



## Public-Private Partnerships and Financing ICT Developments

by

**Paul Ulrich**  
**Independent Consultant**  
**Hong Kong**  
**[Paul\\_Ulrich@aya.yale.edu](mailto:Paul_Ulrich@aya.yale.edu)**

Asia-Pacific Development Information Programme  
United Nations Development Programme  
[www.apdip.net/asian-forum](http://www.apdip.net/asian-forum)

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## Abstract

The paper begins with a taxonomy of the different sets of actors involved in public-private partnerships, identifies their respective roles and interests, and discusses the factors that cause partnerships to succeed or fail. It then analyzes how partnerships provide funding for ICT development with particular emphasis on the promotion of innovation, employment, and small business in ICT—through incubators, technology parks, and special zones—and providing access to ICT for the poor—via rural ICT deployments, universal-access funds, and targeted subsidies. The discussion describes how various options for funding, recent advances in technology, and creative program designs can enable governments to achieve their objectives in ICT.

## 1. Classification of Public-Private Partnerships

Development agencies, civil-society organizations (CSOs), and businesses bandy about the term “public-private partnerships”. Fostering global partnerships even figures as a separate U.N. Millennium Development Goal—the last of the eight—with diffusion of the benefits from information and communications technology (ICT) mentioned as the final target. Partnerships and ICTs, however, are not merely an after-thought to be addressed once communities achieve the other needs of poverty alleviation and sustainable development. Rather, they are integral to the process of reaching those goals. At the same time, while development generates much rhetoric about the need for, and benefits of, public-private partnerships, there is little clarity as to what exactly the term means, its consequences, potential pitfalls, and advantages.

The nebulous nature of the concept partly stems from the myriad actors who can act as partners, on either side of the public-private relationship. The constituents of governments, businesses, civil society organizations (CSOs), academia, and donors come most readily to mind. But how does one classify them and their roles? Upon initial reflection, governments, donors, and academia fall into the public domain, while businesses and CSOs represent the for-profit and non-profit private sector, respectively. Yet, as shown in Figure 1 below, governments may control state-owned enterprises, donors may be private foundations, and academics may belong to private universities or work within corporate-research departments. Some businesses are public-stock companies or non-listed parastatals, with specific government-mandated obligations to fulfill, and civil-society organizations may actually be state-owned or government-

organized non-governmental organizations (SONGOs and GONGO, respectively)—a contradiction in terms, but which nonetheless occurs in places like China.

Moreover, the direction in the flow of funds between the various parties can vary. CSOs may be recipients, but in the case of international NGOs, they more often serve as conduits between international donors and local NGOs. Many large companies practice corporate philanthropy and act as donors in their own right. Others are publicly listed and receive much of their capital from the public and, in some cases, debt financing as well. Partnerships may be bilateral, but can frequently be tri-lateral or even multi-lateral with a host of organizations involved. In some Asian countries like China, private CSO interactions with government are less partnership, more uneasy alliance: the state makes registration difficult, requires local government oversight, and permits neither geographic nor sectoral expansion without approval (Young, 2003).

**Figure 1: A Taxonomy of Entities in Public-Private Partnerships**

<b>Public</b>	<b>Private</b>
<b>Government</b>	SOEs
Listed Firms	<b>Business</b>
GONGOs	<b>CSOs</b>
<b>Academia</b>	Corporate Research
<b>Donors</b>	Foundations

## 2. Factors Affecting Performance

Partnerships take many forms, are inherently complex, and management intensive. Even between similar ICT businesses, they have a high rate of failure. In the early 1990s, studies by consulting firms McKinsey, Booz Allen Hamilton, and Dataquest found that half of all such partnerships failed in that they destroyed, rather than added, shareholder value or ended in dissolution. Strategic alliances tended to have a higher rate of success, followed by equal joint ventures where each held a fifty-percent stake. Acquisitions and mergers fared worst. After mention of overly optimistic expectations, the second leading cause of failure revolved around poor communication and inadequate sharing of information—a shortcoming that ICTs can address, but only if the organizational environment permits it.

