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FEEDBACK TO REGULATORS FROM INVESTORS

Telecommunications in Crisis: Perspectives of the Financial Sector on Regulatory Impediments to Sustainable Investment

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I. Introduction and Preliminary Observations: A Sector in Crisis

Telecommunication operators and service providers around the world, almost without exception, are now facing an extraordinarily adverse climate for generating the financing required to maintain and expand their operations. Some of the reasons for this very adverse environment are quite obvious; others are more complex. Regulating the sector in light of this environment presents challenges that merit a revaluation of a number of aspects of traditional regulatory approaches.

In the two years leading up the high water mark of the Internet bubble in March 2000, investors' enthusiasm for what seemed to be a dynamic sector extended to the staid group of former telecommunication monopolists. Often previously regulated on a rate of return basis with their public utility counterparts in the energy and transport sectors, investors valued the traditional operators in the market with price/earnings ratios like newly minted Internet start-ups – as multi-billion dollar ventures on the basis of mere promise of future revenue and earnings streams. As market appraisals of the Internet sector collapsed, valuations of traditional telecommunication operators also collapsed with a vengeance to more historic and conventional levels. Acquisitions and business strategies based on elevated market evaluations of these operators' securities became exposed to increasingly hard assessments. The attention of investors and their financial advisors is now focusing again on the real dynamics and prospects of diverse market segments in the telecommunication sector. The future financial viability of converging telecommunication, media, and Internet sectors is now subject to unprecedented levels of uncertainty as a result of the combination of collapsing expectations about the prospects of the Internet, the mobile sector's plans for third generation (3G) services, and core fixed line telecommunication services as well as the breakdown of confidence of investors in corporate disclosure and accountability mechanisms. Staggering revelations about the accuracy of the financial reporting of an increasing number of publicly traded companies in the telecommunications sector in the United States and even some other markets have dealt a heavy blow.

Assessments of the potential for growth in the telecommunications sector, the possibility of renewed investment flows, and comparison of the operational and financial results of telecommunication operators depends significantly on the underlying constraints applicable to such operators, and, in particular, to the various regulatory and governance-related arrangements applicable to their operations. This paper is intended to provide some insights from the standpoint of the financial community about how regulation overall, and some specific regulatory policies, may affect the flow of investment into the telecommunications sector and the overall dynamics of growth and competition in the sector. Investment banks and commercial banks play a key role in the conduit of financing to meet investment needs, and in doing so they assess the prospects for returns on investment in light of the scope for market growth and restrictions on such growth.

This paper is not so much based on a scientific survey of the views of investment bankers or financial advisors as on a series of discussions with a range of investment bankers and investment analysts who deal with national and international investment in both developed and developing markets as well as on the experience of its principal author both as a regulatory advisor and then for the past ten years as international legal advisor to a range of telecommunication companies raising debt and equity financing in the international capital markets. The views expressed in this study are those of the authors and may not necessarily reflect the opinions of the ITU and its members. The focus of the paper—given the breadth of the issues addressed—is thus necessarily anecdotal in orientation and reflective of the views of

members of the financial community through the prism of the author's own experience. Nevertheless, the paper will hopefully contribute to further and ongoing exchanges of views among regulators and financiers about how regulatory frameworks and policies can be structured and focused to ensure access to the financial capital necessary for the long-term development of the telecommunications and related sectors of the global economy. The paper focuses both on many issues that would have been a matter of concern irrespective of the condition of financial markets as well as on some views concerning how regulators may have to reassess their task given the current crisis facing the sector.

One of the premises of this analysis is that a fresh new look at the impact of regulation on investment is imperative given current conditions in global financial markets and the views of investors about the prospects for the overall sector. A common theme arising from the discussions with the financial community concerns whether the regulatory community takes a sufficiently broad view of the sector as a whole, as opposed to fragmented application of focused economic theories and social policies to various specific markets within the sector.

A second core theme of this paper concerns the need for regulators to adjust some of the premises of regulation to take into account the rapid changes to the structure of the market resulting from the introduction of competition, whether resulting from the removal of incumbents' exclusivity rights or from the use of alternative technologies (e.g., in the case of fixed line retail services, the substitution effects of mobile services, and use of call-back services and Internet telephony). A key priority in attracting investment is increasingly to ensure that operators and service providers will have the necessary flexibility to adapt to changing market conditions and not be constrained by traditional models that no longer reflect the reality of the competitive market.

II. Regulation From the Investor's Perspective

Financial Analysis and Business Planning

As intermediaries between the sources of capital in the international financial markets and the deployment of that capital to identified business opportunities, investment and commercial bankers play a key role in evaluating the viability of investment in the telecommunications sector. The financial community's various methods of comparing different investment opportunities offer insights into the types of factors that affect the attractiveness and cost of investment, and how management of those factors by governments and regulators might be improved so as to increase investment flows.

An essential part of the work of investment bankers involves monitoring carefully the performance of a wide spectrum of market participants and benchmarking their results on the basis of operational and financial indicators. These indicators include: information about the existing structure of, and potential for future growth in, the market, such as penetration, usage and churn rates, and market share; efficiency measures such as average revenues per subscriber ("ARPU") and employees per line; leverage and capital adequacy measures such as debt/equity ratios; and various income statement measures such as earnings before interest, depreciation, taxes and amortization ("EBITDA").

Table 1: Selected indicators used by investors

Operating Statistics/Ratios	Financial/Operating Ratios	Financial Statistics/Ratios
Subscribers (or lines)	Average revenue per user (ARPU)	Operating revenues
Employees per subscriber (or line)	Revenue/minute	EBITDA (Earnings before interest, taxation, depreciation and amortization)
Minutes of use per subscriber (MOU/Sub)	Subscriber acquisition costs (SAC)	EBITDA margin (EBITDA over revenues)
Churn rate	Enterprise value (EV) per subscriber (EV/Sub)	Free cash flow (FCF)
		Debt/EBITDA
Country penetration	Capital expenditure (Capex)/Sub	Debt/market capitalization
	Capex/Minutes of Use (MOU)	Enterprise value (EV)/EBITDA
		Capex/revenues
		FCF yield
		Price/earnings (P/E) ratio
		Earnings per share (EPS)
		Return on equity (ROE)

Source: Debevoise & Plimpton, London

Whereas operating income and net income are standard line items in a company's income statement, EBITDA is a presentation of selected information derived from the income statement. A company's operating income is comprised of its income from its operations (providing services or selling goods) less the expenses of such operations, such as salaries, maintenance, costs of purchasing services and products required to offer the services or sell the goods, annual license fees, marketing expenses, as well as depreciation and amortization. Depreciation is an annual charge on the income statement of an amount that over time reflects the gradual reduction in value of an asset, for example network assets, over the asset's lifetime. Amortization is an annual charge on the income statement that spreads out a one-time up-front payment for an asset, such as a license, over the lifetime of the license. Operating income is the result of subtracting such costs from the income, before calculating the income tax due. After calculating operating income, a company will calculate its net income by further subtracting its financing costs (e.g., interest on loans), its income tax, as well as other extraordinary charges resulting from particular events or programs, such as asset write-downs or work force reduction programs.

EBITDA is the calculation of a company's earnings without taking into account costs such as interest, taxation, depreciation and amortization. EBITDA has been particularly useful to investors in assessing the cash flow from operations from one period to another without taking into account the expenses related to the original investment (interest, depreciation and amortization) which obscure the trends in the direct revenues and expenses of the actual operations themselves.

EBITDA has the disadvantage that it does not reflect the actual cash flows available to the business for liquidity purposes since interest and taxation expenses are not included in the calculation. In the late 1990s, EBITDA trends were particularly encouraging and EBITDA projections were excessively optimistic, and although some financial regulators such as the United States Securities and Exchange Commission cautioned companies against focusing investors on EBITDA and required such companies to include disclaimers as to its appropriateness as an indicator of cash flow and liquidity, EBITDA and EBITDA projections have been and still are used extensively by financial analysts in valuation of companies. More recently, because of increasing regulatory and market scrutiny, the focus has shifted to more conventional measures of liquidity and cash flow. Investors and financial advisors are making increasing use of valuation methods that rely less on the growth potential of the business and more on its ability to generate cash. Thus there is more focus on operating cash flow yield, the yield dividend and cash flow/earnings ratios. This increases the importance of companies being able to demonstrate their ability to generate cash themselves to fund their investments, and therefore makes it all the more important that regulators consider the impacts of regulation on cash flows.

Future estimates of such indicators are the raw data used by the financial sector in evaluating investment opportunities. Estimations of the net present value ("NPV") of companies' operations, valuations of their discounted cash flows ("DCF") and methods using multiples such as price/earnings ratios and enterprise value/EBITDA ratios typically focus on the key drivers of future revenues and costs, and discount these in relation to investment risks and opportunity cost over the investment horizon. Such valuation methods assist in determining the cost of investment, and ultimately whether a given investment opportunity is worthwhile. Whether an investment is financed in the form of equity or debt also makes a difference to the discount rates applied. Debt, ranking ahead of equity in most bankruptcy systems, is lower risk and therefore costs less for an operator to raise than equity finance.

Business plans prepared for investment decision-making in the telecommunications sector, as with most infrastructure-intensive businesses, typically take a long term view, modeling the business over five to twenty years. How quickly investment is required to turn a profit depends partly upon the availability of external finance for on-going investment, working capital and liquidity, as well as the speed with which services can commence commercial revenue generation, the predictability of market conditions and flexibility to adapt the core economic terms of the business in response to changes to market conditions. The greater the uncertainty in the market, for example as a result of the possibility of competition and technological innovation, the more important it becomes for investors to know at the time of investment that the operator will have the flexibility to adapt its core economics (prices, for example). If such flexibility is not signaled by regulators, it may become more important from a risk management point of view to achieve profitability on a shorter time scale, or the cost of capital for a given investment opportunity is likely to be higher. To the extent that external sources of finance are unavailable, as is now generally the case in today's capital markets, it becomes more important for companies to be able to use their own cash flows for liquidity and continuing investment, and therefore that they begin to realize profits on a shorter investment horizon.

This paper therefore is not only concerned with the ability to attract capital from external sources, but also – particularly given the current state of the financial markets – the capacity of telecommunication operators and service providers to finance their investment needs from their own cash flows. Indeed, this capacity is also relevant to the attractiveness of operators and service providers to the capital markets, since debt/equity ratios and the impact of debt servicing costs on cash flows have a significant bearing on credit ratings and whether a company can attract further investment. Until it becomes foreseeable for the capital markets to recommence funding the investment needs of the telecommunications sector, it will be important that the sector as a whole be afforded the flexibility to use cash flows from higher revenue generating businesses, such as mobile services for example, to fund its investment needs.

The ability to fund investment from cash flows becomes all the more crucial in developing countries which may find it even harder than operators and service providers in developed markets to access international financial markets. The higher the risk profile of the business, the more important it may become to be able to finance its own investment from its own cash flows. For example, the nexus between price regulation and investment requirements becomes particularly strong where developing country governments seek commitments from strategic investors to ensure increased investment in incumbent operators. Those strategic investors will consider carefully the extent to which projected cash flows will suffice to satisfy the investment needs and may otherwise be unlikely to guarantee the investment commitments required by the governments.

Regulatory Factors Affecting Projected Revenues, Costs and Risks

In estimating projected revenues and costs associated with investment opportunities, and in weighing the risks associated with such investments, investment bankers will analyze a range of likely and contingent factors and influences, and their impact on the bottom line of the business. This paper discusses a sample of factors which come within the realm of governments and regulators, have a significant influence on the fundamentals of the business, go to the heart of the valuation of investment opportunities and therefore have a determinative impact on the viability of capital deployment. The paper is ultimately concerned with the role that governments and regulators can play in improving the viability of investment in the sector. Where governments remain major shareholders in a sector, relevant factors will also include dividend policies and the likelihood of a government using its shareholding to effect sector policy goals. At the broadest level, valuations will take into account governments' taxation policies towards the sector such as general corporate tax rates and exemptions from customs and excise duties, and accounting policies such as relate to depreciation and amortization, and expensing of capital costs. These broader issues are not the subject of this paper, which focuses more on regulatory-specific issues of particular interest to countries whose telecommunication sectors are in the process of reform and development. A number of investment analysts and financial advisors go so far as to say that telecommunications sector regulation is the single most important factor affecting a country's ability to attract investment.

While discussion of telecommunications sector reform in developing countries often focuses on formal and institutional issues such as the introduction of a new legal framework, the establishment of new independent regulatory bodies and the liberalization of licensing policy, there is often inadequate focus on the conditions affecting the economic bottom line of business planning and capital raising. Formal and institutional matters are important primarily from a risk-assessment point of view. Signals concerning regulatory stability and indications that the sector will be governed according to the rule of law and not be subject to expropriation and policy making that may be vulnerable to political change reduce the

discount that an investment analysis will place on its NPV and DCF valuations, and for that reason such factors are important.

What must not be missed, however, is that the fundamental sector economics must be right for the business plan to be viable in the first place. For example, the independence of the regulator will not improve investment prospects where the regulator's – even independently regulated – price controls leave operators without the assurance of realizing a commercial return on retail or interconnection services. More fundamental than the mantra repeatedly delivered by advisors to regulators stressing the importance of creating a stable investment environment is the importance of creating an economically attractive investment environment. It is imperative that policy makers and regulators have this basic tenet of regulatory wisdom at the front of their minds in framing the design of the regulatory regime and the approach to day-to-day regulation.

On the revenue side of the income statement, discussed in Part III, regulatory factors influencing investment include the presence or absence of an articulated vision for price regulation that reflects competitive realities and the structure of the market, focusing in particular on price controls on basic retail services in light of the substitution effects from the mobile sector. Investment analysts monitor carefully tariffs applicable to specific services such as local, long distance and international call charges, post-paid and pre-paid call charges, as well as roaming, termination and interconnection rates, as well as watching likely causes of change to those rates. The paper discusses concerns among the financial community about the narrow vision of traditional price regulation of fixed line operators, particularly at the retail level. Not taking into account the substitution effects from the mobile sector and the emergence of a genuinely competitive market results in disparate regulatory treatment between the fixed and mobile sectors. Unnecessary and outdated price regulation of fixed retail services may produce distortions that ripple through wholesale pricing, and undermine unbundling initiatives and attempts to introduce high speed access at the local retail level. Regulatory pressure on narrowly defined market segments may reduce the financial flexibility of the sector as a whole to pursue otherwise economically viable opportunities and to weather the current crisis.

On the cost side of the income statement, Part IV of the paper discusses the significant impact on the viability of investment that can result from regulatory policies that affect initial costs of capital deployment, as well as on-going costs. The paper discusses concerns in the financial community about how essential public resources are made available to telecommunication sector operators and how this affects the ability of telecommunication operators to finance their needed on-going investments. The paper also comments on other cost-related issues such as universal service obligations and infrastructure sharing.

Investment bankers will typically focus on a number of risk factors – many common to developing markets – in assessing the attractiveness of investment, and determining suitable discount rates to apply in analyzing the NPV and DCF of a given investment opportunity. Many of these risk factors are discussed extensively in literature on sector reform, and include broad concerns about growth forecasts of the economy in question, political risk, stability of the legal regime, and the independence and mandate of the sector regulator. Part V of the paper focuses on some less obvious examples of systemic complexities that may raise the overall risk profile of the telecommunications sector, particularly as it goes through regulatory transition in a reform process. Investment risks relating to the effect on the income statement of changes in institutional structures are discussed, as are some risks that can arise in the process of transition from an old licensing or concession-type regime to a new licensing regime. Taking a broad view of increasingly cross-border and regional investment trends and the increasing internationalization of regulation through global and regional regulatory

initiatives (e.g., World Trade Organization (WTO), the European Union (EU), and a number of regional harmonization regulatory projects), the paper discusses some of the systemic complexities and risks that arise, drawing on lessons from federal and federal-like regional structures such as the United States and the EU.

Part VI of the paper explores some ways in which a more "holistic" approach to sector regulation could be encouraged, including through the use of industry forum structures designed to air views and concerns among policy makers, regulators, market participants and investors, increase transparency and bringing together inter-related issues for negotiation, regulation and dispute resolution among key parties. Part and parcel of such an approach would be increasing usage of informal and alternative dispute resolution techniques designed to focus on consensus building in an inclusive manner that would take into account the imperatives of the investment constituency. Taking this exploration further, the paper refers to a recent discussion paper prepared by one of the authors of this paper entitled, "Discussion Paper on the Use of Alternative Dispute Resolution Techniques in the Telecommunications Sector" (Bruce & Marriott 2002) for the World Bank published as a document number 12 of the Global Symposium for Regulators.

By way of illustration throughout, the paper borrows examples of some key issues being faced in a number of different national and regional markets. The primary intention of the paper is to deal with issues facing regulators in emerging markets, although the discussion suggests that the experience in Europe or North America, where some regulatory and sectoral issues not yet experienced in emerging markets occupy center stage, may provide useful insights to regulators in emerging markets. Regulators and policy makers in developing markets have the opportunity to learn from the experiences of more developed markets, including how not to repeat their mistakes.

III. Regulatory Issues Impacting Projected Revenues

This section discusses some significant potential impediments that may result from current approaches to regulation that affect, directly or indirectly, the projected revenues of proposed investments and asks whether there may be a need, both in light of the current financial crisis facing the sector and the effect of direct and indirect competition, for a new approach to regulation affecting the revenue side of the income statement. The section suggests re-evaluating traditional price controls on fixed retail services in light of mobile service penetration, and discusses distortions affecting fixed wholesale services, as well as the potential effect of applying competition policy to individual market segments without taking into account the overall state and needs of the sector.

Traditional Fixed Line Retail Price Regulation in a Competitive Market

Policies relating to price regulation of fixed line telephone and telecommunication services undoubtedly have a clear and dramatic impact on the bottom line performance of operators who provide these services and on their ability to raise capital to finance their operations.

Traditionally, of course, in an era when telecommunication operators were considered to be natural monopolies at least with respect to fixed line switched telephone services, they were subject to traditional rate of return public utility regulation, at least in North America. In other countries, price regulation has also focused on rates of return on capital invested in the core business. In many countries, and especially as competition was introduced into the fixed line telephone business in Europe and elsewhere, various forms of price cap regulation were introduced to allow telecommunication operators increased flexibility to make pricing

adjustments – especially in the relationship of their long distance and international rates as opposed to the rates charged for local exchange services. It has not been unusual, however, to impose additional caps on the amount of adjustment that could be made to local exchange tariffs, particularly in view of the apparent impact of such price changes on a wide spectrum of consumers. To the extent that governments had traditionally controlled the price levels of local exchange services, price regulation continued to ensure that significant and politically unpopular price increases were unlikely to occur.

