

Policy and Development Challenges of the Internet Economy

There are two approaches to assessing the impact of the Internet. Cyber-optimists claim that the Internet is one of the most important innovations of the last century (or ever!) and will revolutionize the U.S. and world economies. Cyber-optimists tend to live in places like Silicon Valley, Austin, Texas, near Route 128 around Boston and in the Dulles Access corridor near my home in Washington, D.C. By and large, cyber-optimists are already plugged into the Internet world, and they think that if you are not also then you are not “with it”.

At the other end of the spectrum are the Internet skeptics, those who believe that the Internet is important, but no more important than any other part of the much larger telecommunications and computer revolution. One of the best known skeptics is Professor Robert Gordon of Northwestern, who has written a number of very influential papers. The most recent, which is scheduled for publication in the winter issue of the *Journal of Economic Perspectives* (in fact already published at the time this talk has been edited), argues that one cannot yet detect the impact of the Internet in the economic growth figures. Moreover, looking to the future, Gordon is skeptical that the Net will make that much of a contribution to productivity growth – certainly not as much as electricity, the automobile, or air conditioning, to name a few of the many other innovations of the past century that he deems to be more important.

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Whatever one believes about Gordon’s claims about the future, he is certainly correct about the present. The Internet revolution is simply too young to have had a major impact on U.S. economic growth. Even using the largest available numbers about B2C and B2B commerce, the Internet is now accounting for only about \$100 billion in sales in an economy whose production is nearing ten trillion dollars. Gordon, along with other productivity specialists, urge us to pay more attention to the impact of the productivity revolution in computers, where prices (taking account of quality adjustments) have been declining by about 30 percent a year for the past five years.

As for the future, no one really knows the limits of the Internet’s impact. But at Brookings, I am working with Alice Rivlin (a former Vice-Chair of the Fed) and scholars from business schools around the country, to try to get a better handle on this question. So far, we seem to be converging on estimates suggesting the possibility that further use of the Internet alone will be responsible for economy-wide productivity gains over the next several years of anywhere from 0.2 to 0.4 percent. This may not sound like very much, but if you add it up over 10 years, these gains translate into a higher level of GDP of 2-4 percent, or \$800-\$1600 per person



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by the end of the next decade. Not bad, especially in comparison to proposed average tax cuts that have been bandied about by the Presidential candidates this year.

I want to be clear. This additional growth from the Internet does not mean that the overall level of productivity growth – which itself has been remarkable in the 3 percent range for the past five years – will be higher by another 0.2-0.4 percent. Instead, all we are claiming is that it is possible that, other factors being equal, productivity growth may be 0.2-0.4 percent higher than it would otherwise be.

Why does productivity growth matter? Two important reasons come to mind. First, the Fed cares about the speed limit of the economy in setting monetary policy – and productivity growth sets the speed limit. In fact, Fed Chairman Greenspan has been in the cyber-optimists' camp for the past five years or so in letting the economy grow faster, without raising interest rates (until recently), than many other economists thought possible.

The second reason productivity growth matters is that it determines the long-run growth rate of the economy, which is important in projecting the future budget balance of the federal government. The faster the growth in productivity, the larger the projected surpluses.

I would now like to turn my attention to one of the hottest policy issues raised by the Internet revolution, namely the future course of intellectual property protection in the wake of Napster. For those of you who don't have kids and thus are not educated to the wonders of this computer program, Napster allows users to swap sound recordings. Not surprisingly, the recording industry has filed a lawsuit against Napster, claiming it violates the copyright laws. At this time, it isn't clear how the suit eventually will be decided – but I would guess that Napster probably will lose.

What will this mean? To help answer that question, it is useful to step back and look at a much larger debate over appropriate regulation of the Internet. On one side of this chasm are the cyber-libertarians who basically say leave everything alone. If the government tries to regulate, it will fail, and even worse, threaten to kill the goose that laid the golden egg. The cyber-libertarians were basically in control of the debate until about 1998.

Since then, a variety of problems in addition to intellectual

property – including taxation, privacy, and policy toward broadband access – have cropped up and forced many to rethink whether the libertarian approach is appropriate. Some argue for limited government intervention, primarily aimed at making people feel more comfortable about using the Net (for example, through some kind of minimum federal privacy standards). A more extreme, but well articulated view, has been articulated by Professor Lawrence Lessig of Stanford Law School, who argues that government generally should do more than that.

Lessig's argument is this: that on the Internet, law is code – that is, software – that even is stronger than law. But unlike laws, which are written by democratically elected legislators, software code is written by computer programmers, who are elected by none. Lessig urges that elected policy makers need to become more involved in setting the rules of the road in cyberspace before it is impossible to do so, namely before the code writers win.

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The Napster case actually proves Lessig wrong in one significant respect. Napster is code, but instead of strengthening intellectual property protection – a system of laws – it actually weakens it. Unless technology comes to the rescue, the Napster cat is out of the bag and may be impossible to put back in. There are other programs that do the functional equivalent of what Napster does, so that even if Napster loses in court, file-swapping should continue. The entertainment, software and book industries – which all want to distribute content over the Net -- may simply have to come up with a new way to make money in such a world, or not let their most valued content on the Net at all (because it can be too easily Napsterized!).

Let me conclude with a few thoughts about how Puerto Rico can thrive in the world of the Internet. I will begin with a caveat, however. This is only the second time I've been to your beautiful city here in San Juan and I do not pretend to be an expert on urban (or rural) development. So take what I am about to say with the appropriate grain of salt.

Take a look at the other places that are really advanced in high tech: Silicon Valley, Austin, D.C., Raleigh / Durham, and Seattle. Also look at around the world at places that are doing well in the cyber-economy: Bangalore, India; Ireland, Finland, and Israel.