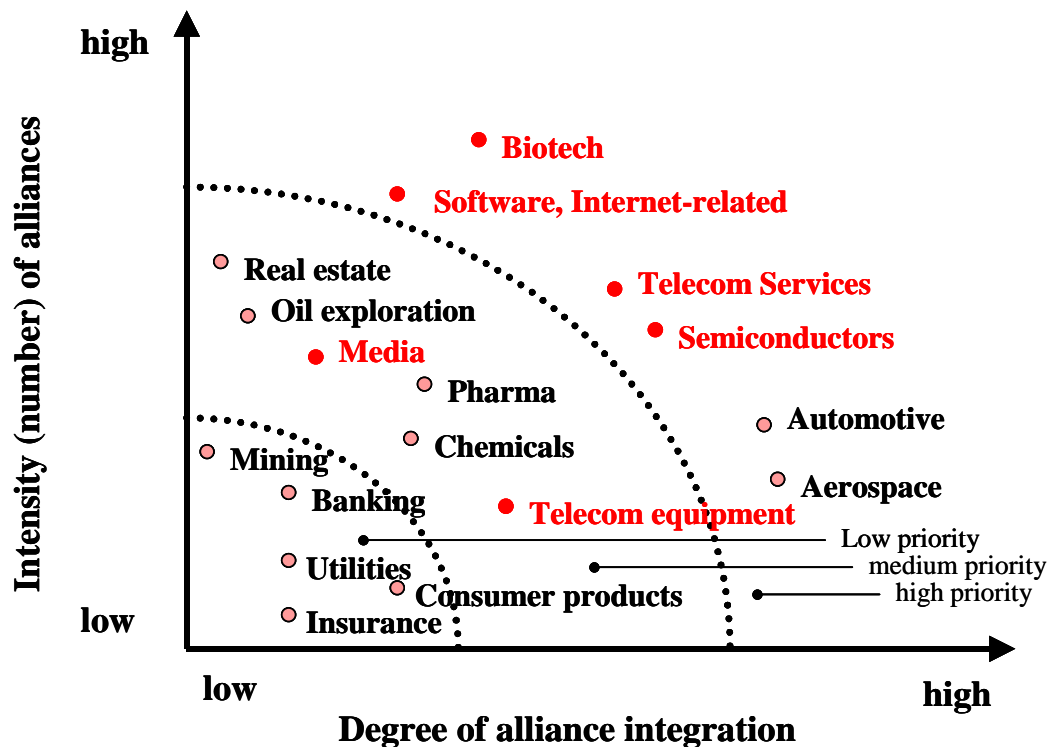
In compensation for the higher risk inherent in partnering with another firm, the studies showed that alliances also provide higher annual returns than going it alone (at an average of 17 percent versus 11 percent), and this explains their popularity, with the frequency of such partnerships growing by as much as 25 percent per year (TA, 1998).

By far the highest returns can come from venture-capital investments, but chances of any one investment's succeeding are slim, thus leading to a portfolio approach of investing in multiple non-related ventures.

Like best pairs with like, but such partnerships of equals are not possible in public-private arrangements of inherently very different entities. Looser alliances and those that are open in dealing with the other party often do well in business ties. That feature can characterize public-private partnerships, as well. Clarity in respective roles is important—for surveyed ICT businesses, this feature, along with communication between partners were the third and fourth most cited attributes to success after selecting the right partner and senior management's commitment to the endeavor (TA, 1998).

Among all sectors, telecom services, software, semiconductors, and biotech tend to place priority on alliances with relatively deep integration and a high number of such partnerships. Telecom equipment vendors and the media tend to have both fewer alliances and less integration than the other three, but still occupy the middle of the range among all sectors.

**Figure 2. Variance by Industry in Number of Alliances and Degree of Integration**



Source: TA, 1998

Strategic alliances fare better than acquisitions, mergers, or joint ventures because the looser arrangements allow partners to more easily isolate and benefit from the other's strengths without also inheriting its weaknesses. Another risk of tighter arrangements,

which is especially prevalent in venture-capital investments, is the need for a viable exit strategy should things go wrong or to recoup one's investment. For example, over three quarters of joint ventures end in sale by one of the partners, but once a joint venture has been formed, it is virtually impossible to sell to anyone but the partner, which means the sale, often inevitable after a number of years, occurs at "firesale prices".

In contrast to some of the many failed corporate tie-ups in ICT, privatizations of public telecommunications operators, which reached their heyday in Asia and elsewhere in the late 1990s, have had a stable track record. Perhaps because of the large sunk costs and high transaction expenses involved in the process, very few privatized telecommunication infrastructure projects have been re-nationalized, re-negotiated, cancelled, or transferred to another private operator (Harris, 2003).

