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Analyzing the World Bank's Blueprint for Promoting "Information and Communications"

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The twin forces of privatization and liberalization have been sweeping across the globe in the past two decades, crumbling the foundations of incumbent telephone operators while introducing a new era of digital connectivity for millions of consumers in developing countries.[1]

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1. The World Bank identifies countries as "developing countries" on the basis of Gross National Income, and further classifies developing countries by geographic region and whether they are low income, middle income, or high income. *See* World Bank, *Country Classification*, http://www.worldbank.org/data/countryclass/classgroups.htm (last visited Dec. 1, 2006). In general, developing countries are those countries outside the major industrialized economies that account for 85 percent of the world's population but only 20 percent of global Gross Domestic Product. *See* Bjorn Wellenius & David Townsend, *Telecommunications and Economic Development*, 2 HANDBOOK OF TELECOMMUNICATIONS ECONOMICS: TECHNOLOGY EVOLUTION AND THE INTERNET 557 (Sumit Majumdar, Ingo Vogelsang & Martin Cave eds., 2005).

Privatization (i.e., the transfer from government to private ownership)[2] started with the sale of shares in British Telecommunications in 1984 and Nippon Telephone and Telegraph in 1985[3] and spread to over 80 developing countries by 2003.[4] Liberalization (i.e., the transition from monopoly to competition)[5] has had an equally dramatic impact. For instance, about half of the markets for fixed local and international telephone services in developing countries are open to competition and 130 countries have at least three competing providers of mobile services.[6] As a result of privatization and liberalization, foreign investors poured $194 billion into telecommunications infrastructure projects in 122 developing countries between 1990 and 2003.[7] This hugely significant transformation is the backdrop to INFORMATION AND COMMUNICATIONS FOR DEVELOPMENT 2006: GLOBAL TRENDS AND POLICIES, issued by the World Bank.[8]

The book raises the following policy questions:

First, how have consumers in developing countries benefited from these new policies and the resulting investments? Are consumers getting more choice, lower prices, and better services for their telecommunications expenditures?

Second, what lessons can policymakers draw from the experience of the past two decades? Is there a blueprint for telecommunications reforms

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2. *See, e.g.*, William L. Megginson & Jeffry M. Netter, *From State to Market: A Survey of Empirical Studies on Privatization*, 39 J. ECON. LITERATURE 321, June 2001 (defining privatization as "the deliberate sale by a government of state-owned enterprises or assets to private economic agents").

3. WORLD BANK, INFORMATION AND COMMUNICATIONS FOR DEVELOPMEBNT 2006: GLOBAL TRENDS AND POLICIES 15 (2006).

4. *Id.* at 7. Chile in 1988 was the first developing country to privatize. *Id.*

5. *See, e.g.*, John Ure & Araya Vivorakij, *Telecommunications and Privatization in Asia*, 23rd Pacific Trade and Development Conference, Business, Markets and Government in the Asia Pacific Taiwan Institute of Economic Research 8-11 (December 1996) ("Liberalization essentially refers to the removal of barriers to market entry."). But, liberalization also means more than simply removing barriers to entry:

> More critical, however, are the rules, regulations and procedures governing the behavior of the dominant Telco towards the new entrants. Issues such as interconnection, predatory pricing, structural and separations accounting to prevent hidden cross-subsidies, discriminatory pricing, tie-in agreements and so forth are the nuts and bolts of regulation in the telecommunications industry.

Id.

6. WORLD BANK, *supra* note 3, at 6, 30, 43 (developing countries retained monopolies on 50 percent of international telephony, 43 percent of local telephony, and 13 percent of mobile telephony).

7. WORLD BANK, *supra* note 3, at 16–17.

8. More specifically, the book was prepared by the Global Information and Communications Technologies Department and the Development Economics Data Group within the World Bank. WORLD BANK, *supra* note 3, at xv.

that meets the needs of developing countries in the post-privatization era?

Third, in what manner do investments in information and communications technologies (ICT) play a vital role in promoting economic growth and reducing poverty?[9] What is the best means of measuring and evaluating the impact of these investments?

To answer these questions, I first summarize the main themes of the book and then offer a brief analysis. The summary will focus on three issues: foreign private investment, a blueprint for reform, and the impact on development.

