

Exchange

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WHAT'S IN A NAME?

Biotech vs. Pharma Investments

It's tough to tease out the health of a biopharma investment portfolio, particularly because, as Richard Thakor and his colleagues reveal in *Nature Biotechnology*, the answer can hinge on how specific companies are classified—as biotech firms or pharmaceutical ones.

With his former Ph.D. advisor, Andrew W. Lo, and a team of researchers from MIT's Laboratory for Financial Engineering, Thakor set out to examine this issue. "A basic starting point is to examine whether investors would be willing to give money," or invest in these often ground-breaking companies, Thakor said. "What we discovered was substantial disagreement: some viewed pharma companies as exceptionally profitable and having little trouble attracting investments. Others viewed *all* biopharma companies as exceptionally risky and unprofitable." Thus, "Our study aims to disentangle these seemingly contradictory views, and we make the point that the performance of biotech and pharma industries is very dependent on companies' classifications into one camp or the other."

Where the biotech sector is seen as providing the pipeline of

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discoveries innovations on which the pharma sector is increasingly dependent, perceived risk in the former can affect the latter. But when a single drug can run up a \$2 billion development tab, R&D intensive companies need to raise capital or see potentially life-saving drugs languish in what industry insiders call biomedicine's "valley of death." That is, drugs and other treatments with huge promise for development can fail to launch without investor backing.

Thakor and his colleagues used a sample of 1,066 companies over 80 years to compare risks and returns between biotech and pharma investments. They first noted that the biotech sector is often characterized by loss-making enterprises and high stock volatility, while pharmaceutical companies have consistently outperformed the market since 2000.

However, it became evident that, in terms of financial performance, the biotech sector is highly responsive to the inclusion or exclusion of a few key companies in classification schemes. Include a handful of high performers among the biotech firms rather than the pharma companies, Thakor tells us, and "it can make the biotech sector as a whole seem like it is performing very well."

To be sure, both the biotech and pharma industries endure enormous built-in risk, but when biotech firms are dismissed outright as underperforming and risky, innovation stalls. Without carefully disentangling company performance from sector-wide assumptions, investors may miss the chance to help fund medical progress and increase the holistic profitability of their biopharma portfolios. ■

Richard Thakor, PhD, is an Assistant Professor of Finance at the Carlson School of Management, University of Minnesota

Commentary

By *Richard Manning, PhD, Bates White, LLC, Washington, DC*

The *Nature Biotechnology* article by Richard Thakor and his coauthors poses an interesting question and sheds light on the financial risks and rewards facing investors and other stakeholders in the biopharmaceutical industry.

Indeed, by choosing to focus on the distinction between biotech and pharmaceutical companies, the authors identify an important dichotomy in medical care. Biotechnology builds on new scientific discoveries about genetics and biology that have led to treatments for life threatening and debilitating diseases that probably would not have been possible with the chemistry-based approaches that underlie much of traditional

pharmaceutical innovation. Decisions in corporate boardrooms, regulatory agencies, legislative halls, and the country's courtrooms involve the distinction between drugs and biotech products, and will have profound effects on the health and quality of lives of people everywhere. They also have important business implications.

The profitability of biopharmaceutical discovery and development has been one of the more enduring controversies in health care. There has been much misunderstanding and misstatement in a wide range of forums. Describing this controversy, the authors cite the following quote from the literature: "Investing at the

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Medical Industry Leadership Institute
Carlson School of Management
University of Minnesota

321 Nineteenth Avenue South, Suite 2-212
Minneapolis, Minnesota 55455-9940

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Commentary

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drug company level is a good, solid, and basically riskless proposition.” While that may have *seemed* sensible at some point, it certainly has not held true. Investors in most of the industry powerhouses would have suffered in some cases severe losses had they accepted that assertion when it was offered.

To illustrate the returns to investing in this industry generally, it is interesting to consider the time trend of the NYSE DRG index. This index tracks the stock prices of “a cross section of widely held, highly capitalized companies involved in various phases of the development, production, and marketing of pharmaceuticals.”¹ Coincident with a decade of new product introductions and growing sales in the biopharmaceutical sector, that index grew substantially through the 1990s to a peak in December 2000. However, after that peak, the index retreated until February 2009, bottoming out at a value equal to about half its December 2000 high.

Since that low point, the index has grown again, but it did not match to its previous high until nearly 13 years after hitting its low point. Moreover, from that low point, the DRG index substantially underperformed the overall stock market, particularly in the most recent three years. As of mid-May, 2018, the S&P 500 index had grown by 270%, while the DRG has grown by less than half that amount (132%) since February 2009.

Hence, while it is clear that the “winners” in the drug discovery lottery do quite well, it is also clear that those that fail to win the game do not do well. Both the DRG history and other recently published research² illustrate the risk and the less than stellar returns to biopharmaceutical investment generally.

Thakor and his coauthors’ findings are consistent with the traditional blockbuster economics of the pharmaceutical industry and with the foregoing description of industry profitability. Given the well-known risk profile of investments in this industry, the companies that have succeeded show extra-normal financial returns from time to time, and those that fail (or have not yet succeeded) show lower than normal financial returns. The article clearly reflects this pattern: there are substantial temporary spikes in the investment returns to the companies classified as the pharmaceutical sector (generally the larger companies); returns to the companies classified as biotech companies (generally the smaller ones) are low and often negative.

In my view, the most important finding of the article is the clear divide in investment returns between those that have succeeded in becoming “pharma” companies and those that have not.

The authors provide supplementary materials that were more than could be included in the journal publication, but which are very helpful in clarifying the analysis and that shed light on the implications of the research. That material is worth reading. It illustrates the way in which the results change under different definitions of “pharma” and “biotech,” and allows the reader to understand that the article is actually much more focused on “feeder” institutions as biotech companies and more mature companies (whether selling biotech or pharmaceutical products) as “pharma” companies. While my preference would be to focus more attention on the performance of companies based on the type of products produced, that can certainly be left for future publications. ■

¹ https://www.nyse.com/publicdocs/nyse/indices/nyse_arca_pharmaceutical_index.pdf

² <https://www.healthaffairs.org/doi/abs/10.1377/hlthaff.2014.1029>; <https://www.healthaffairs.org/doi/10.1377/hblog20170602.060369/full/>

About

Exchange, a publication from the Medical Industry Leadership Institute, features dialogue on medical industry research and application. The content is a summary of research from both academia and the medical industry, followed by commentary on the importance of the research and its application. Topics highlighted in the *Exchange* span all sectors of the medical industry and include commentary from leaders in the field, as well as researchers from the University of Minnesota and other academic institutions.

For additional information about the Medical Industry Leadership Institute, contact Jessica Haupt at jahaupt@umn.edu or 612-624-9202.