To invest or not to invest? Capitalizing R&D Expenses to increase Valuation Accuracy

The profits a firm generates can either be distributed to its shareholders through dividends/share buybacks, pay back some of its debt or be used to invest. A company invests in its future organic growth either through Research and Development (R&D) or by engaging in Capital Expenditures (Capex). In a previous research paper, we studied the effect of Capex announcements on stock returns. The present document analyses R&D activity and its impact on company fundamentals.

After discussing R&D standard expense-based accounting rules, and its relevance in our current economy, we will observe how an alternative capitalization-based treatment modifies companies' statements. We'll then build fundamental factors with both approaches and run quantitative analysis to define if R&D adjustments improve the performance of value-biased long/short portfolios.

All studies are performed on the MSCI US universe, ex-financial sector, and cover the period from January 1998 to January 2021.

ACCOUNTING RULES: AN ALTERNATIVE APPROACH TO R&D TREATMENT

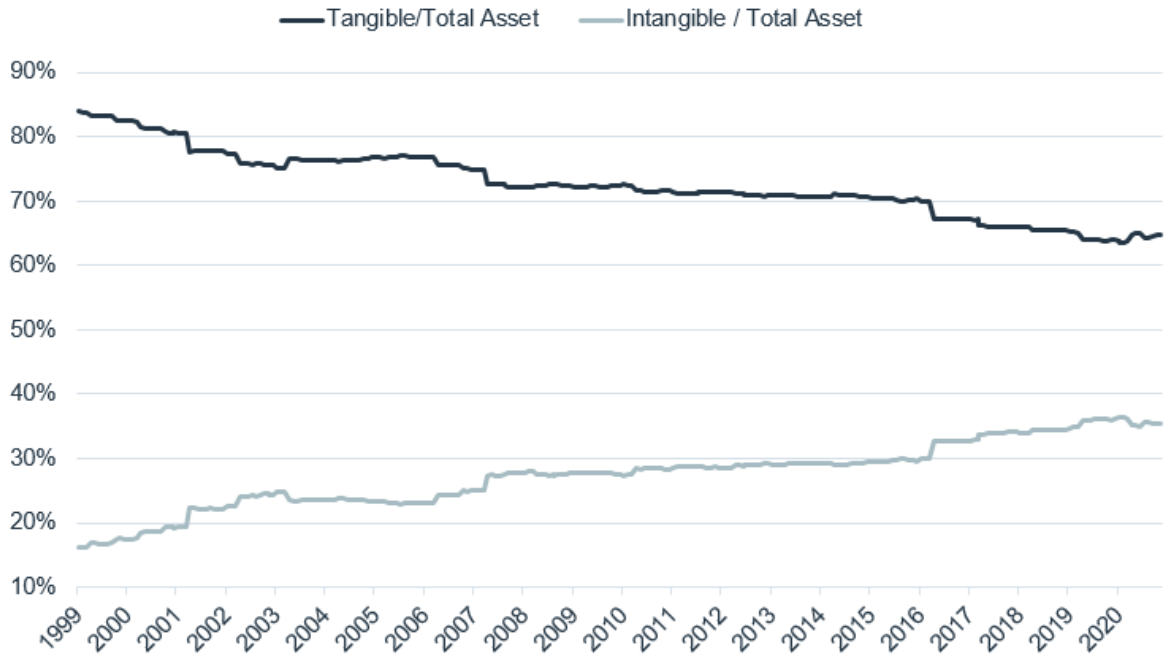
Under Generally Accepted Accounting Principles (GAAP), most of internally generated intangibles, including R&D, are immediately expensed, while expenditures on similar but acquired intangible (including in-process R&D) are capitalized [1]. These rules build up on Financial Accounting Standards dating back 1974 [2] when the economy was heavily relying on tangible assets (plants, machinery, …). Over the past 45 years, the world has seen the rise of industries such as Internet Services, Software Development and Biotech, that are disrupting all sectors by bringing more importance to Intangible assets (patents, copyrights, …).

