Replicating the Carry Trade Through an Exchange Traded Fund

By

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Bachelor of Science in Management
Tulane University, 2002

SUBMITTED TO THE MIT SLOAN SCHOOL OF MANAGEMENT IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE IN MANAGEMENT STUDIES AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

JUNE 2013

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Jonathan Shan

Submitted to the MIT Sloan School of Management on May 10, 2013 in partial fulfillment of the requirements for the degree of Master of Science in Management Studies

ABSTRACT

There is an overarching belief that the carry trade is a simple investment strategy based on the popular mantra of buying low and selling high. However, in reality, there are several factors that need to be taken into consideration when devising a carry trade strategy. These hardships are further complicated by the number of options available in such a strategy. The main objective of my thesis is to implement this popular hedge fund strategy through the structure of an exchange traded fund.

The interest rate spread between two different currencies should be an expectation of future exchange rates, however, empirically, this belief does not hold true. The carry trade takes advantage of this violation of uncovered interest rate parity and I will show that a specific implementation of the carry trade yielded positive returns on a historical basis.

I believe it is essential to understand the basics of the carry trade. I will discuss the mechanics and highlight the inherent advantages and risk factors in making such an investment. I will then discuss the current landscape and what financial products are available to investors who want to take advantage of the carry trade – from hedge funds to exchange traded notes and exchange traded funds. Next, I will discuss how one goes about launching an exchange traded fund and the various considerations that need to be made by someone undertaking such an endeavor. Finally, I will try and establish demand for a carry trade exchange traded fund in the retirement market and investigate the hurdles for such a product.

Thesis Supervisor: S.P. Kothari
Title: Deputy Dean at the MIT Sloan School of Management, Gordon Y Billard Professor of Management
ACKNOWLEDGEMENTS

I would like to express my deepest appreciation and sincere gratitude to my thesis supervisor, Professor S.P. Kothari, who has provided me with valuable advice throughout this process. His background with respect to the carry trade improved my understanding of the investment strategy, and without his guidance and support, this thesis would not have been possible.

I would like to thank Professors Lauren Cohen and Christopher Malloy of Harvard Business School who helped me develop this thesis topic and encouraged me to pursue my intellectual curiosity. I am also indebted to Professor Robert C. Merton of the MIT Sloan School of Management who provided invaluable insight and perspective on the retirement market.

My undying gratitude goes out to all the people who provided me with their valuable input. I owe the greatest debt – in alphabetical order – to Jorge Malibran Angel, Eric Bruggemann, Thomas Martin, John Claes Fredrik Tengberg VI, Tina Tang, and Alexander Williams.

Finally, I would also like to thank all the members of the Master of Science in Management Studies program for their unwavering support.
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I. Introduction

The carry trade is best described as going long high interest rate securities and financing the trade by borrowing, or selling, low interest rate securities. By structuring the trade so that the long and short positions will be equal, you are trying to capture the spread, or difference between the two securities. According to Koijen, Moskowitz, Pedersen, and Vrugt (2012), a security’s expected return can be decomposed into its “carry” and its expected price appreciation, where carry can be measured in advance without an asset pricing model. Through their research, they argue that “carry” predicts returns for a variety of asset classes that include global equities, bonds, currencies, and commodities, as well as within US Treasuries, credit, and equity index options. For the purpose of this thesis, I will focus on the currency carry trade and how it can be replicated through the structure of an exchange traded fund.

II. The Basics of the Carry Trade

The currency carry trade is the name of a strategy of going short a low-interest rate currency, while simultaneously going long a high interest rate currency. If the exchange rate remains constant, the investor will pocket the difference in interest rates, or the “spread.” A popular example in the last decade has been shorting the Japanese yen and going long the Australian dollar. In an efficient market, the difference between the interest rates of two currencies should be an unbiased expectation of future exchange rates. Empirical research has shown that depreciation in exchange rates does not compensate for the difference in interest rates. This is a violation of uncovered interest rate parity. The carry trade exploits the trend that currencies associated with relatively high interest rates tend to rise in value relative to currencies associated with low interest rates. Going short on low interest currencies and long on high interest ones has paid off on average, but in the event of a currency devaluation, investors can face huge negative ramifications. This strategy produces large losses when the high interest currency depreciates in value. (Frankel, 2008) Please find an illustrative example of the currency carry trade below:
The mechanics of carry are explained below:

- Consider a futures contract that expires in period $t+1$ with a current futures price $F_t$ and spot price of the underlying security, $S_t$.
- Assume an investor allocates $X_t$ dollars today of capital to finance each futures contract (where $X_t$ must be at least as large as the margin requirement).
- Next period, the value of the margin capital and the futures contract is equal to $X_t(1 + r_t) + F_{t+1} - F_t$, where $r_t$ is the risk-free interest rate today that is earned on the margin capital, therefore, the return on allocated capital over one period is:
  
  \[ \text{Total return} = R_{t+1} = \frac{(X_t(1 + r_t) + F_{t+1} - F_t)}{X_t} = \frac{(F_{t+1} - F_t)}{X_t} + r_t \]

- Therefore, the return in excess of the risk-free rate is: $R_{t+1} - r_t = \frac{(F_{t+1} - F_t)}{X_t}$.
- The carry $C_t$ of the futures contract is then computed as the futures excess return under the assumption of a constant spot price from $t$ to $t+1$.
- Given that the futures price expires at the future spot price ($F_{t+1} = S_{t+1}$) and the assumption of constant spot prices ($S_{t+1} = S_t$), we have that $F_{t+1} = S_t$, therefore the carry is: $C_t = \frac{(S_t - F_t)}{X_t}$ (Koijen, Moskowitz, Pedersen, and Vrugt, 2012).

The carry trade has been a popular topic for academic research over the last thirty years. Early research by Hansen and Hodrick (1980) and Fama (1984) focused on the irrationality of the Forward Rate Bias. Regarding currencies, if uncovered interest rate parity (UIP) holds, the difference in interest rates should be an unbiased estimate of future spot rates. However, academics found that currencies associated with relatively high interest rates tend to rise in value, while currencies associated with lower interest rates tend to decrease in value – resulting in positive total return if an investor borrows the low interest rate currency and buys the high interest rate currency. There have been differing opinions about whether the carry trade can truly deliver positive returns over time.
Burnside, Eichenbaum, Kleshchelski, and Rebelo (2006) argue that the carry trade might be difficult to implement due to high transaction costs – even though carry trades produce optimistic Sharpe ratios, the amount of profit generated is limited due to transaction costs. This especially holds true in the face of constant rebalancing.

Rationale for this violation of uncovered interest rate parity has been a highly contested topic, and a number of studies attempted to explain the violation. Brunnermeier, Nagel, and Pedersen (2008) documented that crash risk can help explain the violation empirically. Their paper suggests that the carry trade provides negatively skewed returns. In their view, crash risk of the carry trade is due to a possible unwinding of hedge fund portfolios.

Burnside, Eichenbaum, and Rebelo (2011) propose that positive carry trade profit could result from price pressure. Price pressure in this sense was defined in the study as the price at which investors can buy or sell currencies depends on the quantity they wish to transact. Menkoff, Sarno, Schmeling, and Schrimpf (2012) argue that carry trade profits are simply compensation for risk exposure and global foreign exchange (FX) volatility.

