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**Stimulating Investment
in Network Development:
Roles for Telecom Regulation**

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William H. Melody



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The World Dialogue on Regulation for Network Economies (WDR) facilitates an international dialogue to generate and disseminate new knowledge on frontier issues in regulation and governance to support the development of network economies.

Contact:

WDR Project, LIRNE.NET
Center for Information and Communication Technologies
Technical University of Denmark, Building 371
DK 2800 Lyngby, DENMARK

Phone: +45 4525 5178
Fax: +45 4596 3171
Email: info@regulateonline.org

WDR Project Coordinator Merete Aagaard Henriksen: henriksen@lirne.net.
[WDR <www.regulateonline.org>](http://www.regulateonline.org)
[LIRNE.NET <www.lirne.net>](http://www.lirne.net)

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Acronyms

ICT	information and communication technology
IFC	International Finance Corporation (division of the World Bank)
ISP	Internet service provider
ITU	International Telecommunication Union
LRIC	long run incremental cost
PTT	postal telegraph and telephone
SME	small and medium-sized enterprises
VANS	value-added network services
VSAT	very small aperture terminal
WTO	World Trade Organization

Executive Summary

The Dialogue Theme 2003 stems not only from the desperate need for network rollout in most developing countries and concerns about the slow rate of broadband network upgrading in most developed countries, but also from the drying up of investment funds for the telecom sector. All regulated telecom operators and potential investors include “regulatory risk” as a key factor in determining their investment strategies. Possibilities for reducing regulatory risk include, strengthening the credibility of the regulator, improving the efficiency of the regulatory process, reducing barriers to participation in network development, managing public resources to facilitate network rollout, and clarifying rules where ambiguity and uncertainty exists. There are a number of examples (e.g., Chile, Morocco, Denmark, Korea) where informed policy and strategic regulation have stimulated waves of investment in network development. Effective regulation need not be cause of investment risk. It can act to reduce the investment risk associated with the inherent uncertainties in cyclical oligopoly telecom network markets.

There are several specific domains that require examination in any programme to reduce barriers to investment and regulatory risk: the institutional structure of government in the sector; policy directions for regulation; the regulatory process; applications of substantive regulatory standards (return on investment, price caps, LRIC, SMP, etc.); and steps to stimulate demand. However, stimulating investment in the current environment will require a shift in focus from the supply of network physical capacity to the stimulation of demand to justify investment. This in turn will require greater private and public investment in facilitating the awareness, skill, and capabilities for service applications by end users, especially SMEs, public institutions and individuals.

For the future, mobile is the vehicle for achieving universal access to voice-related services. But Internet services are becoming recognised as the new target for universal access. If some kind of universal access to limited Internet service is to be achieved for the great majority of people in developing countries within the foreseeable future, it will have to be provided over existing radio and TV transmission and distribution networks. This will require a greater role for intermediary organisations in facilitating service applications to satisfy demands and needs.

International organisations (World Bank, WTO, ITU, development aid agencies, etc.) influence the telecom/ICT investment environment, as well as the roles and activities of national telecom regulators – primarily in harmonising national telecom policies and regulations, and investing in human capital in developing countries. Yet experience suggests that the limiting factor on the capabilities and effectiveness of regulation is the shortage of essential skills. The Final Report of the WDR Dialogue 2002 on Next Generation Regulation concluded that the key factor leading many developing

countries to consider establishing multisector utility regulators is the severe shortage of the skills necessary to regulate effectively.

Investment in human capital is essential to reduce regulatory risk and stimulate demand. In particular, the strategic management capabilities of regulators will be the key competence determining the capacity to stimulate telecom reforms and network investment. The WDR Dialogue 2003 can best begin by focusing on the priorities for regulatory attention. What are the specific areas where regulation can have the greatest positive impact on the investment environment in the short run?

1. Background and Framework for Dialogue

The WDR Dialogue Theme for 2003 will focus on the roles for the regulator in helping to stimulate investment in network development. This stems not only from the desperate need for network rollout in most developing countries, and concerns about the slow rate of broadband network upgrading in most developed countries, but also from the drying up of investment funds for the telecom sector in the wake of the stock market collapse, the financial fraud in the US industry, and the extortionist prices resulting from government auctions in the large European countries for 3G spectrum licenses.

1.1 Regulation and Investment Risk

Although regulation relating to telecom reform, information infrastructure development, next generation Internet, e-commerce and related matters is not always perceived as being directly associated with the level of investment in the sector, clearly regulation plays an important role in shaping the environment and the incentives for investment. This is clearly evidenced by the fact that all regulated telecom operators and potential investors include “regulatory risk” as a key factor in determining their investment strategies. The foremost element of this regulatory risk is that regulatory decisions affecting investment in the sector will not (or cannot) be made independently and objectively on their merits in a fully transparent regulatory process.

A proactive approach to regulation will prompt a serious investigation into the areas where regulators (and policymakers) can consider specific rules, standards and actions that will not only minimise regulatory risk, but also provide a positive stimulus for network development. Possibilities range from steps to strengthen the credibility of the regulator, to improving the efficiency of the regulatory process, to reducing barriers to participation in network development, to managing public resources (e.g., spectrum, rights of way) in a manner to facilitate network rollout, and to clarify rules where ambiguity and uncertainty exists, e.g., on interconnection and access conditions. Effective regulation need not add a new element of risk that increases investment risk. Rather it can reduce and stabilise the inherent uncertainties in cyclical oligopoly network markets. It can be a force for reducing overall market risks and enhancing investment opportunities in the sector. The WDR Dialogue Theme for 2003 explores precisely how this can be done.

