



University of Pennsylvania  
ScholarlyCommons

---

Operations, Information and Decisions Papers

Wharton Faculty Research

---


10-2009

# What the GDP Gets Wrong (Why Managers Should Care)

Erik Brynjolfsson

Adam Saunders

Follow this and additional works at: [http://repository.upenn.edu/oid\\_papers](http://repository.upenn.edu/oid_papers)

 Part of the [Databases and Information Systems Commons](#), [Economic History Commons](#), and the [Growth and Development Commons](#)

---

## Recommended Citation

Brynjolfsson, E., & Saunders, A. (2009). What the GDP Gets Wrong (Why Managers Should Care). *MIT Sloan Management Review*, 51 (1), 95-96. Retrieved from [http://repository.upenn.edu/oid\\_papers/265](http://repository.upenn.edu/oid_papers/265)

This paper is posted at ScholarlyCommons. [http://repository.upenn.edu/oid\\_papers/265](http://repository.upenn.edu/oid_papers/265)  
For more information, please contact [repository@pobox.upenn.edu](mailto:repository@pobox.upenn.edu).

---

# What the GDP Gets Wrong (Why Managers Should Care)

## **Abstract**

We see the influence of the information age everywhere, except in the GDP statistics. More people than ever are using Wikipedia, Facebook, Craigslist, Pandora, Hulu and Google. Thousands of new information goods and services are introduced each year. Yet, according to the official GDP statistics, the information sector (software, publishing, motion picture and sound recording, broadcasting, telecom, and information and data processing services) is about the same share of the economy as it was 25 years ago - about 4%. How is this possible? Don't we have access to more information than ever before? The answer isn't about quantity, it's about price. The bits that comprise today's information goods are supplanting the atoms that formed yesterday's encyclopedias, movie theaters, music CDs and newspapers. Online information may be updated every minute of the day and accessible almost anywhere in the world, but its price is usually radically lower than that of its physical counterpart, if there even is a price.

## **Keywords**

Information Technology, GDP, Internet

## **Disciplines**

Databases and Information Systems | Economic History | Growth and Development

# **MIT**Sloan Management Review

**Erik Brynjolfsson and Adam Saunders**

---

## What the GDP Gets Wrong (Why Managers Should Care)

# What the GDP Gets Wrong (Why Managers Should Care)

BY ERIK BRYNJOLFSSON AND ADAM SAUNDERS

The irony: We know less about the sources of value in the economy than we did 25 years ago.

WE SEE THE influence of the information age everywhere, except in the GDP statistics.<sup>1</sup> More people than ever are using Wikipedia, Facebook, Craigslist, Pandora, Hulu and Google. Thousands of new information goods and services are introduced each year. Yet, according to the official GDP statistics, the information sector (software, publishing, motion picture and sound recording, broadcasting, telecom, and information and data processing services) is about the same share of the economy as it was 25 years ago — about 4%. How is this possible? Don't we have access to more information than ever before?

The answer isn't about quantity, it's about price. The bits that comprise today's information goods are supplanting the atoms that formed yesterday's encyclopedias, movie theaters, music CDs and newspapers. Online information may be updated every minute of the day and accessible almost anywhere in the world, but its price is usually radically

lower than that of its physical counterpart, if there even *is* a price.

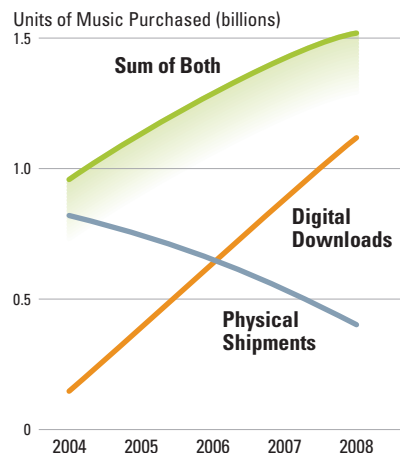
The recording industry embodies this trend. In the past few years, consumers have dramatically shifted their music purchases from physical media such as CDs to online sources such as iTunes. (See "Going Digital.") Consumers have changed their purchasing habits by buying fewer physical units (CDs, cassettes or vinyl records). Sales declined from more than 800 million units in 2004 to just 400 million units in 2008. Contrast that with the vast increase in paid downloads of digital songs. In 2008, more than 1 billion digital single songs were purchased in the United States, as well as more than 50 million digital albums. An even larger number of songs were downloaded illegally, though that's not reflected in our charts.

Yet this increase in the number of *units* has not translated into more *revenue* — in fact, quite the opposite has occurred. Combined revenue from the sale of songs for the record companies went from more than \$12.3 billion in 2004 to \$7.4 billion in 2008 — a whopping 40% decline. Even if we add digital sales made on mobile phones (which would include ringtones), subscriptions from services such as Napster Inc. or Real Network Inc.'s Rhapsody, and digital performance royalties paid by Pandora Media Inc. and others, the digital total expands to just \$2.7 billion, making the overall total \$8.5 billion — still 30% less than it was in 2004. The recording industry is disappearing from the GDP statistics.

