Intern. J. of Research in Marketing 25 (2008) 261–272

Contents lists available at ScienceDirect

Intern. J. of Research in Marketing

journal homepage: www.elsevier.com/locate/ijresmar

Counting chickens before the eggs hatch: Associating new product development portfolios with shareholder expectations in the pharmaceutical sector

Rajdeep Grewal *, Anindita Chakravarty, Min Ding, John Liechty

Smeal College of Business, Pennsylvania State University 07 Business Bldg. University Park, 16802 PA, USA

ARTICLE INFO

Article history:
First received in May 22, 2007
and was under review for 4 months

Area Editor: Jehoshua Eliashberg

Keywords:
Drug development
Marketing and health
New product portfolios
Pharmaceutical industry
Shareholder value

ABSTRACT

Drug development is the lifeblood of pharmaceutical firms and a critical source of innovation in the healthcare industry. Pharmaceutical firms maintain their competitiveness by continuously developing and introducing new drugs, which requires an efficient new drug portfolio management process. However, the current literature does not elaborate on strategies pertaining to these new drug (product) portfolios (i.e., portfolios of drugs under development), nor does it provide the means with which to understand the future cash flow-generating potential of these portfolio strategies. To address this problem, we propose a set of generic descriptors of new drug portfolio strategies (i.e., portfolio breadth, portfolio depth, blockbuster strategy, and stages of the drug development process) and relate these descriptors to Tobin's *q*, a forward-looking measure of shareholder expectations. The results of a latent class regression analysis show that shareholder expectations of firms with broad new drug portfolios and potential blockbusters are positive. For most firms, shareholders focus on the final stage of the drug development process and deemphasize portfolio depth. In contrast, for a minority of mostly small firms, shareholders seem to value the earlier stages of the drug development process and stress portfolio depth.

© 2008 Elsevier B.V. All rights reserved.

1. Introduction

Considering that healthcare expenditures constitute 8–15% of the gross domestic product in most developed countries (Shankar, 2007), research advancing the management of healthcare and life science technologies is considered vital for progress. The pharmaceutical sector has grown more than any other component of the healthcare industry, both in terms of expenditure and innovation. Consequently, proponents of healthcare innovation increasingly focus on the pharmaceutical sector, a major source of advances in life science and healthcare technologies.

The pharmaceutical sector is expanding at a remarkable rate, with global sales increasing from $317 billion in 2000 to $550 billion in 2004 (Trombetta, 2005). Much of the growth is sustained by the continuous introduction of new products addressing diseases in desperate need of remedies. The development of new drugs is the lifeblood of most pharmaceutical firms, and it is no wonder that pharmaceutical firms spend approximately 20–30% of their revenues on research and drug development.

However, managing the development of new drugs in the pharmaceutical industry remains extremely challenging due to the complexities of the development process and government regulations. Drug development is also costly, costing $800 million–$1 billion per drug, and extremely risky, as only 1 in 50,000 chemical entities generated in the earliest stages of development ultimately qualify as a new drug candidate that moves into the later stages of development. In addition, the development time of a new drug is quite lengthy (10–12 years on average), as each drug must clear multiple stages during the development process.

The multiple stages of the drug (product) development process in the pharmaceutical industry comprise the following: *in silico* and *in vitro* analyses identify a potential drug candidate as a treatment for a given disease, after which preclinical animal tests are conducted. If the preclinical tests yield promising results, the firm files an application with the Federal Drug Administration (FDA) to test the drug on human subjects through a series of clinical trials. The clinical trial stage comprises three phases. In phase I the drug is tested in a small number of healthy human subjects for safety; in phase II the drug is tested for efficacy and potential side effects on an average-sized sample of a few hundred patients; and in phase III the drug is tested for dosage guidelines and a detailed clinical profile using thousands of patients is established. Finally, the test results are submitted to the FDA for evaluation and possible approval.

In increasingly risky industry environments, such as the pharmaceutical sector, firms turn to portfolio management to develop new products and maintain sustainable competitive advantages and long-term profitability (Cooper, Edgett, & Kleinschmidt, 2004). Specifically, new product portfolio management, defined as a "dynamic decision process, whereby a business' list of active new product projects is constantly updated and revised," optimizes resource allocation among new product projects at various stages of development and is aimed at

* Corresponding author. Tel.: +1 814 863 0728; fax: +1 814 865 3015.
E-mail address: rug2@psu.edu (R. Grewal).

0167-8116/$ – see front matter © 2008 Elsevier B.V. All rights reserved.
doi:10.1016/j.ijresmar.2008.07.001

diverse markets (Cooper, Edgett, & Kleinschmidt, 1998, p. 3). The management of a portfolio of new drugs under development, otherwise referred to as a *new drug portfolio*, remains one of the most important components of the corporate strategy of pharmaceutical firms. However, portfolio management successes have been adequate at best (Slade, 2006), and it should come as no surprise that many firms, including pharmaceutical companies, struggle to assess the revenue-generating potential of their portfolio strategies.