1.2 Success Stories

There are a number of examples where informed policy and regulation has stimulated a wave of investment in network development. Chile introduced an imaginative

programme of reverse subsidy auctions for serving rural areas. Morocco introduced a clear and transparent process for licensing mobile operators that directed their competition to rapid network rollout. In Denmark minimum barriers to entry and a clear commitment by the regulator to rapid unbundling of the local loop stimulated the incumbent to upgrade its national network for broadband services ahead of the rest of Europe. Korea has adopted a number of strategic policy and regulatory rules to stimulate investment in both mobile and broadband rollout. Unfortunately, these success stories are exceptions to the norm, and although most of them have been well documented, they have not been fully analysed as transferable lessons for regulators in other countries attempting to stimulate investment in network development.

1.3 Regulation and Investment in Stable and Dynamic Markets

Attention to the investment environment has always been central to effective regulation. The primary standard that regulators applied for judging the reasonableness of consumer prices during the monopoly era was rate of return on investment, and it is still widely used today not only by many regulators, but also by investment analysts and investors. In theory, the regulated return on investment calculations should be set to attract the capital necessary to support the desired rate of investment. Unfortunately, in practice, the failure of the PTTs (and their governments) in many countries to attend to the conditions necessary to attract capital and stimulate investment has been the primary cause of massive under-investment in network development, and the creation of long waiting lists of potential subscribers, ready willing and able to pay for the service, but unable to get it.

The rate of return standard as a basic tool of regulation was developed and refined in the US under conditions of relatively mature and stable industry development. The primary purpose of this regulation was to prevent private monopolies from earning excessive returns in telecom and other utilities where universal service had been virtually achieved. Annual growth rates in customers, volumes of service and investment requirements were stable and predictable. Regulation was preoccupied with preventing over-investment as a way to realise monopoly profit. The more dynamic period of network rollout and market development for voice telephone services had been completed earlier.

Applications of the rate of return standard today by regulators are useful in assessing the performance and price levels of incumbent and other operators with significant market power. However the major concern in the current environment is convincing entrepreneurs and new investors, as well as incumbents, to invest in dynamic markets involving greater risks than have prevailed in traditional stable utility markets in the most advanced developed countries. They need to be convinced that returns reflecting the risks that will be incurred can be realised from new investments in infrastructure rollout to new customers and for new services.

Efficient network development in these dynamic telecom and ICT markets requires innovation and continuous learning on the part of investors, operators, service

suppliers, consumers, regulators and other participants in the process. By reputation, telecom regulation is seen by most investors, investment analysts, entrepreneurs and established operators as slow, unimaginative and adding a new element of investment risk. The challenge for regulators is to demonstrate that they can be an institution for reducing risk and increasing investment opportunities.

1.4 Unbalanced Network Investment

During the euphoria of investment in the ICT sector, the investment was directed primarily to very specific network elements. At the same time there was a scarcity of investment in other elements. The investment euphoria was focused primarily on, 1) fibre optic transmission facilities in the US, Europe and across the oceans; 2) Internet software, service provision and content, mostly in the US, but also in other developed countries; and 3) the mobile sector explosion in Europe and Asia. This buoyant telecom investment climate in specific network elements in the developed countries carried over into many developing countries with investments primarily in mobile operators, and secondarily in privatised incumbent operators.

In the developed countries there has been insufficient investment in network broadband upgrading for enhanced Internet services both in local fixed networks and in network connections to smaller cities, towns and rural areas. For developing countries there has been insufficient investment in national fixed network rollout in most countries. The investment euphoria did not provide the investment needed to achieve the broadband universal access objectives of developed countries or the universal fixed network access objectives of developing countries.

1.5 Changed Conceptions of Universal Access

However, these investment patterns in new technologies and services have contributed significantly to changed conceptions of universal access, and how best to achieve it, in both developed and developing countries. In most developed countries the incumbent telecom and cable operators have not been responsive to the challenge of universal access to broadband services. The universal access initiatives are being led by municipal governments, local cooperatives and small businesses, reflecting a locally-based private/public demand pull model of network development, rather than a nationally-based supply push model. This is very similar in fact to that which achieved universal telephone service at an earlier time in many developed countries, including the US.

In developing countries, the innovations of poor people in both urban and rural areas in adapting prepaid mobile service to meet their needs have fostered unanticipated dramatic growth in mobile to the point where mobile penetration exceeds fixed line penetration in many countries, and has much broader geographic coverage. For the

future the major vehicle for universal access to voice and related services will be mobile.

Access to Internet services in developing countries is being rolled out by privatised incumbent operators only to their core fixed networks of more affluent subscribers, with very limited extensions beyond that. Network extensions to rural areas are being pursued primarily by intermediary organisations such as telecentres, teleboutiques, community centres, schools, cooperatives, or other local organisations. They are often funded by investment in physical and human capital from local or national government agencies, international development agencies or NGOs. In these cases, limited fixed network extensions are negotiated to facilitate limited network access to serve local demand and needs. Here also, a public/private locally-focused demand-led model for network development is underway.

1.6 Under-Investment in Human Capital, Skills and Applications

It is now apparent that the preoccupation with investment in new technologies has led to massive over-investment in physical capital on certain components of the supply side of network development, i.e., facilities; and under-investment in associated human capital on the demand side, i.e., skill development and applications. New technologies don't mean much if potential users have no appreciation of their capabilities, the necessary skills to use them effectively, or an understanding of how they can be used in some beneficial way.

