



Risk and return in convertible arbitrage: Evidence from the convertible bond market

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ABSTRACT

In this paper, we identify and document the empirical characteristics of the key drivers of convertible arbitrage as a strategy and how they impact the performance of convertible arbitrage hedge funds. We show that the returns of a buy-and-hedge strategy involving taking a long position in convertible bonds (“CBs”) while hedging the equity risk alone explains a substantial amount of these funds’ return dynamics. In addition, we highlight the importance of non-price variables such as extreme market-wide events and the supply of CBs on performance. Out-of-sample tests provide corroborative evidence on our model’s predictions. At a more micro level, larger funds appear to be less dependent on directional exposure to CBs and more active in shorting stocks to hedge their exposure than smaller funds. They are also more vulnerable to supply shocks in the CB market. These findings are consistent with economies of scale that large funds enjoy in accessing the stock loan market. However, the friction involved in adjusting the stock of risk capital managed by a large fund can negatively impact performance when the supply of CBs declines. Taken together, our findings are consistent with convertible arbitrageurs collectively being rewarded for playing an intermediation role of funding CB issuers whilst distributing part of the equity risk of CBs to the equity market.

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1. Introduction

At the turn of the century, capitalization of the global convertible bond (“CB”) market stood at just under \$300 billion while the US equity market was more than 50 times higher at over \$1.5 trillion. Yet during the difficult market conditions between 2000 and 2002 (with events such as end to the dotcom bubble, September 11, and the accounting scandals at Worldcom and Enron), the new issues in both these markets were of similar orders of magnitude—close to \$300 billion. Even during the financial crisis of

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2007–2008, firms managed to raise about \$118 billion in the US CB market.⁴ This underscores the importance of the CB market as a source of capital for corporations during adverse economic conditions.⁵

To smooth the placement of such a large-scale issuance of CBs, economic agents willing to assume the inventory risk are clearly needed. Coincident to these macro events, the last decade has witnessed a rapid growth of convertible arbitrage (“CA”) hedge funds. In spite of the rapid growth, assets employed by the convertible arbitrage strategy averaged around 4.51% of assets across all hedge fund strategies between December 1993 and June 2007 (Lipper-TASS Asset Flow Report). On the other hand, Mitchell et al. (2007) point out that convertible arbitrage and other hedge funds make up about 75% of the convertible market. Accounts in the financial press support this view; for example, Pulliam (2004) notes that in 2003, CA hedge funds purchased about 80% of newly issued convertible bonds. Brown et al. (2010) document that a large fraction of convertible issues are sold to hedge funds by issuers with greater stock volatility and higher probability of financial distress thereby avoiding high costs of issuing equity—costs that are likely to rise during poor market condition. Although CA funds are typically not among the largest hedge funds in terms of assets under management (being naturally limited by the supply of CBs in the market), CA hedge funds do play a significant role in funding the convertible bond market.

In this paper, we posit that a typical CA hedge fund manager assumes the role of an intermediary—financing the CB issuers while distributing part of the equity risk of CB ownership to the equity market through delta hedging. To test our hypothesis, we explicitly model a commonly used trading strategy that gives us direct insight into the performance of CA hedge funds. Specifically, we assume that CA hedge funds take a long position in the CBs and mitigate the inherent equity risk by shorting the equity of the CB issuers. We demonstrate empirically that such a model explains a substantial amount of CA hedge funds’ return dynamics.

More specifically, our model encompasses both passive and active CB trading styles. The passive component is similar to the “buy-and-hold” strategy commonly used by mutual funds, while the active component resembles the “buy-and-hedge” strategy used by hedge funds. The passive component differs from the active component in two dimensions—leverage and risk management. Since mutual funds rarely use leverage (e.g., Almazán et al. (2004)), the amount of liquidity they provide to CB issuers is limited to the amount of assets they manage. In contrast, through the use of leverage, CA hedge funds can purchase a quantity of CBs well in excess of their capital and therefore can provide greater liquidity to the CB issuers.⁶ From a risk management perspective, unlike CB mutual funds that typically do not short securities, CA hedge funds can hedge the equity risk embedded in the CBs by shorting stocks. Thus, unlike mutual funds, CA hedge funds can use leverage and provide much more liquidity to CB issuers at only moderate levels of overall portfolio risk. We capture these two dimensions by specifying a “buy-and-hedge” strategy, which involves buying CBs at issuance and holding them until maturity (or till the end of our sample period, whichever is earlier) and shorting the shares of the CB issuers to hedge the equity risk.⁷