The necessity for significant rate rebalancing adjustments in traditional price structures is now well understood by telecommunication regulators and policymakers around the world. Traditionally, international services, and sometimes national long distance services, were priced well above their costs, and the substantial margins generated by such services were expected to be made available by telecommunication operators to keep the retail price of local telephone services low. The rationale for such pricing structures was, and is, undermined by the inexorable impact of competition in the provision of long distance services which eroded embedded cross subsidies. It has been evident as well that even in markets where *de jure* exclusive rights have been maintained on the part of incumbent operators, there are practical limitations on the full enforcement of these rights. Private networks bypass public networks and erode the revenues generated from the largest users of incumbent operators which have been responsible for the significant part of historic embedded cross subsidies. Call back, IP telephony, or services provided through mobile operators also chip away at an incumbent operator's market share and effectively render it subject to some competition even though in a formal sense regulators or national policymakers do not acknowledge that competitive conditions already exist.

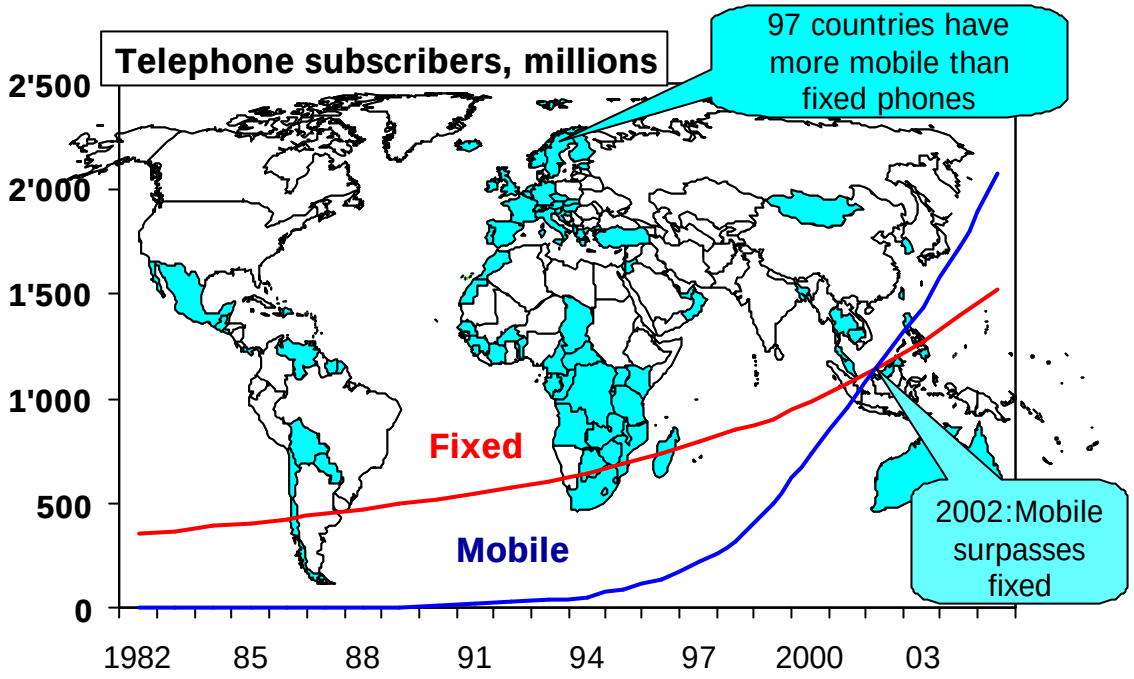
One of the concerns of investment bankers or financial advisors who advise governments in transition is whether policymakers are making realistic appraisals of real competitive conditions and permitting incumbent operators sufficient flexibility to adapt their pricing in anticipation of *de jure* market opening. Likewise, there is concern that other regulatory conditions more appropriate for monopolistic markets are retained in place too long and effectively hinder the ability of an incumbent to adapt to new market realities.

The Reality of Competition From Mobile-Fixed Substitution

With just short of a billion subscribers at the end of 2001, mobile subscribers are expected to exceed the number of fixed lines in 2002. In 1991 less than one percent of the world's inhabitants had a mobile phone; and only a third of countries had cellular networks. At the end of last year, over 90% of countries had mobile phone networks with one in six of the world's inhabitants having a mobile phone. More than 100 countries had more mobile than fixed line subscribers[1]. Much of this success was achieved, in contrast with the fixed line sector, with very little if not with no significant intervention from government and regulators with respect to price regulation.

[1] World Telecommunication Development Report (WTDR): Reinventing Telecommunications 2002, ITU.

Chart 1: Telephone subscribers increase and countries with more mobile than fixed phones



Source: World Telecommunication Development Report (WTDR): Reinventing Telecoms 2002, ITU.

Perhaps more important than substitution effects in access, there are increasingly substitution effects in usage. Traffic on mobile networks comprises an increasing proportion of total traffic, with countries like Japan and Korea leading the way in developed markets and Chile leading the way in Latin America. The importance of substitution effects to investment is a key focus of the financial community, which regularly analyzes the effects of competition between mobile and fixed line services on traffic. For example, some investment bank analysts are assessing market tends in Latin America, projecting future traffic and revenues and ascertaining the viability of investment in that region based on the assumption that every two minutes of growth in mobile traffic will "cannibalize" (be at the expense of) a minute of fixed line traffic. Given the significant levels of penetration of mobile services which are effectively not subject to any price regulation and increased usage substitution effects, it is hard to see the justification for continued traditional forms of retail price regulation such as price cap regulation with respect to fixed line services.

Some of the most dramatic instances of unrealistic conditions for price regulation – and the "lag" in the appraisal by regulators – can be observed in markets where significant mobile penetration is being achieved. For example, in a given country, after the privatization of the incumbent telecommunication operator, as a standalone fixed line operator, the Government was hesitant to acknowledge that mobile operators in the market were diverting significant international traffic both through conventional mobile for fixed call substitution as well as through various techniques for bypass of fixed access facilities to provide access to the mobile operator's gateway. As a practical matter, there was little that the government could do to enforce the incumbent operator's exclusive rights. However, the Government continued to insist, albeit within a fairly flexible price cap regime, on a very deliberate approach to regulating the incumbent's fixed line pricing as if it had effective exclusive rights.

Other interesting case studies are offered by two Arab States operators. In one case, the incumbent has been granted exclusive rights to provide international services. However, as a practical matter, the incumbent has become subject not only to conventional pressures generated by private networks, IP telephony and call back but it also faces significant competition from mobile operators—the incumbent's mobile affiliate and its competitor, whose subscriber members compare with those of the incumbent's fixed and mobile subscriber numbers taken together. The mobile operators together now have more mobile lines than the incumbent has fixed lines, and there is discussion at a policy level of introducing a third mobile operator to the sector, as well as making more spectrum available to the existing mobile operators. The competitor's network is near to full capacity due to demand for its services resulting from its successful customer-oriented marketing and the pricing competition that resulted from the introduction of incumbent's mobile operator, in 2000. Increasingly, these mobile operators, especially in situations with underdeveloped fixed line infrastructure, represent a real alternative to fixed line service for many customers. Indeed, users of mobile services are increasingly likely to originate long distance and international calls using their mobile phones as opposed to their fixed lines. However, a key question that investors will ask – in connection with the incumbent's Initial Public Offering (IPO) – is whether the price regulation scheme applicable to the incumbent's fixed line services allows sufficient flexibility to respond to these new competitive conditions as they continue to develop.

In some countries, the growth in mobile subscribers has even raised problems. This paper discusses later the fractured nature of government policy concerned on the one hand with making infrastructure widely available to the public while, on the other hand, seeking to impose limits on and penalties for installing too many lines. Mobile services are increasingly used in these countries as a substitute for fixed line services, proven by the high mobile usage rates. Mobile call prices are, however, subject to entirely different, and more relaxed, pricing regulation than fixed services.

Another compelling case of this dichotomy in price regulatory frameworks has resulted from the fact that in several countries, it is easier and quicker to get a mobile line than to have a fixed line installed. Some countries continue to have waiting lists in the hundreds of thousands and delays of months to get a new fixed line. Effectively, mobile and fixed lines have become substitutes; and the rates applicable to mobile lines operate as an effective market-based cap on fixed line rates. Nevertheless, the focus of price regulation continues to be on fully controlling the level of all fixed line rates even though by contrast mobile operators will typically offer an array of pricing packages aimed at different segments of the market ranging from large business and residential users to users who are keen to budget their mobile bills through pay-as-you go schemes.

The pricing of mobile services generally remains higher than retail fixed line services in most countries since price controls on retail fixed line services have artificially prevented the full impact of competition between the two types of infrastructure from becoming a complete reality. Yet pre-paid schemes have illustrated in numerous markets, including developing countries, the scope for mobile services to offer competitive packages to low-income users. Those skeptical about the reality of substitution effects between mobile and fixed services in terms of price comparability might focus on the most price-sensitive segments of the market. In fact, it is these very demographic groups – students, young couples and other low-income users – which tend increasingly to subscribe to pre-paid mobile services rather than obtain a fixed line and pay its monthly rental fees. Indeed, mobile services are so competitive with fixed line services that users are prepared to pay higher prices for mobile services compared with their fixed line equivalents. Furthermore, the financial community is increasingly noting that fixed line services become more expensive relative to mobile services

as usage declines and access charges increase. Fixed line operators typically charge a much higher proportion as a monthly access fee, reflecting higher fixed investment with lower marginal costs.

That the fixed and mobile markets are regulated so differently may be more a historical anomaly than a result of present rational policy making. Basic mobile services are comparable to those offered on the fixed networks. Mobile network infrastructure now compares favorably with fixed networks in terms of service coverage, at least for the purposes of retail voice services. Indeed, in many developing countries, mobile networks extend beyond the coverage of the fixed networks and provide an essential connectivity not otherwise available. Bangladesh offers an example of micro-finance being used to provide mobile telephones on a basis comparable to fixed line payphones in other countries. To the extent that substitution effects are not fully apparent in comparative pricing, then, it may be due to the effects of disparate regulatory treatment itself, resulting from the fact that fixed line operators have, before privatization, usually been regulated as state-held monopolies for decades whereas the mobile companies have been new arrivals funded by private investment, entering the market under concessions or licenses in a more liberalized environment.

Slow Recognition of Changing Conditions in Western Markets

It is not surprising that policy makers in emerging markets have been reluctant to conclude that there are significant substitution effects between fixed and mobile services when their counterparts in highly developed markets with significant levels of mobile market penetration still consider fixed and mobile to be separate market segments for the purpose of regulation. Some regulators are beginning to review mobile-fixed substitution effects with a view to determining whether the two markets form a "relevant market" for the purposes of applying competition law but have so far argued that since reductions to fixed line pricing results in only small changes in customer use of mobile calls, there is only a weak demand substitutability[2]. Comparative pricing is, however, only one aspect of competition between services, with accessibility and convenience featuring as important factors in users' choices of service alongside pricing packages.

There is reason to question, especially in the current distressed market, environment whether such an orthodox stance with regard to fixed and mobile substitution is warranted. Most European markets have more mobile than fixed telephones[3]. Substitution effects are particularly apparent in markets like Finland, where about a fifth of households have mobile phones but no fixed line connection.

The United States too is experiencing considerable growth in its mobile sector, with the accompanying substitution effects on the fixed line sector. Some estimates suggest that the number of mobile users in the United States will increase by 50% by 2006, with mobile phones being used more than fixed lines for personal calls.

Regulators remain skeptical about the real substitution effects between fixed and mobile services. However, investment bankers might point them to the Management Discussion and Analyses that are included in the Annual Reports or offering documents of major European telecommunication operators. These reports, which provide detailed assessments of the existing state of and trends in companies' business and financial conditions,

[2] Oftel, *Effective competition review: mobile*, September, 2001; and Oftel, *Protecting Consumers by Promoting Competition*, January, 2002.

[3] ITU WTDR 2002.

indicate that there are a number of evident impacts of mobile services on the revenues of fixed line operators. First, there is increasing evidence that growth in the number of fixed access lines has begun to slow and the number of lines even to decline. Many operators would note that the impact of these changes is most dramatic on the part of younger demographic groups, as noted above. Students or couples that are starting families or have not established themselves in a home find it more convenient – and evidently sufficiently price competitive – to subscribe to a mobile line. More significantly, as the number of mobile phones and penetration level overall increases, there are a significant number of mobile-to-mobile calls that do not ever connect with the fixed line network, particularly as mobile operators develop their own infrastructure that does not require leasing capacity from the fixed network. Additionally, mobile phones originate an increasing part of the overall number of national long distance and international calls thus diverting this traffic from fixed line networks.

Diversified telecommunication operators across Europe are experiencing a decline in the nominal amount of revenues from the traditional fixed network voice telephony business, as well as a decline in the percentage that that business contributes to total revenues. While in some countries a substantial portion of the decrease has resulted from competition in and regulatory pressure on pricing of fixed retail services, it is also a result of the increasing popularity of mobile phones. Those operators which have mobile businesses have benefited from an increase in mobile services' contribution to the share of total revenues. Thus, for example, Deutsche Telekom's fixed network business reflected about 61% of its total revenues in 1999, but this declined to about 49% in 2000 and to about 40% in 2001. Its mobile business, on the other hand, contributed more each year to total revenues, reflecting about 15% of total revenues in 1999, 22% in 2000 and 27% in 2001. Deutsche Telekom reported in its June 2002 annual report for the 2001 fiscal year:

> "Due to declining tariffs for mobile voice telephony services in Germany, which have both resulted from and contributed to increased demand for mobile telephony services, mobile phones increasingly compete with Deutsche Tekekom's traditional fixed-network voice telephony business, particularly in the market for local calls."[4]

Similarly, revenues from France Telecom's standard telephone services in France declined by about 6% in the first quarter of 2002 compared with the same period in 2001 while its French mobile business continued to grow. Explaining the decline in revenues from its French fixed line, voice and data services as a whole, France Telecom said that in addition to price decreases and competition from long distance carriers, such revenues were also "negatively impacted by the growth in wireless services…"[5]

As a general matter, diversified telecommunication operators face a daunting environment. Many are heavily debt-ridden and have experienced significant loss of value of both their Internet-related and their mobile operations for reasons discussed in greater detail below. Increasingly, these operators' fixed line operations are not viewed as an obsolete part of the overall business but as the stable base for generating cash required to finance future expansion of broadband and mobile services that are still in the process of proving themselves in the market. Nevertheless, traditional approaches to regulating the fixed line business have not yet fully adjusted to new competitive realities.

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[4] Deutsche Telekom, *Annual Report on Form 20-F for the Fiscal Year Ending December 31, 2001*, June 2002.

[5] France Telecommunication, *Annual Report on Form 20-F for the Fiscal Year Ending December 31, 2001*, June 2002.

Many regulators in developed markets may take the position that the overall framework of rate regulation for fixed line services is no longer relevant because the process of rebalancing international, long distance, and local rates has effectively been completed. National regulators in the EU have more or less consistently maintained this stance since it has been a condition of the EU regulatory framework that rebalancing be completed within the timetable for opening all markets to competition. However, it is not clear that rebalancing is complete in all EU member states. The European Commission, for instance, has brought complaints against a number of countries including Italy, Germany and other countries with respect to the process of rate rebalancing. Similarly, Telefónica de España reported in its annual report for 2001 that its "rates…are generally higher than those charged by the other principal European operators for domestic long-distance calls and lower for local calls. This reflects the failure to complete the rate rebalancing prior to the liberalization of the fixed-line telecommunications market in accordance with European Union directives."[6]

Though virtually all these countries claim that the process has been completed, it is effectively difficult for the European Commission to verify these claims. It is interesting in fact to compare the levels of local rates in most EU countries. Notably, for example, the level of local exchange rates in Germany is significantly below the EU average notwithstanding the fact that there may not be compelling evidence to support the view that German costs are below average in the EU. In fact, there are a number of knowledgeable observers of the German market environment who believe that local rates in Germany have been maintained at their current levels out of concern about potential adverse political reactions to rate increases. Some maintain even that relatively low local exchange rates have been maintained at their levels as a result of strategic competitive concerns about local entry. Similar concerns have been voiced about the viability of investment in Spanish local loop infrastructure given the relationship between retail connection prices offered by the incumbent Telefónica de España and wholesale prices offered to potential competitors.

Many of the same observations offered about the European market are increasingly applicable to the North American telecommunications market, and to the United States' market, in particular. In the United States, local exchange services continue to be subject to various forms of rate regulation by fifty public utility commissions. However, as is the case in Europe, mobile services are beginning to represent a pervasive alternative to fixed line telephone services. In fact, there is an increasing tendency toward consolidation around six national service providers who offer consumers not only local access services but national and international services increasingly on a postalized per minute basis. Even more than in Europe where international roaming charges still apply to calls originated outside the national market in which the basic mobile phone service is provided, cellular service is becoming a real substitute for a fixed line connection over voice telephony services. Thus, there is a real rationale for a major reassessment of the current scheme of price regulation of basic fixed line voice services and, in particular, the complexity imposed on the operations of increasingly regionalized telephone operating companies by separate state-based regulatory jurisdictions. Traditional retail level price regulation of fixed line voice services may no longer be justified, especially given the wide availability of unregulated mobile service offerings. Some commentators in the financial community believe that, given the lower cost of mobile infrastructure compared with fixed network infrastructure, and the effect of competition in the mobile sector, prices for mobile calling are likely to be reduced with the result that more voice calling will migrate from fixed to mobile networks. Such migration from the fixed networks will put pressure on the fixed networks, effectively raising their costs per unit. The

[6] Telefónica, *Annual Report on Form 20-F for the Fiscal Year Ending December 31, 2001*, June 2002.

combination of lower mobile call prices acting as a competitive ceiling on fixed line pricing and higher per unit costs of the fixed network make the argument for relief from fixed network price regulation all the more compelling.

Negative Effects on Investment of Residual Retail Pricing Controls

The stark disparity of regulatory treatment between fixed and mobile services may itself be partly responsible for the levels of investment that have been and are being made in each of the sectors. Mobile operators, without pricing controls comparative to the fixed line operators, have been able to roll out infrastructure, develop new services and increase user numbers and usage at rates that leave the fixed line operators – which lack the ability to raise capital and generate working capital due primarily to pricing constraints, particularly on the retail business – far behind. This dynamic becomes all the more acute as successful competition and price rebalancing reduces tariffs of cash generating services such as long distance and international calls without permitting operators sufficient flexibility over local retail service pricing.

An ironic result of residual forms of de facto rate regulation in Europe is that it may have maintained market-wide price levels that were not favorable to new investment in local infrastructure. In this respect, the residual populist aspect of local rate regulation may well have contributed to choking off investment to local infrastructure providers who are now widely regarded in the European market as very unattractive targets for new investment.

