

AN EVALUATION OF WORLD BANK GROUP ACTIVITIES
IN INFORMATION AND COMMUNICATION TECHNOLOGIES

Capturing Technology for Development



The World Bank Group

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Capturing Technology for Development

An Evaluation of World Bank Group Activities in Information and Communication Technologies

Volume 1: The Evaluation



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Abbreviations

AAA	Analytic and advisory activities	PPIAF	Public-private Infrastructure Advisory Facility
AFR	Sub-Saharan Africa Region	PSG	Public sector governance
ARPU	Average revenue per user	RCIP	Regional Communication Infrastructure Program
AS	Advisory services	SAR	South Asia Region
DOTS	Development Outcome Tracking System	SME	Small and medium enterprise
DPO	Development Policy Operation	SMS	Short message service
EAP	East Asia and Pacific Region	TA	Technical assistance
EASSy	Eastern Africa Submarine Cable System	VPO	Village phone operator
ECA	Europe and Central Asia Region	VPP	Village Phone Program
ERR	Economic rate of return	WBG	World Bank Group
ESW	Economic and sector work	XPSR	Expanded Project Supervision Report
FPD	Financial and Private Sector Development		
FY	Fiscal year		
GDP	Gross domestic product		
GICT	Global ICT Department		
IBRD	International Bank for Reconstruction and Development		
ICR	Implementation Completion Report		
ICT	Information and communication technologies		
IDA	International Development Association		
IEG	Independent Evaluation Group		
IFC	International Finance Corporation		
ISR	Implementation Status and Results (Report)		
IT	Information technology		
ITES	Information technology-enabled services		
ITU	International Telecommunication Union		
LAC	Latin America and Caribbean Region		
M&E	Monitoring and evaluation		
MENA	Middle East and North Africa Region		
MIGA	Multilateral Investment Guarantee Agency		
OECD	Organisation for Economic Co-operation and Development		

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Foreword

Technological innovation drives economic progress. Information and communication technologies (ICT) can be leveraged for development, but harnessing this potential depends on an enabling environment for their production, diffusion, and use. Otherwise, technology can widen rather than narrow existing inequalities.

Over the past decade developing countries have seen rapid but uneven growth in ICT access and use. The unprecedented spread of mobile technologies, driven by private sector investment and supported by reforms to promote competition, enabled the growth of phone services for the underserved and poor to levels unseen before. But outside mobile telephony, large gaps exist in high-speed Internet access and broadband connectivity and in the diffusion and use of ICT in business, services, and government—the areas where ICT can deliver the largest developmental impacts.

The World Bank Group's strategy has sought development results in ICT by promoting (i) sector reform, (ii) access to information infrastructure, (iii) ICT skills development, and (iv) ICT applications. Among these areas, the Bank Group's most notable contributions have been in sector reforms and support to private investments for mobile telephony in difficult environments and in the poorest countries, where most of its activities have taken place. Countries with Bank Group support for policy reform and investments have increased competition and access faster than countries without such support.

In other priority areas, the World Bank Group's contribution has been limited. Targeted efforts to increase access beyond what was commercially viable have been largely unsuccessful. Access for the poor has been more effectively supported through general, non-targeted interventions focused on the enabling environment and direct support to private investments. But positive examples of Bank Group support indicate the potential of targeted approaches, including those carried out through public-private partnerships. ICT skills development is emerging as an important constraint to ICT diffusion and applications, but has received little attention in Bank Group operations. Finally, with respect to ICT applications, 74 percent of World Bank projects had ICT components, but the Bank Group's record has been modest, reflecting the intrinsic high risks in the implementation of information technology (IT) projects in the public and private sectors, and also shortcomings in the Bank Group's delivery and quality at entry.

Going forward, the World Bank Group should retain a role in ICT, but with an important shift in priorities. First, the importance of reforms suggests a role for the Bank in this area related to (i) updating regulatory frameworks and (ii) preserving competition in the face of consolidation and convergence in the sector. Second, gaps in broadband and Internet access, in the context of overall expansion of coverage, call for a selective role of the International Finance Corporation (IFC) and the Multilateral Investment Guarantee Agency (MIGA) in supporting private investments in difficult environments. Expanding access beyond what market players would provide should remain an important priority for the World Bank Group, with a need to identify effective mechanisms for targeted interventions. Third, building on the significant progress in basic

FOREWORD

connectivity and the opportunities this offers for development, ICT applications should become the main focus of Bank Group support, including through ICT skills development—areas where the Bank Group has had a weak record so far. Finally, the existence of a global mobile network presents enormous opportunities and challenges for the way the World Bank Group delivers its services. This, together with the growing importance of ICT applications for development impact, suggests the need to ensure that the World Bank Group’s organizational structure for ICT enables effective strategy formulation, coordinated delivery, and effective division of labor among the World Bank, IFC, and MIGA.

Vinod Thomas
Director-General, Evaluation

Evaluation Summary

Over the past decade, developing countries have seen rapid but uneven growth in ICT access and use. Progress has been noteworthy in mobile telephony, where the gap between developing and developed countries is narrowing rapidly. The unprecedented spread of mobile technologies was driven by large pent-up demand and, on the supply side, by economies of scale and innovations in business models supported by reforms to promote competition. Dramatic reductions in the cost of communication enabled access to phone services for the poor to levels unseen before, although gaps remain in certain areas and for the poorest. But outside mobile telephony, there are large and widening gaps in high-speed Internet access and broadband connectivity, the development of local information technology (IT) industries, and of ICT applications; that is, the diffusion and use of ICT in business, services, and government—the areas where ICT can deliver the largest developmental impacts.

The World Bank Group's strategy has sought development results in ICT by promoting:

- Sector reform
- Access to information infrastructure, by leveraging the private sector and through efforts going beyond what commercial providers would be willing to do on their own
- ICT skills development
- ICT applications.

Among these areas, the Bank Group's most notable contributions have been in support to sector reforms and in private investments for mobile telephony in difficult environments and in the poorest countries, where most of its activities have been. Countries with Bank Group support for policy reform and investments have increased competition and access faster than countries without such support.

In other priority areas, the Bank Group's contribution has been limited. Targeted efforts to increase access beyond what was commercially viable have been largely unsuccessful. Support to universal access programs was largely superseded by the rollout of phone services by the private sector, in some cases supported by Bank sector reforms. Access for the poor has been more effectively supported through general, non-targeted interventions focused on the enabling environment and direct support to private investments. But positive examples of Bank Group support, as in Chile and Pakistan, indicate the potential of targeted approaches, including those carried forward through public-private partnerships.

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In the case of Chile, a World Bank–funded Rural ICT Study supported the government of Chile in updating the policies and regulations of its Telecommunications Development Fund. This study recommended adjustments to the scope of the Fund and a tendering process for private operators, which have led to a series of projects that have significantly increased Internet access in rural Chile. It is expected that by February 2012, coverage of broadband Internet services will reach more than 90 percent of the rural population of Chile. Pakistan's model—the administration of the Universal Access Fund by a non-profit with an executive management team—is promising. Using a transparent mechanism for the award of subsidies from the Fund, it has already committed over 60 percent of all funds collected since it began operations, four years ago, increasing voice access to remote villages and extending fiber backbones across provinces.

ICT skills development is emerging as an important constraint to ICT diffusion and applications, but has received little attention in Bank Group operations. Finally, in ICT applications, the Bank Group has played a significant role (74 percent of World Bank projects had ICT components). But the Bank Group's record has been modest, reflecting intrinsic high risks in the implementation of information technology projects in the public and private sectors, but also shortcomings in the Bank Group's delivery mechanisms and quality at entry.

Going forward, the Bank Group should retain a role in ICT, but with important shifts in priorities:

- First, progress in reforms suggests a role for the Bank in this area related to (i) updating the regulatory frameworks to support broadband and Internet access and (ii) preserving competition in the face of consolidation and convergence in the sector.
- Second, gaps in broadband and Internet access, in the context of overall expansion of coverage, argue for a selective role in supporting private investments in difficult environments. Expanding access beyond what market players would provide on a commercial basis (for example, by using public-private partnership approaches) should remain an important priority.
- Third, building on the significant progress in basic connectivity and the opportunities this offers for development, ICT applications should become the main focus of Bank Group support, including through ICT skills development.
- Finally, the creation of a global mobile network presents enormous challenges and opportunities for the way the Bank Group delivers its services, and this requires immediate attention.

Development needs and opportunities thus dictate a shift in priorities toward areas where the record has been mixed. This suggests the need for a strategic rethinking of the approach—that is, how to do things differently. This need is particularly pronounced in two areas: (i) the use of targeted approaches to expand access beyond what is commercially viable and (ii) in ICT applications.

Regarding targeted approaches, the Bank Group needs to identify and support effective mechanisms to promote access to the underserved based on successful examples in its ICT

portfolio and nonlending activities, but also drawing on its experience with targeted interventions in other areas. With respect to ICT applications, the Bank Group needs to strengthen its capacity by (i) building greater ICT expertise and awareness across sectors and Regions and in procurement practices; (ii) building incentives mechanisms for collaboration, coordination, and joint approaches across the Bank Group that reflect the thematic nature of ICT; and (iii) transforming the ICT unit to act as a connector between internal/client demands and outside expertise from the public and private sectors.

Context

Developing countries have seen a tremendous increase in ICT access and use over the past decade.

The unprecedented speed of this evolution has been enabled by changes in technologies, markets, and policies and driven in large part by private sector investment. The gap in access to mobile technology between developed and developing countries is narrowing quickly. By 2010, there were 3.9 billion mobile phone subscribers in developing countries, equivalent to a 68 percent penetration rate. Internet and broadband access have also increased rapidly, but the gap between developed and developing countries remains large. More recently, the focus has shifted to the potential of ICT to serve as a platform for productive purposes and to extend services to the public. As ICT continues to evolve, so must the role of the Bank Group.

Developing countries have faced challenges to adapt policies and regulations to rapid changes in technology and market structure. In the early 2000s, these included lack of independent regulation, noncompetitive telecommunication markets, and low levels of privatization of operators. Reforms were needed for spectrum allocation, licensing of new operators to introduce competition, ensuring workable interconnection arrangements, and ensuring ICT access to the poor and underserved. Furthermore, to be able to reap the benefits of ICT for growth and to realize its transformative potential, governments needed to support the development of ICT skills and adopt ICT for better delivery of education, health, and other services and enhanced government efficiency and transparency.

Notwithstanding the progress made in the intervening years, challenges remain. These include voice access in the poorest countries and to the poorest people, and, in certain areas, the lag in Internet access and use, broadband, and the adoption of ICT applications.

In these areas the Bank Group has a role in helping governments to develop policy, providing advice and sector expertise, supporting clients in building ICT skills, and enabling private sector investment and innovation. From a viewpoint of the larger development agenda, the speed of adoption of mobile technology has been in stark contrast to the lagging access to other basic infrastructure, including electricity, water, and roads.

World Bank Group Strategy and Role

The 2002 World Bank Group ICT Strategy focused on four broad tasks: (i) broaden and deepen sector and institutional reform, (ii) increase access to information infrastructure by mobilizing and leveraging private sector investments and by going beyond what commercial providers would be willing to do on their own, (iii) support ICT human capacity, and (iv) support ICT applications to enhance public administration and private sector development.

The strategy coincided with major changes in ICT in developing countries, and was based on three assumptions: (i) ICT development would be contingent on sector reform and a strong regulatory environment, (ii) market failures and equity considerations would require public support for private investment and market-based subsidies to foster access to information infrastructure, and (iii) the International Finance Corporation (IFC) and the Multilateral Investment Guarantee Agency (MIGA) would have a role in mobilizing and leveraging private sector investments, complementing the work of the World Bank on sector and institutional reform, ICT human capacity, and ICT applications, including in education and health.

The evaluation is organized around the main pillars of the Bank Group ICT Strategy. It differentiates between (i) the ICT sector, covering sector reforms and access, and (ii) ICT applications, covering the use of ICT in the private sector, as well as for delivery of services to the public and to enhance government efficiency and transparency. ICT skills apply to both the ICT sector and ICT applications.

The World Bank Group's Evolving ICT Portfolio

The global ICT market has been dominated by private commercial players. The Bank Group has been a catalytic player in the sector. It has supported ICT through lending, policy advice, investments, advisory services, and political risk guarantees. In terms of volume of operations, during fiscal 2003–10, the Bank Group provided \$4.2 billion in support to the ICT sector, or about 1 percent of private investment in telecommunications of \$400 billion between 2003 and 2009. Yet the Bank Group remained the largest multilateral financier in telecommunications in Africa, where its support was concentrated during the evaluation period.

The World Bank, IFC, and MIGA had clearly defined roles and largely attended to their respective areas of comparative advantage. By volume of operations, most of the Bank Group funding has focused on fostering private sector investment in ICT and ICT applications.

In the ICT sector, World Bank support (\$875 million in lending, excluding Development Policy Operations, and nonlending technical assistance) focused on deepening ICT sector and institutional reform, designing and implementing universal service policies to ensure access to the underserved. Capacity building and support for privatization and for providing physical infrastructure declined over the period. World Bank support included 410 nonlending activities for ICT sector reform and capacity building in 91 countries, an important instrument to support ICT sector reform. Nonlending activities were concentrated in International Development

Association (IDA) countries, with the largest number in Africa, and they supported institution building or informed policy.

IFC (with investments of \$2.3 billion in the telecommunications sector) and MIGA (with political risk guarantees of \$600 million) supported private investments for the rollout and expansion of infrastructure and the operation of mobile service providers. IFC's support grew over the period, and, like MIGA's, has increasingly been concentrated in IDA countries, where both institutions had a strong role. In addition to telecommunications projects, IFC also supported IT companies (\$407 million of investments).

ICT applications play a significant role in World Bank operations. Approximately 74 percent of all World Bank projects approved between fiscal years 2003 and 2010 included ICT components (equivalent to about 1,300 projects). Most projects supporting public sector governance, education, agriculture, financial and private sector development, health, social protection, urban development, transport, water, and energy and mining included ICT. Despite the importance of ICT in operations in these sectors, only a few Bank Group sector strategies systematically included ICT as a tool to support development objectives. IFC has recently begun to support ICT application projects in mobile banking, e-commerce, and education (\$119 million in investments).

Effectiveness in Promoting ICT Reforms and Access

The Bank Group has supported basic connectivity through advice for reforms in regulatory and policy frameworks and by helping catalyze private investment.

Regulatory and policy framework. World Bank lending in support of regulatory and sector reforms in ICT was relevant for countries, and 60 percent of operations achieved their objectives of creating more efficient and competitive sectors and enabling enhanced access to ICT services.

Projects where reforms have been successful have generated positive impact in terms of increased competition and enhanced access—the speed of mobile telephone penetration was greater in countries with Bank Group support than in those without it. This finding points to a contribution of the Bank Group in ICT sector reform and in stimulating investment.

The relatively large proportion of lending operations for sector reform that fell short of expectations reflects, to a significant extent, that Bank efforts have focused on the relatively more challenging environments and types of reforms where there was considerable resistance to reform. As a result, policy and institutional reforms in these environments have been difficult, requiring strong government commitment to be successful, as in the case of reforms in Armenia supported by the World Bank. There, the Bank supported the establishment of a new regulatory framework under the telecommunications law of 2005 and enhanced competition through licensing of additional operators. These reforms led to very fast growth in ICT services—mobile penetration grew from 10 percent in 2005 to 85 percent in 2009.

EXECUTIVE SUMMARY

With respect to World Bank nonlending activities, technical assistance activities performed strongly. A large majority of technical assistance activities reported that they achieved key objectives such as developing or strengthening institutions and assisting client policy. The performance of analytical products (economic and sector work) was somewhat lower, with the most prevalent objective—informing government policy—being met by just over half of the activities. Overall, where there was significant government commitment to change, the Bank made an effective contribution to sector reforms.

Promoting access. Fostering private sector investment in mobile telecommunications is the most successful area of Bank Group ICT support. IFC telecommunications projects achieved strong results in IDA and conflict-affected countries, where it had a strong role. For example, IFC played a significant role in Africa, the Caribbean, and the Pacific Islands, where it often promoted access by backing unknown entrepreneurs in the telecommunications sector, some of whom subsequently became major mobile telephone operators.

Three-quarters of IFC telecommunications projects achieved their development objectives, including increased access, geographic coverage, reduced prices, and enhanced competition. Notable examples include IFC telecom investments in Bangladesh and Nigeria. But beyond higher-risk countries, IFC's additionality was more limited. Overall, it made unique contributions in 60 percent of projects. IFC additionality was stronger in its perceived capacity to mitigate political and regulatory risks than through its financial contributions.

Similarly, a majority of reviewed MIGA projects improved access to ICT. Three MIGA projects encountered disputes between investors and host governments, indicating the importance of MIGA's role and the level of political risk associated with investment in the sector.

Regarding efforts to promote universal access, targeted World Bank ICT projects with the objective to directly promote target access for the underserved and the poor had limited success; only 30 percent have achieved their objectives of implementing universal access policies or increasing ICT access for the poor or underserved areas. Bank operations to promote universal access often were slow to get off the ground and were superseded by the rollout of mobile phone networks by the private sector, in some cases supported by Bank sector reform, as in the case of Bangladesh.

In Bangladesh, the World Bank, focused on sector reforms, capacity building, and establishment of key regulations and of spectrum management and monitoring systems and tools through nonlending technical assistance and IDA investment and development policy operations. These contributed to an increase of mobile penetration from less than 1 percent to 46 percent in 2010. The IDA investment operation included a component for the development of a universal access strategy, needed legal and regulatory arrangements, and a funding strategy, but because of the rapid growth in penetration of telecommunications, this component was cancelled.

Equity and inclusion objectives were better served by Bank-supported policy and sector reform operations and IFC investments in telecommunications providers, which contributed to

increased access to previously underserved segments of the population. The Bank and IFC were less effective in projects that specifically sought to promote access to marginalized groups, beyond what commercial providers were willing to do on their own once an adequate regulatory environment was in place. ICT investments are expected to make positive contributions to economic growth, given their high economic rates of return. It is therefore likely that projects supporting private investments in mobile phone operators have impacts on poorer segments of society through the creation of jobs, opportunities for entrepreneurship, and access to services. Some indications of the positive impact of ICT investment on the poor are emerging, but this evidence is more often anecdotal, and systematic monitoring of impacts is lacking.

IFC has provided financial and technical support to a few telecommunications operators with inclusive business models, as it did in Brazil and Madagascar, but it has played a limited role in the design, implementation, and scaling up of such models. For instance, IFC supported VPOs in several countries through its advisory service, with the objective of extending services to the underserved. While the program was successful in expanding access, use declined over time, which was attributed to the lack of innovation and spread of mobile coverage to more remote regions. A significant number of IFC's projects aimed at achieving impact at the sector level, but projects did not track sector-specific, higher-level, and distributional objectives such as enhanced coverage of rural or poorer households that had been articulated as a rationale for IFC's support.

Effectiveness in Supporting ICT Applications

ICT applications represent the area from which most development benefits are expected to be derived. The World Bank Group has supported the diffusion and use of ICT through supply-side, demand, and—to a limited extent—skills-development interventions.

Supply-side interventions. The Bank Group has supported the local development of ICT applications through direct investment and business incubators in the IT sector. Most of this investment has been through IFC. On a project by project basis, IFC support to IT projects has not been successful: only one-quarter of projects achieved their stated objectives of developing local IT industries, fostering innovation, and providing value adding services.

This pattern of performance reflects the sector's riskiness. Considering these projects on a portfolio basis, which is appropriate given the venture capital model used, IFC's returns have been positive and consistent with private equity/venture capital industry benchmarks for these types of investments. IFC has supported some highly successful companies that play transformative roles in their countries' IT industries, as in the case of a company often described as "Russia's Google."

Given IFC's current system of incentives and tradition of project finance, it has been challenging for IFC to support small, innovative, and higher-risk projects. But IFC's experience in the IT sector suggests the potential viability and promise of IFC's venture capital approach. The support to IT companies can generate high development impact by helping to diffuse IT

services and solutions to local economies for enhanced efficiency, and to foster innovation more generally, and IFC needs to strengthen its business model to support this sector.

Demand-side interventions. ICT is a key input in a significant proportion of World Bank projects across different sectors. This includes financing of information management systems, computer and telecommunications equipment, software, and related technical assistance in projects in practically every sector. For IFC, support to projects focusing on delivering services through mobile applications is a relatively new area.

ICT played a major role in Bank projects to enhance public sector governance and support more effective and efficient government. In projects where ICT components supported the delivery of services to the public, ICT has not always been important to the achievement of project development objectives.

ICT applications tend to have a high-risk / high-reward profile. Nearly 60 percent of the ICT components in World Bank projects supporting enhanced governance and more effective government or the delivery of services to the public have achieved (or are expected to achieve) their intended results. However, in more than 70 percent of projects supporting public sector governance, the ICT components were modified (this includes cancellation of this component) or substantially delayed.

Benchmarking the World Bank's performance against ICT projects implemented by the public or the private sector shows similarly high failure rates, pointing to the complexity and riskiness of these projects.

Quality of design is key for overall project performance, but this was lacking in many projects. Almost half of the assessed projects have had design shortcomings that could affect outcomes. These shortcomings related to excessive complexity and number of components, poor ownership and commitment, inappropriate capacity building, and lack of attention to change-management processes. Other design issues affecting project success include the absence of a clear ICT strategy and policy, procurement delays, and insufficient readiness of the client for implementation. Conversely, strong government commitment and a champion for reform and project implementation are key enablers of successful implementation of ICT components in Bank projects.

Modest results are also partly caused by failing to take a holistic view of linkages between sector and IT components; neglecting the country, social, economic, and cultural context, capabilities, and needs (supply driven rather than demand driven); limited World Bank IT sector skills; and cumbersome processes and procurement in a rapidly evolving sector. But well-implemented ICT application projects can deliver significant development benefits, as the Nicaragua Public Sector Technical Assistance and the Bulgaria Revenue Administration Reform Projects illustrate.

IFC's experience suggests that it has yet to find its niche in ICT applications. Thus far, projects in m-banking and m-health have fallen short of their objectives. They have encountered risks

related to technologies, sponsor quality and quality of partner financial institutions, regulatory uncertainties, and competition from other providers. This record underscores the high-risk nature of IT projects. Notwithstanding this limited and fairly recent experience, some projects implemented by the private sector (such as M-Pesa, the pioneering mobile phone-based money transfer system offered by Safaricom in Kenya) have shown the viability and potential benefits of such models to the underserved.

ICT skills development. World Bank support for ICT-related skill development has played a small role with limited results. Of the World Bank IT and education sector projects that supported skills development, two have been completed. The Russia E-Learning Support Project is a good practice example for the development of ICT skills, illustrating the potential for broader impact in this critical area. The small number of nonlending technical assistance exercises supporting skills development (6 countries) reported strong performance.

Delivery Structure and Instruments for Bank Group Support to ICT

The 2002 ICT Strategy devised a clear division of responsibilities among World Bank Group institutions to address issues of coordination noted in a previous 2001 IEG evaluation. The existence of a joint Global ICT (GICT) department between 2000 and 2010, comprising staff from the World Bank and IFC, facilitated coordination and dialogue on policy and investment staff. Coordination between the public and private sector units of the GICT improved during this period.

But the department had no clear mandate to lead the ICT agenda across the Bank Group. While it took the lead in IFC investment operations, its role in World Bank projects and with respect to the coordination of the ICT agenda of sector and country units was more ambiguous, affecting effective collaboration and leadership. Staff also perceived a lack of sufficient support from the relatively small group of ICT specialists.

The dissolution of the joint GICT Department in 2010 has a risk of making dialogue more difficult and puts a premium on maintaining strong working relationships between investment and policy staff. Increased decentralization and fragmentation of IFC investment staff also poses risks to maintaining a critical mass of a global knowledge base and expertise in the ICT sector.

With respect to monitoring and evaluation (M&E) capacity for ICT projects, some progress was made in improving the implementation of a robust M&E system for ICT outcomes, but this has remained a major weakness across the Bank Group. In addition, the rapid evolution of the sector warrants more refined metrics to measure usage, outcomes, and the distributional effects of projects, rather than tracking solely access to basic communication services.

Furthermore, the almost ubiquitous global mobile network presents opportunities for real-time data collection and more effective M&E of development assistance projects, including through open-source mobile software applications, readily available georeferencing tools such as Google Earth, and widespread use of social media in the developing world.

Recommendations

The World Bank Group ought to retain a role in ICT, but with important shifts in priorities. Progress in reforms suggests a role for the Bank in this area related to (i) updating the regulatory frameworks to support broadband and Internet access, and (ii) preserving competition in the face of consolidation and convergence in the sector. Gaps in broadband and Internet access, but in the context of overall expansion of coverage, argue for a selective role in supporting private investments in difficult environments. Expanding access beyond what market players would provide on a commercial basis (by using public-private partnership approaches, for instance) needs to remain a priority for the Bank Group. Building on the significant progress in basic connectivity and the opportunities this offers for development, ICT applications should become the main focus of Bank Group support, including through ICT skills development. Finally, the creation of a global mobile network presents enormous challenges and opportunities for the way the Bank Group delivers its services.

Reform and Access

Recommendation 1. Continue the current shift in World Bank Group support toward broadband and Internet access while incorporating lessons from experience. In regulatory reform, the World Bank ought to (i) maintain the focus on competition combined with promoting stability and predictability of the regulatory environment, and (ii) update its advice and technical assistance related to enabling policy makers and regulators to deal with next-generation policy and regulatory issues, new business models, and convergence of technologies. In access, the World Bank, IFC, and MIGA ought to (iii) support catalytic public-private partnership investments to accelerate the rollout of regional and national backbone infrastructure and (iv) identify and support effective approaches to promote access to the underserved, building on their experience with targeted interventions in other areas.

Applications

Recommendation 2. Strengthen the capacity of the Bank Group to respond to client demands for ICT applications by (i) building greater ICT expertise and awareness across the networks and the Regions regarding the potential applications of ICT, including more consistently capturing ICT aspects in country and sector strategies more consistently; (ii) building incentives mechanisms for collaboration, coordination, and joint approaches for innovation between Bank Group units, reflecting the thematic nature of ICT; and (iii) transforming the ICT unit to enable it to act as a connector between internal/client demands and outside expertise from the public and private sectors.

Recommendation 3. Design and implement World Bank Group ICT application projects, consistently taking into account (i) local context and capabilities, country readiness, complementary investments in infrastructure and training, and project-specific change-management challenges; (ii) the need to support cross-sectoral enablers, including the development of policies and standards that would apply across agencies, and apex institutions to effectively lead the ICT agenda across sectors; (iii) the benefits of shared infrastructure and

services so that applications and services may be shared across government agencies wherever feasible, which is critical to avoid waste and to ensure coherence across government.

Recommendation 4. Strengthen World Bank and IFC support for skills development (including ICT skills development) in client countries to promote the use and production of ICT applications.

Delivery systems

Recommendation 5: Given the recent dissolution of the joint GICT Department, ensure that the World Bank Group's organizational structure for ICT enables effective strategy formulation and coordinated delivery, and that it articulates an effective division of labor among the World Bank, IFC, and MIGA.

Recommendation 6. Systematically review the implications of the global IT platform for how the World Bank Group delivers and assesses the impact of its interventions. In particular, the Bank Group can build on the extensive global mobile network to support real-time data collection and M&E for ICT and other interventions in client countries.

Recommendation 7: Improve the World Bank's procurement outcomes in ICT projects and ICT components by (i) building ICT expertise and knowledge among procurement specialists; (ii) adapting procurement rules to reflect sector specificity and the growing use of public-private partnership-type approaches; and (iii) ensuring the design of consistent procurement procedures to facilitate effective collaboration between technical staff and procurement specialists, including by upstream engagement of procurement specialists during project preparation.

Management Response

INTRODUCTION

Management welcomes this evaluation of World Bank Group activities in information and communication technologies (ICT) by the Independent Evaluation Group (IEG). This evaluation is timely, as the World Bank Group is preparing a new ICT Strategy (for discussion with CODE in fiscal year 2012) and in view of the growing size of the ICT sector in World Bank Group's overall portfolio. Given the tremendous changes that have taken place in the ICT sector and as the sector continues to evolve, the role of the World Bank Group in this sector needs to evolve as well. Management will use this evaluation to inform the new ICT Strategy.

IEG's review demonstrates that ICTs have transformational potential and that appropriately designed and executed World Bank Group ICT interventions can help provide solutions to development problems. The evaluation shows that the World Bank Group, including the World Bank, the International Finance Corporation (IFC), and the Multilateral Investment Guarantee Agency (MIGA), has engaged in International Bank for Reconstruction and Development, and particularly in IDA, countries across a wide range of ICT issues: deepening ICT sector and institutional reform; designing and implementing universal service policies, supporting private investment for the rollout; expansion and operation of infrastructure for mobile telephony; investing in information technology (IT) companies; financing ICT applications in 74 percent of all Bank investment projects; and supporting ICT skills development and capacity building.

Management welcomes the evaluation's key findings on sector reform and access. Specifically, the evaluation finds that: (a) the "World Bank Group has been a catalytic player in the global ICT market;" (b) "the share of Bank Group support relative to global investment in ICT reflects the Bank Group's strategic decision to focus on policy reform to enable private sector investment in network operators [and yet the] Bank Group has been the largest multilateral financier in developing countries in the ICT sector" (c) the "Bank Group's most notable contributions have been in sector reforms and in private investments for mobile telephony in difficult environments and in the poorest countries, where most of its activities have been;" (d) "Bank efforts have focused on the relatively more challenging environments and types of reform, where there was considerable resistance to reform;" (e) "countries with Bank Group support for policy reform and investments have increased competition and access faster than countries without such support;" and (f) the need for the Bank Group and client countries to continue and accelerate its shift towards broadband and high-speed Internet by supporting next-generation reforms and catalytic public-private partnership investments.

As part of the preparatory work for the forthcoming ICT Sector Strategy, the Bank's ICT unit in the Sustainable Development Network carried out its own assessment of the nonlending technical assistance to assist countries' efforts to reform their ICT sectors. The assessment found meaningful and substantial contributions to sector reform objectives, consistent with the IEG evaluation. During the period under review by IEG, the Bank provided direct policy and regulatory assistance to more than 100 developing countries. The Bank's assessment looked at 60 countries where the Bank has had long-term engagement in supporting efforts at promoting

competition, opening markets, strengthening regulatory development, and institutional capacity building. The Bank Group has been at the forefront among development agencies in advising developing countries on the ICT reform agenda and, through its nonlending technical assistance activities, has been able to play multiple roles – as aggregator of global best practice, as convener of disparate actors in the sector, and as “honest-broker.” The Bank’s efforts in the sector have had profound demonstration and domino effects in all developing regions. ICT is a sector where the Bank has helped produce concrete results in terms of sector reforms and associated impact on growth and poverty reduction.

Management also agrees with the overall conclusions of the IEG evaluation on ICT applications and skills development: (i) IFC performance in IT applications investments is at least as good as that achieved by the private sector, but these projects entail a higher degree of risk than normally tolerated by IFC; (ii) the Bank’s ICT applications project components are inherently risky, as shown by the global experience of the private and public sectors, but can have high rewards that justify the risks; (iii) necessary success factors from the Bank’s ICT applications project components include government commitment to implementing reforms beyond investing in technology, implementation agency capacity, and change management considerations; and, finally, (iv) internally, the Bank business model to support ICT applications across sectors requires adapting – continuing the shift to becoming a “connector” between clients and Bank teams working on specific development challenges, and external sources of innovations – as well as strengthening the internal coordination mechanisms and incentives for effective cross-sector work in this area.

As part of its effort to rethink the Bank’s approach to ICT applications, the Bank’s ICT unit is already piloting the “connector” role with a number of innovative partnerships with country governments, development partners, and the private sector to leverage external sources of knowledge and expertise. For instance, the Bank has helped structure a partnership between the governments of Moldova and Singapore whereby Singapore technical assistance is used to help design Moldova’s e-government efforts and underpins the related Bank-financed project. The Bank has also assembled a high-level community of practice of “Leaders for Transformation” (including the government-wide Chief Information Officers from the Republic of Korea, Singapore, United Kingdom, the United States, Canada, and the European Commission) to connect policy makers and experts for issues relevant to developing national ICT strategies and ICT applications in their countries. The Bank’s Knowledge Council recently approved a new “Knowledge Platform” on ICT (with an initial focus on applications that promote accountability in service delivery), precisely focusing on “connecting” clients and staff with external sources of knowledge and expertise. This Knowledge Platform is a joint initiative of the Bank’s ICT unit and the World Bank Institute. Several other ongoing initiatives are worth noting, as part of existing shifts in the Bank’s approach to ICT applications, including the infoDev Mobile Applications Labs or “mLabs” (to support the development of mobile technology content and applications by local entrepreneurs in developing countries in collaboration with Finland), the World Bank Institute’s “Applications for Development” (to encourage external developers to create applications around the use of Bank Group data, in collaboration with the Development Economics Department) and the Institute’s “Mapping for Results” (to visualize on country maps the location of the Bank’s projects with links to project-specific information).

MANAGEMENT RESPONSE

Management also agrees with the guidance from the External Expert Panel that the Bank Group's limited resources should focus on areas that offer the greatest development benefits. In this context, we note the rapidly growing demand for World Bank Group support for broadband policy development, for structuring and financing catalytic public-private partnership investment programs aimed at increasing access to high-speed Internet, and for ICT applications that improve government efficiency, service delivery, accountability and transparency – areas of high development impact. Management also notes the recommendation from the Panel to strengthen ICT policy and project coordination with national governments and development partners.

Management would also like to clarify its views in instances where there may be differences with the IEG methodology and conclusions. Management's specific response to IEG's recommendations, with which it generally agrees, is noted in the attached Management Action Record.

