







Q



Home ▶ All Journals ▶ Economics, Finance & Business ▶ Applied Economics ▶ List of Issues ▶ Diminishing marginal returns from R&D in ➤ Volume 45, Issue 5

Applied Economics >

Volume 45, 2013 - Issue 5

950 26 0 Views CrossRef citations to date Altmetric

Original Articles

Diminishing marginal returns from R&D investment: evidence from manufacturing firms

Robert Faff, Yew-Kee Ho

✓, Weiling Lin & Chee-Meng Yap Pages 611-622 | Published online: 10 Oct 2011

66 Cite this article https://doi.org/10.1080/00036846.2011.608644

> Sample our Economics, Finance, Business & Industry Journals >> Sign in here to start your access to the latest two volumes for 14 days

Full Article

Figures & data

References

66 Citations

Metrics

➡ Reprints & Permissions

Read this article

Share

Abstract

This study analyses the association between R&D Investment (RDI) and growth opportunities and show that there exists diminishing marginal returns in manufacturing firms. Extant literature has found that besides R&D investment, systematic risk, financial leverage and complementary asset investment are also associated with growth opportunities. Accordingly, we employ structural equation modelling to simultaneously estimate both a direct influence of RDI as well as indirect influences of RDI on growth opportunities via these three mediating effects. We find that the direct effect of incremental RDI on growth opportunities is independent of R&D intensity. Instead, the heterogeneous effects of RDI on systematic risk, financial leverage and complementary asset investment across firms with different R&D intensity level accounts for the diminishing marginal returns to R&D investment. We specifically

observe that the greatest indirect effect is via the financial leverage of the firm. This study shows the importance of accounting for the interdependencies in R&D investment.

Keywords:

R&D in	vestment	systematic risk	leverage	complementary assets	structural equation model
JEL Classification:					
C33	G14 (032			
CSS	014	732			

Notes

- ¹ This multiplicative formulation derives from the use of SEM, which will be explained in the subsequent section.
- ² We use the AMOS (Arbuckle, <u>2005</u>) software to run the SEM tests.
- ³ Our study uses objective financial data sourced from the COMPUSTAT and CRSP databases. Thus, each variable is measured by a single item, in contrast to multiple items required for each subjective variable typically used in psychology and sociology research that employ SEM.
- ⁴ It should be noted that we decide not to capitalize R&D expenditure since an economically credible amortization rate is difficult to obtain (Grabowski and Mueller, 1978; Hirschey and Weygandt, 1985; Lev and Sougiannis, 1996) because of the differing opinions concerning the appropriate economic lifespan of the R&D investment.
- ⁵ Although we use two measures of GO, namely, MBASS and MBEQU, the results in this study are reported using only MBASS as the results are qualitatively similar between the two growth measures. The unreported results are available from the authors upon request.
- ⁶ Details of the methodology are suppressed to conserve space, but are available from the first author upon request.

⁷ Full details of the analysis are suppressed to conserve space, but are available from the first author upon request.

⁸ The kurtosis of 101.5, 58.4 and 44.03 for Portfolios A, B and C, respectively, lead us to reject the null hypothesis of multivariate normality (p < 0.01). Multivariate nonnormality may cause the SEs of the path estimates to be underestimated. The remedy is to use the bootstrap approach where multiple samples, each containing the same number of observations as our dataset, are drawn with replacement from our original sample. The sampling distribution from the bootstrap procedure provides the data for empirical estimation of the variability of parameter estimates (Byrne, 2004, pp. 268-9). We ran the bootstrap procedure provided in AMOS for 500 bootstrap samples to obtain estimates of the SEs and the significance levels of the path coefficients.

⁹ Insignificantly different from zero.

Related Research Data

Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives

Source: Structural Equation Modeling A Multidisciplinary Journal

Industrial Research and Development, Intangible Capital Stocks, and Firm Profit Rates

Source: The Bell Journal of Economics R&D investment and systematic risk

Source: Accounting and Finance

The Association Between Investment Opportunity Set Proxies and Realized Growth

Source: Journal of Business Finance & Accounting

Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure

Source: SSRN Electronic Journal

Amortization Policy for Advertising and Research and Development Expenditures

Source: Journal of Accounting Research

Table of contents

Source: IEEE Transactions on Engineering Management

Related research 1



Information for

Authors Overview

R&D professionals Open journals

Editors Open Select

Librarians Dove Medical Press

Societies F1000Research

Opportunities Help and information

Open access

Reprints and e-prints Help and contact

Advertising solutions Newsroom

Accelerated publication All journals

Corporate access solutions Books

Keep up to date

Register to receive personalised research and resources by email







Accessibility

Copyright © 2025 Informa UK Limited Privacy policy Cookies Terms & conditions



Registered in England & Wales No. 01072954 5 Howick Place | London | SW1P 1WG