Governments have insisted on maintaining strict price regulation of fixed line services but permitted an essentially unregulated regime for the expansion of mobile services. In many countries the dichotomy between the price regulatory framework for fixed and mobile services—tightly regulated in the case of fixed line services and virtually no price regulation for mobile services—has resulted in expanding mobile infrastructure while fixed infrastructure remains static and under-funded.

Affordable Access and Tariff Regulation

An underlying concern of local retail price regulation – quite apart from control of a public utility monopoly – has historically been to ensure the widespread availability of affordable services to the population at large. As the telecommunication market has developed, the blanket regulation of local retail pricing, and even price regulation of service baskets can be clumsy, over-reaching the target of ensuring availability of services to those otherwise unable to afford them.

Targeting particular groups can also become administratively burdensome and produce residual anachronistic effects as the market develops and as definitions of particular groups lose relevance. The drag imposed on investment as a result of these effects can result in structural investment disincentives which impair the development of a healthy market in services for the economy as a whole. In many markets where price levels for fixed line telephone service have been maintained at very low levels, price regulation has tended to introduce significant entitlements to rate preferences based on the background or characteristics of an individual user. Such a scheme of entitlements can gradually expand beyond reasonable administrative control. Users who may not require rate preferences or discounts enjoy reduced rates despite their ability to pay. Special treatment for governmental authorities which traditionally exercised degrees of regulatory and price control over local telephone companies imposes significant operational penalties on local operators and impairs their ability to finance their future expansion. Therefore, along with increased flexibility on the part of fixed line companies to set retail pricing, there is a need for simple and easily

enforced schemes of limited use tariffs in place of intrusive and comprehensive schemes of regulation of all retail tariffs.

Moreover, there is a need to ensure that regulatory initiatives relating to universal service obligations do not impose undue burdens on telecommunication operators' ability to finance their future expansion. As discussed below in Part IV, establishing the right market-driven approach to retail pricing may have a more beneficial impact on the build-out of networks generally and access to services in rural communities and low income city areas than burdensome universal service obligations and complex fund mechanisms. Thus, concerns about universal service should not provide a "back door" rationale for imposing price regulation on telecommunication operators' fixed line services. Broadly speaking, investors and financial advisors strongly favor policy initiatives which provide broad flexibility to operators to decide how and when to expand the scope of their infrastructure investment. Obligations that are insufficiently defined and provide regulators with broad discretion to require new investment priorities that are not economically justified are ultimately likely to limit access to financing from domestic and international capital markets.

In emerging markets or even in developed markets where removing traditional price controls could significantly disrupt users' ability to absorb potential price increases, regulators might alternatively focus attention on price regulation of a minimum service offering that is available to users regardless of their economic capacity or any traditional claim for special entitlement to reduced rates. Such a minimum regulatory package would represent a non-discriminatory offering of a basic service without imposing the pressures on pricing that hinder investment.

Revenue Impact of Regulating Fixed Line Wholesale Services

For many incumbent telecommunication operators now operating in a competitive environment, revenue from the provision of services on a wholesale basis to competing carriers including various interconnection and network functionalities is becoming an increasingly important part of their total revenues and contributor to the cash flow generated by their operations. Thus, regulatory controls that affect the pricing of these services can be a very important factor influencing how effectively such operators can access capital markets to finance future infrastructure.

The pricing of interconnection services as well as various unbundled elements of local networks has, of course, long been viewed as a make-or-break concern for new entrants that is likely to determine the future financial viability of their businesses. The impact of regulatory practices on the financial viability of telecommunication operators is not of exclusive concern to new entrants, it is equally grave a concern for incumbent operators who may be mandated to provide existing infrastructure and services at regulated prices that do not provide adequate incentives for new infrastructure investment.

The discussion above regarding regulatory constraints on pricing of retail services is highly relevant in the context of wholesale services. Retail and wholesale price regulation are closely inter-linked. Interconnection prices that are based on unbalanced or distorted retail prices are likely to put incumbent operators in the financially unsustainable position of providing services and infrastructure at prices that do not adequately recover the costs of providing such services. Price regulation of retail services can therefore have a profoundly disruptive impact on the pricing of wholesale services that are required to develop fully competitive markets. It is all too common for regulators in developing countries to focus on overall price rebalancing while underlying distortions remain between retail and wholesale

services, restricting the viability of initiatives such as local loop unbundling and the opening of genuinely competitive markets.

Regulators in developing countries can draw lessons regarding such distortions from the experience of pricing the unbundled elements of local exchange facilities in Europe. In many markets, and the German market provides a useful case in point, the wholesale price for basic copper wire loop has been set at a level in excess of the retail price. Among the reasons cited for this is that retail tariffs for local access have been set at artificially low levels. In such a situation, an incumbent telephone operator must either charge its actual costs in the provision of local loop facilities or it is being required to sell below costs and effectively subsidize entry by potential competitors and eviscerate its own capital base. New entrants seeking to provide local exchange services on a competitive basis claim, of course, that they are victims of a price squeeze in which the input costs of required facilities provide no reasonable margin for providing service.

In the European Union, there has been a notable lack of success in encouraging the provision of unbundled local access services. At a symposium held in Brussels in July 2002 (a public hearing on Local Loop Unbundling organized by the Competition Directorate General of the European Commission), many incumbent operators argued that local loop unbundling had been unsuccessful primarily because of the adverse financial climate affecting new local entrants as well as the sector as a whole. Many incumbents argued for policies that were designed to stimulate competition in the provision of alternative access platforms rather than mandate the provision of unbundled network elements. Some incumbent operators emphasized, however, that a movement toward ending regulation of retail tariffs would create a more favorable environment for the provision on a wholesale basis of the required infrastructure. Such an approach would tend to minimize the likelihood that incumbent operators would be required to undertake uneconomic investments in local infrastructure. More flexible pricing for local access services would be likely to create more favorable conditions for investment on the part of alternative infrastructure providers and new entrants. Many incumbent operators as well as new entrants expressed a hope at the Brussels regulatory roundtable on local loop unbundling that arrangements could be structured in a more normal commercial environment with less intrusive regulatory involvement. We discuss below potential steps that might be taken to reduce the likelihood for contentious proceedings and judicial involvement that creates delay and uncertainty for both incumbents and new entrants alike. See the discussion of cancellation and alternative dispute resolution techniques in Part VI.

Though it is clearly difficult to determine how to determine the basis for setting wholesale prices of local network elements, it may be easier at least on a transitional basis to establish incentives for the provision of services on a wholesale basis if retail pricing can be set on the basis of market-related considerations. On an interim basis then, wholesale prices can be set using some scheme of benchmarking retail-wholesale margins. Such a scheme could be maintained at least until there are better conditions and economic incentives for investment in new local infrastructure.

Alternative approaches to regulating the price of local access have potentially very significant disadvantages. If future public policy does not encourage investment in new local infrastructures, i.e., either cable television infrastructure or satellite-based access as an alternative to xDSL services provided by incumbents, and does not encourage market-based retail pricing, then the only alternative for regulators is to focus close attention on traditional utility style regulation of local network infrastructure. Such initiatives imply resort to well-known practices of cost-based regulation of local infrastructure that are dependent on the formulation and implementation of detailed cost allocation and accounting systems. Such

systems are time consuming and costly to administer both from the standpoint of regulated firms and regulators. The effective management of such systems in a myriad of different jurisdictions may not be a practicable option. Many developing countries lack personnel skilled in the subtle and complex legal and economics aspects of cost accounting. Particularly where there is a real need for transition from a culture of centrally controlled cost management to market-oriented business practices, focusing such human resources as do exist on detailed justification and accounting of costs may well hinder development. The telecommunications sector could become subject to an undesirable process of re-bureaucratization. To the extent that new entrants require to understand and use such cost accounting methods and regulation in order to argue for lower wholesale prices for services they are buying, this may also be a drain on their resources. Hence, neither incumbent operators nor new entrants are likely to benefit from pricing for wholesale services that does not focus on encouraging growing levels of investment within the sector as a whole.

One related alternative to traditional accounting-based regulation that appears to be the subject of more intensive discussion, especially at the European Commission's recent roundtable on local loop unbundling, is to move increasingly in the direction of structural separation of incumbent carriers' retail and wholesale operations, with the fixed network infrastructure held by one company, "netco", while retail services are offered by another entity. Such drastic remedies are hardly likely to generate any significant public support in the midst of the current financial difficulties facing the telecommunications sector in general and an increasingly large group of incumbent fixed line operators in particular.

Though the option of structural separation of the wholesale aspects of fixed line operators is unlikely to meet threshold tests of practicality and political acceptability, it may still be useful to examine in some further detail the public policy implications of such a proposal. Opponents of structural separation, especially those in the United Kingdom, are quick to point out the parallels between the proposal for a fixed line "netco" and the much lamented and now bankrupt Railtrack organization that was central to the United Kingdom government's framework for privatizing rail services. In the rail transport privatization, the British government separated the rail infrastructure from the train service providers and has experienced confounded financial problems ever since, with Railtrack, the infrastructure company, being taken into administration proceedings in 2001.

A "netco" model for the telecommunications sector clearly raises basic questions about who would own such a utility, how it would be regulated, and whether it would be able to generate the financing necessary to expand and develop the wireline infrastructure. It would also require policymakers to wrestle with the scope of the "netco" model and whether it was based on an entity with exclusive rights to provide local infrastructure and whether it could diversify beyond a core set of services into the provision of wireless access or multiplexing over the copper wire network. Instead of representing any kind of solution to current policy questions about how to ensure the ready availability of local network infrastructure, a structurally separate "netco" may only generate a new host of regulatory challenges for regulatory lawyers and economists to wrestle with and potentially end up being entirely unable to generate financing in current or expected future financial markets.

The important point to emphasize is that from a financing standpoint, policies with respect to the regulation of pricing of wholesale and/or interconnection services that involve less detailed regulatory intervention seem likely to be significantly more favorable to generating an increased flow of investment into the telecommunications sector. Retail pricing flexibility is likely to create a better environment for the use on a transitional basis of benchmarking for wholesale pricing by incumbent operators. In turn, a fully rebalanced set of retail prices will not impose artificial constraints on potential investors in new local

infrastructure. Such artificial constraints can arise when local retail prices are kept artificially low by regulation or a combination of regulatory and strategic justifications that incumbent carriers may rely on to discourage new entry in local access markets. As alternative access infrastructure develops either through the expansion of cable television or wireless infrastructure, the rationale for detailed regulation of pricing of the fixed wireline network also diminishes commensurately. Given the importance of increasing the availability of local infrastructure, for example, policymakers may want to increase the priority that is attached to permitting the rapid expansion of wireless Local Area Network (LAN) capabilities based on the United States Institute of Electrical and Electronics Engineers (IEEE) 802.11(b) standards notwithstanding potential concerns that might be raised on the part of holders of 3G licenses.

Regulating Mobile Wholesale Services: the Need for Cash Flow

ITU reports document that the rapid expansion of the mobile sector is perhaps the most stunning aspect of the current international telecommunications scene. Mobile services represent a growing part of the overall revenues of the telecommunications sector as well as an increasingly significant component of the revenues of incumbent fixed line telephone operators. We examine below how regulation has impacted the flow of investment into the mobile sector and how it might affect prospects for future investment.

As a preliminary remark, and noted above in relation to the extraordinarily successful growth of mobile services in the last ten years, it should be stressed here that the investment flows to the mobile sector and the uptake of services occurred in the context of minimal regulation of mobile pricing at either retail or wholesale levels.

Arguably what now confronts the future development of the mobile sector is a very real and demonstrable threat to the flows of investment that until now financed the huge expansion of infrastructure of mobile infrastructure. In other words, what has happened in the past two years with 3G Licensing is an enormous extraction of resources on the order of $100 billion—that could be seen as a gigantic portion of full cash flows—by Ministries of Finance and Chancellors of the Exchequer (e.g., $33.5 billion in the United Kingdom and $45.8 billion in Germany) to finance an unproven next generation of mobile technology. Instead of waiting for the future promise of new technologies to be fulfilled and proven against competitive technologies like wireless LAN services, for example, governments have snatched a golden egg even before it has hatched. Governments have put themselves beyond the risk of whether future cash flows generating tax revenues would be realized and have shifted risks to operators and investors resulting not only in deflated prospects for 3G services but for the telecommunications sector as a whole by generating a liquidity and financing crisis of the first order. We discuss the implications for investment of choices relating to licensing below in Part IV.

The financial state of the mobile sector since the licensing of 3G services provides the backdrop for other regulatory initiatives – some driven by competition policy likely to affect substantially the provision of mobile services that until recently have been subject to a relatively light-handed regulatory regime.

The beneficial effects of applying competition policy to the telecommunications sector are plain, for example, from the surges in subscriber numbers and drops in prices in the mobile sector resulting from the issuance of new licenses. What is particularly important to note is the success in attracting investment into the telecommunications sector. It is the vast amounts of investment in the mobile sector in the last decade, for example, that have transformed the use of telecommunication services. It is important, however, that competition policy remain an enabling factor and not a stifling factor in terms of attracting renewed investment. It is quite

possible for competition policy application to tend towards an ever-increasing level of detailed definition and analysis of relevant market segments, identifying distortions at more and more micro-levels resulting from lack of competitive effects. Where regulators used to focus on mobile services as a whole, they are increasingly focusing now on the next level down – roaming and termination charges. In addition to identifying market segments and seeking improvements in pricing and quality from the point of view of the consumer, however, it is important that competition policy remain fundamentally geared toward ensuring that the sector as a whole is attractive to investment.

Roaming and Termination Charges

The traditionally hands-off approach by European regulators seems likely to change as attention is increasingly focused on the level of termination and roaming charges in Europe. Notwithstanding the effective substitutability of fixed line and mobile services that seems likely to warrant limited regulation of both fixed line and mobile retail prices, there is increasing momentum behind putting regulatory pressure on retail pricing of mobile services through efforts to reduce charges for terminating calls on mobile networks and roaming charges. Importantly, the European Commission has identified these as "relevant markets" for the purposes of competition policy attention[7]. National telecommunication regulators and competition authorities too are increasingly interested in introducing price controls for such services, prompted by public pressure to reduce the pricing. For example, Oftel in the United Kingdom has proposed further inflation linked price controls designed to reduce termination charges by CPI–12% over the next four years[8].

In European markets, termination charges typically contribute to about a quarter of mobile operators' revenues, and roaming typically contributes between 10-15%. Termination and roaming charges tend to have high margins, generally due to the calling party pays ("CPP") principle which insulates the mobile network receiving the call from direct competitive pressure from the ultimate customer and creates what economists call a "bottleneck facility"[9].

Questions are raised in the financial community about whether increased regulatory focus on these markets reflects a narrow focus of competition policy upon too specific a sub-segment of the market and inadequately considers the sustainability of meeting the sector's overall investment needs, particularly given the sunk costs of the 3G license fees. Some analysts' sensitivity analyses have suggested that the potential impact on operators' financial condition if termination and roaming rates are each cut by 30% could be so severe that some operators' EBITDA could be reduced in 2003 by as much as 25% (estimates have suggested 2-8% reductions in EBITDA in 2003 resulting from 10% cuts). Some believe that new pressures on termination and roaming charges would be misplaced given the overall financial turmoil facing mobile operators and the need for mobile operators to be able to generate cash flow to finance highly risky investments in next generation services.

Competition policy tends to focus on the smallest market that can be successfully monopolized, with reference to notions of demand substitutability, supply substitutability and analysis of the effect on customer behavior of "small but significant non-transitory increases

[7] European Commission, "Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services", *Official Journal: OJ C 165/03, 11/07/2002*, 2002.

[8] Oftel, *Review of Price Control on Calls to Mobiles*, February 2001.

[9] M. Canoy, P. de Bijl and R. Kemp, *Access to telecommunicationmunications networks*, September 2002.

in prices" (the "SSNIP" test). A number of arguments suggest that the definition of termination charges as a "relevant market" may be too narrow, inadequately considering the scale of fixed costs in an infrastructure-based capital-intensive industry such as the telecommunications sector, as well as the fact that services are customarily provided and purchased in bundles of services rather than as a single service[10]. (In the case of mobile services, consumers are purchasing access, call origination, call termination, SMS facility and roaming.) Companies which offer a bundle of services in the presence of high exogenous sunk costs will commonly charge higher margins for those individual services within the bundle which have lower demand elasticity. That termination charges have particularly high margins need not necessarily be viewed as determinative of market power and require definition as a "relevant market" and consequently increased regulation. The purpose of this paper is not, however, to take a position on the complexities of economic analysis of market definition pursuant to well-developed theories of competition policy. Rather, it is to emphasize the importance of regulators retaining an overall focus on the impact on investment flows that an increasing focus on regulating ever more narrowly defined markets may have. There have been suggestions from industry leaders that regulation of termination and roaming charges will only require mobile operators to recoup the costs from other sources, with the possible result that services like pre-paid which cater to low income users services may see higher prices.

There are substantial differences in the way in which roaming charges are evolving in the United States and European markets, with mobile pricing in the United States gravitating toward uniform or postalized per minute charges on a nation-wide basis. It is questionable, however, whether there is a need for explicit regulatory intervention to force European operators to move in the direction that market trends may be likely to take them in any event, with competition in pan-European roaming services increasing pressure on pricing.

It is not entirely unexpected that competition officials might take a more limited, controversy-specific view of the mobile sector. The primary objective of competition policy, however, should be developing a more pragmatic and specific understanding of relevant product and geographic markets—the contours of which provide the legal basis for the use of competition law related remedies – in the context of the sector as a whole. Competition officials who have been dealing with the telecommunications sector for many years now certainly have had significant opportunities to develop sector specific know-how, but this may be less likely to be the case in countries which do not have long traditions of competition law enforcement. One option available to competition officials and sector regulators is to provide leeway for an overall adjustment in business models and strategies to reflect emerging business practices in the sector. It may be possible for regulators to encourage such an evolutionary approach through consultative procedures involving key industry participants and regulatory officials such as have been outlined in Part VI of this paper.

The idea of national, regional and international industry fora for consensus building - as discussed in Part VI — may provide a real opportunity for both sector specific regulators and competition officials to heighten their understanding of the commercial dynamics of fast developing industry sectors. New industry fora may assist in generating flexibility to apply both traditional telecommunication regulatory and competition law-related norms and might alleviate the potential for fragmentation of policy. Though the end result of such procedures may be adjustment of business and pricing models in the middle or long-term, the fact that changes can be driven by service providers and operators rather than by regulatory mandate may contribute significantly to a more favorable investment climate. Such an approach may

[10] J. Gual, *Market Definition in the Telecommunications Industry*, September 2002.

acknowledge that regulatory issues facing the mobile sector cannot be dealt with on a segmented basis but have to be addressed in a broader context that takes full account of important past industry developments as well as the various business scenarios facing mobile service providers. What is needed is a regulatory posture that more effectively and openly acknowledges the risks facing the sector.

