Investors' Skepticism Leads to Underinvestment in R&D and How to Overcome It

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Firms Underinvest in R&D and Innovation

Knowledge is nonrival—producers of knowledge cannot fully appropriate its benefits, hence the underinvest (Arrow, 1962).

Even if knowledge producers could fully appropriate benefits (patents, subsidies, secrecy), they will underinvest because of excessive cost of external financing (Hall and Lerner, 2009).

This information asymmetry can be mitigated.

companies, resulting from deficient financial

Deficient and Inconsistent Accounting

All expenditures on internally-generated knowledge (except software development) is expensed, distorting both earnings and asset values (U.S. GAAP).

Acquired intangibles are capitalized, but in-process R&D is still expensed (U.S. GAAP).

Goodwill has to be checked annually form impairment—a very imprecise and frequently manipulated procedure (U.S. GAAP).

Deficient and Inconsistent Accounting

Development costs of identifiable projects can be capitalized, but few follow this rule (International Standard).

Except for total R&D expenditures (poorly defined) all other investments in knowledge (brands, processes, IT) are not disclosed to investors.

Substantial knowledge-related information asymmetry

Consequences: No News Is Bad News

Numerous studies document the systematic **undervaluation** of shares of R&D-intensive companies (evidenced by substantial risk-adjusted future returns). Examples:

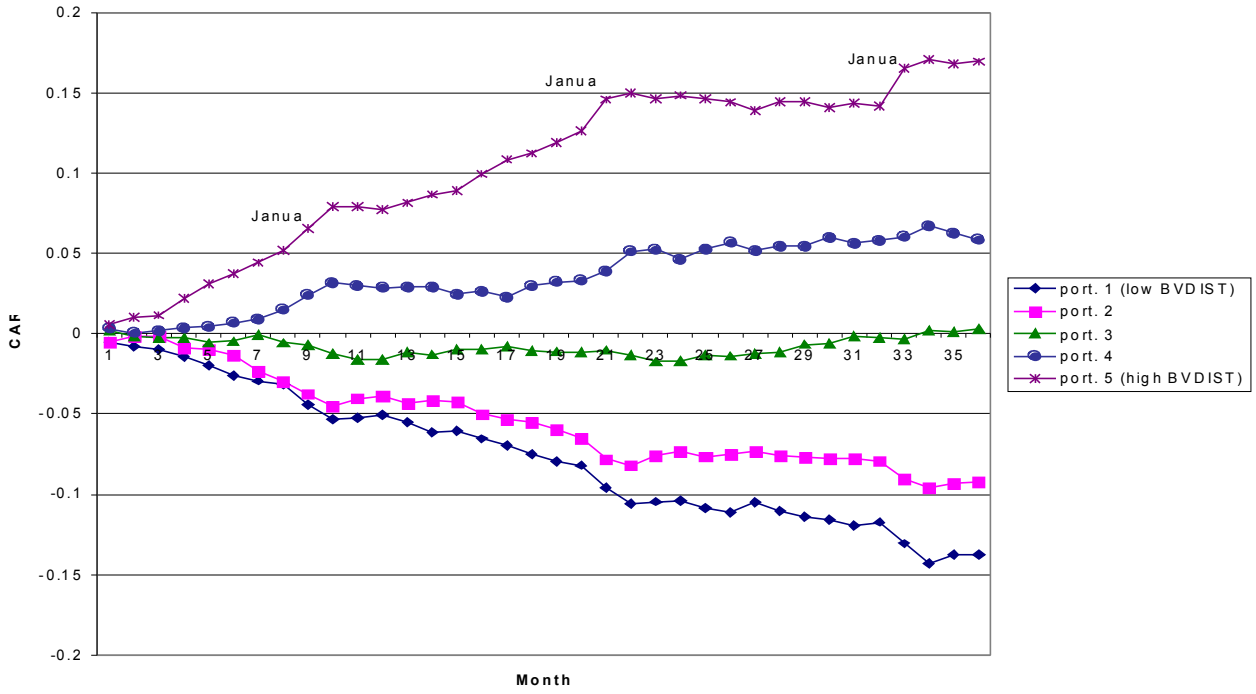
Firms that increase their R&D expenditures exhibit long-term abnormal returns of up to 20% (Eberhart et al., 2004).

Firms ranked by R&D capital (computed)

Share undervaluation implies excessive cost of capital leading to underinvestment in R&D.