Despite all the visionary statements about the importance of investment in human capital in the new network economies and knowledge societies, there is little evidence that it has been occurring beyond excessive management salaries and stock options in companies that are now mostly bankrupt. Clearly an investment profile for successful network development must encompass investment in human capital to facilitate demand as well as physical capital to create supply.

In helping to shape an environment for productive investments, investors, policymakers and regulators will need to look beyond the narrow issues of creating a supply of network physical capacity by telecom operators. They will need to attend to issues of demand and human capital as well. For that reason the scope of the WDR Dialogue Theme 2003 will include investment in human capital and the facilitation of demand, key factors influencing successful network rollout toward universal access objectives that are too often neglected.

2. Can Telecom “Microeconomic” Regulators Stimulate Investment?

Telecom regulators do not have powers to directly influence financial markets or the instruments of macroeconomic policy and regulation that attempt to stabilise national and international capital markets and economic growth. As microeconomic regulators of one increasingly important sector of national economies, they must react to the overall macroeconomic environment and its implications for the telecom industry specifically and the ICT sector more broadly. This raises a question as to whether telecom regulation can do anything about the overall environment for investment in the industry and the sector.

Telecom regulation cannot compensate for boom and bust cycles in financial markets and the macro economy. But telecom policy and regulatory decisions clearly have an impact on the investment climate and investment opportunities in the industry and the ICT sector during both boom and bust cycles. We know from experience that credible (i.e., competent, objective, transparent and accountable) regulation is a great attraction for new investment. Expeditious interconnection regulation is a key element in attracting new investment. Asymmetric cost-based termination prices will attract investment to previously unserved high cost areas by making them potentially financially viable. Governments (or regulators) using their monopoly power to auction licenses and spectrum on the basis of up-front cash payments of monopoly prices will suck investment capital out of the industry. The risk of unilateral imposition of unjustified fees and charges on industry players reduces incentives to invest. Barriers to entry to protect incumbent operators reduce both their incentive to invest and the investment opportunities of potential new entrants. Indeed most decisions by regulators affect the investment climate in their countries.

However, given the current state of, 1) depressed financial markets; 2) the legacy of over-investment in the sector in recent years and excess capacity arising from it; 3) the large levels of debt accumulated by many large players; 4) the perceived increased risk of telecom/ICT sector investments; and 5) the badly burnt fingers of investment bankers and many telecom/ICT sector executives from their recent experiences, one might ask whether in this environment there is anything significant telecom regulators can do to stimulate investment in network development. What might have been effective in a more hospitable investment environment, may be ineffective in the current one.

Whatever regulators do to stimulate investment in the current environment will have a positive impact on long term network development. The uncertain question is how much impact it is likely to have in the short-term. Regulatory initiatives to stimulate investment are worth taking in any event. The current depressed investment environment, and the compelling need for investment in network development, makes it more urgent that regulatory activity to stimulate investment be taken as soon as possible.

3. The Basic Structure of the Investment Environment

3.1 Investment Priorities for Network Development

The opportunities for telecom regulators to stimulate new investment in the sector will vary by region, country, network component, service and demand/need condition. From the supply side, the challenge is to stimulate investment in those network components that are required to facilitate completion of national information infrastructures capable of providing universal access. Investment in local networks is needed almost everywhere; investment in national network extensions to provide universal access is needed in most countries.

However, in most cases, stimulating this investment in the current environment will require a shift in focus from the supply of network physical capacity to the stimulation of sufficient demand to justify the investment. This in turn will require greater investment in facilitating the awareness, skill, and capabilities for service applications by end users, especially SMEs, public institutions and individuals. This is an area that was neglected during the boom investment period, and which traditionally requires investment from both private and public sectors. The sources of investment in developing human capital and stimulating demand must go well beyond the investment of industry players in building facility networks.

3.2 Sources of Funds

The major traditional sources of investment funds include:

- A. Internally generated funds (from retained earnings and depreciation) by the firms in the sector, and new debt or stock issues that these firms choose to acquire so they can take advantage of perceived profitable market opportunities. For telecom, in some countries the dominant investor is the incumbent operator, but in others it is the mobile operators. In recent years the equipment manufacturers have taken over a major share of investment in network R&D and software development for network management.
- B. New investment (often foreign) in domestic operators (e.g., privatisation of the incumbent), new licensees (e.g., mobile), and new service providers (e.g., call centres, VSATs, ISPs, etc.). The largest investments in developing countries have involved major foreign telecom operators investing in partially privatised incumbents, sometimes supported by funds from an investment partner. Suppliers of Internet-related value-added network services (VANS) and content services have become significant in some countries.

- C. Investment by end-users, and intermediary organisations that facilitate end-user awareness, skill development and services applications. This includes investment by public and private organisations, corporations, co-operatives, SMEs, government agencies, schools, individuals, aid agencies and others. The investment is for whatever is needed for end users to use network services effectively. It is for terminal and network termination equipment, training and skill development, new (including experimental) applications of services, and organisational restructuring to allow greater use of ICT and communication services. It includes the creation of intermediary organisations that facilitate services applications, as well as related activities that support the creation of new demands for services.

This is an amorphous, and not clearly defined or even understood area of investment that is difficult to measure and rarely attempted. Yet it seems apparent that in aggregate it involves a significant amount of investment in a diverse array of activities. For the immediate future this may be the most important area for investment. It will be needed to provide a major stimulus to demand that will be necessary to get the attention of those currently cautious about investing in further facilities network development.

