Convertible Bond Arbitrage (unlevered)
An Attractive All-Weather Strategy which Seeks to Provide a Source of Alternative Income and Non-Correlated Returns

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Palmer Square Capital Management LLC
In an environment dominated by uncertainty, historically low interest rates and "risk-on, risk-off," an unlevered convertible bond arbitrage strategy offers investors the potential to capture meaningful yield and potential upside while maintaining strong downside protection. In fact, greater market volatility actually increases the opportunity set for this strategy to create value.

In this thought piece, we will provide some basic background on convertible bonds and convertible bond arbitrage while also discussing the merits of the strategy, how managers strive to earn consistent returns, risk management and ways in which investors can implement the strategy within their portfolios.
What is a convertible bond?

Convertible securities are hybrid securities, usually issued as bonds or preferred stocks, which offer investors an embedded option – the ability to “convert” to a specified number of shares of common stock. The hybrid nature of convertibles creates a unique opportunity for investors given they benefit from having attributes of both fixed income and equity securities. In a difficult market, investors can take advantage of the convertible’s fixed income portion which provides yield and potential downside protection. At the same time, convertible bond investors can earn additional return from the potential price appreciation of the issuer’s common stock. With regard to declining equity market environments, it is important for investors to realize that convertible bonds will typically behave similar to straight corporate bonds because the option to convert to equity is often deeply out of the money. As a result, the bonds may offer considerable downside protection because they have fixed maturities and redemption schedules. In addition, their position in the capital structure of a company is above that of equities and typically in line with senior unsecured debt.

Corporate treasurers view convertible bonds as a relatively inexpensive financing tool, as the bond’s coupon is often much lower than straight debt. In addition, convertible bonds can often be brought to market more quickly and cheaply than raising equity. The global convertible market was estimated at $320 billion as of June 30, 2012 (see Exhibit 1).
As shown in Exhibit 1, while convertible bond arbitrage typically involves investing in domestic issues, the overseas market has grown, now offering opportunities to invest in Europe and Asia, for example.

### What is convertible bond arbitrage?

In its most basic form, convertible bond arbitrage using no leverage involves buying the convertible bonds of a company while simultaneously selling short that company’s stock. For example, a common trade example would be: buying $100 of Goodyear Tire’s convertible bonds while selling short $60 of its stock. What does this simultaneous buying and selling accomplish? First, this strategy should do well as an alternative fixed income opportunity whatever direction equity markets move. If the stock market is declining, the short stock position will appreciate in value to cushion the price decline in the convertible bond caused by the decline in the value of the embedded option to convert. With the short stock position neutralizing the potential downside price move in the convertible bond, the investor is left to capture the convertible bond yield. That same scenario should also work in reverse were the stock market to appreciate in value. Please note that the above examples are meant to provide a clear example of the ‘all weather’ and market neutral nature of the strategy.

### Exhibit 1 - Global convertible universe (as of June 30, 2012)

![Pie chart showing the distribution of the global convertible universe by region.](chart.png)

- **Europe** 23% · $75B
- **Japan** 6% · $18B
- **Asia & Other** 13% · $40B
- **U.S.** 58% · $187B

Source: BofA Merrill Lynch Convertible Research
*Includes convertibles in all currency denominations
**Other includes: Australia, Hong Kong, India, Malaysia, Philippines, Singapore, South Korea and Taiwan
What are the key steps involved in convertible bond arbitrage?

Many different approaches to trading convertible arbitrage exist. For this thought piece, we will focus on an approach called "Cash-and-Carry" using no leverage. Within this approach, managers strive to profit from the convertible bond yield, the potential gain from selecting an undervalued convertible bond, and any rebalancing of the hedge ratio if the underlying stock price moves significantly. In addition, managers can profit from what is referred to as the "credit rebate" once interest rates rise (we will discuss that portion later). Since the yield of the convertible bond as a return is self-explanatory, we will breakdown the other two return drivers in more detail below and also address how managers approach the main risks of convertible bond arbitrage investing:

1. Identifying undervalued convertible securities

Within the "Cash-and-Carry" trading approach, many managers will focus on specific bond attributes such as low-premium bonds (i.e., trade relatively close to or well through their conversion value), or bonds with a high reward-to-risk ratio (i.e., trade at- or near-the-money of the equity call option, thus having attractive gamma). They will run quantitative analysis to screen for interesting opportunities followed by, in many cases, fundamental analysis to assess the credit and pricing versus competitors. For those managers that put forth considerable research efforts and have a deep team, buying convertible bonds that are trading at a discount to their intrinsic value can lead to significant capital gains. All managers must be able to borrow stock to short as a hedge. Please note that many managers will not invest short in stocks that pay significant dividends.