In general and for smaller-scale endeavors, the success factors of public-private partnerships in development mirror those in the corporate world and include:

- mutual trust, complementary strengths, reciprocal accountability, joint decision-making and a two-way exchange of information;
- clearly articulated goals, equitable distribution of costs and benefits, performance indicators and mechanisms to measure and monitor performance, clear delineation of responsibilities and a process for adjudicating disputes;
- shared perceptions and a notion of mutuality with give-and-take;
- mutual support and constructive advocacy;
- transparency with regard to financial matters, long-term commitment to working together, recognition of other partnerships (Lister, 1998).

### **3. Motivations for Business Involvement in Public-Private Partnerships**

As in any form of negotiated agreement, public-private partnerships that succeed share a complementarity of interests. The key interests of respective parties need not coincide or even overlap, but they must not fundamentally come in conflict. Ideally, the two or more parties share, or at least profess to have, the same goals—the development of society. Some companies put the notion of corporate social responsibility higher on their agenda than others. Ultimately, however, for-profit businesses intend to make money and will not enter a partnership that does not in some way lead them toward that aim.

From the business's viewpoint, a public-private endeavor may be entirely philanthropic, and most major ICT corporations have departments for this. One well-known example is Hewlett Packard's e-Inclusion program to bring development through ICT projects to underserved communities. Another is Cisco's global system of networking academies, which train and certify ICT professionals and students in the use of Cisco equipment. Like Cisco, other leading vendors such as Oracle in databases, Microsoft in software, and Intel in microprocessors provide certification courses and often train those in less developed countries for free or at concessional rates.

Many view corporate philanthropy or social responsibility as good for business—directly, in its impact on public relations in the marketplace and indirectly in improving the likelihood that those it helps will become future customers, as well. Winning a new customer can cost as much as ten times that of keeping an existing one, so ICT firms—like most others—will do what it takes to enter or gain dominance in a market. Microsoft, for example, offered to share its secret source code with the Chinese government and tends to turn a blind eye to widespread piracy in Asia—in part as a way of reinforcing the spread of its software as the de-facto standard. Other firms enter money-losing alliances with governments as a way to gain potentially lucrative future public-sector contracts in related areas.

For the same reason, corporations partner with civil-society organizations in developing standards that the businesses feel will ultimately help the sale or development of their products. The standards may benefit the entire industry and society in making technologies simpler and cheaper to deploy, but that is not necessarily the reason for corporate support.

Cisco's networking academies have succeeded because the goals of the company in developing a broader group of technicians able to use its product complements that of the host countries, which need more and better-trained ICT personnel to take advantage of the economic opportunities presented by the sector.

Another success—the Digital Opportunities Initiative, which resulted in one of the better and more widely read analyses of ICT, was a partnership of a donor (the UNDP), a private CSO (the Markle Foundation), and a major ICT consulting company (Accenture). Accenture benefited by strengthening its credentials for ICT strategies in the developing world. However, for whatever reason, the initiative has not continued, and the Markle Foundation, which focuses on media and society, has exited from its involvement.

The success of partnerships often hinge on personal relationships between individuals rather than formal institutional structures. Nevertheless, despite the well-intentioned dialogue about the virtues of partnering for development, truly equal partnership may be impossible due to the asymmetry in power that characterizes most public-private endeavors. The unequal power relationships depend largely on who provides the bulk of the funds and the degree of concentration in that funding. For example, a strategic investor or large minority shareholder in a publicly held firm frequently has more influence on the company's actions than the public at large, which may hold more shares but is not organized to exercise its shareholder rights.

In addition to “hot” money flows of foreign capital, a lack of corporate governance and transparency in public-private partnerships contributed to Asia's financial crisis in 1997 and 1998. An overly cozy relationship between government and the country's major domestic firms led to insufficient oversight over loans that were made on relationships or directed-lending policy rather than strict financial criteria.

Public-private partnerships inevitably involve negotiations, but getting to “yes” can be easier than may at first seem. Even if the two (or more) parties have diametrically opposed views on key points of negotiation, so long as they place differing priorities to the interests in contention, there is a good deal of scope to reach an agreement, combining the top few priorities of each and a blend of those that rank equivalently in importance between them.

#### **4. The Need for Transparency, Accountability, and Vigilance in Partnerships**

Information is the lifeblood of finance and the efficient allocation of capital. Just as public stockholders—to make informed investing decisions—need to know what a company’s management is doing, so too a country’s citizens need to be aware of the terms of any deals between its government and firms contracted to work for it. Subsidies and other incentives provided by government to a business represent an aspect of partnership. To avoid public discontent about crony capitalism or unfair tendering processes, governments (and donors) should make their awarding of grants and contracts as transparent as possible. South Korea’s OPEN program is notable for its use of ICT in facilitating this process of good governance and public accountability.