4. The Directions of Regulatory Activity

4.1 From Regulatory Restraint to Regulatory Stimulation

It is clear that in the current environment regulators must take a more comprehensive view of the factors that determine investment in the sector. In the first stage of telecom reform, policymakers and regulators generally faced a robust investment environment where the licensing process was seen as a competition for the privilege of being allowed to invest in the sector. Regulatory concerns focused on how best to extract money payments to the government or obligations for the rollout of networks and services. The supply of investment capital for the sector exceeded the demand.

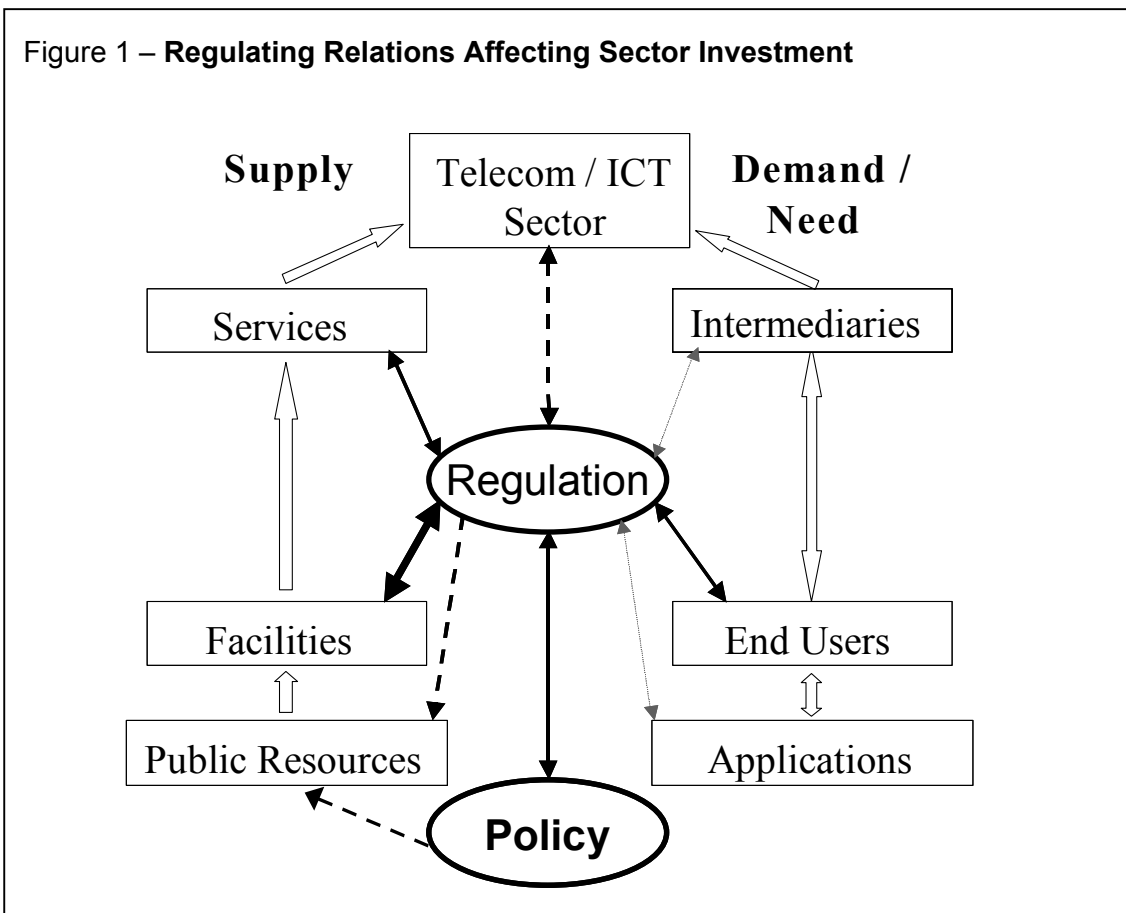
Now the demand for investment in the sector significantly exceeds supply. Licenses are no longer special privileges to invest in perceived lucrative telecom markets. In a number of cases, licenses are not being taken up. In many, license obligations established during the “boom” period cannot be met. Established operators have scaled down investment programmes dramatically.

Policymakers and regulators who continue to try to apply the practices from the boom period will be providing major barriers to investment. They must now turn their attention to the other side of the equation. How can they reduce regulatory barriers to investment to an absolute minimum, and what can they do to reduce regulatory risk and

investment risk in the sector? What can they do to foster the stimulation of demand, the most important element determining future investment?

4.2 Regulatory Relations Affecting Sector Investment

Figure 1 illustrates the directions of regulatory relations that bear on the telecom industry and ICT sector market environment. In a sector of the economy that is in a process of transformation by new technologies, services, demands and applications, the market must provide an environment for innovation, experimentation and learning as suppliers and users are induced to take risks and respond to one another's innovations. The market is the essential learning laboratory. In the present depressed investment market conditions, the environment in telecom/ICT is not supporting significant innovation, experimentation and learning activity. This activity is what regulators need to try to influence in a positive manner so as to promote investment in learning by both suppliers and users, as a foundation for the rollout of network facilities and services.



A dashed line links regulation to the telecom/ICT sector market environment because regulators typically do not see themselves as acting specifically to influence it. They tend rather to see themselves being influenced by the overall market environment which affects how they apply regulatory standards to the operators. A more strategic view would recognise that the link can run both ways. Proactive regulators can develop strategies to influence the market environment directly, e.g., by publishing information and providing support activities to facilitate awareness, opportunity, innovation, experimentation and choice.

