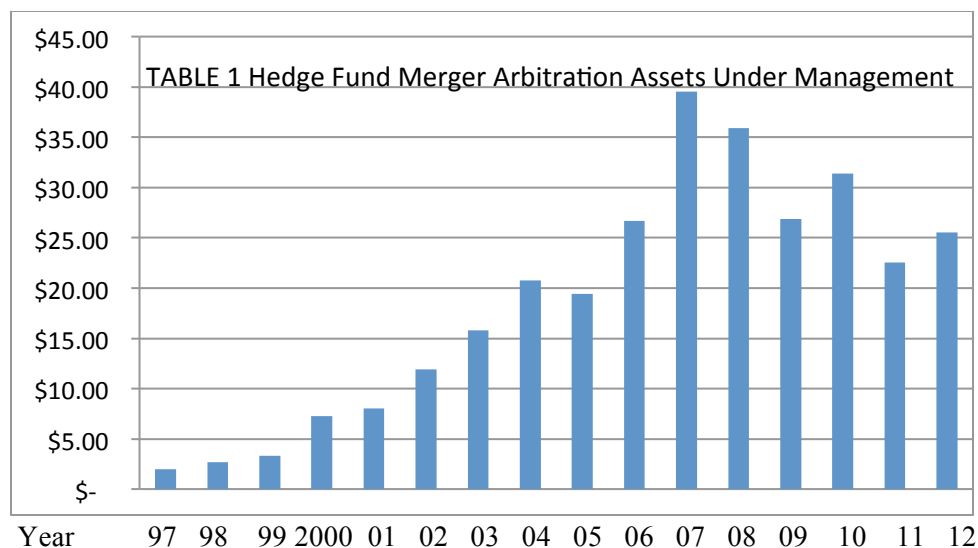# Merger Arbitrage Investment an Effective Strategy for High Rollers and Small Time Investors: Evidence from U.S. Cash Deal Mergers

While returns to merger arbitrageurs have shrunk in recent years, there still is wide interest in a merger arbitrage investment strategy by hedge fund managers (the high rollers). Information about merger arbitrage opportunities has recently become widely available to individuals (small time investors) looking for diversification in their investment portfolio. Some merger arbitrage opportunities are more effective for small time investors than for hedge fund managers. A statistical analysis of hundreds of merger arbitrage opportunities highlighted an effective strategy for small time investors. This strategy was then applied to recent merger deals to determine if reasonable returns were achievable for the savvy individual investor.

Merger arbitrage also known as risk arbitrage is an investment strategy that always consists of buying shares of the company that is being acquired in a merger or acquisition (the target firm). Risk arbitrageurs adopt different trading strategies based on the type of deal that is struck between the acquiring firm and the target firm. In an all cash merger the arbitrageur buys the stock of the target firm and holds until the deal is either consummated or fails. In the more common fixed exchange ratio stock deal, the arbitrageur also shorts the stock of the acquirer so as to replicate the conditions of the cash merger. After the merger is completed, the arbitrageur delivers the swapped stock into her short position to complete the arbitrage by closing out her shorts. Due to the extra level of complexity associated with shorting, transactions costs associated with stock deals are greater than transactions costs for cash deals. Even greater transactions costs occur in stock deals where the exchange ratio is floating within a collar and arbitrageurs must use option-based models to value deals.

The chief risk that the arbitrageur faces is the failure of deals to be consummated or for offer prices to be revised downward. Deals can also be delayed for long periods of time as regulators consider antitrust issues related to the merger or shareholders hold out for better terms. Normally, the price offered by the acquiring firm is substantially greater than the stock price of the target firm immediately prior to the merger announcement (the price premium). If a deal fails, the arbitrageur realizes a loss as the target firm's stock price retreats towards its pre-announcement levels (the deal risk). During the period between the merger announcement and the conclusion of the typical merger deal (the resolution period), the market price of the target firm's stock typically trades below the price offered by the acquiring firm. This difference is known as the arbitrage spread and when positive provides returns to the arbitrageur to offset the risk of deal failures. When a risk arbitrageur creates a portfolio of merger arbitrage deals, any losses associated with an individual deal failure can be eliminated or reduced through diversification. The ability to diversify away risk has led to the growth of this investment strategy by hedge funds and the achievement of positive returns for hedge fund investors.