I. FOREIGN PRIVATE INVESTMENT AND ITS IMPACT

With the opening of markets due to privatization and liberalization, foreign private investment flowed into developing countries. These investments account for a significant portion of total investment in the telecommunications sector in developing countries, namely 30 percent, from 1990 to 2003.[10] Several trends are worth noting:

Total volume: The annual level of investment averaged $5.2 billion from 1990 to 1995, rose sharply to $23 billion from 1996 to 2000, and then dropped to $16.5 billion from 2001 to 2003.[11] Notably, even after the end of the boom in 2001, investment levels remained significantly higher than before 1996. The explanation: massive growth in the mobile sector.[12]

By region and country: Eighty percent of private capital inflows during this period went to Latin American and Eastern European countries, specifically to investor favorites like Brazil, Argentina, Hungary,

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9. As used by the World Bank, the phrase "information and communications technologies" refers broadly to fixed and mobile telephones, the Internet, and computers. *See* WORLD BANK, *supra* note 3, at 1. Because ICT has transformative effects, changes brought on by ICT could also be seen as part of the "Information Revolution." The term "Information Revolution" generally refers to the economic transformation brought on by changes over the last 50 years in technology, machinery, techniques, and software. *See e.g.*, Peter F. Drucker, *The Next Information Revolution,* http://www.versaggi.net/ecommerce/articles/drucker-inforevolt.htm. *See also* Peter F. Drucker, *Beyond the Information Revolution,* THE ATLANTIC MONTHLY (Oct. 1999), *available at* http://www.theatlantic.com/doc/prem/199910/information-revolution.

10. WORLD BANK, *supra* note 3, at 17. As noted previously, foreign private investment during this time added up to $194 billion, out of a total of $650 billion, with the balance coming from domestic investors and government funding. WORLD BANK, *supra* note 3, at 16-17.

11. WORLD BANK, *supra* note 3, at 17. The World Bank uses current (or nominal) dollars, rather than inflation-adjusted dollars. *See* World Bank, *Private Participation in Infrastructure Database, Frequently Asked Questions*, http://ppi.worldbank.org/resources/ppi_faq.aspx.

12. WORLD BANK, *supra* note 3, at 20, 21–22.

Venezuela, Peru, Poland, Chile, and the Czech Republic.[13] Indonesia and Turkey rounded out the top ten recipients.[14] Low income countries got only six percent of the total foreign private investment.[15] Interestingly, the bulk of the investors in Asia were home-grown, not foreign.[16]

Types of investments: There were two waves of investments. The first wave occurred in the early 1990s, when countries divested their telecommunications operators by selling controlling stakes to foreign investors.[17] Developing countries reaped $57 billion from the sale of government assets, i.e., privatization.[18] The second wave, investments in the mobile sector, resulted from the revolution in mobile technology. Investments in this sector rose from an average of seven percent of foreign private investment from 1990 to 1993, to 30 percent from 1994 to 1999, to 51 percent from 2000 to 2003.[19]

Investor profile: The ten largest foreign investors in developing countries from 1990 to 2003 were incumbent telecommunications carriers from the U.S. and Europe: Telefonica, Telecom Italia, France Telecom, Deutsche Telecom, Verizon, Portugal Telecom, MCI, BellSouth, SBC, and Telia Sonera. These corporations made investments totaling $110 billion, or 57 percent of the total.[20] After the collapse of the telecommunications bubble, some of these investors began to exit the market,[21] giving investors from developing countries the opportunity to acquire assets more cheaply. Developing country investors, however, keep their investments within their geographic region.[22] Finally, financial investors, who take limited stakes in

13. WORLD BANK, *supra* note 3, at 18–19.

14. WORLD BANK, *supra* note 3, at 18–19.

15. WORLD BANK, *supra* note 3, at 19.

16. WORLD BANK, *supra* note 3, at 19. ("By contrast, in South Asia and in East Asia and the Pacific, a substantial portion of telecommunications investments came from domestic investors, including large family groups that historically kept their investments within the region.").