The arrow linking regulation to policy in Figure 1 is solid to reflect that regulators are implementing policies that proscribe their responsibilities. They are implementing policy which directs and constrains them, but also implies they should be proactive and innovative to ensure the policies are actually implemented effectively. The arrow to policy runs both ways as proactive regulation will provide feedback to policymakers on the effectiveness of policy implementation and the need for changes in policy as the dynamic market environment changes.

The heavy arrow linking regulation to facilities reflects the traditional preoccupation of regulators with the operators who supply the network facilities, including the incumbent, mobile operators and others. The vast majority of regulation deals with this relationship, e.g., licensing, interconnection, pricing, etc. The solid arrow linking regulation to end users reflects the responsibilities of most regulators for providing some form of consumer protection, typically the reasonableness of prices, levels of service quality and minimal standards of universal access. In the era of monopoly, these two relations pretty much defined the scope of regulation.

The dashed lines linking both regulation and policy to public resources represent rules and decisions relating to the spectrum, rights of way, numbers, and more recently domain names. In some countries, these are the responsibilities of regulators; in others, policymakers; and in still others, both regulators and ministries working together, usually with the ministries (of communication or finance) setting the rules and standards and the regulators administering them. These relations can vary significantly from one resource to another. Often public management of rights of way lies outside the scope of either communication policy or regulation. The lines are dashed in Figure 1 because the regulatory responsibilities of most regulators are highly constrained, e.g., whether or not to auction spectrum. Decisions with respect to the allocation and utilisation of public resources are most often taken without adequate consideration of their implications for network and services development. The European 3G auctions provide the best current illustration.

With telecom market liberalisation, services have become separable from facilities, and regulators have had to fashion standards for examining wholesale and retail services markets. This unbundling of services from facilities has spawned VANS and the Internet, and is making a variety of e-economy services markets possible. Regulators have developed relations with the new services sector, but to date they have been focused primarily on resolving disputes between services suppliers and facilities operators on competition issues, e.g., network interconnection, access, pricing, etc.

There has been relatively little attention to stimulating services market development in ways other than simply providing services suppliers access to the network.

The white arrows in Figure 1 linking public resources to network facilities, facilities to services, and services to the market environment reflect a simplified version of the supply chain. The supply of resources, facilities and services must be coordinated to bring services to the market in an efficient and timely manner. As regulation influences the public resource, facilities and services components of the supply chain, it directly affects the structure and efficiency of the supply side of the market. Inadequate regulation can impose inefficiency in the supply of resources, facilities, services, or all three. Regulators seldom have occasion to examine the coherence of their regulatory activities for the whole supply chain in the context of the particular market environment.

The demand/need side of the market environment is illustrated on the right side of Figure 1. Much less is known about demand than supply issues. This is partly due to the fact the transition from monopoly to a more competitive market environment is still at an early stage of development in most countries. Under conditions of monopoly supply of a public necessity service, attention to demand is not a priority. This supply side approach to market development has also been fostered by the fascination of many old and new operators with the technical capabilities of the new technologies. The prevailing view has been characterised as, “if we build it, they (the customers) will come”. Now that this has been proven wrong, demand side factors should get more attention in investment analysis. Hopefully the WDR dialogue will help to restore a better balance between supply and demand in the attention of all parties involved in network development issues, including regulators.

The existence of intermediary activities and organisations on the demand side of the market, facilitating relations between end users and the market, are common in many industries. Buying agents use their specialised knowledge of the market and of the needs of particular users or user groups. Large firms have their own teams of experts to match the specific needs of the firm with the best available supply possibilities. They typically negotiate with suppliers to modify their offerings in response to the specialised needs of the purchasing firm. Many SMEs hire specialised firms or consultants to do the job. For organisations of all sizes, and particularly individual end users, there often needs to be a significant degree of experimentation and learning to discover beneficial applications of new services to find a match between demand and supply.

For services associated with new telecom network development, a wide array of intermediaries have arisen attempting to facilitate this process. At the one extreme, they include local organisations with a clear demand, responding to the absence of adequate network capacity, e.g. rural co-operatives in the US. At the other, they include facilitators of innovation, experimentation and learning by end users that is necessary for them to become aware of the potential opportunities, learn the potential benefits, and develop the interest and expression of demand. This is a fundamental issue for people in rural areas of developing countries. (The very diverse range of intermediary organisations is described in 3.2C above.)

The broken arrows linking regulation to intermediaries suggest this relationship is a new one for most regulators, and indeed for most intermediary organisations as well. Similarly, the broken arrows linking regulation to end user applications of services, e.g. e-commerce, e-government, e-education, etc., has not been considered part of the responsibilities of regulators. Sometimes new services applications are developed by end users directly, but often they involve intermediaries that facilitate the experimental and innovation stages that precede new applications, especially if they involve significant changes in organisational structure and/or individual behaviour.

The extent to which regulation can make it possible for intermediary organisations to play a more constructive role in demand development remains to be seen, but in the current depressed investment environment they could play a very significant role. More broadly, if regulation can foster an environment for widespread experimental applications by end users and intermediaries, this would help stimulate the growth of effective demand. The white arrows on the demand/need side of Figure 1 illustrate that demand/need is expressed in the market environment sometimes through intermediaries and sometimes directly through end users, and that significant new demand for growth must come from new applications of telecom/information services.

Figure 1 may provide a useful framework for examining the existing and potential roles for regulators that bear upon the conditions of supply and demand that will stimulate investment in network development. Some are familiar as they have been at the heart of regulatory activity since the beginning of the telecom reform process, e.g. regulation of incumbent facility networks. Others are new, e.g., stimulating activity by intermediaries to cultivate demand through experimental new applications. If investment is to be stimulated, it will require that regulatory attention be directed to all of these factors.

5. Domains for Assessing Regulatory Risk and Effectiveness

For regulators interested in stimulating investment in the sector, the most obvious place to begin is to examine existing barriers to investment. These could be in access to public resources, license conditions for constructing network facilities, network access to provide services, end user awareness and understanding of service options, restrictions against beneficial service applications, barriers to market experimentation, or in other areas of supply and demand activity illustrated in Figure 1. A useful exercise would be to identify and document all existing barriers to investment and reassess whether they are justified as essential in the present environment.

A second area for attention is regulatory risk and its implications for investment risk. Regulators are in a position to assess the extent to which the regulatory risk for investors is large or small, and what the causal factors are. Regulators can take specific steps to reduce regulatory risk that they create for investors. They can also

take specific steps directed to reducing investment risk in the sector. But this will require that they take a proactive approach to addressing these important issues.

There are several specific domains that require examination in any programme to reduce barriers to investment and regulatory risk. These include the following five areas.

5.1 The Institutional Structure of Government in the Sector

When potential investors visit a telecom regulator for the first time, they have two important questions to ask. Is it empowered to implement policy in an objective and transparent manner, without political interference from the government? Does it have enough independence to resist the monopoly power of the incumbent operator? If the answers are “Yes”, then political risk is low and investment opportunities are seriously assessed. If the answer is “No”, then political risk is high, and a decision must be made as to whether the investor wishes to play politics in that particular country. In the current environment, potential investors walk away.

When regulators are first established, there are inevitably strained relations between the regulator and the ministry, which formerly performed the regulatory functions. As well, the relations between the regulator and the incumbent are strained as the incumbent was not previously subjected to regulation. In addition, when appeals are made to the court, the court is often examining new issues arising from new legislation about the powers of a new type of government agency. There is a learning process involved for all parties.

An important element of regulatory risk is the clarity and transparency of these relations, not only with respect to the law and administrative procedures, but also with respect to how well this institutional structure actually functions in practice. These relations define the institutional parameters of the regulatory “game”, and heavily influence the cost and time required for potential investors and participants to play the game, and the degree of certainty of decisions made by the regulator.

The institutional environment for telecom regulation functions quite well in the Scandinavian countries, despite the absence of detailed rules about due process and the boundaries among the different roles of the parties. Decisions tend to get made openly, on the merits, in timely fashion, at relatively low cost, and accepted by the parties. There is high degree of mutual trust in the system, and all the parties are more inclined to get on with their jobs than engage in litigious or political turf battles. In contrast, the US has the most detailed legislation and precise rules for the division and delegation of powers, administrative procedures and appeal processes of any country. But it has resulted in a highly expensive, time-consuming, uncertain litigious process that can provide a major barrier to entry for investment, especially for new or small firms.

At the other extreme, in a number of countries, the key regulatory decisions are taken by the Minister, without transparency or accountability, thereby raising investment risks dramatically. All regulators can examine this basic institutional structure for regulation within their respective countries in terms of the results it is achieving and assess where barriers and risks to investment can be reduced.

5.2 Policy Directions for Regulation

Regulators must work within a policy framework that includes directions from government that bear directly upon investment risks. The dividing line between what issues are classified as policy and what are delegated to regulators vary from country to country. In some countries the regulator is no more than an administrative arm of the ministry, and all decisions are subject to being overridden by the Minister. This is not independent regulation and introduces a high degree of regulatory and political risk. At the other end of the spectrum, some regulators have substantial powers over issues that some people would consider to be policy matters, e.g., whether or not to introduce competition by issuing new licenses. In this environment, there is either a high degree of trust and confidence in the regulator, a low degree of confidence in the capabilities of the ministry, or both.

Between these two extremes, there is no optimum dividing line that separates policymaking from regulatory functions. What is important is that the allocation of functions be clearly defined and respected, and that it work effectively in getting the policies implemented. Regulators can assess how well the existing structure is working, and make recommendations for changes to improve effectiveness and reduce the regulatory risk for investment.

5.3 The Regulatory Process

The regulatory process can be a significant barrier to investment and create unnecessary investment risks in several ways. In some countries, costly, time-consuming regulatory filings by established operators and potential new investors must be made to do just about anything in telecom, e.g., become an Internet service provider. In others, filings are not necessary even to become telecom operators. The requirements for filings, the transparency, clarity and cost of participation in the regulatory process, and the speed and certainty of regulatory decisions, all have a significant affect upon investment risk. In most countries, the regulatory process is considered to be a significant barrier to investment. The challenge for regulators is to look for ways to reduce that barrier, or even turn the process into one that supports and facilitates investment, thereby reducing investment risk.

5.4 Application of Substantive Regulatory Standards

Regulators apply a set of substantive regulatory standards to help them implement the policy objectives of government. These vary in application by different regulators, but the following standards are the most commonly used, 1) a rate of return on investment formula for calculating the overall level of prices for an incumbent operator with dominant monopoly power; 2) a price cap formula intended to set maximum prices for certain baskets of services and encourage productivity improvements, applied generally to incumbent operators; 3) a cost standard to provide a basis for determining cost-based or cost-oriented prices for particular services, especially those involving interconnection and access to monopoly networks. These include a variety of interpretations of long run incremental cost (LRIC), fully distributed cost (FDC), and applications of other cost concepts.