$45.00
$40.00   TABLE 1 Hedge Fund Merger Arbitration Assets Under Management
$35.00
$30.00
$25.00
$20.00
$15.00
$10.00
$5.00
$-

Year   97 98 99 2000 01 02 03 04 05 06 07 08 09 10 11 12

Merger arbitrage has become more popular as an investment strategy over the past fifteen years. According to data reported by the well-regarded database provider, BarclayHedge (BH), and shown in Table 1, assets under management associated with merger arbitration strategies by hedge funds grew from $1.95 billion in 1997 to almost $40 billion during the merger spike in 2007 and were over $25 billion at the end of 2012.

As large players have successfully employed the strategy, it is worth examining whether knowledgeable individual investors can also use the strategy to diversify their portfolio so as to yield satisfactory returns and avoid the high costs of asset management associated with hedge fund participation.

Evolution of Merger Arbitrage for Small Investors. Various sources of information have recently become available which identify real time merger arbitrage opportunities for individual investors. Free newsletters listing merger arbitrage deals have been available online since 2010 and include the SIN letter, the Middle Market and the Merger Journal. Moreover, in December 2012, Proshares introduced a merger arbitrage Exchange Traded Fund (ETF) which takes a position only in companies actively involved in an announced merger. Individuals can select their own deals in which to invest or invest directly in the Proshares ETF.

The purpose of this paper is to examine the returns that were achieved on cash mergers to determine whether merger arbitrage is a profitable investment strategy for small investors. Cash mergers are the simplest in which the small investor can participate. Transactions costs are relatively low since the investor only needs a long position in the stock of the target firm. Numerous studies have examined the extent of the returns which accrue to risk arbitrageurs including Mitchell and Pulvino (2001), Baker and Savasoglu (2002), Jindra and Walkling (2004), Jetley and Ji (2010) and Kahn (2012), and have found them to be positive. Jetley and Ji (2010) evaluated the change in the merger arbitrage spread using more recent data and found that the spread remained positive but has significantly declined during the period since 2002. This is consistent with the BH merger arbitrage index of historical yearly returns achieved by the hedge funds that BH tracks. As shown in Table 2, the highest yearly return for the 1997-2012 period was achieved in 2000 and was 19.27%. Not surprisingly hedge funds that offered merger arbitrage investment strategies experienced extremely rapid growth in the 2000s. The negative 3.38% return of 2008 coincided with the growth reversal seen in more recent years.

Table 2: Yearly Merger Arbitrage Returns for Selected Hedge Funds
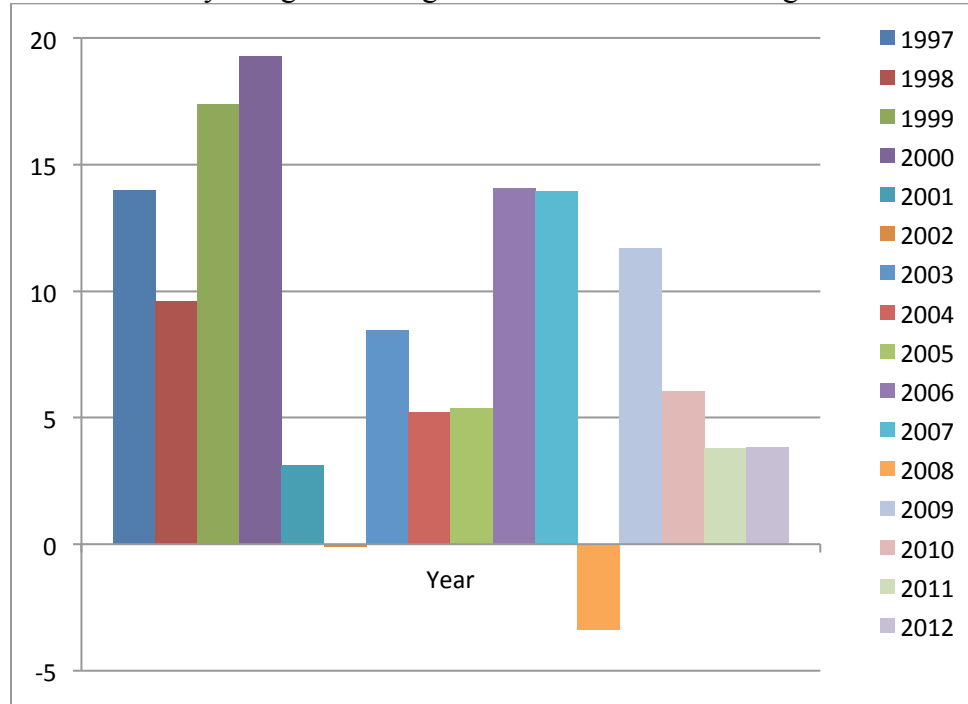
        Based on previous research studies, Jetley and Ji (2010) and Ferguson, Wei and Chichenea (2011), found cash mergers experienced smaller arbitrage spreads than stock deals. Officer (2007) found the opposite result. In this study, the dataset contains 309 cash only mergers of $100 million or more that were announced between 2001 and 2012. Stock prices were gathered from Compustat and deal terms were identified through Lexis/Nexis. Each observation in the dataset had an approved definitive merger agreement, thereby eliminating hostile takeover offers. The dataset was evaluated to determine whether certain characteristics about the deal resulted in statistically significant positive returns for risk arbitrageurs during a period when these returns were shrinking.
        Following the terminology used by Jindra and Walkling (2004), the total return (TR_i) realized from holding the acquisition stock i for the period from the first business day after the first formal acquisition announcement to completion of the offer, the so-called resolution period, is calculated as:

