AMERICAN BANKRUPTCY INSTITUTE
JOURNAL
The Essential Resource for Today's Busy Insolvency Professional

Value & Cents

By Dr. Israel Shaked and Brad Orelowitz

Dr. Israel Shaked
The Michel-Shaked Group; Boston

Brad Orelowitz
The Michel-Shaked Group; Boston

Dr. Israel Shaked is managing director of The Michel-Shaked Group and a professor of finance and economics at Boston University's Questrom School of Business. He also served for 20 years as a coordinating editor for the ABI Journal *and co-authored ABI's* A Practical Guide to Bankruptcy Valuation, Second Edition. *Brad Orelowitz, CPA is a senior vice president in the same office.*

Demystifying a Company's Systematic Risk

Since the pandemic, the public has become familiar with the Greek letters alpha, delta and omicron. However, given the critical role that "beta" plays in the world of bankruptcy, it is shocking how little is known about it. In virtually every bankruptcy assignment we have worked on, the size of beta was highly contested, including our recent work on Neiman Marcus, J. Crew, Tailored Brands and Chesapeake Energy. The best way to explain the role of beta is by reverse-engineering the valuation process. This valuation process takes place in numerous bankruptcy contexts such as fraudulent conveyance, preferences and valuation hearings.

If the discounted-cash-flow (DCF) valuation methodology is applied, there is a need to calculate the present value of the projected cash flows. For that, one needs to calculate the discount rate. The components of the discount rate include the cost of debt and cost of equity. For the cost of equity derivation, we often apply the Capital Asset Pricing Model, and one of its components is beta. The higher the beta, the higher the discount rate and, consequently, the lower the enterprise value as determined by the DCF.

Beta measures the historical volatility of a company's stock price relative to the volatility of the overall market. It is often mistaken as a measure of a company's total risk. Instead, beta represents only the systematic risk of a company and not its total risk. This article attempts to demystify this Greek letter and explains it in plain English.

A beta of one indicates that the company exhibits, on average, the same volatility as the overall market. A beta greater than one generally indicates that the company is more volatile in comparison to the market. For example, a beta of 1.1 indicates, on average, that the stock price of a company is expected to rise by 1.1 percent for every 1 percent rise in the overall market, and fall by 1.1 percent when the market falls by 1 percent. On the other hand, a beta of less than one indicates that an increase or decline of 1 percent by the market is expected to be associated with a less than 1 percent change in the stock price.

Calculation of Beta

While the standard deviation measures the total risk of a security, the beta is a measure of a security's systematic risk. It provides a measure of a security's risk relative to the market as a whole (often represented by the S&P 500). Financial scholars have noted that some stocks are more sensitive to general market movements — both up and down — than others. By applying a statistical technique called a "regression analysis" to past rates of return on an individual stock versus rates of return on the market as a whole, we are able to derive a single number (beta) that describes the volatility of that stock relative or the overall market.

Exhibit 1 demonstrates the application of regression analysis to the return of a particular stock relative to the return on the market. Although generally scattered, we can see that the points in Exhibit 1 (the return of the stock relative to the market for a number of periods) tend to move in the same general direction as market returns. As the return on the market increases, so does the return on the stock. The line in Exhibit 1 is determined through regression analysis, and it represents the "best fit" of a straight line through the scattered data points. The slope of the line (the "rise over the run") is the stock's beta. In this particular case, the slope of the line is 0.9, which implies that, in general, the historical return on the stock typically increases and decreases at a slightly lower rate than the market return.

The betas of a number of well-known company stocks are shown in Exhibit 2. Applying this reasoning to Goldman Sachs stock, whose beta is 1.42, we would expect that a 5 percent decline in the overall market would result in a 7.1 percent decline in Goldman Sachs' market price (*5% x 1.42 = 7.1%*). Obviously, the same relative volatility also works when the market goes up rather than down. Some stocks, albeit very few, have negative betas, meaning that they move in the opposite direction to the overall market and are seen as a hedge against the market. For example, a stock with a beta of -1.0 would be expected to move in the opposite direction to the market, and to the same degree. Thus, if the market rose 10 percent, a security with a beta of -1.0 would be expected to drop by 10 percent.