2. Establishing and re-balancing the hedge ratios

Once managers select an undervalued convertible bond, the appropriate hedge ratio must be determined (i.e., the amount of equity shares to sell short). With the correct hedge ratio, the position can be profitable if the stock rises or falls. For a “Cash-and-Carry” strategy (discussed below), the hedge ratio is set so that the position is generally market neutral (i.e., the convertible bond’s sensitivity to small stock price changes is calculated, and the short stock position established accordingly to offset those moves). As mentioned above, this strategy strives to profit from the bond’s yield, the gain from correctly selecting an undervalued bond, and any rebalancing
of the hedge ratio if the underlying stock price moves significantly. Please note that adjusting the hedge ratio involves selling additional shares as the underlying stock price rises and buying additional shares as the stock price falls. For many managers, volatile underlying stocks are desirable as it gives them an opportunity to profit as they adjust the hedge ratio.

3. Managing the risks

While not exhaustive, the main bond risks in a convertible arbitrage trade are call/takeover risk and credit risk, as most convertible bonds are below investment grade. Managers must assess these risks and the most cost-effective way to manage them. Portfolio diversification is the most common way to address call risk and credit risk. The second is working with an active manager who does not use leverage and has demonstrated the ability to manage through the convertible bond cycle. Looking into how managers fared in 2005 and 2008 may illustrate their ability to deal with difficult environments which can affect liquidity and credit quality. Managers need to be able to analyze each individual credit in the portfolio as well as how certain positions will react to adverse environments. Similar to many other areas within the credit space, please note that the final risk is also liquidity (especially in adverse environments). Liquidity is another reason to be cautious about manager selection and may be reason to avoid those who use any amount of leverage.

Why does this strategy offer such a compelling opportunity?

In essence, convertible bond arbitrage offers investors the potential for significant yield and capital appreciation with less risk than traditional stocks and bonds due to the fact that the strategy is typically market neutral (i.e., fully hedged). In addition, the strategy may also provide opportunities for greater diversification of an investor’s portfolio as it has very low correlation and volatility relative to traditional stocks and bonds. Please see Exhibit 2 which illustrates the correlation of convertible bond arbitrage to traditional stock and bond indices. Adding low correlation investments to a portfolio typically enhances diversification. Finally, convertible bond arbitrage is one of the few strategies that will actually benefit if interest rates rise, due primarily to its ability to earn a more significant credit rebate on its short stock position. We discuss this bonus item at the end of this section.
Exhibit 2 - Correlation of convertible bond arbitrage to traditional asset classes

<table>
<thead>
<tr>
<th></th>
<th>HFRI Convertible Arbitrage Index</th>
<th>Barclays Aggregate Bond Index</th>
<th>NASDAQ Composite</th>
<th>S&amp;P 500 Index</th>
<th>Russell 2000 Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFRI Convertible Arbitrage Index</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barclays Aggregate Bond Index</td>
<td>0.03</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NASDAQ Composite</td>
<td>0.16</td>
<td>0.00</td>
<td>1.00</td>
<td></td>
<td></td>
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<tr>
<td>S&amp;P 500 Index</td>
<td>0.22</td>
<td>0.02</td>
<td>0.70</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Russell 2000 Index</td>
<td>0.21</td>
<td>0.00</td>
<td>0.75</td>
<td>0.66</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note: Individuals cannot invest directly in any index.

Convertible bond arbitrage can also act as a form of downside protection. Falling equity markets present an opportunity to benefit from the equity short position inherent in convertible bond arbitrage while also protecting portfolios through the fixed-income attributes of convertibles, including the bond floor and its yield. Please see Exhibit 3 below which illustrates the solid performance of convertible bond arbitrage over time with relatively low volatility. The strategy's ability to protect capital during difficult market environments has been key to its strong risk-adjusted performance. With regard to difficult market environments such as 2005 and 2008, it is important to emphasize that managers who did not use leverage protected capital. Managers that levered their strategies 8-10 times suffered market declines similar to equities. Since an unlevered index is not available for illustration, most investors don't draw this important distinction when analyzing historic convertible index data.