17. WORLD BANK, *supra* note 3, at 20–21.

18. WORLD BANK, *supra* note 3, at 20-21.

19. WORLD BANK, *supra* note 3, at 21.

20. WORLD BANK, *supra* note 3, at 24–25.

21. In 2001–03, France Telecom withdrew from Argentina, El Salvador, and Indonesia, and offered to sell its assets in Brazil; Deutsche Telecom divested its assets in Malaysia, the Philippines, and Ukraine; Verizon exited Argentina, the Czech Republic, and Mexico; and Telia Sonera sold its holdings in Brazil, Hungary, and India. WORLD BANK, *supra* note 3, at 25.

22. WORLD BANK, *supra* note 3, at 26 ("Over 85 percent of South-South FDI flows stayed within the same geographic region"). For example, Singapore-based SingTel owns assets in Bangladesh, Indonesia, the Philippines, and Thailand. Similarly, Telecom Malaysia's investments are in Bangladesh, Cambodia, Indonesia, Pakistan, Sri Lanka, and

a company, are providing alternative sources of capital in developing countries. For instance, a private equity firm, Advent International, acquired a 65 percent stake in Bulgaria's fixed-line carrier and agreed to invest $450 million in telecommunications infrastructure.[23]

All these investments, coupled with the governmental actions necessary to make them possible,[24] produced tremendous growth in telephone use. In the 1990s, the number of subscribers in developing countries quintupled from 27 to 129 per 1000 people.[25] From 2000 to 2005, subscribership leaped again, to almost 400 per 1000 people.[26] Two additional statistics signify the massive growth in telecommunications services in developing countries between 1990 and 2005: total telephones per 1000 people rose from 27 to 393, and total telephones (as a share of the world total) rose from 22 percent to 61 percent.[27]

Regional variations in telephone use are worth noting.[28] Subscribership per 1000 people in 2004 was 730 in Europe and Central Asia, 507 in Latin America and the Caribbean, 450 in East Asia and the Pacific, 206 in the Middle East and North Africa, 103 in sub-Saharan Africa, and 87 in South Asia.[29]

Similar variations are present for internet use. Subscribership per 1000 people in 2004 was 117 in Europe and Central Asia, 104 in Latin America and the Caribbean, 76 in East Asia and the Pacific, 47 in the Middle East and North Africa, 15 in sub-Saharan Africa, and 21 in South Asia.[30]

Thailand. In sub-Saharan Africa, the three main mobile operators are South Africa's MTN and Vodacom, and Celtel, which is owned by the Mobile Telephone Corporation of Kuwait. WORLD BANK, *supra* note 3, at 28.

23. WORLD BANK, *supra* note 3, at 29.

24. Marcio Wohlers de Almeida & Ricardo Tavares, *Setting the Reform Agenda: What Next, After Privatization*, NETWORKING KNOWLEDGE FOR INFORMATION SOCIETIES: INSTITUTIONS AND INTERVENTIONS 103 (Robin Mansell, Rohan Samarajiva, & Amy Mahan eds., 2002).

25. WORLD BANK, *supra* note 3, at 5.

26. WORLD BANK, *supra* note 3, at 5.

27. WORLD BANK, *supra* note 3, at 41–42 (also noting that while the number of telephones in developing countries grew 40-fold, population rose by one-half and real Gross Domestic Product more than doubled).

28. This includes only developing countries in each of the regions. Wellenius & Townsend, *supra* note 1.

29. WORLD BANK, *supra* note 3, at 6. In the United States, by contrast, 93.5 percent of households have telephones (based on November 2004 data). *See* FCC, WIRELINE COMPETITION BUREAU, TRENDS IN TELEPHONE SERVICE 16-3 (April 2005), *available at* http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend605.pdf.

30. WORLD BANK, *supra* note 3, at 6. In the United States, by contrast, 54.6 percent of households have Internet access and 19.9 percent have high-speed Internet access. TRENDS IN TELEPHONE SERVICE, *supra* note 29, at 2-10 (based on Oct. 2003 data).