$$TR_i = (P_{Fi} - P_{1i})/P_{1i} - H_i \qquad\qquad (1)$$

where P_{Fi} is the final price received from shares purchased for target firm i, P_{1i} is the stock price the first business day following the merger announcement for target firm I and H_i is the percentage holding cost for the transaction. If the deal is consummated, P_{Fi} is the final price received from the acquirer of the target firm i and if the deal fails, P_{Fi} represents the post-offer market price.

Equation (1) can be rearranged as follows:

$$TR_i = (BP_i - P_{1i})/P_{1i} + (P_{Fi} - BP_i)/P_{1i} - H_i \qquad (2)$$

where BP_{ii} represents the bid price for the target firm i's shares quoted in the definitive merger agreement. Hostile takeover offers that are not approved by the board of directors of both companies are not considered here. This version of the equation demonstrates that the total return has two potential components: one measurable just after the announcement is made $(BP_i - P_{1i})/P_{1i}$ and one subsequently observed and dependent on any (upward or downward) revisions in final prices as compared to the initial bid price $(P_{Fi} - BP_i)$. For most deals the second component equals zero as the original offer price is not revised.

One additional risk factor associated with deals that are successful and not subject to price revision is the duration of the resolution period. Although arbitrageurs can sell their stock at any time in a liquid market, the realized return still depends upon the final price at the end of the resolution period. Deals that face regulatory review typically have longer resolution periods than those with no antitrust challenges as described by Kahn (2012).

Two examples from the dataset showing how the total return was calculated follow.
Example 1: On August 15, 2011 Google (GGL) announced they would offer $40 cash for each share of Motorola Mobility Holdings (MMH). One day after the announcement, MMH's share price rose substantially to close at $38.12. For new MMH shareholders who purchased at the market close, the arbitrage spread, $(BP_i - P_{1i})$ was $1.88 = $40.00 - $38.12. The total return was 4.93% , ($1.88/38.12), ignoring holding costs. The deal closed 277 days on Mary 22, 2012 after U.S. regulators approved the deal. Therefore, the annualized return for this deal was 6.5% (i.e., 4.93% divided by 277/365)
Example 2: On December 18, 2006 a consortium of private equity firms headed by Blackstone Group announced they would offer $44 cash for each share of Biomet (BMET). One day after the announcement BMET's share closed at $41.59, a substantial increase over the share price before the announcement was made. The final offer price increased to $46 when an influential shareholder advisory group told Biomet shareholders in June 2007 that $44 was too low. The deal closed 277 days later on September 25, 2007 at the $46 price. The total return was composed of the initial arbitrage spread, $(BP_i - P_{1i})$ of $2.41 = $44 – 41.59, plus the revised price $(P_{Fi} - BP_i)$ of $2,00 for a total return of 10.6% ($4.41/41.59), ignoring holding costs. The annualized return for this deal was 13.97% (10.6% divided by 277/365).

