Capital markets, risk tolerance, and investment horizons

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Questions I will address

- Is there evidence of corporate short termism?
  - The evidence is mixed as short termism can be hard to document from outside the firm
  - Measurement matters

- Do I believe corporate short termism exists?
  - Qualified yes
  - Easier to show in micro data

- Is short termism a possible explanation for declining public company participation in research?
  - Perhaps yes
Survey test: Evidence of myopic decision making

Hypothetical scenario: Your company’s cost of capital is 12%. Near the end of the quarter, a new opportunity arises that offers a 16% internal rate of return and the same risk as the firm. The analyst consensus EPS estimate is $1.90. What is the probability that your company will pursue this project in each of the following scenarios?

<table>
<thead>
<tr>
<th>Actual EPS if you do not pursue the project</th>
<th>Actual EPS if you pursue the project</th>
<th>The probability that the project will be pursued in this scenario is … (check one box per row)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2.00</td>
<td>$1.90</td>
<td>0% 20% 40% 60% 80% 100%</td>
</tr>
<tr>
<td>$1.90</td>
<td>$1.80</td>
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<td>$1.80</td>
<td>$1.70</td>
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<tr>
<td>$1.40</td>
<td>$1.30</td>
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</tbody>
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Survey test: Myopic decision results

If you take project, you will exactly hit consensus earnings

If you take project, you will miss consensus earnings by $0.10

If you take project, you will miss consensus earnings by $0.20

If you take project, you will miss consensus earnings by $0.50

Probability of accepting valuable project

Less likely to take the project if firm is in the technology industry or gives significant earnings guidance
Replication in 2015: 40% will take inferior NPV “myopic” project

Suppose your firm is considering two projects A and B

- A and B are very similar in that they require the same capital up front, have the same expected life, and have the same probability of failure
- A is more valuable than project B (A has greater NPV)
- A generates negative cash flows for the first two years, while B has positive cash flows in all years
- Assuming all cash flow forecasts are equally accurate, does your firm’s culture make it more likely that project A or B will be chosen?

59% said project A

40% said project B

Source: Corporate Culture: Evidence from the Field, Graham, Harvey, Popadak and Rajgopal, NBER Working Paper No. 23255
Commonly used metrics of myopia can be misleading

- We expect firms that display myopic tendencies to perform worse in the long run.
- However, the usual measures of myopia constructed from public accounting data, and relied on by consulting firms and smart beta funds, are questionable:
  - Earnings quality: usually difference between operating cash flows and net income, known as accruals.
  - Not all accruals represent fudged earnings, accruals mostly anticipate future cash flows (e.g., pension expenses).
- Earnings growth v/s EPS growth: picks up stock repurchases - are all stock repurchases myopic?
- Underinvestment, often used as a myopia metric, is also hard to measure.
  - Capital expenditure/depreciation < 1 is the usual measure of underinvestment.
  - A low ratio is consistent with many interpretations: outsourcing, more efficient operations, or simply taking a breather from overinvestment in earlier years.
- Unless we get the measurement right, the debate will not be backed by good evidence.
Measurement issues re: the Arora et al paper

• I am willing to buy the result that corporate participation in publishing has fallen
  • 3% decline per decade. Is that big? What does that mean? Why the same trend for Europe?
  • Like much else, does it reflect the relative rise of China compared to the U.S.
  • Did monopolies break up (Bell Labs) and were hence unable to fund “basic” research?
• I am a bit skeptical about the market value per publication analyses
  • How do we validate the claim that value/pub fell from $15 million to $5.7 million?
  • Internal software now a bigger component of R&D but may not result in a publication
  • Internet era acquisitions designed to buy human capital and customers, not publications
  • 1998-2000, the tech bubble, characterized by over payment for targets
  • The nature of acquisitions and patenting in the 2000s is quite different from before
  • Inferring the market value of a firm’s publication stock or patent stock is fraught with econometric challenges (market value and publication stock are simultaneously determined, omitted variables, publication stock *time correlated with firm size*time, collinearity etc.)
• Suggest a deep dive into the top 50 sample firms over time to get some granularity
One way to validate the $5.7 mill/per pub result: Acquisition value of IPR&D

In January 2016, Merck acquired IOmet, a privately held UK-based drug discovery company focused on the development of innovative medicines for the treatment of cancer, with a particular emphasis on the fields of cancer immunotherapy and cancer metabolism. The acquisition provides Merck with IOmet’s preclinical pipeline of IDO (indoleamine-2,3-dioxygenase 1), TDO (tryptophan-2,3-dioxygenase), and dual-acting IDO/TDO inhibitors. The transaction was accounted for as an acquisition of a business. Total purchase consideration in the transaction included a cash payment of $150 million and future additional milestone payments of up to $250 million that are contingent upon certain clinical and regulatory milestones being achieved. The Company determined the fair value of the contingent consideration was $94 million at the acquisition date utilizing a probability-weighted estimated cash flow stream adjusted for the expected timing of each payment utilizing a discount rate of 10.5%. Merck recognized intangible assets for IPR&D of $155 million and net deferred tax assets of $32 million. The excess of the consideration transferred over the fair value of net assets acquired of $57 million was recorded as goodwill that was allocated to the Pharmaceutical segment and is not deductible for tax purposes. The fair values of the identifiable intangible assets related to IPR&D were determined using an income approach. The assets’ probability-adjusted future net cash flows were then discounted to present value also using a discount rate of 10.5%. Actual cash flows are likely to be different than those assumed.

Selected Joint Venture and Affiliate Information

Sanofi Pasteur MSD

On December 31, 2016, Merck and Sanofi terminated the equally-owned joint venture formed in 1994 to develop and market vaccines in Europe (see Note 8 to the consolidated financial statements).

Also, what about JVs?
Do I believe short termism exists?

- Qualified yes but can be hard to show with large sample data
  - Look at climate change and public sector pension deficits
  - The average CFO’s tenure is 4-5 years now and the CEO’s is about 6 years
- Micro level examples of short termism abound
  - Systematic overstatement of useful lives of company assets
  - Underinvesting in maintenance capex required to keep up with competition
  - Growing reliance on non-GAAP metrics to spin poor GAAP based performance
  - Overpaying for acquisitions because compensation plans reward growth without considering value added
  - Systematic attempts to hide debt in off-balance sheet transactions
  - Assuming pension plan assets will earn rosier returns than considered feasible
  - Not de-risking pension plans when they are over funded
  - Corporate actuaries used mortality tables of 2000 till 2014 to lower projected pension/health care liabilities
  - Projecting health care costs to go up by 5% in steady state although that’s never happened in recent history