Regulation of Mobile Wholesale Services Provided to Mobile Virtual Network Operators (MVNOs)

In the same way, it may be unnecessary to impose specific requirements on mobile operators to make network capacity available to third parties or mobile virtual network operators (MVNOs). The results of the 3G licensing process in Sweden which denied a 3G license to one of the major second generation (2G) players in the market, Telia, have resulted in cooperative marketing ventures between Telia and another designated 3G licensee. Likewise, in the United Kingdom, Virgin has successfully entered the 2G mobile market as a MVNO using T-Mobile's spectrum. The emergence through commercial negotiations and market pressures of various service provider arrangements in Europe is likely to provide a benchmark that will open opportunities in other markets without explicit regulatory intervention. A scheme of regulation that is primarily dependent on effective commercial negotiations rather than regulatory compulsion is likely to minimize the perception of investors that there are substantial risks and uncertainties introduced by regulation into the business operations of cellular operators.

The alternative to a light-handed, market driven approach to the regulation of MVNOs may be a slow slide in the direction of increasingly detailed regulation of access to mobile infrastructure. In an extreme situation, it is possible to imagine the emergence of advocates for a "mobile netco", an infrastructure holding company separate from service providers, a mobile equivalent of the regulatory model that some advance as a panacea for potential concerns with ensuring access to unbundled capabilities of the local wireline work (see above the discussion of wholesale fixed line service regulation). If advocates of the principle of technological neutrality of future regulatory initiatives mean that mobile and fixed network infrastructure should be subject to equivalently intrusive regulatory initiatives, then the principle of technological neutrality of regulation is a profoundly double-edged and worrisome basis for future regulation of the telecommunications sector. Clearly, there are now some structural differences between current fixed and mobile infrastructures given the fact that in most markets there are at least two or three providers of basic mobile infrastructure. That diversity in the numbers of mobile infrastructures should by itself undermine any rationale for detailed regulatory intervention. However, all the drawbacks associated with detailed, accounting-based regulation of the fixed wire network militate against reliance on traditional utility regulation of mobile infrastructure. In addition, nothing could more undermine the confidence of investors in the future of mobile services—already laden down by 3G licensing costs and the overhang of precipitous regulation of roaming and termination charges—than a future prospect of utility type regulation of mobile services.

IV. Regulatory Issues Impacting Projected Costs

The prospective costs facing the telecommunications sector are enormous, particularly in light of the investment required to roll out networks for 3G services after the immense amounts already spent acquiring licenses. A number of mobile operators have already concluded that such costs are beyond their ability to recover, and have abandoned 3G plans. Some members of the financial community are predicting consolidation of the mobile sector in many countries, suggesting that most markets will naturally end up with three mobile

operators, and smaller markets may even have only two. The mobile sector's cost hangover is not only a matter of historical amounts used to purchase licenses. Taking into account the burden of the past, it is imperative that the sector be regulated with a forward-looking approach to its ability to meet on-going costs of investment. The viability of investment flows will depend upon the costs of initial and on-going investment, as well as expected current expenses. In projecting such costs, the key capital investment-related indicators are depreciation and amortization, and interest expense. The cost of investments in tangible assets less their estimated residual value will typically be depreciated annually over the projected life of the asset, typically from the date they are brought into use, based on a straight line method. Similarly, license fees will typically be capitalized and amortized over the term of the license, with amortization often commencing on commercialization of services.

The financing burdens associated with all such requirements raise further the overall costs associated with investment. Interest on debt incurred for the purpose of tangible capital investment is typically either treated as an expense as incurred or capitalized with the assets acquired with the proceeds and then depreciated over the lifetime of the asset. Similarly, interest on debt incurred for the acquisition of intangible assets, such as 3G licenses, may be expensed as incurred or capitalized and amortized over the life of the license.

To the extent that operators are subject to regulatory requirements governing their investments with the result that these projected costs do not bear a commercially viable relationship to associated projected revenues, these requirements may reduce the overall attractiveness of investment in and entry to a sector. In addition, regulatory signals concerning the likelihood of renewal of licenses can affect the severity of amortization of license fees.

Operators' costs are severely affected in a time of crisis since assets are typically accounted for in relation to the economic reality of recovery of value on their sale and revenues expected from their use. In current market conditions, where the values of assets purchased at the high end of the market have plummeted, many companies have recorded severe write-downs of their network assets as impairment losses booked as extraordinary expenses on their income statements.

This section discusses some examples of regulation that have a substantial effect on projected costs as potential investors weigh investment opportunities. Examples of regulatory policy decisions that are likely to have the largest effects on the cost side of the income statement include: factors which raise the initial cost of access to essential scarce public resources, including the method chosen to price such access; requirements to meet specific investment programs and the cost resulting from requirements to build out infrastructure and provide services where such investment and services would otherwise be uneconomic (e.g., universal service obligations); schemes requiring operators to contribute financially to the cost of other operators' costs of meeting universal service obligations; and the extent to which operators are permitted to reduce their burdens by sharing infrastructure.

The Impact of Licensing Methods on Investment

A key issue facing regulators in a number of countries with under-developed telecommunication sectors concerns the licensing of new services. Policy makers and regulators will frequently contemplate the introduction of new operators into the market in order to introduce competitive dynamics, and indeed if they have signed up to WTO commitments under the basic telecommunication services agreement, they will have agreed to open the licensing of services more generally. Liberalization measures frequently involve the introduction of a new licensing regime under which networks and services may require individual or class licenses, or simple registration or authorizations. The choice of licensing

method for specific networks and services may be the subject of considerable discussion in designing the new licensing regime. Whether or not to focus licensing on networks and services separately or together, or to focus on more technology neutral methods of licensing services only and permit the use of any chosen technology is also a matter of some debate in advisory circles.

Investors will, predictably, generally prefer less intrusive regulatory instruments. In addition to the various administrative burdens usually contained in licenses such as information reporting, the key concerns of those considering the viability of investment will be those matters that affect the underlying profitability of the business. The effect of price regulation, universal service obligations and build out requirements often included in licenses are discussed elsewhere in Parts III and IV. This section discusses the impact on investment flows of the decisions relating to how licenses are issued.

The choice of license issuance method becomes all the more important where exclusive use of scarce resources is offered, such as use of the public telecommunication network or use of frequency spectrum, since the exclusive nature of the rights offered makes the optimal choice of licensee a matter of public interest and permits competition among investors for such rights. Policy makers and regulators weighing choices among beauty contests, auctions, hybrid methods and direct negotiations for licensing have to consider a range of issues including maximizing overall sustainable investment in the sector and specific new services, optimizing the speed with which infrastructure can be rolled out and services can be commenced, ensuring that investors are sufficiently qualified in terms of experience and know-how, as well as potential revenue to the government.

It is understandable why developing countries are interested in large license fees, with the high amounts gained in recent years in auctions in countries such as Tunisia and Morocco, expectations of the amounts that may be gained rose in a number of other developing countries.

Learning from the European 3G Licensing Debacle

Although there are obviously attractive reasons to allow investors to price the present value of exclusive rights through auctions, investment flows are likely to serve the telecommunications sector and overall economy best where they are sustainable. The pricing of licenses in the European 3G context offers some useful lessons for policy makers and regulators assessing how to license new services in developing markets. The lessons to be drawn are not so much that auctions are an inappropriate method of granting exclusive rights over scarce resources as understanding the overall importance of focusing on the ability of the sector to sustain the investment needed to develop networks and services, and not to grant licenses in a way that drains the sector of liquidity and has a destructive impact on investment flows.

The mobile sector around the world has grown at an extraordinary pace and, as noted above in relation to price regulation of retail fixed line services, increasingly represents a credible alternative to the fixed network. In spite of the success in providing basic voice telephony services, mobile operators face a much more uncertain future as they aspire to offer higher speed Internet-related services and develop next generation mobile services. Third generation mobile licenses have now been awarded in virtually all the major countries of the European Union. A table showing the award of these licenses and the prices paid by operators is set forth below:

Table 2: Allocation of 3G mobile licences

In selected countries worldwide

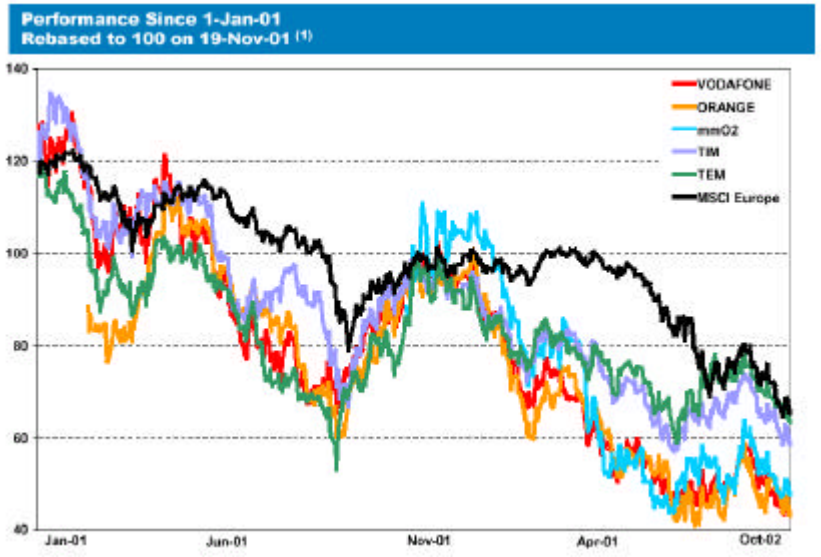
Country	No of licences	Mobile incumbents	Method	Date awarded	Sum paid, US$ million
Australia	6	3	Auction (regional licences)	March 2001	610
Austria	6	4	Auction	November 2000	618
Belgium	4	3	Auction	March 2001	421.2
Czech Republic	2	2	Auction	December 2001	200
Denmark	4	3	Sealed bid Auction	September 2001	472
Finland	4	3	Beauty contest + nominal fee	March 1999	Nominal
France	4 (2 still to be issued)	3	Beauty contest + fee	July 2001	4'520 (subsequently reduced to 553 each)
Germany	6	4	Auction	August 2000	About 7'690 each
Greece	3	3	Beauty contest + auction	July 2001	414
Hongkong SAR	4	6	Hybrid	September 2001	Minimum 170 each plus royalties
Israel	3	3	Beauty contest + fee	December 2001	157.1
Italy	5	4	Hybrid	October 2000	10'180
Japan	3	3	Beauty contest	June 2000	Free
Korea (Rep.)	3	2	Beauty contest + fee	August 2001	2'886
Malaysia	3	3	Beauty contest	December 2001	Nominal
Netherlands	5	5	Auction	July 2000	369 to 667 each
New Zealand	4	2	Auction	January 2001	59.9
Norway	4	2	Beauty contest + fee	November 2000	88
Singapore	3 (+1)	3	Cancelled auction	April 2001	165.8
Slovenia	1	2	Cancelled auction	December 2001	82.2
Spain	4	3	Beauty contest + fee	March 2000	480
Sweden	4	3	Beauty contest	December 2000	44.1
Switzerland	4	2	Auction	December 2000	119.8
UK	5	4	Auction	April 2000	6'100 to 9'100

Source: ITU "Licensing of 3G Mobile", European Commission and 3GNewsroom.com (at: http://www.3gnewsroom.com/index.htm)

The table above demonstrates in quite dramatic fashion that the approaches taken in different countries varied considerably. The highest payments and prices per member of the population (pop) were extracted in the British and German markets and amounted to about €600 per pop in the United Kingdom and Germany. By sharp contrast, only €20 per pop was initially paid in France in a combination of public tender and auction that resulted in only two licenses being awarded. Ultimately, the French Government determined to reduce the price in order to attract additional bidders. In countries such as Portugal, Finland, Spain, and Denmark essentially only nominal fees for the 3G license were paid apparently as a result of the desire of the respective governments to see next generation services deployed on a rapid basis and at affordable prices, since higher license fees would likely mean higher tariffs. The disparity in prices per pop has led to many commentators pointing out how divergent licensing policies within the European market have produced less than a level playing field for the development of services on a cross-border basis.

As is now well known, the very high licensee fees, together with the expected capital costs of installing third generation systems, have combined with various technological concerns relating to the refinement of operational software and the availability of third generation handsets to cast an extraordinary pall over prospects for 3G deployment. Some estimates suggest that 3G will have to generate EBITDA margins similar to current 2G margins for more than 10 years on average in Europe before covering their costs. Many operators have been focusing on the rollout of 2.5G handsets and services; however, the take-up of these services has been disappointing to many analysts in the sector. Collapsing expectations have resulted in sharp downward assessments of the share price of most European mobile operators as is indicated in the chart below:

Chart 2: Performance of selected companies' stock market, from January 2001 to October 2002



(1) Date of mm02 stock market listing
Source: Factset

European regulators are beginning to have to deal with the consequences of spectrum licensing policies that were attuned to a very different environment in the financial markets toward major cellular operators. At the time of the original issuance of licenses in the United Kingdom and Germany, the financial markets reflected the high expectations

about the necessity of leading operators ensuring their future viability through obtaining 3G licenses. Indeed, the bidding process for such licenses was undoubtedly influenced by the expectation that a failure to obtain 3G licenses would result in a huge adverse impact to bidders' share prices and hence to their ability to use their shares as a currency for acquiring new mobile operators and related providers of content or gateway services. Ironically, the bidding for 3G licenses produced its own catastrophic impact on most mobile operators' share prices.

At this point, it is apparent to most observers that little can be done to unwind the dire consequences of the 3G bidding process. Indeed, from the standpoint of most regulators, government officials, and policy advocates of the auction process, there is little second guessing of the results and much attention on the misguided nature of corporate decision-making during the 3G bidding process. Industry participants have, it is suggested, no one to blame for their current economic plight other than themselves.

This view is being subjected, however, to some further reassessment, including in the financial sector. The European Commission commissioned a particularly insightful report on lessons to be learned from 3G licensing by EU member states[11]. As illustrated in the table above detailing the allocation of 3G Mobile Licenses, not all European regulators and policymakers decided to auction spectrum through a one-time bid. In some countries, licenses were awarded through an administrative proceeding or combination of beauty contest and payment of license fee. Subsequent to the completion of the 3G licensing process in Europe, moreover, other policymakers decided to target bidding more narrowly on fees to be paid on an annual basis. In this way, the bidding process alleviated some of the upfront financing for licenses but still required operators to make bids in an environment of extraordinary uncertainty about future prospects for 3G services.

The choice of auction method for the issuance of licensing may have the merits of encouraging competition so that a scarce resource will be used efficiently and not wasted, allowing investors to bear responsibility for determining the current market value of the spectrum based on projected cash flows from business plans, as well as providing revenues for the finance ministries. There are increasingly questions, however, about whether, in governments' structuring of 3G auctions, such priorities overshadowed other extremely important factors, including the uncertainties about demand for future services, the viability of the technologies, the possibility of competing technologies entering the market, and a vastly over-inflated enthusiasm widespread in the market. There are concerns, including in the financial community, that inadequate attention was provided to these investment-related factors in structuring the licensing method in countries such as the United Kingdom and Germany, where governments received particularly high revenues from the 3G licensing. Indeed, the wide disparities of payments for licenses in auctions across different countries emphasize the possibility that these investment-related factors can overwhelm and render irrelevant the advantages of using auctions exposed by economic theory. It is certainly apparent that the auction process selected by these countries required operators to make a bet on the future based—in retrospect—on unreliable information about the market for services and technological conditions.

[11] McKinsey, *Comparative Assessment of the Licensing Regimes for 3G Mobile Communications in the European Union and their Impact on the Mobile Communications Sector,* June 2002.

Some argue that the auction structures used in Germany and the United Kingdom in effect created an environment in which potential future tax and other revenues were pre-paid and effectively set at a guaranteed level. Obviously, the amortization of pre-paid license fees offsets revenue flows that might otherwise have been paid into national treasuries in the future in the form of corporate tax payments. Some believe with the benefit of recent experience that government decisions were taken that overstretched a new industry sector in return for short-term political advantages of bolstering governments' traditional social welfare agenda. Future economic prospects were heavily mortgaged by a scheme of upfront one-time payments for mobile licenses.

Governments and regulators defend themselves from criticism, of course, arguing not only that auction bids were willingly submitted by major mobile operators but also that there is a kind of self-regulating spectrum market that provided inherent checks and balances on the 3G licensing process. The massive one-off allocation of spectrum to an untried brand of services, rather than permitting incremental introduction of new technology and capacity, and the prohibition in some countries on spectrum sharing, combined to intensify the pressure on operators, who had to make their offers in the "now-or-never" atmosphere of the market. The sequential bidding processes in multi-round auctions employed by some member states only served to intensify further the operation of game theory and the prisoner's dilemma. There is also reason to question whether governments' exclusive rights with respect to control over the spectrum market is vulnerable to the influence of traditional political agendas. A number of observers are questioning whether the licensing process in many European countries genuinely reflected effective expert judgments about spectrum deployment or were influenced by more short-term concerns with improving the state of current year budgets. The success – in those terms – of the United Kingdom's 3G licensing process clearly produced emulative responses on the part of other governments which came under increased domestic pressure to create equivalent short term economic advantages.

Distortions Resulting from the 3G License Process

Not only has the sector's ability to invest in the network, technology and services been fundamentally undermined by the scale of financing required for the 3G license fees, but the process of auctioning 3G spectrum has likely created significant distortions with respect to the pricing of other spectrum resources previously granted, as well as with respect to future decisions about the deployment of new spectrum-based services. Distortions resulted within the EU from the widely different amounts paid in different member states, as illustrated above. Further, the 3G auction process resulted in mobile operators paying significantly more for spectrum than has been paid by holders of broadcasting spectrum as well as other spectrum resources that can be used for services with similarities to 3G such as wireless LANs. Likewise, there are disparities in the conditions of use for spectrum for these different services. Indeed, some of the potential uses of spectrum to provide services competitive with those of 3G licenses were not fully anticipated and disclosed in connection with the spectrum bidding process. The fact that such uses were not fully visible to bidders is not necessarily a function of the potentially conflicting interests of government in drafting "prospectuses" for services that are being put on offer; it is also a result of the fact that some potential services and technological applications had not yet clearly emerged in the market.

Although bidders will have been aware of the pace of technological change, the overall build up of exuberance for 3G spectrum should have put policy makers and regulators on alert as to the damaging distortions that would be introduced to the market by

virtue of unrealistic bidding for 3G services as other unregulated new technologies began to emerge. Examples include the use and deployment of wireless LANs (Wireless Fidelity (WiFi)) using IEEE 802.11(b) standards. Such networks have been deployed in various fixed locations such as airport lounges, coffee shops and other public places and provide Internet access at considerably higher speeds than is possible with the most advanced version of 3G services. Such services are not strictly speaking mobile and permit only a limited form of roaming to the extent that a user is able to log onto to an 802.11(b) network, authenticate himself and pay for the use of Internet connectivity. Although WiFi services do not offer the mobility advantages of traditional cellular services while journeying, to the extent that WiFi services proliferate in public spaces, they may become an effective substitute for a significant portion of the 3G market – particularly if they are priced competitively due to the low infrastructure costs and absence of high license fees. Significantly, at least in the United States, such wireless LANs do not use licensed spectrum and hence the business model is based on an assumption of "free access" to spectrum.