**Historical Back Test**

In order to assess the carry trade strategy, a back test was performed using data pulled from a Bloomberg terminal on April 13, 2013 (Bloomberg LP, 2013). The back test was performed by constructing a carry trade portfolio using the Australian dollar, British pound, Canadian dollar, Euro, Japanese yen, and Swiss franc as eligible currencies. The capital allocation was based on the assessment of each currency’s interest rate, which in this case was three month LIBOR (London Interbank Offered Rate). The duration of the back test is from January 1, 1985, to April 10, 2013. These dates were selected as this represented the longest period in which all required data was readily available.
The carry trade portfolio shown in Figure 2 was constructed by evaluating the eligible currencies and their associated three-month LIBOR from January 1, 1986 to April 10, 2013. The US dollar was excluded because the US dollar was considered the home currency for the purpose of this back test, therefore, the fund should never enjoy profit or suffer a loss from long or short positions in US dollars. The portfolio is constructed by assessing the currencies and ranking them by their respective interest rates from highest to lowest. The portfolio goes long the currencies that are ranked 1 or 2 and goes short the currencies ranked 5 and 6. For the interest rate weighted portfolio, the allocations are determined proportionately in terms of interest rate. For the equal-weight portfolio, the same currencies will be included, however, the allocations will be equal-weighted. In the rare event that a third currency will need to be included based on its ranking, then the allocation for that currency will be evenly distributed. The portfolio is market-neutral on a dollar basis, where the long component is equal to the short component. At the end of each period, or on the last trading day of the period, the portfolio will be rebalanced.

Carry trade indexes are relatively nascent, so investors cannot assume that carry trade products from various banks are the same. Carry trade products are differentiated by the number of currencies that are considered, the weighting of each position, and the duration of interest rates. The returns and relative simplicity of the carry trade, compared to other investment strategies implored by the bulge bracket investment banks, explains the emergence of multiple carry trade indexes. According to Jessica James, global head of quantitative investor solutions for FX at Citigroup, “You could come into the office once a month, place a trade, and go home, and you would have seen a better information ratio over the past 20 years than the average equity index” (Marmery, 2008).
Advantages of investing in the carry trade

There is an overarching belief that the carry trade is a simple strategy based on the tried and true preface of “buy low and sell high.” Although in practice, the trade is not nearly this simplistic; the concept behind the carry trade is fairly easy to understand. The carry trade is advantageous during times when central banks are raising interest rates or planning to increase interest rates. The carry trade also offers the opportunity to earn interest over the course of the investment — not only for yield, but possible capital appreciation.

The carry trade exploits the trend that currencies associated with relatively high interest rates tend to rise in value relative to currencies associated with low interest rates. This trend is consistent with economic theory regarding the correct price of a currency future, known as the Interest Rate Parity formula or the Covered Interest Arbitrage formula, and can be seen in the historical trading patterns of currency futures.

Given the long/short nature of the portfolio, an investor can experience gains on both sides of the trade. Price movements of the portfolio currencies can prove to be beneficial in both the long component and the short component. The portfolio will rise as a result of any upward price movement of the portfolio currencies that are expected to gain relative to the US dollar by investing in long positions of such currencies. The portfolio will also rise as a result of any downward price movement of the portfolio currencies that are expected to lose relative to the US dollar by investing in short positions on such currencies. This long/short structure can also serve as a hedge of sorts.

Moreover, the carry trade can help to diversify a portfolio because historically, the carry trade has tended to exhibit low to negative correlation with both equities and conventional bonds. Given that the portfolio’s underlying assets are foreign currencies, brokers tend to require less margin requirements when compared to other assets. Therefore, the return can be amplified through the use of leverage.

Risks of investing in the carry trade

Past performance is not indicative of future results; all or substantially all of an investment in this strategy could be lost. The back test is used to show historical performance of a certain implementation of the carry trade, this historical performance is not an accurate gauge of future performance. There can be no assurance that the strategy will achieve profits or avoid losses in the future.

Investment in foreign exchange related products is subject to many factors which contribute to or increase potential volatility, including, but not limited to: national debt levels and trade deficits, including changes in balances of payments and trade; domestic and foreign inflation rates and investors’ expectations concerning inflation rates; domestic and foreign interest rates and investors’ expectations concerning interest rates; currency exchange rates; investment and trading activities of mutual funds, hedge funds and currency funds; global or regional political, economic or financial events and situations; supply and demand changes which influence the foreign exchange rates of various currencies; monetary policies of governments (including exchange control programs, restrictions on local exchanges or markets and limitations on foreign investment in a country or on investment by residents of a country in other
countries), trade restrictions, currency devaluations and revaluations; governmental intervention in the currency market, directly and by regulation, in order to influence currency prices; and expectations among market participants that a currency’s value soon will change (PowerShares DB G10 Currency Harvest Fund Prospectus, 2012).

A real investment in the carry trade is subject to fees and transaction costs whereas the back test assumes no transaction costs and/or fees.

III. Current Landscape of Carry Trade Financial Products

Investors can gain exposure to carry trades through various avenues, currently the most prominent is through direct investments in hedge funds. Carry trades have been attractive investments for global macro hedge funds. The global macro hedge fund strategy is defined as basing the fund’s holdings across multiple asset classes on overall economic and political views of various countries. Although this is certainly one way to participate in the currency carry trade, this option may not be available to everyone. Hedge funds are limited to accredited investors; federal securities laws define the term accredited investor in Rule 501 of Regulation D as:

- a bank, insurance company, registered investment company, business development company, or small business investment company;
- an employee benefit plan, within the meaning of the Employee Retirement Income Security Act, if a bank, insurance company, or registered investment adviser makes the investment decisions, or if the plan has total assets in excess of $5 million;
- a charitable organization, corporation, or partnership with assets exceeding $5 million;
- a director, executive officer, or general partner of the company selling the securities;
- a business in which all the equity owners are accredited investors;
- a natural person who has individual net worth, or joint net worth with the person’s spouse, that exceeds $1 million at the time of the purchase, excluding the value of the primary residence of such person;
- a natural person with income exceeding $200,000 in each of the two most recent years or joint income with a spouse exceeding $300,000 for those years and a reasonable expectation of the same income level in the current year; or
- a trust with assets in excess of $5 million, not formed to acquire the securities offered, whose purchases a sophisticated person makes. (US Securities and Exchange Commission, 2013)

Therefore, direct investment in hedge funds may not be accessible to everyone who would like to participate in the carry trade.

An alternative to direct investment in hedge funds is through a direct investment in fund-of-funds (FoF). Fund of funds invest in several hedge funds in an attempt for additional diversification. This structure may be advantageous for investors that are not able to invest directly into particular hedge funds either due to size restrictions, closed funds not accepting new capital, or for investors looking for a further layer of diversification. Investing with fund of funds can be seen as costly, as fund of funds add an additional
layer of fees on top of the fees charged by the underlying hedge fund(s). Fund of funds also are restricted to accredited investors, so access may be limited.

Another option is for individual investors to open a foreign exchange (FX) account and trade currencies on their own. This may prove challenging given the structuring of the trade. Trading costs may also prove detrimental to successful execution of the carry trade. Moreover, the inherent inertia to open a separate account for foreign exchange may dissuade individual investors.