In this context, academics have proposed an alternative accounting approach in which R&D are capitalized instead of being expensed [3][4]. It directly impacts all financial statements:

- Balance Sheet: R&D Expenses are capitalized and added to the firm's intangible assets. Those assets are depreciated at a constant rate over the years. The unamortized R&D capital increases the book value of the company.
- Income Statement: The expensing of R&D is replaced by the annual depreciation of the R&D Capital.
- Cash Flow Statement: R&D expenses are removed from Cash Flow from Operation and added to Cash Flow from Investing Activities, alongside capital expenditure.

To verify the increased importance of immaterial resources within companies' balance sheets, we chart the time series of tangible and intangible assets' (including capitalized R&D expenses) relative weights.

Exhibit 1: Tangible Vs Intangible on Total Assets Ratio, MSCI US



Over the past two decades, the Intangible to Total Asset Ratio has more than doubled, from 16% in 1999 to 35% in 2021. It confirms the hypothesis that the accounting treatment of intangibles is non-trivial. In the next section, we will focus on how the performance of Value Factors is impacted by these R&D accounting principles.

R&D ACCOUNTING RULES AND VALUE FACTORS PERFORMANCE

Even though a market rotation toward Value names has been observed since the beginning of 2021, Growth stocks have been consistently outperforming Value stocks since the 2008 Great Financial Crisis, with a significant increase of the performance spread in 2020. It has been argued in the literature that unproper accounting of R&D could be one of the factors explaining that pattern [5].

To measure the impact of the R&D accounting rule (expensed vs capitalized), we backtested Long/Short portfolios based on 3 different value factors – balance sheet based (Book Yield), income based (Earning Yield), and cash flow based (Operating Cash Flow yield).

Financial Statements and Market Data are provided by Factset. For backtests and analytics, a three months reporting lag has been applied to fundamental items. All factors, including R&D adjusted ratios have been computed in-house. Portfolios are rebalanced monthly, and we assume no transaction cost in this study. The Standard and Adjusted factors' cumulative performances are presented in the figures below.

Exhibit 2: Book Yield, Top Vs Bottom Quintile Cumulative Performance, MSCI US

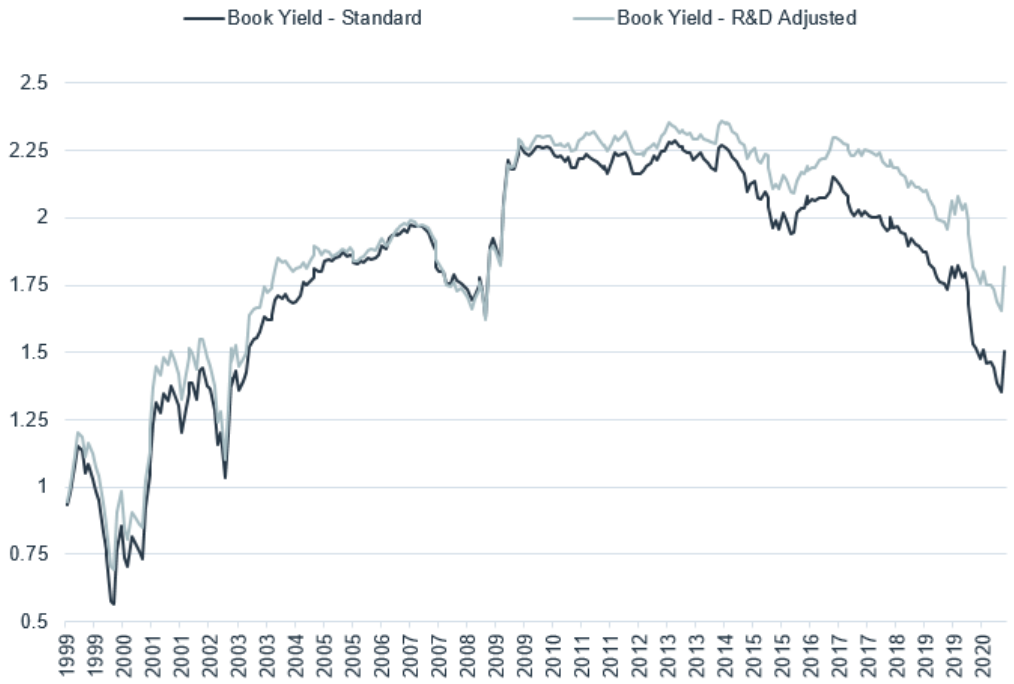


Exhibit 3: Operating Cash Flow Yield, Top Vs Bottom Quintile Cumulative Performance, MSCI US.

