VALUATION INSIGHT
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Zombie Biotechs: Contributing to the High Cost of Capital in the Industry

INSIGHT: Clinical setbacks can cause biotech firms to trade below cash balances. Although rational, this inefficient use of invested funds contributes to the industry's high cost of capital.

Clinical Issues Can Cause a Firm's Equity Value to Fall Below Its Cash Balance

Bringing a new therapy to market requires substantial R&D investment, often totaling hundreds of millions of dollars over years of research and clinical trials. Consequently, biotechnology firms typically raise substantial equity capital early in the development process. It is not uncommon for firms with promising therapies to initiate public offerings while their primary candidate product is still in early-stage trials.

Approximately 90% of therapies fail to advance from Phase I trials through final FDA approval. Given the binary nature of clinical success, program failure typically results in substantial decreases in a firm's equity market capitalization.

Since capital is generally raised to fund a long development horizon, many biotechnology firms that suffer major program failure continue to maintain substantial cash balances. For certain of these firms, particularly ones with undiversified pipelines, we have observed that ***clinical failure can drive a biotechnology firm's equity value below its debt-adjusted cash balance.***

The table below lists examples of biotechnology firms that are trading below their debt-adjusted cash balances after suffering a major clinical setback ("Zombie Biotechs"). The equity values of these firms have decreased to such an extent that they now imply negative enterprise values.

What Does Negative Enterprise Value Indicate?

Enterprise value measures the value of a firm's core business operations to debt and equity investors. For a publicly-traded firm, ***negative enterprise value indicates that the market does not attribute any value to the company's business or net assets.*** Moreover, since most biotechnology firms have no debt, for firms with substantial cash balances, negative enterprise value indicates that ***the firm's equity is not even worth the cash on the books***. Theoretically, a dollar of cash should result in a dollar of equity value. However, the market values of these Zombie Biotechs challenge this notion.

Even though a Zombie Biotech's pipeline may have no risk-adjusted value, firms could use current cash balances to: acquire/invest in other programs or technologies or distribute excess cash to shareholders.

Why does it appear that the market is not recognizing these options? Is the market systematically undervaluing these Zombie

Zombie Biotechs: Cash Balance Exceeds Equity Market Capitalization [1]

Company	Equity Mkt Cap	Net Cash & Invest [2]	Δ	Description of Clinical Setback or Failure
Adverum Biotechnologies	$122.2	$209.5	($87.3)	Phase II b clinical trial of AVA-101 abandoned
Chiasma	36.5	83.3	(46.8)	Phase III trials of Mycapssa fail to elicit FDA approval
Endocyte	70.9	127.6	(56.7)	Phase III trials of Vintafolide terminated following safety analysis
Inotek Pharmaceuticals	51.3	62.6	(11.3)	Phase III of trabodenoson failed to meet its primary endpoint
Mirna Therapeutics	32.3	57.5	(25.2)	Phase I study of MRX34 stopped following adverse events
Nivalis Therapeutics	36.2	52.7	(16.5)	Phase II trial of cavosonstat failed to meet its primary endpoint
Proteon Therapeutics	24.3	34.1	(9.8)	Phase III trial of vonapanitase failed to meet its primary endpoint
Sierra Oncology	61.2	125.0	(63.8)	Phase II trials for PNT2258 discontinued following poor results

Implied Enterprise Value

[1] Data is as of June 22, 2017. None of these firms have preferred equity or minority interests. All amounts presented are in millions of USD.

[2] Interest-bearing debt has been deducted from total cash and investments. Only Chiasma ($1.7M) and Inotek ($52.1M) have interest-bearing debt.

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Biotechs and the potential uses of their cash balances, or are there explanations for this unusual circumstance?

Explanations for Cash Balances Exceeding Equity Market Capitalizations

Even assuming that a firm's R&D and clinical programs have no risk-adjusted value, if a firm's cash balance (net of liabilities) exceeds its equity value, rational investors would force a liquidation of the firm and a distribution of excess cash. Despite this apparent arbitrage opportunity, there are several explanations for why Zombie Biotechs continue to operate.

Minority Shareholders Cannot Force Strategy Changes or Liquidity: A net cash balance in excess of equity market capitalization reflects the inability of minority shareholders to force a liquidation, cash distribution, or strategy pivot. The publicly traded share prices likely reflect a discount for this lack of control. Furthermore, after a clinical failure, managers of Zombie Biotechs are often not incentivized to maximize shareholder value, which may mean the termination of their current research. Unless a Zombie Biotech can generate a new direction with substantial potential value (or distribute cash), the minority shareholders are forced to accept that the value of their investment will likely be lost.

Clinical Failure Inhibits Future Financing: Biotechnology firms often need to raise additional capital due to the high cost of commercializing a therapy. Major clinical setbacks hinder future financing efforts, which will often preclude additional research or trials. In our view, the negative implied enterprise values of Zombie Biotechs in part reflect this issue. Some firms have rebranded themselves to escape the stigma associated with prior clinical issues.

Limited IP Value: Negative enterprise value implies that the firm's in-process R&D, patents and other intellectual property have no value above liabilities. This can be a reasonable conclusion in light of high clinical failure rates. Furthermore, in our experience, it can prove difficult to separate IP covering early-stage therapies from the firm's researchers.

High Cash Burn and Off-Balance-Sheet Liabilities: Despite cutting costs after suffering program failure, Zombie Biotechs often continue to spend millions of dollars per quarter on research, trials, and other expenses. Firms are often contractually committed to future expenses, even after they have suffered major clinical setbacks. These contractual commitments are effectively "off-balance-sheet" liabilities, which offset the firm's cash balance. In addition, the firm's equity value may also reflect contingent liabilities not recognized on the balance sheet. For example, we have seen firms that have experienced clinical issues found liable for misrepresenting their products' prospects to shareholders or for causing unexpected harm to trial enrollees.

High Shutdown Costs: Trading below debt-adjusted cash value can also be due in part to high shutdown costs. It can cost millions for a publicly traded biotechnology firm to undergo bankruptcy proceedings and complete a liquidation. In addition to taking many months to complete, bankruptcies also often reveal unrecognized liabilities or other commitments such as those discussed above.

A Cycle of Inefficient Use of Investor Funds Contributes to the Industry's High Cost of Capital

In our view, if a biotechnology firm's current pipeline and IP have no risk-adjusted value, the firm should either: return capital to its shareholders; or invest in other programs and technologies that have the potential to earn investors' required rates of return.

Zombie Biotechs that fail to use their substantial cash balances for either of these purposes are tying up capital that could otherwise support future innovation. Their inaction constitutes an inefficient use of investor capital that has ramifications for the entire industry.

Specifically, such inefficiencies contribute to the industry's high cost of capital, which typically ranges from 20% to 50%. As previously discussed, this situation is precipitated by the combination of accelerated equity financing and high failure rates.

Pressing Zombie Biotechs to either liquidate or invest in new programs would benefit the industry by promoting the efficient use of investor funds and lowering the cost of capital. This would free up financing for new therapies and ultimately benefit all market participants—researchers, firms, investors, and patients.

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