Reflections From and On The Forum

Some Thoughts on ICT and Growth

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Since the first Harvard Forum on information and communication technology and economic development in 2003, there has been great progress in a number of areas. A truly amazing and rapid expansion of ICT services has occurred. A wide range of important services (informational, financial, and other) have been identified that affect the ability of the poor and, indeed, large parts of developing country populations to conduct transactions at reasonable costs, as well as to start and run businesses. Not only have these services been identified, but there has been major progress in many countries in expanding access to these informational and transaction-based services. While the process is far from complete, evidence suggests that the impacts are large and growing.

The role of ICT in expanding economic opportunities and lowering information and transaction costs, as predicted in the first Harvard Forum, has, in fact, turned out to be true. Many of the questions about the use of ICT by the poor have been positively resolved. Affordability has increased, and the technology seems accessible and easy to use.

The progress in a number of areas, including implementation of safe savings channels, secure and low-cost transfer of funds, micro finance credit availability, and more, has been impressive. It is also fairly clear that mobile phone and data technology has increasingly formed the infrastructure underpinning of much of this.

Some suspected back then (in 2003) that the cellular phone morphing into a digital communication device and an Internet access client would increase in importance. But few of us foresaw the explosive growth in cell phone access and usage. By the time of the second Harvard meeting in 2009, global cell phone penetration was on the order of 60%, with 4.5 billion cell phones in use. The much-discussed digital divide may not have entirely disappeared, but its magnitude has diminished significantly, and the pattern appears to be more like convergence than divergence.

Cell phone growth has been largely the result of private sector investment and initiative seeking new customers and developing the products and services that they need and can afford. Issues such as access to power have been resolved in creative ways. Fortunately, for the most part, this process seems to have largely escaped regulatory intervention, or to have benefited from a more constructive regulatory approach based on competition and new entry. Products have been adapted to particular market needs, fueling additional growth.

On the provision of financial services to the poor, much has been accomplished—in part, because of the availability of cell phone-based platforms. But the process has some ways to go. Costs need to come down, and service provision needs to expand. There is extensive evidence that financing for poorer people in developing countries continues to have

a high cost, as evidenced by the high rates of return on investments that do get made by this group.

Impact on the Poorer Members of Society in Developing Countries

When the Harvard group first met, mobile phone penetration in the developing world was very small, and we were speculating that, maybe, the mobile phone would be the answer to the overwhelming and probably unsolvable challenge of creating expensive fixed-line networks. Much of the population of the developing world was disconnected from telephones and the Internet. TV was actually more highly penetrated, but it represents a different one-way communication technology—great for seeing *Baywatch,* but not so useful for paying bills. The combination of the relatively low capital cost and the fact that the mobile phone industry was able to grow, driven largely by market opportunity and competitive dynamics with relatively little regulatory intervention, contributed to the rapid development of the sector.

From a growth and development perspective, the opportunities that have been created are important and inclusive: safe savings channels; access to productively relevant information about weather, prices, and market conditions; access to credit, banking and payments services; and reduced transaction costs. Much of the world is gaining access to basic banking services for the first time. The costs for payments and remittances are being driven down. A decade ago, studies by the World Bank and others indicated that the average costs of international remittances ran in the range of 10–15% of the funds being transferred. Some of that was due to monopoly power. But a significant contributor was an inefficient, manual, multi-layer payment system that was just too expensive. Economists would call all of these services inputs that enable people of the society to participate in commerce and avoid isolation.

What does that have to do with the cell phone? Well, the cell phone evolved into a digital communication device with SMS services and access to the Internet. By driving down the costs, it allows the delivery of those services—safe saving channels, access to credit, and so on—at dramatically lower costs over time with the building of infrastructure and systems. It also delivers what I would call "light" information reasonably and efficiently—including short messages, news in brief, prices, and transactions originated and confirmed. As noted in the discussions in 2003, and again in 2009, it facilitates social networking and the formation of supportive groups based on interests.

Is this the whole answer to the growth and development challenge and the goal of reducing poverty? We spent a fair amount of time on this, and I think the consensus is probably "no." For example, this technology does not solve the problems of access to high-quality education, though it may help increase the productivity of education by providing an important complementary input, which is access to information and knowledge.

At the heart of the growth and development process is knowledge transfer. Rapid absorption of knowledge or learning, more than any other factor, causes rapid increases in the productive potential of a developing economy, especially in the early stages. That is why IDRC has focused much of its effort on knowledge transfer, as well as on capacity- and institution-building. Those challenges remain. The rapid deployment of ICT will provide additional tools to facilitate knowledge transfer and its productive deployment. It will make it more efficient, more inclusive, and less costly.