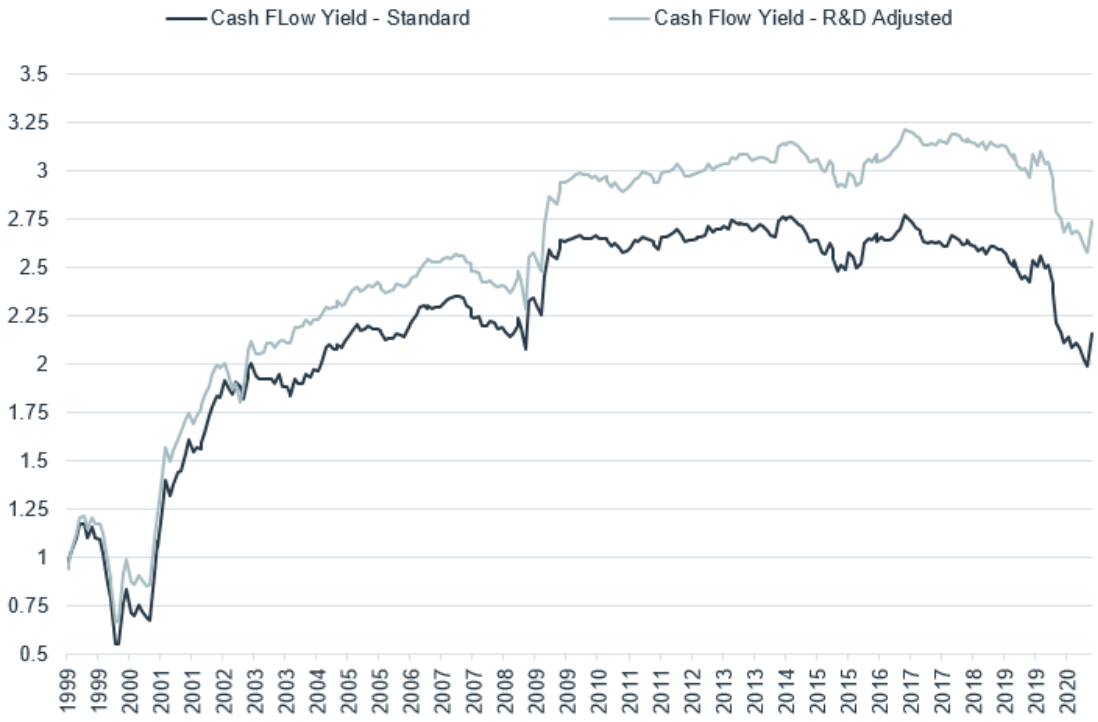
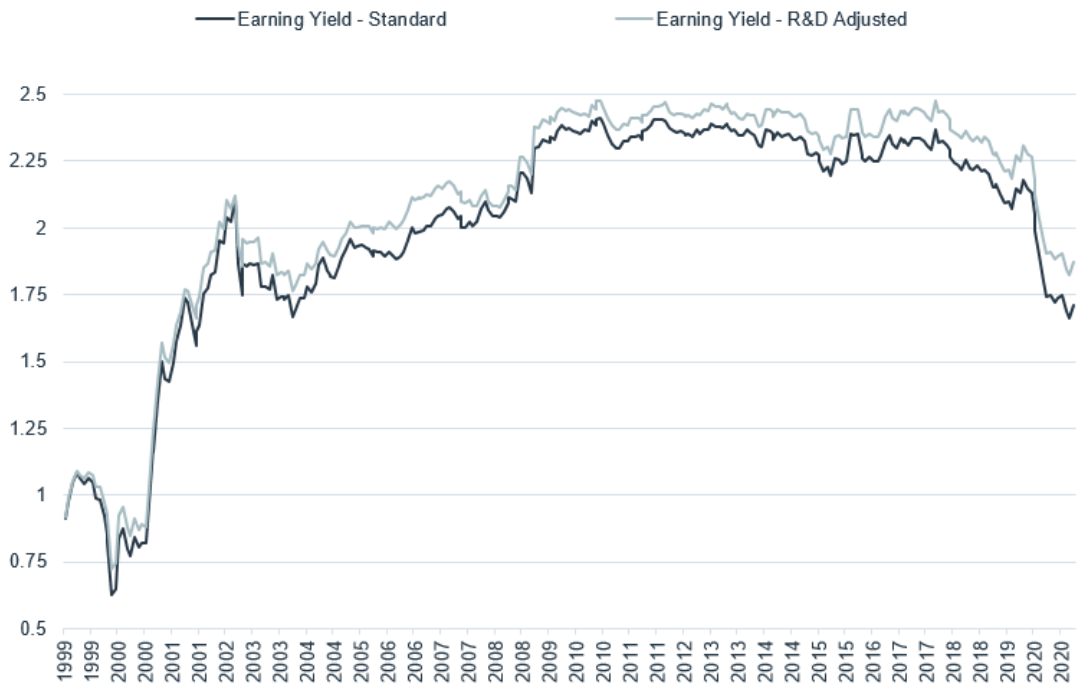


