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# On the trade-off between the future benefits and riskiness of R&D: a bondholders' perspective<sup>☆</sup>

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## Abstract

Existing studies on the value-relevance of R&D tend to overstate the R&D benefits and shed little light on the trade-off between the R&D benefits (mean effect) and their riskiness (variance effect). This study shows that the variance effect of R&D is on average more significant than their mean effect in bond valuation. Hence, for creditors, the R&D risk dominates their benefits. Furthermore, this study documents that R&D measures alone explain approximately 80% of cross-sectional variations in bond ratings and risk premium. These findings contribute to the debate over R&D accounting and the bond pricing literature. © 2003 Elsevier Science B.V. All rights reserved.

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*Keywords:* Benefits of R&D; Riskiness of R&D; Option pricing theory; Bond pricing

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## 1. Introduction

Accounting for R&D follows Statement of Financial Accounting Standards (SFAS) No. 2, which mandates that R&D outlays be expensed as incurred (the expensing rule, hereafter). Critics point to evidence that R&D expenditures, on average, generate future benefits (e.g., Hirschey and Weygandt, 1985; Cockburn and Griliches, 1988; Bublitz and Ettredge, 1989; Lev and Sougiannis, 1996); they contend that recognition of value-creating R&D investments as assets will enhance the value-relevance of financial statements (Elliott and Jacobson, 1991; Chambers et al., 1998). On the other hand, the Financial Accounting Standards Board (FASB) and proponents of the expensing rule are more concerned with the measurement error of expected R&D benefits resulting from the high degree of uncertainty in R&D outcomes; they argue that recognizing such unreliable and noisy estimates in the financial statements may mislead investors and creditors (e.g., CFO, February 1999, p. 30).

The debate about the alternative accounting treatments of R&D investments reflects trade-offs between the future benefits of RD and its riskiness.<sup>1</sup> In general, if the uncertainty regarding future benefits is not so high that it disqualifies the measurability criterion of asset recognition, then one may argue in favor of capitalizing R&D expenditures (as is typical for tangible investments). Conversely, if future outcomes are risky and unpredictable, the expensing treatment may be warranted.<sup>2</sup>

The extant R&D literature generally has focused on the benefits aspect of R&D by examining the relation between R&D variables and equity valuation, that is, the value-relevance of R&D.<sup>3</sup> Researchers have interpreted the significantly positive association between R&D constructs and stock prices/returns as evidence that R&D investments do generate net future benefits (e.g., Hirschey and Weygandt, 1985; Cockburn and Griliches, 1988; Bublitz and Ettredge, 1989; Lev and Sougiannis, 1996). This interpretation, however, is questionable because the benefits *and* the riskiness of R&D have impacts in the same direction on the equity valuation of levered firms (Merton 1973, 1974). In other words, an increase<sup>4</sup> in the uncertainty of future cash flows that is attributed to R&D investments will increase the stock price, even if the expected future cash flows remain unchanged. Hence, the existing *equity-based* research tends to overstate the expected future benefits

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<sup>1</sup>Statement of Financial Accounting Concepts No. 6, *Elements of Financial Statements* (1985), defines two asset recognition criteria: a transaction is qualified for asset recognition only if (1) the transaction will generate future benefits, and (2) the future benefits can be quantified with a reasonable degree of precision. The measurability criterion is adversely affected by the uncertainty associated with the future benefits.

<sup>2</sup>Concern over the uncertainty of R&D benefits is used by the FASB in support of the expensing rule. (See par. 39 and 40 of SFAS No. 2.)

<sup>3</sup>A notable exception is Kothari et al. (2002). Their paper assesses the uncertainty of future earnings from R&D investments relative to that from PP&E and shows that the future benefits of R&D are indeed much riskier than those of tangible investments.

<sup>4</sup>“Increase” and “unexpected increase” are used interchangeably hereafter with an understanding that only *unexpected* changes in the R&D benefits and their riskiness will change equity/bond prices.

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