since September 11, 2001's terrorist attacks in the US, approvals ground to halt because American intelligence officials were preoccupied with the al-Qaeda network.

Divining information in a rapidly and profoundly changing industry is extremely difficult, but without which, assessment of open trade or trade restraint to advance national interest is as problematic. Increasing ownership of telecommunication firms by private investors, coordination among firms increasing competition in sophisticated network switching equipment have ameliorated the situation. Discretionary trade protection creating net losses or identify welfare-enhancing trade restrictions may be suggested for a simple, open trade rule though open trade is a baseline. If opening foreign telecommunication markets is a priority for US trade policy, Asian countries will face formidable demands from that crucial trading partner.

Digital divide, NII

Regulators have a critical role to play in bridging the digital divide by creating a climate conducive to enhanced investment and diffusion of services. However, this can only be achieved if they are given the right tools and resources to become effective. This

requires, inter alia, a firm mandate and clear goals, sufficient human and financial resources, adequate enforcement powers, organisational flexibility and timely decision-making. Most fundamentally, governments and regulators have an on-going responsibility to ensure universal access to telecommunication and this requires that technology and services provided are reasonably priced. Even electricity charges matter as there is absolutely no accessibility if energy and telecommunication charges are unaffordable and schools may be the only starting point for students without telecommunication access at home.

Internet access is harder to measure, but it is becoming a large source of digital divide. The new digital divide is not just about the number of access lines, but also about the quality of the experience, as evidenced, for example, by the availability of Internet service provider (ISP) connectivity (Table 4). In second-generation Internet, the greater the bandwidth, the quicker the response time. The traditional threshold of number of telephone lines per 100 inhabitants has widened to new targets depending on a nation's level of economic development, including 50% household penetration for Internet access in developed nations and 90% coverage by mobile service in developing ones. The difference between fast and super-fast network growth is often the quality and timing of reform.

Regulators hold the key to facilitating ICT investment flows into the sector and enabling the benefits of ICT to be dispersed as widely as possible. Ironically, it is state rather than market which must be responsible for cyber highways and some public-private partnerships (PPPs) may be considered as in hard infrastructural investment. Simply declaring telecommunication "competitive" does not ensure that any new market entrants would, or could, actually begin competing. Government guidance and action has been found necessary in nearly every country to nurture competition and the need for regulatory expertise has become more, not less, acute. Increasingly, governments realise the value of their national ICT assets is linked to the strength of their sector reform programmes.

Case-study of Singapore

Small, urbanised city-state Singapore has embraced information communication technology and globalisation more aggressively than most to maintain its international competitiveness and progress into new growth areas. In its initial factor-driven and investment-driven stages of growth, Singapore has done well in macroeconomic, especially infrastructural efficiency, including telecommunication. At the next innovation-driven stage and the final wealth-driven stage, Singapore aspires to be a knowledge-based economy, a developed and industrial economy to join the first league OECD economies. More microeconomic efficiency at the firm and industry levels, especially on promoting entrepreneurship and domestic corporate sector both to support TNCs and grow indigenous TNCs, have to be targeted.

As a developmental state with a parliamentary system and centralised leadership, Singapore adopted a monopoly modernisation model with close political oversight. Strong government influence in capital infusion and leadership in board of directors in government-linked companies (GLCs) may have reached a limit in a more open and competitive global environment. The Singapore Inc model suited strong government

intervention all round to develop Singapore's preeminent regional commercial centre position. Sectoral reform in telecommunication has to consider the appropriate degree of competition, sector structure including separation of regulatory, policy and operating functions, determining the boundaries between competition and noncompetition, regulatory framework consistent with the degree of competition, sector structure and social obligations and ownership structure.

The government chose to privatise Telecommunication Authority of Singapore (TAS) by spinning off Singapore Telecommunication (Singtel) for the commercial operations, leaving TAS as the regulator. Anticipating WTO and GATS, TAS presided the demise of the state-owned telecommunication monopoly, but it has a steep learning curve. Many lessons are learnt by the controlling state in a more open, competitive global environment. Singtel was initially granted a licence in 1992 with a monopoly over basic telecommunication services until 2007. In the process of deregulation, TAS was restructured as Infocomm Development Authority (IDA) which realised competition has to be brought up to speed for Singapore to be an international information communication hub.