There is currently an exchange traded note (ETN) on the market that claims to capture the total return of a carry trade strategy. According to Barclays, the iPath\textsuperscript{®} Optimized Currency Carry ETN is designed to provide investors with exposure to the Barclays Optimized Currency Carry Index\textsuperscript{TM}. The Barclays Optimized Currency Carry Index\textsuperscript{TM} (the "Index") is designed to reflect the total return of an "Intelligent Carry Strategy," which, through an objective and systematic methodology, seeks to capture the returns that are potentially available from a strategy of investing in high-yielding currencies with the exposure financed by borrowings in low-yielding currencies sometimes referred to as the "carry trade" – the pool of currencies to which the Index may apply these strategies is commonly referred to as the "G10 currencies" and includes the U.S. dollar, the euro, the Japanese yen, the Canadian dollar, the Swiss franc, the British pound sterling, the Australian dollar, the New Zealand dollar, the Norwegian krone and the Swedish krona. Please find details for the iPath\textsuperscript{®} Optimized Currency Carry ETN (NYSE: ICI) below:

Table 1

<table>
<thead>
<tr>
<th>ICI Product Profile</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ticker</td>
<td>ICI</td>
</tr>
<tr>
<td>CUSIP</td>
<td>06739H412</td>
</tr>
<tr>
<td>Primary exchange</td>
<td>NYSE Arca</td>
</tr>
<tr>
<td>Closing price</td>
<td>$47.87</td>
</tr>
<tr>
<td>52 week low/high</td>
<td>$44.96/$48.99</td>
</tr>
<tr>
<td>Average volume (20-day)</td>
<td>211</td>
</tr>
<tr>
<td>Yearly fee</td>
<td>0.65%</td>
</tr>
<tr>
<td>Inception date</td>
<td>01/31/2008</td>
</tr>
<tr>
<td>Maturity date</td>
<td>01/28/2038</td>
</tr>
</tbody>
</table>

Source: Barclays iPath website, Yahoo! Finance
Note: Market data as of 4/16/13
Table 2

<table>
<thead>
<tr>
<th>ICI Product Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily indicative value</td>
<td>$48.30</td>
</tr>
<tr>
<td>ETNs outstanding</td>
<td>357,091</td>
</tr>
<tr>
<td>Market capitalization</td>
<td>$17,247,495</td>
</tr>
</tbody>
</table>

Source: Barclays iPath website

Note: Market data as of 4/16/13; The "Daily indicative value" is historical, does not guarantee future performance, and is shown for illustrative purposes only. The issuer or an affiliate will provide the official Redemption Value to the redeeming holder in advance of any redemption; Market Capitalization = Daily Indicative Value x ETNs Outstanding

Table 3

<table>
<thead>
<tr>
<th>ICI Returns (as of 3/31/13)</th>
<th>One month</th>
<th>Three months</th>
<th>Six months</th>
<th>YTD</th>
<th>One year</th>
<th>Three years</th>
<th>Since inception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>1.78%</td>
<td>2.84%</td>
<td>3.27%</td>
<td>2.84%</td>
<td>4.55%</td>
<td>1.72%</td>
<td>(0.15%)</td>
</tr>
<tr>
<td>iPath Indicative Value Return</td>
<td>1.78%</td>
<td>2.77%</td>
<td>3.03%</td>
<td>2.77%</td>
<td>3.99%</td>
<td>1.09%</td>
<td>(0.77%)</td>
</tr>
<tr>
<td>iPath Market Price Return</td>
<td>1.60%</td>
<td>2.59%</td>
<td>2.96%</td>
<td>2.59%</td>
<td>4.18%</td>
<td>0.98%</td>
<td>(0.77%)</td>
</tr>
</tbody>
</table>

Source: Barclays iPath website, BlackRock

Note: Prior to 3/28, Daily Indicative Value was used as a proxy for Market Price

Figure 3

iPath Optimized Currency Carry ETN Price Performance

Source: Yahoo! Finance
Table 4

<table>
<thead>
<tr>
<th>ICI Correlations (as of 3/31/13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barclays Intelligent Carry Index™</td>
</tr>
<tr>
<td>S&amp;P 500</td>
</tr>
<tr>
<td>MSCI EAFE Index</td>
</tr>
<tr>
<td>MSCI Emerging Markets Index</td>
</tr>
<tr>
<td>Barclays US Aggregate Bond Index</td>
</tr>
<tr>
<td>Dow Jones-UBS Commodity Index Total Return</td>
</tr>
</tbody>
</table>

Source: Barclays iPath website, S&P, Barclays, MSCI Inc., Dow Jones Opco, LLC, and UBS Securities LLC, 5 years based on monthly returns

Figure 4

ICI Currency Breakdown (weight)

Source: Barclays

Note: Data as of 4/15/13

ETNs seem to be out of favor with investors as only two of the top 100 exchange-traded products (ETPs), measured by trading volume, are ETNs, with the remaining 98 being exchange-traded funds. Exchange-traded notes eliminate tracking error because the issuer bases returns on a specific index, in ICI’s case, the Barclays Optimized Currency Carry Index, and not a group of holdings. ETNs also provide advantageous tax treatment because all returns are classified as capital gains.

This does not hold true for ICI -- in December 2007, the IRS issued an adverse tax ruling on currency linked ETNs -- the rule states that any financial instrument linked to a single currency regardless of whether the instrument is privately offered, publicly offered or traded on an exchange should be treated like debt for federal tax purposes. Therefore, any interest is taxable to investors, even though the interest is reinvested and not paid out until the holder sells any such financial instrument, including an ETN, or
the contract, matures and the gain or loss on sale or redemption will generally be ordinary, and investors will not be able to elect capital gain treatment.

Exchange-traded notes are essentially a combination of unsecured debt and a total return swap. This exposes the investor to counterparty risk of the issuer. This proved to be detrimental to investors who were invested in Lehman Brothers ETNs at the time of the bank’s demise. For the most part, ETNs are thinly traded, which can lead to gross imbalances between price and net asset value (NAV).

Exchange-traded funds (ETFs) on the other hand, are structured so the holder owns a basket of securities. If the issuer goes bankrupt, you should receive the underlying assets or the market value of the assets. The first exchange traded fund was launched in 1993 by State Street Global Advisors. The ETF was the Standard & Poor’s depository receipt (SPDR), commonly referred to as “spiders”, which tracks the Standard & Poor’s 500 Index (S&P 500). The easiest way to think about ETFs are as mutual funds that trade like stocks. Since the introduction of SPDR, ETFs have experienced tremendous growth, as evidenced in Figure 5.

![Number of ETFs Traded by Year](image)

Source: CRSP, Center for Research in Security Prices. Graduate School of Business, The University of Chicago 2013. Used with permission. All rights reserved. www.crsp.uchicago.edu

In the traditional open end fund, investors buy or redeem their shares once per day at the end of the trading day at a price determined by the market value of the net assets in the fund. If an investor wanted to initiate a new position, or add to an existing position of a particular open end mutual fund, he/she would need to contribute capital to the fund and in exchange, that fund would issue him/her new shares. The fund would then use the new capital to invest in additional assets dependent on the fund’s investment policy.
If the investor wanted to redeem part or all of his/her shares, the fund would return capital in the amount of the shares’ worth at the end of the trading day. The fund would then reduce the number of shares in accordance to the redemption. Therefore, the number of shares in a traditional open-end fund fluctuates depending on fund flows. Investors in these traditional open-end funds are required to communicate their desire to buy/sell before a certain cutoff time, typically a few hours before the end of the trading day. This is required so fund managers would have enough time to buy/sell assets in the fund in order to accommodate these orders, however, investors would not know the buy/sell price until the end of the trading day, or at 4PM Eastern Standard Time. Furthermore, it was not uncommon to have a certain minimum purchase size, or restrictions and/or limitations on trading. This purchase/redemption process is different than those for traditional equities.