It is increasingly being noted that this could have a significantly distorting impact on strategic plans for deploying 3G services since many users may opt to connect to wireless LAN networks where available in the event that instant access is not essential. Some estimates suggest that between 12% and 64% of the 3G market's revenues could be taken by such technologies over the course of the next four years. Thus, a competing technology could significantly impair the anticipated future market for 3G services and undermine important market related assumptions originally made in evaluating the 3G bid prices. That technological development would result so quickly in the 3G licenses becoming what some might call "stranded assets" is not entirely surprising in retrospect given the rapidity at which IT-based telecommunication services have evolved in recent years.

In light of such developments, governments and regulators face a potential dilemma. They can permit technologies with important public benefits to become available to consumers in the market. Alternatively, they can respond to concerns of 3G licensees that ready and easy deployment of wireless LANs should not be encouraged by administrations that did not fully disclose their intentions to do so. Either the public is denied access to a readily accessible source of high speed Internet connectivity or 3G licenses are dealt another blow as a result of the fact that a government-driven licensing process required upfront one-time payments in an extremely uncertain but buoyant market. Thus, not only is there severe damage to the industry resulting from having had to rely on unreliable assumptions in a wildly excited market, but the result is problematic also for regulators on an on-going basis.

A number of suggestions have been made for specific changes that might be made as a result of lessons learned from the 3G licensing process. Briefly, they include: spreading license fees more evenly across the lives of licenses rather than taking enormous one-off upfront fees; not engaging in multi-round auctions but rather simpler licensing processes; setting fees to reflect the regulators' costs of administrating spectrum rather than auctioning them as a market-priced asset; relaxing coverage and service commercialization targets in the initial years of the licenses; restraining the cost of supply through control of the number of licenses issued and permitting spectrum trading and infrastructure sharing; moderating the suddenness of such costs and the scale of the impact of uncertainty associated with untried services through permitting pioneer licenses followed by staged issuance of new

licenses (rather than all at once); and linking licensing strictly to specific technologies[12]. The purpose of this paper is not to take a position on each of these proposals but to draw broad conclusions about the fundamental approach of government to the sector in the licensing process.

In the case of 3G, the difficulties created by the licensing process might well have been avoided had there not been a focus on licensing spectrum for a new service and on making access to such spectrum key to the provision of next generation services. Even in the European Union, mobile operators have been able to evolve their existing 2G services into higher speed offerings. However, in other major cellular markets, such as the United States and Brazil, operators are constrained by their existing authorizations to offer higher speed services. In the Russian market, the government is now considering whether to issue licenses for new generation services or allow existing 2G licensees to expand their operations on the basis of market demand. The latter approach is proving to be a more practical way to infuse additional value into existing operators that will require access to financing for current as well as future service offerings. Extending spectrum to operators based on market demand may offer the benefit of narrowing the knowledge gap between the decision today to invest and the future prospects for financial returns on the investment.

It may be important also to bear in mind the extent to which governments have traditionally used their economic ownership stakes in state-owned telecommunication operators to their economic advantage and that there may be substantial pressures for governments to exploit any valuable rights they hold with respect to licensing operating rights or access to spectrum. The 3G auctions may only be an example from developed markets of a phenomenon that is more widely reflected across the range of governments' relationships with the telecommunications sector in less developed markets also. For example, concerns that governments may reap immediate revenue benefits from the choice of licensing structure without adequately weighing the difficulties operators face when assessing uncertain future conditions arise similarly in revenue sharing concessions and other arrangements which have often been used in the telecommunications sector for the build out of infrastructure, particularly in less developed markets. Percentage revenue sharing arrangements used in such mechanisms may advantage government ministries over, for example, mobile service providers since it is virtually impossible to assess what the impact of various revenue sharing arrangements may be on the future financial performance of mobile operators. Indeed, the structure of revenue sharing arrangements, often designed to ratchet up governments' percentage share as capital investment is depreciated, has led to disputes between governments and operators when the operators' returns have proved higher than expected. See Part V for further discussion of some risks related to structural complexities arising in connection with concessions and licenses.

A number of valuable lessons may be drawn by policy makers and regulators in developing markets concerning how to approach licensing. The financial sector generally takes the view that structures, mechanisms or policy commitments that hold in check potential aspirations to take short-term advantage of a sector closely entangled with governmental interests are likely to increase the ease with which telecommunication operators can access international capital markets. The key issue is that it is crucial in designing mechanisms for market entry that these take into account not only the conditions

[12] McKinsey, *Comparative Assessment of the Licensing Regimes for 3G Mobile Communications in the European Union and their Impact on the Mobile Communications Sector,* June 2002.

for market entry but also sustainable market development over the course of the initial years of licenses. This is all the more pressing given the potential for imbalances on the revenue side resulting from competition from technological change.

Permitting Economics of Scale: Infrastructure Sharing and Other Cost Reduction Initiatives

An old and obvious tension exists between the policy aspirations of improving choice, pricing and quality of services through competition on the one hand and the conditions necessary to attract investment in the sector on the other. To some extent, however, the former is dependent on the latter. Without substantial investment, the network development and service innovation that have been the central driving force of competition in the telecommunications sector will not continue to have such an impact. Particularly at a time when the sector is in extreme financial crisis, it is important to ensure that the conditions for investment are fundamentally sound. Part III of this paper discussed the need for those making investment decisions to be assured of flexibility on the revenue side of their business plans, particularly in terms of price controls. Similarly, to the extent that rigidly applied competition policy results in infrastructure development costs that make the original investment simply unviable (in the case of 3G networks, for example), it may be appropriate to reconsider the appropriateness of such policies.

In the initial stages of efforts to respond to changed conditions in the mobile market after the European 3G license auctions, operators and regulators focused on how the costs of operations could be reduced and how the timetable for deployment could be stretched out. Many European regulators did begin to deal with the crisis by assessing options for sharing of infrastructure among mobile licenses. Overall, there has been a cautious approach to infrastructure sharing with the focus being on common use of towers and sites for radio transmitters rather than on shared use of frequencies or operational capabilities. Only recently has the European Commission's competition directorate general signaled its willingness to permit an infrastructure sharing agreement for 3G networks between operators O2 and T-Mobile in the United Kingdom. Prolonged doubt about its position on this issue left the industry with considerably increased uncertainty about the ability of operators to finance the build out of 3G networks and the viability of planned investment and not all uncertainty has been resolved. There have been concerns that the fragmented approach of a competition policy that inadequately takes into consideration the state of the industry as a whole could undermine the possibility of many operators ever being able to establish a viable 3G service.

It may be true that sharing of infrastructure by operators reduces some competitive effects. Thus, for example, if O2 and T-Mobile divide some of the United Kingdom into regions in which one or the other – but not both – will construct and own the 3G network and offer use to the other at agreed roaming rates, then the competitive incentives to maximize choice of services, service quality, coverage and overall efficiency at the level of network construction, operation and maintenance may be reduced.

A number of developing countries considering new rounds of licensing services, as well as those more developed markets which have issued licenses but still require investment to roll out networks, are having to weigh the benefits and costs of rigorous application of competition policy in light of the basic conditions required to attract investment. For example, a number of countries now positively encourage duct and pole sharing in order to develop wireline networks, particularly in low population density areas

where such capital costs are high. There are close parallels here with mobile network infrastructure. To the extent that governments are beginning to contemplate licensing 3G services, there may be more room to consider the cost savings of permitting infrastructure sharing beyond the traditionally accepted limits of sharing only base stations and masts. The key concern is that regulators not lose sight of the overall investment climate and the dynamics applicable to specific investment decisions when applying competition policy. There is little value in a rigorously applied competition policy which significantly reduces investment into the sector. In this respect, it is important that both telecommunication regulatory authorities and competition authorities cooperate closely to retain a common vision of the overall need to ensure that the basic conditions are in place that will attract investment. Careful consideration needs to be given to regional disparities, since for example the economies of scale resulting from infrastructure sharing tend to be much stronger in rural areas, another factor that suggests that lighter regulation may benefit universal service policies as discussed elsewhere in this paper.

Even permitting some increased level of infrastructure sharing may not have substantial anti-competitive effects. For example, in the United Kingdom, even if O2 and T-Mobile are permitted to share networks outside the initial build out area, there will still be competition at the network level from the other three 3G operators. Indeed, it is not clear that the British market would not benefit from infrastructure sharing between other operators also. Competition among all licensed operators will exist at the retail level, and although mobile services may have been traditionally more affected by competition at the network than the retail level, the value added aspect of 3G services suggests that the retail level may be a greater competitive driver of service innovation and pricing than was the case with 2G services. Indeed, even with respect to 2G, operators such as Virgin are demonstrating the value of retail level competition. It is important that regulators weigh the sometimes minimal incremental benefits of competition policy in light of the desperate overall need for investment in the sector.

Infrastructure sharing can even on some occasions be not so much anti-competitive as a pre-condition to developing competition. To the extent that infrastructure sharing may be crucial to give new entrants a viable business plan, it may even sometimes be appropriate for regulators not only to permit but positively to encourage such sharing in the similar vein as essential facilities are required to be made available by incumbent network operators and others having significant market power. For example, even with relaxed network coverage and build-out obligations, introducing a new mobile operator to small markets such as Jordan or Bulgaria may not present a compelling business case unless the new entrant is assured the use of the existing networks on the basis of roaming at a fair price for at least an initial period while building its own infrastructure.

The on-going discussion about the exclusive use of infrastructure raises analogous issues relating to the exclusive use of essential resources, such as frequency spectrum. As a result of the decision of Telefónica and Sonera to write off the large scale value of their 3G licenses and abandon their plans to develop greenfield 3G operations in Germany, Austria, Switzerland and Italy, attention is being directed at the conditions in which un-utilized spectrum could be sold or transferred to third parties or other 3G licensees.

There is particularly strong concern about restrictions on spectrum trading in Germany, for example, where it is prohibited under the German Telecommunications Law. Spectrum trading is viewed by a number of investment analysts as the only means for industry consolidation required to reduce costs and make 3G viable given the enormous

costs to acquire the 3G licenses. Yet merger of two 3G German mobile operators would require one to return its 3G spectrum to the government without compensation for the enormous license fee payments.

Impact of Network Build-Out Targets and Required Investment Programs on Investment Flows

In many developing countries emerging from a tradition of state-controlled investment in the telecommunications sector, there may be a residual tendency for their governments and regulators to impose detailed requirements on operators to build out their networks and develop their infrastructure. For example, licenses may contain specific digitalization targets and monetary investment requirements over determined periods.

There may indeed be a greater justification for imposing build-out and development requirements on operators which have secured exclusive rights to resources, whether mobile operators which enjoy exclusive rights to assigned frequency spectrum or fixed line operators who have exclusive ownership of the public fixed telecommunication network (and sometimes the exclusive right to provide basic services), since there is less assurance that relying on competitive effects will result in the networks necessary to provide services becoming available on an accelerated basis.

Nevertheless, it is important to consider the possibility that such requirements may have a negative impact on investment flows. It is entirely possible that, instead of succeeding in compelling the investment as intended, overly intrusive involvement of regulators in investment programs may actually reduce the attractiveness of a sector to investors in the first place.

A core policy aspect of privatization is the transfer of investment risk from the public sector to the private sector. To the extent that this involves sourcing investment from private sector sources, it becomes increasingly important that judgments about how such funds are deployed be made by those bearing the risks associated with the investment. This is particularly so in a turbulent supplier market, and where new technologies are quickly changing the competitive landscape and may reduce the urgency of previous coverage ambitions. While investors will understand that policy makers and regulators appropriately impose certain minimal public service oriented targets concerning coverage, pricing and quality of service, excessive involvement of regulators – who do not bear the risk of the investment – in how those targets are met can make it less desirable to enter the market in question.

The nexus of this concern with price regulation is particularly obvious, and even more so given the scarcity of capital in today's market. To the extent that large scale investment is needed in developing markets and is mandated by regulation or license terms, investors will be wary of entering such markets unless it is apparent that they will be afforded sufficient flexibility on the revenue side to generate the cash flows required to fund such investment. Being required to take on large financial commitments without assurance about the commercial viability of the investment may result in investors not even bidding for assets, or reducing bid prices.

It is important that policy makers and regulators bear in mind the lack of flexibility they may encounter at a later stage when build out obligations prove not to be viable and operators seek relaxation of the obligations. For example, competitors for licenses who withdraw from contests because they judge a given timetable for network development,

geographical coverage and commercial launch of services to be unviable may be in a position to challenge the grant of licenses to wining bidders who later benefit from a relaxation of the requirements due to the discovery at that later date that indeed they were unviable. This sort of problem, which has been raised in the context of 3G services in Europe, needs to be anticipated prior to the licensing process by keeping focused on the importance of ensuring that investment commitments are sustainable.

Investment and Universal Service Obligations

Ensuring access to telecommunication services across geographic and income boundaries remains a central goal of policy makers and regulators, particularly in developing markets. There is extensive literature on the subject of universal service obligations, addressing questions about which services should be provided universally, what proximity of access to services is appropriate, who should bear the obligations of providing such services in uneconomic conditions or have the opportunity to receive subsidies for so doing, who should fund any such subsidies and on what basis contributions should be paid, how subsidies should be administered, as well as complex issues relating to retail and interconnection pricing given the higher cost of providing networks in rural areas compared with higher density urban areas. The purpose of this section is not to address these subjects comprehensively but to make some observations and raise some issues related to encouraging investment in the telecommunications sector as a whole, and in particular in less economic or uneconomic areas.

A variety of techniques may be used to achieve universal service policies, including: requiring telecommunication operators to pay access deficit charges to incumbents directly, or through an administered fund mechanism, to cover their unrealized costs of serving uneconomic areas pursuant to mandatory coverage obligations; permitting incumbent operators to cross-subsidize services in high cost areas from revenues from higher margin areas and services; and market-based reforms encouraging competition and permitting cost-based pricing, as well as leveraging private investment through targeted subsidies.

Perhaps the most interesting factor to note at the outset of the discussion of universal service policy making is the difference that the growth in mobile services has made to access to basic voice services over the last decade. Not only is it valuable to understand that growth in the overall mobile service sector has largely been in the context of minimal price regulation and without obligations to provide universal services, but specifically the benefits enjoyed by lower income users (e.g., through innovative pricing techniques such as pre-paid services) may only have been possible in light of a hands-off regulatory approach whose role primarily was simply to make licenses available to generate competition. The quick availability of mobile services has effectively cut through waiting lists of incumbent fixed line operators, with countries like Uganda and Kenya evidencing the value of mobile communications for serving low income areas. With successful returns realized from higher income customers, mobile operators turned to low income users as a viable market segment. Thus probably the most successful universal access results in recent years have come not from complex administrative mechanisms but – perhaps rather inadvertently as far as regulators were concerned – from allowing operators sufficient pricing flexibility to determine their own economic risks. We are not suggesting that unregulated mobile services have sufficed to fulfill all universal service policies but rather are drawing attention to the basic trend and tendency of enormous investment and extension of services – even to previously un-served population groupings – to have a close relationship with light-handed price and other regulation.

In telecommunication sector reform advisory circles, trends suggesting an emerging consensus on universal service policies focus on establishing a universal service fund to be drawn from a percentage of telecommunication service providers' revenues or other sources, to be administered by the telecommunication regulatory authority or another new institution in close coordination with the telecommunications ministry and/or regulatory authority, and for such funds to be designated to subsidize and provide an incentive to those operators for some or all of the losses incurred in serving geographical areas and population groupings that are otherwise uneconomic to serve[13]. Variations of this have been implemented, and with some notable success in Chile and Peru in recent years[14].

In Chile, operators' revenues contributed to a fund from which subsidies were made available for the purpose of developing payphone networks on a reverse auction basis – i.e., with operators bidding for the lowest amount of subsidy. A key priority in evaluating whether or how to institute a universal service fund is evidently not so much to focus on funding the cost gap – as estimated by the regulators – of providing services in uneconomic areas but rather to focus on the ability of a universal service fund to leverage private capital investment. Chile's program is indicative not so much for the amounts of the subsidies as the amounts of private investment that were induced into the sector through its universal service program.

Effective universal service funds are not common, however. For example, even though the European Union has introduced a comprehensive framework for the provision of universal services, it has been actually implemented only in a few countries: Italy, France, Spain and the United Kingdom. Although these countries have calculated net universal service obligation costs, not all have established a cost-sharing mechanism. Such programs are viewed by knowledgeable observers as being administratively complex and creating a risk of providing incentives for expansion of infrastructure that do not have a sound financial rationale. In markets that have traditionally suffered from low penetration and under-investment, there is good reason to believe that establishing the right market-driven approach to retail pricing for fixed line telephone services is the best way of rapidly widening access to such services.

From the point of view of those making investment decisions, a number of factors are of particular importance. Although higher inventory levels of suppliers has somewhat reduced capex costs, with the telecommunication sector in financial crisis and general skepticism in the sector, the cost of capital is higher and the threshold tolerance of the risk of bearing unprofitable obligations has lowered. Increased scrutiny of investment decisions may reduce the tendency of investors to view universal service obligations as an incidental externality in incumbent operators' business plans, and there may be less inclination for new entrants to fill the universal service gap, however that gap may be defined.

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[13] H. Intven, Telecommunications Regulation Handbook, an InfoDev project carried out by McCarthy Tetrault, 2000; ITU-CTO, Model Universal Service/Access Policies, Regulations and Procedures, *Part I: Universal Service/Access Policy, and Creation and Operation of Universal Service Funds*, D. Townsend, 2002; Trends in Telecommunication Reform, Effective Regulation, 2002, ITU.

[14] B. Wellenis, "Extending Telecommunications beyond the Market", *Public Policy for the Private Sector*, March 2002; B. Wellenius, Closing the Gap in Access to Rural Communication: Chile 1995-2002, November 2001; G. Crannock, "Telecommunication Subsidies: Output-Based Contracts for Rural Services in Peru", *Public Policy for the Private Sector*, June 2001; C. Lawson and N. Meyenn, "Bringing Cellular Phone Service to Rural Areas", *Public Policy for the Private Sector*, March 2000.