Exhibit 2: Select Fortune 500 Company Betas

Company	Beta	Industry
Boeing Company	2.75	Aerospace and Defense
Simon Property Group Inc.	2.31	Equity Real Estate Investment Trusts (REITs)
American Airlines Group Inc.	2.27	Airlines
Tesla Inc.	1.96	Automobiles
Ford Motor Company	1.57	Automobiles
D.R. Horton Inc.	1.50	Household Durables
Marathon Oil Corp.	1.43	Oil, Gas and Consumable Fuels
Goldman Sachs Group Inc.	1.42	Capital Markets
Bank of America Corp.	1.32	Banks
Las Vegas Sands Corp.	1.19	Hotels Restaurants and Leisure
Dow Inc.	1.16	Chemicals
Qualcomm Inc.	1.12	Semiconductors and Semiconductor Equipment
Coca-Cola Company	1.01	Beverages
Apple Inc.	1.00	Technology Hardware Storage and Peripherals
CVS Health Corp.	0.97	Health Care Providers and Services
Alphabet Inc. Class A	0.88	Interactive Media and Services
Microsoft Corp.	0.83	Software
Pfizer Inc.	0.57	Pharmaceuticals
Amazon.com Inc.	0.55	Internet and Direct Marketing Retail
Netflix, Inc.	0.52	Entertainment
Verizon Communications Inc.	0.38	Diversified Telecommunication Services
Walmart Inc.	0.33	Food and Staples Retailing
General Mills Inc.	0.19	Food Products
Clorox Company	0.03	Household Products
Moderna Inc.	-0.41	Biotechnology

Source: FactSet. For illustrative purposes, this data includes two-year weekly betas as of Nov. 29, 2021.

A recent example of a negative beta stock is Moderna. Its current two-year weekly beta is -0.4, which is not surprising, as Moderna stock was rising as it conducted trials on its vaccine in March 2020 while the overall stock market dropped 35 percent.

Common Mistake

A common mistake is confusing total risk (standard deviation) with systematic risk (beta). A company might be risky, and its market returns might be highly volatile. However, if these returns are not correlated with the market, its beta might be low. For example, gold miners have high total risk (as measured by the standard deviation of their returns), but very low market risk — even a hedge against market risk.

Beta represents operational risk or business risk. This risk cannot be diversified away, as it relates to the operation of the business and the nature of its products and/or services. Beta is also affected by a company's specific capital structure. All else being equal, debt financing results in more risk for equityholders. This risk causes stock price volatility and, thus, a higher beta.