Closed-end funds raise capital in a manner similar to traditional companies, or through an initial public offering. Unlike the open-end fund described above, the number of shares is fixed. If investors want to buy or redeem their shares, then they need to find other investors to be on the other side of the trade; unlike their open-end counterparts, closed-end funds do not have a legal obligation to create/liquidate shares based on demand. Closed-end funds are listed as publicly traded companies, and thus can be traded throughout the day. Shares of closed-end funds tend to trade in excess or at a discount to net asset value; this is a function of demand.

Exchange-traded funds share characteristics of both open and closed-end funds. ETFs represent a fractional ownership of the underlying securities, are listed on an exchange and thus can be traded intraday, and respective share count can fluctuate based on demand. ‘Authorized participants’ such as market makers, specialists, or large institutional investors, create ETF shares by assembling a portfolio of stocks that match the holdings of the ETF, the portfolio is then given to the fund and exchanged for shares.

ETFs have certain advantages to their mutual fund counterparts. Since ETFs are traded on an exchange, investors benefit from intraday pricing. Other advantages include the ability to utilize limit and stop orders, be purchased on margin, or borrow them to implement short positions.

ETFs are also considered a low cost alternative to mutual funds. Expense ratios reflect the percentage of assets under management (AUM) taken to cover associated costs such as fund management, administrative, and operating costs. Trading costs were quite low since they did not need to accommodate fund flows. It should be noted that investors do incur brokerage fees when trading in and out of ETFs, just as they would when trading traditional shares of a company.

Proponents also argue that ETFs are tax-efficient investment vehicles. As opposed to mutual funds where when investors redeem shares, the fund may be forced to sell underlying securities which would create taxable capital gains all fund shareholders, ETFs were bought and sold on an exchange instead of directly with the fund, therefore, most transactions involve investors exchanging shares on the open market and did not impact the fund directly. Therefore, their actions would not impact all the investors of the ETF, only those who decided to sell would be responsible for taxes on capital gains. Investors were thus responsible only for taxes resulting from their own actions. ETFs are also transparent financial
instruments because they disclose their holdings daily. Mutual funds are only required to disclose their holdings on a quarterly basis.

Not since the advent of index funds, hedge funds, or possibly the mutual fund itself, has the asset management industry witnessed an innovation as profound as exchange traded funds (ETFs). This disruptive investment vehicle has given individual investors access to asset classes and strategies once out of reach, attracted assets at an industry-leading clip and turned the passive investment arena into a hotbed of competition (McKinsey, 2011). Considering that retail investors who may want to gain exposure to the carry trade without paying the fees associated with hedge funds, the exchange-traded structures mentioned above could be appealing. For the reasons mentioned above, an exchange traded fund may be particularly appealing for investors.

At current, there is a carry trade ETF on the market, the PowerShares DB G10 Currency Harvest Fund (Ticker: NYSE Arca: DBV). Please find the product details below:

<table>
<thead>
<tr>
<th>Ticker</th>
<th>DBV</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUSIP</td>
<td>73935Y102</td>
</tr>
<tr>
<td>Primary Exchange</td>
<td>NYSE Arca</td>
</tr>
<tr>
<td>Closing Price</td>
<td>$27.31</td>
</tr>
<tr>
<td>52 week low/high</td>
<td>$23.34/$28.09</td>
</tr>
<tr>
<td>Average volume (3 months)</td>
<td>139,692</td>
</tr>
<tr>
<td>Management fee</td>
<td>0.75%</td>
</tr>
<tr>
<td>Estimated futures brokerage fee</td>
<td>0.06%</td>
</tr>
<tr>
<td>Expense ratio</td>
<td>0.81%</td>
</tr>
<tr>
<td>Listing date</td>
<td>09/18/2006</td>
</tr>
</tbody>
</table>

Source: Invesco PowerShares website, Yahoo! Finance
Note: Market data as of 4/16/13

| Price | $27.31 |
| Shares outstanding | 13.40 mm |
| Market capitalization | $366.0 mm |

Source: Invesco PowerShares website
Note: Market data as of 4/16/13; Market Capitalization = Price x Shares outstanding

<table>
<thead>
<tr>
<th>DBV Returns (as of 3/31/13)</th>
<th>YTD</th>
<th>One year</th>
<th>Three years</th>
<th>Five years</th>
<th>Since inception</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index history</td>
<td>DB G10 Currency Harvest Index</td>
<td>4.15%</td>
<td>9.25%</td>
<td>5.66%</td>
<td>2.19%</td>
</tr>
<tr>
<td>Fund history</td>
<td>Net asset value</td>
<td>3.98%</td>
<td>8.50%</td>
<td>4.85%</td>
<td>1.42%</td>
</tr>
<tr>
<td></td>
<td>Market price</td>
<td>4.13%</td>
<td>8.79%</td>
<td>4.88%</td>
<td>1.44%</td>
</tr>
</tbody>
</table>

Source: Invesco PowerShares website
PowerShares DB G10 Currency Harvest Fund Price Performance

Source: Yahoo! Finance

Table 8

<table>
<thead>
<tr>
<th>DBV Correlations (as of 3/31/13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB G10 Currency Harvest Index</td>
</tr>
<tr>
<td>S&amp;P 500</td>
</tr>
<tr>
<td>U.S. Treasury Bills Index</td>
</tr>
</tbody>
</table>

Source: Invesco PowerShares website
IV. Launching a New Exchange Traded Fund

To start a new exchange traded fund, the fund provider must first register the product with the Securities and Exchange Commission (SEC) under the Investment Company Act of 1940, also known as the “40 Act.” Managers of exchange traded funds often have to request SEC exemptions from certain restrictions under the 40 Act (Citi Transaction Services, 2013). Bringing a new ETF market is a lengthy and challenging process. In order to do so, one must consider a number of factors ranging from product design, partnerships, registration, marketing, seeding, and listing. Each factor will be discussed briefly in this paper.

During the initial product design stage, the fund provider will design the exchange traded fund that he/she hopes to establish. The provider will choose an appropriate legal structure, which involves tax considerations, regulatory issues, and accounting practices. Next, the issuer will need to determine how to address issues related to the intended underlying securities such as liquidity and transparency. How the trades are cleared and settled also needs to be taken into consideration. The provider then needs to decide on the complexity of the fund, whether it will be a multiclass, master-feeder, or fund of funds, and how to address intellectual property such as patents and trademarks (Frush Financial Group, 2012).

The fund provider also needs to form partnerships with numerous service providers and intermediaries. This group includes a stock exchange where the fund will be listed, custodian, distributor, specialist firm and authorized participants. All these other factors should be considered secondary to shareholder demand and satisfying shareholder preferences.
The registration process with the SEC is the next step in launching a new exchange traded fund. The provider will file a registration statement, prospectus, and exhibits for the planned ETF. The SEC has been known to be slow with their responses and the approval process could take many months and in certain cases, even longer. This timeframe for this process with the SEC is uncertain, as the commission only faces potential downside. If all goes well, no praise will go to the SEC, however, if something goes wrong, they will shoulder the brunt of complaints.

