A new way of measuring the impact of innovation

IESE Prof. Bruno Cassiman and Stijn Vanormelingen reveal how process and product innovation can directly impact price/cost margins at the firm level.

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Innovation is a crucial element in the value creation process. However, there remains a great deal of confusion about the actual impact of innovation on a company's bottom-line performance.

If firms can't grasp how much value they can expect to capture from their innovation efforts, then there's good reason to believe that they're not innovating as much as they could or should be.

Unfortunately, most existing research on the subject relies on data and methods that fail to provide a clear picture of innovation's impact on the firm's bottom line.

In their paper, "Innovation and Markups: Firm Level Evidence," IESE Prof. Bruno Cassiman and Stijn Vanormelingen, of HU Brussels and KU Leuven, try to track firm operations at the micro level.

Rather than focusing purely on productivity, as most studies have, they explore the relationship that exists between product/process innovation and value capture through the markups a firm is able to extract after innovating.

Traditional research shortcomings

Historically, research on innovation has focused on productivity gains, typically focusing on

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the links between R&D spending and measures of labor and total factor productivity, instead of linking these efforts to the firm's bottom line.

Failure to distinguish between the effect of innovation on price- and cost-related elements limits insights.

Meanwhile, overreliance on accounting variables to measure profitability, such as net profit margins, creates an additional problem. Wrongly accounting for capital costs, or ignoring returns to scale in the measurement, can obscure relationships between innovation and productivity or price markups.

As the authors show, using the classical accounting measures seriously underestimates the effect of innovation on firm profitability.

The authors try to bolster existing methodology for calculating markups by using a technique to identify the output elasticity of inputs — how much output increases as inputs increase — and then comparing it with the share of input costs in revenue.

This method makes it possible to infer a measure for firm-specific price markups, as well as estimating how innovation drives market power.

Product vs. process innovation

The authors studied an 18-year dataset of 4,600 Spanish-based manufacturing firms, including 3,400 SMEs and 1,200 large corporations.

They analyzed how product and process innovation impacts not only productivity, i.e., technical efficiency, but also firm-specific pricing and markups above costs.

Previous research has suggested that product innovation has a substantial and positive impact on productivity. The impact of process innovation has been more ambiguous, with some studies even suggesting a negative relationship between process innovation and productivity.

As expected, the study confirmed that product innovation has a broadly positive impact on prices and markups. Naturally, companies that incorporate new functionalities or new designs into their products expect to be able to sell their products at a higher price.

More surprising was the study's finding that process innovation can also lead to price markups. While process innovation reduces costs, prices are adjusted to reflect some part of

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this cost reduction. But overall, firms tend to capture some returns to process innovation through higher markups.

In other words, while companies drop prices as a result of improved processes and reduced costs, the drop in prices tends to be somewhat lower than the drop in marginal costs.

The authors found markups to be 2.8 percent higher after process innovation, and 3.9 percent higher following product innovation.

Sector by sector

Perhaps unsurprisingly, the highest markups were found in the chemical industry. High markups were also reported in the publishing sector, as well as the food and beverage industry.

Sectors such as textiles, leather products, wood products and office machinery charged the lowest markups over the period studied.

Gains from markups were found to occur most with design- and function-based product innovation, and with process innovation from the introduction of new machinery. Smaller firms seem to benefit most from product innovation.

In sum, the research revealed that product innovation resulted in larger price increases, without impacting marginal costs, while process innovation placed downward pressure on prices and marginal costs — some, but not all, of which were passed on to the consumer.

Overall, this deeper understanding of the firm-level impact of product and process innovation offers valuable insights for managers and policy makers to inform major investment decisions in innovation going forward.

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