Domestically, one grievous error occurred when in 1996, the government decided to accelerate the deregulation and modify the competition to open up the market by 2002 instead. A compensation package of S\$1.5 billion was offered to Singtel by IDA on a presumption of a tax component. When the tax authority ruled there was no income tax liability on the S\$1.5 billion, IDA tried to recover S\$388 million in a suit which it lost. The high court ruled IDA's claim as "wholly unjust and contrary to fair play" (Asian Wall Street Journal, 31 May-1 June 2002, p 7). While an honest mistake, this chronology highlights a culture where civil servants shied away from taking responsibility to avoid decisions for fear of making mistake, not double-checking in cases with no precedence and taxpayers bore the cost, regardless.

Externally, partially privatised GLCs has an image problem as arm's length state influence has to be credible and sensitive. Moods, perceptions and sentiments prevail in the global market economy, more so in new, highly volatile sectors like dot-com and telecommunication. With a saturated domestic market and opportunity beckoning in the region, Singtel like all GLCs have to regionalise, accelerate investments outside Singapore to survive the competition. Singtel had regionalised into Malaysia, Thailand, the Philippines and elsewhere but met its first rebuff as a GLC in its attempted takeover of Cable & Wireless (HK) (Asian Wall Street Journal, 26 January 2000) which had political repercussions. This and the subsequent failed bid to acquire Malaysia's Time Engineering also in 2000, marked a concerted phase for the state to reduce its stake in GLCs. To pave the way for Singtel's acquisition of Australian Optus, the government gave up its "golden share" in Singtel.

Buffeted by fiscal surpluses and an entrepreneurial state, Singtel as other GLCs in banking may have over paid for foreign acquisitions from lack of savvy experience (Low, 2002). A Wealth Added Index compiled by Stern Stewart, a consulting firm ranking 5,069 largest quoted companies by shareholder value created (or destroyed) between June 1996 and June 2001 where Singtel was ranked the 8th among the bottom 25 (The Economist, 1 December 2001, pp 59-62). Singtel's inauspicious mention suffered from its costly acquisitions as in Optus as a good way to destroy value. It did not help that it is in a volatile market where the quest for shareholder value creates as many spectacular

failures as successes. Singtel's cost of equity at 8% exceeded total shareholder return at – 10%. Since companies create shareholder value only if returns to investors from share price rises and dividends exceed cost of equity, Singtel destroyed \$29.9 billion in value for the period under study, implying its shareholder capital could be better used elsewhere. Even if a very long-term haul of its recent acquisitions to pay off is possible, it must heed being in a high technology, highly volatile market still in the risky throes of global deregulation.

Singapore fared relatively better in its second generation Internet broadband infrastructure, probably more in hardware, technical information economy than in software information society. Typical of any national initiative which delivers a new level of interactive, multimedia applications and services to homes, businesses and schools, Singapore One Network for Everyone (Singapore One) comprises two distinct but integrated levels. The first is a broadband infrastructure level of high-capacity networks and switches. The second is a level of advanced applications and services that take advantage of the infrastructure's high-speed and high-capacity capabilities which presumes an IT-literate population in a cosmopolitan urban environment is ready. Internet access is only one of the many applications and services that Singapore One offers. As Singapore One contributes to the larger concept of the global information infrastructure, it would be inevitable that the Singapore information society will be influenced by external forces and other knowledge societies.

Broadband technology's high-speed and high-content capacity allows Singapore One to handle multimedia content, such as cassette disk-quality audio, near broadcast-quality video and interactive three-dimensional graphics. The World Wide Web still consists mainly of text and two-dimensional graphic images which follow a page model. Web pages have minimal animation and sound effects. Singapore One incorporates the latest digital technologies in an optimised, integrated network. With its huge amounts of bandwidth, Singapore One delivers information to subscribers at least 100 times the speed of Internet dial-up through a normal 56.6 kilobytes per second analogue modem.

Singapore One's high-speed and high-capacity enables users to experience richer, more exciting and interactive content, which includes entertainment and news-on-demand, distance learning, on-line shopping and other electronic commerce services, video conferencing capability, government services, as well as fast Internet. Thus, beside the Internet on-line environment for interactive video and audio and multidimensional graphics, Singapore One offers an ideal research and development (R&D) environment, sophisticated urban user base. Efforts are underway to develop and mesh a regional network which will enhance links and a springboard to the emerging broadband markets of Asia and be fully plugged into the world net economy by the year 2010.

Singapore One creates a whole new community in virtual reality chat rooms, instant tele- and video-conferencing and on-line game and help lines. The ability to deliver video, voice, sound and data, all through a single medium, redefines the telecommunication, broadcasting, financial and even publishing infrastructures. By removing bandwidth restrictions, Singapore One frees developers' imaginations as engineering and standards committees, vendors and all make it a platform for all electronic services by continuing to push Internet's capabilities. This evolution is slow and incremental, as all are shackled by the fundamental limitations of the Internet's

design and decentralised nature. Thus, despite Singapore One's optimised broadband environment being ahead in the race, it remains paced by Internet at the world net level.