In any economy, the state of development is captured in part by physical assets that have been accumulated. Important as those are, it's the intangible assets that dominate: knowledge embodied in people, institutions, and processes. One can think of it as the accumulated effect of learning.

In the discussion at Harvard, I think we agreed that we are expecting an acceleration in knowledge transfer, based in part on ICT.

Is There a Way to Make Mobile Phones Do More Through Regulation or Other Means?

There will be lots of answers to this. There were in the Harvard discussions.

As Yochai Benkler noted, we know that, in the advanced countries, the mobile and wireless networks are now being accessed by a growing array of devices of various sizes and capabilities. The speed is getting higher and higher, the size of the device is declining, and so are the costs. Moore's law appears to be alive and well.

One would expect to see a somewhat different evolution of devices in the developing countries,

skipping over much of the landline system and probably computers as the main clients. Because the technology is advancing so rapidly, many developing countries will probably just skip several steps.

But the straight answer to the question of regulation, from an economist's point of view, has two parts. First, there is nothing better than competition for ensuring that pricing is right and the access to services is as complete as you can manage, given the cost structure. True, there are network externalities, so that subsidizing those who access it early would make sense in theory. But it doesn't appear that is necessary to jump start the growth of network access, at least in the wireless area. And, I would expect that the dynamic competitive process would produce a growing array of services as a result of continued innovation.

Second, there are remote areas where the density is low and the economics, from a private sector investment point of view, do not work: That is a legitimate area for subsidies in order to expand access by making it more universal.

However, in the discussions here there was a concern, now that the cell phones represent a large fraction of the telecommunications network, that the regulators will re-arrive and intervene in counterproductive ways by restricting competition or regulating service pricing in a way that limits access. That's the principle concern that I heard in the discussions.

Having said that, regulation is important. Monopoly can develop and be misused. Interconnects are important, both among mobile phone service providers and to the fixed line providers. As I understand it, unregulated interconnect restrictions and pricing are sometimes used to gain competitive advantage. You don't want a balkanized set of networks. That is an important area where regulatory intervention is normally required to achieve efficiency. In a way, it's a form of standardization.

Growth, ICT Investment, and Positive Externalities

The Commission on Growth and Development identified a number of key ingredients in the successful sustained growth experiences in the past 30 years. Exploiting the global economy's knowledge and demand or market size to enable catch-up growth was one. A second was high levels of saving and investment. A third was a pattern of, and a focus on, inclusiveness. There are others, but I picked these three as they are all closely related to ICT investment, infrastructure, and services.

Public sector investment is too low in many developing countries. There are reasons for that. Current needs are pressing, and long-term investment gets crowded out. The social returns are hard to measure and tend to be ignored. Short-term macroeconomic thinking usually doesn't distinguish between expenditure and investment. Too often, the implicit assumption is that the social return is zero.

There may also be a widespread lack of appreciation of the social returns to public sector investment—in part, because the return is achieved largely indirectly by increasing the returns and accelerating the investment on the private sector side. To sustain growth above 7% per year, we guessed that public sector investment in the range of 5–7% of GDP was required. There don't seem to be any counter-examples, and that proposed range is consistent with the data from the sustained high-growth cases.

ICT infrastructure is undoubtedly negatively influenced by these kinds of considerations, but mobile technology has dampened the negative impact. Much of that investment is in the private sector, and it is driven by competition for the market. While the social returns are clearly much higher than the private returns to the investors, the latter appear to be sufficiently high to sustain a high level of investment and growth in the networks.

At the previous Harvard meeting, there was a sense that the influence of the regulated monopoly era and the mindsets that went with it were still in place. An understanding of the idea that ICT infrastructure and the maintenance of a stable, accessible network created huge positive externalities was not sufficiently widespread. I assume this has changed some, but I suspect that there is still wide variability across countries and jurisdictions in this respect. The discussion in 2009 would, I think, support this view.

Fundamental Role of Knowledge in Economic Development

As I noted earlier, there are two critical factors that have transformed many developing economies and led to 7–10% economic growth and poverty reduction at astonishing rates in the past 30 years. One is political leadership that builds a consensus around a

growth strategy that is credible and establishes a pattern of inclusive governance and economic impact. The second is accessing and taking advantage of a global knowledge economy and its accordingly huge potential market.

Knowledge transfer is at the heart of sustained high growth, often called catch-up growth. This requires education and then access. It is a work in progress. Access seems to be a positive. My impression from the research we reviewed in the Commission on Growth and Development is that there are substantial education quality problems in many countries (both advanced and developing), and that these adversely affect learning, knowledge absorption, and growth potential. Left unaddressed, these deficits also reduce the potential impacts of ICT.