Exhibit 3 - Convertible bond arbitrage index - risk/return (01/01/90 - 12/31/11)

<table>
<thead>
<tr>
<th></th>
<th>Annual Return</th>
<th>Annual Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFRI Convertible Arbitrage Index</td>
<td>8.62%</td>
<td>6.74%</td>
</tr>
<tr>
<td>S&amp;P 500 Index</td>
<td>8.22%</td>
<td>15.22%</td>
</tr>
<tr>
<td>Barclays Aggregate Bond Index</td>
<td>7.03%</td>
<td>3.76%</td>
</tr>
</tbody>
</table>

Source: Bloomberg
Note: Individuals cannot invest directly in any index.
In addition to potential yield/performance, diversification, and downside protection, most unique to convertible bond arbitrage is its potential to prosper in rising rate environments. Exhibit 4 below illustrates the value of having convertible bond arbitrage investments in a portfolio as interest rates rise. Why has convertible bond arbitrage demonstrated an ability to perform well in rising rate environments?

**Exhibit 4 - Returns in rising interest rates environments**

<table>
<thead>
<tr>
<th>Yield Increase (bps)*</th>
<th>10/15/93-11/7/94</th>
<th>1/18/96-6/12/96</th>
<th>10/5/98-1/20/00</th>
<th>11/7/01-4/1/02</th>
<th>6/13/03-6/14/04</th>
<th>6/1/05-6/28/06</th>
<th>6/12/08-6/30/09</th>
<th>10/7/10-12/15/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>HFRI Convertible Arbitrage Index**</td>
<td>287</td>
<td>154</td>
<td>263</td>
<td>125</td>
<td>176</td>
<td>136</td>
<td>189</td>
<td>115</td>
</tr>
<tr>
<td>Merrill Lynch All U.S. Convertibles Index</td>
<td>0.33%</td>
<td>8.37%</td>
<td>18.26%</td>
<td>3.48%</td>
<td>2.40%</td>
<td>11.52%</td>
<td>34.26%</td>
<td>4.20%</td>
</tr>
<tr>
<td>Barclays Capital U.S. Government/Credit Index</td>
<td>-2.28%</td>
<td>11.97%</td>
<td>68.85%</td>
<td>2.29%</td>
<td>11.49%</td>
<td>9.46%</td>
<td>24.68%</td>
<td>5.31%</td>
</tr>
</tbody>
</table>

*10-year Treasury yield

** HFRI Convertible Arbitrage Index is priced monthly and performance figures are calculated using those monthly values. The periods of performance measured for this analysis are as follows: 9/30/93 - 11/30/94; 12/31/95 - 6/30/96; 9/30/98 - 11/31/00; 10/31/01 - 4/30/02; 5/31/03 - 6/30/04; 5/31/05 - 6/30/06; 11/30/08 - 6/30/09; 9/30/10 - 12/31/10.

Sources: Morningstar and Bloomberg

Note: Individuals cannot invest directly in any index.

For the convertible bond arbitrage strategy which involves a corresponding stock short, managers have the ability to profit from what is referred to as “the credit rebate.” As described above, the core aspect of a convertible bond arbitrage strategy is to go long the convertible bond and short the corresponding stock. When an investor shorts a stock, an investor effectively sells it today receiving cash proceeds with the hope of buying it back at a lower price in the future. The cash proceeds sit in an account earning a rebate. In today’s low interest rate environment, that rebate does not yield a significant amount of incremental return. However, to the extent interest rates begin to rise (as many analysts expect), the “credit rebate” rises as well, offering convertible bond arbitrage investors another source of return.
How do investors utilize the strategy within portfolios?

In the institutional world, pension funds often use unlevered convertible bond arbitrage strategies as part of their fixed income allocation to provide additional diversification while also providing yield to help the fund reach the target return necessary to satisfy its obligations.