For all other practical purpose and intent, Singapore One as a national broadband network delivers interactive multimedia on-line applications and services to all Singaporeans. It forms the basis for a broadband centre of expertise, from R&D of new technologies to creating the next generation of interactive multimedia applications and services. Singapore is on its way as a KBE and infocomm hub (Kuo and Low, 2001 and Koh and Lim, 2002). But its progress as an information or knowledge society is perhaps not quite in tandem in pace as the socio-political impact of new technology on democratisation is harder to manage (Low, 1997 and Low and Kuo, 1999).

Overall, the media industry has to review how best to strengthen the local media to ensure they can anchor local audiences to local content, structure to ensure companies are competitive locally, grow regionally and compete effectively against global media players. The 2000 interministry review involving Ministry of Information and the Arts and Ministry of Trade and Industry, was necessary and timely because of convergence of traditional media such as broadcasting and print with the Internet, digitalisation and coming 3G technology. With the changed operating environment of the media industry, the challenge is to ride the wave of media convergence and globalisation while enabling an identity to flourish among Singaporeans.

A dilemma is posed as the KBE also needs knowledge-based entrepreneurship. The new KBE calls for creativity and innovation and neither comes about in an over-regimented state. Governance and governability have been attained with a socio-political culture which eschews law and order for stability and cohesion rather than chaos or diversity for intellectual capital and space to operate. Singapore is caught in a technology sandwich. It lags behind OECD, even Korea and Taiwan in most IT and science and technology indicators like research scientists and engineers and proportion of gross output spent on research and development (R&D). But it is threatened by lower technology, less expensive labour abundant economies, notably, China. It needs a quantum leap to race with the OECD league and neither can it slow down and be caught with the fast-coming generation of newly-industrialising economies. Shorter technology and product cycles are butted against a demographically ageing Singapore labour force. Both for productivity and vibrancy, topping up with foreign talents may be a solution with socio-political tradeoffs and costs especially when Singapore is in its worst structural and cyclical recession since independence in 1965. There will be those left behind by age discrimination or technology discrimination and widening income inequality is a generalised global observation.

On third generation (3G) technology, consumer acceptance of this high-speed wireless service is slow except in Korea. Korea is an exception with consumers aggressive to upgrade their telephones, embrace new gadgets to enable them to surf the net at high speed while on the move. Indeed, Korea is one of the world's most wired nations, some 64% of its 47.5 million people carry mobile phones and half of all households have broadband access to the Internet. Online consumers with more time, affordability and proclivity for leisure and sophisticated pursuits, are not just the young, but older Koreans are very much on board in an advance state of information society. Korea's appetite for 3G is logical to help its robust economy given its relatively insular market.

Unlike their European peers, Korean companies benefit from relatively benign local regulators which may be a lesson for Singapore. As multiple 3G handset operating modes jostle for market acceptance in the highly competitive digital cellular market, Singapore is on board exploring the R&D and solutions which will support 3G applications and develop advanced products in close vicinity to the market. But it is clearly not as far ahead in entrepreneurial risk-taking as by Hong Kong's Li Ka-shing and Whampo in pushing ahead with an aggressive roll-out of its 3G mobile network as noted. Experiences from Spain, Finland and Germany may give Singapore cause for pause as only the very strongest operators can succeed (Financial Times, 27-28 July and 30 July 2002, pp 18, 7 and 13 respectively).

Broadband telecommunication is redefined with digital compression technology and growing popularity of multimedia compact disc technology with portable media technology displacing fixed wire and wireless transmission (Egan, 1996). Personal computer-based multimedia has reached individuals and households. With Internet, television and videocassette recorders, it is truly difficult to predict the future of competing network and technological alternative. Beside market considerations, regulation remains largely responsible for the structure of the industry, both in terms of number of players and the way in which they operate and compete. Whether technology progresses in a free market setting, how the private sector responds, influences and challenges the regulatory framework are some key issues in public-private interests, politics and bureaucratic process.

The path of technology adoption and diffusion, rate of investment including human skills and software development is as much affected by regulatory politics. In the final analysis, the societal goals in telecommunication policy remain affordable universal service and network interconnection. Even with affordability in local telephone service, that all local networks are effectively interconnected or universally affordable local access lines should be coupled with universal and affordable network interconnection for ubiquitous call completion. The world of perfect connectivity characterised by “anyone, anytime, anywhere and anyhow” is becoming possible as with Singapore One. However, the economics of perfect competition must be matched with perfect connectivity and a parallel deregulation and democratisation before a knowledge society can evolve.