MANAGEMENT COMMENTS

Conclusion on Targeted Subsidy Programs

The sector has been going through rapid evolution and will continue to have a fast-evolving, unpredictable nature. For example, very few observers were able to foresee the impact that market reforms have had in driving growth in mobile phone penetration and in reducing prices to levels affordable to the people at the "bottom of the pyramid." The section of the evaluation that assesses targeted subsidy programs does not sufficiently recognize that this unexpected market response has made many universal access subsidy programs obsolete even before they were operational. The evaluation cites the fact that 11 out of 24 operations have not achieved their development objectives and that some project components were cancelled as evidence of limited Bank Group effectiveness. In management's view, the project components were in many cases cancelled not because of effectiveness limitations, but because the market moved faster than expected, at a pace that was not foreseen by most market players, rendering the subsidy schemes no longer needed. As countries shift the focus of their Universal Access Programs toward Internet and broadband, management however agrees with IEG that it is timely to draw lessons from past experience and rethink Bank interventions in this area.

Bank Performance in ICT Applications

Bank work on ICT applications has grown rapidly over the last decade, with more than 1,300 Bank investment projects across sectors now including ICT components, or 74 percent of the portfolio. This is the area within the ICT sector where the most important benefits can be expected. At the same time, this is a high risk/high reward area that requires taking a continuous learning approach. The Bank's success rate is consistent with the global experience of project implementation of ICT applications in both the private and public sectors, where the success rate is 50–70 percent. Bank performance has been mixed, but compares with the performance of the private and public sectors in activities not supported by the Bank Group (59 percent of Bank ICT applications project components have achieved or are likely to achieve their objectives fully or substantially). Active engagement of the Bank in ICT applications across sectors will be essential to the relevance of the institution at a time when services are increasingly delivered using ICT.

Management is also of the view that both the Bank and IFC should continue to make investments in innovative approaches (for example, in cloud computing) and tolerate some degree of risk (and higher failure rates) to help countries/clients achieve the high rewards and enhanced development outcomes from successful projects in this area.

IEG RECOMMENDATIONS

Relevance of some of the ICT Applications Recommendations

ICT applications in the Bank portfolio are evolving from being mainly about back-office, government-managed IT systems and applications, to increasingly being about citizen-facing applications (increasingly through mobile devices) and private sector-led. Key challenges going forward will include how to form appropriate public-private partnerships, how to create the necessary enabling environment, and how governments can reorient their processes and integrate private sector-led applications into public service processes. The evaluation was not able to cover in detail these new trends, or to elaborate on the potential of open government data initiatives and using ICT applications to strengthen accountability. Management believes that the evaluation could have further analyzed recent external and internal trends related to this evolution and provided relevant recommendations for the Bank Group to meet challenges in this high-impact area going forward.

Except for this omission in the evaluation, all IEG's recommendations for the way forward closely align with management's own strategic directions, as expressed in the Approach Paper for the new ICT Sector Strategy, which CODE reviewed in March 2010 (World Bank Group 2010). The analysis in the evaluation report will be useful to add to the diagnostics and background work being carried out for the strategy. Management's draft responses to IEG's recommendations are attached. A detailed Action Plan will be proposed in the context of the CODE discussion of the new ICT Sector Strategy.

Annex - Management Response Table: Capturing Technology for Development: An Evaluation of World Bank Group Activities in ICT

IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
<ul style="list-style-type: none"> • Going forward, the Bank Group should retain a role in ICT, but with important shifts in priorities. First, progress in reforms suggests a role for the Bank in this area related to (i) updating the regulatory frameworks to support broadband and Internet access and (ii) preserving competition in the face of consolidation and convergence in the sector. • Operating in increasingly saturated markets with lower margins and potentially higher risk to business performance will require selectivity for telecommunications projects and increased scrutiny of clients’ business models and investment strategies. IFC’s focus may shift from voice 	<p>I. Reform and Access</p> <ol style="list-style-type: none"> 1. Continue the current shift in Bank Group support towards broadband and Internet access while incorporating lessons from experience. <ul style="list-style-type: none"> • In regulatory reform, the World Bank ought to: <ol style="list-style-type: none"> 1.1 1.2 (i) Maintain the focus on competition combined with promoting stability and predictability of the regulatory environment. 1.3 (ii) Update its advice and technical assistance 	<p>Agree</p>	<p>Management agrees with the recommendation, which is at the core of the upcoming Sector Strategy. The Bank Group has been responsive to growing demand to provide technical assistance on next-generation reforms and to increase policy advice on broadband. The Bank Group has also been responsive by providing catalytic public-private partnership investments to accelerate the rollout of regional and national backbone infrastructure. Support to such public-private partnership s is growing rapidly. Between fiscal years 2007 and 2011, public-private partnership s for regional</p>

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<p>telephony to supporting private investment in higher-speed broadband infrastructure to enable access to data and commercial uses of the Internet. Market trends, such as convergence of technologies and consolidation of market players in the ICT sector, may open new opportunities for IFC assistance.</p> <ul style="list-style-type: none"> • Overall, the evidence points to an effective Bank Group contribution to reforms in the sector. Reforms have progressed rapidly, and this has facilitated innovation, entry, and growth in penetration rates. • In countries where the World Bank or IFC supported the ICT sector—through regulatory reform or fostering investments—the speed of mobile telephone penetration was greater than in countries without support, controlling for other factors . 	<p>related to enabling policy makers and regulators to deal with next-generation policy and regulatory issues, new business models, and convergence of technologies.</p>		<p>and national backbone infrastructure have been supported in 19 countries with another 11 planned in fiscal year 2012.</p> <p>Going forward, the Bank will (a) further define its broadband engagement areas, based on the forthcoming Broadband Toolkit; (b) explore external funds for a technical assistance facility to provide rapid response to client countries on policy and regulatory issues, in particular in the areas of broadband and competition; (c) draw lessons from ongoing public-private partnership initiatives to inform future project design and implementation; and (d) provide policy direction on promoting access to the underserved and the poor, building on lessons from experience with targeted interventions.</p>

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IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
<ul style="list-style-type: none"> • Countries with World Bank support for ICT institutional and sector reforms and IFC investments have increased competition faster than those countries without World Bank Group support. • Over the past decade, developing countries have made strides in reforming their ICT sectors, but the reform agenda is not yet complete. Substantial gains could be achieved by countries that have lagged behind in reforming their ICT sectors. • As technologies and markets continue to evolve rapidly, policy makers and regulators in developing countries face new sets of issues. • Effective competition and early adoption of a focus on a mass market, low-price business model have emerged as factors in successfully providing access to wider segments of the population, increasingly 			<p>Going forward, IFC will (a) continue to shift its investment focus to support capital investment in, and operation of, fixed and mobile broadband access networks and backbone infrastructure and (b) draw lessons from past public-private partnership initiatives and current Bank experience in the development and pursuit of future joint initiatives.</p> <p>MIGA will continue to provide political risk mitigation services to telecommunications operators for a wide range of investments, including fixed and wireless access and backbone infrastructure.</p>

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including low-income households and the poor.			
<ul style="list-style-type: none"> • Regional communications infrastructure and backbone projects have been highly complex and have suffered delays. As the World Bank continues to extend this type of project, it should continue to draw lessons from the implementation of these programs and incorporate these lessons into the design of any future operations. • Targeted efforts to increase access beyond what was commercially viable have largely been unsuccessful. • Gaps in broadband and Internet access, in the context of overall expansion of coverage, argue for a selective role in supporting private investments in difficult 	<ul style="list-style-type: none"> • In access, the World Bank, IFC, and MIGA ought to: <ul style="list-style-type: none"> 1.4 (iii) Support catalytic public- private partnership investments to accelerate the rollout of regional and national backbone infrastructure. 1.5 (iv) Identify and support effective approaches to promote access to the underserved, building on their experience with targeted interventions in 	Agree	Same as above.

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IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
<p>environments. Expanding access beyond what market players would provide on a commercial basis (for example, by using public-private partnership approaches) should remain an important priority.</p> <ul style="list-style-type: none"> • Because many countries are faced with unused amounts in their universal service funds, the effectiveness of World Bank support has been quite limited. Amid the major setbacks of these operations, the Bank-supported programs in Chile, Mongolia, Pakistan, and Uganda and the use of public-private partnerships provide encouraging examples that these mechanisms could work. • Based on the experience with universal service policies, future Bank support in this area needs to be reexamined. As mobile service is becoming ubiquitous and demand for Internet access is increasing, 	<p>other areas.</p>		

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<p>several countries are adopting broadband subsidy programs. Given the record so far, the Bank needs to examine its experience before engaging in these programs and incorporate the lessons of experience with universal access funds.</p>			
<ul style="list-style-type: none"> • Despite the frequent occurrence of ICT applications, only a few sector strategies have included ICT. • Task team leaders lacked sufficient ICT support. Bank task team leaders are not able to secure support or advice from the ICT unit. Only one network (education) was identified as very proactive in disseminating knowledge related to the use of ICT in projects, although it was not able to offer direct support during project preparation or implementation. 	<p>I. Applications</p> <p>2. Strengthen the capacity of the Bank Group to respond to client demands for ICT applications by:</p> <p>1.6 (i) Building greater ICT expertise and awareness across the networks and the Regions regarding the potential applications of ICT, including more consistently capturing ICT</p>	<p>Agree</p>	<p>Management agrees that implementation of this recommendation is crucial to the Bank’s effectiveness in the ICT applications area. The Bank’s involvement in this area is key to the relevance of the institution, at a time when all types of services are increasingly delivered using ICT.</p> <p>As part of the ICT Sector Strategy formulation, most other sectors are developing approaches and specific</p>

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<ul style="list-style-type: none"> Technical and operational staff in the GICT Department increased as the Bank Group ICT portfolio expanded. Although this increase might help the ICT unit address the insufficient support that task team leaders reported for the ICT components in their operations, it probably will not be enough, and other solutions should be pursued to ensure the needed support (for example, the ICT unit could put together a roster of ICT experts that task team leaders could call when they need such support). 	<p>aspects in country and sector strategies</p> <p>1.7 (ii) Building incentives mechanisms for collaboration, coordination, and joint approaches for innovation between Bank Group units, reflecting the thematic nature of ICT</p> <p>1.8 (iii) Transforming the ICT unit to enable it to act as a connector between internal/client demands, and outside expertise from the public and private sectors.</p>		<p>plans to mainstream ICT within their sector—this will be captured in a companion piece to the upcoming ICT Strategy.</p> <p>The Bank has already initiated the transformation of the ICT unit in the Sustainable Development Network of the Bank (the Bank’s ICT unit) to add a function of “connector” and is piloting a number of innovative partnerships with various sources of external expertise, including country governments, other development agencies, and the private sector.</p> <p>To strengthen collaboration and joint approaches among Bank Group units, management will (a) consider introducing a Bank-wide cross-sector ICT practice and ICT practice leadership, including representation</p>

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			<p>from IFC and MIGA; (b) encourage networks and Regions to reassess and further develop their ICT skill mix as part of the yearly strategic staffing exercise; (c) leverage the Bank’s new Knowledge Platform on ICT for Accountability and Service Delivery to connect clients and staff with external sources of knowledge and expertise; (d) continue to make use of networks’ training and knowledge-sharing activities to raise awareness across sectors; (e) pursue trust fund sources to strengthen the “connector” function in a constrained budget environment; and (f) develop a pool of external experts to provide support on various ICT project design issues, including technical and procurement.</p> <p>IFC will continue to support companies</p>

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IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
			that develop new IT applications or use them in new business models.
<ul style="list-style-type: none"> • Quality of design of the ICT component is the most critical factor affecting the overall performance of projects. • Almost 40 percent of projects with ICT components have design shortcomings that could affect overall project outcomes. • Most of the design shortcomings could be minimized by avoiding a narrow technological approach to ICT solutions. • While country approaches and arrangements for e-government vary, coordination of IT initiatives and investment is important. External evidence suggests the need for e-government institutions to promote a national strategy for e-government and common information infrastructure and applications across 	<p>3. Design and implement World Bank Group ICT application projects, consistently taking into account:</p> <p>1.9 (i) Local context and capabilities, country readiness, complementary investments in infrastructure and training, and project-specific change management challenges</p> <p>1.10 (ii) The need to support cross-sectoral enablers including the development of policies and standards that would apply</p>	Agree	Management agrees with the recommendation, which is at the core of the new Sector Strategy under development. The Bank’s ICT unit will formulate a concise guidance note for use by task team leaders designing ICT project components.

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IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
<p>sectors to promote a consistent approach across different agencies and sectors and to avoid duplication of efforts and investment.</p> <ul style="list-style-type: none"> • Integration of IT systems in projects with ICT components requires strong government implementation capacity. • Change management needs to be incorporated in the implementation of ICT components in large projects. 	<p>across agencies and apex institutions to effectively lead the ICT agenda across sectors</p> <p>1.11 (iii) The benefits of shared infrastructure and services so that applications and services may be shared across government agencies wherever feasible, which is critical to avoid waste and ensure coherence across government.</p>		
<ul style="list-style-type: none"> • ICT skills development is emerging as an important constraint to ICT diffusion and applications, but has received little attention in World Bank Group operations. • World Bank support for ICT-related skill development has played a small role, with 	<p>4. Strengthen World Bank and IFC support for skills development (including ICT skills development) in client countries to promote the use and production of ICT</p>	Agree	<p>A World Bank initiative to scale up support to ICT skills development has been set up in the Africa Region: the New Economy Skills for Africa Program with a focus on ICT. The initiative is a joint effort of the ICT</p>

Annex - Management Response Table: Capturing Technology for Development: An Evaluation of World Bank Group Activities in ICT

IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
<p>limited results, thus far.</p> <ul style="list-style-type: none"> ICT skills development was supported by 9 percent of the analytical and advisory activities through programs such as the New Economy Skills for Africa, which is testing new approaches and partnerships between universities and the ICT industry. 	<p>applications.</p>		<p>sector unit, the Africa education sector unit, and Africa finance and private sector development units. Possibilities will be explored to include other Regions in the initiative. It is important to note that the objective of ICT skills development includes promoting the use and production of ICT applications, as well as increasing competitiveness of local ICT industries.</p> <p>IFC will increase its efforts to invest in ICT companies that support the creation, use, and development of ICT skills.</p>

Annex - Management Response Table: Capturing Technology for Development: An Evaluation of World Bank Group Activities in ICT

IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
<ul style="list-style-type: none"> Coordination between IFC and the World Bank in ICT sector operations improved, in part as a result of having a joint department. Coordination may again become an issue. The joint GICT Department was dissolved in September 2010, which was not the result of a strategic decision related to the location of the joint department, but rather as part of the IFC 2013 reorganization. The implications of the new organizational structure for mainstreaming ICT across sectors will need to be closely monitored. 	<p>I. Delivery Systems</p> <p>5. Given the recent dissolution of the joint GICT Department, ensure that the World Bank Group's organizational structure for ICT enables effective strategy formulation and coordinated delivery, and that it articulates an effective division of labor among the World Bank, IFC, and MIGA.</p>	Agree	Specific measures for coordinated strategy formulation and delivery among the World Bank, IFC, and MIGA are already in development. These measures will be presented as an annex of the Draft ICT Sector Strategy.
<ul style="list-style-type: none"> Going forward, the availability of a global mobile network presents enormous challenges and opportunities for the way the Bank Group delivers its assistance. The 	<p>6. Systematically review the implications of the global IT platform for how the Bank Group delivers and assesses</p>	Agree	IT-based communication networks (including in particular the networks enabling mobile connectivity) provide new opportunities to enhance delivery

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<p>near ubiquity of mobile phones creates a platform that opens new opportunities for the World Bank to enhance its reach and effectiveness in designing, implementing, and monitoring its projects. The World Bank should give priority to designing projects that include the applications and content needed to capitalize on this platform to realize social benefits from ICT. Furthermore, the global mobile network presents opportunities for real-time data collection and more effective M&E of development assistance projects, including through open- source mobile software applications, readily available georeferencing tools such as Google Earth, and widespread use of social media in the developing world.</p>	<p>the impact of its interventions. In particular, the Bank Group can build on the extensive global mobile network to support real-time data collection and M&E for ICT and other interventions in client countries.</p>		<p>and assessment of Bank interventions. In the context of this recommendation, management proposes to broaden the opportunity to also include public services more broadly, beyond Bank interventions. New opportunities include real time data collection, greater citizen and stakeholder participation in service delivery, and in holding government and service providers accountable, as well as enabling greater transparency. The upcoming ICT Sector Strategy will propose specific strategic directions to exploit this opportunity, including with respect to monitoring of results under P4R lending. In addition, the Operations Policy and Country Strategy Results Secretariat, the ICT sector unit, and the World Bank Institute will carry out a joint analysis of the opportunity during the first half</p>

Annex - Management Response Table: Capturing Technology for Development: An Evaluation of World Bank Group Activities in ICT

IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
			of FY12 and propose a specific action plan.
<ul style="list-style-type: none"> ICT procurement has been highlighted as a major implementation constraint in several country and Regional portfolio reviews and is a critical dimension of design. Procurement issues can be reduced by careful procurement planning at entry and early involvement of procurement specialists. Staff have highlighted the lack of specialists with expertise in IT procurement. World Bank procurement rules were designed for infrastructure projects, which separate goods and works from consulting service. This approach has not been useful for IT contracts, especially large ones, which usually require combined procurement because of the 	<p>7. Improve the World Bank’s procurement outcomes in ICT projects and ICT components by (i) building ICT expertise and knowledge among procurement specialists; (ii) adapting procurement rules to reflect sector specificity and the growing use of public-private partnership-type approaches; and (iii) ensuring the design of consistent procurement procedures to facilitate effective collaboration between technical staff and</p>	Agree	<p>Management agrees with the overall objective of improving procurement outcomes in ICT projects and components. Improving ICT implementation bottlenecks needs a simultaneous focus on enhancing client capacity, early discussion on procurement and contract management risks, and making available requisite technical skills and procurement expertise within the Bank task teams.</p> <p>The Bank is exploring opportunities to simplify procurement and technical procedures and to identify and address resource gaps, if any. The Procurement Guidelines were revised in January</p>

Annex - Management Response Table: Capturing Technology for Development: An Evaluation of World Bank Group Activities in ICT

IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
<p>change management that accompanies adoption of IT.</p> <ul style="list-style-type: none"> World Bank task team leaders expressed the view that the Bank’s approach to procurement has been inconsistent, in both substance and process: different departments provided different advice to the same government. The process is complex and long: Bank procurement requirements take an average 27 months to complete, and this is coupled with the lack of capacity in countries to use procurement contracts. 	<p>procurement specialists, including by upstream engagement of procurement specialists during project preparation.</p>		<p>2011 to include ICT-specific approaches (e.g., framework contracts) and procurement methods to reflect the complexities of ICT system design and development (e.g., use of brand names, nonprice factors for bid evaluation). The provisions related to public-private partnerships have been amended to provide flexibility to accommodate public-private partnership procedures, and are supported by guidance notes to help staff apply the flexible interpretation.</p> <p>To better support the needs of ICT projects, an ICT procurement working group has been formed and is updating training materials for procurement staff to focus on ICT procurement risk management, and is also reviewing and updating the ICT-specific standard</p>

Annex - Management Response Table: Capturing Technology for Development: An Evaluation of World Bank Group Activities in ICT

IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
			<p>bidding documents and staff guidance. The Bank leads a dedicated multilateral development bank working group on ICT procurement that has achieved significant results in recent years, including harmonization of bidding documents and guidance notes. The reviews of large and complex ICT procurement contracts (where most issues are present) are channeled through the most experienced procurement officers (the Regional procurement office and Operational Procurement Review Committee).</p> <p>With respect to coordination among Bank units, management recognizes the importance of providing consistent advice to clients in relation to technical and procurement aspects and of engaging technical and procurement</p>

Annex - Management Response Table: Capturing Technology for Development: An Evaluation of World Bank Group Activities in ICT

IEG Findings & Conclusions	IEG Recommendations	Acceptance by Management of Recommendation	Management Response
			expertise early in the design discussions. This will be emphasized in the task team leader guidelines referred earlier.

Chairperson's Summary: Informal Subcommittee of the Committee on Development Effectiveness (CODE)

On June 27, 2011, the Informal Subcommittee of the Committee on Development Effectiveness (CODE) considered the report entitled “Capturing Technology for Development: An Evaluation of World Bank Group Activities in Information and Communication Technologies” prepared by the Independent Evaluation Group (IEG) and the Draft Management Response. The ICT Advisory Panel Statement was also circulated as a background document.

Summary

The Subcommittee welcomed the timely evaluation as management of the World Bank Group is preparing the new ICT strategy. The Subcommittee appreciated IEG's comprehensive report and its opening comments on the context, motivation, and follow-up of this evaluation as well as the pilot implementation of the reform in the Management Action Record (MAR). The Subcommittee also appreciated management's opening remarks and commended its broad agreement with IEG's recommendations. Members agreed that there are many challenges ahead for the World Bank Group's support to its clients in this field, given the dynamic nature and vitality of this sector, including in mobile telephony, high-speed Internet access, and broadband connectivity. In this regard, there were comments on the importance of expanding universal access of affordable ICT to the underserved, while taking into account the interrelation with other key sectors such as energy and education.

For the new ICT strategy, members suggested to: draw lessons from the implementation of the 2002 Strategy, including identifying main impediments to broaden access; address security concerns in ICT, including systemic technical issues and management of data; manage expectations of what can be delivered by the World Bank Group, taking into account that there are many key players, in particular private sector participants; clarify the issue of attribution of World Bank Group interventions; present clear recommendations on what can facilitate private sector ICT investment, including promotion of public-private partnership investment; building on the IEG analysis, disaggregate data, including the composition of the \$4.9 billion World Bank Group ICT portfolio; define suitable indicators to measure the impact of interventions in ICT; consider organizational and resource

issues of implementing the ICT agenda across the World Bank Group; and consider shortcomings in procurement and whether there is an impact on the current procurement policy as well as on governance of the public sector.

The relevance of selectivity in World Bank Group interventions in ICT application was highlighted. Further elaboration was sought on how ICT will be integrated in country assistance strategies. Comments were raised on the need to strengthen synergies within the World Bank Group and effective division of labor and coordination among the Bank Group institutions and with external development partners, based on their respective comparative advantages; and enhance monitoring and evaluation and development of suitable indicators. In addition, speakers underlined the importance of focusing on organization, cooperation between Regions and networks, and ICT human capacity and skills development as well as incentives—both internally to the World Bank Group and in client countries—given the high-risk/high-reward profile of ICT applications projects.

Anna Brandt, Chairperson

Statement by the External Expert Panel

The external expert panel has reviewed the draft dated April 22, 2011, of the evaluation report “Capturing Technology for Development” and has also been informed of the main comments from the managements of the World Bank Group to that version of the report. The panel discussed on this basis the report on May 19, 2011, and provides the following comments.

The panel welcomes this excellent report on the World Bank Group’s activities in information and communication technologies (ICT), which it found to be comprehensive, well structured, and well written, with a good balance in its reporting of Bank Group successes and failures.

The report is also very timely. The panel reflected in its discussion on the tremendous changes that have taken place internationally, including those in developing countries, in the ICT sector over the period covered by the evaluation. We now live in a world with an estimated four billion cell phones in developing countries. The report shows in this regard that the penetration of and access to ICT has grown rapidly in developing countries. Changes in technologies, markets, and policies (toward increased competition) have made possible the advances in access to ICT and set the stage for what the report describes as a “massive ICT revolution,” driven by an explosive growth of private sector participation. The huge increase in mobile penetration, in and of itself a driver of development, can now serve as a platform for expanding the delivery of services.

The panel endorses the conclusions and recommendations in the report, and discussed the implications going forward for the Bank Group, especially in light of the dramatic changes that have already taken place—a fast process of change that is likely to continue. The panel in this regard wishes to underline the conclusion in the report that there would need to be important shifts in Bank Group priorities, driven by development needs and changes in markets and technologies.

The panel focused its discussion on the forward-looking aspects of the evaluation report, in light of its importance for the upcoming new Bank

Group ICT Strategy. The panel observed that the Bank Group is in dollar amounts a small ICT player in developing countries,¹ and that fast technological and industry developments are driven increasingly by the private sector. In the panel's view, the Bank Group cannot play a major overall role in ICT; it needs to be very strategic, and must be prepared in important ICT areas, such as where investments can be left to the market, to recognize when it no longer can play a sufficiently important role—in a sense, at times, to declare victory and do something else where its limited resources can be put to better use.

There will likely be areas where the Bank Group can provide important assistance going forward, including through support for regulatory reforms, in particular in continually updating regulatory systems to enable private sector participation (while recognizing that much work has already been done in this regard), and for IFC and MIGA to support private sector investments directly.

The panel also recognized that there can be important roles for governments (often through public-private partnerships) in “going the last mile” in helping to provide access to ICT services for the poorer and/or more isolated population groups, building inter alia on the lessons from existing promising efforts. There is a need to have appropriate business models for such activities, and it may be preferable if the regulatory frameworks can encourage the private sector to address such issues.

In the areas of ICT applications, private sector development is astounding. There are, however, areas (such as mobile money) where public-private partnerships may add value above and beyond what the private sector can handle on its own—not to develop new applications, but to ensure that those applied can be used widely. However, it is not therefore clear that there would necessarily be an important role for the Bank (for example, some such public-private partnerships involve the social sector.) Other important issues, such as illiteracy, are outside the ICT sector but have important influence over the use of ICT, and would also need to be addressed by the World Bank as a matter of high priority.

The Bank Group should also be reminded to give greater emphasis to M&E inter alia to recognize in a timely manner and learn from successes

¹ World Bank Group commitments in the ICT sector (excluding other funding sources for these projects) have accounted for about 1 percent of total developing country ICT investments.

and failures; this would involve the definition of suitable indicators to measure the impact of ICT projects.

The panel concurred fully with the view that the Bank Group needs to look horizontally to improve its integration of ICT into other sectors and strengthen internal learning. The panel noted in this regard the evaluation finding that many projects supported by the World Bank include ICT components,² but that only a few sector strategies have included ICT, and that only about 50–70 percent of ICT components in World Bank operations in other sectors achieved their objectives.

Finally, touching on an area not addressed in the evaluation, the Panel would like to encourage the Bank Group to strengthen ICT policy and project coordination issues with the national governments and other major multilateral development bank partners. The panel has observed that the situation for at least some governments has been confusing, and would encourage more coordinated multilateral development bank approaches in providing assistance to governments.

Jenny C. Aker

Assistant Professor of Development
Economics, Fletcher School, Tufts University.
United States.

Jose Maria Figueres Olsen

Former President of Costa Rica (1994-1998),
former Chairman, United Nations
Information and Communication
Technologies Task Force. Switzerland.

Michael Joseph

World Bank Fellow, former CEO of
Safaricom, Ltd (2000-2010). Kenya.

² The report found that about 74 percent of Bank-financed investment projects approved during the evaluation period have included ICT as a component, sub-component or within components but that only a few sector strategies have included ICT.

1. Introduction

1.1 Information and communication technology (ICT) is constantly evolving and affects many aspects of everyday life. Recent examples of its impacts include increased business sector productivity enabled by access to price information for market participants, newly gained access to financial services through ICT-based mobile banking in Kenya, and the use of technology for rapid damage assessment following the devastating earthquake in Haiti. ICT has also been an important tool in organizing political dissent in the Middle East. The many applications of ICT over the past decade have shown its transformative potential.

1.2 ICT has affected the ways in which people, governments, and businesses interact. The potential benefits from ICT extend to the solution of development problems. ICT applications and uses have multiplied rapidly, driven largely by innovation and market developments and enabled by reforms and private sector investment. But in spite of all that change, the promise of ICT to enhance economic opportunities for the poor, improve delivery of services to the underserved, enhance government efficiency and transparency, and affect social change has yet to be fully realized.

1.3 More skeptical views of ICT's potential development benefits are based on the premise that technology alone cannot provide solutions, and may lead to growing rather than diminishing divides between and within countries. We need more knowledge about how ICT affects development and its impact on peoples' lives (Unwin 2009a).

1.4 The World Bank Group is currently revising its strategic approach to ICT, an exercise it last completed in 2002, before the transformative changes of the past few years. While the Bank Group has been involved in ICT for many years, it now must anticipate future changes in this dynamic area.

1.5 This evaluation is intended to inform the revised strategy. This chapter lays out the approach and methodology of an Independent

Evaluation Essentials

- ❖ The World Bank Group has been active in both the ICT sector and in applications of ICT.
- ❖ This evaluation assesses the Bank Group's strategic choices, performance, and positioning in the sector to inform a new strategy.
- ❖ It covers the FY03–10 period and seeks to answer whether Bank Group support has been relevant and effective in leveraging ICT for development.

Evaluation Group (IEG) assessment of the role and effectiveness of Bank Group activities in ICT over the period FY03–10.

1.6 This evaluation has several objectives. It seeks to assess the Bank Group's role and comparative advantage in ICT, the soundness of its strategic choices, how well its support has performed, what has worked and what has not, and how well the Bank Group is positioned and equipped to help clients reap the benefits of ICT for development.

1.7 The evaluation is tailored to reflect the specific characteristics of ICT, including rapid change in a general-purpose technology and the unprecedented adoption and diffusion of that technology across countries and sectors. As technological possibilities change and the main actors respond to them, today's knowledge becomes obsolete. There is thus a renewed need to assess the effectiveness and relevance of Bank Group interventions in the sector (Unwin 2009b).

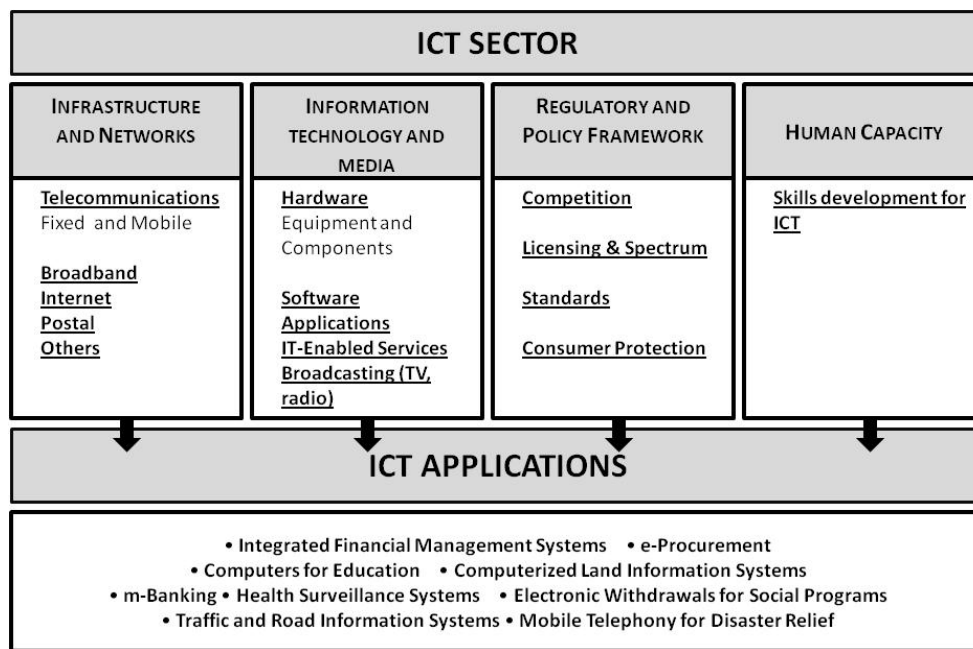
Information and Communication Technology: Scope and Definition

1.8 The 2002 ICT Strategy defines ICT as "all technical means for processing and communicating information," a definition that spans a wide variety of activities. As a sector, ICT has been defined by the Organisation for Economic Co-operation and Development (OECD) as encompassing manufacturing and services industries that capture, transmit, and display data and information electronically. The Bank Group has engaged in both the ICT sector – the ICT regulatory and policy framework, infrastructure and networks, information technology and media, and human capacity – and in ICT applications – the use of ICT in commerce, banking, the social sectors, and government. The evaluation therefore includes both the ICT sector and ICT applications, and it uses the framework shown in Figure 1 as an organizing principle.

1.9 This evaluation examines World Bank Group support for ICT between FY03 and FY10. It covers sector and country strategies, policy notes, operations, investments, and advisory services approved in this period. The period was chosen to coincide with the implementation of the 2002 ICT Strategy (World Bank 2002). The evaluation reviewed strategies, operations, and advisory services implemented by the World Bank (International Bank for Reconstruction and Development, or IBRD, and the International Development Association, or IDA), the International Finance Corporation (IFC), and the Multilateral

Investment Guarantee Agency (MIGA) throughout the period, and it included closed, mature, and ongoing projects.

Figure 1. Information and Communication Technology: Scope and Definition



Sources: World Bank ICT Strategy (World Bank 2002), IEG.

Note: Postal services were not covered by the evaluation but are shown in the diagram to provide a complete picture of ICT. The list of ICT applications is not exhaustive; it includes examples of possible uses of ICT for enhancing public sector governance, supporting more effective and efficient government, and enhancing the quality and reach of services to the public.

SCOPE AND METHODOLOGICAL APPROACH

1.10 The evaluation responds to the overarching question: *Has Bank Group support for ICT been relevant and effective in leveraging ICT for development?* Interventions in the ICT sector typically do not address an end, but instead provide a means to help address a range of development issues. These technologies and markets are evolving rapidly and are driven largely by private commercial players. These features have determined the scope of the evaluation and its focus on assessing the relevance and effectiveness of Bank Group activities.

1.11 The evaluation findings were developed through desk reviews; thematic, literature, and country studies; and project assessments. These were supplemented with interviews of staff and stakeholders and a survey of Bank task team leaders. The studies conducted included papers on the global ICT sector and technologies; a literature review on empirical evidence on ICT and development

outcomes; and a review of Bank Group ICT country strategies. The ICT portfolios of the World Bank, IFC, and MIGA were identified for the study. A full list and more complete description of evaluation inputs can be found in appendix A.

1.12 The evaluation also builds on the findings of an earlier evaluation conducted in 2001. That evaluation, a joint assessment of Bank and IFC experience in the telecommunications sector, recognized a shift in priorities toward institutional reform and promotion of private sector investment. It found excessive reliance by the Bank on poorly performing multisector loans and recommended a shift toward stand-alone ICT assistance. Regarding cooperation between the World Bank and IFC, the evaluation found that much more integration of activities across the telecommunications, information technology, InfoDev, and IFC programs was required.