Strong personal ties, or “social capital” can help bridge the disparities in status between partners, but not overcome them, which makes such arrangements especially vulnerable to changes in leadership. Some have said that the partner that most completely assimilates the knowledge of the other will benefit most from the relationship; another view states that one party exercises power by shaping the needs of the other so that it not only acts in ways it might not otherwise do, but actively wants to pursue the aims in the former’s interests (Lister, 1998). According to the first approach, those who succeed are good learners; according to the second they are good manipulators.

By virtue of their grassroots presence close to communities, many CSOs can act as honest brokers in partnerships between governments and donors on the one hand and private ICT firms on the other. They are able to monitor the results of the endeavor and ensure that those affected have a voice in the decision process and actually benefit as intended. For the more remote communities, ICTs represent an entirely new product or service that may initially seem to be of dubious benefit. Since all new markets tend to follow an S-shaped curve of market demand, characterized by initially slow uptake by a few early adopters, followed by a rapid surge once the items become mainstream, and finally a second leveling off at the market’s saturation, CSOs can also help catalyze demand in the early stages by explaining the uses and benefits of the new technologies.

Academic institutions can play a role in helping design and evaluate joint projects that often can involve technically demanding research. They and their corporate research counterparts are active in developing standards that are revolutionizing the spread and use of ICT: from open-source software and the next-generation Internet (IPv6), which will enable pervasive telemetry, to wireless local-area networks (IEEE 802.11b or “Wi-Fi”),

the longer reaching standard of 802.16 (or “Wi-Max”), and the proposed 802.20 “Wi-Mobile”.

Governments and big businesses that close the deals for a joint endeavor may be far removed from those who experience (and sometimes suffer) its impact. As in any complex undertakings that involve multiple stakeholders, public-private partnerships can also have unintended consequences outside the interests of any one party.

For example, some groups like Digital Partners in the U.K., have hit upon the eminently reasonable notion of donating used (or “pre-owned”) corporate ICT equipment to communities in developing countries that can ill afford to buy the products themselves. Indeed, the Organization for Economic Cooperation and Development (OECD) estimates that companies worldwide will decommission 500 million PCs over the next five years. Digital Partners has lined up a number of top-tier corporations who are more than happy to participate. And why not—by the time of disposal, their idle stocks will have a net negative value to the company: the components contain so many hazardous materials that strict environmental policies in their host countries mean that they would have to pay recyclers to dispose of the equipment for them. In fact, it is ten times cheaper to ship what has come to be known as e-waste to Asia than to recycle it in the U.S. (Goodman, 2003), and that is what already happens. Eighty percent of discarded computers and components go to Asia for recycling and most of that to just one country: China. The transfers are illegal, as China has banned the import of hazardous waste, but it is smuggled in and dumped in places not far from Hong Kong (BAN, 2002). Admittedly, the work of recycling provides much needed jobs, but it also generates horrific environmental and health damage in the affected area.

E-waste is the dirty secret of an otherwise model industry. A true public-private endeavor to solve this problem must involve global organizations like the U.N. to pressure the U.S. to prevent its companies from shipping hazardous materials overseas for disposal, or better yet, to design the products from the start to be more easily disassembled and environmentally friendly. To defray the costs of re-designed products, governments might enlist consumers to pay a small tax on all product purchases with proceeds going into a fund for payment to those who re-design their products. Producers of such components—and many of them are in Asia—would be eligible recipients.

## **5. Sources of Funds**

One commonly thinks of the private sector, and particularly large, mainly Western firms, as the primary source of funds for public-private ICT partnerships in Asia. During the decade of the 1990s, flows of private portfolio and direct foreign investment to the region swamped in magnitude the degree of aid provided by international financial institutions (IFIs): nearly a quarter trillion dollars of private investment flowed into infrastructure projects and much of this, perhaps a third or more, went into telecommunications. Indeed, for this reason, the World Bank has stopped making loans to many large telecom projects in Asia’s emerging markets, which nevertheless may still receive support in social infrastructure like health and education, for which private capital is less forthcoming.

