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Capital Structure Arbitrage

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Capital structure arbitrage[1] is one of many strategies used by distressed-debt investors within the context of a firm's bankruptcy.[2] The strategy is premised on the assumption that the market prices of equity, debt and credit default swaps (CDSs) can temporally diverge from their relative value in equilibrium due to the different types and strategies of investors active in the market, as well as differences in investor expectations regarding the performance of an investee company.[3] The objective of capital structure arbitrage is to profit by exploiting the misinformation that may exist between equity and debt markets, and related mispricing of a single issuer's securities,[4] thereby hedging the risk of the subject credit investment, or bet on the default of the firm and the secondary market trading levels of its securities on default.[5]

Background[6]

The practice of capital structure arbitrage goes back to at least 2002. Based on the assumption that both equity and debt can be viewed as options on the underlying value of a firm, with default occurring when the value of the asset falls below a predetermined default barrier,[7] the concept is relatively straightforward: Take a position in a debt instrument to hedge an equity position, and vice versa. This evolved out of fundamental changes in how the credit markets traded, given the development of the credit default market and, in particular, CDSs, which allowed investors to go long on equity and short on debt "synthetically" — that is, by using the CDS as a derivative instrument.

Credit Default Swaps

A CDS is a derivative contract that allows an investor to hedge the risk of a credit investment or bet on a firm's default and subsequent trading levels of its securities in the secondary market.[8] In practice, the buyer pays the seller a periodic, upfront fee, referred to as the CDS spread or CDS premium, that is equal to a fraction (the premium calculated as a proportion of the notional value of the CDS in basis points) of the notional, or face, value[9] of the underlying reference asset, whether it is a bond, loan or other liability,[10] in addition to an annual premium to compensate the seller for taking the default risk. The spread reflects the probability of default and the recovery rate.[11] In the case of a credit event, such as a failure to pay a debt or bankruptcy filing, the seller is obligated to pay the buyer the par value of the debt, regardless of where it is trading.

CDSs may also be used to make speculative investments absent a position in a related debt. Sellers of CDSs are synthetically going long on the firm's credit under the assumption that it will not default. Conversely, buyers of CDSs are synthetically going short the firm's credit assuming that it will default. The implication is that CDSs can be used in place of debt-to-arbitrage disparities in the relationship between the pricing of a firm's debt and equity securities. The use of CDSs rather than bonds is also

1 These include distressed debt for control, spread-tightening, fundamental value, trade claims, vendor puts and liquidation trades.
2 Michael A. Gatto, *The Credit Investors Handbook: Leveraged Loans, High Yield Bonds and Distressed Debt* (John Wiley & Sons. Inc.), p. 269.
3 M.P. Wojtowicz, *Pricing Credit Derivatives and Credit Securitization* (Tinbergen Inst. 2014) (PhD-thesis, research and graduation internal, Vrije Universiteit Amsterdam).
4 *Id.*
5 Gatto, *supra* n.2 at p. 322.
6 Antony Currie & Jennifer Morris, "And Now for Capital Structure Arbitrage," *Euromoney* (December 2022).
7 Robert C. Merton, "On the Pricing of Corporate Debt: The Risk Structure of Interest Rates," *Journal of Finance*, Vol. 29, No. 2 (1974).
8 Steven G. Moyer, *Distressed Debt Analysis: Strategies for Speculative Investors* (J. Ross Publishing Inc.), pp. 322-26.
9 Yuan Wen & Jacob Kinsella, "Credit Default Swap –Pricing Theory, Real Data Analysis and Classroom Applications Using Bloomberg Terminal," State Univ. of New York at New Paltz, p. 2, assets.bbhub.io/professional/sites/10/WhitePaper_Wen.pdf.
10 George Chacko, Anders Sjöman, Hideto Motohashi & Vincent Dessain, *Credit Derivatives: Understanding Credit Risk and Credit Instruments* (Pearson Education Inc.), p. 152.
11 *Id.* at p. 24.

preferable given the greater liquidity and responsiveness of CDSs to market dynamics.[12]

The Nature of Arbitrage

Pure arbitrage is described as the process of producing riskless profit today by statically or dynamically matching current and future obligations to offset each other *exactly*, including *known* costs of financing.[13] The underlying principle is the *law of one price*, which holds that the same item cannot sell for two different prices simultaneously.[14] Given the sophistication of the capital markets today, opportunities to profit from pure arbitrage are limited. Consequently, hedge funds and proprietary trading desks rely extensively on relative value arbitrage, which is trading to realize a profit today by statically or dynamically matching current and future obligations that *nearly* offset each other, net of *estimated* financing costs. In substance, relative value arbitrage is equivalent to capital structure arbitrage within the context of quantitative finance, which entails the use of quantitative, structural models to identify and take advantage of pricing discrepancies between related securities of a firm based on statistical and historical patterns and relationships.[15]