The Singapore case-study shows it has risen to the challenges of technology, globalisation and hyper competition whether in terms of regulatory reform or hard infrastructure. Both leveling up to make the telecommunication sector the gateway to overall economic growth and development and minimising inequity and the digital divide involves massive investment in infrastructure. If state funds were available as in Singapore or Malaysia, they act as both seed capital and basic social capital and national information infrastructure. With KBE and dot-com culture as the fount for entrepreneurship and enterprise, telecommunication and national information infrastructure linking with first Association of Southeast Asian Nations (ASEAN) information infrastructure and global information infrastructure become imperative.

Labour casualisation and employment

Trade unions in the telecommunication sector are positioned to take advantage of their knowledge of the industry for the purpose of lobbying government to include the

interests of labour and consumers in their policies for industry regulation, particularly in relation to negotiations with international financial institutions, the WTO, and other regional policy-making bodies such as APEC, ASEAN and others. Across the region there are clear similarities in the employment practises that are prevalent in the industry. Employment in the telecommunication sector is characterised by outsourcing of as many functions as possible, contract and other forms of contingent employment. Casualisation is a problem in all parts of the region as employers demand the flexibility of casuals for work in traffic-based functions and services. The vast proliferation of employers in the industry does not, however reflect the telecommunication sector as a major employer. Many new services are offered requiring little human intervention, but sophisticated technology which is now universally available.

Organisation rates in new enterprises are low or non-existent in many parts of developing Asia, not China. But unions in traditional companies are struggling to maintain their memberships in the face of contracting, casualisation, downsizing, and other restructuring intended to meet the market in the competitive environment of deregulated telecommunication. Reorganisation of the telecommunication industry and the changing concept of core business competencies has created a new phenomenon which is rapidly becoming an entrenched part of the employment scene. On one hand, Asia is becoming an attractive region for business processing offices as in call centres to establish as a number of countries can offer relatively well-educated, multi-lingual workers in tight job markets who are prepared to perform the repetitive work that is required. Call centres are undertaking much of the business that has previously been the task of telephone companies or telcos as well as banks, insurance companies, financial services companies, and all kinds of direct sales agencies and customer services facilities. Rates of pay are relatively lower than those payable in the home countries of the companies whose services they perform, like operators at a call centre in Delhi answer for British Airways accounting section.

In addition to the more obviously telecommunication-oriented work of call centres, cable laying and installation of customer premises equipment and such, there are many people in employment in other related sectors. These jobs rely for their existence on the convergence of telecommunication and information communication technology and other disciplines as in journalism and design. The multi-media sector includes many new areas of work. But because work is creative and innovative rather than standardised and amenable to across-the-board negotiations, unions have penetrated very little if at all in the new service industry. Yet, this an example of a sector where unions must expand their organising activities if they are to protect their membership and retain/regain their relevance in the future. Coordinated campaigns of union publicity and organisation are urgently needed, as are innovative strategies to attract new younger workers in emerging sectors.

On the other hand, such new services impinge on unemployment and casualisation of labour elsewhere and of older, less educated and skilled employees. For them, employability with skills upgrading and retraining may still prove a problem for their employability. Psychological, mindset change with new technical, cognitive skills is a tremendous for elder workers set in their ways and work attitudes. They have certain standards of living and family commitments to meet which make it difficult to accept lower remuneration no longer requiring their previous work experience. As traditional

employment relations are no longer valid and change with atypical work and new employment practices, it is stressful for governments, workers and employers alike, except the footloose TNCs bent on globalising for the cheapest labour cost.

Information society

Taken to its logical conclusion, an information economy should lead to an information society with pervasive socio-political implications. An information society defined as one which grows and develops around information that brings about a flourishing state of human creativity instead of mere affluent material consumption (Masuda, 1990, p 1). More specifically, the concept of an information society is based on two premises. The first involves the production of information values (and not material values) as the driving force behind the formation and development of society. Furthermore, following a historical analogous model, it is projected that human society is moving towards an economy in which information is the core of society's economic needs. Both the economy and society hence grow and develop around the production and use of information values.