Exhibit 4 - Earning Yield, Top Vs Bottom Quintile Cumulative Performance, MSCI US



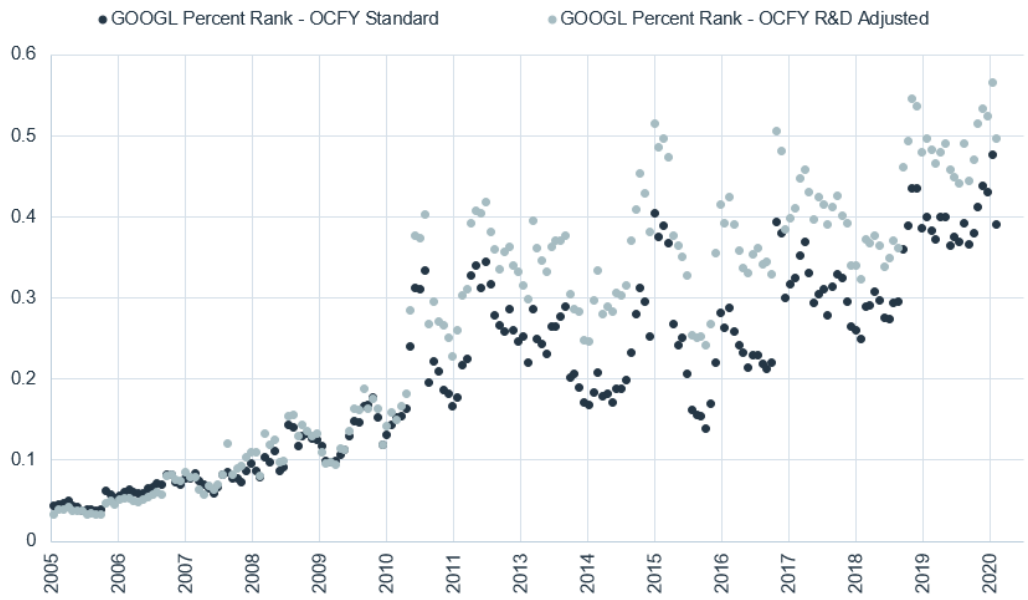
R&D Adjusted factors have been overperforming standard value factors over the past 20 years. The cumulative return gap has been increasing since 2009, coinciding with the start of Growth stocks outperformance vs Value stocks. Even though the long-short returns of value factors still don't appear attractive for the 2009-2020 period, we observe that building value ratios from capitalized R&D statements improves stock forward return predictions. It helps mitigate the pain when this family of factors is out of favour, without negative impact during period of Value outperformance (before GFC).