In addition to the overall condition of the sector, a number of other variables suggest that the telecommunications sector might benefit from regulators drawing on increasingly flexible methods of achieving universal service aims while keeping focused on the economic fundamentals of investment. The proliferation of technologies that may offer a potentially suitable alternative to extending the public fixed network in rural areas and low income parts of cities introduces the possibility of a range of business models with different capital investment costs and break-even horizons. Services such as analog Nordic Mobile Telephone System (NMT) wireless systems, Global System for Mobile Communications (GSM) and Personal Communication Services (PCS) mobile networks, very small aperture terminals (VSAT), wireless local loop (WLL) and perhaps wireless LANs may be more feasible than laying miles of cable and switches and indeed may be particularly useful for Internet connectivity in addition to basic telecommunication services. A variety of financing structures aimed at developing viable rural networks are available, including direct investment from international and domestic telecommunication operators, encouragement of local entrepreneurial resources, use of franchise structures, as well as multilateral agency micro-finance schemes. Thirdly, an ever-increasing range of retailing techniques has been successfully tried in numerous countries, perhaps most strongly led by the use of pre-paid mobile services. Sales of mobile handsets in brand retail outlets and local kiosks, charging of minutes through scratch cards, local community arrangements to share basic telecommunication and more advanced ICT services in telecenters, local women with tariff print-outs offering use of mobile handsets as payphones, combinations of technologies, financial structures and retailing methods permit a wide variety of models.

With market liberalization, the possibility – and desirability – of other operators entering the market with competing technologies makes it all the more important not to box sources of investment into one or other model but to ensure that the overall conditions offer a sound basis for investment. The higher level of capital required to develop and maintain networks in rural areas due to geographical breadth and lower population density, and the lower levels of revenue to be expected due to low income in rural areas and poorer parts of cities, are the principle concerns taken into account by investors in preparing the business plans used to assess investment opportunities. The cost structure of establishing networks in and serving rural areas sets a high floor, and traditional price regulation sets a low ceiling, between which operators in such areas have very little room for maneuver, with narrow margins (if any positive margins are attainable at all) raising the overall risk profile.

As mentioned above, much discussion of universal service obligations has focused on the problem of regulatory pressure on the cost side – imposing penetration targets, maximum kilometer distances to the nearest telecommunication services and quality of service targets – and has proposed solutions in the form of subsidies intended to alleviate that cost burden. It may be, however, that easing regulatory pressure on the revenue side would make the argument for investment more compelling, particularly to the extent that investors – who bear the risk of the relationship between costs and revenues – are permitted greater control over that relationship.

The lower costs, higher revenues and therefore lower prices that result from the higher incomes, population densities and competition in urban areas, combined with the desire of policy makers and regulators to apply tariffs on a national basis and to ensure that low income areas do not suffer the additional hit of having to pay higher prices, means that rural areas tend to be subject to an uneconomic ceiling on potential revenues. Given the availability of financing methods and technological possibilities with different cost structures, however, it may be questioned whether offering support on the cost side that may

only further distort the relationship between costs and revenues – and therefore investment incentives – is more appropriate than introducing more flexibility on the revenue side, permitting cost-reflective access charges.

The key revenue drivers for rural areas are rates applicable to retail services and interconnection. Interconnection has been identified as the most important regulatory issue for the commercial viability of rural services in Chile, with the emergence of a regulated rural interconnection access charge (i.e., for call termination on the rural networks) far above the access charges of non-rural companies and below, but comparable to, the access charges of the mobile companies. Limited price regulation at the retail level has also been identified as a factor that contributed to the success of the Chilean universal service program, with rural operators being free to set all retail prices for their services except for payphone calls within the primary calling area. Similarly, urban operators in Uganda pay terminating operators in rural kiosks higher termination fees than elsewhere in the country. Also, permitting operators to charge higher rates for calls from urban areas to rural areas would reflect such higher interconnection rates.

The traditional regulatory concern that monopolies may abuse their control of the market to charge high prices may have less weight in low income areas where users are limited in terms of what they will be able to pay for services: generating revenues will require offering low enough prices for usage to grow. Indeed, a surprising aspect of development of mobile services in many countries, exemplified by the Uganda case study undertaken by the ITU, is that there may often be a latent market demand for telecommunication services[15]. It may also be possible to introduce incentives to encourage operators to focus on increasing usage so that they cover their costs and generate margins by encouraging higher usage levels by more users at lower prices, rather than lower usage by fewer users at higher prices. Furthermore, to the extent that national incumbent operators are expected to bear universal service obligations, a lighter tariff regime at a national level might ease their ability to provide the needed investment in those areas where costs are higher and revenues lower.

In ensuring that populations across developing countries are not priced out of access to essential services, regulators might focus the universal service obligation on a basic package of minimum services and low user schemes. Beyond such packages, it may be that signaling the release of pressure on revenues through lightening tariff regulation would attract greater investment to the sector as a whole. That is not to say that government should withdraw from pro-active policies geared towards achieving the important priority of ensuring that all members of the population have access to telecommunication services. There may be combinations of innovative technologies and innovative financing structures that can be used to improve the prospect of achieving such aims. For example, it may be possible to encourage the development of wireless LAN based telecenters on the basis of a national or regional franchise system. Where, for example in Eritrea, there exists backbone infrastructure but there is a lack of local infrastructure to offer connectivity, it may be possible to offer local investors or communities a franchise right to develop wireless LANs – offering basic as well as advanced telecommunication services – on the basis of 802.11(b) technologies. The principal investment outlay for such a structure would be the hardware and software designed to manage the connection and usage of customers, and handsets

[15] The Internet in an African LDC, the Uganda Case Study, 2001, ITU.

designed to detect connectivity and obtain authentication. Such wireless technologies should drastically reduce the infrastructure costs that would be involved in constructing a mobile network, for example, that requires the posting of masts. Franchise arrangements would offer a level of uniformity required to deploy such technologies on a national basis while providing sufficient flexibility and control to local operators over what services they offer and how they market them in a given village.

There are a number of other concerns worth mentioning here regarding universal service policies, and in particular a tendency to resort to use of universal service funds. An important priority in establishing a mechanism is that it prove to be a sustainable way of encouraging investment to the sector. The use of subsidies inevitably introduces concerns about reliance upon support and the sustainability of services when such subsidies are eventually withdrawn, although such concerns are certainly less acute where reverse subsidy auctions are used and low subsidy amounts are provided. Permitting an improved balance between costs and revenues may reduce this tension.

There also remain certain unresolved paradoxes in current ideas about funding universal service funds from the revenues of telecommunication operators and service providers. The penumbra of the definition of those required to contribute to a universal service fund (e.g., whether or not to include Internet or cable companies) raises the question as to why telecommunication operators as a class are earmarked to bear this particular burden in the first place. Even a contribution of only 1% of gross revenues can be a very substantial portion of net cash flows, reducing scope for further investment in the sector. In fact, such a 1% universal service obligation fee applied to the gross revenues of an operator with limited or no financial margins can effectively disable its ability to access financial markets. Investment analysts point, in particular, to the burdens that seem with good intentions to have been imposed on fixed line operators in less profitable areas of the Brazilian telecommunications market that have resulted in significant financial dislocations and distress.

Furthermore, a cross-sector charge based on a percentage of revenues does not take into account the different investment cycles and risks specific to different telecommunication operations in the way that regular corporate taxation does. For example, wireless networks generally are quicker to establish and commence revenue generation, enabling them to reach break-even points sooner than wireline networks. In most developed markets, corporate taxation generally only applies when businesses begin to record profits – ie. when the investment has proven worthwhile. Highly capital intensive network-based operations involve much longer periods before showing a profit, and a relentless revenue-based charge can have a particularly high impact on long-term margins, and a possibly long term drag on investment flows to the sector.

The most obvious reason for establishing a universal service fund contributed to by telecommunication operators and administered by the sector regulatory authority (or by the sector minister, or market participants) is that it enables sector policy makers and regulators to avoid competing with other demands on centrally controlled national resources, for example, by circumventing budgetary controls in Finance Ministries. In using universal service funds to support universal service obligations, policy makers and regulators aim to encourage the development of telecommunication networks and availability of services in areas that cannot otherwise afford them because such networks and services have numerous benefits across the full range of economic and social activities, including schools, hospitals, agriculture, local businesses and other sectors of the local economy. It may be argued that

the costs associated with providing universal service are more appropriately viewed as an aspect of regional development policy. This is not to say that telecommunications sector policy makers and regulators should not have the lead influence on the deployment of any funding to be made available. It simply raises the question as to why telecommunication operators in particular are expected to bear the funding burden.

There also remain unresolved questions concerning administrative aspects of universal service funds. Many developing countries are still only in the process of establishing independent regulators, often encountering the political dilemmas of conferring financial and operational autonomy to regulatory bodies for the first time. In addition to the political obstacles in relinquishing powers, many such countries lack the human or financial capital to build institutions that will effectively regulate the market for some considerable period of time without extensive assistance from – and dependence on – multilateral agency funding and consultancy support. Resolving the types of questions that arise in connection with administrating universal service funds – in addition to their basic regulatory functions – may be beyond the institutional capacity of most developing country regulatory bodies and, together with the political pressures that inevitably accompany choices about the allocation of public funds, may make it more difficult for nascent regulatory bodies to develop their regulatory role comfortably and assume authority effectively. Defining services and geographical areas, reconciling funding of defined universal service obligations with pre-existing network build-out obligations and penetration rate targets in the licenses of incumbent operators, regulating retail and interconnection prices of subsidized operators, and designing subsidy auctions – to mention only a few highly contentious issues – introduce questions of complexity likely requiring a level of expertise that may not be available and that distract from the basic imperative of allowing those who bear investment risks the scope to set the conditions for securing a return on investment. While newly-appointed regulators certainly have the capacity to develop expertise in managing universal service fund mechanisms, it is open to question whether this is the best deployment of scarce human capital.

The administrative complexity contemplated by some universal service fund proposals does not match the mobility of capital and the flexibility of technological and financial structures discussed at the beginning of this section. To the extent that economists and lawyers are available, it may be that offering support to local investors in developing business plans and models would be of greater assistance to those who contemplate venturing into areas where margins are likely to be tight. There may even be legitimate concerns that the establishment of a universal service fund – which by definition ought to have the purpose of "doing itself out of a job" – may result in an entrenched subsidy culture, both for operators and fund administrators, and raise questions about the sustainability of investment in the areas targeted for support. The involvement of the official sector in determining – despite the use of subsidy auctions and commitments to technological neutrality – how public funds will be used to support the development of infrastructure may lead inexorably to increased public sector influence over decisions affecting the deployment of capital and the types of networks and technologies to be used.

To the extent that subsidies are necessary, there may be merits in considering approaching such subsidization from a demand perspective. Instead of subsidizing operators' costs, it is worth considering whether providing subsidization to users would improve the focus of the economic dynamic. The prospect of assured demand due to the issuance, for example, of pre-paid vouchers to community organizations and local governmental agencies which might be distributed to local businesses and families, might

ensure an initial boost to usage and provide an opportunity for users to experience the benefits of the services before such subsidies were fazed out. Providing subsidies to users instead of operators might have the added benefit of improving the visibility of the true development-related purpose of the subsidy.

For the reasons discussed above, many financial analysts and telecommunications sector economists will argue forcefully against the imposition of administratively complex universal service programs including those based on the EU acquis communitaire that interestingly has been implemented in only a handful of EU countries. What is advocated instead is a vigorous program of price rebalancing and even outright forbearance from retail price control that is linked with a strong commitment to tariff packages guaranteeing basic connectivity. In addition, these advisors point toward heavy reliance on technology driven initiatives that provide limited accessibility with low cost technologies such as use of analogue NMT mobile systems to provide rural connectivity in many Central European countries or the deployment of a combination of wireless loops and IP telephony applications.

It is not the purpose of this paper to offer a single solution to the challenges of securing universal access and universal services for populations, particularly given the variety of population sizes, stages of network development, preparedness of markets, legal systems, general economic development and gross domestic product. The key concern is to ensure that, in designing universal service policies and regulations, policy makers and regulators approach the subject with the priorities of investors close to the forefront of their minds. Countries such as Chile, with its attitude to economic reform, may be able to benefit from use of a complex universal service fund. This is particularly so where reverse auctions are used to minimize the amount of subsidy and maximize the leveraging capability of the subsidy to attract private investment, and where asymmetric interconnection and roaming arrangements apply between rural and urban areas. In many countries, however, such a system may create structures and incentives that direct scarce human capital away from investment-focused regulation and towards bureaucratic institutions and processes.

V. Risks and Structural Hindrances to Investment

Investment bankers weigh a wide range of generic risks in assessing investment opportunities, including political risk, legal stability, exchange rate risk and the like. Regulatory-specific risks issues that typically come into focus in developing markets typically include uncertainties regarding the timing and scope of sector liberalization and whether, in light of existing competition and planned liberalization, operators – particularly incumbent fixed line operators – have sufficient commercial flexibility to deal with increasing competition from mobile operators, call-back services and Internet telephony, as well as competition that may be introduced with the loss of exclusivity rights. Investment bankers' due diligence meetings with sector ministries and regulatory institutions will focus on the official sector's vision for price regulation and political pressures to build out networks and maintain widely based subsidized pricing schemes for geographical areas and population segments.

Risks concerning politically achievable targets for price rebalancing surface as business plans require analysts to model future revenues and costs over long term periods based on uncertain assumptions. Interconnection-related risks typically concern the ability of operators to offer services on a commercial basis, as well as the powers and inclinations of the regulator to become involved in setting interconnection rates as opposed to simply

resolving interconnection disputes or intervening in failed negotiations. The powers and intentions of policy makers to grant new licenses to potential competitors is a common risk that arises in assessing investment in a sector which is in the process of liberalization. For example, discussion in Jordan about whether or not to permit a third mobile operator to enter the market will naturally have included perspectives from the government's financial advisers concerning the impact of a third GSM license on the recent marketing of the Jordan Telecom's shares. Similarly, the introduction of new technologies that may offer indirect competition is of key concern, as illustrated by the share of the 3G market that wireless LAN services are predicted to take.

Investment bankers will also regularly consider the broad direction of regulatory change, as well as the likely impact of specific regulatory initiatives on the attractiveness of investment. For example, in considering the attractiveness of investing in certain state-owned mobile operators in countries just beginning to liberalize, the investment banking community is looking carefully at the adjustment of telecommunication regulations to follow global norms, to meet political pressure to provide basic services in less developed regions, the separation of regulatory and operational functions and other reform initiatives. Financiers will also analyze the likely impact of specific regulations on specific operators. For example, recent developments in the EU relating to definition of relevant markets in the mobile sector and the increasing focus on roaming and termination charges are being reviewed by investment analysts in relation to their likely impact on the EBITDA of European mobile operators.

Institutional reform of regulatory regimes is frequently discussed in telecommunication sector reform circles with a focus on the stability and transparency of regulatory decision-making, and the effect of such certainty or uncertainty on the risk dimension of investment. It is certainly true that transparency and stability are important attributes of the regulatory regime for attracting investment capital to the telecommunications sector (as evidenced by the highly successful auction of Morocco's second GSM license in 1999 for US$ 1.1 billion), and investment bankers will indeed focus on the benefits of new legislation and regimes that offer investors assurance in taking a long-term view of the investment environment. Another initial public offering in a developing country was less successful in part because the country lacked a transparently articulated policy on tariffs and interconnection and due to the overall regulatory environment, compounded by pricing changes to some tariffs made towards the end of the offering process.

Given that the importance of transparency and stability is now generally taken for granted as a basic tenet of regulatory reform by most advisors (if not by all of their advisees), this section explores how the transition of institutional mechanisms can sometimes introduce risks which may directly limit revenue generation or impose costs making investment less attractive.

This section discusses concerns about a lack of coherence in governments' approaches to the telecommunications sector in relation to structures of and inter-relationships among regulatory institutions – particularly those in countries in transition – which may result in fragmentation of policy aims and the prolongation of residual pricing controls that are no longer necessary or helpful in the existing market. Other transition-related issues discussed in this section include the use of concession arrangements by some governments in developing countries, and risks difficulties involved in converting such arrangements to licensing regimes. Also relevant to the risk profile of the

telecommunications sector is the intersection of regional investment trends and the accumulating systemic complexity of geographic regulation. There are a number of regional initiatives in developing regions to align regulatory practices of neighboring countries more closely with one another. At a global level, for example, many countries have now signed up to the commitments in the WTO basic telecommunication services agreement, with the result that there may be increasing convergence of regulation. The jurisdictional complexity introduced by such developments raises a number of questions regarding the relationship between local and central institutions. This section discusses some lessons for developing markets that may be drawn from the experience of developed markets such as the EU and the United States in this regard.

Risks Arising in Institutional Transition

One of the most difficult issues facing policymakers in emerging markets can be how to manage the transition from exercising controls through corporate governance mechanisms to a more independent process of regulatory oversight. This process can be particularly vexing where basic decisions about pricing and investment policies have been exercised through a government owned holding company or a supervising Ministry which has taken a leading role in setting sector policy.

Institutional mechanisms and procedures can often be policy outcome-determinative. Thus, financial advisors focus not merely on substantive policies but on the institutional arrangements for implementing them. For example, the creation of institutions to counterbalance old structures that traditionally directed investment policy can sometimes have unintended consequences of accentuating social policies such as consumer protectionism or ensuring social equity in an unbalanced fashion, thereby negating important pricing and other signals much needed to attract new investment.

We discuss below the issues raised by the transition processes from state-owned to a more market driven approach where pricing policies historically were used for broad social aims.

Some markets have experienced difficulty with tariff rebalancing where different governmental entities share or even have conflicting roles with regard to end user tariffs. The result is that local tariffs are entirely out of alignment with other prevailing local tariffs and are in need of restructuring to permit local operators to generate revenues from new services such as local access for Internet services and origination and termination of traffic to and from the mobile networks. Pricing decisions in some countries evolve out of an institutional stand-off and inter-Ministry negotiation process. Uncertainty and lack of transparency resulting from the relationship of the sector Ministry to the operators is thus compounded by the role of competition authorities or other ministries with a pricing policy mandate. The division of roles may undermine the ability of the government to regulate the sector as a whole, politicize pricing issues, stifle the cash flows needed for further investment and undermine the attractiveness of the sector to international capital.

In the view of many observers, pricing policies in some major markets are beginning to be driven more by concerns about encouraging wider accessibility of services than by considerations relating to the ability of mobile service providers to attract investment into the telecommunications sector.

It may be that the goal of ensuring that pricing policies will attract increased investment is being superceded by different policy concerns relating to protecting

consumers' rights and/or widening access to service. Despite the legitimacy of both such policy objectives, this may actually result in constraints on the speed and effectiveness with which the overall telecommunications infrastructure can be expanded to offer access to a larger number of users. Investors become wary where decisions benefiting specific customers through reduced or preferential rates, or initiatives to expand the telecommunications infrastructure into un-served or under served territories, become captive to particular social agendas or stranded between different institutional structures. Investors, in short, may have second thoughts about whether capital can be attracted into either telecommunications sector without potential distortions and impediments on the effective deployment of capital. Shifts in the institutional structures for overseeing pricing policy, or for facilitating access to services consistent with basic social objectives, can often have quite unintended and adverse consequences for the rapid expansion of telecommunications infrastructure.