In the retail world, investors should also consider placing this strategy within fixed income given the risk/reward profile we discuss throughout this paper. For those investors who are overweight fixed income, they don’t often realize how susceptible their portfolios are to capital loss if interest rates rise. As we have discussed throughout this piece, convertible bond arbitrage not only provides yield, but also downside protection and an ability to prosper in a rising rate environment.

Finally, Palmer Square also believes that both institutional and retail investors can utilize the product as a core piece of an alternatives allocation. Given its focus on generating absolute returns and income while taking relatively less market risk, a strong allocation to convertible bond arbitrage can provide stability and diversification to an alternatives allocation.

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- Investing in Today’s Markets – Is Opportunistic Credit Becoming Increasingly Attractive?
- “Cash is a weapon in this environment”
- Recent Market Volatility Provides Argument for Hedged Mutual Funds
- Hedge Fund Strategies: Key Risks and the Benefits of Investing in a Fund of Funds Structure Through a Mutual Fund

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Common Definitions

Barclays Capital Aggregate Bond Index: The Barclays Capital Aggregate Bond Index is a market value-weighted index that tracks the daily price, coupon, pay-downs, and total return performance of fixed-rate, publicly placed, dollar-denominated, and non-convertible investment grade debt issues with at least $250 million par amount outstanding and with at least one year to final maturity.

Barclays Capital U.S. Government/Credit Index: The index measures the performance of U.S. Dollar denominated U.S. Treasuries, government-related and investment grade U.S. corporate securities that have a remaining maturity of greater than one year and less than ten years.

Bond Floor: The bond component of a convertible security, where the convertible's floor trades based on its credit quality, expressed in percent.

Conversion Premium (Price): The additional amount paid for a convertible security over its conversion value measured in percent (price).

Conversion Premium Points: The additional amount paid for a convertible security over its conversion value measured in points, where 1 bond point = $10.

Conversion Ratio: The number of common shares the convertible holder is entitled to receive for a convertible security upon conversion.

Conversion Value (Parity): The convertible security's value if converted at a given stock price.

Credit Rebate: A portion of the interest in a T-bill account earned by a hedge fund from shorting a security. When selling a stock short, a hedge fund borrows the stock from a prime broker (who borrows it from an existing shareholder) and the short sale's proceeds are typically held in a T-bill account with the prime broker as collateral. Much of the T-bill interest is then rebated to the hedge fund. (Note: The hedge fund must pay dividends to the original shareholder.)

Current Yield: The convertible security's coupon or preferred dividend divided by its current price as measured in percent.

Gamma: The sensitivity of the hedge ratio (delta) to changes in the stock price. A convertible bond (CB)'s gamma is highest when the equity’s call option is at-the-money. Gamma refers to the curved shape of the CB price path. High gamma means the bond price goes up more when the stock price rises, than it goes down when the stock price falls. Conversely, low gamma means a more linear CB response to stock price movements.

Hedge Ratio (Delta): The amount of common stock sold short against a convertible security position, relative to the convertible security's stock equivalency, expressed in percent.

HFRI Convertible Arbitrage Index: Convertible Arbitrage includes strategies in which the investment thesis is predicated on realization of a spread between related instruments in which one or multiple components of the spread is a convertible fixed income instrument. Strategies employ an investment process designed to isolate attractive opportunities between the price of a convertible security and the price of a non-convertible security, typically of the same issuer. Convertible arbitrage positions maintain characteristic sensitivities to credit quality of the issuer, implied and realized volatility of the underlying instruments, levels of interest rates and the valuation of the issuer’s equity, among other more general market and idiosyncratic sensitivities.

Merrill Lynch All U.S. Convertibles Index: The index consists of convertible bonds traded in the U.S. dollar denominated investment grade and non-investment grade convertible securities sold into the U.S. market and publicly traded in the United States. The Index constituents are market value weighted based on the convertible securities prices and outstanding shares, and the underlying index is rebalanced daily.

Russell 2000 Index: The Russell 2000 Index measures the performance of the 2,000 smallest companies in the Russell 3000 Index, which represents approximately 8% of the total market capitalization of the Russell 3000 Index.

S&P 500: An unmanaged capitalization-weighted index (weighted by the market value of the companies) of 500 stocks listed on various exchanges.
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