Once the SEC has granted approval, marketing becomes integral. If no investors are aware of the new product, the issuer will not see inflows of capital. Another interesting point that should be made is the importance of a good ticker. To expand on this point, gold is a commodity that will be used for illustrative purposes. The two ETFs used to demonstrate the importance of selecting a good ticker are SPDR Gold Shares (NYSE Arca: GLD) and iShares Gold Trust (NYSE Arca: IAU). Please find relative price performance each security below:

Figure 8

Comparative Price Performance

<table>
<thead>
<tr>
<th>Date</th>
<th>GLD</th>
<th>IAU</th>
<th>Gold</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/28/05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/28/06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/28/07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/28/08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/28/09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/28/10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/28/11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/28/12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/28/13</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: World Gold Council and Yahoo! Finance

*The gold price used in the chart represents spot price for an ounce of gold and is the London PM fix. This price is quoted in US dollars. The gold price reflects not only the inherent value of gold, but also the relative strength of the currency in which it is quoted.*
The gold price used in the table represents spot price for an ounce of gold and is the London PM fix. This price is quoted in US dollars. The gold price reflects not only the inherent value of gold, but also the relative strength of the currency in which it is quoted.

As shown in Figure 8 and Table 9, GLD and IAU trade relatively in line with one another. As can be expected, the ETFs track the price movements of gold. Given the relative performance of GLD, IAU, and the underlying commodity, one would expect that investors would be relatively indifferent between owning GLD or IAU. However, that does not seem to be the case when the dollar volume traded is compared. Please find additional detail below:

### Table 9

<table>
<thead>
<tr>
<th></th>
<th>YTD</th>
<th>One year</th>
<th>Three years</th>
<th>Five years</th>
<th>Since 1/28/05</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPDR Gold Shares (GLD)</td>
<td>(13.8%)</td>
<td>(9.8%)</td>
<td>18.7%</td>
<td>59.7%</td>
<td>227.0%</td>
</tr>
<tr>
<td>iShares Gold Trust (IAU)</td>
<td>(13.8%)</td>
<td>(9.5%)</td>
<td>19.4%</td>
<td>60.8%</td>
<td>228.8%</td>
</tr>
<tr>
<td>Gold¹</td>
<td>(13.9%)</td>
<td>(10.8%)</td>
<td>19.2%</td>
<td>62.8%</td>
<td>234.2%</td>
</tr>
</tbody>
</table>

¹ The gold price used in the table represents spot price for an ounce of gold and is the London PM fix. This price is quoted in US dollars. The gold price reflects not only the inherent value of gold, but also the relative strength of the currency in which it is quoted.

Source: World Gold Council and Yahoo! Finance

Figure 9

![Daily Dollar Volume Traded (in $ millions)](image)

Source: CRSP, Center for Research in Security Prices. Graduate School of Business, The University of Chicago 2013. Used with permission. All rights reserved. www.crsp.uchicago.edu

Note: GLD initiated trading on 11/18/04 and IAU started trading on 1/28/05
A huge disparity can be seen in Figures 9 and 10 in terms of dollar trading volume of GLD when compared to the dollar trading volume of IAU. Even though IAU has outperformed GLD on a returns basis, investors seem to prefer GLD. This can be explained in three ways – First, the tickers could account for the vast difference between dollar trading volume. When one thinks of gold, GLD could be easier to remember when compared to the commodity as it is represented on the periodic table with the letter “I” preceding the “AU” designation. Another explanation could be first mover advantage. Since GLD initiated trading 71 days prior to IAU, investors may have become more aware of GLD, and thus associated GLD with gold moving forward. Lastly, the third explanation is an extension of the second, and investors may view ETFs as network assets, or the belief that a product increases in value depending on the number of other users. Since one of the key differentiating factors of ETFs compared to their mutual fund counterparts is the ability to trade the securities intraday, as the dollar volume traded increases, the attractiveness to other investors could increase linearly.

The next phase of the process comes in the form of incubation, or the seed phase. During this phase, authorized participants will deliver baskets of underlying securities determined by the ETF provider for deposit into the ETF’s portfolio with a custodian. The authorized participant shall receive in return, ETF shares of equivalent value, commonly referred to as creation units. Once the ETF is seeded, it can be listed on the selected exchange and trading can commence. Please find an illustrative diagram of how an ETF works, below:
Intermediaries  

Retail Investors  

Institutions  

Secondary Market Trading  

Market Makers  

Basket Redemption  

Basket Creation  

Exchange Traded Fund  

Authorized Participant  

Creation Units / Shares  

Securities  

Units  

Source: State Street Global Advisors, Morgan, Lewis & Bockius LLP
A New Carry Trade ETF

In the design phase, it is important to determine how the underlying portfolio will be constructed. In terms of the carry trade, it is not as simple as just borrowing the low interest rate currencies in order to buy higher interest rate currencies. The fund manager must consider which currencies should be eligible for inclusion and how inclusion will be determined, on an absolute basis or on a spread basis. In the case of this new carry trade product, the fund manager will assess LIBOR rates of the eligible currencies – comparing the interest rate of eligible currencies on an absolute basis.

Next, the fund manager will need to determine how to allocate the capital of the fund. The two methods considered in this study are using an equal weight allocation and an interest rate weighted allocation. The former methodology allocates an equal amount of capital to all the eligible currencies identified to be borrowed and purchased. The second methodology, interest rate weighted allocation, means to allocate capital based on the interest rate – the capital allocated is relative to the interest rate of eligible securities identified to be borrowed or purchased. In order to make these important design decisions, historical performance was analyzed and interpreted. Please find a comparison of interest rate weighted and equal weight portfolios below:

Figure 12

Interest Rate Weighted Carry Trade Performance (1995 - Current)

Source: Bloomberg
Figures 11 and 12 show carry trade performance based on different durations. Figure 11 shows interest rate weighted portfolios using one-month LIBOR rates that rebalances on a monthly basis, three-month LIBOR rates that rebalances quarterly, six-month LIBOR rates that rebalance biannually, and lastly, 12-month LIBOR rates that rebalances annually. Figure 12 shows equal weight portfolios for the same durations. In both cases, 12-month duration outperforms the other durations. Therefore, the carry trade ETF under construction will base its capital allocation on 12-month interest rates.
One-Month LIBOR Carry Trade Performance (1995 - Current)

Interest rate weighted - Equal weight

Source: Bloomberg

Three-Month LIBOR Carry Trade Performance (1995 - Current)

Interest rate weighted - Equal weight

Source: Bloomberg
Figures 13, 14, 15, and 16 compare the daily performance of an interest rate weighted portfolio to an equal weight portfolio at durations of one, three, six and 12 months. In three of the four cases, the interest rate weighted portfolio outperformed its equal weight counterpart. The lone exception was in the case of
12-month duration, where the interest rate weighted portfolio returned 75.29% since inception compared to 75.62% since inception for the equal weight portfolio.