Much of the growth in telecommunications has been in the mobile sector. For example, in Nigeria, the number of mobile subscribers soared from 370,000 in 2001 to 16.8 million in 2005.[31] In the Philippines, the number of mobile subscribers rose six-fold from 2001 to 2005, to 40 million.[32] As noted elsewhere, the significance of mobile-sector growth is that it "quickly reached unserved population groups [e.g., rural consumers]."[33]

Even smaller countries showed large gains from increased foreign investment. For instance, in the five countries that make up the Organization of Eastern Caribbean States (Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent), foreign investment rose from $40 million in 2001 to $90 million in 2004, spurring a boom in mobile telephone penetration. In Dominica, subscribership went from 1.6 percent in 2000 to 60 percent in 2004, and in Grenada, subscribership rose from 4.5 percent to 86 percent in the same time period. Retail prices fell by 50 percent.[34]

II. PRINCIPLES AND PRACTICAL SOLUTIONS

As other analysts have noted, in the post-privatization world the challenge is less on institutional reform than on policy implementation.[35] The World Bank offers a five-prong blueprint to guide policymakers in the post-privatization era as follows:

A. Let the Markets Work

There is consensus that market forces should be given primary responsibility for making communications and information services available throughout the population.[36] Research suggests that to obtain the fullest benefit of a market-based policy, developing countries should strive to adopt competition before privatization. For instance, based on a review of thirty countries, one study found that "those that opened major market segments to competition before privatizing the incumbent or at the same time grew and reduced costs faster that those that privatized first and introduced competition later."[37] Countries that privatized in the early

31. WORLD BANK, *supra* note 3, at 6.

32. WORLD BANK, *supra* note 3, at 6.

33. *See* Wellenius & Townsend, *supra* note 1, at 578.

34. WORLD BANK, *supra* note 3, at 33.

35. Wohlers de Almeida & Tavares, *supra* note 24.

36. WORLD BANK, *supra* note 3, at 43 ("Competitive markets grow faster, lower costs, facilitate innovation, and respond better to users' needs.").

37. WORLD BANK, *supra* note 3, at 44, citing Scott Wallsten, *An Empirical Analysis of Competition, Privatization, and Regulation in Telecommunications Markets in Africa and Latin America*, (Policy Research Working Paper, World Bank 1999). *See also* Wellenius &

1990s, for instance, granted lengthy exclusivity periods during which the incumbents were free from competition. The result in such countries was higher prices for domestic and international telecommunications services, as well as delays in introducing new services (e.g., Internet access) even after competition was introduced.[38]

B. Remove Obstacles to Letting the Markets Work

Because there is so much pent-up demand for telecommunications services in developing countries,[39] the challenge for policymakers is to open up markets to let service providers "tailor their service offerings and technical choices to tap this revenue potential effectively."[40] There is no mystery about how to open up markets. The World Bank's specific recommendations, recognizable to telecommunications specialists in the United States, are:

> a. Encourage new entrants to enter the market by offering general licensing and authorizations;
>
> b. Rebalance rates to raise fixed and local call charges as monopoly rents are competed away;
>
> c. Require cost-oriented interconnection to enable competition to develop;
>
> d. Unbundle the local loop;
>
> e. Encourage new wireless technologies by making more spectrum available.[41]

C. Extending Access Beyond the Market

In some cases, because of high cost or low revenue potential, private operators may not offer services or delay doing so. Government intervention may be warranted in these circumstances, but the World Bank argues that "not all unprofitable services deserve public support."[42]

Townsend, *supra* note 1, at 563 ("rapid growth and improved performance" resulted from liberalizing in 1992–96 and partially privatizing in 1997).

38. WORLD BANK, *supra* note 3, at 43.
39. WORLD BANK, *supra* note 3, at 44.
40. WORLD BANK, *supra* note 3, at 44.
41. WORLD BANK, *supra* note 3, at 44.
42. WORLD BANK, *supra* note 3, at 46.