Organization of the Report

1.13 This report is structured as follows. Chapter 2 provides context on the relevance of Bank Group involvement in ICT, based on the accelerated evolution of the sector, empirical evidence linking ICT to development, and the Bank Group's strategy for ICT. Chapter 3 presents findings from the analysis of the ICT portfolio of the World Bank, IFC, and MIGA. Evaluation findings of the effectiveness of World Bank, IFC, and MIGA activities in the ICT sector that supported policy and regulatory reform and increased access are presented in chapter 4. Chapter 5 discusses findings on the relevance and effectiveness of Bank Group supply-side and demand interventions for achieving development results through the use of ICT. Finally, chapter 6 summarizes the conclusions of the evaluation and recommends actions for future Bank Group engagement in ICT.

2. Rationale for World Bank Group Involvement in ICT

ICT and Development

2.1 ICT is considered a means to achieve four general development outcomes – identified in the 2002 ICT Strategy – that are relevant to the World Bank Group’s mission:

- Enhance productivity, economic growth, and job creation.
- Improve the quality and reach of services to the public.
- Increase transparency, efficiency, and accountability in governance and government functions.
- Increase equity and integration of marginalized groups.

2.2 The conceptual framework in Figure 2 has been used to guide the assessment of the relevance and effectiveness of Bank Group support to the ICT sector and ICT applications. The framework reflects the components of ICT introduced in chapter 1 (Figure 1) and shows the results chain for Bank Group interventions in ICT, as contained in strategy and Board documents and derived from a literature review.

2.3 This evaluation reviewed the literature for empirical evidence related to the four identified development outcomes. From the results, presented in the remainder of this section, it is possible to infer a rationale for World Bank Group involvement in ICT. That rationale specifically rests on the contribution of the ICT sector and ICT applications to growth, productivity, and the potential for poverty-reducing effects of improved equity and access to services.

PRODUCTIVITY AND GROWTH

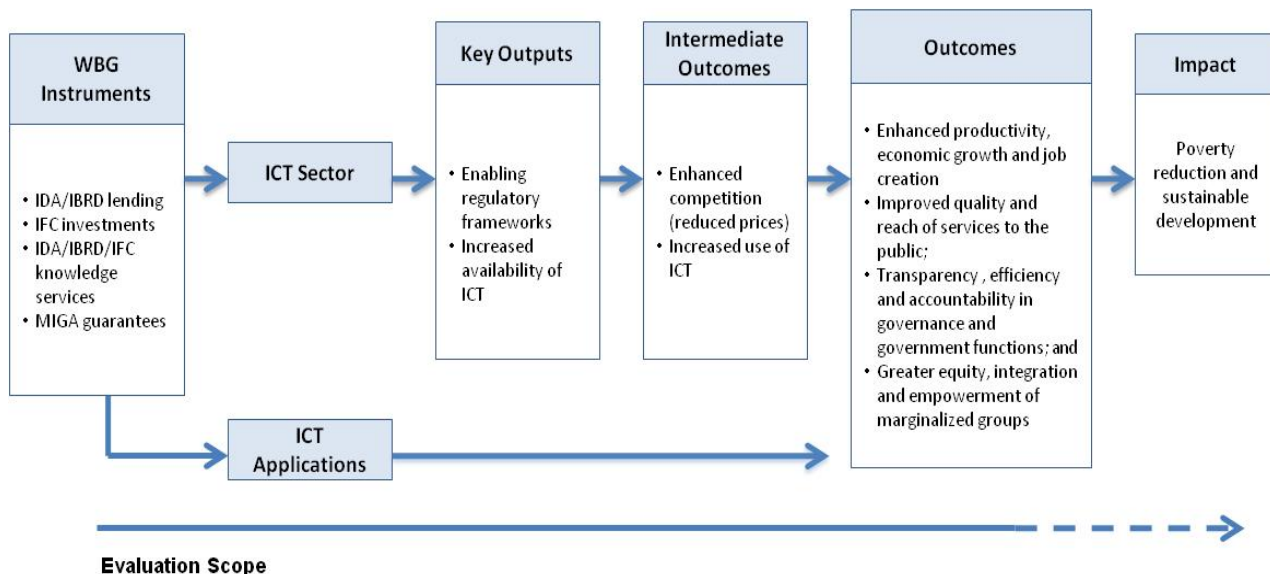
2.4 **ICT matters for growth and development.** Both the ICT sector proper and ICT applications can have significant economic impacts, and the two are somewhat symbiotic. The ICT sector itself can be an engine of growth and is generally regarded as a source of innovation, with some of the highest growth in productivity over the years. By increasing the availability of ICT, the sector enables wider application and use of ICT. Use of ICT can increase firm-level productivity through efficiency gains from access to information

Evaluation Essentials

- ❖ ICT has significant economic impacts on growth and development.
- ❖ ICT may affect governance and service delivery by enhancing efficiency, accountability, and transparency.
- ❖ ICT for social inclusion requires careful attention to both the local and social contexts.
- ❖ The rapid growth in mobile communications has been driven by private-sector market activity.
- ❖ Internet growth has been steady in developing countries, but the digital divide will persist until more people have access beyond mobile connectivity.
- ❖ The World Bank Group 2002 ICT Strategy committed to intervene in four areas: sector and institutional reform, access, human capacity, and ICT applications.
- ❖ The Strategy was Bank Group-wide and specified roles for the World Bank, IFC, and MIGA.

and reduction of transaction costs (Brynjolfsson and Hitt 2000b; Stiroh 2002; Brynjolfsson and others 2007). The use of ICT in applications also can increase the efficiency of government services and service delivery to the public (in health and education, for example).

Figure 2. Translating World Bank Group Interventions into Impact: The Results Chain



2.5 **Consensus has emerged that both the production and use of ICT contribute to aggregate productivity** (Jorgenson and Stiroh 2000; Jorgenson and Vu 2005). Total factor productivity increased from 21 percent of world economic growth between 1990 and 1995 to 29 percent between 1995 and 2003. This increase has been associated with the ICT revolution. The share of this gain that is attributable to the ICT sector has declined, while productivity growth in ICT-using industries has accelerated. Two important components of the ICT sector, equipment manufacturing and information technology-enabled services (ITES), are highly concentrated regionally, and productivity gains generated are being captured largely by consumers in developed countries, not by developing-country producers (Best and Kenny 2009).

2.6 **Macroeconomic evidence of mobile telephony’s impact on growth in developing countries is well established** (Waverman, Meschi, and Fuss 2005; Qiang 2009b; and Best and Kenny 2009). Researchers have found significant impacts of increased mobile penetration on the rate of economic growth for the average developing country (1980–2005). Microeconomic analysis has also shown voice telephony to have considerable impact on firm and labor productivity and enhanced market efficiencies through the diffusion of information (Jensen 2007; Aker 2008, 2010), noting in some cases pro-poor effects of ICT (Klonner and Nolen 2008). Although the evidence is sparse, there is no reason to believe that investments in ICT would be less

effective in developing countries than in developed ones (Best and Kenny 2009).

EQUITY, INTEGRATION, AND EMPOWERMENT

2.7 In some parts of the world, it is evident that ICT is contributing to revolutionary changes in business and life, but in others, it is creating greater disparities (Mansell 1999, p. 2). As societies become increasingly dependent on new or changed ICT, those who find access difficult are progressively marginalized and excluded.

2.8 **With the right supporting capacities and institutions, ICT can help promote development goals and greater equality.** ICT has the potential to be “a formidable and effective development tool” that in some cases can allow “leapfrogging” (Steinmueller 2001) – the idea that countries and societies can jump over one or more generations of technology and that poor nations can thus move more rapidly into the modern information age (Sundén and Wicander 2003, p. 21). In the absence of supporting capacities and institutions, ICT may entrench inequality. ICT can enhance and magnify existing capacities and capabilities (Toyama 2010; Warschauer and Ames 2010), and thus may further increase inequalities, marginalize those without access or know-how by depriving them of the opportunities that ICT offers (Basu and others 2004; Vaccaro and Madsen 2009).

2.9 **Inclusion policies are necessary and important, but their success may depend on sensitivity to local conditions and capabilities.** Attention to factors such as which groups are excluded from what; the different mechanisms, degrees, and forms of exclusion; the boundaries of the groups; differences within and between groups (perceived and actual); costs and benefits of exclusion and ways to produce inclusion; and the duration of exclusion, which is important to factor into the design and implementation of inclusion policies. For some, ICT simply may not be relevant given their daily struggle for food and other survival pressures.

SERVICE DELIVERY

2.10 **ICT may affect governance and service delivery outcomes through efficiency, effectiveness, transparency, and increased access.** ICT may help reduce the minimum unit cost of a particular service by reducing transaction time and improving staff productivity; maximize the total benefit of services in the short run; or increase incentives for continuing investment, innovation, and improvement of service provision. But the gains are not automatic. Technology is just one ingredient among many inputs and conditions necessary for successful implementation; the others relate to organizational changes, incentives, and human capacity.

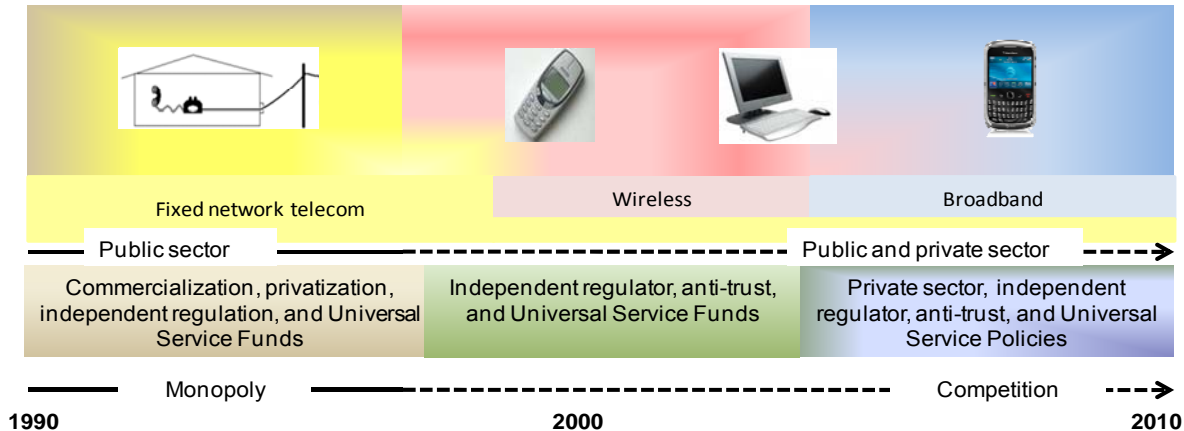
2.11 For ICT use in services, complementary conditions are also important. Discussions of how ICT can contribute to education suggest that school infrastructure, resources, distribution of skills, and cultural and political factors can affect how and if the use of ICT results in changes in learning and teaching (Akinsanmi 2005; Nambiar 2005). For instance, in the One Laptop per Child Initiative, though laptops were designed to physically function well in developing countries, using such technologies in teaching and learning still requires compatibility with network and human capabilities. ICT must operate within system innovations, in training, educational content, maintenance, and sustained commitment for long-term changes in education (Kraemer, Dendrick, and Sharma 2009; Warschauer and Ames 2010).

Evolution of the ICT Sector and of ICT Use in Developing Countries

2.12 The penetration of and access to ICT has grown rapidly in developing countries over the past decade. This development was driven by explosive growth of private sector participation and enabled by reform geared toward increased competition. The increase in access also reflects demand for communication services from even the poorest people. The diffusion of some technologies, such as broadcasting and mobile voice telephony, has outstripped the provision of other basic infrastructure in developing countries (such as water).

2.13 Changes in technologies, markets, and policies made possible the advances in access to ICT services and set the stage for a massive ICT revolution (Figure 3). During the early 1990s, developing countries began to implement telecommunication sector reforms similar to those taking hold in many developed countries, including commercialization, independent regulators, privatization, and universal access policies. Changes in technology and markets—particularly for mobile communications—have challenged policy makers to implement policies and regulations to open market opportunities and created an environment that fosters private sector participation and rapid ICT adoption.

Figure 3. Evolution of the ICT Sector



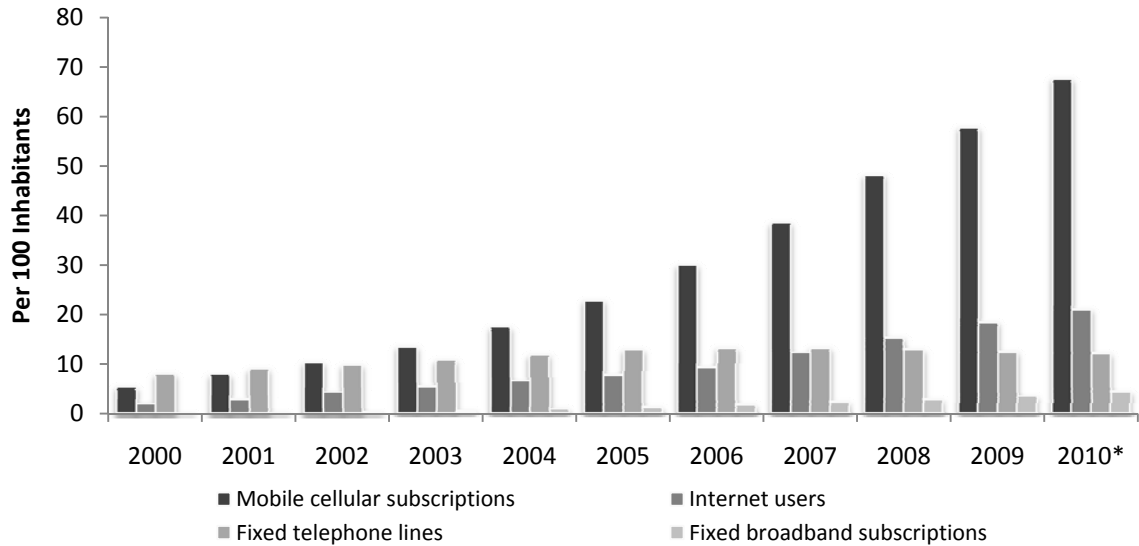
2.14 **Mobile phone technology has seen the most widespread adoption in developing countries.** Mobile phone use has increased to 3.9 billion people in developing countries – a 68 percent penetration rate (2010), up from very low access in 2000 (4.4 percent penetration) (ITU 2010b). The number of mobile subscribers quickly overtook the limited subscription base of fixed-line telephony (Figure 4).

2.15 **The gap in access for voice telephony between developing and developed countries is narrowing quickly.** Given double-digit annual growth rates for mobile telephony, many markets in developing countries are expected to reach saturation within a few years (Figure 5). Developing country mobile markets are now so large that technology developers are beginning to focus on their distinctive characteristics for further technological development and adaptation, including continuing reductions in the cost of handsets for the high-volume markets of poor people and priority non-voice applications such as mobile banking. Notwithstanding this progress, coverage gaps in voice are expected to remain in developing countries in areas where it would not be commercially feasible for the private sector to invest (World Bank 2010a).¹ Addressing this gap through catalytic interventions would remain a priority for the public sector.

2.16 The rapid spread of mobile technologies throughout developing countries was a function of enormous revealed demand; the effects of sector reform, notably the introduction of competing mobile network operator licenses and the allocation of spectrum specifically for mobile services using standardized digital technology; declining costs from economies of scale in the production of handsets and network equipment; viable markets in secondhand handsets at very low prices; the unbundling of subscriber identity module (SIM) cards from the handset; and the rolling out of prepaid

service capabilities that enhanced affordability for poorer segments of the population. Mobile technologies also have advanced through several generations of technological change that have driven costs down and expanded the capabilities of mobile networks and handsets.² Adoption of mobile technology in the population has been faster than for other technologies in the past (Jack and Suri 2011).

Figure 4. Growth in ICT Access in Developing Countries, 2000–10

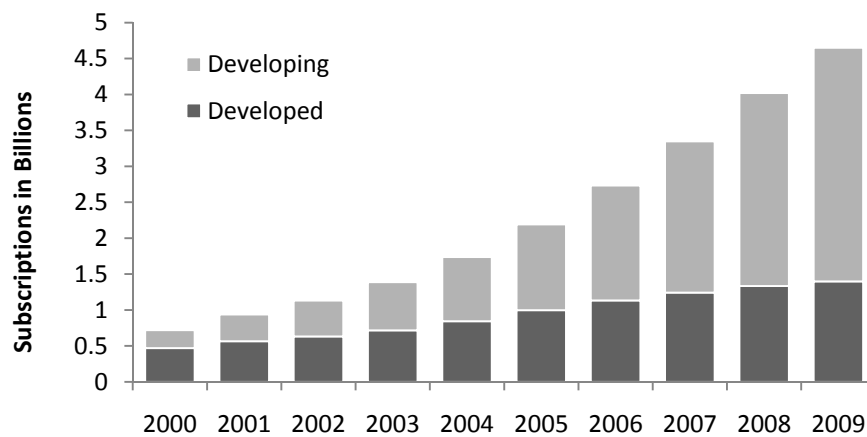


Source: ITU World Telecommunication/ICT indicators database.

Note: The developed/developing country classifications are based on the UN standard classification (M49).

*Estimates.

Figure 5. Mobile Cellular Subscriptions, in Billions, 2000–09

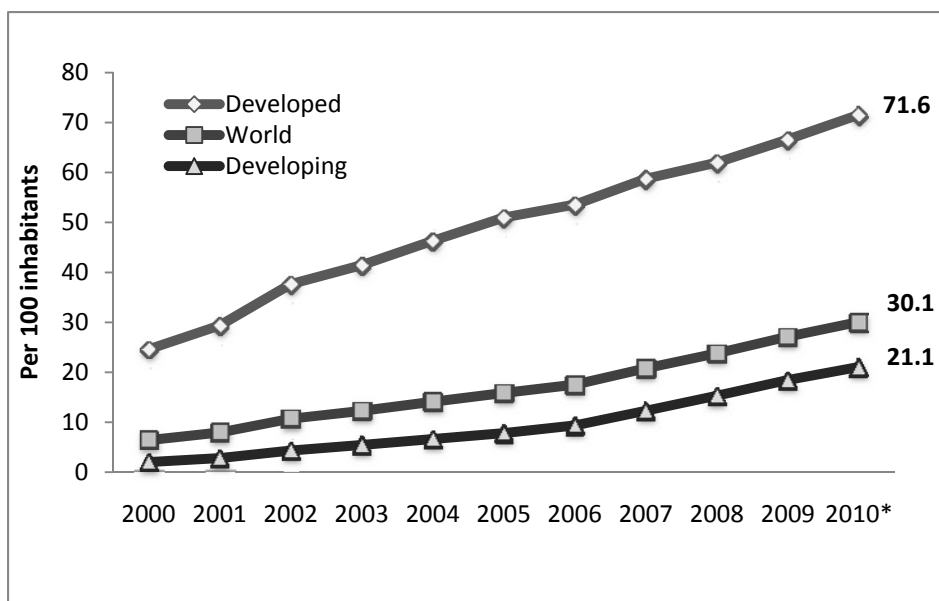


Source: World Bank/IFC Global ICT Department (GICT).

2.17 The rapid growth of mobile voice communication in developing countries has been driven by private sector market activity, enabled by sector reform. The business environment for mobile communication has been hospitable due to positive interactions among policy and regulation, technology, and market factors. Policy and regulation generally allocated the essential spectrum resources, licensed new operators to introduce competition, ensured workable interconnection arrangements, and took other steps to facilitate market development. The ICT sector responded to the market opportunities with continuous capability and capacity improvements, as well as major cost reductions made possible by economies of scale and scope associated with global production. The discovery of distinctive market characteristics and the application of new business models have also been important drivers of growth.

2.18 Growth in Internet access in developing countries over the past decade has been rapid, reaching 1.2 billion households in 2010, or 21 percent, but the access gap with developed countries remains large (Figure 6). Figure 7 shows current user penetration rates by region, and exhibits a pattern similar to that seen for mobile growth data in early- and late-adopting countries. As with mobile telephony, access is particularly low in Africa (9.6 percent). However, Internet usage significantly lags access (Best and Kenny 2009).

Figure 6. Internet Users per 100 Inhabitants, 2000–10

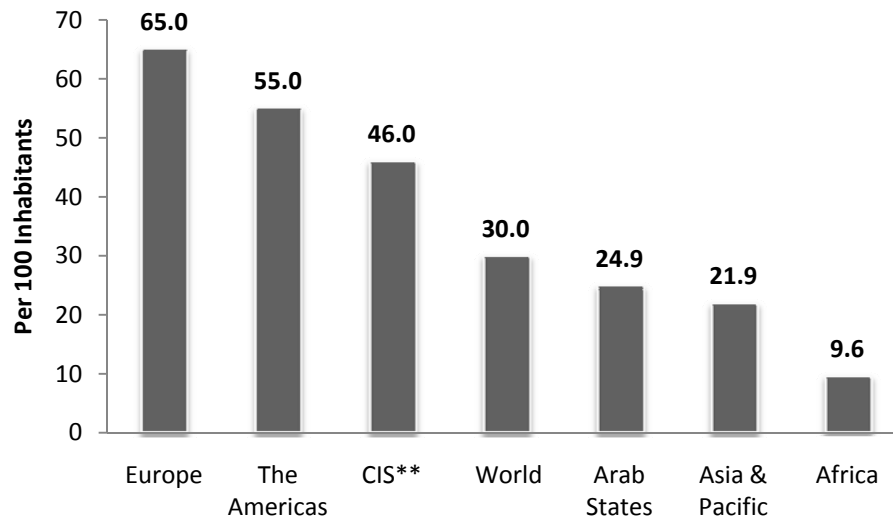


Source: ITU World Telecommunication /ICT Indicators database.

Note: The developed/developing country classifications are based on the UN M49.

*Estimates.

Figure 7. Internet Users per 100 Inhabitants, 2010



Source: ITU World Telecommunication /ICT Indicators database.

Note: Regions are based on the ITU Telecommunication Development Bureau (BDT) Regions.

*Estimate.

**Commonwealth of Independent States.

2.19 Developing countries cannot begin to overcome the international or national digital divides in Internet access and use, or any other services, until a significantly higher proportion of the population has access to basic network connectivity. Basic connectivity is essential to determining the potential for development of all services. Challenges related to access to high-speed Internet include the cost of broadband access and devices, availability of wireless broadband, and availability of high-capacity transmission backbones.

2.20 **As ICT convergence progresses, the number and types of information and communication services accessible over the communication infrastructure will continue to increase.** The rapid growth of the Internet, anticipation of new communication demands, and growth in ICT applications have focused attention on the need for increased network capacity for high-speed Internet access – that is, broadband. Significant increases in network capacity are key to further growth in ICT applications and the development of services for an information society and an information economy in developing countries.

2.21 **The wide disparity between developed and developing countries in broadband penetration levels and rates of Internet access poses the risk that developing countries may not be able to capture the potential benefits of ICT for development.** While the average penetration level of mobile broadband services was 5.4 subscriptions per 100 inhabitants in developing

countries, it is 10 times higher in the developed world, at 51.1 per 100 inhabitants. While technology development and regulatory measures are accelerating the growth of mobile broadband penetration, developing countries continue to lag behind when it comes to fixed (wired) broadband, where the limited number of fixed telephone lines constrains the deployment of broadband access. Even though subscriptions are increasing, a penetration rate of less than 1 percent in Africa, for example, illustrates the challenges that persist in increasing high-speed, high-capacity Internet access in the region (ITU 2010).

2.22 More recently, focus has shifted to the use of ICT for productive purposes, in the social sectors (education and health), and for government: ICT applications. While such applications have been in use for some time, near ubiquitous mobile phone coverage, convergence of technologies (such as telephony and IT solutions), and successful implementation of some e-commerce and m-banking projects has led to an increased focus on applications by the development community, aiming to more effectively deliver assistance to the poor and underserved. Some of the more recent innovative uses or concepts associated with ICT use are summarized in Box 1.

2.23 Developing countries have faced challenges in adapting policies and regulations to rapid changes in technology and market structure. In the early 2000s these challenges included lack of independent regulation, competitive telecommunication markets, and privatization of operators. Reforms needed to focus on spectrum allocation, licensing of new operators to introduce competition, ensuring workable interconnection arrangements, and ensuring ICT access to the poor and underserved, among others. Furthermore, to be able to reap the benefits of ICT growth and its transformative potential, governments needed to support the development of ICT skills in their populations and adopt ICT themselves for better delivery of education, health, and other services and enhanced government efficiency and transparency.

2.24 Progress has been made on these issues, but the era of stimulating connectivity primarily through institutional reform and mobile network expansion is far from complete. The remaining challenge is related to how far access can be extended to the poor and underserved in rural areas, and even the poorest of the poor. This will depend significantly on the effectiveness of policy and regulation, continuing improvements in mobile technologies (including decreases in the cost of wireless broadband devices and the ability to adapt these devices for the illiterate population), the significance of competition and interconnection, barriers to local participation, the performance of targeted subsidy programs, and timely catalytic interventions by the donor community.

Box 1. Innovative Uses for ICT

The universe of ICT is vast and growing. In recent years, the number of innovative ways for people to share information with one another has exploded, driven by human ingenuity and the ability to use technology in creative ways. Many applications—Skype, Google, and Twitter among them—have changed the way people connect with each other. The Internet has expanded from a vehicle for data services, e-mail, and the World Wide Web to encompass radio and TV, blogs, games, and applications (such as e-commerce). Social media has expanded in a short time.

The combined effects of emerging Internet technologies, increased computing power, and pervasive digital communications have reshaped the ways businesses manage talent and assets. Rapidly evolving technologies present challenges for companies needing to manage change processes and adoption of technologies. Some expect technology to be a key factor in ensuring business success, as companies are moving in the direction of networked organizations fostering collaboration and innovation among employees, customers, and stakeholders.

While this report cannot cover the whole universe of ICTs, below are examples of key innovations.

Interactive maps, such as those of Ushahidi, which maps reports sent by text messages to its Web site, have proven valuable during crises such as the 2010 Haiti earthquake. After the earthquake, “the Ushahidi teams gathered information from news reports and individuals about the most acute needs on the ground: rescue, food and water, and security” and placed the coordinates on a map that was made available to rescue and relief teams.

Crowdsourcing is “distributed problem solving and production,” where problems are broadcast to an unknown group of solvers, who typically form online communities to find the best solutions to the problem. Crowdsourcing has been used in disasters, market research, urban and transit planning initiatives, editable maps, and many other applications.

The *Internet of things* is the interconnection of everyday objects allowing communication among devices without direct human intervention. At present, the Internet of things is associated with linking products such as thermostats and security systems to smartphones or Web browsers. It is expected that this technology will enable more efficient processes, enable new automation capabilities, and support new business models, such as allowing companies to manage stocks and usage of inputs, car insurance companies to charge premiums according to actual driving patterns, and enhancing energy efficiency.

Cloud computing provides access to computer systems, applications, and data through networks, which are independent of the location of the service provider or the user and are typically provided through the Internet. Cloud computing is thought to reduce the cost for computing equipment, avoid duplication of IT investment, and enhance the reliability and security of data.

2.25 As technologies and markets continue to evolve rapidly, policy makers and regulators in developing countries face new sets of issues.

Major efforts were, and still are, required from policy makers and regulators

to keep abreast of the changes occurring in the markets and to build understanding, knowledge, and expertise to ensure effective policy making and market regulation. An important policy and regulatory issue at present concerns broadband access. This involves continued focus on the supply of competitive access to networks (that is, wireline and wireless broadband networks) and allocation of spectrum targeting wireless broadband services.

2.26 As evidence is emerging that broadband access is important for development, policy makers and regulators in developing countries are being confronted with the question of what role, if any, they should play in broadband rollout and adoption. Although data on the effects of broadband access are limited, more than 70 countries have adopted a national broadband policy, strategy, or plan to promote access (ITU 2011). Policy makers and regulators in developing countries need new tools to be able to assess the need for policies and support for their implementation to speed broadband rollout. However, policy makers must also focus on facilitating the production and use of broadband applications and services. Addressing these components of the broadband ecosystem may require new tools for policy makers and should be grounded in a comprehensive diagnosis of the reasons for nonadoption of broadband and ICT (ITU 2010).

2.27 The nature of the broadband ecosystem requires ICT regulators and policy makers to engage in cross-sectoral cooperation. Since ICT interacts and intersects with major social issues and sectors of the economy, including the environment, cybercrime and security, education, health, and banking, governments need to coordinate various interests in order to achieve large-scale objectives, including promoting global environmental policies and addressing transnational cybersecurity concerns. It would also require regulatory frameworks broad enough to allow the ICT regulator to consider all the relevant interrelated issues, while remaining focused on promoting innovation and development in the ICT sector. ICT regulators and policy makers would need to coordinate with regulatory authorities responsible for other sectors, such as banking, the environment, and health, to ensure that the benefits of ICTs reach all members of society.

2.28 As the ICT sector continues to evolve, so too must the role of the World Bank Group. Expanding the connectivity of the telecommunication networks to reach more people has been a shared policy objective of most governments since the earliest days of telephony. Access increased dramatically with the introduction of mobile telephony and private sector involvement. However, universal access and reaching the poorest segments of the population may require continued support from the public sector. Further, as new technologies and applications are developed and rolled out,

new policies and regulations will be needed to foster adoption and efficient allocation.

2.29 By all indications, the dynamism of ICT will persist, and new issues will be met with new solutions. While it is not possible to foresee the future directions of the ICT sector and applications, areas of continued attention will include the following:

- Regulatory and policy reform to promote competition and adapt to technological changes (in particular, technology-neutral regulation, spectrum management and reallocation to accelerate wireless broadband rollout, interconnection issues, and competitive access to international gateways and backbones)
- Gaps in access to basic ICT services in the poorest countries and for the poorest populations
- Gaps in access to broadband infrastructure for data and productive uses
- Increased focus on ICT applications to enable commercial, social, and e-government services
- Skills development to enhance adoption and use of ICT
- More effective diffusion of IT solutions to help enterprises become more productive and reap benefits from connectivity.

World Bank Group Strategy and Approach

2.30 **The World Bank Group committed to intervene in four areas, covering both the ICT sector and ICT applications.** The 2002 Bank Group ICT Strategy coincided with tremendous changes in ICT adoption and use in developing countries. It identified four areas for intervention:

- Broadening and deepening sector and institutional reform
- Increasing access to information infrastructure by mobilizing and leveraging private sector investments and finance and to extend access beyond what commercial providers are prepared to do on their own
- Supporting ICT human capacity
- Supporting ICT applications to enhance public administration and private sector development, as well as ICT components in Bank lending (World Bank 2002).

2.31 **The 2002 ICT Strategy aimed to respond to technological advances and changes in the sector in the years before its formulation.** The strategy was based on the consideration that public sector and development agencies

such as the Bank Group had a role to play for two reasons. First, ICT development would be contingent on sector reform and a strong regulatory environment and, second, market failures and equity considerations would require support of private investment and a role for market-based subsidies to foster ICT access beyond what the market alone would provide. These directions aimed at articulating an ambitious vision for the Bank Group “to be a catalyst in improving access to ICT and promoting their use for stimulating economic growth, increasing equality, and reducing poverty” (World Bank 2002).

2.32 **The 2002 ICT Strategy was conceived as a Bank Group strategy and identified a specific role for IFC and MIGA to support enhanced access to information infrastructure** through private sector investment. The strategy noted that IFC and MIGA would mobilize and leverage private sector investments and finance in support of one of the pillars – increasing access – effectively complementing the World Bank’s focus on sector and regulatory reform. IFC was also expected to support ICT applications as a platform to enhance public sector administration, private sector development, and applications with “significant social development impact.” As part of its implementation plan for the strategy, the World Bank Group identified a division of responsibilities for delivering the four pillars (Figure 8) in line with the roles identified for each of the institutions.

Figure 8. Evolution of the ICT Strategy in the Bank Group

Strategy Before 2001	Strategy 2001	Strategy 2010
<ul style="list-style-type: none"> • Physical Infrastructure • Extend communications and information networks (pg. 32) <ul style="list-style-type: none"> • Expand postal network to rural regions • Extend e-mail, Internet, and tourism info services • Develop legal and regulatory frameworks • Strengthen institutional capacity • Promote private sector partnerships • Expand capacity through private ownership / operations 	<ul style="list-style-type: none"> • Broadening and deepening sector and institutional reform <ul style="list-style-type: none"> • Integrated policy framework to deal with increased convergence among technologies • Legislative and regulatory changes to facilitate use of Internet through e-commerce/e-gov applications • Sector policy reform (postal) • Increasing access to information infrastructure <ul style="list-style-type: none"> • Soft infrastructure development • Supporting ICT human capacity • Supporting ICT applications <ul style="list-style-type: none"> • Business models and information technologies in operational projects • Enhance public administration and private sector development 	<ul style="list-style-type: none"> • Connect (affordable access to voice, high-speed Internet and information and media) <ul style="list-style-type: none"> • Maintain emphasis on ICT policy and reform • Catalytic investments and demand stimulation • Enabling environments for media industries • Frontier markets and in innovative business models for access • Innovate (ICT for innovation and IT-based service industries) <ul style="list-style-type: none"> • Support growth of IT-based service industries • Programs for innovation and ICT applications development • Innovative ventures, including clean technology • Knowledge sharing on early stage development and innovation • Transform (ICT applications to transform services for increased development results) <ul style="list-style-type: none"> • Scale up applications for service delivery and accountability • Strengthen policy and business environment for applications

2.33 **IFC's strategic framework was consistent with the World Bank Group ICT Strategy, while MIGA's strategies have paid little attention to ICT.** IFC has articulated a vision: to “create opportunity for people to escape poverty and improve their lives” (IFC's Vision, Value and Purpose), primarily through sustainable private sector investments. Support to ICT is subsumed under IFC's strategic pillar *addressing constraints to private sector development through investments in infrastructure, health, and education*, and it has also designated ICT as a strategic, high-impact sector.³ MIGA's strategies did not identify ICT as a strategic sector and did not specifically focus on the sector, but in 2010 MIGA developed a strategy to guide its business development in the sector.