Table 10

<table>
<thead>
<tr>
<th>Summary</th>
<th>1m - EW</th>
<th>1m - IRW</th>
<th>3m - EW</th>
<th>3m - IRW</th>
<th>6m - EW</th>
<th>6m - IRW</th>
<th>12m - EW</th>
<th>12m - IRW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return - cumulative</td>
<td>43.14%</td>
<td>53.00%</td>
<td>32.00%</td>
<td>50.58%</td>
<td>36.64%</td>
<td>53.07%</td>
<td>75.62%</td>
<td>75.29%</td>
</tr>
<tr>
<td>Return - per annum</td>
<td>1.98%</td>
<td>2.36%</td>
<td>1.53%</td>
<td>2.27%</td>
<td>1.72%</td>
<td>2.36%</td>
<td>3.13%</td>
<td>3.12%</td>
</tr>
<tr>
<td>Volatility - per annum</td>
<td>10.67%</td>
<td>11.15%</td>
<td>10.92%</td>
<td>11.39%</td>
<td>11.08%</td>
<td>11.20%</td>
<td>11.55%</td>
<td>11.40%</td>
</tr>
<tr>
<td>Return/Risk</td>
<td>0.1857</td>
<td>0.2112</td>
<td>0.1403</td>
<td>0.1990</td>
<td>0.1556</td>
<td>0.2106</td>
<td>0.2711</td>
<td>0.2736</td>
</tr>
</tbody>
</table>

Source: Bloomberg
Note: IRW denotes interest rate weighted, EW denotes equal weight

As shown in Table 10, the volatility of an equal weight portfolio tends to be lower than that of its interest rate weighted counterpart. The lone outlier is the 12-month duration, where the volatility of the equal weight portfolio is 11.55% compared to 11.40% for the interest-rate weighted portfolio. Lower volatility in itself does not mean that an equal weight allocation is the ideal methodology. When comparing risk-adjusted returns, the interest rate weighted portfolios outperform the equal weight portfolios for every duration. Therefore, for the carry trade portfolio under construction, an interest rate weighted allocation methodology will be used.

Figure 18

Annual Return Contribution by Component Type (1995 - 2012)

Source: Bloomberg
Figure 17 shows the return contribution by component for the 12-month duration interest rate weighted portfolio. In 12 out of 18 periods, the interest component is generating the majority of the returns.

Although there currently is another carry trade ETF available, such as the PowerShares DB G10 Harvest Fund, there is an opportunity for another carry trade ETF. Based on the data shown above, the new carry trade ETF should be 12-months in duration and interest rate weighted. This means that at the inception of trading and at the end of each subsequent period, the fund should allocate its total capital in the eligible currencies, the Australian dollar, British Pound, Canadian dollar, the Euro, Japanese yen, and Swiss franc, based on their respective interest rates. At inception, or on the last trading day of each period, the fund manager will rank all of the eligible currencies from highest to lowest based on their interest rates. At which time, the fund will purchase forward contracts in the two currencies that have the highest respective interest rates and sell forward contracts in the two currencies with the lowest interest rates. Both transactions will be made in the amount of the total capital of the fund at the end of the period, thereby creating a market neutral portfolio in dollar terms. In the rare case that multiple currencies are identified to be included based on their interest rates, then the allocation between the currencies will be split evenly amongst them. For example, if at the end of a given period, the interest rates for the eligible currencies are as shown in Figure 19.

<table>
<thead>
<tr>
<th>Currency</th>
<th>Interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australian dollar</td>
<td>6.0%</td>
</tr>
<tr>
<td>British pound</td>
<td>5.5%</td>
</tr>
<tr>
<td>Canadian dollar</td>
<td>5.5%</td>
</tr>
<tr>
<td>Euro</td>
<td>2.0%</td>
</tr>
<tr>
<td>Japanese yen</td>
<td>0.5%</td>
</tr>
<tr>
<td>Swiss franc</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

For illustrative purposes, assume the total capital to be allocated is $1,000,000. In this case, \( \frac{6.0\%}{(6.0\% + 5.5\%)} \), or $521,739 would be allocated to Australian dollars. The remaining $478,261 will be allocated to the currency with the second highest interest rate. Since both the British pound and Canadian dollar share the second highest interest rate, each currency will be allocated half of the $478,261 or $239,130. For the short component, \( \frac{0.5\%}{(1.0\% + 0.5\%)} \), or $333,333 will be allocated to the Japanese yen, and the remaining $666,667 will be allocated to Swiss francs. The resulting portfolio can be found in Figure 18.
At the end of each subsequent period, the returns from the long component and the short component will be netted against one another. At the beginning of each period, the net return will be added or deducted from the total capital of the fund and the new currency allocations will be determined based on the total capital. Although the interest portion could be distributed to investors, this carry trade product has elected to reinvest the interest payments in the fund.

The new ETF will list its shares on the NYSE Arca, under the symbol KRY. The ETF is designed for investors who want a cost-effective and convenient way to take advantage of the carry trade. In addition to the advantages associated with the carry trade in general, investing in the ETF can be easier and less expensive for an investor than constructing and trading a comparable foreign currency portfolio. The ETF can also serve as a simple way for investors to gain exposure to currencies in their investment portfolio. The shares may be bought and sold on the NYSE Arca like other exchange-listed securities.

**Risks of Investing in the Carry Trade ETF**

Investors can lose money investing in shares of the carry trade ETF as past performance is not indicative of future results. Therefore, investors need to make investment decisions without relying on the ETF’s performance history. Investors need to consider the risks described below before making an investment decision.

The value of the shares relates directly to the value of the underlying currencies held by the fund and movement in the price of these currencies could have an adverse effect on an investment in the shares. The shares of the ETF are designed to reflect the changes in value of the currencies held over time.
through the fund’s portfolio of forward contracts. The value of the shares should relate directly to the
value of the portfolio, less the liabilities of the fund. The price of the currencies may fluctuate widely.
Several factors may affect the prices of the currencies, including, but not limited to:

- National debt levels and trade deficits, including changes in balances of payments and trade;
- Domestic and foreign inflation rates and investors’ expectations concerning inflation rates;
- Domestic and foreign interest rates and investors’ expectations concerning interest rates;
- Currency exchange rates;
- Investment and trading activities of mutual funds, hedge funds and currency funds;
- Global or regional political, economic or financial events and situations;
- Supply and demand changes which influence the foreign exchange rates of various currencies;
- Monetary policies of governments (including exchange control programs, restrictions on local
  exchanges or markets and limitations on foreign investment in a country or on investment by
  residents of a country in other countries), trade restrictions, currency devaluations and
  revaluations;
- Governmental intervention in the currency market, directly and by regulation, in order to
  influence currency prices; and
- Expectations among market participants that a currency’s value soon will change (PowerShares
  DB G10 Currency Harvest Fund Prospectus, 2012).

The net asset value of shares may not correspond to market price of the shares, therefore, baskets may be
created or redeemed at a value different from the market price of shares. The net asset value per share
will change as fluctuations occur in the market value of the portfolio. This price difference may be caused
by supply and demand forces in the marketplace. Investors also should note that the size of the ETF may
change over time as baskets are created and redeemed.

The ETF is not actively managed and rebalances once a year. Therefore, if positions in any of the
currencies are declining in value, the ETF will not close out these positions, except in connection with a
re-weighting of the portfolio. The portfolio is re-weighted annually based upon the highest and lowest
yielding eligible currencies at the time of rebalancing. At any point in time between rebalancings, the
currencies may fall out of the eligibility criteria. Therefore, the ETF may not be able to exploit the trend
that currencies associated with relatively high interest rates tend to rise in value relative to currencies
associated with relatively low interest rates. If the interest rates of the underlying currencies change
drastically during any year, the ETF may find itself in the unenviable position where the effects of this
trend will cause the ETF to lose money. Even if the interest rates associated with the underlying
currencies shift considerably between rebalancings, the ETF will not adjust its portfolio of currencies
until the next rebalancing.

Given the long/short nature of the strategy, the ETF is expected to rise as a result of any upward price
movement on long positions and any downward price movement on short positions. Therefore, if the
fund’s long positions decrease or the fund’s short positions increase, then the value of shares may decline.
The decline may be amplified if both sides of the trade fail at the same time.