In deciding on the appropriate role for the public sector, the World Bank distinguishes between established markets and new markets. Thus, "public sector support to narrow gaps in established markets is often justified" because commercial enterprises have succeeded in serving a substantial portion of the population and people who are unable to receive the service will be seriously disadvantaged. By contrast, in new markets, such as for Internet access, the World Bank's preferred solution is to "let the Internet and related services advance at their own pace through the market."[43]

D. *Public Sector Support*

Governments all across the world also seek to support investment in services that may be unprofitable, though socially desirable, by stimulating demand or jump starting supply. For example, Ireland, Kazakhstan, and the United States offer discounts on the telephone bills for low-income consumers. Chile prices rural public phone calls below cost and provides a subsidy to operators. Egypt and Morocco offer subsidized Internet access.[44] Governments can increase supply through cash subsidies, as Peru did by paying private operators to install payphones in villages with no telephones.[45] Although the World Bank opines that, in the interests of economic efficiency, "subsidies should be financed from general revenues, as in Chile and Nepal," the report notes that subsidies are often financed by taxes on telecommunications revenues.[46]

E. *Competing for Subsidies*

One of the more interesting developments is that firms in lower-income countries are competing for subsidies to offer services such as rural payphones. This is a salutary step.[47] The government sets the program goals, the target population, and the level of funding, and private firms submit competitive bids for the projects.[48]

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43. WORLD BANK, *supra* note 3, at 48.

44. WORLD BANK, *supra* note 3, at 48. Bolivia, Chile, Colombia, Peru, and Uganda are also providing development funds to help develop more advanced services and facilities. WORLD BANK, *supra* note 3, at 50.

45. WORLD BANK, *supra* note 3, at 49. In addition, "capital contributions and risk guarantees may also be appropriate in some circumstances." WORLD BANK, *supra* note 3, at 49.

46. WORLD BANK, *supra* note 3, at 49.

47. WORLD BANK, *supra* note 3, at 50 ("Competition among firms for subsidies results in lower subsidies, more effective mobilization of private investment, and greater transparency than occurs in traditional public sector funding of these investments.").

48. WORLD BANK, *supra* note 3, at 50–51.

III. ICT AS AN "ENABLER" OF DEVELOPMENT

Rather than seek to develop any new indicators, the World Bank's approach appears to be to use its expertise to refine and shape several widely-adopted indicators. For example:

Impact on Enterprises: Although it is probably widely assumed that ICT is a necessity in the modern global economy, the World Bank makes its point using a survey of 20,000 firms in 56 low- and middle-income countries. Thus, the World Bank finds that firms using computers, email, and a Web site in their business operations are "more productive, grow faster, invest more, and are more profitable" than firms that do not use ICT.[49]

National e-strategies: Although developing countries were urged at the World Summit for Information Societies in 2003 to adopt a national e-strategy, detailed guidance was lacking. In this volume, the World Bank does a useful service in identifying essential elements of these plans.[50]

Millennium Development Goal ("MDG") targets: This refers to using ICT to achieve broad social goals like eliminating hunger, improving access to health care, improving the status of women, and protecting environmental resources.[51] The World Bank has performed the useful service of translating MDGs "into measurable indicators that can be monitored on an ongoing basis."[52]

IV. ANALYSIS

Given its solid reputation for professional expertise, it is no surprise that the World Bank has done an able job of documenting the tremendous explosion in the availability of more and better telecommunications services at lower prices. As the examples in section A demonstrate,

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49. WORLD BANK, *supra* note 3, at 60–62. While this is an interesting finding, more research is needed to show causality between ICT investments and enterprise productivity. For example, the results could be explained by other factors, such as that firms that are more productive and profitable are more likely to use ICT than other firms.

50. *See, e.g.*, WORLD BANK, *supra* note 3, at 89–103. For example: "Jordan's case shows how all elements of e-strategy design are important. Laying out an ICT plan using real data and indicators is necessary. But emphasizing implementation and measuring results is also essential for realistically achieving stated goals and targets." WORLD BANK, *supra* note 3, at 93.

51. UN ICT Task Force, *The Role of Information and Communications Technology in Global Development – Analyses and Recommendations* xii (2005), *available at* http://www.unicttaskforce.org/perl/documents.pl?id=1360.

52. WORLD BANK, *supra* note 3, at 125.

consumers in developing countries have realized significant benefits from the information revolution of the past two decades. This is a signal achievement that is worth celebrating.[53] Yet, it is also unquestionably true that growth rates vary between countries: "Fast growth in large emerging markets—notably, China, India, and Brazil—masks slower development in other economies. Progress has been made reaching out to rural areas and the urban poor, but in many countries these groups still lag in relative terms."[54] Even where advanced communications services have become available through the Internet, "they are reaching mainly the better-off population groups." [55] In other words, there is a digital gap within and between the developing countries.