2.34 **The quality of IFC's strategy formulation with respect to ICT improved over time.** IFC strategies prepared early in the period presented support to ICT in general terms and did not articulate well the development rationale for IFC's support to ICT. IFC's engagement was presented as a business opportunity as developing countries restructured their telecommunications sectors. Beginning with “IFC Strategic Directions FY08-10: Creating Opportunity” (IFC 2007), the rationale for IFC engagement in the sector – as a catalyst for growth – became more explicit. IFC's strategy also recognized ICT's potential to enhance the reach and quality of services and to promote equity and integration of marginalized groups.

2.35 A concept note for the updated ICT Sector Strategy now in preparation indicates three main directions for World Bank Group support: connect (expand affordable access, including through support to policy and reform and through investment in infrastructure); innovate (use ICT for innovation across the economy and promote the growth of ICT industries); and transform (use ICT applications to transform how sectors operate and how services are delivered to enhance development impact). It is noteworthy that the objectives of “Connect-Innovate-Transform” (World Bank Group 2011) have evolved from the previous strategy and do not represent a new direction; however, the new strategy aims to pursue a stronger focus on ICT as an enabler of transformation.

Conclusions

2.36 Over the past decade developing countries have seen rapid although uneven growth in access to and use of ICT. Progress has been noteworthy in mobile phone networks, where the gap between developing and developed countries is narrowing rapidly. Growth in connectivity has been underpinned by reforms in the sector, particularly by promoting competition. But large and growing gaps exist in high-speed Internet and broadband

access, development of local IT industries, and diffusion and use through ICT applications, the areas where ICT can deliver the largest social benefits. The World Bank Group has been a small but active player in the global ICT market. Its interventions have focused on promoting (i) sector reform, (i) access, (iii) ICT skills, and (iv) ICT applications.

3. The Bank Group's Evolving ICT Portfolio

Bank Group Support for ICT

3.1 **The Bank Group has played a catalytic role in the ICT sector, but in dollar amounts it is a small financier in the global ICT market.** During FY03-10, the World Bank Group provided \$4.2 billion in support to projects in the ICT sector, equal to about 1 percent of the \$401 billion of private investment in developing countries' telecommunications sectors between 2003 and 2009. Notwithstanding the dollar amounts committed, Bank engagement in support of reform (through lending and nonlending activities) has been significant, covering 92 countries. The share of Bank Group support relative to global investment in ICT reflects the Bank Group strategic decision to focus on policy reform to enable private sector investment in network operators. The Bank Group has been the largest multilateral financier in developing countries in the ICT sector, followed by the European Investment Bank (with €2.8 billion in commitments).

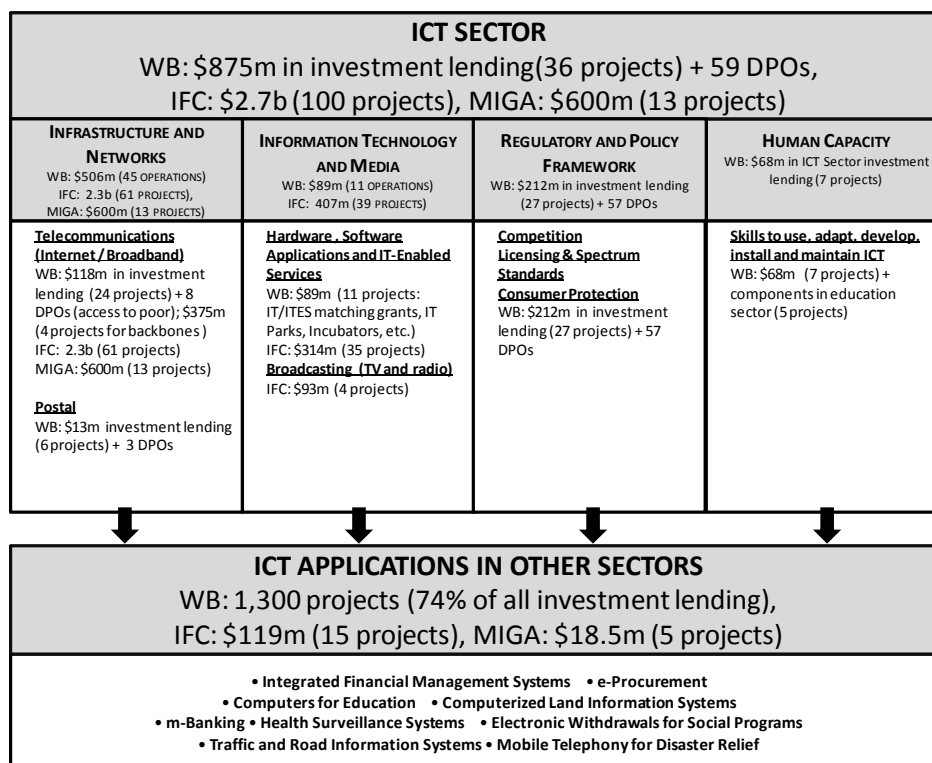
3.2 **The World Bank, IFC, and MIGA have clearly defined rules of engagement in ICT** and have largely focused their support on their respective areas of comparative advantage during the period. World Bank support focused on deepening ICT sector and institutional reform and helping address gaps due to lack of commercial viability, such as access to the poor and underserved and broadband backbone infrastructure links. The Bank's role derived from its ability to influence policy and support reforms, combined with expertise in working with governments on ICT issues. There was also a strong rationale for a role of the World Bank Group in supporting ICT applications, based primarily on its expertise in public sector governance reform and in sectors such as education and health. IFC and MIGA, in line with their mandates, focused on supporting private investment, primarily the rollout of infrastructure for mobile phone networks.

Evaluation Essentials

- ❖ The World Bank Group is a small financier in the global ICT market.
- ❖ The number of World Bank Group operations supporting ICT has declined overall, but investment amounts have risen.
- ❖ Bank Group nonlending activities were significant during the period.
- ❖ Most World Bank support focused on deepening regulatory and institutional reform.
- ❖ Since FY03, 74 percent of World Bank investment projects in sectors other than ICT had ICT elements.
- ❖ World Bank ICT nonlending activities, especially technical assistance, increased throughout the period.
- ❖ IFC investments in ICT rose, but its exposure has remained modest, focused mainly on mobile networks.
- ❖ IFC advisory services in ICT have been limited but have been growing.
- ❖ About half of IFC advisory services in the sector were for IT applications.
- ❖ MIGA, too, has focused on mobile phone operations.

3.3 World Bank Group support to ICT focused on fostering private sector investment. Between FY03 and FY10, IFC's \$2.3 billion and MIGA's \$600 million support to private sector investments in telecommunications companies made up the largest portion of the World Bank Group's funding in the ICT sector. World Bank lending for the ICT sector (\$875 million)⁴ focused on regulatory and sector reform, supporting backbone infrastructure and access to the poor and underserved. However, the World Bank was predominant in support to ICT applications, driven by ICT components in projects supporting public sector governance, education, and health, among others. Figure 10, which guides the discussion in this chapter, indicates the areas of World Bank Group activities during FY03-10.

Figure 9. World Bank Group Support for the ICT Sector and ICT Applications (Lending, Investment, Guarantees)



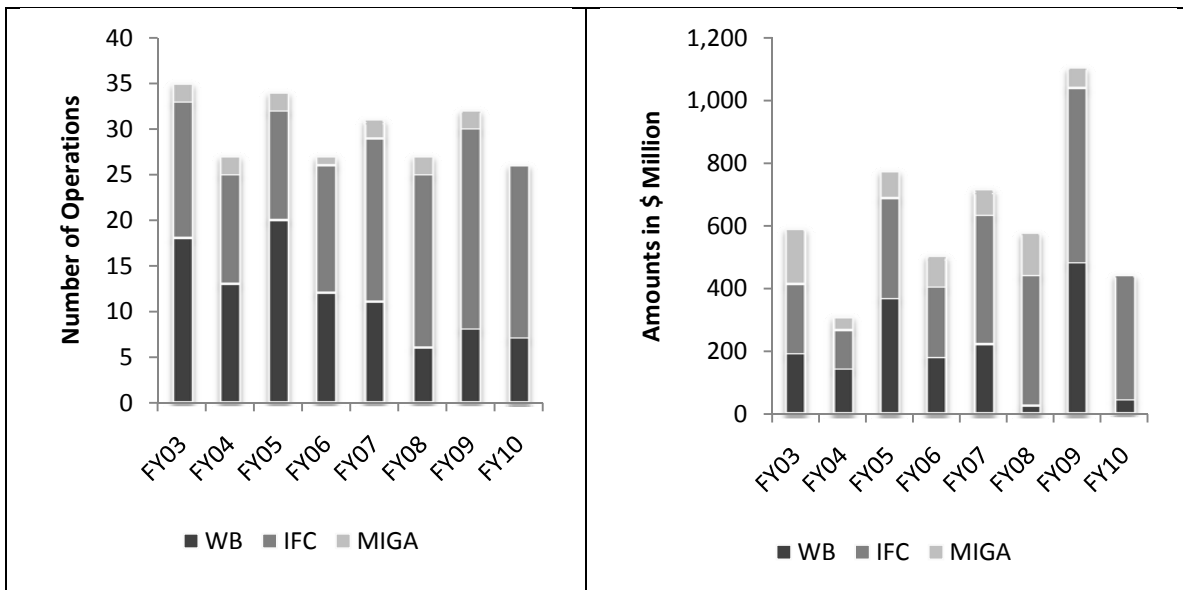
Source: IEG ICT database.

Note: DPO = Development Policy Operation.

3.4 The composition of the Bank Group's ICT portfolio has shifted with evolving technology and changes in market structure. As the role of the private and public sectors have evolved, so too have

the Bank Group's activities in ICT. The total number of Bank Group lending operations supporting the ICT Sector declined during the evaluation period. The overall decrease was driven by a decline in World Bank ICT policy and sector reform operations, but it was partly offset by increases in both nonlending technical assistance and IFC ICT investments (number and volume), signifying the changing role of the Bank Group in the sector (Figure 10).

Figure 10. World Bank Group Portfolio in the ICT Sector Is Shifting from Public to Private Sector Activities



Source: IEG ICT database.

Note: The figures for the World Bank include the number of both investment and development policy lending operations (95 approved from FY03 to FY10), but include the amounts for ICT investment lending only (in the case of multisector projects, the amounts included correspond to the ICT component or subcomponent). The amounts for development policy lending are excluded, because these operations support many sectors in addition to ICT.

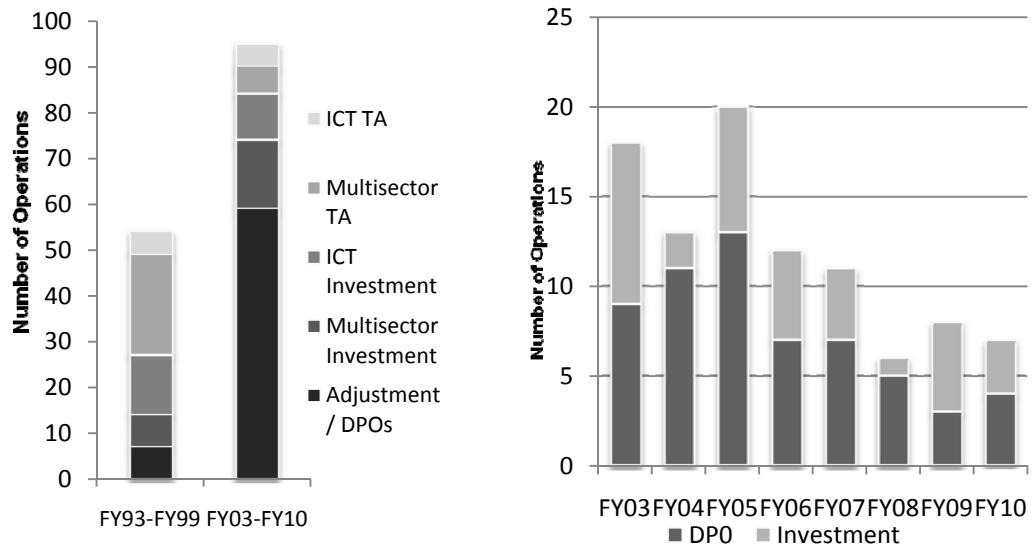
World Bank Group Portfolio in the ICT Sector

WORLD BANK ICT SECTOR LENDING

3.5 **The type and volume of World Bank support to the ICT sector evolved during the FY03-10 period.** The number of approved projects for the period involving ICT increased from 54 during FY93-99 to 95 during FY03-10 (representing 4 percent of all operations). Lending volume to the sector declined from an average of \$210 million per year during FY93-99 to \$109 million per year during FY03-10; total lending in ICT during the period was \$875 million—

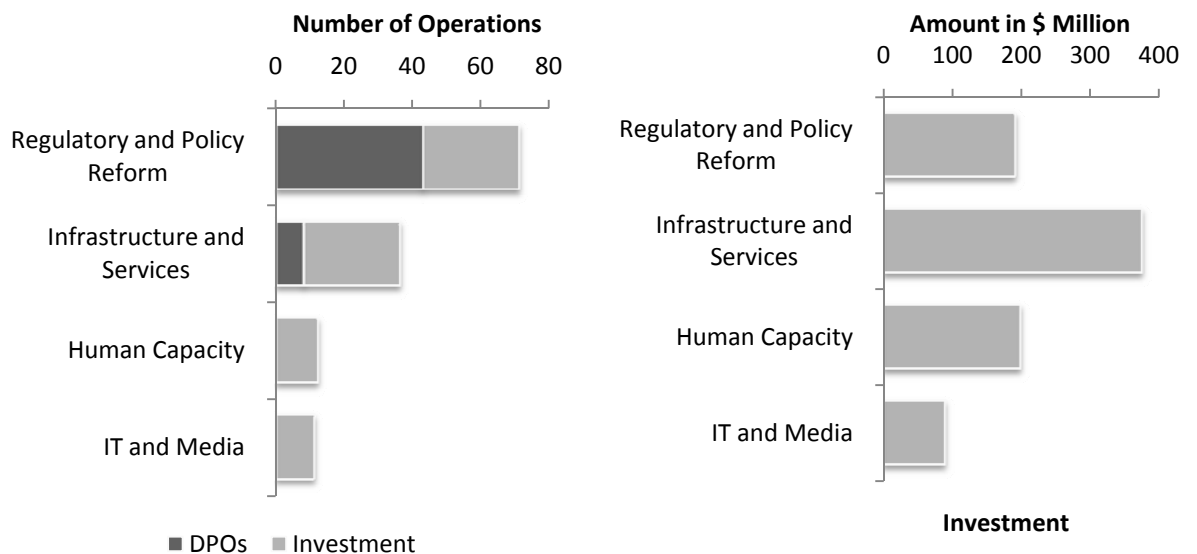
\$676 million in stand-alone ICT operations and \$199 million in ICT components of multisector operations. This increase in multisector

Figure 11. While the Total Number of ICT Projects Increased Overall in FY03–10, There Has Been a Declining Trend since FY06



Sources: IEG ICT database and IEG (2001).
Note: Total number of World Bank operations: 95 (approved from FY03 to FY10).

Figure 12. World Bank Operations Have Focused on Issues of Competition and Regulation



Source: IEG ICT database.
Note: Total number of operations: 95 (approved from FY03 to FY10).

operations (84 percent of the total) was the result of a dramatic rise in the use of development policy operations (DPOs) compared with other instruments (DPOs represent 62 percent of the total; Figure 11).

3.6 World Bank support focused largely on deepening ICT sector regulatory and policy reform. This was in line with the strategic directions laid out in the 2002 ICT Sector Strategy, which was intended to ensure sustainability and effective development of competitive ICT markets (Figure 12).

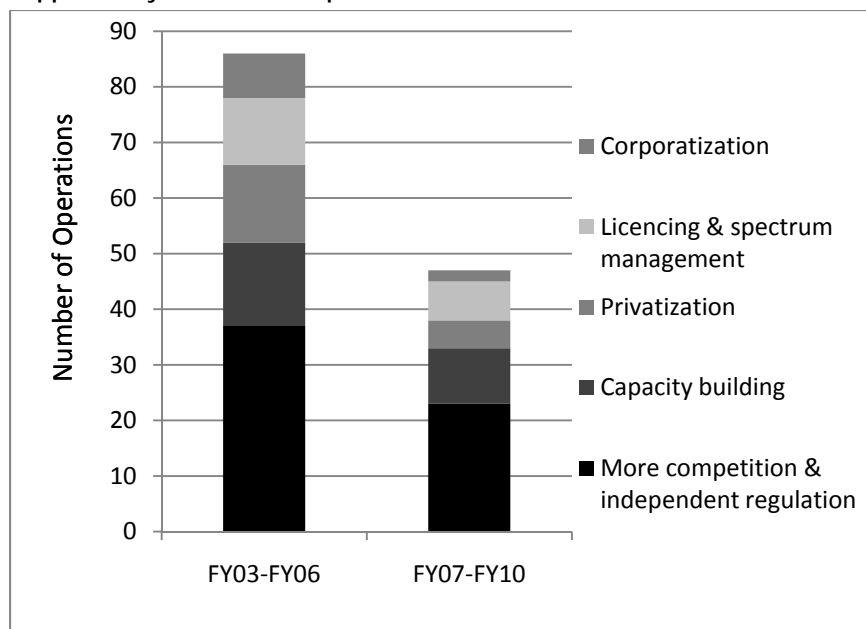
3.7 World Bank ICT reforms addressed issues and challenges relevant to developing countries. At the beginning of the evaluation period, a significant number of developing countries had yet to undertake reforms to make ICT regulation more transparent and ICT markets more competitive (for example, 50 countries lacked a separate regulator and 60 had a monopoly or only partial competition in mobile services). Given these circumstances, the World Bank supported a large number of operations that helped implement regulatory and policy reforms (more than 60 percent of all ICT sector operations) in line with the priorities of the countries. More than 50 percent of this support was through development policy lending and the rest was through investment lending. Because developing countries increasingly adopted transparent regulatory frameworks and competitive market structures over the review period, there was less need for World Bank operations to support these objectives in the later part of the evaluation period (FY07-10) (Figure 13).

3.8 Support for capacity building was a priority for World Bank lending in the sector, but that support declined through the evaluation period. About 34 percent of all ICT sector operations supported this, including technical assistance, training, secondments, and studies. There was a declining trend during the period as more developing countries strengthened their independent regulatory function and fewer World Bank operations were needed (see Figure 13). The decline, however, was less than for other objectives, as 15 of these operations (44 percent) were approved between FY07 and FY10.

3.9 World Bank support for privatization declined sharply. Although a large proportion of countries had privatized their ICT sector by the start of the period (47 percent), a substantial number of them still had state-owned telephone operators, most of them in countries where the environment for reform and liberalization was more difficult. Support for privatization was included in 19 operations (almost 30 percent). This was a sharp decline from the

earlier evaluation period, in which 42 operations (76 percent) supported this objective.

Figure 13. The Number of ICT Sector Regulatory and Policy Reform Objectives Supported by World Bank Operations Declined

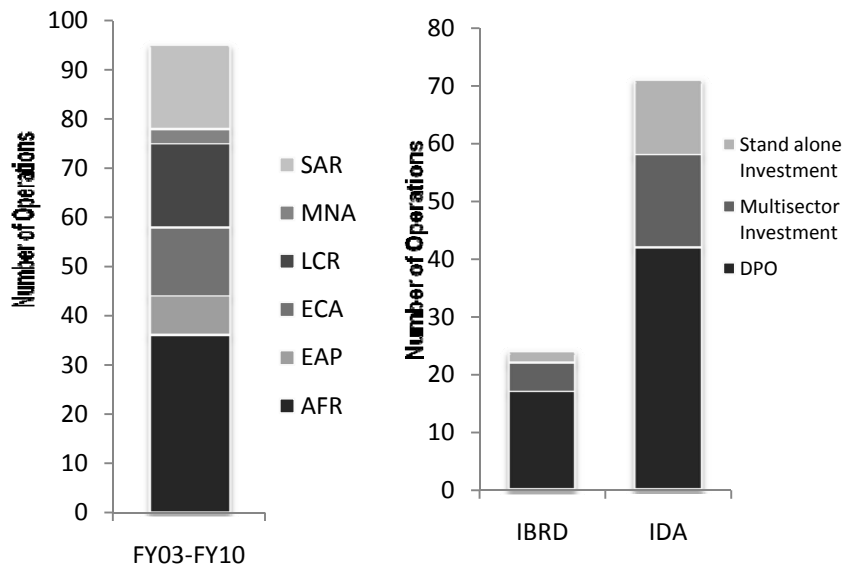


Source: IEG ICT database.

Note: Total number of operations: 95 (approved from FY03 to FY10); 73 if each series of programmatic DPOs are counted as one operation.

3.10 World Bank ICT sector operations were heavily concentrated in the Africa Region and IDA countries during the period. The World Bank supported operations in 61 countries. The concentration of lending in the Africa Region was consistent with the need for ICT sector reform in the countries of Sub-Saharan Africa. This Region accounted for 36 of the 95 ICT operations during the period for \$491 million of the total ICT commitments of \$875 million.⁵ Because a large number of middle-income countries had reformed their ICT sectors during the 1990s, ICT sector operations were focused on IDA countries, representing 81 percent of commitments (compared to 42 percent of World Bank investment lending) and 75 percent of all operations during the period (Figure 14).

Figure 14. Heavy Concentration of World Bank ICT Operations in the Africa Region and in IDA Countries



Sources: IEG ICT database.

Note: Total number of World Bank operations: 95 (approved FY03-10). SAR = South Asia; MNA = Middle East and North Africa; LCR = Latin America and the Caribbean; ECA = Europe and Central Asia; EAP = East Asia and the Pacific; AFR = Africa.

3.11 As the private sector led in providing ICT infrastructure and services, the World Bank focused its support in this area on helping to address market failures such as missing links for broadband backbone infrastructure and access to the poor and underserved.

For the latter, the World Bank used a combination of sector reform and universal service programs. The 2002 ICT Strategy recommended universal access packages under the theme of increasing access to information infrastructure. Subsidy policies or universal access programs, for equity reasons, are meant to help establish a minimum level of connectivity. Policies aimed at increasing ICT access in areas where commercial providers would not do so on their own (in poor or remote rural areas, for example) were supported by 32 operations, or 34 percent of the total. Most of the support (24 of the 32 operations) was through investment lending to entice the private sector through minimum subsidies to extend the infrastructure to remote or poor areas; this support also included technical assistance for designing and implementing universal access policies. Support for this objective declined over the period, as 21 of the 32 operations were approved before FY07.

3.12 Major national and regional backbone networks became a new area of Bank ICT support during the period. As developing countries have rapidly adopted mobile phones and narrowed the digital divide in voice communications, demand for high-capacity/high-speed broadband networks has also grown. Broadband networks are critical for high-bandwidth services and value-added services over cellular networks. Under the premise that broadband networks are essential for growth, many African countries are giving priority to increasing the availability and affordability of broadband services. The World Bank supported projects in 10 African countries during the evaluation period, using public-private partnership approaches. The first regional communications infrastructure project was for Burundi, Kenya, and Madagascar (RCIP 1), approved in FY07. RCIP 1 seeks to complement regional undersea cables, such as the Eastern Africa Submarine Cable System (EASSy), developed with assistance from the World Bank and other development partners, including an IFC investment and advisory services.

3.13 The World Bank has given limited support to the development of the IT sector and IT-enabled services. As developing countries such as China and India made inroads in the IT sector and IT-enabled services, other developing countries wanted to follow suit and sought World Bank support. This effort was small and accounted for approximately one operation per year – a total of 11 projects or project components (\$89 million) during FY03-10. According to the 2002 ICT Sector Strategy, IFC and the Information for Development (InfoDev) program⁶ – not the World Bank – were expected to expand efforts to stimulate private sector investment and public-private partnerships in this area. The case for World Bank support of these industries has been justified based on market failures – for example, in establishing public-private partnerships.

3.14 Despite being a pillar of the 2002 ICT Strategy, support to the development of ICT skills has been limited. To be able to reap the benefits from ICT, people in developing countries need the skills and capacity to use, adapt, develop, install, and maintain it. The World Bank provided little lending in this area during the evaluation period – 12 projects for a total of \$198 million had components or subcomponents aimed to develop ICT-related skills. Some nonlending initiatives supported ICT skills development as outlined below.

WORLD BANK NONLENDING ACTIVITIES

3.15 Analytic and advisory activities (AAA) were an important Bank instrument to support ICT sector objectives. Between FY03 and FY10, the Bank completed 410 AAA products for ICT in 91 countries at a total cost of \$45 million, for an average of \$111,000 per task. The majority of these were Bank-funded activities, but a portion was financed by trust funds (for example, 53 AAA products were financed by the Public-Private Infrastructure Advisory Facility, or PPIAF). The ICT unit delivered most AAA (62 percent).⁷ Delivery of ICT AAA increased throughout the period, especially nonlending technical assistance (51 percent of AAA), while economic and sector work (16 percent of AAA) declined. This trend was consistent with World Bank Group priorities identified in the 2002 ICT Sector Strategy with respect to the development of a series of knowledge resources for its clients, as well as for the Bank Group's work in the sector.

3.16 Most ICT AAA supported institution building and informed policy in a wide range of key ICT aspects. The majority of nonlending technical assistance (TA) was used to develop or strengthen institutions (87 percent) and to assist clients to implement policies or programs (53 percent). Most economic and sector work (ESW) sought to inform government policy and to inform or stimulate public debate. Thematically, as in the case of lending, the largest proportion of AAA (51 percent) supported ICT policy, regulatory and competition issues. ICT AAA was also an important instrument to build capacity of ICT regulators and other institutions (40 percent). AAA was also used to support the development of country ICT strategies (26 percent) and emerging issues such as spectrum management, convergence, backbones/broadband networks and public-private partnerships (17, 16 and 11 percent respectively). ICT skills development was supported by 9 percent of the AAA through programs such as the New Economy Skills for Africa (NESAP) which is testing new approaches and partnerships between universities and the ICT industry.

3.17 AAA were concentrated in IDA countries, and the largest number of activities was in Africa. There were 110 AAA in Africa, above the Region's share in all AAA (27 percent of ICT AAA compared to 20 percent of all AAA). A large share of activities (19 percent) were not linked to a specific country or region, including knowledge management products and training activities that are delivered across regions and on worldwide or on non-region-specific

topics. The majority of ICT AAA (62 percent) benefited IDA countries, since a large number of middle-income countries had already reformed their ICT sectors. The World Bank also supported reimbursable TA in Egypt, Saudi Arabia, and Thailand, among others.

IFC ICT SECTOR

3.18 IFC investments in the ICT sector⁸ increased during FY03-10 and its telecommunications investments were countercyclical.

During the period, IFC approved 100 investment projects in the ICT sector for a total commitment of \$2.7 billion. These were distributed between telecommunications projects (\$2.257 billion) and IT/media projects (\$407 million). In telecommunications, the pattern of IFC's portfolio was countercyclical compared to global telecom investments in developing countries. This pattern was particularly evident following the bursting of the speculative dotcom bubble in early 2000. Commitments for ICT peaked in FY09 at \$558 million – more than twice the amount committed in FY03.

Box 2. IFC Investments in the ICT Sector Aimed to Address Multiple Output Objectives

Along the results chain (see Figure 2) IFC's investments in the ICT sector translate into several key outputs of projects highlighted in IFC Board documents. Overall, IFC's telecommunications projects have sought to enhance connectivity through establishment, expansion, or upgrade of telephone services, increase geographic coverage, and increase access to lower-income segments of the population; enhance affordability; increase competition; provide direct and indirect employment; foster the development of peripheral industries and small and medium enterprises; and leverage private sector investment.

IT/media projects have aimed to foster growth and local markets through support to IT companies and strengthening of local IT industries, allow countries to move into services that add higher value, foster technical innovation, create highly skilled jobs and support transfer of know-how, offer demonstration effects, and contribute to efficiency of businesses and government functions.

Source: IEG project reviews.

3.19 **Despite this growth trend, IFC exposure in the ICT sector has remained modest.** As a share of IFC commitments, ICT accounted for 5 percent of investments by volume (and 6 percent by number of projects) during FY03-10. Considering the overall cost of ICT projects

(equivalent to \$16 billion, on average), IFC supported 6 times the amount invested on its own account.

3.20 Investments in mobile telephony were the largest and fastest-growing ICT subsector for IFC – commitments more than doubled between FY03 and FY10, from \$180 to \$370 million. By comparison, investments in IT/media averaged only \$49 million per year over the period, for a total \$407 million (Figure 15).

Figure 15. Growth in IFC's ICT Portfolio Is Driven by Mobile Telephone Sector

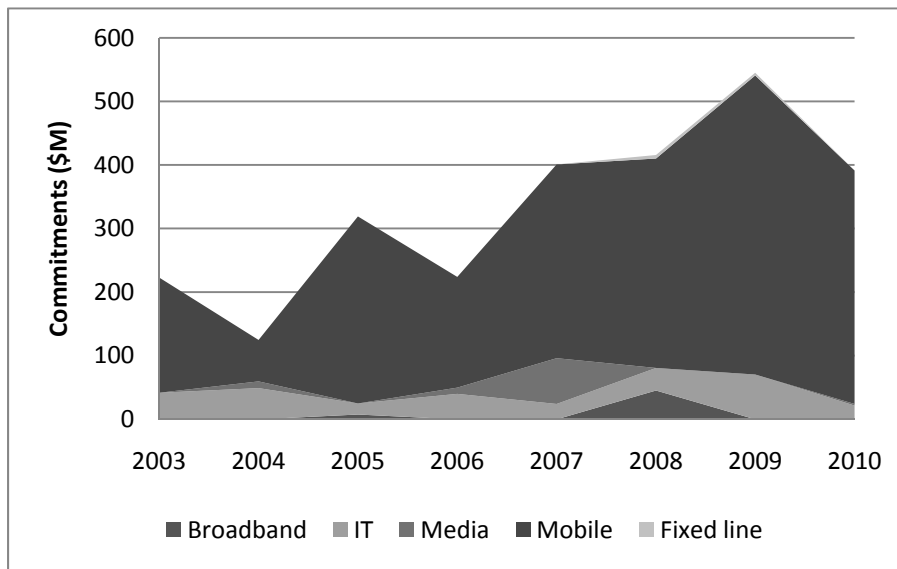
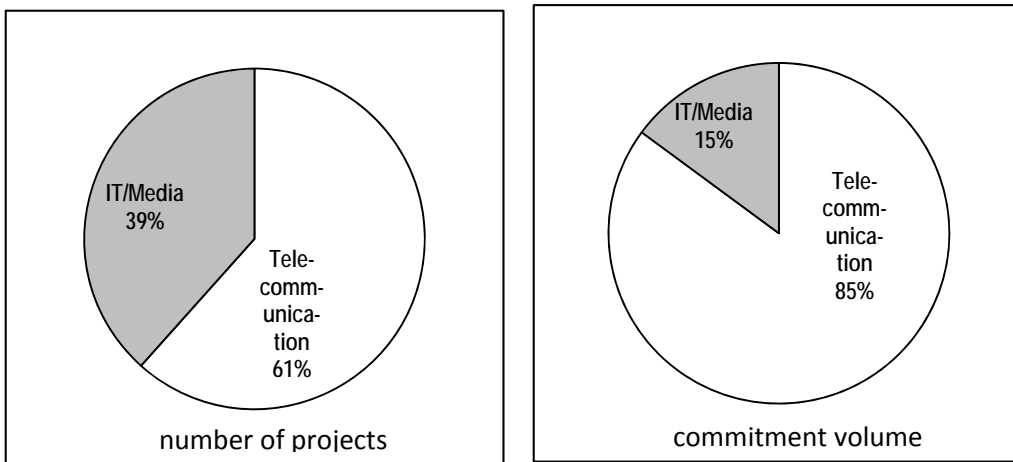


Figure 16. IFC Investments in ICT, FY03–10, by Number of Projects and Commitment Volume

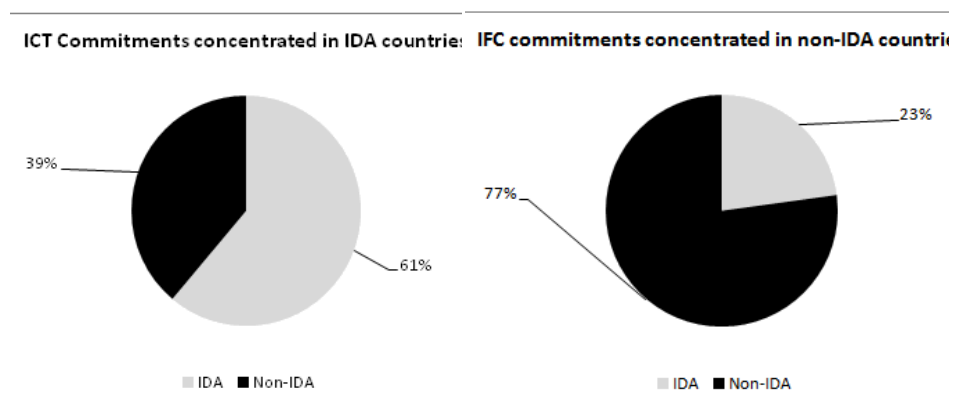


3.21 Investments focused largely on the rollout of mobile networks. Telecommunications projects – primarily in mobile

telephony – accounted for 85 percent of commitments over FY03-10. Thus, IFC's activities focused mainly on enhancing access to communications infrastructure. IT and media projects accounted for a relatively modest share of ICT commitments (15 percent), but they represented a sizable share of ICT projects (39 percent). They included a wide range of activities, such as IT system design and integration and related services, IT-enabled services such as business process outsourcing, Internet access and content provision, and media (Figure 16).

