



Measure for measure in the new economy

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..... Even with the recent restructuring in the dot-com economy, nobody doubts that new IT has improved the US economy. On that everyone agrees.

But, of course, that's the end of the agreement. It's one thing to recognize the difference between a gain and a loss. It's another to recognize the difference between little improvement and a big one.

How much impact has IT had on an economy? Should a sophisticated observer err on the side of optimism or pessimism? Should a very sophisticated observer, somebody like Alan Greenspan, believe the numbers reported to him on a weekly and daily basis, or should he read better or worse things into them? What should an investor with a large portfolio think, such as someone at Lehman Brothers or Morgan Stanley?

The answer is less obvious than it might seem. It depends on understanding what IT does to the economy and what it does to government statistics. In practice this topic isn't as arcane as it sounds, but it's a bit subtle.

Why IT's improvements are hard to measure

Let's start with a simple example of how hard it is to measure the true impact of IT. Is there any statistic about how much time society saved from the diffusion of IT in government? Nope. The basic problem is that it's inherently impossible to figure out.

IT makes one of the most onerous

parts of society just a bit less onerous. That is, it makes government more accessible and less bureaucratic. Specifically, it has become much easier in the last five years to get copies of government data and copies of government forms—simply by going on line. This is true at the federal, state, and local levels (though to different degrees, depending on where you look). Anybody who spends time working with governments knows about this.

Is this an improvement to society? Sure it is. Accountants, taxpayers, lawyers, and permit applicants can get their tasks completed faster and with more efficiency. That's a net gain. Lawyers will have a bit more free time to take new cases, accountants to consult, and construction supervisors to spend on site instead of at city hall.

Now here is the tricky question: How much of an improvement is this? It might be big since there are many accountants, taxpayers, and lawyers out there. If each of them saves 10 hours a year, that adds up to a big savings in the aggregate economy. Then again, it might be a small improvement, particularly if less bureaucratic procedures simply lead to longer rules and no net gain in efficiency.

More broadly, is more efficient government a big boon for society? Sure. These sort of changes should matter, since government activity involves such a huge fraction of GDP and employment (over 20% when education, police, and other local services are added in). But how do we know

how much improvement can be attributed to IT? That's inherently ambiguous.

Now consider the broader question. Is it possible to measure the impact of IT in another part of the economy such as hospital administration or publishing? Sure, anyone who works in those sectors knows about improvements in the last five years. Is there likely to be a statistic for those sectors or any other sector of the economy soon? Don't count on it.

New economic phenomena require new statistics

More generally, information technology alters what we ought to measure because it alters fundamental economic behavior and the patterns of economic life. This seems like a simple principle, but it's quite subtle to put into practice.

For example, if better IT leads to faster feedback between customer and supplier, then it ought to lead to faster product cycles and upgrades. This is as true in consumer electronics as it is in women's fashion. Clearly everyone is better off. The shelves have the right products, the retailers don't waste inventory, and the manufacturers match demands.

Now then, how do we measure that gain? How much better off are we? It's hard to know with conventional statistical techniques, which are what the US government largely uses. All of this simply shows up as less material for the same amount of output, that is, a productivity improvement. This is part of the gain, to

be sure, but not all of it. There's nothing in there about satisfying demand more precisely or lowering the transaction costs of coming to a decision, that is, about saving somebody time.

Here's a related version of the same problem. If the diffusion of the Internet lets someone in a low-density-area access get a collector's items on e-Bay, is that a benefit to society? Sure it is.

This transaction benefits e-Bay's bottom line, which is a gain. But it also leads someone to avoid a flea market or trade show. That might mean that a hotel for the trade shows made less money.

There's more. If the user saved money at e-Bay (or by not getting a hotel room), then that savings also shows up somewhere else in the economy. That's great for the economy overall, though not necessarily good for the hotel business.

This is what an economist would call an example of a "decline in the cost of transacting." Present statistics only partially estimate how big the savings are.

It's easier to look where the light is brightest

So that gets us back to the source of the problem, government statistics. Statisticians end up measuring economic activity simply because it's all they can measure with confidence. So what's wrong with that? If we don't think about it, we end up underemphasizing many other important things happening just a bit outside the spotlight.

Don't misunderstand me. Good statisticians know about this bias, so there are many self-conscience attempts to avoid it, especially within government statistical agencies. Nonetheless, this bias often creeps into a statistic.

Let me use one more example to illustrate the point, one that's well known in the online world. Because pornography is one of the few revenue-generating activities online, it's tempting to conclude that this is where the Internet has made its largest contributions to economic activity. While titillating, that inference is grossly misleading, since every household survey in the last five years shows that pornog-

raphy is an activity that involves less than 10% of the total time spent on line.

Yet, that also shows just how hard the real statistical problem can get. How big is the nonpornographic part of the Internet? So-called free Internet activity or advertising-supported online activity accounts for over two thirds of household activity online.

The important contributions of this activity to the improvement in economic welfare are largely unmeasured. That is, online technology involves a qualitative change in the way people communicate and receive information. For example, have you seen a teenager use instant messaging recently? That's not what statisticians measure.

Revenue is what statisticians can measure, so this is how statisticians see it, at least for now. The household subscriptions to American Online, Mindspring/Earthlink, and other ISPs go up. The accounts for advertising services on the Internet also go up. Then there's a loss in advertising to television, radio, and magazines, whose viewership has subsequently fallen.

Will any government statistician change soon? Do not count on it.

There's no typical experience

Some industries are more influenced by IT than others. It's already clear to every observer that music, news, entertainment, electronic games, and consulting services will look very different ten years from now, maybe even five years from now. But what about other activities that are essential to the economy such as warehousing, transportation, medical services, or publishing? Those probably will change dramatically too.

There's a natural human tendency to understand the world in terms of a few typical examples, but that tendency can lead one astray if every example differs from the other. As we watch this revolution work its way through our economy, it will be difficult to keep track of the stories of how one market influences different submarkets and their interactions.

What good are comparative statistics

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if the statisticians need to make a number of corrections and qualifications in every industry? This is the big problem. Even the best statistical agencies in the world are relatively overmatched by present events.

So for the foreseeable future government agencies are under siege, trying to produce some numbers, even if they're only partially informative. More to the point, the changes wrought by IT are often not measured using conventional approaches. That's because most of the change associated with new IT involves qualitative change to the delivery of a market activity or changes to the features of hard-to-measure services.

This isn't a story where the government does a bad job. On the contrary, the US statistical agencies are among the best in the world. They deserve our sympathy because their work receives so little glory. Rather, this is a story in which real events place virtually unsolvable challenges in front of the best statistical agencies in the world.

Said more soberly, our government's present numerical habits will, at best, only provide a partial answer. At worse, they may direct our attention away from what really matters.