Although beyond the scope of this article, pricing discrepancies between related securities of a firm might also be identified and traded based on strategies developed using fundamental credit analysis.[16] The objective of financial due diligence is to understand the value of the firm and its short-term financial issues for use in connection with the findings of legal due diligence to develop a valuation and strategy with respect to a specific security in the firm's capital structure. A nonexhaustive list of analyses typically performed include (1) historical financial information; (2) the outlook for the industry and firm position within it; (3) projections of future operating results; (4) identification of the corporate location of key operations and significant liabilities; (5) a liquidation analysis; and (6) valuation of tax attributes.[17]

The documents analyzed in legal due diligence[18] might include credit agreements, indentures, registration statements, 10-Ks and 10-Qs. The issues assessed arise as a matter of law, or in contracts or documents pertinent given the situation. Bankruptcy brings additional considerations that surface when the debtor has filed or may file for bankruptcy. Matters to be considered could include voidable preferences, substantive consolidation, equitable subordination, claims in nonnegotiable instruments, and whether the firm has entered the zone of insolvency.[19]

General Approach

In a quantitative finance setting, arbitrageurs generally use a structural model such as that introduced by Black and Scholes (1973),[20] Merton (1974)[21] or CreditGrades[22] to predict what a fair CDS spread should be given the price of a subject firm's equity.[23] The inputs of the structural model (including the volatility of the asset price, amount of debt outstanding, barrier below which default is expected, and percent recovery expected in case of default) are calibrated using CDS market quotes and maturities.[24] If the relationship between equity and CDSs observed in the market is mispriced based on a comparison with that predicted by the model, the arbitrageur might sell overvalued CDS protection and short equity, or buy undervalued CDS protection and buy equity. The arbitrageur will only profit, however, if the instruments traded revert toward equilibrium.

For background, the Merton Model posits that a firm can be divided into two parts: debt and equity, both of which can be thought of as derivative securities on the value of a firm's assets.[25] Specifically, the model illustrates that equity is a call option (a contract that gives the holder the right — but not the obligation — to buy the underlying security for a specified price on or before a specific date[26]) on the market value of a firm's total assets, with a strike price equal to the book value of the firm's debt. Debt can also be regarded as a put option (gives the holder the right, but not the obligation, to sell the underlying security for a specified price on or before a specific date)[27] on the market value of the total assets of the firm, with a strike price equal to the book value of the firm's debt.

Strategies and Outcomes

Generally

Strategies that have developed for arbitrage between debt and equity from the Merton Model[28] include shorting stocks of highly levered firms while going long on their bonds; trading the misalignment of CDS spreads (CDS as an alternative to debt) and declining stock prices; and selling the high implied volatility (a measure of how much the price of the asset is expected to change in the future) of one asset class and buying the lower volatility of the other asset class. Differences between theoretical credit spreads and traded spreads in the market, and between different classes of debt, junior and senior, may also be arbitraged.

For example, assume that an arbitrager has sold a CDS and shorted equity. For purposes of this example, if an arbitrager take such a position, the investor believes that four potential outcomes can be identified.[29]

12 Bocconi Students Investment Club, "A Primer on Capital Structure Arbitrage," Bocconi Univ. (February 2022), bsic.it/wp-content/uploads/2023/10/A-primer-on-Capital-Structure-Arbitrage.pdf.
13 Robert Dubil, *An Arbitrage Guide of Financial Markets* (John Wiley & Sons Ltd.), p. 13.
14 *Id.* at p. 12.
15 *See* "What Is Arbitrage?," Certificate in Quantative Fin. *CQF Blog*, cqf.com/blog/quant-finance-101/what-is-arbitrage (unless otherwise specified, all links in this article were last visited on Feb. 25, 2025).
16 Gatto, *supra* n.2, pp. 49-203; Moyer, *supra* n.8 at pp. 95-117; 119-36; 257-307.
17 Moyer, *supra* n.8 at pp. 267-84.
18 *Id.* at p. 286.
19 *Credit Lyonnais, c. Pathe Commc'ns*, 33 Del. Ch. 215 (Dec. 30, 1991).
20 Fischer Black & Myron Scholes, "The Pricing of Options and Corporate Liabilities," *The Journal of Political Economy*, Vol. 81, No. 3 (May/June 1973), pp. 637-54, cs.princeton.edu/courses/archive/fall09/cos323/papers/black_scholes73.pdf.
21 Merton, *supra* n.7.
22 Christopher Finger & Thomas Ta, "CreditGrades Technical Document," MSCI (May 1, 2002), msci.com/www/research-report/creditgrades-technical-document/018193536; Wojtowicz, *supra* n.3 at pp. 90-91.
23 Wojtowicz, *supra* n.3 at p. 84.
24 Damiano Brigo & Marco Tarenghi, "Credit Default Swap Calibration and Equity Swap Valuation Under Counterparty Risk with a Tractable Structural Model" (Aug. 24, 2004), ssrn.com/abstract=581302.
25 Oliver Berndt & Bruno Stephan Veras de Melo, "Capital Structure Arbitrage Strategies: Models, Practice and Empirical Evidence," School of HEC at Univ. of Lausanne, Inst. of Banking and Finance (November 2003), p. 22, citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=03f-082c7f3fbfe61063126cfb96eee1b42a13fee.
26 Chacko, *et al.*, *supra* n.10 at p. 71.
27 *Id.*
28 Berndt & Veras de Melo, *supra* n.25 at p. 11.
29 Ričardas Visockis, "Capital Structure Arbitrage," Tilburg Univ. (April 4, 2011), p. 9, arno.uvt.nl/show.cgi?fid=115341.