The exchange where shares are listed, which in this case is the NYSE Arca, may have adverse effects on
the trading of shares. This may influence an investor’s ability to sell his/her shares. The shares are listed
for trading on the NYSE Arca under the market symbol KRY. Trading may be halted due to market conditions or for reasons the NYSE Arca deem inadvisable. Although the shares are listed and traded on the NYSE Arca, there is no assurance that there will be a market for the shares. If investors need to sell shares when no active market exists, the price could be adversely affected.

The six eligible currencies are the Australian dollar, British pound, Canadian dollar, Euro, Japanese yen, and Swiss francs. The portfolio is comprised of a subset of the six eligible currencies. Thus, the portfolio is rather concentrated in terms of number of currencies represented. Concentration in fewer currencies may result in additional volatility. In addition, price volatility may have adverse effects on investments in the ETF. Currencies have a high degree of variability and are subject to rapid and substantial changes. Consequently, investors could experience significant losses.

Short selling exposes the ETF to unlimited losses. The ETF holds short positions in the lowest-yielding eligible currencies. A short position in foreign currency requires the ETF to buy back the amount it borrowed at a future date. The ETF will profit if the price of the foreign currency falls and will lose money if the price of the foreign currency rises. Hypothetically, the price of the foreign currency could rise to infinity, therefore, a short position exposes the ETF to unlimited liability.

The total return generated by the fund is reduced by expenses and transaction costs. Fees are assessed to the investor, regardless of performance. These fees will have an adverse impact on the performance of the fund. In addition, the current fund manager may discontinue their management of the ETF. Investors cannot be assured that the current fund manager will be able to deliver positive returns, and a change in manager could impact the performance of the ETF, both positively and/or negatively.

V. The Carry Trade ETF in Retirement Portfolios

The Retirement Market

According to the Investment Company Institute, the national association of U.S. investment companies, including mutual funds, closed-end funds, exchange-traded funds, and unit investment trusts, U.S. total retirement market assets reached $19.5 trillion in 2012.
Figure 20

Total US Retirement Market (in $ billions)

Sources: Investment Company Institute, Federal Reserve Board, National Association of Government Defined Contribution Administrators, American Council of Life Insurers, and Internal Revenue Service Statistics of Income Division

Figure 21

Total US Retirement Market by Assets

Sources: Investment Company Institute, Federal Reserve Board, National Association of Government Defined Contribution Administrators, American Council of Life Insurers, and Internal Revenue Service Statistics of Income Division
An argument can be made for ETFs to become more prevalent in retirement plans. As demonstrated in Figure 20, defined contribution plans are becoming a larger piece of the retirement market, growing from 17.6% of the total retirement market in 1974 to 25.9% by the end of 2012. Citing data from the Labor Department, there are currently 483,000 individual retirement account plans covering 72 million participants. With the changing landscape and an increased focus on cost and transparency in 401(k) plans, it is time to retire the old ideas of what should comprise the 401(k) plan. The Department of Labor has instituted new rules requiring better transparency of fees.

According to Bloomberg, ETFs control just one percent of assets in defined contribution plans in the United States. As previously mentioned, ETFs could provide a cost advantage to their mutual fund counterparts. Potential additional benefits may be found in risk diversification, avoidance of “style drift,” and additional transparency. In contrast, one of the largest benefits cited earlier in this paper, the ability to trade intraday, could be viewed as a negative for the retirement market. The ability to trade during market hours could be perceived as “putting a loaded gun in the employee’s hand.”

Why are ETFs not widely adopted by investors in their 401(k) plan?

Two potential barriers for ETF providers are the 401(k) plan sponsors and investor wariness. The first obstacle is that ETFs are not widely available on the investment menu that employees select from. Second, the investor wariness stems from simply not understanding what these financial instruments are – a study by Mintel Comperemedia finds that nearly 60% of investors pass on ETFs because they do not know what they are.

In an effort to help workers save more for retirement, Congress passed the Pension Protection Act (PPA) in 2006. The Qualified Default Investment Alternative (QDIA), a name given to certain types of investment services that can be used by employers to provide retirement account management to their employees. Employers who do not implement a QDIA may be legally responsible if their retirement plan fails to produce adequate results for participants. In establishing a QDIA, the plan sponsor is selecting a default investment for each of the plan participants' retirement accounts. Employees can still opt out if they want to make their own asset allocation decisions.

With the introduction of QDIA, the purveyance of ETFs in the retirement market may become more difficult. In order to become the default option in a retirement plan, one must ask, what is in it for the plan sponsor? As gatekeeper to the retiree, the plan sponsor has no reason to deviate from the status quo. However, if he/she chooses to deviate and introduce an ETF option as QDIA, then that person just opens him/herself to scrutiny and potential lawsuits if the decision turns out poorly.

With regards to the Carry Trade ETF product, it would not be under consideration for QDIA. The carry trade ETF is simply too specialized of a product to be under consideration. However, the retirement market still presents an interesting opportunity and a wealth of potential demand. The carry trade ETF could be sold as a complimentary product to broaden diversification within retirement portfolios.
Total Defined Contribution Plan Holdings (in $ billions)

Source: Investment Company Institute

Figure 22

Defined Contribution Plan Holdings of Mutual Funds by Fund Type

Source: Investment Company Institute

1 Hybrid funds invest in a mix of equities and fixed-income securities. The bulk of lifecycle and lifestyle mutual funds is counted in this category.
As can be seen in Figures 21 and 22, as assets have grown in defined contribution plans, a trend is emerging where retirees are moving assets out of domestic equities and into other asset classes. This could mean that investor preferences are shifting away from traditional equities and the appetite for products like the carry trade ETF is growing.

In order to penetrate this highly competitive market, marketing and distribution are integral factors to success. Mutual funds are sold through five principal distribution channels: (1) the direct channel, (2) the advice channel, (3) the retirement plan channel, (4) the supermarket channel, and (5) the institutional channel (Reid and Rea, 2003).
<table>
<thead>
<tr>
<th>Channel</th>
<th>Principal investors using the channel</th>
<th>Companies or organizations providing transaction services</th>
<th>Method of conducting share transactions</th>
<th>Mutual funds offered in the channel</th>
<th>Investor services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>Individual investors</td>
<td>Mutual fund companies</td>
<td>Transaction orders placed directly with mutual fund companies by mail, telephone, or Internet, or at customer-service centers</td>
<td>Mutual funds of the fund company offering direct transactions</td>
<td>Investment information</td>
</tr>
<tr>
<td>Advice</td>
<td>Individual investors</td>
<td>Full-service securities firms, registered investment adviser firms, and insurance agencies</td>
<td>Transaction orders placed with representatives of firms providing transaction services who transmit orders to fund companies</td>
<td>Mutual funds from a large number of fund companies</td>
<td>Investment information, advice, and ongoing assistance, access to funds from different companies within one account</td>
</tr>
<tr>
<td>Retirement Plan</td>
<td>Participants in defined contribution plans</td>
<td>Plan sponsor or employer</td>
<td>Transaction orders placed with plan administrators who transmit orders to fund companies</td>
<td>Limited number of mutual funds selected by plan sponsor</td>
<td>Investment information</td>
</tr>
<tr>
<td>Supermarket</td>
<td>Individual investors and registered investment advisers acting on behalf of individual investors</td>
<td>Discount brokers</td>
<td>Transaction orders placed with discount brokers who transmit orders to fund companies</td>
<td>Mutual funds from a large number of fund companies</td>
<td>Investment information, access to funds from different fund companies within one account</td>
</tr>
<tr>
<td>Institutional</td>
<td>Trusts, businesses, financial institutions, endowments, and other institutional investors</td>
<td>Mutual fund companies</td>
<td>Direct contact with mutual fund companies or with agents of the fund companies</td>
<td>Mutual funds of the fund companies offering direct transactions</td>
<td>Investment information</td>
</tr>
</tbody>
</table>

Source: Investment Company Institute, Reid and Rea 2003
Similar considerations should be made when considering the distribution and marketing of the carry trade ETF. With respect to marketing, the fund provider needs to decide how and to whom the product will be marketed, before they can decide if it makes sense as a retirement product. There are three different sets of people one should consider when marketing the carry trade ETF, the public, assemblers, and financial advisors.

