BRADFORD L. GOLDENSE | Contributing Technical Expert

R&D Spending Level: What Is the Right Amount?

Determining how much to spend on R&D and product development each year is an issue that has plagued management for decades. It is a difficult question.

One of the big challenges has been tying R&D spending to results. Projects are funded, development occurs, products are launched, and commercialization ensues. Years pass before the data is in place to tie spending to results. Companies have tens to hundreds of projects going on at the same time. The relationship between spending and results is unknown, so many executives modulate R&D spending to mitigate variations elsewhere in the business without knowing the effect on R&D over time.

Since the 1970s, academics and practitioners have experimented with various formulas and approaches to tie spending to results. In small sample sizes, such as a single product, the numbers can be assembled and crunched. But even that is not definitive for many. Is success measured by revenues? Profits? Units sold? Market share? Technology leverage? Customer satisfaction? Something else? There will likely never be a perfect solution, but we need something better than what we currently have.

Total Factor Productivity: For decades, academics and economists have been using a formula named TFP, or Total Factor Productivity. It is based on the "production function," a fundamental concept in economics. TFP measures the excess, or remainder, of output not accounted for by inputs. By inference, it is believed that this excess is a measure of the degree of innovation and all other factors that are not quantifiable inputs. TFP has never really excited people responsible for running companies. It does not uniquely isolate R&D's contributions.

Patents: Another popular approach has been to use patents. The more patents a company is granted, the more it is considered to be innovative. Many popular innovation-ranking methods incorporate patent count. There are numerous holes in the logic of using patents to measure innovation, and the data is uniformly available. Patents might work in scenarios where all competitors have the same means and propensity to patent, but that is not the case for most industries. Some patents are worthless. Some companies prefer Trade Secrets for protection. Small companies typically can't afford patents. Practically speaking, the more R&D spending that goes to patent expenses, the less funds available to develop new innovations. Patents are not the panacea to determine R&D spending nor results.

Competitive Analysis: Many companies look at the spending levels of their competitors to determine their own spending. Some companies want to spend more than competitors, some the same, and some just slightly less. Spending more might be viewed by the markets and investor community as a greater commitment to innovation. Spending less might be viewed as being a more efficient and productive innovator. This approach relies on perceptions of innovation and not the results of innovation.

Vitality Index: The Vitality Index, originally created by 3M in 1988, has risen to be the third most popular R&D metric behind patent count and head count. It measures the percentage of company revenues that come from new products. Some companies have found that an increase in R&D spending increases their Vitality Index. Analysts and the investor community are increasingly interested in this index. Low numbers, year after year, generally indicate that innovation is not thriving. Consistent high numbers indicate consistently high levels of new products. Companies then modulate R&D spending to produce the Vitality Index they desire. But this index does not take profits into account. It falls short of being a true indicator of the right amount of spending.

In summary, there are innumerable techniques and data points company leaders use to determine and satiate themselves that they are making the "right" spending allocation for R&D. Next month, in Part 2, we will look at an emerging method called "Research Quotient (RQ)" that alleviates many foibles of current approaches to determining proper R&D spending levels. md

BRADFORD L. GOLDENSE is founder and president of Goldense Group Inc. (GGI; *www.goldensegroupinc.com*), a consulting, market research, and education firm focused on business and technology management strategies and practices for product creation, development, and commercialization.