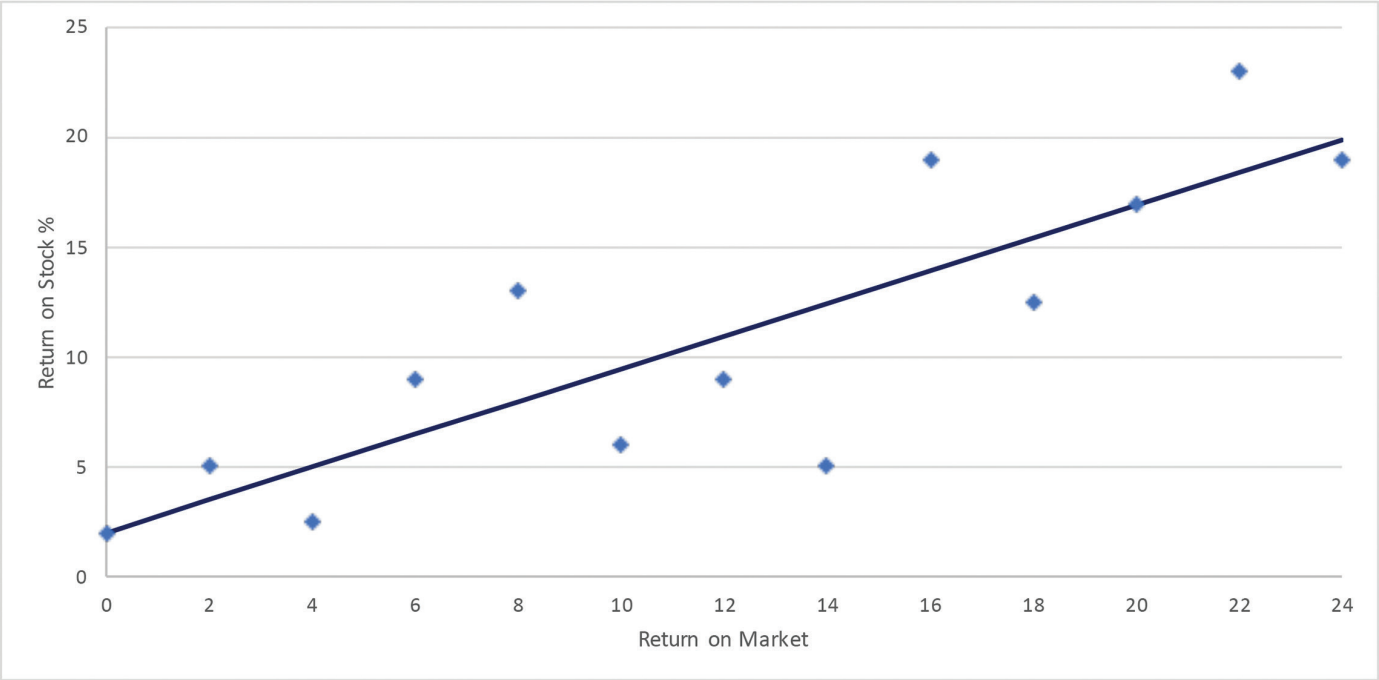
Cases Where the Calculation of Beta Requires Extra Attention

In certain cases, it is not possible or meaningful to simply run a regression to calculate beta. The following list discusses examples of some of the more common reasons.

Privately Held Firms

As privately held firms do not have stock that trades on public markets, their betas cannot be directly calculated. Therefore, a common way to determine a beta for a privately owned company is to use the betas of publicly traded peer companies. Typically, the peer group used

Exhibit 1: The Regression Line



in this analysis is the same as the peer group one would use in applying a comparable publicly traded multiple-valuation approach. However, there are several reasons why these lists may differ. For example, if one of the peer group companies recently filed its initial public offering (IPO), it might not have sufficient trading information to calculate its own beta.

The beta for a comparable publicly traded company (whether downloaded from sources such as Bloomberg, or calculated) typically reflects the capital structure of that comparable company, as well as its tax rate. All else being equal, debt financing results in more risk for equityholders. As previously discussed, this risk causes stock price volatility and, thus, a higher beta. Therefore, when using comparable company betas as proxies, the differences in debt financing (and tax rate) must be accounted for by "unlevering" the proxies' betas according to each comparable company's capital structure and tax rate, then "relevering" using the subject company's own capital structure and tax rate, its target capital structure, or its industry's capital structure, depending on case specifics. An unlevered beta, or asset beta, represents the risk of the company if it were financed entirely with equity.

In some situations where a company's characteristics are truly unique, no single company, or group of companies, may be deemed comparable to the subject company. Therefore, we instead rely on industry betas. A common source for these industry betas is the database maintained by Prof. Aswath Damodaran of NYU's Stern School of Business. Once again, these industry betas should be unlevered to eliminate the financial risk of the industry, and relevered with the target capital structure of the subject company. In order to determine an appropriate target capital structure, depending on case specifics one may use the capital structures of the subject company's peer companies or an industry capital structure.

Recent IPOs

The downloaded or calculated beta of a company that recently went public might not be meaningful. Beta is typically calculated using monthly rates of return over five years, or weekly rates of return over two years. In certain situations, beta might be calculated over one year. However, for recent IPOs, there might not be sufficient data points on which to calculate beta. To overcome this lack of data, beta might be calculated in the same way we calculate it for privately held companies: by using comparable companies, or industry betas.

For example, electric vehicle manufacturer Rivian Automotive went public on Nov. 10, 2021, in a much-anticipated listing. At the time of this writing (late December 2021), the company had a little over one month of trading data. This is insufficient to calculate a historical beta, because the number of observations (data points) is too small to obtain a statistically significant beta estimate.