The challenge in assessing portfolios of new products under development stems from their valuation, which can refer only to expected future income; new product portfolios themselves do not generate any current income. Furthermore, it is impossible to assess portfolios on the basis of their historical performance — akin to counting chickens before the eggs hatch. Unfortunately, no objective measures of the future revenue-generating potential of new product portfolios exist, though such measures would represent powerful tools for distinguishing among new drug portfolio strategies. Decisions regarding individual projects often rely on a net present value analysis to make go/no-go decisions for product development projects. Although similar techniques could be adapted for portfolios, incorporating synergies and complementarities would be difficult, and managerial judgments regarding revenues, expenses, and synergies across the projects in a portfolio would remain necessary, which means judgment biases would still exist (e.g., Sharma & Lacey, 2004).[1]

We believe that shareholder expectations, as expressed through stock market-based indicators, might help overcome this lack of objectivity in understanding the firm's future cash flows accruable to new drug portfolio strategies. The efficient market hypothesis found in the finance literature suggests that financial markets integrate all relevant knowledge to arrive at a stock price and can absorb new information about the current value of an uncertain future income quickly, as reflected in rapidly updated stock prices (e.g., Fama, Fisher, Jensen, & Roll, 1969). Forward-looking measures are common (e.g., Goldenberg, Libai, Moldovan, & Muller, 2007); especially stock price-based indicators, which are increasingly popular for assessing the value of market-based assets (e.g., Rust, Ambler, Carpenter, Kumar, & Srivastava, 2004). Consistent with the efficient market paradigm, we propose that the association of new drug portfolio strategies and a stock price-based measure can assist in understanding shareholder expectations of a firm's future cash flows accruable to its new drug portfolio strategies. We also clarify that we do not intend to make generalized claims about the effectiveness of new drug portfolio strategies, but rather to explore their relationships with stock price-based measures. Due to federal regulations, information about drugs under development is made public by the FDA. Hence, the pharmaceutical sector is ideal for research into the connections between new drug portfolio strategies and stock price-based measures of firm valuation.

We propose descriptors of new drug portfolios that capture four key strategic dimensions, namely portfolio breadth (number of different markets targeted), portfolio depth (variation in allocation of resources among different targeted markets), blockbuster strategy (a portfolio with a high expected market potential and few targeted diseases), and the stage of drug development (earlier versus later). The literature on product policy supports the use of some of these descriptors, such as breadth and depth (e.g., Bordley, 2003). In turn, we hope to capture these four descriptors of a firm's new drug portfolio strategies and relate them to Tobin's q, a stock market-based indicator of a firm's value (Wernerfelt & Montgomery, 1988).

Because both systematic studies on product portfolio valuation and relevant historical results in the area of healthcare innovation and management are lacking, we recognize that our research is largely exploratory. We further characterize this research as exploratory because we claim only associations between the four descriptors of new drug portfolio strategies and Tobin's q, not causal effects of the descriptors on Tobin's q. Nonetheless, we seek to make several important contributions to the general innovation management literature and the domain of life sciences and healthcare in particular. Because we study new drug portfolios for the pharmaceutical sector, we offer substantive contributions in terms of understanding the economic potential of portfolios in this strategically important sector. By providing an objective assessment of shareholder expectations of new drug portfolios, and consequently of the firm, we make it easier to identify the most favorable practices among pharmaceutical firms. Finally, we use a measure based on stock prices (Tobin's q; e.g., Simon & Sullivan, 1993) to understand the economic value of new drug (product) portfolios and thus respond to requests by scholars who suggest that marketing should "engage in a meaningful dialogue with financial and top management" and focus on issues critical to shareholders (Srivastava, Shervani, & Fahey, 1999, p. 168; see also Rust, Ambler, Carpenter, Kumar, & Srivastava, 2004).

We organize the remainder of this article as follows: in the following section, we provide a background of the previously conducted innovation research set in the context of the pharmaceutical industry. Based on this overview, we discuss four descriptors of new drug portfolio strategies and theoretically explore their associations with Tobin's q. Next, we examine these associations by a latent class regression analysis to account for the possibility of multiple regimes[2]. We conclude with discussions of the limitations of the study and its implications for further research.

2. Conceptual background

2.1. Innovation in the pharmaceutical sector

Innovation and drug development form the crux of life sciences and healthcare-related research in the pharmaceutical sector. A broad range of studies examine (1) drug development decisions, (2) interfirm alliances to develop new drugs, and (3) the economics of drug development. Together, these studies provide valuable guidelines for managing a creative and dynamic drug development strategy.

Research on drug development decisions focuses on two broad areas: the drug development process and the new drug portfolios. A broad range of theoretical perspectives serves to suggest improvements to the drug development process and related innovations. On the basis of a valuable decision model that reveals the ideal extent or number of new drugs on the market, Ding and Eliashberg (2002) showed that leading firms underspend on drug development during clinical trials and suggested that firms need different drug development pipelines for different development problems. Applying a problem-solving perspective, Chandy, Hopstaken, Narasimhan, and Prabhu (2006) explained that though pharmaceutical firms are under extreme pressure to develop and release new drugs, a strong focus on rapid innovation and varied new drug concepts may harm firms by lowering their ability to convert these concepts into commercial products. In contrast, the use of control theory mandates that, irrespective of the extent or number of new drugs,

[1] As summarized by Cooper et al. (1998), several scholars define a new product portfolio as effective if it meets the following criteria: (1) it aligns with business objectives, such as maximizing financial returns, (2) it includes high-value projects, (3) it achieves resource efficiencies through congruence between project spending and business strategies, (4) projects reach completion in a timely manner, (5) projects are balanced, and (6) it includes an appropriate number of projects. Following these criteria, managers can collect perceptual data using Likert scales and assess the extent to which their portfolios are effective.

[2] In our empirical analysis, different segments or regimes of firms might exist for which the coefficients of interest differ in magnitude, direction, and statistical significance. Such different segments result from the inherent heterogeneity among firms, which makes certain associations valid for some firms and invalid for others (see the Appendix).

دریافت فوری ← متن کامل مقاله

ISIArticles
مرجع مقالات تخصصی ایران

✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
✓ امکان دانلود نسخه ترجمه شده مقالات
✓ پذیرش سفارش ترجمه تخصصی
✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
✓ دانلود فوری مقاله پس از پرداخت آنلاین
✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات