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# The Impact of Technological Innovation on Outsourcing Decisions

A brief synopsis of **Outsourcing and Technological Innovations:  
A Firm-Level Analysis** (Centre for Economic Policy Research working  
paper, March 2008) by Ann P. Bartel, Saul Lach and Nachum  
Sicherman

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## SUPPLY CHAIN

# The Impact of Technological Innovation on Outsourcing Decisions

When technology changes rapidly, outsourcing looks more attractive.

The “make or buy” decision has been a staple of industrial economics as far back as the start of the Industrial Revolution. So when perceived levels of outsourcing began to rise around the world over the past decade or two, researchers began to ask why.

One reason might be the speed of technological innovation during that period. According to *Outsourcing and Technological Innovations: A Firm-Level Analysis*, a March 2008 working paper: “As the pace of innovations in production technology increases, the firm has less time to amortize the sunk costs associated with purchasing the new technologies. This makes producing in-house with the latest technologies relatively more expensive than outsourcing.” Thus, for example, periods of rapid innovation could result in new or shorter-lived manufacturing

robots that only specialist suppliers can justify acquiring.

The paper’s authors — Ann P. Bartel, the A. Barton Hepburn Professor of Economics at Columbia University’s Graduate School of Business, Saul Lach, associate professor in the economics department at The Hebrew University of Jerusalem, and Nachum Sicherman, professor of economics and finance at Columbia’s Graduate School of Business — studied Spanish manufacturers from 1990 through 2002 and concluded that outsourcing does increase with technological change. Using the Encuesta sobre Estrategias Empresariales, an annual survey of Spanish manufacturing companies, for the years 1990, 1994, 1998 and 2002, the researchers examined responses to whether the companies outsourced the manufacture of custom-made finished

products or parts and, if so, the value of the outsourced items purchased. The number of respondents ranged from 1,708 in 2002 to 2,189 in 1990.

The researchers also had access to financial data on each company's research and development intensity (its spending on R&D, if any, as a percentage of revenues), which they used as a proxy for technological change. After all, companies that invest in research and development clearly expect innovation and technological change to be part of the business environment.

The data confirmed that spending on research and development is linked to outsourcing. Overall, the percentage of companies that reported outsourcing rose from 35% in 1990 to 43% in 2002, confirming the impression that outsourcing in general has risen in recent years. And companies with R&D spending were between 6% and 10% more likely to outsource than those that did not choose to invest in R&D. This relationship remained robust even when controlling for factors such as capacity utilization, work force size and costs, the age of the company and product market volatility.

To be sure, there may be other reasons behind the link between technological change and outsourcing apart from the various innovations that companies buy from their parts suppliers and the sunk costs related to state-of-the-art production equipment. It is possible that the rapid advances in Internet and communications technologies, for example, could have lowered the costs associated with seeking out suppliers and managing relationships with them.

Nevertheless, the relationship between technological change and outsourcing demand appears to be established. As a result, advises Bartel, "Be prepared to think more seriously about outsourcing as a way of dealing with technological change. If you are in a world in which technology is continually evolving, it may be expensive to try to keep pace. Outsourcing may be a solution."

While the research is focused on manufacturing industries, its importance may

**FURTHER READING**

**Outsourcing: Design, Process and Performance**  
Michael J. Mol (Cambridge: Cambridge University Press, 2007), 232 pages

How much should a company outsource? That's one of the questions addressed by a recent book on the topic, *Outsourcing: Design, Process and Performance* by Michael J. Mol, a senior lecturer in strategic management at the University of Reading Business School and a visiting researcher at the Management Lab at London Business School. In his book, Mol examines outsourcing from an academic perspective but includes examples of successful and unsuccessful outsourcing experiences from the world of business.

Central to Mol's argument is the idea that, at any given time, any given company has an optimum level of outsourcing that is specific to that company. He points out that there are some things few businesses would outsource — such as their CEO position — as well as some activities few companies would try to do in-house — such as generate all their own electricity. In between, Mol maintains, are a wide range of activities, with varying degrees of what he calls "outsourcability." He suggests that, if one could graph the relationship between a company's possible outsourcing levels (on the horizontal axis) and its resulting performance (on the vertical axis), the graph would look something like an upside-down U — at some optimum point the organization is outsourcing an ideal amount, at the high point of the curve, where the performance benefits are maximized. Outsource too much or too little, Mol argues, and the results are less than optimal, as the organization's performance moves further down the curve from the peak.

But the exact shape and slope of that outsourcing curve, Mol thinks, varies by company — because the advantages of outsourcing vary as well. Toyota Motor Corporation, for example, has found a competitive advantage through outsourcing that involves long-term, close partnerships with a number of suppliers, Mol notes. But he also shares examples such as a British railway infrastructure company whose outsourcing of maintenance functions left it without sufficient in-house capability to verify that maintenance was being done well.

The optimum level of outsourcing for a company can be hard to figure out in practice — and can vary over time, depending on factors such as changes in information technology and in transportation costs. And, Mol suggests, a company sometimes can benefit from choosing a different outsourcing strategy than is common in its industry, if the company's business model warrants that. To find the right level of outsourcing for your company, Mol offers this advice: Think in terms of conducting small outsourcing experiments and creating mechanisms to evaluate the results over time.

— Martha E. Mangelsdorf

extend further. As Bartel points out, "To the extent that technological change makes it costly to update technologies, [the research findings] would certainly be applicable to the outsourcing of services as well."

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man at Nachum.Sicherman@columbia.edu. The working paper is also available for download, for £3, at [www.cepr.org/pubs/new-dps/dplist.asp?dpno=6731](http://www.cepr.org/pubs/new-dps/dplist.asp?dpno=6731).

— Larry Yu

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