3.22 IFC investments in the ICT sector were heavily concentrated in IDA countries. IFC's ICT commitments in IDA-eligible countries represented 61 percent of total ICT investments, compared with 23 percent for IFC investments overall during the period (by number of projects: 53 percent and 31 percent, respectively). This is indicative of IFC's move into more difficult and riskier markets, taking advantage of increased investment flows and investor interest in Africa and markets such as Papua New Guinea and Haiti. It also indicates that IFC has been focusing on markets where it has a more clearly defined role, providing finance and comfort to investors in more unstable business environments. The share of ICT investments in IDA countries rose from 38 percent in FY03 to 71 percent in FY10. By comparison, IFC investments overall were mainly focused on non-IDA countries (Figure 17).

Figure 17. IFC's ICT Investments (FY03-10) Are Concentrated in IDA Countries, in Contrast to IFC's Overall Portfolio



3.23 Sub-Saharan Africa was the largest host Region for investments in the ICT sector during FY03-10. Africa received 29 percent of commitment volume in the ICT sector and 22 percent of the

projects. In commitments, the Region was followed by South Asia, Europe and Central Asia, and Latin America and the Caribbean. The shares of ICT activities in the South Asia and Europe and Central Asia Regions declined over the period, while those of Africa and, to a lesser extent, East Asia and the Pacific increased (Figure 18). The increased focus on Africa mirrored global investment trends in telecommunications, which grew strongly during the 2000s.

Figure 18. Regional Breakdown of IFC ICT Investments (FY03-10)

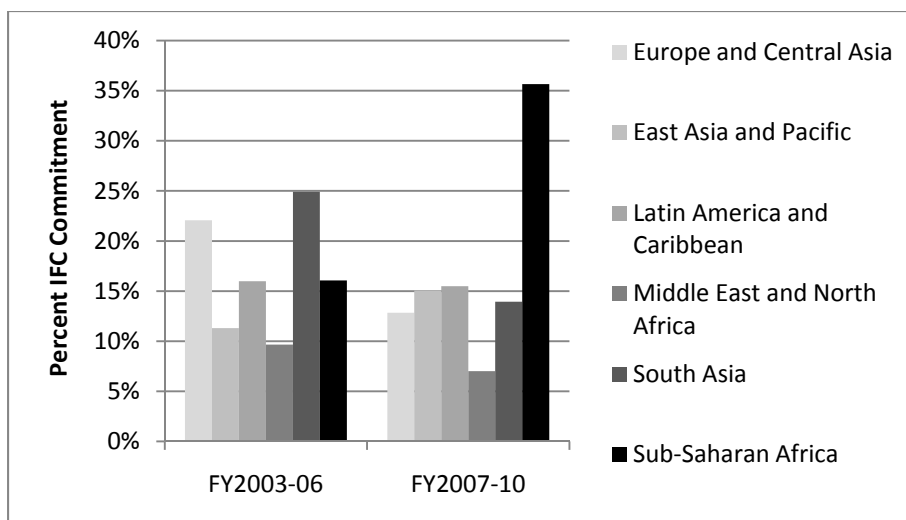


Table 1. Distribution of IFC Advisory Services for ICT

<i>Advisory service activity</i>	<i>Total funding (USD millions)</i>	<i>Project count</i>
Regulatory framework	7.8	8
Infrastructure/connectivity	5.5	15
Diagnostics	2.5	9
ICT services/applications	10.5	30
Incubator	4.9	6
IFC internal	0.1	1
Grand total	31.3	69

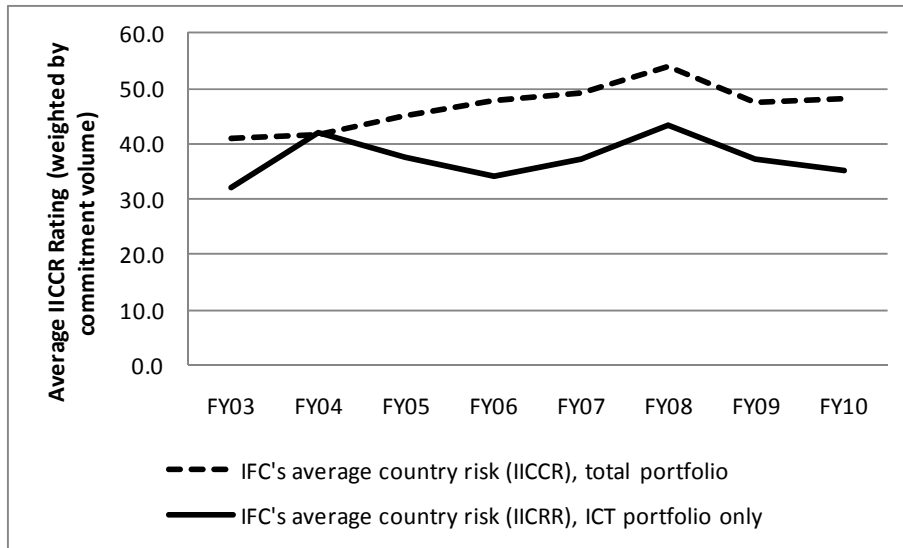
3.24 Advisory services in support of the ICT sector included advice on privatization of telecommunication incumbents, regulatory frameworks, connectivity, and diagnostic studies. During FY03-10, IFC undertook 69 advisory services activities related to the ICT sector and ICT applications for total funding of \$31.3 million (Table 1). Fifteen projects were linked to improving ICT sector infrastructure and

connectivity in client countries, including supporting (i) the implementation of the Eastern Africa Submarine Cable System (EASSY) project through feasibility, legal, and regulatory studies; and (ii) replication of the Village Phone Program to enhance rural connectivity, providing support to client companies in Madagascar, Malawi, Nigeria, and Uganda.

3.25 IFC has a role in the ICT sector, especially in higher-risk, poorer countries. IFC's support to ICT has been more concentrated in IDA countries and Sub-Saharan Africa compared with private investment flows, indicating that it has been important to developing these markets, responding to demand from investors. In FY07, IFC's commitments in IDA countries leveled off, perhaps due to the high liquidity in credit markets for developing countries at the time. Between FY07 and FY09, IFC commitments to IDA countries almost doubled, at the same time the global financial crisis caused credit markets to freeze, making financing more difficult to obtain for projects in the developing world. This indicates that IFC likely had a greater role in IDA countries during the crisis.

3.26 IFC's ICT investments have been in riskier markets than IFC's overall portfolio. The risk profile of IFC investments in ICT, as represented by the Institutional Investor Country Credit Rating, has been consistently below (worse than) IFC's overall risk profile, indicating that IFC has been active in countries with more difficult business environments. The average country risk for IFC ICT investments improved from FY06 to FY08, even as IFC was focusing increasingly on poorer and more difficult markets in Africa and other frontier markets, reflecting improved macroeconomic and business conditions in many developing countries (Figure 19).

Figure 19. Average Country Risk Ratings for ICT Projects Worse than IFC's Average



MIGA ICT SECTOR

3.27 **Like IFC, MIGA's activities in the ICT sector have largely focused on supporting mobile phone operators.** MIGA has supported private sector investments in the ICT sector through political risk insurance. MIGA's guarantee volume in the sector peaked in FY02, and during the period reviewed has remained modest. In all, MIGA issued guarantees for \$600 million for 13 projects in the ICT sector between FY03 and FY10, accounting for about 5 percent of the total guarantee volume and 7 percent of guarantee projects. Projects in mobile telephony, covering aspects of mobile licenses, accounted for 97 percent of guarantee volume. In FY09 and FY10, MIGA did not support any ICT projects.

3.28 **MIGA's portfolio in the ICT sector has been heavily concentrated in IDA and conflict-affected countries,** an important shift compared with the previous decade. Consistent with MIGA's strategic priorities, the ICT sector portfolio shifted heavily toward IDA (83 percent in volume) and conflict-affected countries (55 percent) during the evaluation period, in stark contrast to MIGA's overall portfolio.⁹ Furthermore, the regional distribution of MIGA's ICT sector portfolio evolved from a focus on Latin America and the Caribbean and Europe and Central Asia toward Africa (63 percent) during FY03-10, also a much higher concentration than for MIGA overall (16 percent of guarantee volume). A majority of MIGA's guarantees in ICT during the period have supported investments originating from developing countries ('south-to-south' investments).

World Bank Group Portfolio in ICT Applications

3.29 World Bank support for ICT applications has been extensive. Approximately 74 percent of Bank-financed investment projects approved during the evaluation period (about 1,300) have included ICT as a component, subcomponent, or within components in these operations.¹⁰

3.30 ICT is used at all levels of the results chain in Bank-funded projects in non-ICT sectors. In some cases ICT is used as a major element to achieve the overall project development objective – for example, a procurement reform project that aims at increasing, through electronic procurement, the efficiency, effectiveness, accountability, and transparency of government procurement. In other cases ICT is only one of the many outputs of a project – for example, a solid waste management project that aims at improving the sanitary conditions of a city. This project includes ICT for improving the solid waste authority's billing and collection system. While ICT will help ensure financial sustainability, the implementation of the billing and collection system is one of the many outputs of the project. In other cases ICT plays a minor role, and if the ICT component or subcomponent were dropped, it would have no impact on the project development objectives.

3.31 ICT is most prevalent in public sector governance. Support of ICT applications was another of the strategic directions of the 2002 ICT Sector Strategy. The Bank was expected to provide such support by continuing to include ICT as components of projects, especially in education, health, finance, small business development, and public sector management. The review of investment projects approved since FY03 found that 98 percent of public sector governance projects included ICT components or subcomponents. In this sector, ICT has been used in many ways, including public financial management systems, tax administration systems, e-government, personnel management systems, and e-procurement.

3.32 ICT applications have also been included frequently in education projects. Of all education projects, 81 percent included an ICT component, subcomponent, or ICT within a component. ICT was used for ministry information systems, as a pedagogical tool, as part of the curriculum for developing sector-specific skills and capacities at the secondary and post-secondary levels, for distance learning, for education assessment, and for teacher training. ICT has also been used to increase productivity, especially in the agriculture sector (81 percent of the projects), in which ICT could be used to improve

communications between farmers and suppliers and help farmers manage their supply chains more efficiently. The financial and private sector development sector (FPD) was another intensive user of ICT – 78 percent of Bank FPD operations contained ICT components, subcomponents, or ICT within components. ICT has been used as a component, subcomponent, or within components in at least 50 percent of the projects in other sectors (Table 2).

3.33 Despite the frequent occurrence of ICT applications, only a few sector strategies have included ICT. Although ICT occurred often in operations in other sectors and the 2002 ICT Strategy highlighted the importance of integrating ICT applications into Sector Strategy Papers, only a few such papers issued during the evaluation period did so. The evaluation reviewed all 17 sector strategies or implementation updates issued during FY03-10; 12 of them considered the potential role of ICT in fostering development goals, although most of them did so only to a limited extent. The other five sector strategies did not include ICT at all.

3.34 ICT applications have remained a small area for IFC. IFC has only recently begun supporting IT applications, mainly focusing on mobile banking, other payment systems, and education. Mobile applications have been highlighted as an area of growth for IFC since FY09 as part of its corporate strategy and with the establishment of a practice group focused on mobile banking.

3.35 Support to IT applications and the IT services industry accounted for just above half of IFC's advisory services in ICT. It included diagnostic studies as well as advisory activities in e-commerce (such as in tourism, local marketplaces, business-to-business directory), IT services companies, and IT-related business associations. More recently IFC's advisory services have focused on supporting the development of mobile-banking. In 2008, InfoDev started an incubator program aimed at developing a replicable ICT Center/Business Incubator model that could be piloted and, if successful, replicated. Advisory services activities in this area were initiated in Mozambique, Nicaragua, and Senegal.

3.36 MIGA issued five guarantees for ICT applications in the services and financial sectors during the period for a total guarantee amount of \$18.5 million. These aimed to support the development of IT solutions in government agencies (in Kenya and the Former Yugoslav Republic of Macedonia) and the development of electronic and mobile payment solutions (Rwanda, Sierra Leone, South Africa).

Most of these guarantees have been issued under MIGA's Small Investment Program.¹¹

Table 2. ICT Applications in the World Bank Investment Lending Portfolio (approved FY03-10^a)

Sector	Number of projects	Number of projects with ICT components/ subcomponents	Percent of projects with ICT components/ subcomponents
Public sector governance	108	106	98
Education	163	141	87
Agriculture and rural development	317	258	81
Financial and private sector development	106	83	78
Health, nutrition, and population	184	144	78
Social protection	104	75	72
Urban development	137	96	70
Transport	222	144	65
Water	131	77	59
Energy and mining	167	94	56
Other ^b	117	84	72
Total	1,756	1,302	74

Source: IEG ICT database.

a. The investment lending portfolio for FY10 included projects approved during the first two quarters, because there were project documents available at the time of the review.

b. Environment, Social development, economic policy, global ICT, financial management, poverty reduction, procurement.

Conclusions

3.37 The World Bank has an important role to play in regulatory reform and ICT applications and a supplemental role in infrastructure and telecommunications services to address market failures and to catalyze investment in difficult markets. Bank Group support to ICT skills development has been small, even though it is a strategic priority.

3.38 The majority of telecommunications investment over the past decade was undertaken by private (foreign) investors without a need for IFC or MIGA support. IFC and MIGA focused their support in riskier frontier markets in IDA and conflict-affected countries, indicating a role derived from the (at least initial) risk averseness of

investors in entering frontier markets and in dealing with emerging regulatory systems in host countries.

3.39 However, diffusion and use of ICT in the productive sectors (such as commerce and banking) are not being addressed systematically by the World Bank Group, even though ICT use by enterprises in developing countries is lagging behind that in developed countries.

4. Promoting Reform and Access: Results of World Bank Group Activities in the ICT Sector

4.1 This chapter presents findings on the results of Bank Group activities in the ICT sector. IEG assessed the performance of Bank Group support in the sector using the instruments described in chapter 1. Details of the methodology are in appendix A.

4.2 The analysis finds that the Bank Group has made effective contributions in ICT sector reform where government commitment was strong, and it succeeded in helping to foster private sector investment in mobile networks. Targeted operations specifically designed to increase access to the underserved and poor, beyond what commercial providers were willing to do on their own, were less effective in achieving their objectives than those designed to foster general policy reform and private sector investment.

Regulatory and Policy Reform

4.3 **Over the past decade, developing countries have made strides in reforming their ICT sectors, but the reform agenda is not yet complete.** An increasing number of countries now have separate telecommunications regulators and privatized fixed-line operators, and the number of countries with competitive markets for mobile phone services has increased. Yet, as Figure 20 shows, the policy and sector reform agenda is not complete. Substantial gains could be achieved by countries that have lagged behind in reforming their ICT sectors. It is estimated that in Africa, for example, the private sector could increase wireless voice coverage to reach 83 percent of the population (up from the current 44 percent) if an efficient competitive environment were established (World Bank 2010a).

4.4 **The World Bank Group has used a mix of instruments to support regulatory and sector reform and IEG has adapted its methodology to assess the range of instruments.** Bank Group support

Evaluation Essentials

- ❖ World Bank–supported regulatory and sector reforms were relevant, and 60 percent achieved their expected results.
- ❖ Poor performance was usually attributable to weak monitoring and follow-up.
- ❖ Success with privatization was assisted by strong government commitment and a realistic scope and timetable for reform.
- ❖ Where the World Bank Group supported ICT, the speed of mobile telephone penetration was greater than in countries without such support.
- ❖ Bank investments directly aimed at extending ICT coverage to underserved areas had a poor record.
- ❖ Three-quarters of IFC projects that focused on enhancing connectivity achieved their goals for access and use of telecommunications services.
- ❖ MIGA's experience illustrates the regulatory and political risks in the ICT sector.
- ❖ IFC-supported projects designed to be pro-poor have had moderate success.
- ❖ Coordination between IFC and the Bank has improved.

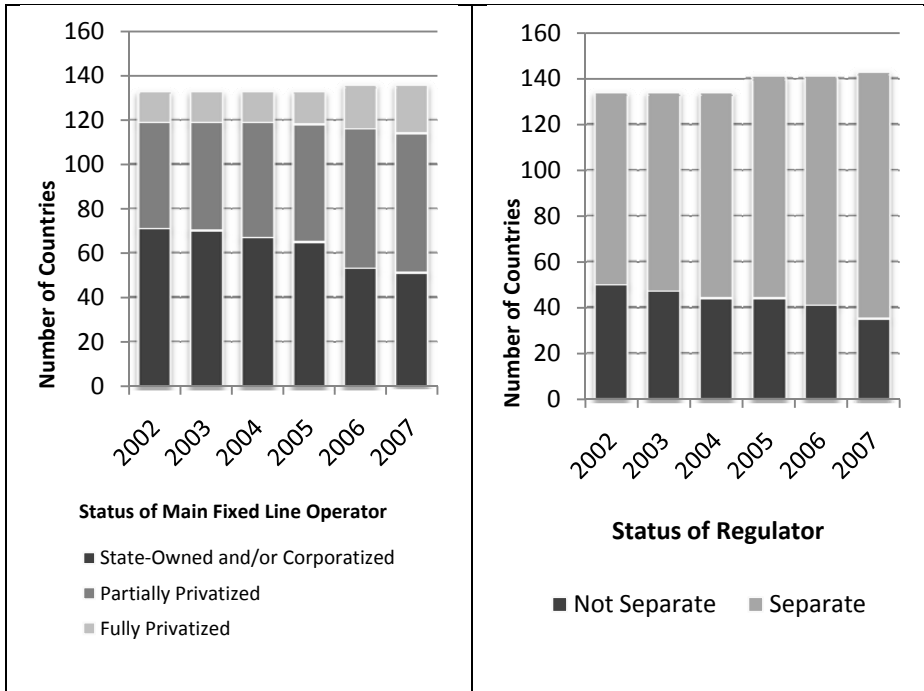
for sector reform and capacity building included 95 Bank lending operations (of which 59 were DPOs), 410 nonlending activities, and 8 IFC advisory services activities. Assessing the performance of Bank Group support to ICT projects entails two methodological challenges. First, the majority of lending operations are multisector (84 percent), and ratings of project outcomes or progress do not necessarily reflect the performance of the ICT component. To address this issue, IEG developed and applied a special methodology to assess the performance of the ICT components. Second, self-evaluation of the performance of nonlending activities is less developed than in the case of lending operations. The evaluation assessed these activities from four angles: (i) an overview of the AAA portfolio, without independently validating each AAA intervention, based on the self-assessments of the extent to which the AAA objectives were met according to Activity Completion Summaries; (ii) review of AAA in conjunction with the review of a sample of ICT lending operations; (iii) within the 20-country review; and (iv) through an econometric analysis of the effect of ICT AAA in competition and the diffusion of mobile telephony.

4.5 Overall, World Bank-supported regulatory and sector reforms were relevant, and 60 percent achieved their expected results.¹² IEG reviewed the achievement of results for a statistically significant sample of lending operations – both stand-alone and multisector operations – that supported regulatory and sector reforms (see appendix A for the methodology). Objectives have been achieved for more easily attainable outputs, such as separating policy setting and regulation. Development Policy Operations (DPOs) have been more effective than investment loans – 71 percent of DPOs either fully or significantly achieved ICT regulatory or sector reform results, compared with 50 percent of investment loans. Lack of commitment to reform was the main factor affecting the performance of Bank operations supporting regulatory and policy reform. These Bank operations experienced challenges and achieved performance comparable to that of other sectors undergoing similar reforms, such as the power sector.¹³

4.6 In countries in which there has been strong commitment, the results from Bank-supported operations have been substantial. An example of strong client commitment to ICT reforms that led to significant results is Armenia. There, the Bank supported the establishment of a new regulatory framework under the telecommunications law of 2005 and enhanced competition through licensing of additional operators. These reforms led to very fast growth

in ICT services – mobile penetration grew from 10 percent in 2005 to 85 percent in 2009.

Figure 20. Snapshot of ICT Regulatory Environment in Developing Countries



Source: World Bank, Development Data Platform, Information and Communications for Development Database.

4.7 DPOs supporting ICT sector reform have weak results frameworks. The monitoring and evaluation (M&E) design, implementation, use of data, and evaluation of all closed DPOs supporting ICT sector reform (58) were rated substantial or high at the time of their Implementation Completion Report (ICR) review by IEG in 44 percent of cases, although this is a relatively strong performance when compared with 36 percent so rated for operations that did not support ICT reforms. A review of the results frameworks of the DPOs that supported ICT sector reform revealed that 52 percent of operations supporting ICT sector reform did not include indicators to measure the ICT-related outcomes or outputs in the project documents presented to the Bank’s Board of Directors, nor did they report ICT-related indicators in the ICRs. A larger percentage of these operations were missing other important elements of their results frameworks (see Table 3).

Table 3. M&E in DPOs Supporting ICT Sector Reform (approved FY03–10)

ELEMENT	Percent of DPOs supporting ICT reforms	Number of DPOs supporting ICT reforms
Include indicators to measure ICT-related outcomes/outputs	48	28
Include baseline values for the ICT-related indicators	40	23
Include target values for the ICT-related indicators	45	26
ICT-related indicators are reported in the ICR	48	28
M&E rated substantial or high in ICR review	44	39

Source: IEG ICT database.

Note: Figures based on the full portfolio of DPOs supporting ICT sector reform: 59 (approved FY03-10), of which 58 are closed.

4.8 Weak monitoring and follow-up of ICT reforms resulted in poor performance. A contributing factor to the relatively poor performance of operations supporting ICT policy and regulatory reform has been a lack of follow-through and reporting on progress in a large percentage of DPOs, the most common lending instrument used to support ICT reforms. Through the use of prior actions (legally binding conditions required for Board approval), monitorable indicators, and benchmarks (non-legally binding results of the government’s program supported by the Bank), DPOs provide financing and policy advice in support of a country’s medium-term development goals (World Bank 2009a).

4.9 Among DPOs, the poorer performers in terms of ICT results are those in which the reforms are listed among multiple sets of reforms and are not included as prior actions. A majority of ICT reforms have been included in DPOs as benchmarks; the 57 DPOs that supported reforms in the ICT sector during the period contained 82 benchmarks in addition to 34 prior actions (Table 4). When reforms are not tied to prior actions or triggers, they easily fall off the radar screen of policy makers and the World Bank, and are not implemented.

Table 4. Prior Actions and Benchmarks in DPOs Supporting ICT Sector Reforms (approved FY03–10)

DPO type	Number of ICT prior actions	Number of ICT benchmarks	Number of all prior actions	Number of all benchmarks	Number of DPOs
DPOs supporting ICT—FY03–06	20	71	571	1,663	40
DPOs supporting ICT—FY07–10	14	11	188	232	17
All DPOs supporting ICT	34	82	759	1894	57
All DPOs			5,291	6,569	435

Source: IEG ICT database.

Note: Figures based on the full portfolio of DPOs (approved FY03-10): 435 of which 57 supported ICT sector reform.

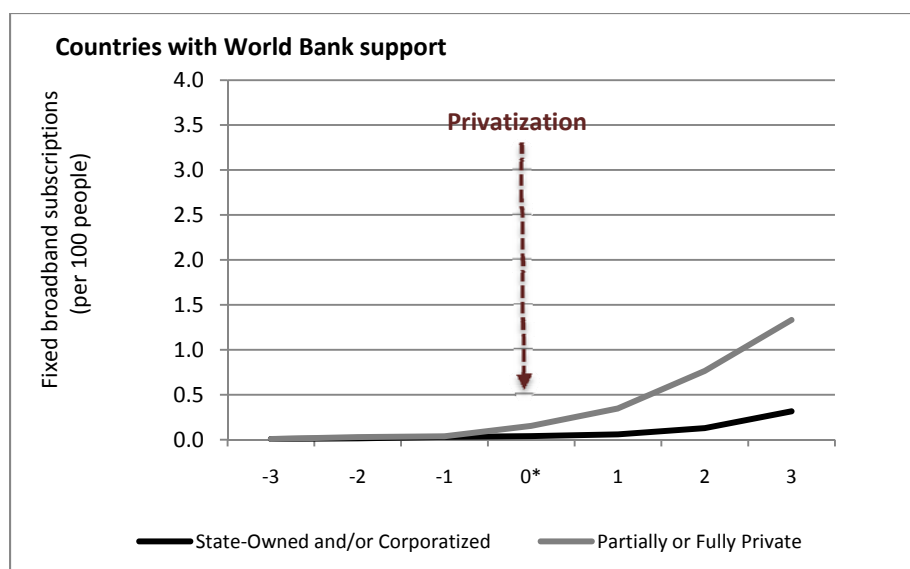
4.10 The World Bank continued to support privatization of fixed-line services in developing countries to increase ICT rollout and performance. Support for privatization -- intended to attract private capital, new technologies, and technical expertise, and to achieve fiscal objectives -- focused on countries with more difficult environments. Of the 16 countries that pursued privatization with World Bank support (25 operations), 11 (69 percent) partially or fully privatized their state-owned operators. Although in some cases quality of service deteriorated following privatization, its impact was significant when factors such as the privatization transaction model or the firm-restructuring strategies are tuned to the specific firm, market, regulatory, and country conditions.¹⁴

4.11 A simple comparison of broadband penetration -- which in many developing countries has increased solely by the most economical means of deploying broadband, by adding x-DSL technology¹⁵ to the existing fixed-line networks -- shows a significant difference between countries that privatized successfully with World Bank support and those whose operators were only corporatized or remained state owned (Figure 21).

4.12 The World Bank was more successful in supporting corporatization than privatization. In countries that were not ready to privatize their state-owned fixed-line operators, the Bank supported their corporatization. Corporatization was achieved in all four countries (supported by 16 operations) that pursued this objective. Corporatization

is a useful step for increasing efficiency, productivity, and reach and quality of telecommunications services, but its benefits are limited compared with those of privatization. State-owned fixed-line incumbents, even those corporatized, could be a source of market distortions and inefficiencies due to preferential treatment such as exclusivity agreements over certain market segments. Privatization should therefore be the ultimate goal for developing countries with state-owned fixed-line operators. Although privatization is more difficult to implement than corporatization, the World Bank should continue supporting these efforts. For this, key factors for success, such as strong government commitment (see below), should be considered by countries pursuing these efforts.

Figure 21. Successful Bank-Supported Privatization of Main Fixed-Line Operator Matters for Broadband Access



Source: World Bank, Development Data Platform, Information and Communications for Development Database.

* Year 0 in the figure is the year in which the privatization or corporatization took place. For the countries that were supposed to privatize but did not, it represents the average year in which the other countries privatized.

4.13 Key factors for success with privatization were strong government commitment and a realistic scope and timetable for reforms. Projects were more successful when client capacity was considered in the project design and when consensus for privatization was present. Support was not successful when it was limited both in intensity and in skills mix, compounded by poorly designed and used M&E. In Benin, all of these factors contributed to a delay in privatizing the state-owned company (Box 3).

Box 3. World Bank and IFC Support for Privatization

The first attempt to privatize **Benin Telecom** started under the Benin Private Sector Development Project (P039882- FY00-08). However, the government failed to strengthen the institutional framework for privatization to ensure a process that was technically powered and transparent, and the Privatization Unit had neither the independence nor the capacity to implement the privatization. Despite this, the government decided to use its own resources to control the privatization. By 2005, the government had failed to privatize Benin Telecom on its own and realized the importance of swift privatization because the company was incurring huge losses. The Bank has supported Benin's privatization effort since 2005 with two technical assistance loans and two DPOs. Privatization finally occurred six years after the beginning of Bank support.

IFC's advisory services have facilitated the privatization of state-owned telecommunications operators in several countries. Through its corporate advisory services, IFC assisted governments in the privatization and restructuring of telecommunications companies, acting as a transaction advisor. In Kenya, IFC advised the government on divesting a majority stake (51 percent) in **Telkom Kenya Limited** to a strategic investor.

IFC's assistance was relevant and effective, helping to implement the restructuring and partial divestment of telecommunications operators, which had been attempted unsuccessfully earlier. The objectives of IFC assistance were to enhance competition and availability of telecommunications services. Although the bidding and divestment processes were considered largely transparent, they have not been free of controversy. But stakeholders were highly satisfied with IFC's work. The positive outcome was likely facilitated by strong government commitment to privatization and the perception of IFC as a neutral party in a highly politicized environment. Given the difficult issues surrounding the privatization and unbundling of telecommunications companies, and considering that previous privatization attempts failed, there was a strong role for IFC. Notwithstanding their successful outcomes, the transactions raise an issue regarding IFC's comparative advantage as a transaction advisor compared with other providers of such services (as well as a need to more clearly define IFC's role and rules of engagement).

Sources: IEG and IFC databases.

4.14 AAA was an important component of Bank support for ICT, especially in policy reform and capacity building, and performed better than ICT sector lending. For tasks with completed Activity Completion Summaries (88 percent of all ESW and nonlending TA), self-assessments showed that 82 percent of AAA was reported as fully or largely meeting their objectives, which is better than ICT lending, but similar to non-ICT AAA. These results should be interpreted with some caution, because there is no systematic follow-up with clients to evaluate the results of these products after their completion. However, client feedback received during the country visits indicated that ICT AAA is valued.

4.15 AAA designed to develop or strengthen institutions and to support client program implementation were the most successful in meeting their objectives. Based on self-assessments, more than 80 percent of ICT activities aiming to develop or strengthen institutions or to assist client policy or program implementation achieved these objectives. Examples of successful activities include AAA in support of the Regional Africa Communications Program.

4.16 ESW to inform government policy has been less successful in achieving its objectives than other kinds of AAA. The self-assessment of the extent to which the AAA objectives were met shows that for the most prevalent objective of ICT ESW – to inform government policy – 55 percent of activities reported meeting this objective fully or largely, compared to 70 percent for non-ICT ESW. Underfunding of the tasks (this is the case of the West Africa Multisector Regulation Project) or limited engagement by the counterparts were reasons for the limited achievements of some of these tasks. Despite this lower success rate, there are several examples of AAA that have informed government policy and achieved significant impacts in increasing connectivity, as in the case of the Chile Rural ICT Study.

4.17 ESW that sought to inform or stimulate public debate fared better. Knowledge products were an important part of AAA, but there is no framework for assessing their performance. Ninety percent of ESW that sought to inform or stimulate public debate reported fully or largely meeting their objectives – on par with non-ICT ESW. Knowledge development and sharing was another important aspect of the Bank's AAA – there were 58 knowledge products on a variety of topics (such as ICT linkages to climate change, ICT for health, and use of mobile phones in education). They were relatively small in terms of cost, but their potential impact can be significant due to their innovative nature. Completion Summaries are not required for this kind of AAA, so there are no records to assess their performance.

4.18 More than half of ICT AAA fell outside of the planned programs in Country Assistance Strategies (CASs). IEG assessed the extent to which ICT AAA were part of the strategic support in 20 randomly selected country cases. Less than half of the ICT AAA (47 percent) was included in a CAS nonlending program. This might be due to the quick response required in the fast-changing ICT sector. The majority of the tasks not included in the CASs are task managed

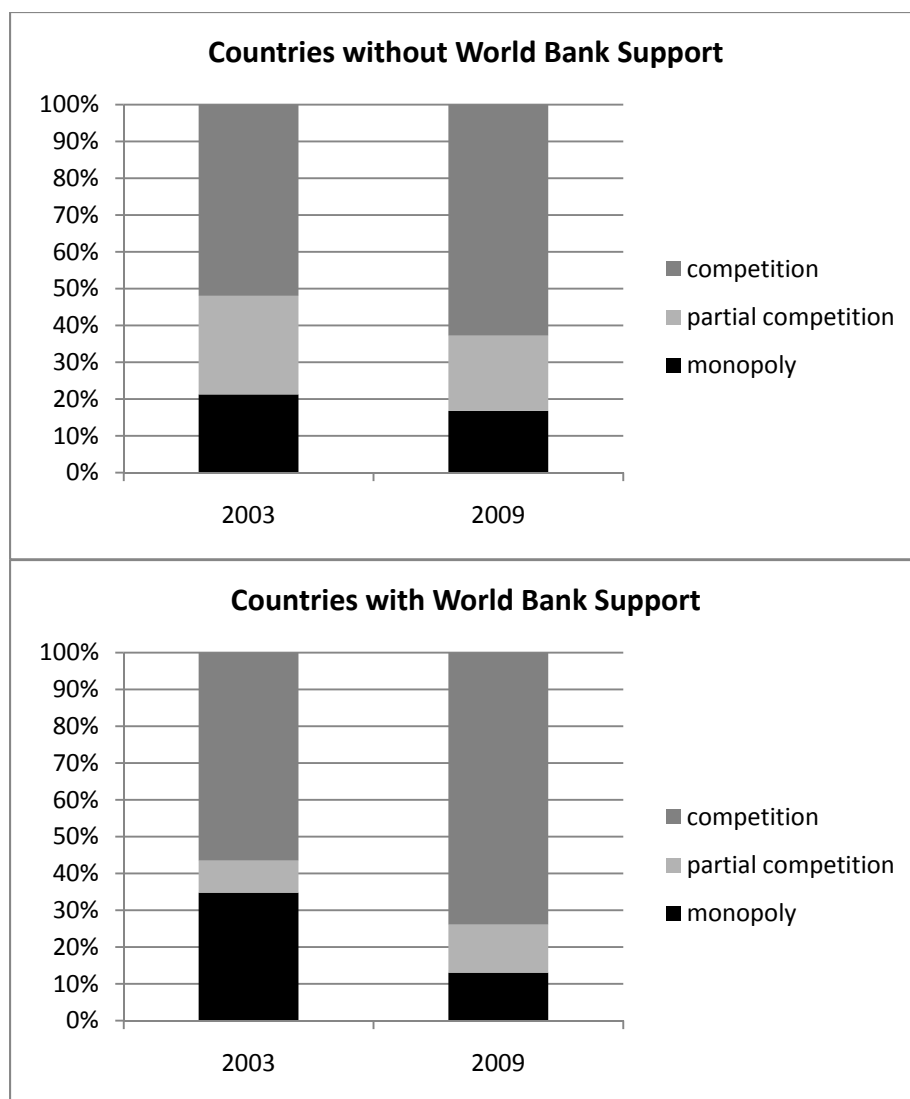
by the ICT unit (76 percent), which might entail limited coordination between the task team leaders and the country teams, as indicated by some of the task team leaders interviewed. Furthermore, the preparation of fewer Activity Completion Summaries for ICT AAA not included in CASs – 38 percent lacked them – indicate a less stringent accountability for these tasks.