As telecom services markets have become more competitive in some countries, standards relating more directly to competition are being assessed, e.g., in the European Union. These include criteria for defining specific telecom services markets and the measurement of significant market power by the larger players in these markets. These indicators are intended to help determine whether specific markets are effectively competitive, and where significant market power exists that requires the application of the more traditional regulatory standards.

The effectiveness of the application of these regulatory standards depends not only on the appropriateness of the standards to achieve specified regulatory objectives, but also how, where and when they are applied. A theoretically good standard can be applied inappropriately and achieve negative results. For example, LRIC is an appropriate cost standard in theory, but incumbent operators claim that it provides no incentive for them to invest in improving their networks, and many reduced their investment programmes, even during the boom period in the sector. This claim needs to be seriously examined with respect to, 1) the relevance of the LRIC concept and methods of measurement as a standard for stimulating investment; 2) the appropriateness of the particular applications of LRIC by regulators; and 3) the possibility that these incumbents are “gaming” the regulator, i.e., blaming the regulator’s application of the LRIC standard as an excuse for anti-competitive behaviour. But the important matter is that investment in network development is not taking place, so this matter must get priority attention.

Regulatory standards can also be applied imaginatively to solve unusual problems. For example, cost-based pricing has been applied to determine higher prices for terminating calls in high cost rural areas. This more precise application of cost-based pricing to determine asymmetric termination prices has made many rural areas financially viable and stimulated significant investment in network development in previously unserved areas, as demonstrated dramatically in Chile. In assessing the effects of different regulatory standards upon investment in the current environment, one must examine not only the standard itself, but also how, where and when it is being applied, as well as its effectiveness in achieving the desired results. It is now

timely to reassess the implications of all the traditional regulatory standards with specific reference to their implications for investment in network development.

5.5 Steps to Stimulate Demand

Regulation has been focused almost entirely on supply side conditions, i.e., preventing the exercise of monopoly power by incumbent operators and establishing conditions for participation in the market by competitors. Certainly consumer benefits flow from these activities in terms of lower prices, service quality, new services, increased consumer choice for some services, and universal access/service provisions. Some regulators publish information to help consumers make more informed choices, e.g. price and quality of service comparisons. But taking more specific steps to stimulate demand typically has not been viewed as part of a regulator's mandate.

Yet if the policy objective is to achieve full network development to make a variety of services available to everyone, attention to demand as well as supply issues would seem to be necessary, especially during a period of depressed investment in the rollout of potentially beneficial new services. If one then considers the policy statements of most governments with respect to the development of their information infrastructures for future e-economies and information societies, regulatory attention to demand as well as supply would seem to be essential.

Just as there are barriers and risks on the supply side of the market that regulators can reduce, so there are barriers and risks to demand development that regulators can reduce. One important area relates to information. Telecom tariffs often defy comprehension by consumers. Yet an efficient market requires that consumers be fully informed about prices, service capabilities and potential applications. It could be argued that in theory a perfectly competitive market will supply this information. But at present telecom markets are far from perfectly competitive, and the supply of additional information to consumers can only help markets function more efficiently. Moreover, as information is part of the transparency that makes both markets and regulation function more effectively, regulators can improve their effectiveness by examining the specific areas where gathering and publishing information will support the development and implementation of consumer demand.

Regulators can often play a facilitating role to assist intermediary and end user organisations adapt their demands more efficiently to existing or newly designed services. A common story heard from banking and finance, education, health and other sectors is that available telecom services do not match their needs well and the pricing structure of the services makes them too expensive. Often the regulator is in the best position to facilitate the necessary adaptations in both demand and supply that enables new service applications associated with major organisational changes in the end-user organisations. Regulators can act as intermediaries themselves or facilitate the work of other organisations performing the intermediary function. This kind of facilitating activity fostered the creation of the SWIFT network in banking a generation ago, as well as educational television, telemedicine and other new applications.

Associated with this activity is the creation of a regulatory framework that encourages flexibility for experimentation and innovation in the development, application and marketing of new services. More typically, both regulatory rules and tariff restrictions prevent experimentation and add to the risks of innovation, particularly by intermediaries and end users on the demand side of market development. The issue for examination here is how regulatory agencies can play a more proactive role facilitating the development of new services applications to underpin e-economies and information societies.

6. Expanding the Boundaries of Participation

Until recently, network development directed to achieve universal access has been associated only with the fixed network of incumbent operators. Yet in many countries mobile service coverage far exceeds the fixed networks for voice services. Prepaid mobile service is now the vehicle for achieving universal access.

For the future, access to Internet services is becoming recognised as the new target for universal access. Mobile networks are not likely to be capable of satisfying this objective. Upgrading the fixed networks of telecom operators to broadband information infrastructures will take many years and enormous amounts of investment under the best of circumstances. In some countries, electricity, gas, pipeline, rail and road infrastructures are being used by new network operators to achieve economies and speed in network rollout. But enormous numbers of people still will be without any form of Internet access for the indefinite future.

The most universal communication facility infrastructures by a long way are those providing radio and television services. Although ICT convergence now makes it technically possible to supply limited Internet service over radio and TV communication networks, they have not been seriously examined as vehicles for providing at least some minimal Internet access to people living beyond the limits of fixed telecom networks. If some kind of universal access to limited Internet service is to be achieved for the great majority of people in developing countries within the foreseeable future, it will have to be provided over existing radio and TV transmission and distribution networks.