A recent study by the United Nations Commission for Trade and Development (UNCTAD) surveyed the effect of host-country policies in attracting foreign direct investment. The study found that investment incentives ranked lower than access to markets (the top priority), the policy environment, production costs, workforce competence and level of education. This confirms similar findings from the past twenty years that LDCs frequently give away too much in hopes of getting foreign investment. The process leads to a “race to the bottom” as country competes against country as to who can give the biggest or longest tax holiday. The same process repeats itself within countries between different regions or even between different counties vying for the jobs that a new production plant or service center might offer.

China has recently overtaken the U.S. as the world’s largest recipient of foreign direct investment (FDI). However, one should read investment data with care—there is a fair amount of “round-tripping” of money that goes from China to Hong Kong (and another tax haven, the British Virgin Islands) before returning to China for registration as “FDI”—a kind of tax dodge to earn rebates from apparent exports. Similarly, by a strict accounting measure, the tiny country of Luxembourg—not the U.S.—ranked in 2002 as both the world’s leading source and recipient of FDI. Large corporate mergers and acquisitions involving multinational companies with headquarters based in that country (again for tax reasons) resulted in the accounting anomaly (Sauvant, 2003).

China’s dominance in attracting FDI becomes apparent in comparing its levels with those of the Association of Southeast Asian Nations (ASEAN). Ten years ago ASEAN received 75 percent of U.S. FDI in East Asia; today much of that now goes to China, and ASEAN’s share in East Asia has dropped to ten percent. China’s huge domestic market, disciplined labor force, and low production costs are key inducements. While Indonesia has the largest population and market in the ASEAN region, its periodic flare-ups of instability are not conducive to encouraging foreign investors, who abhor risk and uncertainty.

FDI to fund Asian ICT need not come from the West: it may come from other Asian countries within the region. Throughout Asia-Pacific a number of countries share related historical or cultural similarities. Such ties and mutual understanding facilitate foreign investment. South-South efforts at cooperation might try to pair these, with businesses and governments of economically more advanced countries partnering with their poorer or smaller neighbors—whether Thailand helping Laos; India helping Sri Lanka, Bangladesh, or Pakistan; Central Asian countries cooperating with Mongolia; Singapore with Malaysia; Indonesia with East Timor, and so on. As channels for FDI, Taiwan and Hong Kong have contributed enormously to China’s development, particularly in its most dynamic region—the Pearl River Delta, while the Japanese and Koreans are more prominent in northeast China’s Bohai rim. China also has a formal program of internal partnerships, pairing each of its most advanced eastern provinces with a relatively backward western one as a means for spurring development and convergence of living standards.

In addition to job creation and economic growth, countries encourage FDI to transfer knowledge and technology. China presents probably the best case study in successfully attracting FDI and requiring explicit conditions of joint research and training as part of the package. However, smaller countries generally without the enticement of a large internal market lack the leverage to make similar demands.

Forms of private financing for public-private ICT partnerships resemble those of conventional private-sector investment and run the gamut from direct domestic investments, foreign direct investments, as well as domestic and foreign portfolio investment in publicly listed entities. In privatizing major telecom assets, the government can involve the private sector through (1) joint ventures, as in Indonesia; (2) build, then transfer facilities back to the government entity; (3) build, operate for a fixed period, then transfer, as in Macau; (4) build, transfer, and then operate, as in Thailand (where the country's constitution does not allow the private sector to own such strategic assets); or (5) undertake some form of outsourcing arrangement.

Some IFIs such as the International Finance Corporation of the World Bank or a similar facility at the Asian Development Bank can take equity stakes in private ventures. Others cannot: they either provide loans, typically on concessionary terms (and hence containing a grant component), give loan guarantees, or they provide outright grants. A few donors have also tried to use fancier instruments to like subordinated debentures to get around restrictions on taking equity shares. Such debentures are like equity in having a subordinate claim on the investee's assets. Governments may also provide grants directly to a partnership, but more frequently offer grants in other ways: as discounted rates on use of supporting infrastructure, as tax holidays, or as exclusive territorial and service franchises. In return, they make take a share of revenues, royalties, or licensing fees.

Alliances need not involve equity or debt financing but can be contractual in, for example, a marketing alliance. In China, one cell-phone manufacturer partnered with the government postal system to market its handsets at local post offices. No matter how loose the arrangement, however, alliances and partnerships require a standard legal contract defining the terms, spelling out the parties' responsibilities and recourse should any party fail to meet its commitments. Otherwise, informal agreements based on intentions or good will are unlikely to produce meaningful results.