Corporate Divisions

We are often requested to value divisions or subsidiaries of publicly traded companies. These entities do not have publicly traded stock. In fact, they might not even be in the same line of business as their holding companies. For example, consider the many subsidiaries or divisions of Berkshire Hathaway. Its subsidiaries include apparel and clothing (Brooks Sports and Fruit of the Loom), chemicals (Lubrizol), energy distribution (PacifiCorp), food and beverage (Dairy Queen), insurance companies (GEICO and General Re), railroads and logistics (BNSF Railway and McLane), materials and construction (Benjamin Moore), and sports equipment (Russell Brands), to name just a few.

In addition, Berkshire Hathaway owns significant investments in the securities of dozens of publicly traded companies, including Apple, Bank of America, Coca-Cola and American Express. Therefore, the beta of Berkshire Hathaway, which was approximately 0.8 at the time of this writing, is that of a conglomerate and would be incorrect to use for the valuation of its insurance subsidiaries (where the typical beta in the industry is around 1.0) or its chemical subsidiaries (where the typical beta in the industry is around 1.2). Furthermore, divisions might have totally different capital structures, costs of capital and tax rates than its holding companies.

In the bankruptcy of J. Crew, we were asked to value its high-growth subsidiary, Madewell. However, Madewell was not publicly traded. In this case, we used the median unlevered beta of Madewell's comparable companies to determine its beta (once we verified that the median was the appropriate measure to apply).

Highly Distressed Companies

The betas of highly distressed companies entering bankruptcy might not be meaningful, because the results of the regression analysis do not reflect the company's true (non-distressed) beta. Specifically, the rates of return of highly distressed companies are often negative for a certain period. For example, if the stock market index increased over the same time period, the regression will show a very low, or even negative, beta, implying that the company is a good "market hedge." However, it is clear that this beta should not be relied on.

One option is to calculate the company's beta for the pre-distress period. Moreover, if the purpose of the valuation is to determine the value of the company post-emergence, with a different level of debt and capital structure, then it would be incorrect to blindly use the company's own beta prior to its bankruptcy filing. One could unlever the company's historical beta (from before the distress period), then relever it using the updated capital structure or target capital structure.

Drastic Change in Capital Structure

A company that undergoes a significant change in its capital structure will have a beta that is no longer meaningful. For example, following a leveraged buyout (LBO), a company's debt-to-equity ratio would increase significantly. We were retained to value the target company in an LBO where the company's debt-to-equity ratio was 1:10 prior to the LBO and increased to 10:1 post-LBO. In this case, the company's historical beta should be unlevered using its pre-LBO capital structure and relevered using its expected post-LBO capital structure, as the cash flows we apply the discount rate to are expected future post-LBO cash flows.

Shocks to the Economy/Industry

In March and April 2020, there was abnormal stock market activity as a result of COVID-19. As discussed in a recent *ABI Journal* article,[1] due to the ongoing COVID-19 pandemic and the extreme market volatility associated with it, betas of companies and their peers at this time did not properly represent the typical volatility under otherwise normal market conditions. Therefore, in that situation it was important to use a normalized beta, either from before the pandemic or adjusted for the extreme volatility that occurred at the start of the pandemic in March and April 2020.

Conclusion

Most corporate bankruptcy procedures and litigations involve disputes as to the value of the entities in the estate. In the majority of these cases, the DCF valuation methodology is applied. In this valuation methodology, the cost of capital is a key input into the valuation framework. The beta is an important parameter in determining the cost of equity, which is part of the cost of capital.

Although the process of calculating beta is relatively well-defined, there are several situations where special attention should be given to the derivation of the beta. This article discussed six of these special situations, but based on case specifics, other situations can also create conditions that necessitate careful handling of the derivation of beta. abi

Reprinted with permission from the ABI Journal, Vol. XLI, No. 2, February 2022.

1 Dr. Israel Shaked, Brad Orelowitz & Paul Dionne, "The Cost-of-Capital Dilemma: Valuation During Abnormal Market Conditions," XL *ABI Journal* 4, 20-21, 76-77, April 2021, *available at* abi.org/abi-journal.