Holding costs are comprised of direct costs associated with the stock purchase and indirect opportunity costs. Mitchell and Pulvino (2001) estimated that direct costs associated with the stock purchase would be about $.04 per share of stock for the 1990s. Since 1999 Scott Trade has offered customers a $7.99 price to buy stock. A small time investor who purchases $1000 of a target firm's stock faces a transaction cost of less than 1%. Since the holding costs are fixed, as the small time investor increases his stock purchase the transaction cost drops accordingly. Indirect opportunity costs are estimated by comparing the Treasury bill rate to the rate earned on the merger.

Table 3 presents summary information regarding the 309 mergers in the dataset.

Table 3. Summary Statistics of M&A Deals, 2000-2012

	Deals	Arbitrage Spread	Average Annual Return	Minimum Return	Maximum Annual Return
Total Return on All Study Deals	309	1.29%	6.50%	-64.47%	98.39%
Total Return - Positive Arb Spread Deals	280	1.73%	7.53%	-64.47	98.39
Total Return - Negative Arb Spread Deals	29	-2.97	-3.59%	-43.15	52.74
Total Return on Terminated Deals	11*	-33.32%	-28.10%	-64.47	-12.38
Total Return on Revised Deals	8**	4.51%	16.80%	-30.12	72.47
Private Buyout Deals***	99	-0.25	5.71%	-64.47	72.47
Duration on All Study Deals (in days)	309	136	n.a.	12	608
Price Premium (Percentage)	309	27.86%	n.a.	-8.03	163.42
Deal Size ($B)	309	4.79	n.a.	0.1	52
Treasury Rate	309	n.a.	2.05%	0.01	6.23

	Deals***	Study	Study	Barclay Hedge	Treasury Bill Rate
Avg. Annual Return on Deals 2000-3	11	3.89%	9.26%	7.71%	2.50%
Avg. Annual Return on Deals 2004	8	4.16	9.29%	5.20%	1.58%
Avg. Annual Return on Deals 2005	14	3.63	10.34%	5.38%	3.48%
Avg. Annual Return on Deals 2006	24	2.74	8.60%	14.06%	5.00%
Avg. Annual Return on Deals 2007	62	0.25	5.91%	13.96%	4.53%
Avg. Annual Return on Deals 2008	25	-0.47	6.28%	-3.38%	3.47%
Avg. Annual Return on Deals 2009	8	3.00	6.03%	11.71%	0.34%
Avg. Annual Return on Deals 2010	55	0.15	3.55%	6.05%	0.18%
Avg. Annual Return on Deals 2011	59	2.01	6.50%	3.80%	0.06%
Avg. Annual Return on Deals 2012	43	1.19	7.72%	3.82%	0.09%
	309				

*3 negative arb spreads

**2 negative arb spreads

***Eight deals terminated; five in 2007 when financing dried up

The arbitrage spread on all 309 deals was 1.29% and the average resolution period was 136 days.   The annualized return on these deals was 6.5% (the arbitrage spread divided by the deal duration divided by 365).   For example, a definitive merger agreement was signed by the board of directors of Shell and Pennzoil on 3/25/2002 and the merger closed on 10/1/2002, resulting in a deal duration of 186 days. The bid price was $22 and the market price one day after was $21.50 so the arbitrage spread was 2.33% (.50/21.50). The annualized return was 4.56% (2.33% divided by186/365)). Therefore, this deal was substantially below the average return and considerably longer than the average duration.

Twenty nine deals had negative arbitration spreads on the next business day after the deal announcement when buyers bid up the market price beyond the offer price. Typical deals that started with negative arbitrage spreads remained in the red, yielding an overall negative return at the conclusion of the deal. Final prices were revised in only six percent of the 309 deals (eleven which were terminated and eight which experienced revisions to the original offer price). Terminated deals yielded large negative returns to the arbitrageur while revised deals yielded large positive returns to the arbitrageur. Since there were very few deals with price revisions (2%) and more than 10% of the deals had negative arbitrage returns, investors overestimated the number of deals that would experience upward price revisions.

