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Debunking the productivity paradox

The party line is mistaken. The “productivity paradox” is not responsible for all the problems with computers. When all the evidence is in, there probably is almost no productivity paradox at all.

Now that I’ve got that out of my system, let’s have a civilized discussion.

The party line

At dinner parties I like to talk about the computer market. The topic usually initiates a lively conversation. Computer chatter is governed by an easily overlooked, but dependable regularity. Every computer user at every dinner party has at least one complaint about a computer system. It does not matter who the guests are—engineers, administrators, mechanics, medical doctors, lawyers, sales representatives, or warehouse supervisors—everyone has at least one complaint. It never fails.

Actually, this regularity holds not only for dinner parties, but for any moderately small gathering over, say, lunch or coffee—and for settings where these things should not be discussed. (Once a reporter from a famous newspaper called to solicit my opinion about the productivity paradox. Instead, we spent most of the interview talking about his newspaper’s new malfunctioning computer system.)

This little social tonic has led me to take a somewhat unscientific survey of many users’ complaints with the computer market. Here is the unexpected observation: Many people seem to think that their complaints have something to do with the productivity paradox.

This has got to stop.

A little intellectual history

The productivity paradox began as a by-product of an economic conundrum known as the “productivity slowdown.” Then, almost without evidence, the paradox took on a life of its own.

Think of productivity as the average output

per worker for the whole US economy. Economists pay attention to productivity because it underlies the growth of worker income and predicts the success of US industries. If productivity grows slowly, the US economy is in for a tough ride.

In the early 1980s, economists began documenting that US productivity has not grown as rapidly from the late 1960s onward as it had in the two decades after World War II. This trend alarmed many economic Cassandras. (You are forgiven if you have never heard of the productivity slowdown. While this is a compelling economic question, it is a topic best suited to late-night CNN.)

Anyway, sometime during the mid-1980s, the research shifted focus. The hype surrounding the information age found its way into productivity slowdown research. Economists began to ask, Why haven’t the improvements in computing translated into US productivity growth?

At first this was nothing more than a question about a simple anomaly. The rest is harder to trace. Out of this query arose the productivity paradox. Not only did the productivity paradox show up in academic journals, but it eventually started showing up in newspapers, magazines, and on CNN. Maybe headline writers loved the alliterative way “productivity paradox” rolls off the tongue. Maybe it really hit a nerve. In any case, the paradox began taking the blame for everything—low wages among the computer illiterate, downsizing at major corporations, and everything wrong with computers. (Nobody has yet blamed the failures of the Chicago Cubs on the productivity paradox, but this seems just around the corner.)

What’s wrong with the paradox

Let’s confront the paradox on its own terms. How strong is the evidence that the paradox exists? Mixed, at best. For example, most economists now agree that the productivity slowdown

disappeared from US manufacturing in the 1980s. Yes, that's right: There has been no productivity slowdown in manufacturing in the last decade. Manufacturing is doing just fine.

Of course, that then means that the question behind the paradox is badly posed. Paradox supporters must maintain that computers helped manufacturing, but nothing else. At best, manufacturing industries might be unusual. Manufacturing accounts for only a third of the US gross domestic product (GDP) and a smaller fraction of employment. It might just be that manufacturing is not representative of the rest of the economy, but this is a tricky argument to sustain.

The question behind the paradox also seems badly posed for another reason. Was there really such a dramatic change in computers? Everyone knows about the changes in the prices and quality of computer hardware, but is that all that is relevant? Shouldn't we also examine the costs of everything else?

Here's a comparative analogy: If jet engines got dramatically better and cheaper over many years, would anyone seriously expect the price of a whole plane ride to get dramatically better as well? Not if the cost of everything else—pilots, airplane crews, fuel, airframes, airport maintenance, and so on—did not change. The quality of airplane rides might improve slightly, but that will hardly show up in GDP.

So here's the crux of it: Computers must be combined with many other things to be useful. Most of the complementary inputs in computing have not gotten cheaper or better at a dramatic rate. Software, programmers, supervisors, basic R&D at user establishments, invention of new uses, operations, and management—all the stuff that really costs money in computing—is still expensive today. Yes, it is better than it was decades ago, but vendors are still promising the big breakthrough just around the corner. Is it any wonder that the total output from computer-intensive enterprises does not grow as fast as hardware improves? Hardware is just a small piece of the puzzle.

Finally, why should computers take the blame for a slowdown in productivity growth in nonmanufacturing

industries? Why not blame something more obvious, like poor accounting? Output is difficult to measure in service industries, where computers are most widely used. Banking, insurance, medical services, higher education, engineering services, on-line services, and financial forecasting are all computer-intensive industries. They all generate lots of revenue. However, revenue is a poor measure for the economic benefits associated with market activity in these sectors. The growth of total revenue is an even worse way to measure the increase in quality that results from introducing better computers. Maybe GDP accounting needs fixing, not the computers.

Keeping the paradox in its cage

Some things belong in the productivity paradox, but most things do not. More precisely, most dinner party complaints are about unrealized expectations, not the productivity paradox. Unproductive investment and unrealized expectations are conceptually different. If most investment in computing is unproductive, we would observe enormous sums of money wasted on machines that no one ever uses. We would see wizened and repeatedly burned administrators vowing never, ever to invest in this technology again.

In fact, this is not what we observe. Only in a few isolated instances do new computers go unused. Rarely do administrators rip out the new technology in favor of the old. Experienced administrators continue to invest in computers. This is not symptomatic of a problematic addiction to new technology. It is just that administrators are happy with their past investments and want more.

Most user complaints highlight two features of the market: unscrupulous vendor behavior and poor management of technological uncertainty. Unscrupulous vendors regularly promise more than their technology can deliver. This has something to do with salesmanship, but more fundamentally, it arises from the gaps between the culture of designers and the actual needs of most users. On the one hand, these instances are unfortunate and frustrating for the duped

users. On the other, these types of promises have been a feature of the high-technology sector of the US economy for most of this century. These situations hardly qualify as a burning public policy issue, except in the extreme case when a vendor makes patently fraudulent claims.

Managing technological uncertainty is a different matter. There is a learning curve associated with new computing technology. Much of the networking revolution today—often called client-server technology—is close to the technological frontier and inherently risky. By definition, an occasional user will find it more difficult to install and use than anyone—even the experts—expected. By definition, many new applications will take time—perhaps years—to perfect.

Do most companies have the resources to expose their managers and their workers to this risk? Would a company be better off playing it safe as technological laggard instead of a risk-taking technological leader? Are most managers competent enough to manage their way through these risks?

These are hard questions, and the answers affect everyone's work lives. A hard question, however, is not a paradox, mystery, or conundrum. It does make for good dinner party conversation nonetheless.

Improving the party line

Many users have legitimate complaints with their systems. If you and I should ever meet at a dinner party, I will happily listen to your stories about your company's computer system. There is much to learn from these stories. However, let me state this emphatically: It may be a headache. It may cause you pain. Yet, whatever is wrong with your computers, it is probably not the productivity paradox!

This is not the party line. It is just a more careful use of concepts.

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