Researchers develop new metrics to better decipher how companies exploit investment opportunities

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Analysis of product life cycles has been underutilized by the likes of research economists and financial analysts in examining firm investment policies.

But new research in *The Review of Financial Studies* has produced a text-based analytics model of how firms tailor their investments to their portfolio of products. The key is the four-stage (product innovation, process innovation, maturity and decline) product cycle to better understand how companies exploit their investment opportunities.

"Firms' activities in different product cycle stages are difficult to quantify and compare across firms and time. Most existing studies are limited to using a company's age—on the basis that over time firms become less dynamic—as a life cycle proxy and do not focus on the firm's products. This can miss most of the picture of a dynamic firm," says Vojislav (Max) Maksimovic, professor of finance at the University of Maryland's Robert H. Smith School of Business. He co-authored the new research with Gerard Hoberg of the University of Southern California's Marshall School of Business.

The authors derived their new life cycle variable from publicly available 10-K statements using text processing software that employs "Chained Context Discovery," which "includes pre-built modules for fast and flexible querying and visual interpretations," they write. The model "substantially improves the power of existing models which are based on Q (market value divided by its assets' replacement cost) to explain investment and reveals a natural ordering of investments over a product's life cycle."

In applying the new metrics to predict firm disclosures, Maksimovic and Hoberg show that firms with early life cycle products disclose less in order to hide from rivals. But mature firms disclose more in order to attract synergistic partners—for strategic alliances. And other mature companies are usually the targets.

Significantly, firms interpret their investment opportunities quite differently depending on the life cycle of their products. "Firms expenditures initially have high Q-sensitivities for R&D. Q sensitivities then rise for [capital expenditures] as firms shift from product to process innovation," the authors write. "As products reach maturity, firms shift from organic to inorganic investment in the form of acquisitions. Finally, firms with products entering decline disinvest (sell more assets) when Q declines, and favor product extension strategies and acquisitions when Q increases."

"The findings are useful for understanding the evolution of an industry and its players in a tight, statistical way," says Maksimovic. "The framework can be further useful for fund managers looking at firms active in product development and has natural applications in other disciplines such as marketing, management and strategy."

More information: Gerard Hoberg et al, Product Life Cycles in Corporate Finance, *The Review of Financial Studies* (2021). DOI: 10.1093/rfs/hhab134

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