The bursting of the stock market bubble in 2000 and near ruinous over-bidding for 3G wireless licenses among Europe's telecom providers have meant a slow-down in overseas capital for Asia's telecommunications investments. Foreign telcos are strapped for cash and wary of new entanglements, so large domestic players are increasingly filling the void. Several major providers in China and Singapore have even purchased stakes in, or acquired, Western telecom companies. At the same time, funds from IFIs and bilateral donors are unlikely to rise and may decline as the rebuilding of Iraq swallows an ever-larger share of foreign-aid budgets.

While most governments in the region recognize the benefits of liberalized telecom regimes of independent regulators and multiple private competitors, even private

monopolies have generally brought better telecommunication services than those run by the state. However, where markets fail—when benefits accruing to society exceed those captured by the private participants—the public sector of governments and donors need to craft public-private solutions to provide appropriate incentives for investment. In the realm of ICT, two such areas are the funding of innovation to spur growth and the extension of services to apparently unprofitable, isolated communities as a way to enhance equity. The need to generate economic growth without compromising societal equity illustrates two potentially competing priorities for policymakers.

## **6. High-Tech Zones, Industrial Parks, and Incubators**

Although some Japanese firms lead in the number of annual high-tech patents they receive, Asia as a whole invests a lower percentage of its gross domestic product in research and development than the U.S. and Europe. Big companies often have their own internal research departments, but the vast majority of employers and sources of jobs are small businesses, and an increasing number of these are in ICT sectors.

Software constitutes an ever-growing part of telecommunications devices. Governments such as India early on recognized its importance, and now others like China and Vietnam actively support the industry, consisting mainly of small firms, with tax policies and investment incentives unavailable even to other ICT firms (Chidamber, 2003). However, the recent accession by China and the ongoing effort by Vietnam to join the World Trade Organization (WTO) may mean a phasing out of some concessions, due to the WTO requirement of non-discrimination in treatment of national and foreign companies.

Software firms and Internet start-ups, by virtue of their small size, low capital intensity, and high potential for growth are well suited for business incubators and government research grants. Studies of programs from the U.S. Small Business Innovation Research programs to incubators in OECD countries have shown the efficacy of incubators in generating jobs in surrounding communities and in doubling the survival rates of member firms. Growing in number at an estimated twenty percent per year, incubators in Asia are a relatively recent phenomenon. Nevertheless, South Korea has over three hundred, China well over one hundred, and both Malaysia and India have invested considerably in them, as well. China also has dozens of software parks, many supported by its Ministry of Science and Technology, while its incubators tend to be physically larger in floor space per firm, to have close government support, and to receive more foreign investment than in many other Asian countries (Scaramuzzi, 2002). The country even has special science and technology parks specifically for Chinese students returning from overseas to set up business. Others are targeted to women, particularly those laid off from restructuring state-owned enterprises. Since much of China's ICT services fall in the realm of sensitive or protected sectors, most of the country's venture-capital firms are government-owned.

Surprisingly, most incubators worldwide are non-profit and supported by local governments, while the fewer for-profit business incubators receive help from both private and public sources, including international donors—often, for example, in the form of subsidized use of facilities or help in licensing and marketing new products. In

return, the member start-ups sometimes offer an equity stake or a share of royalties from sales. Once they leave the protective environment of the incubator, wealthy private investors or “angels”, venture-capital funds, and large high-tech firms sponsoring their own R&D—either as separate spin-offs or sometimes in the form of internal “intrapreneurs”—are the main sources of capital in addition to that of the business founders themselves.

Incubator models range from those with a strong real-estate component located near universities, in specially designated technology parks, or at high-tech zones with government provision of advanced infrastructure, to “virtual” incubators of companies linked primarily via communication networks but not physically co-located, to international incubators with foreign joint-venture investment. China, Korea, and Malaysia have successful examples of the latter, while mainly non-Asian countries have tried the virtual format. Since much of innovation depends on the informal and serendipitous sharing of ideas fostered by proximity, it is doubtful that virtual connections can achieve the same results as more conventional ones. Incubators tend to have a time limit—typically one to several years—by which point, members must graduate and move out on their own. The dot-com phenomenon in recent years accelerated that period to tenures lasting just a few months, but such a breakneck pace ultimately proved unsustainable.