Given these findings, the World Bank's ICT-related mission properly is the following: to help developing countries establish the conditions necessary to attract private investment and to bridge the digital gap.[56]

Overall, the blueprint discussed in section B is an effective prescription for promoting a vibrant and productive ICT sector in developing countries. Some of the policy prescriptions (e.g., rate rebalancing, subsidy reform) may be difficult to accomplish due to political resistance, but nonetheless, these are all worthwhile goals. To the World Bank's credit, sufficient recognition is given to the need for "well-managed regulatory bodies operating under a clear legal framework . . ."[57]

A few limitations are also worth noting. There is no country-by-country discussion in the World Bank's report of whether, and to what extent, these policy prescriptions are being adopted in the developing countries. This is a disappointing omission. In fact, though the report

53. Although not discussed in this publication, due credit should also be given to the developing country governments for successfully resolving the many problems associated with the old regime, i.e., pre-privatization. Some of these challenges include: "the negative political influence on state-owned operators' business decisions; the government budget constraints on telecom investments; and the bundling of operations, regulation, and monitoring in a single entity." Wohlers de Almeida & Tavares, *supra* note 24.

54. WORLD BANK *supra* note 3, at 42.

55. WORLD BANK, *supra* note 3, at 42.

56. WORLD BANK, *supra* note 3, at 11, 14.

57. WORLD BANK, *supra* note 3, at 31. *See also* Joseph Stiglitz, *Creating Competition in Telecommunications*, Conference on Managing the Telecommunications Sector Post-Privatization at The George Washington University (Apr. 27, 1998), *available at* http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:20019907~menuPK:64255840~pagePK:34370~piPK:42770~theSitePK:4607,00.html ("Even when . . . barriers are swept away, regulation will still be necessary to ensure competition in the telecommunications industry."); Rohan Samarajiva, *Bridging the Divide: Building Asia-Pacific Capacity for Effective Reforms,* Keynote Presentation, Digital Opportunity Forum 2006 (Aug. 31, 2006), at 15, *available at* http://www.itu.int/osg/spu/digitalbridges/materials/samarajiva_paper.pdf. ("The demand for expertise may be such that there is no alternative but to mobilize external consultants . . .").

includes "at-a-glance" country tables with critical ICT-related facts on 144 countries, none of the five elements discussed above are included in the tables or analysis.[58] Admittedly, this would be a harder task than reporting the sorts of numbers (e.g., telephone main lines per 1000 people) and facts (e.g., whether there is a separate regulator) in the "at-a-glance" tables as presently constituted. Judgments would need to be made about whether governments are letting markets work, removing obstacles to the market economy, intervening in established or new markets, etc. Yet, this would seem to be a worthwhile effort to undertake in future reports.

Additionally, it is not clear the extent to which these policies are high priorities of the World Bank's lending programs. Is adoption of these policies a condition for loans? Are they included in the World Bank's poverty reduction strategies for specific countries? Nothing in this report provides an answer. Indeed, the report's authors appear to have set a functionally modest goal of serving diffuse stakeholders rather than guiding World Bank investment decisions.[59]

In section C, the World Bank's dilemma is simply stated: In the absence of a clear theoretical understanding of the causative linkage between ICT investment and development, what indicators should the World Bank measure? In connection with the industrialized economies, the academic consensus is that investment in information technology "provides the key to the surge in economic growth."[60] In connection with the developing world, broad assertions of such a linkage are plentiful,[61] even by noted economists,[62] but the causative relationship is not well

58. *See* WORLD BANK, *supra* note 3, at 149–299.

59. As the authors note: "This report will have achieved its purpose if the views, analyses, data, and indicators it contains help stakeholders determine how their separate and collective efforts can yield the highest returns and contribute to inclusive information societies around the world." WORLD BANK, *supra* note 3, at 14.