Information as an economic product will thus exceed physical goods, energy and services in importance (Masuda 1990, p 66). The knowledge economy turning social values of the industrial society on its head. On one hand, time-space distantiation stretches social relations over time and space so they have to be controlled and adjusted over longer periods, longer distances and in more activity areas. On the other, time-space compression involves intensification of discrete events in real time and/or increased velocity of material and immaterial flows over a given distance. The conquest of space by time linking material technology with social technology may enable a more precise control over shorter periods of action,

A significant implication of a knowledge or information society is it means more freedom for the general public, as information can no longer be effectively regulated or contained under universal access. The democratisation of information by technology in the knowledge society means the new ethic is cooperation, not repression or competition. Participation becomes the *modus vivendi* as the means and ability of doing so have increased. At the family level, the roles of gender are changing because equal and universal acquisition of education (between males and females) lead to a levelling up of power of information, knowledge, income and financial independence. Meanwhile, new knowledge also gives rise to new organisational hierarchy. The gap may widen between those able to deal with the knowledge explosion and those who only marginally can or left behind. In the final analysis, beside production, work and employment relationships changed in a new KBE, its political culture and ethos must alter in commensurate in a knowledge or information society.

4 Prospects and impact on future development

Uneven, diverse telecommunication development in Asia stand amidst the huge potential for cooperation to realise prospects in both the supply and demand sides. While a latecomer and laggard as a whole, there are some very advanced telecommunication sectors in Japan and the Asian NIEs. Increasingly, globalisation has affected telecommunication sector as everywhere else. An almost instant graduation is witnessed

as developing Asia can grasp the latest in technology if finessing that is somehow worked out. For instance, smart phones will increasingly include an operating system to retrieve files, manage address books and calendars and compose documents with a mini keyboard and fixed-lines have gone to cellular, wireless communication.

Beside public-private partnership as for hard infrastructure, various hybrids of build-operate-and-transfer modalities, global telecommunication alliances are also emerging. These are mostly “pure play” alliances in ventures in which partners offer unlike but closely related products, technologies and markets, some “converging alliances” where two companies from different industries collaborate in converging technologies, enabling innovative services like Microsoft and Comsat, US cable operator to support cable modem entry into telephony and data access to homes (Culpan, 2002, pp 183-202). Apart from Japan, Hong Kong, China and Singapore, rest of Asia not quite caught up in global alliances.

A clear policy preference for “managed competition” on many Asian countries is observed. There are relatively larger welfare gains from increased competition than from a change in ownership (Fink, et al, 2001). There are no convincing arguments for not introducing market competition from a technical standpoint or scale economies. On regulatory reform, competition and liberalisation, the NIEs should liberalise further by allowing competition in nonvoice services, foreign ownership rules relaxed for privatisation and learn from Thailand’ built-operate-transfer (BOT) arrangements to bring in private investors. Parallel networks as a means of competing with the existing operator would need adequate regulatory structures which are still largely lacking in Asia.

Political commitment and institutions matter, including the electoral and party system, degree of federalism and division of power within the government which affect the regulation model selected. Singapore started with sectoral liberalisation in telecommunication, banking and energy. A generic competition law is in the making in Singapore. Whether other ASEAN countries need to bypass ethnic and nationalistic imperatives to open telecommunication sector further and faster, is a political choice and decision. But to have NIEs lead the way for rest of ASEAN, create the right demonstrative effect in the globalised marketplace and join up in a regional information infrastructure, is in the right direction.

Despite three packages negotiated, ASEAN Framework Agreement on Services (AFAS) is not as GATS-plus in commitments as claimed. Generally, bolder and far-reaching commitments have been made in GATS rather than AFAS (Nikombirirak and Stephenson, 2001). Comparing AFAS commitments in telecommunication in Indonesia, Malaysia and Thailand, there are marked variation (Rajan and Sen, 2002). Malaysia has made commitments in all but two value-added telecommunication services, namely, electronic data interchange (EDI) and on-line information and/or data processing services. Thailand is at the other extreme, offering the least number of commitments in value-added telecommunication services. Indonesia has been rather cautious in liberalising value-added telecommunication services compared to basic services partly due to state-owned PT Telkom, PT Indosat and PT Satelindo.

For the phenomenal growth in mobile networks due to digital cellular technology, governments appear more willing to open as there is less political need to protect incumbent operators with state ownership. The introduction of 3G mobile technology will give the market a boost. Indonesia has offered ASEAN members a higher level of equity

participation under AFAS. Malaysia has made identical AFAS commitments as in GATS except for foreign equity shareholding up to 35% compared to 30% under GATS. Thailand's AFAS commitments have not been GATS-plus.