In many countries with long traditions of state ownership and direction of economic policy rate structures have become embedded with special preferences accorded particular classes of customers or institutions. The political case for such preferential rates for the elderly or war veterans is hardly assailable. However, over the years, many preferences and cases of special treatment have accumulated that may no longer be justified in a more commercial or market-oriented environment. For example where government ministries are not required to stay current with their bills from local telecommunication operators or receive other preferential pricing treatment.

Especially, where governments are keen to encourage the rapid take-up in the public and private sectors of broadband information related services, there is a need for careful reassessment of how rates should be set to ensure affordability and basic access. Many advocates of more contemporary and progressive pricing policies are urging the introduction of pricing plans that are dependent on users' own decisions about how much capacity to use to ensure basic affordability and access. The focus of attention is being shifted to pricing plans that offer limited and basic connectivity for discounted prices without regard for the actual identity of the user.

Likewise, many investment analysts express concerns that institutional mechanisms and social policies to ensure universal access can actually undermine progress toward expanding the basic availability of telecommunication services in a market. These analysts focus their attention not on the aggregate penetration rates in a sector but on the part of the market that can be effectively served by service providers. Thus analysts do not look so much at gross numbers of potential subscribers but instead try to estimate the commercially viable market segments for particular types of services. Certain types of technologies, such as PAS Handyphone, wireless services may be more viably deployed in certain less economically favored regions. As discussed above in Part IV, a program intended to ensure universal service may in fact create uneconomic incentives for the expansion of infrastructure, effectively obligating operators to offer services that even when subsidized are still loss generating.

In the context of regimes in transition, a key question then is how to structure institutional mechanisms that undo old and no longer effectual mechanisms for corporate control through state-owned holdings and Ministries but still ensure a commercial and investment oriented approach to retail as well as wholesale pricing policies. Institutional change has been a traditional focus of aid assistance to countries introducing liberalization measures. It may even be possible sometimes for international development banks, in an

earnest effort to help design policies serving important social and political objectives in a reform process, actually to set back the process of sector reform and new investment. Reaching the right balance between politically disruptive, controversial and unpopular price reform and necessary safety net protections is exceedingly difficult. Increased and improved dialogue between governments and traditional investment bankers and development bankers would greatly assist in ensuring the continued flow of investment into the sector.

One possibility may be to structure new institutions that provide significant leeway for industry participants and government officials to engage in consensus building activities with regard to the dynamic interplay among transitional pricing, investment in infrastructure and social policies. The rationale for such new mechanisms is described more fully in Part VI and in a discussion paper prepared under the auspices of the World Bank, "Discussion Paper on the Use of Alternative Dispute Resolution Techniques in the Telecommunications Sector" (Bruce & Marriott 2002). Institutions that give significant weight to commercial and investment-oriented interests may be able to assist in minimizing the potential unintended consequences of a migration of supervisory authority with respect to the telecommunications sector from old style dirigiste institutions to more independent regulatory mechanisms.

The same type of distortion that can be introduced into decisions relating to pricing policies can also be introduced when there is concurrent jurisdiction between telecommunication regulatory agencies and competition authorities or where the balance of policy making initiatives shift from traditional sector-specific regulation to a regime more dependent on competition. We discussed above in Part III the example of how competition authorities in Europe and other countries may begin to intervene in the mobile sector with respect to roaming or termination charges without regard for an overall vision of the full range of regulatory, commercial and financing issues facing the sector. The following section discusses some of the complex jurisdictional issues that are increasingly arising in the telecommunications sector.

Systemic Complexity Risks: Harmonization and Jurisdictional Layering

Over the past five years, the number of national regulatory entities has increased significantly in response in part to the WTO basic telecommunication services agreement. More than 110 countries had created regulatory authorities by the end of 2001, with 140 expected by 2005, according to the ITU Trends in Telecommunication Reform, 2002, report. This proliferation of regulatory authorities has occurred, of course, in the context both of the emergence of an overarching set of basic regulatory principles embedded in the WTO basic telecommunication services agreement and the WTO reference paper and an increasing trend toward cross-border investment on both a regional and international scale. As the detail and potential diversity of regulatory regimes have increased so have pressures for convergence of approaches and common policies from the standpoint of potential cross-border operators and investors. Investors are increasingly investing regionally. For example, France Telecom has taken a significant interest in a number of Middle Eastern and North African countries, as has Orascom; MTN, Telecal and MSI invested all across Africa, as has Shim Corporation in South East Asia; and Vodafone, Hutchinson, Orange and NTT DoCoMo exemplify a growing tendency to invest over a wide geographical span. The 3G licensing process in Europe evidenced trends towards a more regional and cross-border approach to investment, and merger and acquisition activity has seen increased regional activity, with major incumbent operators such as France Telecom and Deutsche Telekom taking over major mobile operators such as Orange and One-to-One in the United Kingdom.

The increasing globalization of services adds to pressures for convergence of regulatory approaches. Increased international traffic, the availability of vast international capacity, international roaming arrangements which have benefited from use of common technologies such as GSM, changes to international accounting rates and increased use of services such as callback, calling cards and global satellite systems all combine to produce a more global market for services. Disparities of regulatory treatment across borders which would otherwise benefit from being viewed as a single wider market likely introduce distortions that hinder aggregate flows of investment to the sector on regional basis.

In some areas, international institutions and mechanisms like the European Union have emerged to create common cross-border markets. Such regional economic and political institutions are structured, or are being structured, to achieve increasing degrees of political and economic integration comparable to the conditions prevailing with nation-states which may have varying degrees of federal-type structures balancing the claims of central authorities against those of state or provincial officials. There is, in practice, a continuum between the market environments that exist in the context of federal nation-states, international institutional arrangements such as the European Union, other less highly developed regional structures like the Mercosur, as well as a range of other regional cooperative mechanisms in Latin America or Africa. What is significant is that there is increasing complexity in the global telecommunications environment as a result of the co-existence of multi-tiered regulatory frameworks, resulting from the convergent applicability of WTO-based, regional, and national regulatory frameworks and policies.

From the standpoint of potential investors, it is critical that the increasing complexity and differentiation of policies through the establishment of new regulatory institutions, not inadvertently create barriers to flows of investment, especially on a regional basis. Thus, as the numbers of separate regulatory authorities increase, it is likely to be increasingly valuable to examine various approaches and models — even the experience in developed markets such the United States or the European Union —for dealing with jurisdictional complexity and for achieving effective scope and scale in regulatory policy setting.

There are, of course, an increasing number of regional associations and entities specifically focused on issues of regional cooperation and harmonization, including Common Market for Eastern and South Africa (COMESA), Regulatel in Latin America, the Telecommunications Regulators Association of Southern Africa (TRASA), the Eastern Caribbean Telecommunications Authority (ECTEL) as well as other similar organizations. Most such regional organizations have yet to develop on-line information sharing arrangements at a significant substantive level. The degree of institutional formality and the scope of cooperative initiatives vary from organization to organization and from region to region. However, the potential success and effectiveness of regional initiatives may not depend as much on having a formal legal basis for cooperation as on practical initiatives to exchange information about key policies and to harmonize policies on a cross border basis. The Independent Regulators Group within the European Union is a good example of an institution based on informal cooperation rather than a formal legal mandate. For example, such informal groups can develop a basis for data that can be used for cross-border benchmarking of retail and wholesale pricing arrangements. Other fruitful areas for collaboration could center around developing information on low usage tariff schemes, interconnection, rate rebalancing initiatives and timetables as well as various approaches to encouraging universal service or access to basic telecommunication service offerings. Undoubtedly, current cooperative efforts are already centering around these core topics of common importance. However, much would be gained by formulating common

methodologies for collecting, presenting, and disseminating key sector-related information and for distilling "case studies"—real-life relevant regulatory experience—that are useful to regulators on a cross border basis.

As discussed in Part VI, there are likely to be significant benefits from ensuring that exchanges among regulators is part of an overall process of increasing and strengthening dialogue among key industry participants. Indeed, the proliferation of separate regulatory entities may create a strong rationale for a "virtual forum" linking service providers and users on a cross-border basis that is intended to encourage consensus building initiatives with respect to key industry developments. Such informal mechanisms may indeed be ideally suited to deal with environments where regulatory mechanisms are not fully developed or are not likely to develop given political or institutional constraints.

Jurisdictional Complexity in More Developed Markets

Regulators in developing countries can draw lessons from the experience of more developed markets with issues arising in relation to institutional complexity. More developed markets themselves may benefit from a more widely cast institutional method of collecting the variety of relevant inputs necessary to prevent the fracturing of policy that is destructive to investment, particularly given some of the changes being introduced in markets like the European Union. Many industry analysts have focused concern not only on competition policymakers entering the policymaking fray, but have noted as well that the European Union's new regulatory framework anticipates that traditional relationships between national and EU regulatory officials will be structured with EU officials having increased authority to veto or override national policy initiatives. New consultative mechanisms involving not just EU and national regulatory authority officials but also a range of industry participants may be required to add more transparency and predictability to the way that the new EU framework is implemented. A first step in the direction of implementing new mechanisms may be to experiment with the use of consensus building and dispute resolution at both the national and EU levels. As discussed in Part III, the European Union's far-reaching July 2002 forum in Brussels addressed issues raised by the unbundling of local loops and deployment of new high speed Internet access services. Mechanisms designed to develop further and bring into focus issues discussed at such fora in a similarly consultative and collaborative manner are likely to play an important part in ensuring that policy making and regulation attend to the realities and needs of the market, including the details of conditions that would encourage investment.

The complex and multi-tiered relationship between the Federal Communications Commission and public utility commissions in the fifty states and the District of Columbia has long been a central part of the telecommunications landscape in the United States. However, there may be a critical need to examine whether a simpler and less intrusive approach to regulation may be warranted in light of increased consolidation of incumbent regional telecommunication operators, the emergence of nation-wide wireless service providers, and other changes in competitive relationships in the telecommunications sector. As noted above in Part III, the investment community is increasingly questioning the basis for traditional public utility regulation of retail prices of fixed line service services given the increased substitutability of wire and wireless services. There is also an important nexus between local regulation of pricing of fixed line telephone services and the basis for pricing the provision of xDSL services on a retail and wholesale basis. Any distortions in the level of retail pricing for local fixed line services may well adversely affect the basis for determining the right pricing for common elements of local infrastructure that are utilized in

providing high speed Internet connection services. For example, local regulators may be inclined to apply the same methodologies for setting the pricing of unbundled elements of local network infrastructure and potentially not permit recovery of local infrastructure costs on a basis that will stimulate new investment in such infrastructure. In any event, continued local regulation of the pricing of unbundled network elements will result in an asymmetrical approach to the regulation of pricing for alternative types of infrastructure used for high speed Internet access, ie. the local wire network and facilities of cable television operators which are not necessarily subject to regulation by local public utility commissions.

It may be possible to address such concerns through the pre-emption of local regulation by the FCC. The fracturing of policy along jurisdictional lines due to outdated institutional structures which do not reflect the nature of the market, however, suggest that it may be an appropriate time for an overall review of the continued role of public utility commissions established in the last decade of the nineteenth century in addressing the challenges of overseeing complex new industry arrangements in the first decade of the twenty-first century.

Such a review might focus on whether there are simpler and less administratively complex arrangements to protect basic consumer interests and oversee an important industry sector. In this effort, it may be useful to initiate a dialogue among regulatory officials in the United States and regulators in other countries which have begun to gain important experience in regulating the telecommunications sector with less formal and cumbersome arrangements than have been traditionally used in the United States. From the vantage point of an expatriate former regulator in the United States—the perspective of the principal author of this discussion paper— United States regulators might benefit from an open-ended dialogue with counterparts in various countries including several Scandinavian countries with simple but still effective regulatory regimes. Indeed, there may be substantial mutual benefit in a dialogue that focuses on innovative ideas that might have a stimulative impact on the current depressed conditions that telecommunication operators face in today's financial markets.

The lessons for regions with under-developed markets is that investment in new regulatory regimes may be best directed towards simpler regulation and informal cross-border regional consultative mechanisms aimed at continuity and convergence using information sharing and benchmarking, and not towards structures that encourage tension between central and local authorities and wrangling over jurisdictional control.

Risks Relating to Licensing Regime Transition

One of the more complex scenarios in which regulatory policies and investment concerns can become closely intertwined involves the conversion of revenue sharing concessions into conventional licenses. In a number of different countries including Turkey, Lebanon, Thailand, and Indonesia, to point to some prominent examples, revenue sharing concessions were issued to privately owned service providers to exploit rights granted by the state. The exclusive rights held by a state-owned telecommunication company such as CAT and TOT in Thailand or Telekom Indonesia in Indonesia were granted under concessions, in substantial measure, to permit state-owned enterprises to access the know-how and capital of the private sector without resort to a traditional privatization of a state-owned enterprise. In Turkey and Lebanon, by contrast, revenue sharing concessions were issued to private service providers as an alternative to conventional licenses and were intended to permit the government to obtain some of the economic and financial benefits of

a government-owned enterprise without imposing any burdens on government authorities to finance, manage or bear the risk of such ventures. All these various approaches were initially intended to provide increased access to private capital in a market environment in which the introduction of competitive entry or full privatization of state-owned enterprises were not viewed as politically feasible.

As liberalization and privatization policies have become more politically acceptable, government policymakers have had, for a number of different reasons, to find ways to convert such revenue sharing arrangements into more conventional licenses. This has often been required as part of reform of the overall regulatory scheme involving new legislation and the transfer of licensing responsibility to a new independent authority responsible for sector regulation. The creation of a new regime designed to promote legal certainty, competition and other conditions required to attract investment has meant that existing revenue sharing arrangements become obsolete, effectively stranded assets under the new regulatory regime. Conversion of the licenses has not usually been easy and has created substantial uncertainty, often casting a long shadow over efforts to provide new policy direction and momentum in the telecommunications market as a whole. Often, the distortion introduced into national telecommunication policies is a result of the fact that responsibilities for setting regulatory policy and for overseeing the government's financial interest in a concession agreement are treated in a compartmentalized fashion and not properly integrated and coordinated on an intra-governmental or inter-ministerial basis.

It is sometimes difficult for countries to reconcile pressures on the Government to reduce large budget deficits using short term revenue from the telecommunications sector from licenses and concessions with its longer term sector development objectives. Such objectives might have placed higher priority upon achieving the economic benefits, and likely tax revenues, from a profitable, rapidly expanding telecommunications sector than on gaining immediate economic returns from concession or license fees. Such tensions are often present in setting telecommunications sector policy. There has never been an easy remedy to the disquieting consequences of deep-seated conflicts of interests between governments' budgetary imperatives and their long-term economic policy making responsibilities. However, it may be possible to make these conflicts more visible and strengthen the checks and balances within governments that might counteract the tendency towards viewing the telecommunications sector as a lucrative source of revenue. The kind of consensus building fora discussed in Part VI might well have helped to air the issues relating to, and integrate the approach to, the liberalization and growth of the sector, the privatization of incumbent operators, the transition to a new regulatory regime, and other like issues.

The restructurings of revenue sharing arrangements in some countries are likewise creating significant uncertainties as policy makers weigh how to evaluate the conflicting claims and interests of incumbent state-owned operators and private investors in revenue sharing concession holders, and to convert revenue sharing agreements into more conventional interconnection arrangements.

How Governments organize themselves to deal with such restructuring processes has enormous long term significance for future investment flows in the sector. In some countries, the government is faced with a significant conflict of interest between its responsibilities as policy maker and sector regulator and its interests as owner of important industry participants. It may be especially important in some countries to identify mechanisms such as a negotiating forum or informal dispute resolution that can be relied

upon to create transparency and a sense of fairness about the decision making process. Such mechanisms would assist in including the investor community in the resolution of the situation in a manner that ensures that the long-term investment needs of the sector are not marginalized.

The transition of certain concession systems to a licensing regime due to the complexities produced by interrelated concession agreements established at different stages in the sector's development may make it difficult to attract investment.

The process of converting concessions into licenses in some countries has further been complicated by new legislation that limits foreign investment in licensed operators to levels below the existing investment base in concession holders. Other problems relate to the lack of guidelines for determining the cost of converting concessions to licenses, especially concerning the valuation of assets acquired by concession holders and transferred to state-owned companies. Under the terms of some concession agreements, the concession granting entities are able to demand payment for transferring assets back to concession holders for their use under the new licensing regime. Likewise, revenue sharing agreements will have to be replaced by conventional interconnection agreements.

Difficulties in implementing structural reforms in which concessions are converted into licenses leave investors unable to evaluate likely future operational scenarios for state-owned operators as well as for former concession holders. This uncertainty created by difficulties in navigating a difficult and complex restructuring process can effectively immobilize the ability of international financial markets to provide an increased or reliable flow of funding into the sector. To the extent that the government approaches the problems in a fragmented manner, it may lose the opportunity to attract the maximum aggregate investment. Thus the pricing of new licenses, the cost of the assets and the economics of the new interconnection agreements need to be handled on an integrated basis, particularly in light of the historic economic structures. Again, then, there is much need for a mechanism to pull together the different constituencies and issues. A forum in which these issues can be aired and negotiated transparently by all parties concerned might accelerate the process by ensuring that parties receive a fair hearing and improve the overall conditions for investment flows.

VI. Using Consultative Industry Fora to Develop a New Regulatory Style

A basic problem facing policy makers and regulators in developing markets which are in the process of liberalization is the lack of established regulatory expertise and understanding of the key concerns of investors and the technological and economic complexities of the market. Even in developed markets, the detail involved in various aspects of regulation, whether defining market segments or adjudicating on the hardware and software required for the physical and logical interconnection of networks, places an increasingly demanding burden of understanding on regulators and appears to require their increasing involvement in the detail of the business. Continuing to regulate in a manner determined by traditional approaches to the heirarchies of jurisdiction-focused legal norms, based on the issuance by a regulatory authority of regulations and requirements that it approve tariffs, interconnection agreements, technical standards and the like, may be unsustainable in this light. It is becoming increasingly important that industry participants – operators, service providers and investors – become more involved in and share more of the burden of the regulatory process than they have hitherto. The importance that the regulatory process take into account and indeed be led by the factors affecting decision-making of

investors and operators concerning the financial realities of developing new infrastructures only makes this more urgent.