Experiments involving intermediary organisations using radio and TV to facilitate indirect access to Internet services for “off-net” peasants in rural areas have demonstrated that this can be done. The challenge for regulators is to reduce the barriers that now exist among the variety of existing and potential telecom facility and services networks. By establishing conditions that permit experiments by intermediaries to become catalysts for the extension of network services, regulators can help create demand and stimulate investment.

7. International Organisations and National Regulation

International organisations influence the telecom/ICT investment environment in most countries, as well as the roles and activities of national telecom regulators. They do this primarily in two ways, 1) harmonising and coordinating national telecom policies and regulations; and 2) investing in human capital in developing countries, by providing consulting advice to government and regulatory agencies, and training for people directly involved with telecom reform. The World Bank has provided funds for investment in network facilities in developing countries in the past, but with the initiation of telecom reforms, it has shifted its primary activities to facilitating reforms, including privatisation of incumbent operations. Its IFC division engages in a limited amount of investment in new private (mostly mobile) operators.

The ITU provides a world forum for agreeing technical standards and spectrum allocation rules, studying common policy and regulatory issues, publishing reports and statistical information, holding workshops, training programmes, exhibitions and conferences. It plays a significant role in harmonising and coordinating national telecom policies and regulations among its member countries. Most regions of the world have telecom regulatory associations that perform harmonising, coordinating and mutual support activities. The WTO provides a forum for harmonising telecom liberalisation and trade policies and practices.

The World Bank, the ITU, the development aid agencies of a number of developed countries and other organisations invest in human capital to facilitate the telecom reform process and to train the staff of regulatory agencies in developing countries. This investment in human capital has influenced the telecom reform process in these countries to the point that the reforms have been driven more by foreign than domestic interests in some countries. Despite these investments in human capital, the experience so far suggests that in most developing countries, the limiting factor on the capabilities and effectiveness of regulation is the shortage of essential skills.

The WDR Dialogue 2003 will include an examination of how the activities of these international organisations, individually and collectively, are influencing the roles of national regulation, and opportunities for investment in both network facilities and human capital. In this respect there are marked differences between developed and developing countries. One important issue is whether these differences are narrowing or becoming wider.

8. The Competence and Credibility of Regulation

Both the credibility of regulation, and the scope of activities that a regulatory authority can undertake are directly related to the competence of the regulator. During a period of institutional change, when the roles of the regulator are being developed and shaped, new skills and competences must be obtained to address new issues. It is

important that all parties affected by the telecom reform process understand its purposes and how they can participate most effectively. Competence about regulatory issues is essential for policymakers and operators as well as regulators, and desirable for trade unions, consumer groups and educators.

Investment in human capital about regulatory issues has been, and continues to be a key element determining the competence of all parties to the regulatory process, and the credibility and effectiveness of regulation. The most successful countries in implementing telecom reform have paid special attention to developing and updating regulatory skills. They invest continuously in human capital development. The roles for regulation in stimulating network development in any country will be constrained by the competence of its human capital and that of the participants in the regulatory process.

The technical skills needed by regulators generally fall into the categories of law, accounting/finance, engineering, economics, administration and management. In these areas the regulatory authority must compete with the operators, the ministry and others to attract people, and it is often at a disadvantage in the skills markets. The problem is particularly acute in most developing countries where skill shortages are severe and affect all parties to the regulatory process, not just the regulators. Moreover established education and training institutions and labour markets typically have very limited capabilities to respond to the needs. Regulatory competence is the limiting resource in implementing effective telecom reforms.

A number of operators in developing companies consider the uncertainties associated with “regulation by photocopy” – i.e., the uninformed application of regulatory rules and standards that have been faxed from somewhere else, usually the UK or the US – high on their list of regulatory risks. The Final Report of the WDR Dialogue 2002 on Next Generation Regulation notes that the key factor leading many developing countries to consider establishing multisector utility regulators, rather than sector specific regulators, is the severe shortage of the skills necessary to regulate effectively. Investment in human capital is essential to reduce regulatory risk and prepare the ground for regulatory activity that will reduce the risk of investment in network development.

But technical skills alone are not likely to lead to significant institutional change. The key competence for driving institutional change is strategic management capacity, the capability to assess when and how to apply regulatory standards, tools and skills to achieve policy objectives in a dynamic technological and market environment. Strategic management capacity will be the key competence determining the capability of regulatory authorities to undertake activities to stimulate telecom reforms and network investment. Unfortunately, the regulatory authorities in relatively few developing countries will be capable of implementing a full agenda of activities for stimulating investment in network facilities development that is likely to arise from the WDR Dialogue 2003 because of an insufficient capacity of human capital.

9. Conclusion

This paper has established an overall framework for examining the variety of ways that telecom regulation does influence and can influence investment in network development. This framework has been designed to encompass all the potential activities that regulators might consider undertaking, so they can be prioritised and critically examined. Some issues will be generally applicable to telecom regulation everywhere; others will be applicable to countries at different stages of the telecom reform process, different levels of network development, and different economic circumstances; still others will be country specific. Research on these issues in the form of theoretical and conceptual analysis, case studies of specific regulatory issues and country experiences, and individual viewpoints reflecting a variety of perspectives will all contribute to the WDR Dialogue for 2003.

The particular framework that has been adopted for structuring the issues in this paper is intended to stimulate and guide the dialogue, not to limit or constrain contributions in any way. Perhaps the best way to begin the dialogue is to focus directly on the matter of priorities. If regulatory authorities intend to take steps to reduce regulatory risk and establish a more hospitable environment for investment in network development, where should they start, and why? What are the issues that are likely to have the greatest impact in the short run? What should be done and what are the likely effects?