China is a case of its own by sheer size, diversity and capability of almost setting up its own standards and practices. China's strategy of economic development is encapsulated as socialist market economy means using market forces to improve the efficiency of production while retaining a managed, predominantly state-owned economy and authoritarian control over political activity. The tension between competitive market system and socialist reform is nowhere clearer than the telecommunication and information sectors. On one hand, an open door and free market policy is needed to attract more investment, improve efficiency and stimulate development. On the other hand, this would undercut the central government's ability to build up national enterprises in that sector. Too much diversity, free trade and commercial competition would erode the government's powers of surveillance and censorship and conflict with other political economy desires like for a more geographically balanced distribution of wealth, balance overall development goals with its need for control and national protection.

With China's historical opposition to allowing foreigners into its telecommunication sector, joint ventures in which China remains the major shareholder allow foreign enterprises only to provide telecommunication equipment and expertise (Lee, ed, 1997, Wong and Nah, 2001 and Dahlman and Aubert, 2001). The changing political economy reform has not loosened the Chinese Communist Party's grip on media and communication, but less political control, more commercialization and modern technology have been adopted. Together with market forces, a policy rethink has made China a class of its own. After hyper growth from 1985 to 1999, China's telecommunication sector boasts of among the world's largest telephone and mobile telephone networks, set to surpass the US in 2002. Remarkable in catching up and raising teledensity as the former Ministry of Posts and Telecommunications (MPT) revamped and corporatised to introduce competition by 1993 with deregulation of paging services and VSAT communication. Ministry of Information Industry (MII) is a merger of MPT and Ministry of Electronic Industry in 1998 taking over information and network administration to fulfil separation of regulatory and commercial functions to develop competition. Since then, China Telecom as the former MPT-controlled monopoly has lost its grip and succumbed to divestiture driven by many economic-political factors.

In reality, China's telecommunication regime is miles apart from the WTO agreement as it does allow the establishment of wholly-foreign-owned enterprises, equity or contractual joint ventures in manufacturing of communication equipment. In all types of telecommunication services, China strictly prohibits foreign investors, or wholly-foreign-owned enterprises, equity or contractual joint ventures to operate, or take part in operations, whether they are provided as part of the public communications network or as specialised, dedicated communication networks. China's restrictions on foreign involvement in telecommunication services are among the tightest in the world. To fulfil WTO commitments, China has to revamp its rules in line with international norms, improve its legal and regulatory framework, increase transparency of legal and administrative systems and sure market order.

Competition in the domestic market will increase with lower entry barriers and with the rise of new carriers, the oligopoly comprising China Telecommunications or Unicom, Jitong Communications, Netcom, China Mobile and China Telecom will continue to decline as competition among them also intensify, thus dismantling the previous cross-subsidising tariff structure, squeezing profits, preempting cream-skimming opportunities of foreign entrants. Infrastructure development cannot keep pace with the potential of telecommunication demand and universal service provision will be a long time coming unless the government intervenes actively or technology progress provides the alternative. Nonetheless, the high-end market in international calls, data transmission and sophisticated mobile communication will be better serviced at the cost of affordability and availability of low-end market services in plain old telephony for the local and rural areas. MII is likely to remain highly interventionist given concerns over security and sovereignty, universal service and indigenous carriers' chance of survival in an open market.

With an official target to maintain 20% growth in telecommunication sector between 2000-5, thrice the expected GDP growth rate, telecommunication as the engine and backbone of IT industry, the sector will continue to play a strategic role in China's industrial policy. Uncertainties remain on MII's successful separation of its regulatory function from the business of divested China Telecom and retention of control by listing Chinese carriers in Hong Kong and overseas stock market without blatantly violating commitment to allow 49% foreign ownership with WTO. A hands-off or passive approach is unlikely even if an impartial regulator to ensure a level-playing field is what foreign investors would hope for. Simply put, the more successful is MII in strengthening state-owner carriers, the less likely or necessary it would be for it to intervene to protect them post-WTO.

Deregulation particularly messy in China with huge market and unsettled rules, politics enter when foreign competition is involved (International Herald Tribune, 19 August 2002, p 1). With all telephone companies SOEs, competition is fierce dramatising corporatising of power, shift of political gravity away from government toward companies which pay better and an endless river of bribes ensue. China Unicom created in 1994 with investment from ministries of electronics, railways and electric power, but its owner, former regulator Ministry of Post and Telecommunications was not giving in to competition. With restructuring by late 1990s, other companies split off from China Unicom include China Mobile, the biggest by revenue in telecommunication and ChinaSat, a satellite communication company. Guerrilla companies run by local governments or private entrepreneurs use Internet to carry telephone calls to compete in long distance services. Cable TV experimented with pay television which allowed customers to surf the web around China, violating regulations which have China Telecom as monopoly provider of Internet access. Competition has forced prices down, mobile phone revenue dropped some 50% in three years for China Telecom.