Hsieh and Walkling (2005) investigated whether arbitrageurs are passive or active investors where active arbitrageurs are defined as influencing acquisition terms and outcome, while passive arbitrageurs have no influence. They identify two passive roles for arbitrageurs. In the conservative passive role, arbitrageurs are naïve investors, investing in deals that the market assigns little risk and is expected to succeed. These include friendly deals, deals with high bidder toeholds, and deals with low first-quarter spreads. Passive arbitrageurs that are more selective in their investments attempt to rely on their superior ability to predict offer outcomes, looking for deals with higher arbitrage spreads. Deals with negative arbitrage spreads would appeal to active arbitrageurs who hope to influence deals by gaining price revisions. Based on the data examined here, this strategy is quite risky but also can be quite rewarding in a limited number of cases.

Approximately one third of the all cash deals were leveraged buyouts (LBOs) in which the acquirer sought to take the target firm private. Generally the LBO acquirer was a private equity firm or a consortium of firms but in a few instances billionaire individual investors also initiated such LBOs. The majority of terminated deals had an LBO acquirer who backed out when financing became unavailable during the 2007 credit crunch or the target firm's financials substantially weakened. Pulvino, Pederson and Stafford (2007), Officer (2007), and Ferguson, Wei and Chicernea (2011) focused on the role of arbitrageurs to provide liquidity for deal success. Someone has to be willing to buy the target stock in a down market and arbitrageurs have a compelling incentive to accept this responsibility. However, the LBO acquirer must still rely on external financing to avoid deal termination and usually arbitrageurs are not in a position to provide loans to private equity firms when credit is tight.

As shown in the Summary Table, returns are reported for deals that concluded during the year listed and vary considerably by year. Returns on deals that concluded in the earlier years were generally higher which is consistent with the previously noted findings of Jetley and Ji (2010). The returns on the 309 deals in the study differed from those reported by BarclayHedge's index of hedge funds which includes both cash and stock deals. However, the BarclayHedge index also shows returns declining over the study time period. Since hedge funds invested much more heavily in merger arbitrage activities in the later years of the decade, the increased buying interest may well have driven down overall returns. The Treasury bill rate also declined significantly during the later period which reduces the opportunity costs associated with these deals.

Model and Estimation. The arbitrage spread return variable for target firms in the dataset was regressed against variables that were expected to have explanatory power. These variables were the U.S. treasury bill rate, the deal size (a measure of market capitalization), a dummy variable for negative returns one business day after the terms were announced, a dummy

variable for terminated deals, a dummy variable for revised price deals, a dummy variable for deals where the acquirer was a private equity partnership or private investor, duration of the deal and the size of the deal premium,. This equation is:

$$AS\ Return = \alpha + \beta_1\ Treasury\ Rate + \beta_2\ Deal\ Size + \beta_3\ Initial\ Negative\ Returns\ Dummy$$

$$+\ \beta_4\ Terminated\ Deal\ Dummy + B_5\ Revised\ Price\ Deal\ Dummy$$

$$+\ B_6\ Private\ Equity\ Dummy + B_7\ Duration + B_8\ Deal\ Premium\ + \varepsilon \qquad (3)$$

The treasury rate (annual percentage rate earned on U.S. Treasury bills) is a surrogate for the transactions costs associated with each deal since it measures the opportunity cost associated with a riskless deal. This rate showed substantial variability over the study period of the sample with the interest rate dropping precipitously from 2009 through 2012. The expected sign for the treasury rate variable would be positive since a higher transaction cost should result in a higher arbitrage spread return.

The deal size variable (billions of dollars) is a proxy for capital constraints and liquidity. Large companies with a lot of outstanding stock enhance liquidity and allow more arbitrageur trading. Researchers have found that merger arbitration hedge funds own from 15-35% of the target firms's stock (Hsieh and Walkling (2005) and Officer (2007). The expected sign for the deal size variable is positive, since trading volume will not drive down the arbitrage spread as much when arbitrageurs trade.

The negative returns one day after deal announced dummy variable is an indicator of expectations about possible upward price revision for the deal. Therefore, we would expect that this variable should have a positive sign if expectations are rational.

The deals terminated dummy variable identifies whether the merger or acquisition was not carried out. Since the initial definitive merger announcement typically results in a substantial price premium for the target firm's shareholders, deals that are not carried out usually result in the elimination of the price premium. Therefore, the expected sign for the deals terminated dummy variable is negative.

The revised price dummy variable identifies whether the price must be modified to close the deal. This revision can be positive or negative depending upon new information that is learned during the duration of the deal. Since very bad information about the target firm is likely to result in deal termination rather than deal revision, the expected sign for the revised price dummy variable is positive.

The private equity dummy variable classifies whether the acquirer is a private equity firm, consortium or investor group seeking to take the target firm private. This type of acquirer manages leveraged buyouts of public firms which they take private. The acquirer relies heavily on debt that the acquirer borrows in order to complete the buyout. When financing is difficult due to reluctance on the part of financial institutions to make loans, the acquirer may have to terminate the deal or revise the price downward. Therefore, the expected sign for cash deals initiated by private equity firms (particularly during credit crunch periods) is positive as the risk is greater that the deal will not be carried out as initially anticipated.

The duration variable (in days) specifies the amount of time between the merger announcement date and the deal closure date. Ideally this variable should be the expected number of days when the deal will conclude, but precise expectations are hard to determine. When the merger is first announced, the companies specify a time period when the deal is expected to close. The analysis was performed in two ways. In the first approach, the duration variable is measured as the actual length of the deal rather than the expected length of the deal. In the second approach, the duration variable is either the actual duration when the timing is consistent with the specification given by the companies or is the midpoint of the expected close date when the timing is inconsistent with the specification given at the time of the signing of the definitive merger agreement. For instance, if the firms indicate the deal will close in the second quarter but instead the deal closes in the fourth quarter, the expected deal duration will be May 15, the midpoint of the second quarter. The expected sign is positive since longer deals face more risk and lower returns.

The final variable included in the regression is the price premium (percentage). The price premium measures the percentage change in the target firm's pre-announcement stock price to the price offered by the acquirer. When the premium is large, it is unlikely that other firms will bid for the target and the opportunity for price revision is muted. Officer (2007) also suggests that the bid premium is a rough gauge of the loss suffered if a deal fails. For both reasons, the expected sign of the bid premium variable is positive.

Table 4 shows the results of a regression equivalent to equation (3). The adjusted R^2 of this equation is 47% and four of the eight variables are statistically significant. The results are consistent with the findings of other researchers. When the average values of non-dummy variables (intercept term, treasury rate, deal size, duration and price premium that are shown in the Summary Table) are substituted into this version of the equation, the estimated average return for the 309 cash deals is 1.34% which is very similar to the overall average of 1.29%. One concern with the estimate is that the intercept term is quite large (although not statistically significant) which is not consistent with the findings of other researchers.

Table 4	Coefficients	Standard Error	t Stat
Intercept	-1.517	0.969	-1.565
Treasury Rate	0.066	0.201	0.329
Deal Size	0.135	0.058	2.344
Negative Return	0.462	1.322	0.349
Deal End	-35.973	2.270	-15.844
Deal Revised	2.746	2.570	1.069
Private Equity	3.621	0.474	7.641
Duration	0.004	0.005	0.783
Price Premium	0.055	0.017	3.201

Table 4A shows the results of a regression equivalent to equation (3), where the arbitrage spread has been annualized. Annualizing the arbitrage spread is an important consideration as it standardizes the return on deals with widely differing resolution periods so that more meaningful comparisons between deals can be made. This study is the first to show regression results based n annualized returns as well as arbitrage spread returns. Researchers report annualized returns

but also note that this approach assumes arbitrageurs can continually invest in comparable deals throughout the calendar year (Jindra and Walking 2004). The adjusted R^2 of this equation is 33% and six of the eight variables are statistically significant. All the variables have the expected signs other than the duration variable and the negative arbitrage return dummy variable. However, because the dependent variable uses the duration of the deal to standardize the return on an annualized basis this standardization may be impacting the results for the duration variable. Also the coefficient on the negative arbitrage return dummy variable which is expected to capture the likelihood of upward price revision may be affected by also including a price revision dummy variable. When the average values for the non-dummy variables (treasury rate, deal size, duration and price premium) that are shown in the Summary Table are substituted into this version of the equation, the estimated average return for the 280 deals with positive arbitrage spreads that are not leveraged buyouts is 7.43%. This compares well to the 7.53% shown in the summary table for all deals with positive arbitrage spreads. One anomalous result is that the intercept is large and highly significant.