What do we see? One thing is that there appear to be two different models for economic development in all these places: what I call the entrepreneurial and subcontractor models. Clearly, the U.S. cities I mentioned are examples of the entrepreneurial model, as they are home to increasing numbers of high-tech startups (and failures). The places outside the U.S. I cited generally are examples of the subcontractor model – firms in these countries work for those in the U.S. and Europe – but increasingly, the subcontractors are turning into entrepreneurs. This happens as local people gain skills and talents, and then move out on their own, attracting venture money from home and abroad.

A second observation is that all of the successful high-tech areas – both inside and outside the United States – have a plentiful supply of well-trained talent. Training can be provided by both universities with research faculty on the cutting edge and by foreign firms that directly invest in local areas.

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The lessons for Puerto Rico, therefore, seem obvious. First, assuming the island wants to develop its high-tech economy, then it should invest in attracting professors with training in computer engineering. In essence, follow

the “Field of Dreams” strategy by trusting in the adage that “build it and they will come”. In this case, the building is in the form of human capital, and the “they” are the students who will be trained in the process.

Second, having a well-trained work force is key to attracting firms from the mainland to locate here – the weather is great after all, and Puerto Rico already is a gateway to Latin America. Venture capitalists (either home grown or from the mainland) also will be more attracted to Puerto Rico if the island is home to technical expertise and an entrepreneurial spirit.

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If any of you say now that this transformation can't be made, then I urge to look to the example of Washington, D.C., which for almost two centuries was a “one company” town – namely, the home of the federal government. But then Northern Virginia and Maryland invested in the training of high-tech workers (computers and biotech) and our Dulles Access corridor and the I-270 spur north of the city are now home to thriving Internet-based and biotech-related businesses.

One concern commonly voiced about the university-based “Build It and They Will Come” strategy is that it can facilitate brain drain. India seems to be a prime example of this. India is now turning out over 100,000 college educated high-tech professional engineers a year and a lot of them have found their way to Silicon Valley. But is India poorer for this? No way. Many successful Indian entrepreneurs in the Valley have hired their colleagues back home in India to do software work, and now even some of them are coming back home to start venture capital firms to fund home grown Indian companies.

In short, the broad horizons of high-tech beckon to Puerto Rico. I urge all of you to take up the challenge.

Thank you very much.

Actions to grow Puerto Rico's Digital Economy

The Center for the New Economy (CNE) recently sponsored a major conference entitled, Silicon Reef: Puerto Rico in the e-economy. The conference included experts and opinion leaders of the Internet industry and the New Economy in Puerto Rico and the U.S., among them the Principals of Oracle Caribbean, Sprint International Caribe, Abaco, Centennial de Puerto Rico, Microsoft Caribbean, Hewlett-Packard Caribe, Advent-Morro, Grupo Guayacán, ExecuTrain, Human Capital, Liberty Cablevision, Microjuris.com, Bittime.com and IslaZ.com as well as representatives from AT&T, Puerto Rico Telephone, Zonai Networks, Compaq Puerto Rico, PuertoRicoWow, Starmedia Networks, Lucent, KPMG Peat Marwick, Ernst & Young, Banco Popular, Banco Santander, Citibank and Procter & Gamble. The purpose of the Conference was to determine how Puerto Rico could best mobilize to capitalize on New Economy growth opportunities.

Out of that conference came a series of action items and imperatives that the group considered critical for Puerto Rico's participation in the New Economy. Among the issues that garnered consensus that day and that will be further developed and advocated by CNE were the following:

General Proposals of Changes in Thinking and Vision

- Cultivate Puerto Rico's image as a world-class business center.
- Promote within Puerto Rico a more global business outlook.
- Encourage a stronger entrepreneurial spirit in Puerto Rico to displace collective risk aversion.
- Forge a culture of collaboration between competitors and amongst the private, public and academic sectors.
- Retain and develop local talent by taking into account new generation styles in compensation plans. This includes flexible work structures, freedom to take leadership and most importantly, increased compensation both directly and through stock or profit participation.

Infrastructure Imperatives

- Undertake aggressive capital investments in Puerto Rico's connectivity with a strong emphasis in the swift provision of competitively priced broadband access.
- Aggressively promote the provision of free or low-cost island-wide internet access.
- Stimulate and undertake greater investments in last mile infrastructures.
- Develop the Telecommunications Regulatory Board into a more proactive, more aggressive body.
- Dedicate immediate attention to Puerto Rico's submarine fiber-optic capacity deficit. Must provoke partnerships, consortiums and alliances in telecom infrastructure between government and international infrastructure companies.

Education Imperatives

- Establish private sector endowed University Chairs with world-class computer science professors.
- Update and retool curriculums so that they are in closer accord with labor force expectations and needs.
- Include New Economy business models and marketing in local business schools curriculums.
- Improve the language skills, particularly in English, of students.
- Reinforce the teaching of math, science and computer sciences.
- Develop, establish and promote internship programs between schools and companies.
- Establish strategic alliances with universities from the U.S. and abroad that have strong e-commerce and Information Technology programs.
- Grow the local IT workforce to meet demand by training the unemployed and continuously educating current employees.

Finally, as regarded all these imperatives, the key word was speed. Ready, fire, aim.

This Policy Brief is a synopsis of the Keynote Address delivered by Robert E. Litan at the Center for the New Economy's Silicon Reef Conference on September 8, 2000 at San Juan's Caribe Hilton. Mr. Litan is Vice President and Director of the Economic Studies Program and Cabot Family Chair in Economics at the Brookings Institution. Additional copies of this brief may be ordered from CNE or downloaded from our website. The Center for the New Economy (CNE) is a private, non-profit, non-partisan, research and policy development organization dedicated to developing innovative economic development strategies.

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