60. Dale W. Jorgenson, *Information Technology and the U.S. Economy*, Presidential Address to the American Economic Association (Dec. 13, 2000), at 1–2, 23–27, *available at* http://post.economics.harvard.edu/faculty/jorgenson/papers/NewAmerican.pdf. *See also* Dale W. Jorgenson, *Information Technology and the G7 Economies*, WORLD ECON., Oct.-Dec. 2003, at 139–169; Lars-Hendrik Roller & Leonard Waverman, *Telecommunications Infrastructure and Economic Development: A Simultaneous Approach*, 91 AM. ECON. REV. 909, 909–923 (evidence from 21 OECD countries over a twenty-year period shows positive causal link between telecommunication investment and macro-growth).

61. *See, e.g.*, UN ICT Task Force, *supra* note 51, at 73–74 ("ICT will increasingly become one of the main enablers in the pursuit of poverty alleviation and wealth creation in developed and developing countries alike.").

62. *See, e.g.*, Stiglitz, *supra* note 57 ("In most countries, telecommunications represents only 1 to 2 percent of gross domestic product. But it is central to the rest of the economy, both in developed and developing countries."); Wellenius & Townsend, *supra* note 1, at 560 ("[I]nformation and communications provide key inputs for economic development [and] contribute to global integration while helping retain the identity of traditional societies, and enhance the effectiveness, efficiency, and transparency of the public sector.").

understood.[63] Thus, as a senior World Bank official noted in prefatory remarks to this report: "*[I]mproving the identification and measurement of the actual effects of ICT in development remains an important challenge going forward*, especially in light of the rapid pace of change in the sector and the dearth of concrete, long-term data across countries."[64] Given this dilemma, the World Bank's approach of refining measures in vogue elsewhere may be as good an approach as any.[65] At least for now, that may be the best case scenario.

V. CONCLUSION

The telecommunications sector has performed in a spectacular fashion over the past two decades, bringing modern technologies at affordable prices to consumers throughout the world. The future holds the promise of even greater gains, as ICT ripples through economies, increasing productivity and generating efficiencies. To achieve the desired results, governments, scholars, investors, and the international community must successfully negotiate many challenges. Not the least of these is the particular challenge of dealing with issues in developing countries, where "*there are often fundamental differences between what is proposed by technological visionaries, many of whom have never seen a village, and what is actually needed by end users, many of whom have never used a*

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63. As a recent analysis notes:

> Although there is shared agreement on the potential of information and communications technologies to influence economic growth, econometric analysis at this point cannot yet provide a clear demonstration. . . . Assessment of an independent relationship between ICT investment and economic growth, however is limited by several factors including a lack of differentiated data on IT investment, as well as inherent problems in isolating the effects of ICT investment from other influences. Several factors determine economic growth and controlling for these factors as well as determining how information technology fits in with these other measures is but one challenge. At this stage, analysis that does show a correlation would need to be very carefully scrutinized, given the limited data that currently exists.

Elizabeth Fife, Laura Hosman, & Francis Pereira, *Jumpstarting Growth with ICTs in the Developing World: Is Corporate Involvement the Panacea?*, 34th Telecommunications Policy Research Conference (Sept. 30, 2006), at 8, *available at* http://web.si.umich.edu/tprc/papers/2006/632/TPRCFifeHosmanPereira.pdf.

64. WORLD BANK, *supra* note 3, at xi (from Foreword by Katherine Sierra, Vice Pres., Infrastructure, The World Bank) (emphasis added).

65. *See* Rahul Tongia, Eswaran Subrahmanian, & V. S. Arunachalam, INFORMATION AND COMMUNICATIONS TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT: DEFINING A GLOBAL RESEARCH AGENDA 88 (2005), *available at* http://www.cs.cmu.edu/~rtongia/ICT4SD_Full_Book.pdf. "There are as many success stories for ICT in SD [sustainable development] as there are failed projects, and we often don't know the details of the latter. . . . ICT for SD requires formalization of measures for success, standardization of evaluation, and rigorous critical analysis." *Id.*

telephone."[66] This book is filled with reliable data, thoughtful analysis, and time-tested policy prescriptions. It is an essential roadmap for anyone seeking to accept this challenge.

66. UN ICT Task Force, *supra* note 51, at 112 (emphasis added).