## **7. Funding Expansion of ICT to Supposedly Unviable Areas**

Unlike other utilities such as water and electricity where revenues cover only a fraction of the costs, telecommunications overall generate surplus revenues. In many Western countries, legislation requires universal service, whereby an incumbent operator or a fund created from general tax revenue or from pro-rated levies on operator proceeds cross-subsidizes the deployment of phone service to remote households that may be economically unprofitable to serve. Most developing countries cannot afford this and, for the time being, are opting instead for universal access—cross-subsidies to pay for shared rural community facilities like payphones or Internet kiosks within, for instance, a five-kilometer or thirty-minute walk of all inhabitants. In the poorest countries with weak government budgets and insufficient telecommunications revenue, donors like the World Bank often provide initial seed financing to get the universal-access funds operational as quickly as possible.

In 1995, Chile pioneered an approach to reduce the cost to the government’s fund for telecommunications development of providing payphones in rural areas. Over five years, the government set up multiple rounds of reverse auctions whereby pre-qualified private operators bid for the chance to enter new rural markets with help from a government subsidy. Administrators of the fund estimated the maximum subsidy needed to allow an operator to serve a designated area or group of communities and made that amount potentially available to the winner in competitive bidding. Those bids requiring the least subsidy won for each round, and winners, upon fulfilling the mandate to provide coin-operated payphones, could also provide additional revenue-generating telecommunication services to the same communities. The technique reduced the share of Chile’s population

without access to basic telecommunications from fifteen percent in 1994 to one percent in 2002, and the least-subsidy auctions resulted in huge savings from what the government would otherwise have had to pay, with total subsidies costing just 0.3 percent of overall telecom revenues. In addition to its careful design, the process encouraged efficiency by transferring market risk to the operators themselves—those best able to bear it (Wellenius, 2002).

In Chile, the fund granted the subsidy to a winning bidder only once—as an enticement to cover any capital or expected operating shortfalls and thereby yield an acceptable rate of return on the investment. Future plans may shift from this format to one of extending a line of credit from, for example, an IFI, which might provide greater leverage in ensuring that the operator actually fulfilled its commitments.

The success of the Chilean endeavor prompted other countries to follow suit. As of mid-2002 four additional Latin American countries had least-subsidy auctions underway, and Uganda and Nepal were beginning the process (Dymond, 2002). A year later, it seems that Nepal is still the only Asian country adopting this approach, although Sri Lanka has announced intentions for doing so as a way to encourage the private-sector build out of broadband access to rural areas. Elsewhere in developing Asia, Malaysia and India have created universal-service and universal-access funds, respectively, and the Philippines and China also have plans. Malaysia has not used competitive bidding as in Chile but opted instead to distribute funds based on the applications, development targets, and actual investments in uneconomic areas by a single incumbent, Telekom Malaysia Berhad (Hamid, 2002). This approach, however, may be less transparent, and more prone to error or interference than open bidding (Navas-Sabater, 2002).

Countries vary in their requirements as to who should contribute to the funds: from fixed operators alone, to fixed and mobile, Internet Service Providers, and even the postal sector. Typically, operators do not receive exclusive licenses, but as the first to enter a remote region, are unlikely to face competition for some time. Initial rounds, as competitors seek footholds in others' territories tend to be the most hotly contested and generate the greatest savings in spread between low winning bids and the amount of funds potentially available as subsidy.