As a funding intermediary for CB issuers, a convertible arbitrageur’s performance depends on the supply of CBs as well as discrete liquidity events such as the Long Term Capital Management (LTCM) crisis. The supply of CBs will affect the investment opportunities and therefore profitability of CA funds. Liquidity events can negatively impact CA funds’ ability to borrow short-term capital from brokers and raise long-term capital from investors thereby adversely affecting their ability to effectively implement the CA strategy. Therefore, liquidity events can also affect the risk appetite of arbitrageurs. We test these hypotheses by incorporating the impact of changes in supply conditions and major market events while modeling the return of CA hedge funds.

Using the daily prices of 1646 US CBs from January 1993 to April 2003, we have five major findings. First, we show that a combination of buy-and-hold and buy-and-hedge strategies explains a significant proportion of the variation in CA hedge fund returns. In addition, we show empirically that the returns of CA hedge funds are positively related to the supply of CBs. Second, responding to adverse liquidity events, we show that after the LTCM crisis, CA hedge funds do reduce their reliance on the buy-and-hold strategy thereby paring their directional exposure to the CB market. Third, combining both supply conditions and market events, we find alpha on average to be either insignificantly different from zero or significantly negative. At first glance, persistent negative alphas appear to be at odds with the growth in CA funds. We show empirically that these observed negative alphas depend on the assumption underlying the monetization of specific measures of CB supply. Put differently, conventional measures of alpha can be associated with the reward for providing liquidity to issuers of CBs. Fourth, we find that larger funds rely more on the buy-and-hedge factor relative to the buy-and-hold factor, and are affected more by supply shocks. This is consistent with economies of scale that large funds enjoy in accessing the stock loan market. However, the friction involved in adjusting the stock of risk capital managed by a large fund can negatively impact performance when the supply of CBs declines. Finally, going beyond

⁴ Equity data are from Federal Reserve Bulletin (various issues). We thank Jeff Wurgler for making it available on his website <http://pages.stern.nyu.edu/~jwurgler/>. CB estimate is from the public and private proceeds of convertible debt from Thomson Reuters Financial’s SDC Platinum database, which we also use later on for our out-of-sample analysis.

⁵ Apart from being a useful source of liquidity to issuers during adverse market conditions, the issuance of CBs depends also on the costs and benefits compared to other forms of securities issuance. Firms selling CBs incur costs including issuance costs (e.g., underwriter fees and discounts) and dilution of existing stockholders’ interest upon conversion. Firms can also enjoy certain benefits from issuing CBs. These include reduction in the agency cost of debt (Green, 1984; Jensen and Meckling, 1976), mitigation of underinvestment problem due to adverse selection (Brennan and Kraus, 1987; Brennan and Schwartz, 1988; Constantinides and Grundy, 1989), avoidance of high costs of direct equity sales (Brown et al., 2010; Stein, 1992), and reduction of the costs of sequential financing while controlling overinvestment incentives (Mayers, 1998). Firms will only issue CBs if these benefits exceed the costs of issuing CBs.

⁶ Anecdotal evidence suggests that some CA hedge funds employ a leverage ratio of up to \$5 borrowing to \$1 equity (Zuckerman, 2008). Gupta and Liang (2005) apply the Value-at-Risk Approach to evaluate the capital adequacy of hedge funds and find that convertible arbitrage funds are better capitalized than funds in emerging markets, long/short equity, and managed futures categories.

⁷ Since we cannot directly observe the extent to which CA hedge funds actively hedge the equity risk as opposed to buying and holding CBs, we allow for both the passive and active components in our model and empirically estimate their relative importance in determining the CA funds’ performance.

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