Weighted Average Cost of Capital (WACC): Explanation and Examples

Weighted average cost of capital (WACC) is the weighted average of the costs of all external funding sources for a company.

WACC plays a key role in our economic earnings calculation. It is hard to be 100% certain about the exact cost of a company's capital. Our guiding principle when calculating WACC is that it is better to be vaguely right than precisely wrong. We make sure that WACCs are reasonable first and employ many rules to normalize the inputs to WACC to ensure none of them cause an abnormal WACC to occur in any of our models.

The formula for WACC is in Figure 1. For more on WACC, see here.

Figure 1: How To Calculate WACC

(Ke) * (E/TC) + (Kd * (1-T)) * (D/TC) + Kp * (P/TC)

where:

Ke	=	Cost of Equity
E	=	Total Equity
Kd	=	Cost of Debt
D	=	Total Debt
Kp	=	Cost of Preferred
P	=	Preferred Capital
E/TC	=	Equity Total Adjusted Market Cap Ratio
D/TC	=	Debt to Total Adjusted Market Capital Ratio
P/TC	=	Preferred Stock to Total Adjusted Market Capital Ratio
T	=	Tax Rate

Sources: New Constructs, LLC and company filings

The primary drivers of WACC are the cost of equity and cost of debt. More details on how we calculate each of these is below:

Cost of Equity

- Based on the capital asset pricing model (CAPM).
- We use the market value of equity when calculating all total adjusted market capital ratios.
- The equity risk premium is the average of the current implied equity risk premium and the historical implied equity risk premium.
- For beta, we use industry and sector averages, which we calculate based on daily prices over the past five years. We are careful to normalize beta to avoid it having undue influence on the cost of equity.

Cost of Debt

- Risk-free-rate is approximated by the 30-year Treasury bond. If the 30-year is not available the 20-year rate is used.
- We add the debt spread associated with the debt rating on the company's long-term debt to the risk-free-rate.
- The resulting pre-tax cost of debt is then multiplied by (1- marginal tax rate).
- We use debt ratings from Moody's or S&P.

If a company fails to generate a return on invested capital (ROIC) greater than its WACC, it is destroying shareholder value. Figure 2 shows which companies have the highest and lowest WACCs.

Figure 2: Companies With Highest/Lowest WACC

Ticker	Name	WACC
Highest Weighted Average Cost of Capital		
ARDM	Aradigm Corporation	12.7%
NBIX	Neurocrine Biosciences	12.2%
CLDX	Celldex Therapeutics	11.8%
ETSY	Etsy, Inc.	11.8%
HALO	Halozyme Therapeutics	11.7%
Lowest Weighted Average Cost of Capital		
GAS	AGL Resources	4.3%
ED	Consolidated Edison	4.2%
DRYS	Dryships Inc.	4.2%
DUK	Duke Energy Corp	4.1%
POM	Pepco Holdings	4.0%

Sources: New Constructs, LLC and company filings. Only includes companies with positive NOPAT

Aradigm Corporation (ARDM) has the highest WACC of 3000+ companies under coverage. See ARDM's historical WACC dating back to 1998 in our model here. The company has never earned a ROIC greater than WACC in any year of our model. As such, the company has generated negative economic earnings each year as well. WACCs affect on ARDM's economic earnings can be seen in our reconciliation of GAAP net income to economic earnings here.

Neurocrine Biosciences (NBIX), Celldex Therapeutics (CLDX), Etsy (ETSY) and Halozyme Therapeutics (HALO) rank two through five in highest weighted average cost of capital.

Pepco Holdings (POM) has the lowest WACC of all companies under coverage. See POM's historical WACC dating back to 1998 here. Over the past decade, Pepco's ROIC has stagnated around a bottom quintile 3%. The last time Pepco earned a ROIC greater than WACC was 2001. AGL Resources (GAS), Consolidated Edison (ED), Dryships (DRYS), and Duke Energy (DUK) round out the list of lowest WACC across all companies under coverage. WACC's affect on ED's economic earnings can be seen here.

Our models and calculations are 100% transparent because we want our clients to know how much work we do to ensure we give them the best earnings quality and valuation models in the business.

Disclosure: David Trainer and Kyle Guske II receive no compensation to write about any specific stock, sector, style, or theme.

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How New Constructs Creates Value for Clients

We find it. You benefit. Cutting-edge technology enables us to scale our forensics accounting expertise across 3000+ stocks. We shine a light in the dark corners of SEC filings so our clients can make safer, more informed decisions.

Our stock rating methodology instantly informs you of the quality of the business and the fairness of the stock's valuation. We do the diligence on earnings quality and valuation so you don't have to.

In-depth risk/reward analysis underpins our ratings. Our rating methodology grades every stock, ETF, and mutual fund according to what we believe are the 5 most important criteria for assessing the quality of an equity. Each grade reflects the balance of potential risk and reward of buying that equity. Our analysis results in the 5 ratings described below. Very Attractive and Attractive correspond to a "Buy" rating, Very Dangerous and Dangerous correspond to a "Sell" rating, while Neutral corresponds to a "Hold" rating.

QUESTION: Why shouldn't fund research be as good as stock research? Why should fund investors rely on backward-looking price trends?

ANSWER: They should not.

Don't judge a fund by its cover. Take a look inside at its holdings and understand the quality of earnings and valuation of the stocks it holds. We enable you to choose the best fund based on its stock-picking merits so you do not have to rely solely on backward-looking technical metrics.

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Our Philosophy About Research

Accounting data is not designed for equity investors, but for debt investors. Accounting data must be translated into economic earnings to understand the profitability and valuation relevant to equity investors. Respected investors (e.g. Adam Smith, Warren Buffett and Ben Graham) have repeatedly emphasized that accounting results should not be used to value stocks. Economic earnings are what matter because they are:

1. Based on the complete set of financial information available.
2. Standard for all companies.
3. A more accurate representation of the true underlying cash flows of the business.

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