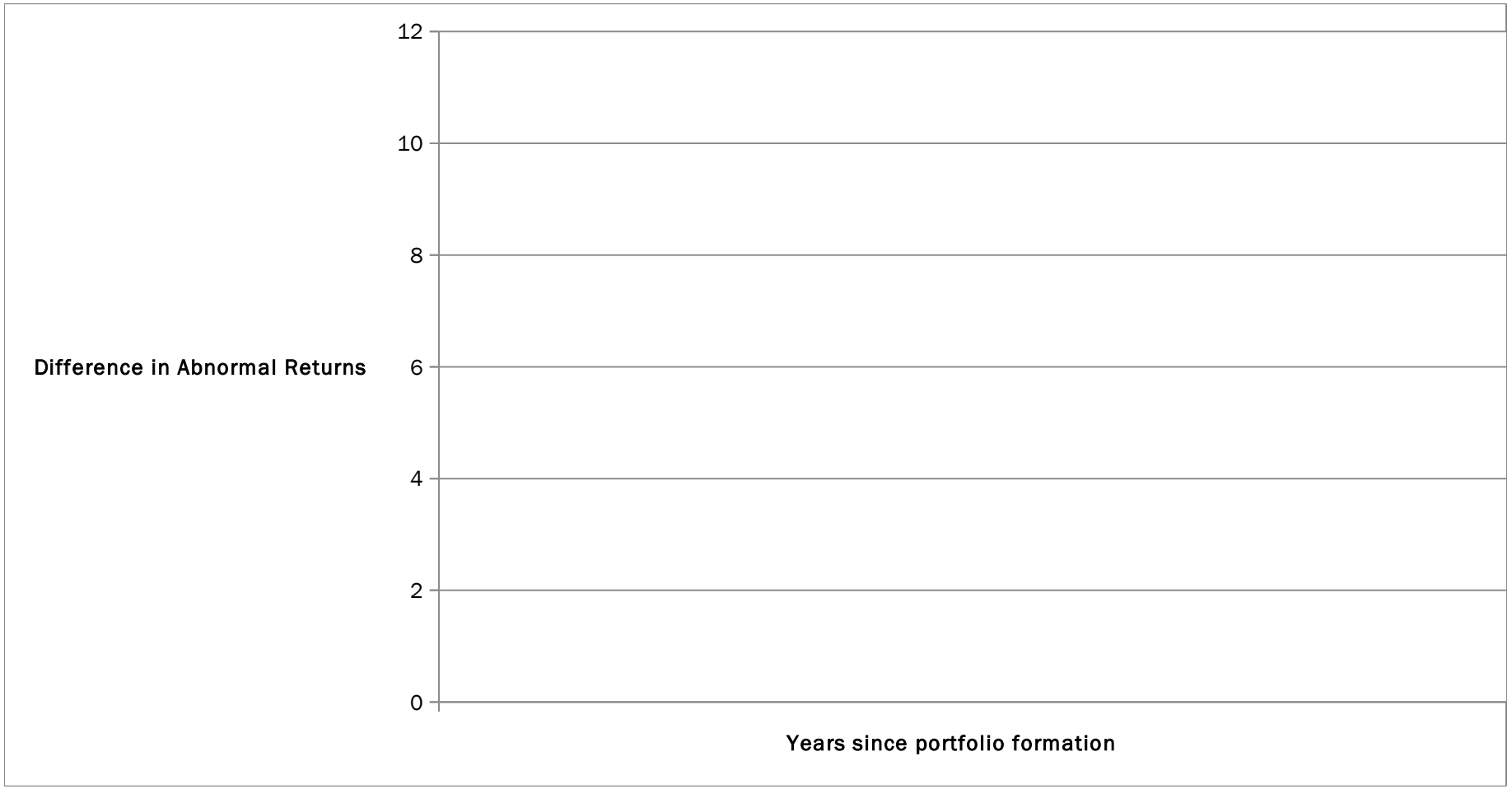
Abnormal Stock Returns on R&D Capital

Figure 2: Cumulative Abnormal Returns (CAR) to BVDIST Portfolios



Source: Lev, Nissim and Thomas (2007).

Abnormal Returns: Chemicals vs. Pharma and Biotech



What's to be Done?

Contrary to widely-held beliefs, knowledge-related information asymmetry can be substantially mitigated by smart disclosure. Evidence below.

But first, lets dispose of the "competitive harms" red herring.

Pharma and biotech companies, operating in intensely-competitive industries, routinely provide extensive information on the product pipeline, prospective launch dates and revenues, and patent protection, without apparent competitive harms (Novartis).

The Evidence: Disclosure Mitigates Information Asymmetry

The capitalization (and amortization) of software development costs improves the prediction of future earnings. (Note: smart capitalization) (Aboody and Lev, 1998).

Extensive product-development and patent protection disclosure by biotech IPOs reduces stock volatility and bid-ask spreads (Guo et al., 2004).

Capitalization of intangible assets acquired in M&A affects investors' valuations (Kimbrough, 2007).

The Evidence: Disclosure Mitigates Information Asymmetry

Discussion of R&D and innovative activities in earnings releases and conference calls shrinks investors' share undervaluation (Ciftci et al., 2009).

R&D capitalization by U.K. companies substantially improves the informativeness of share prices (Oswald and Zarowin, 2007).

Disclosure of innovative activities by high tech

Improved disclosure about innovative activities substantially reduces information asymmetry without apparent harms.

Smart Disclosure

Principles: (1) Provide Standardized, comparable indicators.

(2) Link inputs to outputs, enabling investors' valuation models.

Source: Lev (2010)

Takeaway

Underinvestment in R&D is not an Act of God.

The underinvestment resulting from information asymmetry due to deficient disclosure can, and sometime is mitigated.

Given the well-known feedback effect from external disclosure to internal planning and control systems, enhanced disclosure will also improve managerial R&D decisions.