4.19 In countries where the World Bank or IFC supported the ICT sector – through regulatory reform or by fostering investments – the speed of mobile telephone penetration was greater than in countries without such support, controlling for other factors.¹⁶ Technology diffusion generally follows an s-shaped path, associated with the number of both potential and current users of a given technology; the more people with cell phones, the faster the rate of adoption of new users – up to a point. The diffusion of mobile telephony in developing countries is consistent with this pattern of technology diffusion.

4.20 Analysis of the diffusion of mobile telephony in developing countries (between FY01 and FY09) exhibits this pattern of diffusion and significant effects of competitive markets (controlling for gross domestic product (GDP) per capita and overall country risk). Among all Bank lending and nonlending instruments, DPOs and PPIAFs are associated with faster mobile telephone penetration, independent of the role these operations play in promoting competition. For example, the majority of DPOs comprise an array of other reforms that improve the overall environment for private investment and growth. And PPIAFs support a broad range of objectives that work through mechanisms other than competition – for example, more efficient pricing.¹⁷ In partially competitive environments, IFC investments in mobile telephony were associated with faster mobile diffusion, consistent with the removal of capital constraints by IFC investments.

4.21 Countries with World Bank support for ICT institutional and sector reforms and IFC investments have increased competition faster than have countries without World Bank Group support (Figure 22).¹⁸ Controlling for factors associated with greater competition in mobile telephony, such as overall country risk, the presence of a separate regulator and the degree of privatization in fixed-line telephony, IFC investments and World Bank interventions are associated with higher levels of competition in mobile telephony. In the case of the World Bank, Development Policy Lending (DPL) is significantly associated with greater competition, whereas investment lending and nonlending activities are not.

Figure 22. Competition in Mobile Markets in Developing Countries



Sources: World Bank, Development Data Platform, Information and Communications for Development Database; IEG ICT database.

4.22 Overall, the evidence points to an effective World Bank Group contribution to reforms in the sector. Reforms have progressed rapidly, and this has facilitated innovation, entry, and growth in penetration rates. Pitfalls of earlier attempts at reforms, such as privatizing without accompanying measures to ensure competition, have been largely avoided. Thus, efforts to privatize, enhance competition, and strengthen regulatory capacity and independence have largely proceeded hand-in-hand, delivering better results compared with earlier efforts in this and other sectors. The experience suggests the key role that competition plays in achieving access. However, threats to competition in the sector remain, and a strong focus on pro-competition regulation and capacity is required

as the sector and markets evolve and boundaries among technologies become blurred.

Promoting Access

WORLD BANK INVESTMENTS IN UNIVERSAL SERVICE PROGRAMS

4.23 The record of World Bank investment projects directly aimed at extending ICT coverage to underserved areas is poor. The 24 investment projects pursuing these objectives did so using two mechanisms: (i) technical assistance to support the establishment of universal/rural access/ICT service funds (7 operations); and (ii) investments to expand the reach of ICT through direct investments or output-based aid (17 operations, of which 15 are using output-based aid). Of the 24 operations, 11 have been canceled or have not achieved their development objectives. Only two have fully achieved their development objectives and four are still at early stages of implementation. In addition, eight DPOs supported universal access policies, including either prior actions or benchmarks for the design, enactment, and implementation of these policies. This support has had little success. DPOs that supported universal access policies suffered from problems similar to those noted above regarding DPOs in support of ICT policy and sector reform.

4.24 Difficulties in establishing disbursement schemes have been a major shortcoming, but some mechanisms have had encouraging results. In Brazil, delays in establishing guidelines for the use of funds have resulted in an accumulation of approximately \$4 billion in its Universal Service Fund, which has not been used for its intended purpose (Intelecon 2010). In most cases delays have resulted from the limited capacity of implementing agencies to design and carry out the bidding processes and to administer implementation. Another source of delays has been the institutional arrangements to manage the fund efficiently and transparently. Because many countries are faced with unused amounts in their Universal Service Funds, the effectiveness of World Bank support has been quite limited.

4.25 Amid the major setbacks of these operations, the Bank-supported programs in Chile, Mongolia, Pakistan, and Uganda and the use of public-private partnerships provide encouraging examples that these mechanisms could work. Pakistan's model, the administration of the Universal Access Fund (USF) by a non-profit with an executive management team, is promising. Using a

transparent mechanism for the award of subsidies from the USF, it has already committed over 60 percent of all funds that it has collected since its start of operation, four years ago, increasing voice access to remote villages and extending fiber backbones across provinces.

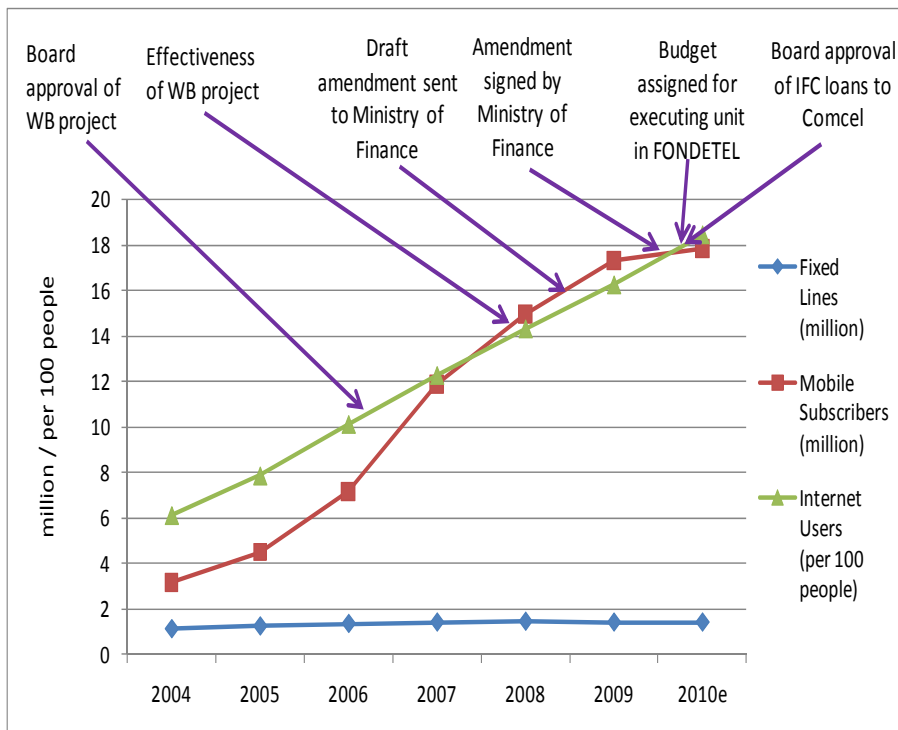
4.26 Cancellations of Bank projects or components intended to design policies and/or extend ICT access to underserved areas reflected projects' limited relevance due to a combination of factors, including rapid growth of voice services, bureaucratic hurdles, and limited implementation capacity. As the private sector expanded coverage of voice services following sector reform, in some cases supported by the Bank (for example, Bangladesh), or governments accumulated resources in their Universal Service Funds (for example, Senegal), Bank funding was no longer needed and was cancelled or reallocated. This was the case in seven projects. In Guatemala, for example, a combination of external factors, bureaucratic hurdles, and complex institutional arrangements delayed the start of the project greatly. By the time the ICT activities were ready to be implemented, the private sector was already providing mobile services in the project area. Hence, the ICT subcomponent was no longer a priority for the government and was cancelled (Box 4). The relatively large number of pilots among these operations (six) also seems to indicate risks perceived by governments and the need to explore these approaches without putting too much at risk.

4.27 Based on the experience with universal service policies, future Bank support in this area needs to be reexamined. As mobile service is becoming ubiquitous and demand for Internet access is increasing, several countries are adopting broadband subsidy programs (as in the Africa regional networks and backbones). These new-generation access programs have proved to be more complex than those focused on voice telephony only. Given the record so far, the Bank needs to examine its experience before engaging in these programs and incorporate the lessons of experience with universal access funds, which include the need to simplify processes and institutional arrangements to manage the funds; strengthen the capacity to design and implement the programs; and better target and assess market conditions.

Box 4. Private Sector Outpaces a Subsidy Program—Support for Increasing Rural Access to ICT in Guatemala

The Guatemala Rural Economic Development Program, approved in 2006, had a subcomponent for \$15.7 million to extend ICT services to rural areas using output-based aid. Start of this ICT subcomponent was delayed (18 months from Board approval to effectiveness, and 12 more months for processing an amendment to reallocate Bank financing to fund the implementing unit), because congressional approval of the loan and government approval of the loan amendment were required. Complex implementation arrangements – three implementing agencies for this subcomponent and changes in the project administration following a change in government – also contributed to delays. While the project was held up, voice telephony in Guatemala grew from 8 million mobile subscribers at Board approval to 18 million in late 2009 (figure below). By the time the Bank-financed ICT subcomponent was ready to be implemented, there was no longer a need for it – the expected ICT outcomes had already been achieved.

Milestones for the Rural Economic Development Project and IFC Loan versus Evolution of Voice Telephony and Internet Use in Guatemala



Sources: World Bank project documentation and interviews with project teams.

Note: 2010 is estimated based on first-semester figures.

4.28 Equity and integration of marginalized groups have been more effectively supported by Bank support for ICT policy and sector reform than by operations specifically designed to achieve these goals. ICT operations that supported reforms to introduce competition into the sector, when successful in supporting those reforms, have had significant impact, especially in access to cellular telephony services. This increase in overall access has had a spill-over effect of providing access to the underserved. Lower tariffs (especially in cellular telephony), falling handset prices, and the expansion of prepaid cellular services are all channels that facilitate access by the poor. One indicator of the poor becoming part of the customer base of cellular telephony providers is the monthly average revenue per user (ARPU), which declined from about \$20 in 2002 to about \$5 in 2010 in developing countries.

BANK GROUP SUPPORT TO ICT BACKBONE NETWORKS

4.29 The World Bank has begun to support regional communications infrastructure and backbone networks. This has been a combined effort from the World Bank and IFC. The Bank leveraged the preparation of the Regional Communications Infrastructure Program (RCIP) to help shift the policy momentum and secure mechanisms toward open access to infrastructure and minimum government ownership of cross-border infrastructure links. The Bank also structured (jointly with IFC and other development partners) the private sector-led Eastern Africa Submarine Cable system (EASSy). During the review period, four projects under the Bank-funded RCIP, covering 10 countries, were approved in the Africa Region (Table 5). While it is early to assess the effectiveness of these projects, implementation to date provides some lessons.

4.30 The project with the longest implementation record, RCIP 1 (Burundi, Kenya, Madagascar), has two overarching objectives: (i) to contribute to lower prices for international capacity and to extend the geographic reach of broadband networks and (ii) to contribute to improved government efficiency and transparency through e-government applications. The “connectivity” component of the RCIP 1 Kenya Project does not finance a national backbone network because this has already been put in place, but it consists of subsidies for purchasing broadband capacity for targeted user groups (universities, technical colleges, government users, and the business processing outsourcing industry).

4.31 The effectiveness and sustainability of direct subsidies to stimulate demand for Internet access and address issues constraining the

supply side have yet to be demonstrated. Project documentation lacked an economic analysis to underpin the rationale for direct subsidies to user groups. The subsidy component directed at private sector users was largely undisbursed. Subsidies for government and educational institutions were well received in the country and have helped enhance connectivity of universities. However, the rationale for purchasing capacity long term, while market prices for broadband access were expected to fall, and for bypassing local operators should be revisited in designing future support.

4.32 Regional communications infrastructure and backbone projects have been highly complex and have suffered delays. RCIP 1 has had implementation delays since inception, and four years after approval has only disbursed 30 percent of the loan amount. The project is highly complex, comprising 3 main program components and at least 24 subcomponents, and it has faced limited implementation capacity on the part of government counterparts. The project has since been restructured to reduce its complexity and accelerate disbursement.

Table 5. Regional Communications Infrastructure and Backbone Projects in Africa (FY07–10)

Project name	Fiscal year of approval	Countries	IDA commitment (US\$ million)	IDA disbursements as of 01/2011 (US\$ million)	DO rating in latest ISR	IP rating in latest ISR	M&E rating in latest ISR
3A-Telecommunications APL (FY07)	2007	Kenya, Burundi, Madagascar	169.5	41.6	MS	MS	MS
RCIP - Phase 2 - Rwanda Project	2009	Rwanda	23.5	2.2	S	MS	MS
RCIP - Phase 3	2009	Malawi, Mozambique, Tanzania	153.1	12.2	MS	MS	MS
Central African Backbone - APL1A	2010	Cameroon, Central African Republic, Chad	28.6	3.2	MS	MU	MS
Total			374.7	59.2			

Note: MS = marginally satisfactory; S = satisfactory; MU = marginally unsatisfactory; DO = development outcome; IP = implementation progress; ISR = Implementation Status and Results Report.

4.33 The RCIP program in Madagascar is on hold due to the political situation, and the RCIP in Burundi faced delays in awarding

a public-private partnership for broadband network rollout. The results so far indicate that this portfolio requires intensive attention to bring it to fully satisfactory performance. The Bank has already begun to incorporate lessons from the RCIP 1 into other regional infrastructure/backbone projects. These lessons include: simplifying the design to focus on connectivity,¹⁹ building consensus for crafting public-private partnership agreements, building open access and competition features into the project design, and customizing solutions to the specific institutional frameworks and political economies of different countries. As the World Bank continues to extend this type of project, it should continue to draw lessons from the implementation of these programs and incorporate these lessons into the design of any future operations.

DIRECT SUPPORT TO PRIVATE SECTOR INVESTMENT IN ICT SECTOR INFRASTRUCTURE AND NETWORKS

4.34 The World Bank Group's direct support to private investments in ICT is taking place mainly through IFC and MIGA activities. Most of the support has been in telecommunications operators.²⁰ IFC's rationale for supporting ICT sector projects has been to enhance growth, productivity, and efficiency through improved access to ICT services, but also to foster equity and social inclusion. Projects have sought to foster growth, promote auxiliary industries, enhance the efficiency and effectiveness of local small and medium enterprises (SMEs), and create employment (in ICT-producing sectors, and indirectly economywide). Approximately one-third of telecommunications projects also aimed to support social inclusion—for instance, through increased geographic coverage of telephony to areas not previously served and access to lower-income households. In addition, several projects complemented investments with advisory components to enable increased access through innovative means such as the Village Phone Program (see Box 6).

4.35 Much like IFC, MIGA support to ICT sector projects focused on enhancing connectivity, but they also included some distributional objectives. Projects sought to increase coverage and access for remote areas, increase competition and lower prices, increase direct and indirect employment, promote local economic growth and microenterprises, foster the development of peripheral industries and SMEs, and leverage private sector development. Given the long time lag before impacts from projects can be observed and to the methodological difficulties in attributing results, the focus here is on intermediate outcomes of IFC and MIGA projects, rather than

impacts in terms of growth, productivity, and job creation. Wherever feasible, the evaluation will provide context on growth and equity.

4.36 Most ICT projects were relevant to assisting countries' development objectives. Projects were broadly aligned with development strategies, such as supporting mobile licenses to enhance competition, catalyzing private investment in infrastructure, enhancing competitiveness, and improving rural connectivity.

4.37 Three-quarters of IFC projects achieved their objectives for increased access and use of telecommunications services.²¹ IEG reviewed the achievement of project objectives outlined in IFC's Board papers and other documents related to project outputs or intermediate outcomes as defined in the transmission chain in Figure 1. Overall, IFC has been successful in helping to establish and expand mobile telephone networks, improve access, and reduce prices for telecommunication services. In many cases, unexpected rapid adoption of mobile phones caused the projects to exceed initial expectations. Projects rated as successful met or exceeded their objectives (or were expected to fully meet their objectives) with respect to the number of subscribers or users, contributing to increased mobile phone penetration rates.

4.38 Reduced prices for telephone services were also indicative of increased competition. Of the 40 mobile telephony projects with data on market entrants, IFC supported 29 companies that were first or second operators in their respective country markets. Based on IEG analysis, IFC investments are associated with increasing levels of competitiveness in mobile telephony. In turn, competition was found to be key to enhancing access.²²

4.39 Little systematic information was available regarding other IFC project objectives, such as the quality of service, but anecdotal evidence points to gaps in service quality. Many projects aimed to improve quality and reliability of services. In several cases, however, there were indications of poor service quality, because investments were insufficient to keep pace with the extension of the user base of mobile networks. In one country, consumer representatives observed a decline in quality of service following privatization of the state-owned operator. Consumer complaints were reported regarding reliability of service, billing, and lack of network coverage.

4.40 The strongly positive development outcomes of IFC ICT projects are confirmed by project evaluation ratings. Expanded

Project Supervision Report (XPSR) results showed that telecommunication projects achieved mostly successful or better development outcomes²³ in 93 percent of projects (90 percent in terms of net commitments). These results are based on the 2003–09 XPSR cohorts. Projects in this cohort were particularly strong in their economic contribution and private sector development. Positive development outcome ratings were mirrored by high ratings for IFC's investment outcomes. The ratings from IFC's XPSR system emphasize project performance based on indicators such as business success, economic impact, and environmental and social effects. They primarily reflect standard project evaluation indicators such as financial and economic rates of return.

4.41 The majority of reviewed MIGA projects have contributed to the development of the ICT sector in host countries by enhancing access, geographic coverage, and increased competition. Of the five projects for which there was some information available after contract signing, three projects appeared to have achieved at least some of their development objectives. The two remaining guarantees were cancelled early, one of them due to financial difficulties of the insured project.

4.42 The experience of two MIGA projects, both in conflict-affected countries, highlights risks and differences in performance. One project, implemented by a leading international mobile telecommunications operator with prior operational experience in difficult countries, was highly successful in increasing access. The project was also supported by IFC. At the time of underwriting, the project had identified a clear set of indicators to measure project progress. By 2010, the project had exceeded its sector-specific targets and also performed well financially. The country's mobile penetration rate had increased to 33 percent, from less than 1 percent in 2002. These gains were attributable in part to the MIGA-supported project.

4.43 In contrast, a guarantee provided for a small project in a conflict-affected country was cancelled due to failed business performance of the project. The expected viability of the project, reflected in the company's overly optimistic business plan and projections, depended on the installation of equipment, which turned out to be secondhand rather than "state of the art," as specified in MIGA's underwriting documents. Frequent equipment failures caused service disruptions, which undermined the project's viability.

4.44 MIGA's experience illustrates the regulatory and political risks encountered by investors in the telecommunications sector.

Three MIGA telecommunications projects in Africa have encountered problems involving host governments that were relevant to the events insured by MIGA. MIGA has not paid any claims related to ICT projects. In two cases, these related to aspects of the licensing agreements, such as imposing additional license fees (or demanding accelerated payments). In one case the government limited the operator's direct access to international connections and demanded that such connections be made through the state-owned operator – leading to the suspension of a license of a MIGA-insured operator. A third project encountered delays in converting payments of the underlying commercial loans. In all instances, MIGA deployed its dispute-resolution services. Two cases have been resolved through direct negotiation between operators and government authorities (partly with MIGA's assistance); one matter is still pending. Similarly, IFC has offered assistance and comfort to clients regarding risks related to interconnection, license fees, and political interference.

4.45 Notwithstanding IFC's success in the telecommunications sector, its additionality was more limited. Among the projects reviewed, IFC's additionality was significant in 59 percent (13 of 22) of telecommunications projects. IFC's additionality was stronger in its perceived capacity to mitigate political and regulatory risk as a member of the World Bank Group than in its financial contributions. A significant number of projects would have gone forward without IFC's financing. Where IFC was additional, its unique contributions came in the form of offering financing at tenors or terms not available in the country. Other aspects of additionality in telecommunications projects included providing reassurance to investors in dealing with regulatory issues or licensing and IFC's knowledge and global perspective on the sector and its ability to provide advice to clients. IFC also had a role in analyzing risk, enhanced by the knowledge base available through the global ICT department.

4.46 IFC projects in IDA and conflict-affected countries had strong results. In these markets, IFC had a significant role in projects. Fully 13 of the 17 projects in IDA countries had strong performance with respect to the achievement of project outputs and intermediate outcomes. In conflict-affected countries, four out of five reviewed projects were achieving their development objectives.

4.47 Competition is a driver of successful development outcomes, and there can be tension between development outcomes and project business success. While three-quarters of evaluated IFC telecommunications projects met or were expected to meet their development objectives, according to output and intermediate outcome indicators, less than two-thirds (12 of 20) had satisfactory or higher business success ratings (that is, return to project financiers, including IFC). Several projects were successful in meeting their development objectives, but have shown weak private returns. While increased competition was strongly associated with good development outcomes, by enabling increased access to telephone networks among wider segments of the population, it has, in some instances, detracted from achievement of the business objectives.

4.48 Intense competition has developed in certain markets, which has created pressure for the industry to consolidate. As mobile operators pursued low-cost approaches²⁴ as a way of attracting new subscribers and increasing their market share, this strategy affected margins negatively by putting downward pressure on revenues (such as declining average revenue per user because more low-income customers were connected). Increasing competition was also enabled by new licenses offered by regulators concerned by the cost of services to final users and through entry of global operators into the market through acquisition of existing operators. In addition, in some projects management and implementation issues had a direct impact on the projects' bottom line. IEG analysis shows that IFC is most effective in reaching development outcomes when it supports projects in partially competitive markets.

4.49 Conversely, poor performance in outcome achievement was linked to inefficient market structures. A small number of projects have been affected by the global economic crisis, as weaker demand has affected revenue generation and difficulties in accessing financing have slowed the implementation of network expansion plans.

4.50 Favorable demand factors, including low initial penetration levels, pent-up demand, and the rapid adoption of mobile phone technology, enabled achievement of project development outcomes. Telecommunication projects with satisfactory and better business success²⁵ expanded their operations in markets with lower initial mobile penetration rates and experienced higher-than-expected growth rates because of large pent-up demand. Projects with business success were implemented in countries with lower penetration rates

(19 percent, on average), compared with projects that did not find business success (29 percent penetration, on average).

4.51 Strong results have been associated with IFC's approach of supporting repeat investments involving global telecommunications companies. Sound business models and strong support and commitment from sponsors and sponsor expertise in the telecommunications sector were critical for successful implementation. IFC followed a model of replicating projects with key players in different countries. This approach was prudent from a risk management perspective, because previous IEG findings indicate that projects involving repeat clients are more likely to succeed.

4.52 IFC has been successful in associating with new telecommunications companies and helping them to expand and become major players. IFC supported early (cross-border) investments by new companies, many of which originated in developing markets, such as Bharti Airtel, Celtel, Digicel, Grameenphone, and MTN Group. By supporting these companies in repeat business across different countries, IFC was able to enter IDA countries or countries with difficult environments. During FY03-10, these five companies accounted for a significant share of IFC's telecommunications portfolio: 29 projects (47 percent of the total) and \$777 million in commitments (34 percent).

4.53 While country risks were high, they did not appear to determine project performance. Institutional Investor Country Risk Ratings indicated slightly improving country risks, on average, throughout implementation of ICT projects, from a low base. However, the performance of individual projects did not appear to be determined by the change in country risk ratings. These findings also reflect the specific nature of mobile telecommunication, which needs relatively little in terms of complementary inputs to be sustainable.

4.54 IFC's appraisal work for telecommunications projects was based on thorough analyses of sector-specific issues and risks. IFC's due diligence covered issues such as the independence and capacity of the regulatory agency; issues related to changes to interconnection regimes, license renewal, security (conflict environments), macroeconomic and foreign exchange risk, price, competition risk from additional mobile licenses, management and staffing, and political risks; access to finance; management capacity; and small market size. IFC's focus on these issues is consistent with its role in

providing comfort to investors in relation to policy issues such as licensing or interconnection.

4.55 MIGA's project appraisal focused on the underlying political risks it covered. In addition, MIGA's underwriting work identified risks that would have a significant impact on the success of the projects. In some instances, however, project risks not directly related to risks covered by MIGA were not thoroughly identified or mitigated, including analysis of the sector and market and the financial viability of the project.

4.56 IFC tracked a limited set of ICT-specific project outcomes. IFC's Development Outcome Tracking System tracks standard project performance indicators such as financial rate of return better than it tracks sector-specific data. Sector indicators such as access, price (average revenue per user, or ARPU), market share, and overall penetration of mobile access in the country are not always consistently tracked or monitored. Among the project objectives that are not usually tracked are those referring to enhanced competition, quality of service, and increased geographic coverage, as well as socioeconomic and distributional objectives that served to justify the project, such as coverage of remote and disenfranchised communities and support to SMEs and local enterprises.

Project-Level Evidence for Impact of ICT on Economic Growth and on the Poor

4.57 IFC has identified growth and distributional aspects in its project objectives. IFC has improved in linking its support to higher-level development objectives. Earlier objectives tended to be at the project level (that is, to enhance project company performance), but more recent statements have linked projects more effectively to higher-level socioeconomic objectives. Project objectives included increased access by lower-income households and enhanced coverage of more remote and rural areas.

4.58 IFC ICT investments are expected to make positive contributions to the economy based on their economic rate of return (ERR). The ERR is a proxy for projects' contribution to the economy and economic growth (IEG 2011a). It measures societal benefits to financiers, consumers, suppliers, employees, and others. ICT investments can affect development and marginalized groups by addressing geographic isolation, social and economic exclusion, and by opening up income opportunities to lower-income groups. For instance, employment growth in ICT companies and distributors,

private telecenters and Internet cafes, and even street vendors selling airtime can be significant. In addition, ICT has played a role in relief efforts following natural disasters (as in Haiti).

4.59 The World Bank Group's market-driven approach to mobile telephony has contributed to increased penetration rates to levels that have expanded access and coverage to lower-income segments of the population and to more remote areas. As noted earlier, IFC's interventions have successfully contributed to increased competition and mobile penetration, and it played a significant role, particularly in Africa, the Caribbean, and the Pacific. In Albania, mobile penetration increased from 35 percent of the population to over 100 percent from the time IFC's investment in Albania's second-largest mobile operator in 2003 to 2009. With 97 percent geographic coverage, the poor and those in rural areas have likely benefited from increased access to mobile telephony, driven purely by market forces. IFC invested in Nigeria in 2001 (a greenfield company that would become the largest mobile operator in the country). Rapid adoption of mobile telephony in Nigeria through competition and the expansion of services increased mobile penetration from 1 percent in 2001 to 48 percent in 2009. Similarly, in Haiti mobile penetration has increased by 200 percent (from 12 percent to 36 percent) in the three years since IFC's investment in a mobile network operator, by far the largest provider in Haiti.

4.60 Based on these observations, it is therefore likely that IFC's support to ICT had an impact on the poorer segments of society through creation of jobs, opportunities for entrepreneurship, and downstream effects such as access to information and financial services. Some indications of the positive impact of ICT investment on the poor are emerging, but distributional aspects are not systematically monitored. Effective competition and early adoption of a focus on a mass market, low-price business model have emerged as factors in successfully providing access to wider segments of the population, increasingly including low-income households and the poor.

4.61 Expected ERRs for the telecommunications projects reviewed anticipated positive contributions to the economy and society as a whole. Telecommunications projects had high expected (ex-ante) ERRs, with a median rate of 29 percent, and ranging from 15 to 44 percent. In all, 68 percent of reviewed projects had an expected ERR of 25 percent or higher.²⁶ High economic returns reflected

healthy financial returns, which indicated highly profitable enterprises based on explosive growth in demand for communications services, as well as payments to the government in the form of taxes or license fees.

4.62 ERRs did not reflect benefits such as consumer surplus or externalities, and it is likely that they underestimated the true economic contribution and benefits to society, such as access to communication services and to information, efficiency gains and reduced transaction cost, enhanced security, and economic opportunities. High economic returns, however, do not automatically translate into increased inclusion and equity, benefiting the poor and disenfranchised. For projects where ex-post ERRs were available, the record is mixed. IEG found ERRs far exceeding estimated ex-ante returns, but also several projects that fell short in achieving their economic contributions.

4.63 **Several IFC projects have incorporated specific pro-poor and inclusion components.** IFC has aimed to support disenfranchised groups by replicating successful business models that promote low-cost access. Examples of this approach have included (see also Box 5):

- **Implementation of pro-poor business models:** Support to a mobile operator with a low tariff strategy to target the mass market.
- **Innovative programs targeting the poor and underserved rural areas:** Village Phone Programs offered by mobile operators to extend services to underprivileged.
- **Foster access to services for the underserved:** For example, through provision of financial services to unbanked people (this aspect is discussed in more detail in chapter 5).

4.64 **Project components that are specifically designed to be pro-poor and to foster inclusion have had only moderate success.** IFC's direct support to enhance access for the poor had limited success. It lacked replicability and sustainability. The village phone model did not significantly contribute to productive and commercial activities and had limited impact on the poor (Box 6). IFC has provided financial and technical support to some successful telecommunications operators with inclusive business models, but has played a limited role in the design, implementation, and scaling up of such models.

Box 5. IFC Support to a Mobile Phone Operator Adopting a Mass Market Strategy

This company was the first to adapt a mass market, low-tariff strategy to connect poorer segments of the population, making it the market leader in its country. The project aimed to expand phone access to districts not yet covered by the network and to provide women an opportunity to earn income. As an innovative feature, it established a Village Phone Program (VPP) through which rural women used microcredit to buy specially designed cell phone kits and airtime at wholesale prices. Using the kits, these village phone operators (VPOs) then set up shop in rural villages where they live, charging a small commission for people to make calls. The program provided access to phone services to millions of people in poor, rural areas who would otherwise not have had access.

The company has performed successfully, increasing the number of subscribers from 1.1 million in 2003 to 23 million in 2009, while prices for three-minute local calls fell from \$0.08 to \$0.01. Mobile subscription in the country – not attributable to the company alone – increased from 0.2 percent to 28 percent (2008). The pioneer VPP is estimated to have covered 55,000 villages and provided opportunities to 416,000 people.

Source: IEG 2011.

4.65 Going forward, IFC will need to update its engagement in the ICT sector to take account of market developments. The pattern of performance for IFC presents challenges. Notwithstanding the overall success of operations in mobile networks and services, increasing market saturation and a larger role for the private sector in developing countries will require IFC to rethink its role in ICT and adapt to new business trends.

4.66 Operating in increasingly saturated markets with lower margins and potentially higher risk to business performance will require selectivity for telecommunications projects and increased scrutiny of clients' business models and investment strategies. IFC's focus may shift from voice telephony to supporting private investment in higher-speed broadband infrastructure to enable access to data and commercial uses of the Internet. Market trends, such as convergence of technologies and consolidation of market players in the ICT sector, may open new opportunities for IFC assistance. Similarly, declining margins will make it more difficult to support

additional infrastructure investment and may lead companies to increase development of shared infrastructure as a means to enhance connectivity. Moreover, because there are still uncertainties about the evolving ICT policy and regulatory environment in many countries, IFC may play a useful role in addressing investor concerns.

Box 6. Findings on the Outcome of a Village Phone Program

The Village Phone Program in one African country was successful in expanding access to affordable communication by low-income households. It enabled local micro-entrepreneurs to become village phone operators (VPOs) in remote rural villages. There were no VPOs in 2008 when the project started, but there were about 7,000 by 2010.

The intended effects of the VPO on productive and commercial activities in rural areas were very limited. Micro entrepreneurs in the villages did not use the phones for commercial purposes because they owned cell phones. They were also reluctant to discuss business matters in public places. Thus, even though pricing innovations made the cost of communications more affordable, VPO usage was much lower than expected.

The declining use of VPOs is also attributed to the lack of innovation to keep them relevant in response to changing technology. A key assumption of the project was that mobile telephony would not be affordable to a large proportion of the rural populations. However, since the inception of the project there has been a surge in mobile phone ownership, driven mainly by technology-related cost reductions for access and handsets. A lack of understanding of the demand for information was a key factor in the limited use of VPOs, as well as the lack of innovation and value-added services beyond access to voice telephony. Respondents reported that they were not using the VPO to get access to agricultural or health information.

Enhanced access to village phones has delivered important social benefits. The VPO allowed people to stay in touch with relatives. In addition, respondents noted positive impacts on their personal safety.

The field study concluded that the contribution of the VPP to poverty reduction is moderate, and that a majority of interviewed persons asserted not having recorded a specific improvement of their economic activities due to the implementation of the program.

Source: IEG 2011.

Delivery Mechanisms and Organizational Aspects

4.67 **The previous IEG evaluation of ICT (2001) underscored the Bank's fragmented approach to ICT-specific issues due to a lack of institutionwide leadership and focus and the absence of a clearly recognized and funded informatics thematic group.** The 2002 ICT Strategy put forward a clear division of responsibility to pursue its identified strategic directions: the joint GICT Department would (i) take the lead in Bank Group operations and nonlending activities that focus on sector policy reform and extending access to ICT; (ii) play a shared role regarding broader e-economy reforms with the Regions and other sectors, including Poverty Reduction and Economic Management; and (iii) play a catalytic and supporting role with the Regions and networks to increase the ICT human capacity base of client countries and the use of ICT in applications in other sectors, such as education.

4.68 **Coordination between IFC and the World Bank in ICT sector operations improved, in part as a result of having a joint department.** Both Bank and IFC staff interviewed and focus groups of task team leaders noted that coordination has been facilitated by the joint GICT Department. Staff saw the organizational setup as reinforcing the expertise and strengths of investment and policy reform units. Coherence of Bank Group support was among the stronger aspects of work quality in the case of IFC projects. IFC projects generally benefited from sector reforms promoting competition and entry that were supported by the World Bank, and World Bank staff stated that they valued the private sector perspective in their ongoing policy dialogue. MIGA was not part of GICT, and interactions between the Agency and the other institutions were minimal.

4.69 At the same time, collaboration between transaction and policy teams on joint projects and products was limited. Where it happened, it produced results and contributed to overcoming bottlenecks to reform and sector development, including catalyzing complex projects. For example, in Burkina Faso, an IFC investment assisted in the privatization of a state-owned operator, addressing a World Bank ICT policy priority. Similarly, policy and transaction staff collaborated on structuring and providing finance for a highly complex sea cable project in eastern Africa, helping to bring high speed broadband access to this region. But although ICT investment and policy units generally managed conflict of interest situations well, a few instances of perceived conflicts of interest between IFC advisory services or investment and World Bank TA or lending remained.

4.70 While the GICT Department took the lead in Bank Group nonlending activities and IFC operations that focused on extending access to ICT, its role in World Bank lending operations was ambiguous. In World Bank lending, GICT did not have a clear mandate for project implementation, creating ambiguity in the business model of the ICT policy unit. In the case of the World Bank, GICT implemented a model of Regional coordinators co-located in the Regions with other sector staff (for example, in the Africa, Latin America and Caribbean, and East Asia and Pacific Regions) and decentralized some staff to the field. Despite this, one-quarter of the task team leaders of ICT sector operations expressed the view that collaboration with country departments either did not happen or, when it did happen, it worked partially or not at all. A better model has been used in the Africa Region, where ICT has been identified as a Regional strategic issue and has resulted in a wave of new Regional communications infrastructure operations led by the ICT unit.

4.71 Coordination may again become an issue. The joint GICT Department was dissolved in September 2010, which was not the result of a strategic decision related to the location of the joint department, but rather as part of the IFC 2013 reorganization. There is now a risk of diminished dialogue and missed synergies between policy and investment staff and a loss of critical mass due to the decentralization of investment staff. This places a premium on maintaining close formal and informal working relationships to maintain the coordination of the work of World Bank and IFC teams. The implications of the new organizational structure for mainstreaming ICT across sectors will need to be closely monitored.

4.72 The reorganization has implications for the global ICT investment practice. On the one hand, greater decentralization of staff may increase the flow of ICT projects by strengthening proximity to clients and projects. But on the other hand, decentralization of investment staff in IFC was viewed as detracting from the value of the global ICT practice, which was seen as an asset for IFC's value proposition to clients in this sector. IFC should ensure that the current reorganization does not result in a loss of global knowledge among staff from implementing telecommunications and IT projects, one of the strong features of the global practice group.

Conclusion

4.73 In sector reform, Bank operations emphasized greater competition and independence of the regulator, and 60 percent of operations achieved expected outcomes. This is, in part, because the Bank focused on more challenging environments and more difficult reforms. However, when governments committed to reform, operations produced results, and countries with World Bank support saw competition increase faster than those without such support. Overall, therefore, the Bank has made an effective contribution to sector reforms.

4.74 Through its support for increased competition, Bank operations helped enhance access, which led to higher connectivity rates. IFC's support to private investment in telecommunications was effective in enhancing competition and access. But neither the Bank nor IFC was effective in interventions specifically targeting access to underserved or marginalized groups beyond what the private sector was willing to do. Bank operations to promote universal access were often slow to get off the ground and were superseded by market developments. IFC has provided financial and technical support to a few telecommunications operators with inclusive business models, but it has played a limited role in the design, implementation, and scaling up of such models. The Bank Group's role was also limited in the critical area of ICT skills development.

5. Achieving Development Results through ICT Applications

5.1 **The ultimate impact of ICT depends crucially on the diffusion and use of these technologies for productive purposes, for the extension of services, and for more efficient governance.** On the supply side, diffusion and use in other sectors depends on the emergence of actors that can produce and develop the applications and the content and adapt it to local needs and capacities. On the demand side, positive impact depends on local circumstances, capacity, and complementary investment or assistance to ensure adoption and use of ICT. ICT is only one input in achieving desired development outcomes, and the adequacy of its use and effectiveness depends on the quality of complementary conditions, such as local capacity and skills, infrastructure, and other factors.

Supply-side Interventions

5.2 Telephony, ICT infrastructure, and backbones provide a platform for the exchange of information. On this platform, applications and content need to be developed so that social benefits from ICT can be realized. The IT and media sector is on the supply side of this, and their development is critical for achieving the potential of ICT to affect development outcomes.

5.3 **The World Bank provided very limited support for IT and IT services.** The effectiveness of World Bank support cannot be assessed yet, because only one project has been completed.²⁷ However, implementation to date has not been satisfactory, indicating that the ongoing projects may not fully achieve their development objectives. Furthermore, the limited results achieved might not be sustainable, especially when the instruments used rely solely on public sector support. In addition to the component(s) aimed at supporting the ICT-producing industry, the projects included other ICT objectives, which made them highly complex.

Evaluation Essentials

- ❖ ICT applications have typically contributed to achieving highly relevant objectives.
- ❖ Quality of design of ICT components is a critical factor for overall project performance.
- ❖ Government commitment is a factor of success.
- ❖ ICT procurement has been a major implementation constraint in many countries.
- ❖ Service delivery using mobile applications is a relatively new area for IFC support.
- ❖ IFC's services delivery projects have not met financial or development objectives.

5.4 IFC IT/media projects have included a variety of activities.

Investments included an Internet portal, IT services (business process outsourcing), software companies and systems integrators, semiconductors, and IT content and production (such as animation). Media projects have included investments in private television companies. IFC support to IT/media projects was conceived to enhance countries' ability to move up the value chain, create high-skilled employment, foster entrepreneurship and international trade, modernize local manufacturing through IT services, and promote technology development. Project documents often cite contributions to the development of the national IT industry (as in China and India) as development objectives, consistent with supporting the productivity, growth, and job creation dimension of ICT.

5.5 Only one-quarter of IT projects achieved their stated development objectives.

Six of 21 projects reviewed by IEG were successful in achieving development outcomes;²⁸ these included diverse activities such as three software/IT services companies, an IT content and production company, an Internet portal, and a media project (Box 8). This success rate is confirmed by a sample of XPSRs in the IT/media sector completed in 2003–09, which had a share of projects with mostly successful development outcomes of 25 percent. This, in part, reflects the high risks and the unique business model in this sector. Box 7 presents context on the risk and chances of success for IT companies.

Box 7. Entrepreneurship and Information Technology

IT companies face long odds to succeed. Between 20 and 30 percent of start-ups close during the first year, and after six years, less than 80 percent remain (Dollinger 2003). Company survival rates differ among sectors, with IT being among the more likely to fail. Analysis conducted for U.S. companies estimate the four-year survival rate for IT start-ups at only 38 percent (Shane 2008).

Obtaining funding for a business presents a major challenge. It is estimated that less than 1 percent of business ideas presented to venture capitalists are funded, and only 1 in 6 million high-technology ideas succeed in having an initial public offering. Fully 60 percent of projects funded by venture capital funds go bankrupt.

Source: Aggarwal and Esposito (2001); Dollinger (2003); Shane (2008).

5.6 However, overall investments in IT/media projects have been profitable for IFC. Using a portfolio approach to assess the performance of this group of projects, reflecting their venture capital type, shows that in the aggregate, IT/media projects were profitable for IFC during FY03-10. As expected, the projects in the portfolio showed wide variability in returns, ranging from several highly profitable projects to some that incurred losses.²⁹ This performance is consistent with comparable industry benchmarks for these types of investments over the same period.

Box 8. Examples of Projects with Successful and with Poor Performance

Successful performance: IFC has supported some highly successful companies that play transformative roles in their countries' IT industries, as in the case a company – often described as “Russia’s Google”, an Internet portal that has been successful in gaining market share.

Poor performance: A business process outsourcing project in South Asia that failed to achieve development and financial objectives. The result is questionable from a development perspective: the project operates call centers in the United States and Europe with no apparent link to IFC’s development mandate. A project in East Asia that encompassed development of computer games and animation failed financially.

These examples also raise the issue of lack of clarity in defining in Board submissions the project scope IFC supports. IFC equity or debt is often expected to cover working capital or finance general business expenses, including covering losses. While such financing could reflect the specific needs of start-up companies, IFC needs to assure itself that the funds it invests are used in developing countries.

Sources: IEG project reviews.

5.7 Projects in IT have been riskier than those in telecommunications, on average. This reflects the higher risk associated with nascent companies that may lack proven product marketability. IEG’s analysis found high sponsor risk (in 88 percent of IT/media projects with XPSRs during 2003-09), market risk (75 percent), and project-type risk (63 percent) in the IT/media projects it reviewed. IT/media projects were implemented in lower-risk countries than were telecommunications projects, and also benefitted from an improvement in the business environment following approval.

5.8 **Unlike the telecommunications sector, IT projects did not support repeat clients or projects.** The IT/media portfolio encompasses heterogeneous activities covering a variety of IT subsectors. It includes very few projects that have replicated successful business models or involve repeat clients. A recent increased focus on a few key subsectors could allow IFC to build on experience with previous projects.

5.9 **IFC's additionality was lower for the IT projects than for the telecommunications projects reviewed.** Forty-two percent of the reviewed IT/media projects had significant additionality (10 of 24 projects). IFC's additionality referred to its financing and enhancement of corporate governance in young companies. The lower additionality overall compared with telecommunications projects may reflect lower political risk in these types of projects compared with telecommunications companies. Instead, IT projects have higher commercial risks.

5.10 **For IT/media projects, IFC's additionality was defined as helping projects to improve corporate governance standards and corporate strategy, and enhancing financial rigor related to IFC's participation.** IFC's financial role was also highlighted due to the inability of companies to obtain financing. However, IFC's capacity and expertise to deliver on these aspects of additionality has been limited. Moreover, in several instances venture capital financiers had taken equity stakes in the company before or at the same time as IFC, indicating a lower unique contribution by IFC.

5.11 IFC may lack an appropriate business model to effectively respond to the needs of small projects, which require nimbleness and streamlined procedures. This may cause a concentration of IFC IT projects in higher-risk segments due to adverse selection. IFC's systems and business model have precluded its IT/media portfolio from resembling the overall IT market. Pursuing a wholesale, rather than a retail, project approach may help IFC to address some of its weaknesses in processes and structure. More recently, IFC has pursued a more systematic approach to IT projects by identifying three areas of support: (i) payment systems and mobile finance, (ii) IT services, and (iii) data centers.

5.12 **Successful IT projects were driven by strong demand and had well-designed business strategies and expansion plans.** These included an Indian business-process outsourcing company that services clients in the United States and Europe, a Chinese animation

company; and an Internet portal project in Russia. The success of these projects was also linked to the availability of financial resources, and, more important, to the presence of higher-quality sponsors and management teams with key expertise, which led to the adequate implementation of their respective business plans. Incidentally, these projects were located in countries with successful IT services industries.

5.13 Projects with poor development results lacked strong business models and comparative advantage in their market (15 of 21). These projects suffered from overly optimistic and ambitious business strategies. Some unsuccessfully attempted to compete in global markets dominated by global players such Intel and Cisco. In others, the companies lacked the competitive advantage necessary to compete in the target markets. Projects also lacked capable and experienced management teams to guide growth and organizational change.

5.14 IFC also lacked needed expertise in IT. The absence of internal expertise was identified by IFC in several IT subsectors in which it had been active. Project sponsors often lacked sector-specific expertise, as needed for the operation of a call center, for example. IFC failed to adequately identify some of the relevant underlying risks, such as demand, implementation, and sponsor risks, and projects lacked realistic objectives, given their small size.

5.15 Support to IT companies can potentially generate high development impact by helping diffuse IT solutions throughout the economy. As indicated in the literature review (chapter 2), the diffusion and use of IT may be key to reaping productivity benefits from ICT. IT services companies can play an important role in promoting this diffusion among local enterprises, helping them to become more efficient. IFC faces challenges in its support of small and innovative IT projects. It can play a role in supporting innovation by providing finance and by mitigating risk, but it needs to manage the cost and risk effectively – for example, by moving away from the current retailing model toward wholesaling IFC's support for these types of projects. IFC is currently not well placed to support small projects that require a lot of hand-holding, but once such companies are more mature and have grown in size, IFC may no longer be needed as a financier or find itself competing with other financial institutions.

5.16 Developing countries face the challenge of fostering innovation and entrepreneurship. Linking innovation to entrepreneurship creates the potential for economic and social development. Successful business incubators help create relationships between entrepreneurs, universities, industry and government (Khalil and Olafsen 2009). The WBG has supported business incubators through InfoDev. Its Incubator Initiative was designed to improve SME performance by effectively using ICT. According to an external assessment, the Initiative had positive results, including increasing access to finance for SMEs and addressing policy and legal reforms that benefit the broader business environment. This assessment found incubators to have been effective in launching businesses, creating jobs, and generating tax revenue (OTF Group 2006, Universalia 2007).

Demand-side Interventions to Enhance Public Sector Governance and Service Delivery to the Public

5.17 The assessment of Bank Group demand-side interventions is based on a review of a random sample of 91 closed and ongoing World Bank operations with ICT components or subcomponents in sectors other than ICT. The sampled World Bank projects were divided into two categories: (i) those for which the main objective of the ICT component was to support a more efficient government and governance (public sector governance projects) and (ii) those that supported the improvement of service delivery to the public in all sectors. All sampled projects were further divided into three categories, depending upon the estimated importance of the role of ICT in the overall project: *crucial* to achieving the project's development objectives; *important* for one aspect of the project (for example, for piloting or sustainability), or *minor* for achieving development objectives. The assessment also included a purposive sample of four IFC projects involving ICT applications in the finance and health sectors.

5.18 ICT components in Bank Group projects in other sectors aimed to contribute to highly relevant objectives for the development of the country. ICT-related objectives for the majority of operations were material to the country's development priorities; aligned with ongoing reform and investment efforts; and complemented support from other development partners. Overall,

ICT played a crucial or important role in affecting overall project objectives in 74 percent of reviewed projects.

5.19 ICT played a major role in Bank projects designed to enhance public sector governance and support a more efficient government.

Public sector governance (PSG) projects with ICT components are designed to improve the quality and reach of government services and the accountability, efficiency, and transparency of general government. The entire sample of PSG projects incorporated ICT components that were crucial or important for achieving development objectives—the overall project depended quite significantly on the performance of the ICT component.³⁰ This underscores the central role ICT is often expected to play in improving efficiency, transparency, and accountability in Bank-supported government reform. In this respect, task team leaders concurred: ICT components in PSG projects tend to be important or significant by design.

5.20 Compared with PSG projects, the role of ICT was less important, but still significant, in projects to support the delivery of services to the public.

ICT was important or crucial to achieving overall project development objectives in 60 percent of projects with an ICT component in agriculture and rural development; education; energy and mining; environment; FPSD; health, nutrition, and population; social protection; urban development; transport; and water. Thus, in 40 percent of projects ICT was added as a “nice to have” component, but its cancellation or modification would be unlikely to affect the project’s overall implementation. In most of the cases the ICT components were important, and in a few cases they were crucial to achieving project objectives—that is, the project would not have been implemented without them.

5.21 ICT components in projects in other sectors supported a wide range of activities.

A simple input→output→outcome model for service delivery is complicated by the multiplicity of objectives in projects designed to deliver services to the public. For example, in health projects, objectives ranged from strengthening medical statistics systems to setting up an integrated bio-behavioral surveillance system for HIV/AIDS. ICT was used in disaster management to develop an improved digital elevation model and obtain supporting satellite imagery. In social protection, a pension project was expected to improve efficiency of government services by financing information technology improvements for pension offices and providing training for staff and management. In education, a

project was supposed to “pave the way” for modern technology in the country. In water and sanitation, a project intended to supply and install information technology equipment to allow for the regular and efficient monitoring of utility performance and program implementation.

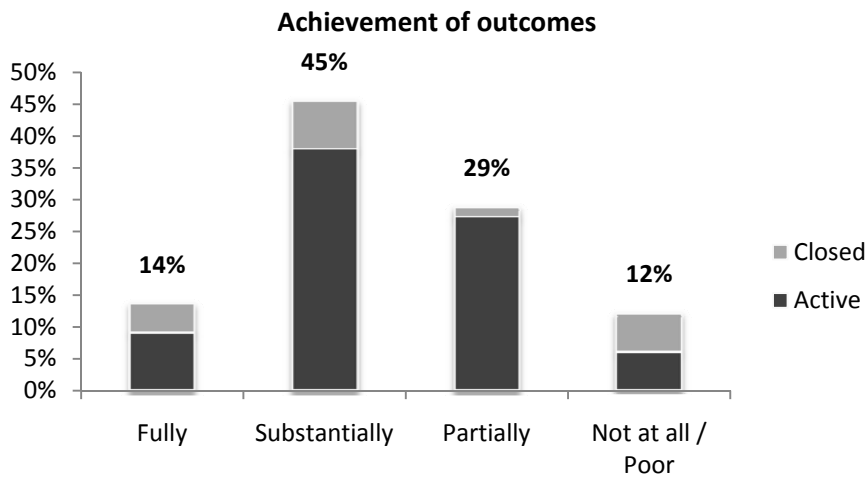
5.22 It is difficult to identify specific transmission mechanisms from ICT components to overall project objectives. Almost 30 percent (28 percent) of all projects reviewed did not clearly articulate how the ICT element is related to overall development objectives. In most cases expected outcomes were not commensurate with overall project scope and size, resources for the ICT activity, or time allocated for the implementation of ICT elements. In the delivery of services, internal benchmarks for monitoring achievement are necessary given the lack of standard outcome measures (Bhatnagar and others 2007). Funds dedicated to ICT inputs are often a disproportionately small amount of the overall lending for PSG reform. In other sectors, such as health, finance, or education, the ICT transmission mechanisms tend to be clearer, partly due to the narrower development objectives of Bank projects in those sectors.

5.23 For IFC, support to projects focusing on delivering services through mobile applications is a relatively new area. IEG reviewed IFC’s support to mobile banking (m-banking) and payment systems and mobile health. The broad objectives of m-banking projects were to enhance the availability of banking services to the “unbanked and underbanked.”³¹ Projects aimed to facilitate the growth of microfinance agencies, improve financial services, expand mobile banking, and increase electronic payments. IFC identified a role in this segment based on its experience with financial markets projects. IFC’s role was stated as financial (provision of equity risk capital), as promoting corporate governance in early-stage companies in a new sector, provision of advice on regulatory and money laundering issues, and through its international expertise and knowledge.

5.24 More than half (59 percent) of ICT components in projects in other sectors have achieved (or are likely to achieve) their intended results³² (Figure 23). Notwithstanding that 82 percent of evaluated projects are still active in the portfolio and have not reached the expected outcome, the rate of achievement (or likely achievement) of ICT objectives is low for several reasons, including design issues, implementation shortcomings, and a high rate of cancellation of ICT components. Examples of high-risk/high-reward projects with ICT

components include the Nicaragua Public Sector Technical Assistance Project. The ICT component was critical to achieving the project's development objectives of strengthening the public investment system with a single, integrated registry.

Figure 23. Achievement of Results for ICT Components (All Reviewed World Bank Projects with ICT Components)



Source: IEG ICT database.

Note: N =66 (excludes projects in which ICT was categorized as a minor component).

5.25 About half of ICT components in projects supporting public sector governance are likely to achieve their intended result.

Thirteen percent of the PSG projects fully achieved their intended objectives and 39 percent substantially achieved them. The ICT components were at the core of the projects and included the design and implementation of a management information system, establishment of an ICT department, and implementation of an integrated revenue and registration management system with access to third-party information to increase efficiency and compliance. Conversely, a judicial reform project in Russia aimed at strengthening judicial transparency and efficiency in courts failed. In this case, the crucial ICT component – the implementation of information systems – was not implemented.

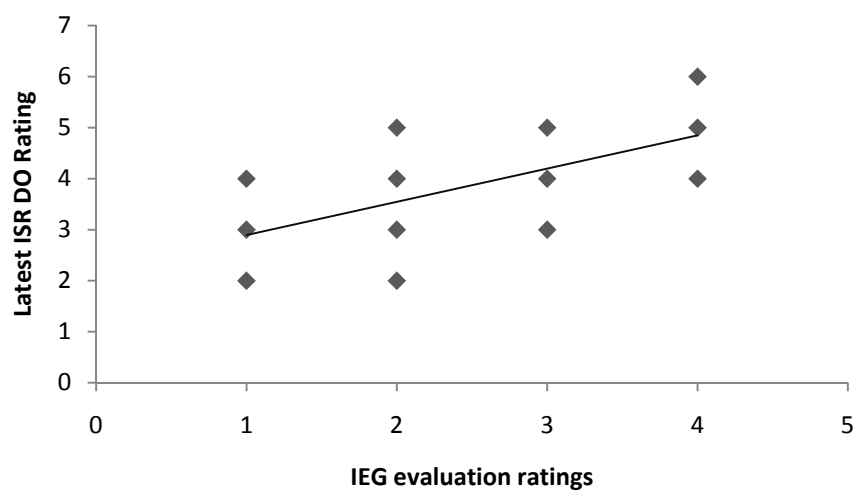
5.26 ICT components in projects to improve delivery of services are more likely to reach intended results when they are important or crucial for the overall project.

In 66 percent of projects with ICT applications, these components fully or substantially achieved their intended objectives. The ICT components were a key design feature to improve delivery of services. For example, the Social Fund for Development in Yemen was intended to improve access of low-income

groups to basic social services, while providing an example of an effective, efficient, and transparent institutional mechanism for providing social services in Yemen. ICT was successful in supporting the Governorate Local Authorities through transfer of information technology, with special emphasis on assisting local authorities in the inventory of public assets in their jurisdiction using geographic information system tools, field surveys, computers, and mapping equipment.

5.27 In most cases, there is a direct relationship between the performance of ICT components rated by IEG and the self-rated overall performance of the project. IEG evaluated only the ICT component of projects, finding a limited rate of success. However, comparing these ratings to self-ratings of overall project outcomes (based on ICRs and ISRs) for the same projects reveals a positive relationship. That is, the performance of a critical or important ICT component is associated with the achievement of the overall performance of the project (Figure 24). Projects with ICT components of minor importance to achievement of objectives were excluded from this comparison.

Figure 24. Performance of ICT Components Is Linked to Development Outcomes



Source: IEG ICT database and IEG Assessment of Bank Group projects with ICT components across all sectors.

Note: N = 66 projects (excludes projects in which ICT was categorized as a minor component)

5.28 IT projects implemented by the private and public sectors faced challenges similar to those encountered by World Bank ICT components. ICT-enabled change is challenging to organizations in developed and developing countries alike. In the United Kingdom,

public sector ICT projects were as successful as private sector projects, but government program failures had a higher profile (National Audit Office, U.K. 2006). From enterprise resource planning to health, successful implementation and outcome achievement is challenging in IT projects or projects with significant ICT components. Estimates of failure rates in ICT projects across services – banking, securities, manufacturing, health care, insurance, and other services – range from 50 to 70 percent.³³ Successful organizations implemented appropriate projects with sound portfolio management. Projects tended to be ambitious and complex; sound governance and control over the project lifecycle were crucial for success. Failures to address issues specific to ICT-enabled business change resulted in unsuccessful projects. In general, delays and associated cost overruns were common.

5.29 The high failure rate of ICT projects in both private and public sector projects and across developed and developing countries suggest that these projects are inherently risky and challenging. But the development rewards can be significant if their potential is leveraged. Examples of a tax project in Bulgaria and custom modernization project in Kazakhstan illustrate the development potential of such projects. This high-risk/ high-reward project profile indicates the large potential gains from learning and improving performance. Lessons from experience outside the World Bank Group refer to the role of factors such as (i) complexity added by organizational and political pressure to “think and act big”; (ii) improper or absence of understanding of users; and (iii) failure to focus on real problems and needs (see Box 9).

5.30 Results indicate that IFC projects in ICT applications have thus far not met their development objectives.³⁴ While still in the early stages of implementation, each of the reviewed projects failed to meet milestones, and, in one case, financial sustainability was called into question just 9 months after project approval. Each of the projects had difficulties scaling up their business and building a user base in line with expectations at approval.

5.31 Attention to robust business models and local partners (especially financial institutions) is important, as is an assessment of readiness (technological, infrastructure, and absorptive capacity of target clients). The performance of one project was undermined by a dispute with its partner financial institution over compliance with

national regulatory requirements, culminating in the bank shutting down accounts held by clients of the IFC project.

5.32 The number of mobile accounts has remained below expectations, and less than 10 percent of accounts were reported to be active. Similarly, a mobile health project to track disease incidence fell short of its development terms and is exiting operations in developing markets due to losses in this segment. The project also was affected by the lack of a functioning health information system in the country, which is necessary for effective use of the health information the project collected.

5.33 **From the limited experience available for examination, it appears that IFC has yet to find its niche in this segment.** All projects also faced competition from other providers of similar services. Project performance was reported to have been affected by the global financial crisis. Innovation and adaptability were crucial. One project had difficulty adapting to a changing market environment and incurred losses because of its focus on low-margin business segments. In one case, the project changed its business model to focus on established financial services companies and government initiatives, rather than serving microfinance institutions to improve operational performance. Early results also point to the importance of the evolving regulatory framework to the outcome of mobile finance projects.

5.34 **This market segment has been difficult for IFC, given the risks related to technologies, quality of sponsors and their partner financial institutions, regulatory uncertainties, and a rapidly evolving competitive environment.** Going forward, IFC should be involved in projects leveraging mobile networks for financial applications only where there is a strong case for IFC additionality (for example, a need for the services in the country that is not being met by the private sector or existence of policy issues that IFC could effectively address due to its association with the World Bank Group) and focus on quality sponsors. It should also strengthen its due diligence with respect to business models, markets, regulatory risks, and quality of local financial-sector partners.

Box 9. Evidence of ICT Impact on Service Delivery from Impact Evaluations

The 2002 ICT Strategy noted that ICT components in projects outside the ICT sector are the largest and least monitored of ICT investments by the World Bank. A review of impact evaluations done at the World Bank, Inter-American Development Bank, and elsewhere found very few evaluations from which to draw causal evidence of ICT impact on student learning, health outcomes, or government service delivery.

The evidence of the effectiveness of ICT in education is mixed. ICT interventions in education are most successful in mathematics, with lesser success in language. Evidence from **Ecuador** showed that computer-assisted instruction had a positive impact on mathematics test scores (about 0.30 of a standard deviation) and a statistically insignificant effect on language test scores. The impact was much greater for students at the top of the achievement distribution (Carrillo, Onofa, and Ponce 2010). Computer-assisted learning (CAL), in the form of math games, introduced into schools in **India**, increased math scores by 0.35 standard deviations the first year, and 0.47 the second year, as compared with scores for students educated in non-CAL schools. This program was equally effective for all students. The program found a way to make these computers pedagogically useful in the treatment schools, without placing additional demands on the teachers' time (Banerjee, Cole, Duflo, and Linden 2005). In **Colombia**, failure to incorporate computers into the educational process resulted in little effect on students' language test scores with the Computers for Education Program (Barrera-Osorio and Linden 2009).

The implementation of the One Laptop per Child Initiative has been marred by issues related to its approach and design. The program has had limited results in the number of laptops distributed to students and in their actual use. Studies indicate that the program suffered from a lack of complementary infrastructure, skills development for teachers and students, and adaptation to local practices and constraints. Laptops were little used in schools, and there are indications that marginalized students are not able to exploit the potential of laptop use on their own. Students with higher socioeconomic backgrounds were found to be using computers more creatively, thus exacerbating existing divides (Warschauer and Ames 2010).

Only one impact evaluation was found for ICT and health. In **Uruguay**, Internet-based and SMS information on type 2 diabetes was tested against the distribution of a brief educational brochure. No significant impact of the Internet and SMS intervention was found on knowledge, behavior, or health outcomes. Most participants were only reached by SMS; use of Web-based information was correlated with gender, education, and marital status.

Little rigorous evidence is available on the impact of ICT on government service delivery. Bhatnagar (2007) reports that the lack of effective project design, inadequate infrastructure, and a lack of willingness to reengineer processes can result in online service centers and government portals that show little improvement over the status quo, as was seen in the programs in **India** and **Chile**. Yet a government program in **Colombia** using SMS to inform internally displaced persons of available benefits was found to be successful in empowering the target group.

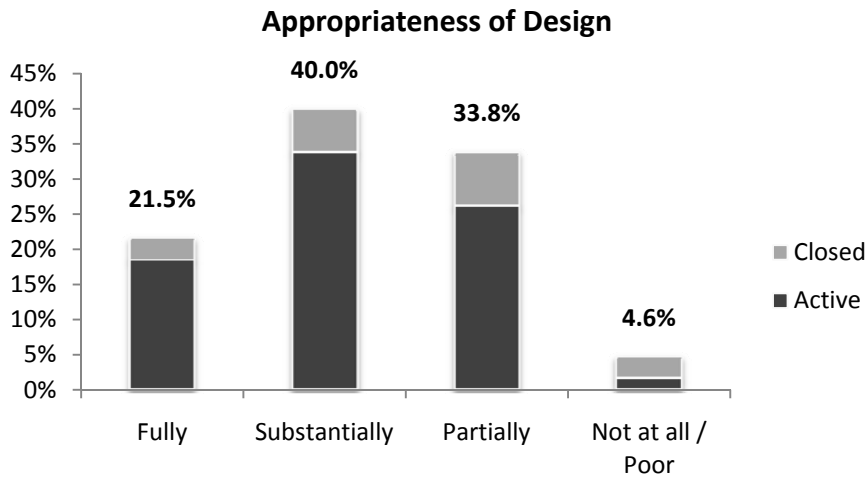
Design and Implementation Issues in Bank Group Projects

5.35 **Quality of design of the ICT component is the most critical factor affecting the overall performance of projects.** Design encompasses many dimensions – physical, institutional, and organizational – but complexity of design is the most pervasive issue among the poorly performing sampled projects. The large numbers of poorly designed projects are also the ones least likely to reach their intended objectives or to reach them only partially.

5.36 PSG projects usually have a large number of components and subcomponents and are associated with multiple implementing agencies. For example, the Yemen Civil Service Modernization Project focused on the technological change and neglected process, institutional, human resource, administrative, and capacity changes. Others, such as the Guatemala Integrated Financial Management TA, were designed to tackle a staggering number of components and institutions at the same time. The initial project was scheduled to run for four years, but it was first extended for two years, only to be restructured in 2008 with a three-year extension. Projects designed to improve the delivery of services in other sectors have different quality-of-design issues. Some ICT components are disconnected from the overall project objectives or too deeply embedded in other subcomponents. This contributes to the lack of an adequate M&E framework.

5.37 **Almost 40 percent of projects with ICT components have design shortcomings that could affect overall project outcomes.** These shortcomings often involve setting overly ambitious and unrealistic goals for ICT's role in the overall project. There is a tendency to overlook the complexity of the technical, managerial, organizational, institutional, policy, and human capacity context of projects and, as a result, substantially underestimate the implementation constraints and risks. This leads to delays, high rates of project extension and restructuring, and high failure rates, with high costs for the client country and the World Bank. Only 22 percent of all reviewed projects had a fully satisfactory design that completely articulated ICT results in relation to the projects' objectives (Figure 25). Thirty-eight percent of projects were rated only partially satisfactory or unsatisfactory³⁵ on appropriateness of project design because of shortcomings in incorporating their planned ICT elements into the overall project design. There seems to be no significant difference between closed or active projects in the quality of design of ICT elements.

Figure 25. Appropriateness of Design: Projects with ICT Components, FY03–09



Source: IEG assessment of Bank Group projects with ICT components across all sectors.

Note: N = 66 projects.

5.38 Most of the design shortcomings could be minimized by avoiding a narrow technological approach to ICT solutions. A common failure in design identified by IEG is that task team leaders and counterparts do not fully recognize the transformational impact that ICT elements could have in their projects. They tend to view ICT primarily as a pure technical challenge to be taken care of by an ICT specialist. For complex projects, the required business process reengineering, change management, and organizational implications of ICT components are underestimated or, even when they are mentioned in the Project Appraisal Document, they are not effectively linked with the rest of the project or they are not efficiently implemented. A recent Quality Assurance Group review shows similar findings.

5.39 In a majority of cases, the ICT component was not implemented as planned, and most projects required modifications. For the group of PSG projects, including several recent projects, ICT was implemented as planned in only about 30 percent of projects. IEG’s findings are consistent with other reviews of PSG projects. In 70 percent of the cases, the ICT component or project was modified, partly or substantially – including cancellation of the ICT component – or substantially delayed. Project extensions ranged from nine months to five years; a few projects have been partially or completely cancelled. Half of the projects that are being implemented as planned are either a follow-ups to a previous project or a supplemental. This suggests that one project cycle may be insufficient

to reach the intended outcomes in projects with substantial ICT components.

5.40 The case is more critical for ICT components in projects designed to improve the delivery of services. These were modified or dropped without much explanation. Among this group of projects, in about 90 percent of cases, the ICT elements were delayed, modified, or cancelled. A review of the project documentation does not clarify the reasons for these modifications or cancellations in either active or closed projects. An IEG field visit revealed that an agribusiness project had not yet achieved its objective in creating a market information system for use by local farmers and was delayed.

Factors for Success in Public Sector Governance and Delivery of Services through ICTs

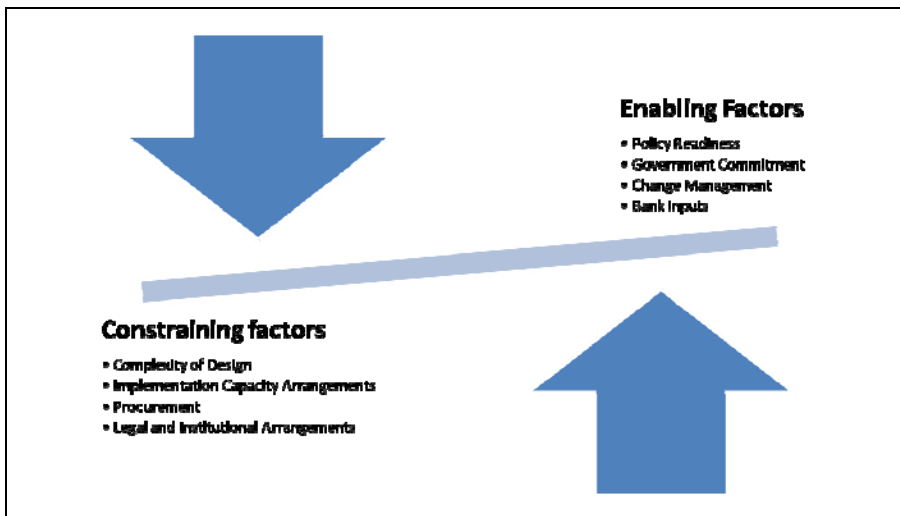
5.41 The drivers (and enablers) and constraints to implementing ICT projects differed between governance and services projects, but they cover similar areas (see Figure 26). Heeks (2003) introduced two models to explain the failure of e-government. In his Factor Model, he considers five factors – strategy, management, design, competencies, and technology – that can act as either a constraint or an enabler/driver of the success or failure of the applications. In his Design-Reality Gap Model he introduces seven dimensions of this gap: information, technology, processes, objectives and values, staffing and skills, management systems and structures, and other resources. Rand Europe (2010) listed five capacities and readiness conditions (infrastructure, financial, institutional, human, and relationship or receptivity) for successfully using ICT in service delivery.

5.42 While country approaches and arrangements for e-government vary, coordination of IT initiatives and investment is important. External evidence suggests the need for e-government institutions to promote a national strategy for e-government and common information infrastructure and applications across sectors to promote a consistent approach across different agencies and sector and to avoid duplication of efforts and investment. The World Bank has identified three institutional models for leading e-government agenda: (i) policy and investment coordination in a cross-cutting ministry (e.g., finance, planning), (ii) administrative coordination (e.g., ministry of public administration, prime minister's office), and (iii) technical coordination (e.g., ICT ministry) (Hanna and Qiang

2009). The importance of a clearly defined locus of responsibility for implementing the e-government agenda was confirmed in the course of cases reviewed by this evaluation.

5.43 Integration of IT systems in projects with ICT components requires strong government implementation capacity. Integrated ICT systems, such as the Integrated Financial Management Information System involving many Bank-financed projects, are inherently complex and require strong implementation capacity at the agency or country level. In several countries, large integrated systems may exceed the capacity of government to fully coordinate and supervise them. The involvement of other donors may also be difficult to manage.

Figure 26. Enabling and Constraining Factors for Achieving ICT Objectives



Source: IEG assessment of Bank Group projects with ICT components across all sectors.

5.44 Government commitment to ICT is a clear enabler for success in all projects. A survey of Bank task team leaders identified government commitment as the most important of the factors that facilitate achievement of results (64 percent of respondents). This is especially the case in all e-government projects, where government commitment is more critical as driver than it is in other types of projects. This is because one or two key ministerial departments, usually including the Ministry of Finance, are responsible for making decisions. The strong commitment of both the Chilean and Pakistan Ministries of Finance were key to the successful implementation of their complex projects.

5.45 Although sustained high-level commitment is necessary for a successful outcome, it is not sufficient. The experience with ICT applications shows that the commitment of middle-level management

to the project approach and design is also important. Projects that fail to build ownership and commitment at that level are likely to fail. For example, a project promoting the development of a national statistics system in Burkina Faso provided computers for the national statistics office and had a positive effect on delivery of the office's deliverables, but the project did not link the office with other government agencies or establish a national system.

5.46 Implementation capacity commensurate with the complexity of IT solutions is another major factor for achieving ICT results.

Operations supporting ICT applications are mostly multisectoral, and therefore more difficult to implement because they require good coordination and capable counterparts in the various implementing agencies involved. For example, public sector financial management projects are inherently complex and require strong implementation and coordination capacity at the agency or country level. Therefore, implementation capacity commensurate with the complexity of these operations is crucial. The task team leader survey identified implementation capacity as the second-most important factor facilitating the achievement of ICT application results (highlighted by 61 percent of task team leaders who considered that the ICT-related results were or will be either fully or substantially achieved). Delays in project implementation caused by limited (government) counterpart capacity was mentioned as the main factor to negatively affect the achievement of results in ICT applications (highlighted by 64 percent of task team leader respondents who considered that the ICT-related results were or will be partially, poorly, or not achieved).

5.47 Well-designed ICT projects have factored in the capacity limitations of the implementation agencies and have made early arrangements for mobilizing a calibrated set of capacity-building inputs as well as the technical assistance necessary to support the local implementers. Yet these arrangements go wrong for several reasons, starting with a deficient or overoptimistic assessment of institutional capacity, which may delay the project for several years. A related constraint has been the resistance of some borrowers to using Bank monies to fund technical assistance and the need to rely on grant funds provided by other donors to fund TA experts. The two-track approach, with a TA component disconnected from implementation, was a contributing factor in the delayed implementation of the Pakistan Tax Administration Reform Project. At the same time, having the implementing agency staff taking care of

implementation has the merit of building local commitment and sustainability.

5.48 One hallmark of a successful ICT component is a strong and effective management unit. The unit needs to be guided by a medium- to long-term strategic vision and able to stay the course. That unit also needs to be responsible for steering the change management process and for ensuring that the ICT component is well integrated with the complementary organizational changes. A large part of the success of the Bulgaria Revenue Administration Reform Project was based on the establishment of such a Strategic Planning and Change Management Department, which was in charge of project implementation. Similarly, in the Pakistan project, the role of the Communications and Change Management Unit was a factor in project success. Conversely, many failures are rooted in the failure to identify and set up an effective management and change management structure.

5.49 Change management needs to be incorporated in the implementation of ICT components in large projects. Because of the transformation process involved in more complex ICT projects, as opposed to the simpler and early-stage “automation” process, project management and the design of a change management approach requires very careful assessment. There is a need to rely on a project manager and a management unit able to champion and steer the overall reform/transformation effort, including its ICT dimension (see Box 10).

5.50 Because of the growing importance of the ICT applications to be implemented, it is sometimes necessary to set up a full-fledged ICT department. Such a recommendation was recently formulated for the Azerbaijan Judicial Modernization Project to ensure satisfactory progress on the multiple ICT aspects of the project. Ensuring that the stewardship of the project is entrusted to a department with sufficient responsibility and strategic vision was considered critical to accelerating progress of the IFMIS implementation in the Kenya Institutional Reform and Capacity Building TA. Insufficient attention to change management and communications linked to the absence of a comprehensive ICT strategy were hampering project progress.

5.51 ICT procurement has been highlighted as a major implementation constraint in several country and regional portfolio reviews and is a critical dimension of design. Procurement issues can be reduced by careful procurement planning at entry and early

involvement of procurement specialists. Staff have highlighted the lack of specialists with expertise in IT procurement. World Bank procurement rules were designed for infrastructure projects, which separate goods and works from consulting service. This approach has not been useful for IT contracts, especially large ones, which usually require combined procurement because of the change management that accompanies adoption of IT.

Box 10. An Illustration of the Change Management Process as Opposed to the Purchase of a Single Procurement Package

In the Armenia Public Sector Modernization Project, the original plan to hire a consultant to help prepare technical and functional specifications for the e-procurement system failed.

The Bank's leading e-procurement expert later brought more clarity and realism to the government's vision of reform in this area. One important aspect the specialist highlighted was the time needed for change management, which would turn the reform into a continuous e-procurement program rather than a one-time investment, as previously planned.

Establishment of an e-tendering system followed, which, in turn, passed several stages of modification, following consultations within the government as well as comments from the Bank. The results of the previous bidding in mid-2009 were canceled, since all financial proposals exceeded funds available under the project. As a result, the Ministry of Finance was unable to provide the previously agreed cofinancing.

Ultimately, a more successful second bidding, carried out in 2010 with a smaller scope of assignment, led to the selection of a Greek company. The successful implementation of the assignment is the last remaining challenge of PSMP I.

Since the change management process takes time to fully implement, the e-tendering system may be used for several years before the government of Armenia will be ready to go ahead with the remaining phases of the e-procurement program and the introduction of an e-purchasing system.

Source: Armenia Public Sector Modernization. WB project files.

5.52 Another issue is the lack of a common internal World Bank approach with respect to IT components, which results in delays in deciding whether to select an off-the-shelf IT package or a customized solution. The survey of task team leaders identified Bank procurement procedures as the third-most important factor

constraining achievement of ICT results (38 percent of respondents who considered that the ICT-related results were or will be partially, poorly, or not achieved. World Bank task team leaders expressed the view that the Bank's approach to procurement has been inconsistent, in both substance and process: different departments provided different advice to the same government. Procurement has sometimes stalled projects, in some cases by years, because it is claimed that procurement specialists are unduly risk averse. The process is complex and long: Bank procurement requirements take an average 27 months to complete, and this is coupled with the lack of capacity in countries to use procurement contracts.

Human Capacity for ICT

5.53 World Bank support for ICT-related skill development has played a small role with limited results thus far. It is early to assess outcomes of the seven World Bank IT/ITES projects that supported skill development in client countries during the evaluation period — only one has been completed and four others have been under implementation for more than three years. As in the case of other projects in the ICT sector, indicators; to measure results were weak. Only two projects had outcome measures, most only measured outputs.³⁶ So far, these seven projects have trained approximately 25,000 people. Of the five education sector projects that included ICT skill development components, most are in early implementation, and only one has been completed — the Russia E-Learning Support Project. This project is a good practice example for the development of ICT skills (see also Box 11).

Box 11. A Good Example of ICT-Related Skills Development

The recent IEG Education Portfolio Note found that, of the completed projects in the review that measured learning outcomes, the Russia E-Learning Project was the only one focused on competency in ICT (IEG 2011b). The project was rated highly satisfactory for outcome, and all targets were exceeded; for example, the number of 9th-grade students demonstrating ICT competence (126 percent of original target).³⁷ The following factors contributed to the success in achieving the ICT-related objectives:

- A balance between installing and using IT and developing and integrating appropriate learning content and teaching methods
- Provision of mechanisms to manage the process of integrating ICT-enabled learning with more traditional teaching methods
- A clear results chain from interventions to outcomes and substantial M&E quality
- A very proactive counterpart that resolved initial delays and the lack of educational standards and regulations needed for ICT.

Sources: World Bank project documentation, Russian Federation E-Learning Support Project (Phase I of the Education Modernization Program Adaptable Program Loan [P075387]).

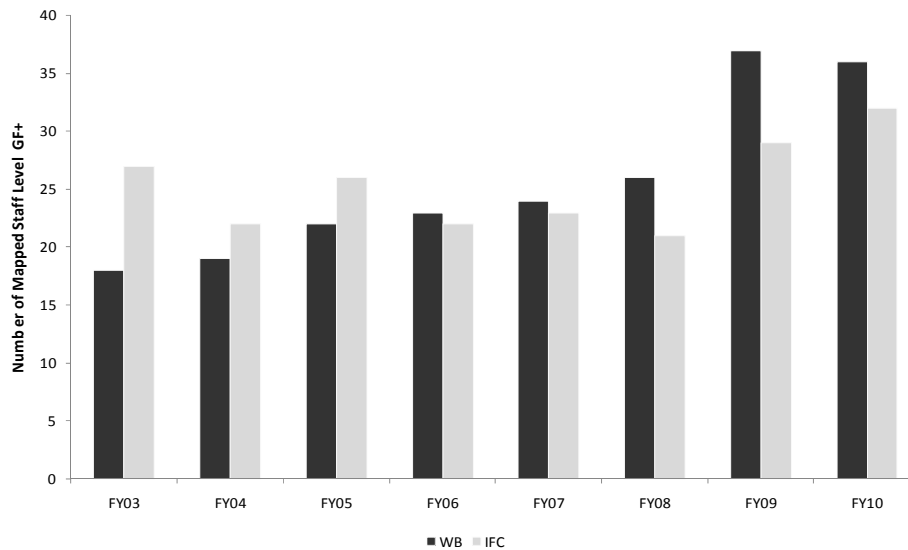
Delivery Mechanisms and Organizational Aspects

5.54 Task team leaders lacked sufficient ICT support. Bank task team leaders are not able to secure support or advice from the ICT unit. This issue was raised by both participants in the focus groups and in the task team leader survey. In the survey, only 9 percent of task team leaders of projects for which ICT was either crucial or important for achieving the development objectives received support from the ICT unit. Only 6 percent of them received support related to ICT from the networks. Only one network (education) was identified as very proactive in disseminating knowledge related to the use of ICT in projects, although it was not able to offer direct support during project preparation or implementation.

5.55 Technical and operational staff in the GICT Department increased as the Bank Group ICT portfolio expanded. The 2001 evaluation recommended that ICT staff skills be upgraded to keep pace with the rapidly changing ICT sector. Consistent with that recommendation, the 2002 ICT Strategy proposed an “expansion of staff numbers and of staff training in order to ensure skills are available for an expanded program of project offerings.” While the upgrading of skills is difficult to measure, staffing data show that

overall ICT staffing in the GICT Department at levels GF and above grew very little in the FY03–10 period, except in the last two years (Figure 27). This growth started in FY09, the year in which the number of ICT operations accelerated. Although this increase might help the ICT unit address the insufficient support that task team leaders reported for the ICT components in their operations, it probably will not be enough, and other solutions should be pursued to ensure the needed support (for example, the ICT unit could put together a roster of ICT experts that task team leaders could call when they need such support). New approaches are being explored. For example, in 2008 a roundtable chaired by the World Bank president was convened to discuss areas where the World Bank Group can partner with the private sector and with client countries.

Figure 27. Technical and Operational Staff in the GICT Department



5.56 IFC’s business model to support IT/media projects had shortcomings. IFC’s ability to support small, high-risk companies in a timely way has been hampered by its business model and process. IFC’s retail approach, tailored for larger operations, may have led to delays in processing and caused stronger companies to withdraw from IFC. IFC also has lacked experience in some IT subsectors. Its work quality was also a factor, in not identifying weak management capacity and business models in some projects as risks. Additionally, projects often included unrealistic objectives compared with the size of the IFC investment or overall project size.

5.57 **Going forward, the availability of a global mobile network presents enormous challenges and opportunities for the way the Bank Group delivers its assistance.** The near ubiquity of mobile phones creates a platform that opens new opportunities for the World Bank to enhance reach and effectiveness in designing, implementing and monitoring its projects. The World Bank should give priority to designing projects that include the applications and content needed to capitalize on this platform to realize social benefits from ICT. Furthermore, the global mobile network presents opportunities for real-time data collection and more effective M&E of development assistance projects, including through open-source mobile software applications, readily available georeferencing tools such as Google Earth, and widespread use of social media in the developing world.

Conclusion

5.58 ICT project components have had modest results because of intrinsic risks and flaws in design and implementation that failed to take into account local context and capabilities or necessary change management processes. However, the performance of World Bank and IFC in ICT applications is consistent with the implementation record of ICT projects implemented by the private or public sector. Procurement expertise and practices and organizational arrangements were also inhibiting factors.

5.59 Going forward, the Bank Group needs to internalize the opportunities presented by the global mobile network. The Bank should increase its focus on the success factors including government commitment, country readiness, implementation agency capacity, change management considerations; institutions leading the ICT agenda across sectors and agencies; and shared infrastructure and service so that applications and services can be shared across agencies, and duplication of IT investments is avoided. IFC's investments through direct support to IT companies were not successful at the project level; taking a portfolio approach, IFC was able to achieve returns consistent with private equity/venture capital benchmarks. IFC's experience reflects the riskiness of this market segment, but also limitations in its business model.

6. Conclusions and Recommendations

6.1 Over the past decade, access to ICT in developing countries has grown rapidly, a development enabled by changes in technologies, policies, and markets. Increased access has unleashed the transformative potential of ICT, affecting the ways in which people, governments, and businesses interact. The changes in those interactions, and ICT itself, promise to enhance economic opportunities for the poor, improve delivery of services to the underserved, enhance government efficiency and transparency, and accelerate social change.

6.2 Technological innovations and policy reforms over the past decade have opened opportunities for the private sector, which has been critical to the expansion of access. Technologies, markets, and policies have developed rapidly, and access to mobile telephony has grown, driven by private investment in networks, new business models to target mass markets, and economies of scale. With the growth in private investment, the role of the public sector, and of the World Bank in particular, has been largely supportive. Governments, with Bank assistance, have opened markets to competition through regulatory reform.

6.3 Together, the private sector investments and public sector reforms have helped to narrow the gap in access to mobile telephony between developing and developed countries (reaching a penetration of 68 percent for developing countries in 2010). Use of the Internet, although also growing rapidly, is lagging behind the explosive growth of mobile telephony.

6.4 The increase in ICT access and use has been accompanied by some important issues and constraints. Developing countries have had to adapt policies and regulations to the rapid changes in technology and market structure. In the early 2000s, the challenges to adaptation included lack of independent regulation, uncompetitive telecommunication markets, and privatization of operators. Reforms

focused on spectrum allocation, licensing of new operators to introduce competition, ensuring workable interconnection arrangements, and ensuring ICT access for the poor and underserved, among others, were needed. Furthermore, to be able to reap the benefits of ICT growth and its transformative potential, governments needed to support the development of ICT skills by their people and adopt ICT themselves for better delivery of education, health, and other services and to enhance government efficiency and transparency. While progress has been made on many of these challenges, some important challenges have yet to be mastered. These include ICT access in the poorest countries, the lag in access to and use of the Internet and broadband (important for business), ICT skills, and the adoption of ICT applications in other sectors.

6.5 With its 2002 ICT Strategy, the World Bank Group committed to intervene in four areas: broadening and deepening sector and institutional reform; increasing access to information infrastructure by mobilizing and leveraging private sector investments and finance and to extend access beyond what commercial providers are prepared to provide on their own; supporting ICT human capacity; and supporting ICT applications to enhance public administration and private sector development, as well as ICT components in Bank lending. The strategy specified roles for the public sector and development agencies (such as the World Bank Group) for two reasons. First, ICT development would be contingent on reform and a strong regulatory environment. Second, market failures and equity considerations would require support of private investment and market-based subsidies to foster ICT access beyond what the market alone would provide. The strategy specified a division of labor between the World Bank and IFC/MIGA.

6.6 The Bank Group has a catalytic role in ICT. Its most notable contributions have been in sector reform and fostering private investments in mobile telephony. In terms of volume, World Bank lending amounted to \$875 million, excluding DPOs. Bank lending over the period increased for regulatory and sector reform and for supporting access to the poor and underserved, while support for privatization and physical infrastructure investment declined. During the period, the Bank undertook 410 nonlending technical assistance activities in support of ICT sector reform and capacity building. IFC (\$2.3 billion in telecommunications) and MIGA (\$600 million) focused on supporting private investment for the rollout and expansion of infrastructure for mobile telephony and the operation of mobile

service providers. Both IFC and MIGA have increased their involvement over the period, with increasing concentration in IDA and frontier countries, where both agencies had a greater role to play. In addition, IFC supported IT and media companies (\$407 million).

6.7 A large number of World Bank operations in sectors other than ICT include ICT applications. A review of investment projects approved since FY03 found that in about 1,300 projects (74 percent of all investment loans) ICT was used as a component, subcomponent, or within components. The majority of public sector governance, education, agriculture, financial, health, social protection, urban, transport, water, and energy and mining projects included ICT in some way. IFC has recently supported ICT application projects in mobile banking, e-commerce, and education (\$119 million in commitments).

6.8 Countries with Bank Group support for policy reform and private investments have increased competition and access faster than countries without such support. With respect to policy reform, 60 percent of lending operations achieved their objectives. The relatively large proportion of operations falling short of expectations reflects the focus on more challenging and difficult environments. Nonlending technical assistance activities reported strong performance.

6.9 IFC projects supporting private investments in mobile telephony showed strong development results. Its investments were highly concentrated in IDA and frontier markets, especially Africa, where it played a significant role.

6.10 Targeted efforts to increase access beyond what commercial operators were willing to do on their own have been largely unsuccessful. Access to the underserved and poor was more effectively achieved by projects focusing on the enabling environment and direct support to investments. But positive examples of Bank Group support (in Chile and Pakistan) indicate the potential of targeted approaches, including through public-private partnerships.

6.11 The performance of the Bank Group in ICT applications was modest – 50 to 60 percent of projects achieved their ICT-related objectives. This performance may reflect weaknesses in key prerequisites, such as effective institutions and planning for change management processes and the greater difficulty of implementation of IT projects, which have high failure rates in both developed and developing countries. IFC's support to IT companies was not

successful on a project level, reflecting the high risk of this sector and limitations of IFC's business model. However, considering these projects on a portfolio basis, in line with IFC's venture capital approach, IFC's returns have been positive and consistent with industry benchmarks. Finally, the area of ICT skills development has received little attention in Bank Group operations.

6.12 The Bank Group's effectiveness has been influenced by both internal and external factors. Among external factors associated with positive outcomes were pent-up demand and willingness to pay for communications services, regulatory reform and enhanced competition in telecommunications, strong government commitment, capacity to implement reforms or IT solutions, and experienced private sponsors with strong business plans and market strategies. Internal factors that affected performance included the lack of robust results frameworks with respect to measuring specific ICT objectives, weak follow-up on ICT components in projects, delays in implementation, lack of procurement specialists with IT expertise, assessment of regulatory risk during project appraisal, (lack of) ICT sector expertise, work with repeat versus nonrepeat clients, limitations in the business model addressing needs of small innovative companies, and focus on the need for change management and local conditions and capabilities.

6.13 The existence of a joint GICT Department facilitated coordination across public and private sector units. But the department lacked a clear mandate to lead ICT operations across the Bank Group, and World Bank staff perceived a lack of sufficient support from the ICT unit. The recent reorganization may diminish the benefits of a global, integrated ICT Department and underscores the need for incentives for collaboration, coordination, and joint approaches for innovation among Bank Group units.

Recommendations

6.14 This evaluation finds that ICT can be a tool to advance development objectives under the right circumstances and when policy makers consider enabling factors, local context, constraints, and capabilities. The findings are in line with the body of evidence linking investment in ICT to productivity and growth and the potential of ICT to transform the way governments function or the manner in which services are delivered to the public. The near ubiquity of mobile phones offers the potential for this medium to evolve from a communication

tool to a delivery platform for services. ICT is not a panacea for development challenges, but it may be part of a package, together with investment in basic infrastructure, reform processes, and skills development in bringing about change.

6.15 Going forward, the World Bank Group ought to retain a role in ICT, but with important shifts in priorities. Progress in reforms suggests a role for the Bank in this area related to (i) updating the regulatory frameworks to support broadband and Internet access and (ii) preserving competition in the face of consolidation and convergence in the sector. Gaps in broadband and Internet access, but in the context of overall expansion of coverage, argue for a selective role in supporting private investments in difficult environments. Expanding access beyond what market players would provide on a commercial basis (by using public-private partnership approaches, for instance) needs to remain an important priority for the Bank Group. Building on the significant progress in basic connectivity and the opportunities this offers for development, ICT applications should become the main focus of World Bank Group support, including through ICT skills development. Finally, the creation of a global mobile network presents enormous challenges and opportunities for the way the Bank Group delivers its services.

REFORM AND ACCESS

Recommendation 1. Continue the current shift in World Bank Group support toward broadband and Internet access while incorporating lessons from experience. In regulatory reform, the World Bank ought to (i) maintain the focus on competition combined with promoting stability and predictability of the regulatory environment; and (ii) update its advice and technical assistance related to enabling policy makers and regulators to deal with next-generation policy and regulatory issues, new business models, and convergence of technologies. In access, the World Bank, IFC and MIGA ought to (iii) support catalytic public-private partnership investments to accelerate the rollout of regional and national backbone infrastructure; and (iv) identify and support effective approaches to promote access to the underserved, building on their experience with targeted interventions in other areas.

APPLICATIONS

Recommendation 2. Strengthen the capacity of the Bank Group to respond to client demands for ICT applications by (i) building greater

ICT expertise and awareness across the networks and the Regions regarding the potential applications of ICT, including more consistently capturing ICT aspects in country and sector strategies; (ii) building incentives mechanisms for collaboration, coordination, and joint approaches for innovation between Bank Group units, reflecting the thematic nature of ICT; and (iii) transforming the ICT unit to enable it to act as a connector between internal/client demands and outside expertise from the public and private sectors.

Recommendation 3. Design and implement World Bank Group ICT application projects, consistently taking into account (i) local context and capabilities, country readiness, complementary investments in infrastructure and training, and project-specific change management challenges, (ii) the need to support cross-sectoral enablers, including the development of policies and standards that would apply across agencies, and apex institutions to effectively lead the ICT agenda across sectors, (iii) the benefits of shared infrastructure and services so that applications and services may be shared across government agencies wherever feasible, which is critical to avoid waste and to ensure coherence across government.

Recommendation 4. Strengthen World Bank and IFC support for skills development (including ICT skills development) in client countries to promote the use and production of ICT applications.

DELIVERY SYSTEMS

Recommendation 5: Given the recent dissolution of the joint GICT Department, ensure that the World Bank Group's organizational structure for ICT enables effective strategy formulation and coordinated delivery, and that it articulates an effective division of labor among the World Bank, IFC, and MIGA.

Recommendation 6. Systematically review the implications of the global IT platform for how the World Bank Group delivers and assesses the impact of its interventions. In particular, the World Bank Group can build on the extensive global mobile network to support real-time data collection and M&E for ICT and other interventions in client countries.

Recommendation 7: Improve the World Bank's procurement outcomes in ICT projects and ICT components by (i) building ICT expertise and knowledge among procurement specialists; (ii) adapting procurement rules to reflect sector specificity and the growing use of public-private

partnership-type approaches; and (iii) ensuring the design of consistent procurement procedures to facilitate effective collaboration between technical staff and procurement specialists, including by upstream engagement of procurement specialists during project preparation.

Endnotes

¹ For example, in Africa, a voice coverage gap of more than 15 percent of the population is expected to remain in countries such as the Democratic Republic of the Congo, Madagascar, and Zambia, which the private sector could not meet under commercial terms even under efficiently functioning markets.

² See Kalba (2008) for a more detailed discussion. First generation (1G) – (1980s) analogue mobile telephony (voice) applied in vehicles and very large, heavy handsets operating in several different and incompatible standards and frequency bands; second generation (2G) – (1990s) early digital technology providing voice and narrowband data with greater standardization (GSM dominant globally) and realistically portable handsets; third generation (3G) – (2000) enhanced digital technology providing voice and high-speed data (Internet access) with greater standardization and smaller handsets with expanded capabilities; and fourth generation (4G) – (2009+) next-generation technology (WiMax, LTE, UWorld Bank), now in early stages of adoption, expected to provide broadband, multimedia, flexible access at much higher signal transmission rates.

³ IFC considers the financial, infrastructure, ICT, and social sectors to be high-impact sectors because they contribute relatively more to development through spillover effects.

⁴ The total of \$875 million includes amounts for ICT investment lending only. In the case of multisector projects, the amounts included correspond to the ICT component or subcomponent. Amounts for DPOs are excluded because these operations support many sectors in addition to ICT.

⁵ Full list of operations is in appendix D.

⁶ *Infodev* is a donor-funded global development program for ICT knowledge sharing and financing, coordinated and served by a secretariat housed in the Vice Presidency for Financial and Private Sector Development (FPD) of the World Bank. As part of its mandate, Infodev has supported a network of 189 business incubators in 80 developing countries.

⁷ These represent completed and ongoing tasks managed by the World Bank ICT unit in addition to those that listed ICT as the major sector, funded by both Bank budget and trust funds.

⁸ ICT projects include telecommunications (fixed, mobile, satellite, and broadband) and IT projects (software, hardware, media).

⁹ There is significant overlap between conflict-affected countries and IDA-eligible countries, which explains that the shares of guarantee volumes in IDA and conflict-affected countries add up to more than 100 percent. Although MIGA's portfolio also increased in IDA and conflict countries during the period, these agencywide strategic priority areas accounted for only 27 and 13 percent of total business volume, respectively.

¹⁰ See appendix A for the methodology on how the identification of ICT components or subcomponents was carried out.

¹¹ The Small Investment Program insures eligible investments with a guarantee amount of up to US\$10 million.

¹² Assessing the performance of World Bank support in the ICT sector is challenging. The majority of operations reviewed were multisectoral (84 percent), therefore the ratings of their overall development outcome or implementation progress do not necessarily reflect the performance of the ICT component or subcomponent of the project. Furthermore, in order to capture the dynamic nature of the sector, the evaluation included reviews of both closed operations and newer projects, providing an assessment of quality at entry and early implementation of active projects.

¹³ According to IEG (2003), results of the Bank's reform-intensive private sector development projects in the electric power sector are positive in only 55 percent of cases, and mixed in 22 percent.

¹⁴ For a detailed analysis of ownership structures and their impact on fixed-line telecommunications performance see Welch and Molz (2002). For an analysis of privatization and its impact on the performance of fixed-line operators see Gasmi and others (2011).

¹⁵ xDSL or Digital Subscriber Line (x denotes a "family" as there are several variants of this technology) allows digital data transmission over the copper wires of the fixed-line telephone network at transmission speeds that range from 256 Kb/s to 40 Mbit/s.

¹⁶ An econometric analysis was conducted to investigate the role of competition in mobile telephone diffusion. Using a country-level panel data set (2003-10), the change in mobile penetration is modeled against a set of explanatory variables thought to influence the adoption of mobile telephony. It is assumed that the adoption of mobile technology occurs through interaction of individuals, using the lag of mobile penetration to model this behavior. Controlling for the level of competition in mobile telephone service (monopoly, partial competition, full competition) as defined by the ITU and the World Bank, overall country characteristics (International Country Risk Guide), and technological innovation (annual dummy variables), we find evidence that the rate of adoption is significantly related to the mobile penetration in the preceding period. Holding constant technological innovation (annual time dummies), country characteristics and "diffusion," competition is found to significantly increase the rate of mobile adoption. Partitioning the sample into partially competitive and fully competitive markets, we tested the independent effects of World Bank and IFC investments on the rate of mobile diffusion.

¹⁷ PPIAFs are also larger than non-PPIAF AAA (\$227,000 vs. \$94,000), and are more focused (supporting two objectives on average vs. three for non-PPIAF AAA). PPIAFs have a more comprehensive system of performance monitoring than other AAA.

¹⁸ Running a separate regression, we estimated the effect of the World Bank and IFC on the level of competition, using a country-level panel data set (2001-08), controlling for country characteristics, the presence of a separate

regulatory agency, and the degree of privatization of the fixed-line telephone operator. World Bank and IFC activities were assumed to impact competition with a delay of up to three years.

¹⁹ This has been the case for the Central African Backbone Program, the West Africa Regional Communications Infrastructure Program, the Pacific Island Regional Communications Infrastructure Program, and the Caribbean Regional Communications Infrastructure Program.

²¹ The analysis of this section is based primarily on a structured review of a random sample of IFC ICT projects supported during FY03-09. The universe of IFC ICT projects was 87, representing 75 companies. Of these, IEG reviewed 47 (22 telecommunications and 25 IT/media projects). Project reviews were conducted using a standardized template for assessment of projects' relevance, design quality, achievement of outputs and outcomes, and IFC's additionality. See appendix A for more detail on the methodology; a list of IFC ICT projects, by subsector, is in appendix E. Where projects were too recent to assess outputs or outcomes, the review focused on design and relevance. IEG also reviewed Expanded Project Supervision Reports (XPSRs) and Evaluative Notes completed for projects in the ICT sector during calendar years 2003-09.

²² However, the decline in the price of calls and average revenue per user are not directly attributable to the IFC-supported project, because prices were also affected by the entry of other phone companies. Affordability of service was also facilitated by the introduction of prepaid phone service, including by IFC projects.

²³ The development outcome rating refers to the synthesis XPSR rating, which encompasses the following indicators of project performance: project business success, economic sustainability, environmental and social effects, and private sector development impacts.

²⁴ For instance, through the provision of lower-cost or subsidized handsets.

²⁵ Based on business success rating of satisfactory or higher, IFC database.

²⁶ The sampled telecommunications projects compare favorably with a larger sample of nonfinancial sector projects recently reviewed by IEG, which had median ERRs of between 19 and 24 percent. See IEG 2011.

²⁷ Empirical evidence from countries such as New Zealand, which have had a long record in supporting these kinds of programs – such as incubation initiatives – indicate that the impact on growth and jobs has usually not materialized until between four and seven years after the incubated firm has graduated (New Zealand Ministry of Economic Development 2008).

²⁸ IEG assessed achievement of project objectives. In three cases, outcome ratings could not be assessed, because the projects were too recent.

²⁹ Calculations of the profitability of IFC's IT project portfolio are based on data generated by IFC's accounting system.

³⁰ Examples of these objectives in PSG projects are: giving the public access to financial/budgetary information and statistics, making cadastre and

property rights information available on-line, and allowing e-filing of income taxes.

³¹ The underlying economic rationale for m-banking applications is to take advantage of the proliferation of mobile phones in developing countries to address the lack of access to basic banking services, such as transferring and storing money, paying bills, and borrowing, by large segments of the population. Using mobile handsets to access banking services significantly reduces the cost of banking access compared with traditional delivery models such as bank branches and ATMs. Extending access to financial services to the unbanked is expected to have benefits that include: enhanced safety, greater convenience, lower cost for transferring money (such as remittances), and better allocation of funds between times of surplus and deficit (harvest and planting periods, for example). Conversely, offering financial services for the unbanked also makes good business sense for mobile operators, which are encountering a slowdown in the number of subscribers and low revenues per users. See Beshouri and Gavrák 2010.

³² If the project has been restructured, the assessment would be relative to the revised results framework. Also, projects with “minor” components are excluded from this calculation.

³³ http://www.it-cortex.com/Stat_Failure_Rate.htm

³⁴ Based on an IEG desk review of three mobile finance and payment systems projects and one m-health project.

³⁵ IEG assessed projects using a four-point scale: 4 (fully satisfactory); 3 (substantially); 2 (partly satisfactory); 1 (low or unsatisfactory).

³⁶ Outcome indicators included the number of ICT trainees that are now working using acquired skills, number of SMEs that after the training are using ICT for their business); intermediate outcomes measured involved number of college graduates in ICT-related majors.

³⁷ Russian Federation E-Learning Support Project (Phase I of the Education Modernization Program Adaptable Program Loan (P075387), World Bank database.

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