Many regulators in developed countries regularly consult with industry participants, seeking and receiving comments on regulations proposed by the regulatory authority, although such consultations typically occur after it has conducted market analyses and determined the frameworks in advance. A number of regulators in developing markets have also seen the benefits of a consultative approach to regulation, with countries such as Botswana regularly singled out for their public consultation processes. A wealth of regulatory consultative information is available on the Internet. Anatel, the Brazilian regulator, for example, regularly publishes its consultation and discussion documentation on-line. The Telecommunication Regulatory Authority of India maintains a regularly updated website with consultation papers and responses from the market containing a wealth of information and input from investing operators, investors, academics, policy makers and other stake holders. There may be, however, an important need and opportunity to change fundamentally the underlying approach of the regulatory process itself in a way that not only involves consultation by regulators with industry participants but that actually builds operators and investors into the regulatory process itself.

There are likely to be significant benefits from introducing a fresh, "bottom up", consultative approach to regulation that employs structures and institutions which ensure that market participants become engaged, with official supervision and involvement, in monitoring their own markets, benefiting from experience in more developed or neighbouring markets, identifying problems that require to be addressed through regulatory processes, initiating proposals to address such problems, and managing dispute resolution and other consultative procedures which are alternatives to traditional adjudicatory systems.

Establishing industry fora comprised of interested operators and potential sources of investment and focused on specific policy goals, such as increasing infrastructure in rural areas or alternatives to traditional local access infrastructure, may greatly assist regulators in identifying the key factors that would permit investment flows to achieve the desired aims. A fundamental shift in the approach to how regulation operates in relation to market participants and investors so as to give them a larger role in the process might also permit the development of efficient dispute resolution procedures. Several financiers have expressed concerns about the danger that the enforcement powers accorded regulators can result in accumulating and escalating litigation to determine major issues, such as line sharing, for example in Germany. For this reason, RegTP has been seeking to shorten appeals processes to reduce the period required to reach final judgments, and to increase its powers to fine. It may be, however, that alternative dispute resolution procedures could be developed to accelerate determination of contentious issues within the fora of industry participants themselves while simultaneously easing concerns about due process.

There are a range of types of mechanisms and platforms that might be used in a variety of situations. Alternative dispute resolution and mediation procedures can be used where individual or groups of operators and service providers are in direct conflict on specific issues such as the pricing or logistics of interconnection, or the pricing or co-location in local loop unbundling. More broadly, groups of interested market participants might participate in roundtable discussions to provide market-led initiatives aimed at increasing investment and competition in the sector. At the technical level, industry fora might focus on the technical issues arising in network inter-operability in the logical and other software-related aspects of interconnection.

In each of these scenarios, it should be possible to ensure that the public policy dimension frames the processes, whether by defining the range of expected outcomes, requiring benchmarking of results against more developed markets, or by including regulatory officials in the actual process itself. The role of regulatory officials might vary from being party to a proceeding, organizer or monitor of proper process in a proceeding between or among market participants, identifying key issues or recommended outcomes, or being merely an interested on-looker. Further, regulators might use their ultimate authority to introduce regulation as a background "stick" to encourage informal negotiation among market participants on an issue of public policy interest.

The importance of transparency in regulatory policy making cannot be overstressed. Investment bankers monitoring certain markets have expressed concern about the lack of information available about basic issues that affect competition in the market and therefore the attractiveness of investment in operators. Many regulators in more developed markets already collect substantial amounts of information from operators and analyze it with a view to developing regulation. Introducing structures which encourage more information sharing among market participants in a country's market, as well as cross-border benchmarking, would offer industry participants and regulators alike greater access to the key information about the key drivers of access to and quality and pricing of services.

It is certainly conventional wisdom that steps to create independent regulatory bodies are a valuable step toward transparency. It is arguable, however, that independent regulatory bodies that are similar in structure and operation to Oftel, FCC, the CRTC in Canada, RegTP in Germany, the ART in France cannot easily be established in countries that do not have a long tradition of independent regulation and monitoring markets. The first option of policy makers in some countries may sometimes not be to create an independent regulatory body. There is also a concern that new regulatory bodies may actually operate in a fashion more similar to traditional closed ministries that they replace. Investors may not actually have an opportunity to gauge how key sector decisions will affect the market, business opportunities and investment risks because they cannot see and judge for themselves how decisions are taken. It is of even potentially more concern, and a growing concern in some countries in the European Union, that the creation of new regulatory bodies will lead to an increase in litigiousness in the telecommunications sector and even contribute to a condition where administrative litigation becomes an accepted part of competition in the marketplace and that delay in resolving disputes begins to impair the functioning of commercial markets.

As discussed throughout this paper, one of the arguable advantages of consultative industry fora is that investors can have a better view of how key industry decisions are likely to be taken and be involved in the process. Moreover, such mechanisms may begin to increase the likelihood that key policy issues will be dealt with by discussion and agreement and not through litigation. Thus, not only will regulators have the benefit of understanding better the key factors for investment, but institutional mechanisms may contribute toward improving investors' confidence in the regulatory process and ultimately in the dynamics of the telecommunication markets in which they decide to invest.

Another key institutional step in adding to investor confidence is strengthening mechanisms for the predictability and enforcement of key sector policies. Investors will weigh in their decisions to invest in a particular sector whether written policies are actually followed in practice. The more investors doubt whether regulation will operate as "advertised" the less they will be able to make sound investment decisions based on a clear

understanding of how industry players are likely to behave in a given market setting. Involving investors and operators in policy-making and regulatory processes increases the likelihood that high sounding intentions are carried out in the pragmatic detail of the operating market.

One of the factors that can deter investment is a failure of regulators and policy makers to address how some very critical regulatory issue is likely to be addressed. For example, questions remain in some countries whether newly created regional companies will be authorized to provide intra-regional, inter-regional, and international services in competition with the incumbent long distance operator and when as a general matter competition with the incumbent may be permitted. Investment analysts have been left to speculate about how the issue is likely to be addressed and when. However, there may well be useful ways of delineating the overall framework within which potential policy concerns are likely to be addressed. One of the potential advantages of a sector forum involving key industry players and government officials is that those interested in investing in the sector may be able to develop a better view of how key relationships among industry participants are evolving and how regulators and industry participants view longer term prospects for the sector.

In many cases, issues arising in markets – particularly those that are under-developed – will have arisen in other markets. For example, there may be scope for liberalization initiatives to be taken on the basis of commercial negotiations which start from operational procedures and documentation developed in other liberalized markets. Instituting formal mechanisms designed to encourage regulators and market participants to take advantage of experience accumulated in other markets may offer considerable improvements to the collective vision for the sector and a reduction in the contentiousness that often accompanies regulatory change.

We discussed in Part V the increasingly regional nature of investment flows and some indications of trends towards convergence of regulatory practices resulting from countries' WTO commitments and regional initiatives, as well as some lessons about jurisdictional complexity resulting from institutional tensions between central and local norms and authorities. The use of informal cross-border mechanisms sharing information and benchmarking trends may be a more efficient way to bring about regulatory convergence than traditional legalistic approaches such as have traditionally been employed in the European Union and the United States.

VII. Concluding Perspectives on the Importance of Investment-Oriented Regulation

A Fresh Approach to Regulation

Regulatory policies that are well focused on encouraging investment do not merely service the interests of investors but can and should also promote the basic policy objectives of widening access to infrastructure and services and establishing a basis for competition in the sector. It is easy to forget that if adequate investment does not flow into the telecommunications sector it is likely that overall service penetration cannot be increased, waiting lists for services are likely to grow longer and the objective of encouraging universal service or increased access to services will not be served. Likewise, if investment is stifled by restrictive regulatory policies, it may prove to be impossible to ensure new entry and competition in the sector or to be confident that incumbent operators will develop adequate backbone infrastructure to make available to new service providers. Indeed, as is

suggested above, inordinately burdensome policies that are designed to encourage universal access or competitive access to backbone infrastructure can actually prove not only to be ineffectual but could restrict the flows of investment without which increased access or competitiveness is unachievable.

The extraordinary emergence of mobile services over the past decade, and the current difficulties now facing the sector, dramatically illustrate the key beneficial role of investment-oriented regulatory policies. As we have pointed out, and as is so well emphasized in the ITU WTDR 2002 report, the mobile sector has grown over the last decade to such an extent that the number of mobile subscribers now exceeds fixed lines in over a hundred countries and one in six of the world's inhabitants has a mobile phone. What is significant is that this growth was largely achieved entirely without the type of traditional price controls applied over the decades to fixed line services. Moreover, such conditions made the market attractive to a number of operators, thereby enabling the effects of competitive pressures to improve services and pricing further. What is also of equally compelling importance is that the very success of the mobile sector generated a tendency on the part of government officials in many parts of the world to seek to benefit from the potential cash flows generated by the next generation of mobile technology even before private operators and service providers are able to make them a commercial reality. Revenues that might have later been taken in the form of tax revenues on future services were realized upfront in the form of 3G license payments, thereby immunizing governments from the risk of business failure, and substantially increasing the risk of business failure borne by the investors.

One of the underlying threads of this analysis is the continuing inclination of government officials to use the leverage government has – as the exclusive vender of spectrum, as the owner of other strategic assets such as controlling interests in state-owned telecommunication operators, or as the issuer of licenses and authorizations – to capture economic benefits and sector revenues that might be otherwise deployed in expanding infrastructure and services. In short, government policy can short circuit, for immediate political or budgetary advantage, opportunities that might result in even more significant economic and social benefits on a longer term perspective. Much of the focus of this paper is on how policy making mechanisms can be better structured to ensure that longer term investment-driven policies are given the weight appropriate considering the need for renewed investment flows.

We have also suggested that an investment-oriented approach to regulation may result in and benefit from institutional arrangements that are less complex and involve greater involvement of key industry participants in consensus building and dispute resolution than there is currently. We recognize, of course, the importance of the rapid emergence of new regulatory institutions around the world in response to the efforts of the ITU and growing support for the WTO's basic telecommunication services agreement. It is unlikely, however, that effective regulation necessarily depends on hornbook application, even in simplified form, of the precepts underlying telecommunications sector regulation in North America or Europe. On the contrary, the increasing jurisdictional complexity of telecommunication regulation around the world—and especially its multi-layered aspects—may require the development of new techniques of consensus building among key industry players, increased reliance on cross border benchmarking of experience on a non-prescriptive basis, and new notions about how the regulatory process should work that are less "statist" and dirigiste in approach.

The telecommunications sector globally would benefit from increased effort to ensure that regulation percolates upwards from discussions, negotiations and agreements among key participants in the sector, conducted and reached with governmental oversight and involvement, as opposed to being originated, analyzed and imposed (albeit after formal comment from interested parties) by the official sector. An investment-oriented approach could take its inspiration from the emerging cooperative and self-regulatory initiatives of the Internet sector rather than from now obsolete traditions of public utility commission-type regulation with origins in the nineteenth century.

A key ingredient of such a new approach to regulation would be for government officials not so much to forbear from regulating but to structure policies that are designed to minimize the likely need for regulatory intervention. Thus, less can be more, simple regulation can be more effective regulation, and investment-oriented policies can successfully promote many strongly espoused regulatory initiatives favoring wide accessibility of services and effective competition. The objective is to focus on how government can encourage key industry participants to pursue practices and initiatives that promote key objectives, such as increased access, increased competition and affordable pricing, without mandating the details of how telecommunication operators price their offerings and behave in the market to their competitors and their customers.

This paper suggests that a fresh look at traditional approaches to regulation is both urgent and appropriate in the current extremely adverse climate in financial markets now facing the telecommunications sector. Regulators and government officials should carefully consider how a range of inter-related regulatory initiatives can have a fundamental and adverse impact on the potential of telecommunication operators to generate the cash flows upon which access to both internally generated and external sources of capital.

Some Steps Toward Investment-Oriented Regulation

We are aware that many of the points developed in this paper will not necessarily be the subject of ready agreement by regulators and experienced observers of the telecommunications scene. However, we hope that this paper will encourage further discussion and dialogue. We are also aware that perspectives such as these, influenced as they are by our involvement in financing transactions especially in developed markets, may be viewed with substantial skepticism by regulators and operators involved in less developed markets. We hope that this paper reflects our concern and sensitivity to the importance of increasing the availability of telecommunications infrastructure in such less developed markets and encouraging accelerated economic and social development. Summarized briefly below are some of the key areas where we believe close attention and policy reassessment by regulators is likely to be warranted.

- First, we have argued that the increasing substitutability of fixed and mobile services should result in new approaches to price regulation of retail fixed line services. Mobile subscribers now outnumber fixed line subscribers in many markets. Mobile services, which now represent a real alternative to fixed line services and an effective cap on fixed line pricing, have expanded substantially over the past decade in an environment of little or no price regulation. We believe that incumbent fixed line operators should be accorded substantially similar pricing flexibility. Moreover, benchmarking of prices against comparable prices and services in other jurisdictions can provide useful guidance on an interim basis to regulators concerning how increased pricing flexibility by operators is utilized in practice. The focus of regulation of fixed line services should be on tariffs

which ensure minimal connectivity for low levels of usage of the fixed line network rather than on price regulation of fixed line operators' overall service offerings. Increased pricing flexibility would enable operators to generate increased cash flow and more effectively raise financing from external sources, in each case required to finance further expansion of network infrastructure.

- Second, removing pricing constraints on fixed line retail prices should also eliminate the likelihood that price regulation can be used as a pretext for or have the effect of artificially maintaining low retail prices that limit prospects for market entry by new providers of local infrastructure. Such new entry is potentially an important prerequisite and stimulus for encouraging not only competition at the retail level but also the right environment for encouraging the provision of services on a wholesale basis by incumbent operators. As we have argued above, artificial constraints on the level of retail prices may result in incumbent operators being required to provide access to their local infrastructure on an uneconomic basis as well as conditions in which pricing for wholesale services appears to result in a price squeeze with respect to retail pricing. On an interim basis, issues relating to wholesale access to network infrastructure can be addressed by the use of benchmarking of wholesale pricing discounts or benchmarks for underlying service elements, especially once retail pricing constraints are eased. Over the longer term, increased facilities based competition, stimulated by a lifting of retail price controls or by other initiatives to encourage wireless alternatives to fixed networks, should enable regulators to rely on a more hands-off approach to wholesale pricing.

Such a regulatory stance can also be promoted by steps to increase reliance on consensus building and private dispute resolution. We believe that there are affirmative initiatives that regulators can take to reduce the likely resort by incumbent operators and new entrants to the full panoply of legal rights and remedies that may be available to them. It may be realistic to establish a policy framework that is designed and structured to result in progressive reduction in the level of regulatory conflict by creating a "new climate" for commercial dealings much as, by analogy, de-commissioning or reduction in arms by negotiation represents a calculated effort to change approaches to conflict.

- Third, we believe that an investment-oriented approach to regulation requires regulators—and especially government bodies responsible for fiscal and budgetary controls—to recognize that the state, as the exclusive source of licensing authority for authorizations of spectrum-related and nonspectrum-related rights as well as in its role as a controlling shareholder of telecommunication enterprises, can misuse this authority to impose extraordinary costs of telecommunication operators that impede and even paralyze investment and overall growth in the telecommunications sector. The economic benefits derived from 3G services are just one clear example of how government can profit in the short run through here-and-now income streams that might ultimately adversely affect longer term revenues to be expected from taxes on successful businesses. There is, we believe, clearly a need to make more visible how governmental interventions in the telecommunications sector can distort prospects for investment and long-term growth.

We believe that licensing of spectrum should be seen not as a revenue raising opportunity but primarily as an administrative undertaking of the state. To illustrate the point with one concrete example, we believe that there is much wisdom in spectrum licensing for mobile services that does not seek to capitalize on new evolutions of technology—ie. that does not necessarily view 3G service as separate and distinct from earlier generations of mobile technology. Rather, allowing operators to evolve the scope of

the services they offer in response to technological and market-driven considerations rather than "bell ringing" initiatives by government officials to exploit new opportunities arising from buoyant financial markets. Much the same point could be made about the response of some governments that have sought economic advantage from the conversion of mobile or even fixed line concessions into licenses.

- Fourth, we are also skeptical about how legitimate aims of encouraging universal service or access can create burdensome administrative mechanisms that may actually deter as opposed to promote new investment. Even a small percentage assessment of revenues taxed for the purpose of funding the cost of universal services can represent a very substantial portion of an operator's EBITDA—a key indicator of an operator's ability to finance investment with internally or externally generated funds. In addition, the creation of a universal service fund can create a parallel structure that ultimately and unavoidably becomes engaged in making investment-related decisions about future infrastructure. The establishment of subsidy levels whether by auction or administrative fiat necessarily involves the USF apparatus in significant price setting decisions, whether at the retail level or wholesale prices that are the basis of "subsidized" services. The USF has significant potential to become an administratively complex superstructure, with potential for misuse or ineffectual use of large amounts of capital that might otherwise be directed by operators—not government officials—into expanding infrastructure and services in rural or underserved areas. There is certainly a respectable argument that subsidies to encourage expanded infrastructure should be targeted directly to users, local businesses and families—to community organizations, governmental agencies on behalf of users—to buy services from operators at market prices.

As we have argued above, policies that result in setting retail prices based on investment costs — with minimal regulatory control — can provide an enormous stimulus to the expansion of infrastructure and the reduction of waiting lists. Overall, initiatives to expand services in rural or under — served areas might benefit significantly from efforts to encourage operators to explore technologically innovative solutions such as the use of combinations of wireless LAN and IP telephony techniques. A number of innovative solutions have yet to be used, such as for example establishing franchise arrangements under which local operators might establish telecenters offering voice and data services based on wireless LAN 802.11(b) technology. We believe that policies that combine market-based pricing with initiatives to exploit the potential for new services and technologies are likely to yield more substantial returns in the long run than creating universal service fund administrations aimed at developing "concession with subsidies" services in under-served areas.

Finally, we believe that there is a need to explore and develop new mechanisms for consultation and consensus building both in a national context and in regional settings where new regulatory bodies are now developing. Such consultative mechanisms should put the emphasis on active involvement of operators and investors in formulating future regulatory and industry scenarios. These mechanisms can often be "virtual fora" which focus on aggregating relevant data and case experience that assist industry players in devising new rules of engagement in the sector. These initiatives are in no respect incompatible with the emergence of new regulatory authorities and competences; indeed, they would be primarily focused on ensuring that public authorities have access to the information and useful perspectives that may be available to private sector participants and investors. Such new arrangements can assist in achieving more uniform and consistent regulatory policies at the regional level. They can also accommodate, as we have suggested

above, the increasing relevance of new policy perspectives that competition and media regulators might bring to the policymaking process.

Importantly, as well, we believe that new consultative mechanisms can provide an important ongoing channel for views and information from investors to regulators. In the same way, they can offer better and more transparent insights into how the telecommunications sector is likely to evolve as a result of governmental oversight and regulation. Such increased transparency—a transparency that operates on a genuinely two way basis—is likely to create a more favorable future climate for investment in the telecommunications sector.

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