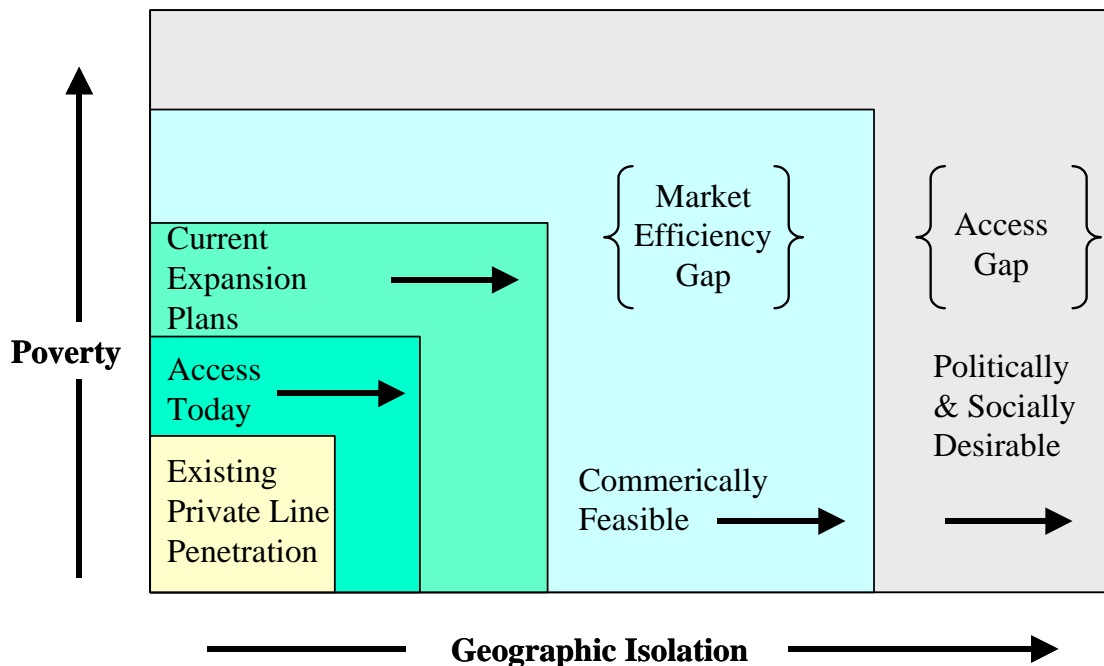
Certain elements have characterized successful auctions: a well-designed process providing contracts worth bidding for, careful research to give baseline data to help bidders make informed bids, and a regulatory regime that lets rural operators charge higher rural tariffs (within limits) and higher access charges on interconnection for calls terminating in the countryside. Appropriate interconnection policies are crucial because they can allow rural operators to profit from what is often significant demand for incoming calls from urban relatives phoning the village. Such a phenomenon has led to the cellular practice of beeping, where a rural cell phone user calls the cell phone of a (typically wealthier) urban one and hangs up just before incurring charges. The recipient then returns the call based on the number left on the handset (Oestmann, 2003). As in the U.S., where long-distance providers pay five times more to connect calls into rural

networks than into urban ones (Witte, 2003), several Latin American countries have instituted asymmetric interconnection plans to help rural operators cover their costs.

## 8. Public-Private Cooperation in the Countryside

The lower cost of deploying mobile services versus fixed-line infrastructure in rural areas has expanded the boundaries of commercially feasible territory, illustrated in Figure 3 below. Mobile investments are more amenable to economies of scale with low marginal costs of serving additional customers. Moreover, as the first mover in many rural areas, they attract all pent-up demand for services. For those mobile operators targeting urban users roaming outside the cities, rural users represent additional income. Popular mobile pre-paid phone cards also provide operators with cash upfront, eliminate customer administration, credit checking, billing, collections, or exposure to bad debt—a problem particularly prevalent in poor areas (Dymond, 2002). Such attractions mean that even fixed-line operators like Philippines Long Distance Telephone are starting to use pre-paid cards.

**Figure 3: The Market for Universal Access**



Source: Navas-Sabater et al, 2002

In countries with micro-credit programs, it may make sense to integrate them with the expansion of rural telephony where such programs are viable and not, for example, subject to anti-usury laws that prevent the charging of interest rates sufficient to cover costs. In the Grameen Phone program of Bangladesh, for instance, Grameen bank recruits women entrepreneurs and gives them each a micro-finance loan to buy a mobile-phone handset to operate as public phones in rural areas. The International Finance Corporation

of the World Bank Group has invested in Grameen Phone to expand its franchise network to thirty thousand villages. In India, Spice Telecom, a mobile operator, likewise enlists small entrepreneurs to operate mobile phones as payphones. Similarly, Indonesia has several thousand telekiosks and “Xpress Connection” revenue-sharing phone businesses in remote villages based on very-small-aperture-terminal (VSAT) satellite stations, and in Thailand, village heads and storeowners provide public-phone businesses as agents of the Post and Telecommunications operator (Navas-Sabater, 2002).

Even with declining technological barriers and improvements in the competitive and regulatory environments, there will remain areas that require government subsidies for access. Where commercial markets fail to reach, local governments can encourage telecenter start-ups through competitive bidding procedures, following principles that have so far succeeded with least-subsidy auctions for rural-telephony funds.

## **9. Conclusion**

Public-private partnerships are fundamental to the development process and to the diffusion of the benefits of ICT. Despite the complexities of interactions among inherently different entities, both sides, and society in general, benefit from the process. Where markets work, the private sector is best suited to capitalize on them in spurring development; where markets are weak or absent—as in financing innovation or in extending ICT to remote areas—the public sector can catalyze participation with public funds. In all circumstances, successful joint programs and projects require due diligence, careful design, monitoring, and clear communication at every stage of the endeavor.

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