In meeting up with WTO and GATS, for competitive safeguards, China passed an anti-unfair competition law as early as in 1993, but enforcement responsibility is vague. Physical interconnection of the MPT-administered public telephone network and the alternate networks administered by Unicom does exist. However, there is dissatisfaction with the timeliness with which interconnection facilities are offered and the limited scope of interconnection. Universal service has MPT's revenue accounting system structured to

cross-subsidise high-cost areas. Such universal service subsidy which is embedded internally into the monopoly provider's accounting, does not conform to the WTO regulatory principles, it is not transparent, explicit, or competitively neutral. Yet, China does not impose any specific universal service contribution on competing service providers, a case of China neither complying nor failing WTO, simply a case of its own. Overall, that China currently has yet to attain the required level of institutional development in telecommunication to fully comply with WTO. A close connection between government and business exists, not unlike that in ASEAN. China lacks the legal and regulatory framework required to implement interconnection agreements and prevent anti-competitive behavior.

Hong Kong's proximity make China-Hong Kong a de facto market in basic telephone services, roaming paging, mobile telephone and value-added services though technologically, China remains poor and backward in equipment and Hong Kong is weak in technology innovation. But as China has adopted an open policy and decentralization as a long term strategy all round including telecommunication, Hong Kong has an economic role as much as its greater government intervention in telecommunication would encourage China's political pressure implying prospects of a web of relationships involving technology development, market operations and politics on both sides.

Japan has a much earlier start in telecommunication and its technology is globally competitive and spread out. For instance, first introduced in 1999 only in Japan, i-Mode is the world's first smart phone for web browsing, a wireless data service offering colour and video over many telephones. Its mobile computing service enables users to do telephone banking, make airline reservations, conduct stock transactions, send and receive e-mail and have access to the Internet. The biggest telecommunication operator, Nippon Telegraph and Telephone (NTT) DoCoMo Inc seems to have i-Mode aspirations beyond Japan, making inroads and investment all over the globe, including a 16% stake in AT&T Wireless, bought for US\$9.8 billion. DoCoMo plans to launch the next great wireless war based on the idea that instead of an assortment of palm pilots, blackberrys, discmen, pagers and mobile phones carried to keep in touch, the DoCoMo's world has people carry only a single broadband phone to e-mail friends, download and listen to music, read magazines and log on to thousands of i-mode websites for anything from menus to dating services to medical help, least of all, use the telephone to call somebody. Thus, i-mode is 2.5G services.

Logically, Japan being a global telecommunication player with its Fair Trade Commission (FTC) established to uphold competition along with institutional reforms as in deregulation of market entry and rates and technological innovation, can provide some leadership in Asia. Lessons learnt include Japan's establishment of flexible networks to ensure that carriers can make use of their originality and creativity to the maximum extent. To promote new entry and competition in the telecommunication, a system under which carriers can build up a telecommunication network that they believe is the most efficient at their own responsibility such as a network combining telecommunication facilities they establish on their own with those procured from other companies is desired. Transparency in interconnection services of the carriers and monitor over them are essential with interconnection rates as low as possible because they have impacts on new entry into the telecommunications market and the promotion of competition as its result. Market competition to lower level of interconnection rates and telecommunication rates,

is best. The so-called "the last ten mile" before reaching the consumer is the most critical, connecting users' circuits from their terminal switching devices to users' terminal units. That NTT has a 96% market share and there is little competition in this field, is not exemplary for the rest of Asia.

As witnessed in Singapore, a competition policy is among the challenges and prospects that other developing Asian economies will have to face. With some carriers also built with networks for new means of telecommunications such as cable TV (CATV) circuits and other broadband applications, competition policy will extend across sectors, from telecommunication to broadcasting and media if a generic competition law is not at work. China has also shown that changes may run across ministries and agencies as telecommunication has merged, converged or impinged on so many disciplines and sectors. A more holistic approach has to be taken though the politics and management of power among agencies and bureaus may be thickened with other socio-political considerations peculiar to idiosyncracies in Asian economies.

5 Conclusion, policy implications and prognosis

This paper has clearly shown that technology is one single force which has wrought changes and many modalities of telecommunication policy. First and foremost, if telecommunication is perceived as a vital stepping stone to overall economic growth, development, efficiency and development, national information infrastructure has to be planned and finessed. Soft infrastructure as in human resource development follows as the ICT revolution catches on across-the-board as well. Universal access becomes a primary goal for telecommunication provision and the disparity between even basic telecommunication service provision and accessibility across Asia is great with resulting outcome on the digital divide.