We believe that the difference in performance can be mainly explained by the reduction of two biases implicitly impacting the construction of value portfolios:

- **Reduced negative valuation bias toward research driven companies**

As an example, we compare the time series of Operating Cash Flow Yield cross-sectional percentile ranks of a typical high R&D-spending companies: Alphabet. While the accounting rule didn't significantly impact the ranking of the company until 2010, we can observe a clear pattern since then: Alphabet's valuation cross-sectional ranks is higher when R&D are capitalized rather than expensed.

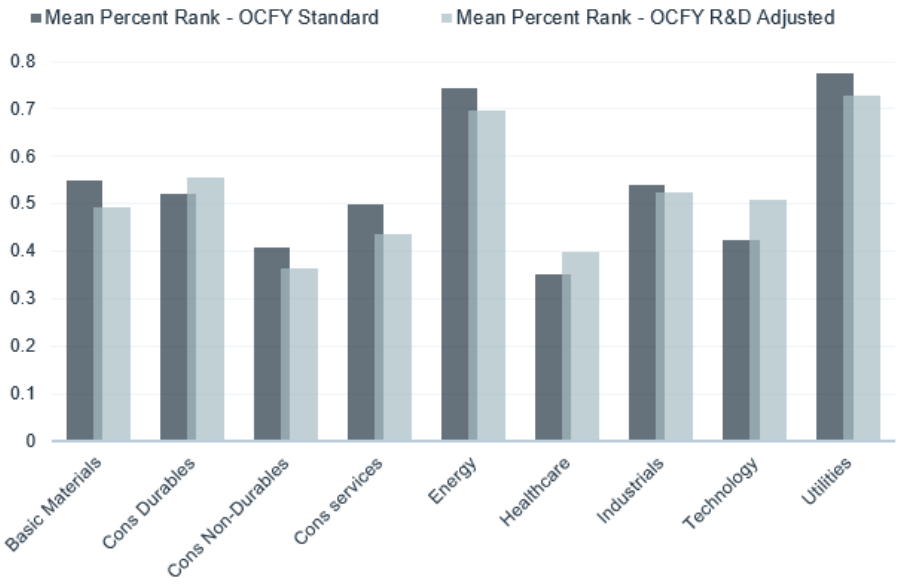
Exhibit 5: Operating Cash Flow Yield, GOOGL US Percentile Rank



- **Reduced Sector Valuation Bias**

At sector level, we observe a reduced average valuation spread between R&D intensive sectors (Technology, Healthcare, …) and non-R&D intensive sectors (Materials, Utilities Services, ...), relying almost exclusively on tangible assets. The standard deviation of cross-sectional percentile ranks' sector averages is reduced from 14% to 12%.

Exhibit 6: Operating Cash Flow Yield, Sector Mean Percentile Rank, MSCI US, 1999-2020



BIBLIOGRAPHY

[1] Lev, Baruch Itamar, Intangibles (July 23, 2018). Available at SSRN: https://ssrn.com/abstract=3218586 or http://dx.doi.org/10.2139/ssrn.3218586

[2] Financial Accounting Standards Board, Accounting for Research and Development Costs, October 1974

[3] Peters, Ryan H. and Taylor, Lucian A., Intangible Capital and the Investment-q Relation (February 21, 2016). Journal of Financial Economics (JFE), Forthcoming, Available at SSRN: https://ssrn.com/abstract=2405231 or http://dx.doi.org/10.2139/ssrn.2405231

[4] Lev, Baruch Itamar and Sarath, Bharat Sarrukai and Sougiannis, Theodore, R&D Reporting Biases and their Consequences. Contemporary Accounting Research, Vol. 22, No. 4, Winter 2005, Available at SSRN: https://ssrn.com/abstract=795605[5] Lev, Baruch Itamar and Srivastava, Anup, Explaining the Recent Failure of Value Investing (October 25, 2019). NYU Stern School of Business, Available at SSRN: https://ssrn.com/abstract=3442539 or http://dx.doi.org/10.2139/ssrn.3442539

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