We have a lot left to learn about the channels through which knowledge passes from country to country in the global economy. In a way, this is surprising, given the amount of experience that has been accumulated in numerous cases over an extended time. As these channels become better understood, the role of ICT will emerge more clearly. My intuition is that much of the learning comes as a spillover effect of engagement with the global economy, supply chains, and markets.

For example, the rapidly growing trade in highly skilled, labor-intensive services is clearly built on ICT platforms. By itself, that represents a major change in the structure of the global economy and of labor markets related to these services. This is one of the most important trends in the global economy, the increasing accessibility and value of geographically remote labor. It is also a principal growth driver in the Indian economy and, prospectively, elsewhere.

Is Human Development Really About Food Security and Health and Women's Empowerment—and Never About Information and Communication Technologies?

In the ongoing debate about the key factors in development, there appears to me to be a propensity to look for silver bullets, or to think in what I call "either/or," rather than in "and" terms. As Amartya Sen noted, development involves the coming together of a number of factors that underpin the politics and economics of growth. I want to reinforce that.

The policy makers in successful developing countries do not appear to act as if they know or think they know the necessary and sufficient conditions for growth. They have learned by experience and experimentation to use good conceptual thinking, combined with a dose of skepticism, and with a large amount of pragmatism mixed in. In this respect, I think that the Indians and Chinese, and a number of others, are in some ways ahead of those of us in more advanced countries.

We, at least in America, have highly ideological discussions—where markets, at least until recently, were presumed to be largely self-regulating, and to be innocent until proven guilty. That frame of reference is being questioned as a result of the recent crisis.

If the Chinese and Indian authorities, after a suitable internal debate, think there is a housing bubble, they require the banks to increase the reserve requirements on mortgage loans. If they think the Shanghai or Mumbai equity markets are out of control and there are people betting their life savings in a frothy capital market that probably has a bubble embedded, they slap on a stamp tax and increase the margin requirement. We debate about whether we can identify a bubble with near certainty so that we don't make what statisticians call a type 2 error.

So I would like to put in a plea for two things: one is getting rid of the "either/or" thinking, and the second one is this combination of wise analytical thinking in the use of evidence and in the framing of policy, but not to the exclusion of common sense and pragmatism.

ICTs and Gender

I agree with comments here about gender, and the impossibility or inadequacy of gender neutrality in ICT usage in a world that is not gender neutral now. The only way to respond to that is to react by leaning against the gender nonneutrality, and this does not apply only to gender. It isn't easy to implement proactive prescriptions. India wrestles with this all the time in the form of caste-based preferences, and sometimes they may get it right, and sometimes they may get the balance wrong. But I do not believe that most people think, in a long-standing caste system, that the notion of having preferences is a bad thing. Some people in America think that affirmative action is not a good idea, but the major-

ity think that it may sometimes go too far, as opposed to being inappropriate.

It seems entirely appropriate that there are certain actions for younger women that are needed to counter gender asymmetries: safety on the way to and from school, appropriate lavatory facilities, and all those missing things that make it difficult to get through the process of education and on to productive adulthood.

ICT Incentives, Faith and Measurement, and Focus

The late Milton Friedman was right to draw attention to incentives. We fail this test all the time in the field of economic policy. Outcomes are determined not so much by the intent of policies, but by the incentives that they create or modify. If we do not think about incentives, we end up with unanticipated Nash equilibria that are suboptimal. They can favor the powerful and leave the weak at a disadvantage. Ignoring incentives is a prescription for encountering unintended consequences.

The problem of precisely measuring the impact of ICT4D is that it is too hard to do because of the cascading scope of the impacts over time. But we should not let this trip us up.

Let me give an example. China, in the 1950s, did the best job any country has done in educating its children, at least through elementary school. In a few years, literacy rates for men and women were above 80%. But China did not see significant economic benefits, because other aspects of the state and the economy were mismanaged and broken. When that changed in 1978, the educated and literate population turned out to be an important pillar of growth. In the intervening three decades, the economic return to the educational investment would have appeared pretty modest.

You can have progress in areas that affect people's education, or access to information, but it may not have an immediate visible effect, because it's blocked by other factors. The United States made heavy ICT investments for more than 30 years, and we saw few, if any, measurable gains in terms of productivity and growth. But in the past 15 years, we have seen a steady productivity acceleration and dividend, which we believe comes from taking the potential asset of IT and unlocking it via the Internet. The point of all this is that there are long lags and complementary factors that influence the return on investments in education and ICT.

Development economists have tried to measure the impact of education via regression analysis. The results are mixed or negligible probably for the reasons outlined above—missing complementary pieces. But no one really thinks that education has a modest impact on economic development if other conditions are in place. With still incomplete models of growth in a developing context, policy at least needs to be based on judgment, common sense, and a little bit of faith. ■