The public channel would mean that the product will be widely available to retail investors, and it would be on the onus of the investor to seek out this product and understand its inherent risks and benefits to his/her retirement portfolio. This may prove difficult considering the typical investor’s knowledge of currency products and in particular, the mechanics behind the carry trade. Trying to market the carry trade ETF directly to retail investors would require a larger marketing budget than alternative distribution methods as the fund provider will need to inform/educate a larger audience.

Selling the carry trade ETF through a select group of financial advisors might make more sense than the retail channel. This strategy is implored by Dimensional Fund Advisors and AQR Capital Management. A retail investor that is interested in buying Dimensional’s or AQR’s funds, cannot simply go out into the market and buy those respective funds, they must go through authorized sellers of each respective fund. According to the Dimensional Fund Advisors website:

One of the cornerstones of our approach is a client base committed to their investments through all market cycles, both good and bad. Buy-and-hold investors enable us to keep turnover and transaction costs low, which adds to their bottom line. We believe financial advisors play a vital role in educating investors about the financial science that drives this approach and in instilling the discipline required to benefit from it.

As a result, Dimensional does not offer funds directly to individual investors. Instead, we choose to make our funds available through a select group of fee-only advisors.

Investment success begins with a properly diversified portfolio. Constructing such a portfolio is a complicated process that can benefit from the guidance of a qualified, professional advisor. In our view, independent advisors free from the conflicts associated with commission-based transactions are best positioned to assist individual investors in developing long-term investment solutions (Dimensional Fund Advisors, 2013).

The benefit from such an approach is the fund and its associated manager will get an investor base that is educated about the role of the particular fund in a diversified portfolio of investments. This should, in theory, translate well to the carry trade ETF. Given that the carry trade is a bit “off the beaten path,” financial advisors can serve a vital role in educating investors about the carry trade and its mechanics, as well as its diversification implications on their respective investment portfolios.

The last approach to consider is distribution of the fund through assemblers, or those that offer an integrated product to retirees. This boils down to whether the fund provider wants an integrated product or intermediate product. An intermediate product in an investment product sense is a separate product that will be “bolted on” in order to add a new dimension to your existing portfolio. As a part of an
integrated solution, the fund provider would sell the fund directly to a plan advisor and the advisor will then offer a complete solution to investors.

This option could be compelling to the fund provider as this focus could further reduce the number of parties you need to educate about the carry trade ETF and how it fits into an investment portfolio. On the other hand, this could limit assets under management for the fund provider as the fund would be dependent on the integrated solution provider and its ability to sell the integrated solution.

In order to penetrate the vast retirement market, the key will be on simplicity and ease of use. This bodes well for the carry trade ETF product as the basis of the trade is simple to understand. These three methods of distribution are not mutually exclusive, and thus multiple avenues should be considered.

It is highly unlikely that retirees will seek out a product like the carry trade ETF, therefore, the ETF should be offered to financial advisors who will then serve as intermediaries. The product would then be “bolted-on” as a complimentary product to existing investment portfolios. This way, the carry trade ETF can serve a purpose as it applies an additional level of diversification. Through this diversification, hopefully, the overall volatility of the investment portfolio will be decreased. Moreover, the carry trade ETF should also be distributed to assemblers, where the ETF can serve as a piece of an integrated solution.

VI. Conclusion

As previously discussed, the benefits of the carry trade are considerable. Wall Street seems to share this view as various products exist in order to take advantage of the violation of uncovered interest rate parity. However, investors need to understand that there are numerous risks associated with the carry trade. Although the “buy low, sell high” mantra is simple to understand, implementation of the trade is complex and difficult to optimize.

The investment management industry is highly competitive and in order to thrive in such a market, every product needs to address investor demand. When launching a new financial product, the main concern should be around customer preferences and whether the product is meeting those preferences. In the case of an ETF, a fund provider must consider the design, registration, its partners, and marketing and distribution. Of these factors, marketing and distribution is likely the most important, as it is hard to attract assets if customers are not aware of the product or its existence.

The retirement market represents a huge opportunity for not only a carry trade ETF, but for all ETFs. In order to take advantage of the retirement market, a carry trade product should market itself as a complementary piece of an integrated retirement solution. The majority of retirees do not want to be burdened with making a lot of decisions when it comes to their retirement portfolio. Therefore, in order to take advantage of the ~$20 trillion market, one should devise a retirement portfolio that is well diversified across asset classes, geographies, and industries – of which, a carry trade ETF could represent a small piece.
Limitations and Further Research

In order to truly gauge the performance of the carry trade, one needs to consider transaction costs. In practice, transaction costs will decrease the returns generated from any investment strategy. The exclusion of transaction costs is the single largest limitation to the research presented in this thesis. The strategies mentioned in this paper were limited to six eligible currencies, specifically the Australian dollar, British pound, Canadian dollar, Euro, Japanese yen, and Swiss franc, and additional research should consider including additional currencies. Emerging market currencies would be of particular interest as a comparison between the currencies of developed countries and emerging markets could prove very compelling.

The focus of this paper was on replicating the carry trade through an exchange traded fund; however, the exchange traded fund structure could prove useful in the replication of other popular hedge fund strategies. Popular strategies that could be considered for replication are merger arbitrage, convertible arbitrage, distressed debt, and statistical arbitrage. Short extension funds, or funds that are net 100% long, but include a short component that “extends” the long component might also be attractive as an ETF. Typical short extension funds are 130-30 funds, or funds with 130% long and 30% short positions. Another consideration may be to focus on the asset allocation side of things, and exploring an ETF that attempts to diversify the assets of the investor by investing in asset classes outside of traditional stocks and bonds. These asset classes include, but are not limited to currencies, real estate, hedge funds, private equity, and timber.

The importance of ticker selection for ETFs is another area for further research. In this paper, the focus was on two ETFs tracking the price movement of gold. Even though IAU slightly outperformed GLD, the daily dollar trading volume of GLD is many times that of IAU. Research and analysis utilizing a multi-faceted approach on other ETFs with similar objectives could help explain the vast difference in assets and daily dollar trading volume.

According to the 2013 Fact Book from the Investment Company Institute, U.S. retirement assets grew to a $19.5 trillion by the end of 2012. A market this large obviously represents a huge opportunity for any firm that can create a financial product that satisfies the needs of retirees. However, this may be harder than it sounds – this class of investors is very fickle. Additional research on this investor class could prove fruitful for those able to identify and produce new financial products that outperform the status quo. Outperformance in this sense is not meant just in total return, but in meeting the demands and preferences of retirees.
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