Asian developing countries grappling with technology and infrastructure have both the promise of the latest as well as the worry of ever catching up with others ahead. Early Internet was about collaborative research and e-mail. Second generation Internet is for more intensive and diversified uses and in terms of quantity of data transmitted and received for asymmetrical applications such as accessing multimedia information on the web, other information services, bulletin boards and databases than symmetrical applications such as e-mail, collaborative communication and "chat" forums. The new generation of Internet requires bandwidth which refers to the speed or frequency of a transmission or communication channel, broadband is high speed or high frequency transmission signal or channel (Egan, 1996, p 6). They have enabled cable and television lines which together with specialised electronic equipment like modem have allowed them to transmit and receive two-way point-to-point signals like telephone lines. Bandwidth is the primary factor affecting the type and quality of telecommunication and hence interactive multimedia telecommunication.

Network engineering aside, successful multimedia systems must accommodate the nature of household demand from entertainment to education. Any number of services may be demanded and supplied simultaneously in multimedia environment of information superhighway. Households receive a broadcasted downstream signal in point-to-multipoint pattern. Interactivity implies an upstream signal from subscribers to service providers or another subscriber in point-to-point traffic pattern. As more and

more uses of the network for two-way telecommunication occurs, network traffic flow becomes more symmetrical and less symmetrical. A more costly and different type of network engineering is required to handle symmetrical and point-to-point traffic than one-way traffic flow. Beyond capacity to provide upstream and downstream bandwidth to meet demand, the nature of traffic in terms of inherent latent delay in actual transmission has to be considered. Infrastructure media network provider may save on costs by engineering underlying infrastructure network to take advantage of fact not continuous transmission is always required to provide idle capacity for other services. Network-induced delay as opposed to latent delay is a critical quality variable for users and network operators.

The “right” level of multimedia service for the average household is difficult to define, implying market viability of multimedia infrastructure network. Convergence potentially allows interactive communication among people and machines where voice text and images are all carried on an integrated digital information superhighway. Creates value added for business households manufacturing and services bolstered higher standard of living quality of life worklife productivity. Web will not dominate two-way voice and data communication or digital video telephony. Neither Web nor Internet represents a general-purpose computer-based network platform. Internet's unorganised system structure legacy as a "free" forum is a blessing for public demand to access and usage and a curse for those unable to prioritise messages according to their value. Technology notwithstanding substantial regulatory barrier discourages superhighway construction. Regulatory policy is a blunt tool for competition policy with two undesirable consequences, they take on a life of their own beyond original intention to jumpstart competitive market entry and rules often hinder more than stimulate infrastructure development.

The political process of regulation and the practice as dilemma of balancing economic efficiency (price of some basic service raised) while protecting "captive" consumers by keeping prices regulated at artificial level. Real world regulatory schizophrenia aimed at introducing competition at same time subsidy offered to network subscribers, free market competition and cross subsidy as natural enemies. Policy must at minimum improve or at least do no harm to private market incentives for infrastructure investment. Irony is fundamental drivers of private market investment incentives with monopoly power and high profits are exactly the opposite of those the government prepared to adopt. The solution for policy is to eliminate restrictions on market entry profits and scope of operations of all market players.

Managed competition like efficient regulation is oxymoronic. Until market entry creates a workable competitive situation, direct price regulation of incumbent monopolists is best policy to protect basic service subscribers, everything else deregulated, period. Regulation aimed to provide consumer benefits as service choice and competitive prices and emulate forces of competition by mandating lower prices when market fails in such discipline. Digital technology renders old monopoly model of public utility regulation obsolete. Modern regulation is to promote, at least not hinder competitive market entry for market forces to provide more choices at competitive prices. Best way is deregulation though mistaken notion is regulation is synonymous with consumer benefits.

A diverse range of modalities from the most advanced in Japan to the most complex and complicated for China has been demonstrated. There is no single best model. Be it in the area of regulation, competition or trade liberalisation as political economy differs. In the final analysis, Asia cannot be a laggard as a global information economy comes with free trade in telecommunication and information services, in turn, generating a global information society. Like globalisation, it is not so much a choice between it is desirable or not, but that the telecommunication revolution and deregulation have already arrived. It is best to get on with the issues and challenges as preparing the economy, labour force and society takes mindset changes as well as infrastructure and education and training.

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