The case in which both the CDS spread and stock price fall indicates convergence, with both positions profitable. First, if the CDS spread falls while the price of equity rises, the trade will still be profitable on net if the CDS spread falls quicker than the increase in the price of equity, facilitating convergence. Second, where the CDS spread increases and the equity price decreases, the position will still be profitable provided that the equity price falls faster than the CDS spread increases. Third, both the CDS spread and equity price rise in the case of divergence. Fourth, both sides of the trade will suffer losses regardless of the size of the equity hedge.

Distressed Investor[30]

Capital structure arbitrage strategies used by distressed investors include liquidity plays, legal analysis plays, insurance/overheated market trades, hedged convertible bond trades, *pari passu* securities with different maturities, and senior vs. junior securities. In a *liquidity play*, a firm's short-term bonds are bought and its long-term bonds are sold short on the assumption that while the firm has sufficient liquidity to attempt a turnaround, it will nevertheless file for bankruptcy. Also referred to as a "curve trade," the strategy entails the arbitrage of different instruments across the yield curve.

Getting the timing of the bankruptcy is important, however. Short-term bonds trade higher than long-term bonds, the former reflecting the probability of being paid and the latter the recovery value in bankruptcy. As all bonds with the same seniority and security converge to the same price in chapter 11, the loss on the long position will exceed the gain on the short.

Legal analysis plays arise out of differences in a firm's bond indentures that result in one bond in a company's capital structure having better terms and conditions than another. In this case, the strategy is to buy the better bond and sell the other short. An example of this strategy is the LBO of Safeway. Certain of Safeway's bonds had a change of control put that gave the owner the right to compel the company to repurchase the bonds at 101 in the case of an LBO. Alternatively, Safeway's bonds that lacked this provision would "travel "with the company and likely decrease in value, as Safeway would have a significant amount of new debt. Hedge funds consequently bought the bonds with the change of control put and sold short those without it.

In *insurance/overheated market trades*, when a market is overheated — with securities overvalued and at unsustainable levels due to factors, including asset bubbles, excessive growth and inflation, or otherwise disrupted such as in the Great Recession — risk might not be correctly priced. For example, in 2006 and early 2007, certain investors thought that the market was not pricing the spread between healthy firm secured and unsecured debt. Those investors opted to arbitrage the difference by going long on secured debt and shorting unsecured debt to insure against losses from a primary investment or exposure, and to profit from the convergence of the difference.

In *hedged convertible bond trades*,[31] the arbitrageur purchases a convertible bond and goes short on an appropriate amount of stock. Shorting the stock offsets the effect on the price of the convertible bond of changes in the price of the stock. This serves to "lock in" the coupon income with minimal capital investment.

Where two bonds with different maturities in the capital structure are considered to be *pari passu*, but trade at a significant spread, there are usually two opportunities to arbitrage.[32] The first is where the near-term maturity exhibits a price spread that may contract, and the second is where two securities trade at similar levels but have different claim statuses, suggesting that the spread may widen.

Senior vs. junior securities trades[33] might be put on when the relationship between the prices of a senior and junior security diverge from their relative value in equilibrium. Depending on the complexity of the capital structure, this can arise in a variety of contexts. For example, this could include senior secured vs. senior unsecured, senior vs. subordinated, or holding company vs. operating company. In each scenario, investors look to identify a discrepancy that misstates the actual value or potential recovery.

Conclusion

Capital structure arbitrage is a complex trading strategy used to profit from misinformation that might exist between equity and debt markets, and the related mispricing of a single issuer's securities. The strategy can serve to hedge the risk of a credit investment or bet on the default of a firm and the trading levels of its securities in the secondary market subsequently.

The Merton Model, from which the strategy is derived, posits that a firm can be divided into two parts: debt and equity. Both can be thought of as derivative securities on the value of a firm's assets. Equity is a call option on the market value of a firm's total value, and debt is a put option on the market value of the total assets of the firm with a strike price equal to the book value of the firm's debt. Depending on the investor's investment thesis, the investor can employ one of the aforementioned strategies to take advantage of situations that the investor believes reflect misinformation in the equity and debt markets. abi

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30 Gatto, *supra* n.2 at pp. 339-43.

31 Moyer, *supra* n.8 at pp. 243.
32 *Id.* at p. 250.
33 *Id.* at p. 252.