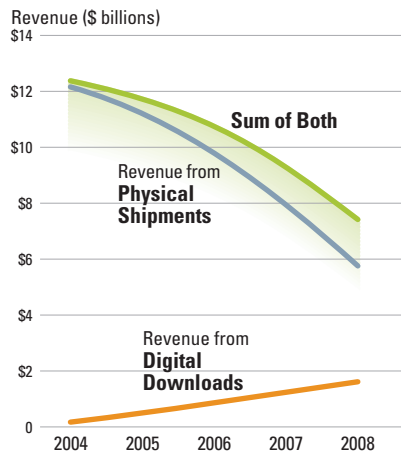
Have people stopped listening to music? Of course not. But GDP is a measure of current market value of production. So if you listen to a free song, there's virtually no

## GOING DIGITAL

Consumers Are Buying More Music...



But Are Paying Much Less for It



contribution to GDP (perhaps a few fractions of a cent for the electricity you use). Similar economics apply to reading *The New York Times* online. Yet if you buy the same newspaper at a newsstand, you add \$2 to GDP, whether or not you get around to reading it. The Google Inc. searches you do, the Wikipedia articles you read and the Facebook Inc. photos that make you laugh don't directly affect GDP for the simple reason that their market prices — what you pay for them — are zero. But this doesn't mean they have no value.

The irony of the information age is that we know less about the sources of value in the economy than we did 25 years ago. GDP is a more accurate metric of value in industrial-age industries like steel or automobiles than in information industries, and can miss most of the value in information goods. However, there is one measure that economists have thought about for decades that may help us determine the value of these innovations: *consumer surplus*. Consumer surplus is the aggregate net benefit that consumers receive from using goods or services after subtracting the price they paid. While it can be difficult to measure directly, economists can infer consumer surplus using price experiments from purchase data, lab experiments or surveys. Consumer surplus can be enormous even if — in fact, especially if — the price is low or zero.

Let's go back to the recording industry. Suppose that for most people, the vast majority of the value of a CD comes from their three favorite songs on it. Those consumers will do much better paying \$3 for those three songs on iTunes, rather than paying the \$18.99 retail price for the CD. While most of the record company revenues disappear from GDP, consumer surplus increases enormously — but that amount is unmeasured. This is not a bug in the free market system. In fact, it is its essence. As Adam Smith noted more than 200 years ago, the invisible hand of competition

drives producers to deliver ever more value to consumers at an ever lower cost. If the cost of producing a good is zero, then over time, the competition should drive the price to zero as well. The invisible hand has been particularly ruthless in information markets. As a result, consumer surplus has soared even if the contribution of information goods to GDP hasn't.

If we used consumer surplus data to examine the true size of the information economy, we would find trillions of dollars of benefits that are not measured in the Bureau of Economic Analysis's official GDP statistics. While GDP statistics measure prices and quantities, just as corporate income statements measure costs or profits, neither approach is a particularly accurate way to understand the ultimate value that consumers get from information goods and services. But over time, policymakers and business executives will need to understand not only how innovations affect GDP, but also alternative measures like consumer surplus, which may be more suited to measuring the information economy. The lesson from information economics is that consumers assign value differently than does GDP. What matters most to acquiring and keeping customers is the value that a product delivers — even if that value isn't directly monetized into revenues.

*Erik Brynjolfsson is the director of the MIT Center for Digital Business (<http://digital.mit.edu>) and a professor at the MIT Sloan School of Management. Adam Saunders is a lecturer at the Wharton School, University of Pennsylvania. Their new book, *Wired for Innovation: How Information Technology Is Reshaping the Economy*, is available from MIT Press.*

### REFERENCE

1. Apologies to Bob Solow.

**Reprint 51119**

**Copyright** © Massachusetts Institute of Technology, 2009. All rights reserved.

**PDFs ■ Reprints ■ Permission to Copy ■ Back Issues**

Articles published in MIT Sloan Management Review are copyrighted by the Massachusetts Institute of Technology unless otherwise specified at the end of an article.

Electronic copies of MIT Sloan Management Review articles as well as traditional reprints and back issues can be purchased on our Web site: [sloanreview.mit.edu](http://sloanreview.mit.edu) or you may order through our Business Service Center (9 a.m.-5 p.m. ET) at the phone numbers listed below.

**To reproduce or transmit one or more MIT Sloan Management Review articles by electronic or mechanical means** (including photocopying or archiving in any information storage or retrieval system) **requires written permission.** To request permission, use our Web site ([sloanreview.mit.edu](http://sloanreview.mit.edu)), call or e-mail:

**Toll-free** in U.S. and Canada: 877-727-7170

International: 617-253-7170

Fax: 617-258-9739

e-mail: [smrpermissions@mit.edu](mailto:smrpermissions@mit.edu)

**Posting of full-text SMR articles on publicly accessible Internet sites is prohibited.** To obtain permission to post articles on secure and/or password-protected intranet sites, e-mail your request to [smrpermissions@mit.edu](mailto:smrpermissions@mit.edu).

**Hyperlinking to SMR content:** SMR posts abstracts of articles and selected free content at [www.sloanreview.mit.edu](http://www.sloanreview.mit.edu). Hyperlinking to article abstracts or free content does not require written permission.

MIT Sloan Management Review  
77 Massachusetts Ave., E60-100  
Cambridge, MA 02139-4307  
e-mail: [smrorders@mit.edu](mailto:smrorders@mit.edu)

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.