TABLE 4A	Coefficients	Standard Error	t Stat
Intercept	4.710	1.723	2.734
Treasury Rate	0.424	0.336	1.262
Deal Size	0.354	0.096	3.689
Negative Return	-7.220	2.333	-3.095
Deal End	-33.202	3.773	-8.800
Deal Revised	11.181	4.335	2.579
Private Equity	1.988	1.495	1.330
Duration	-0.0250	0.008	-3.265
Price Premium	0.128	0.029	4.378

In order to evaluate what the high intercept term might be masking, the annualized returns regression was run with the constraint that the intercept be zero. The constraint on the intercept forces the positive arbitrage spread on unrevised deals undertaken by non-private equity acquirers to be driven by the non-dummy independent variables. Moreover, the constraint forces the positive arbitrage spreads to be correlated with known factors such as the treasury rate, the size of the deal, the length of the resolution period and the price premium. The results of this regression are shown in Table 4B. The adjusted R^2 of this equation is 43%, although the overall standard error of the estimate is slightly higher. All eight variables are statistically significant, although the duration variable and the negative return variable both continue to have a negative sign. The coefficient on the treasury rate is much higher than in the previous regression and the coefficient on the private acquirer dummy variable is now higher and statistically significant. However, when the average values for the non-dummy variables shown in the Summary Table are substituted into this constrained version of the equation, the estimated average return for the 280 deals with positive arbitrage spreads that are not leveraged buyouts is 6.27%. This is considerably lower than the 7.53% shown in the summary table for all deals with positive arbitrage spreads. The private equity dummy variable increases the estimated average return to 6.91% which is more in line with the 7.53% value.

Table 4B	Coefficients	Standard Error	t Stat
Intercept	0	#N/A	#N/A
Treasury Rate	0.712	0.3223	2.210
Deal Size	0.368	0.0968	3.798
Negative Return	-5.725	2.292	-2.497
Deal End	-34.334	3.790	-9.059
Deal Revised	10.408	4.372	2.380
Private Equity	3.315	1.429	2.320
Duration	-0.014	0.007	-2.145
Price Premium	0.1778	0.023	7.642

In order to consider how expectations associated with the resolution period rather than the actual length of the resolution period impacts arbitrage spreads and annualized returns, the dependent variable was also regressed on the variables from equation (3) where the duration was the expected duration at the time the definitive merger agreement was signed. Typically, when the merger is first announced, the companies specify the expected time period for the closure of the merger (e.g, 4th quarter of the year). When the merger closed in the specified time period, the actual date was used as the expected date. When the merger closed earlier or later than expected, the mid-point of the expected time period was substituted for the actual date the merger closed. Since the majority of mergers closed during the expected time period the average expected duration was 132 days rather than the 136 day average shown in the Summary Table. Tables 5, 5A and 5B report the comparable results of the regressions shown in Tables 4, 4A and 4B when the expected duration variable rather than the actual duration variable was used.

Table 5	Coefficients	Standard Error	t Stat
Intercept	-0.508	1.037	-0.490
Treasury Rate	0.131	0.197	0.665
Deal size	0.137	0.056	2.429
Negative spread	-1.181	1.378	-0.857
Deal End	-36.598	2.217	-16.507
Deal Revised	1.178	2.521	0.4675
Private Equity	0.866	0.878	0.986
Expected Duration	0.006	0.005	1.230
Price Premium	0.043	0.017	2.487

Table 5A	Coefficients	Standard Error	t Stat
Intercept	3.984	1.942	2.051
Treasury rate	0.473	0.369	1.279
Deal size	0.173	0.106	1.635
Negative Spread	-6.738	2.582	-2.610
Deal end	-27.055	4.153	-6.515
Deal revised	0.968	4.722	0.205
Private equity	1.248	1.645	0.759
Expected duration	-0.010	0.009	-1.056
Price premium	0.113	0.032	3.500

Table 5B	Coefficients	Standard Error	t Stat
Intercept	0	#N/A	#N/A
Treasury rate	0.715	0.352	2.032
Deal size	0.184	0.106	1.732
Negative Spread	-5.422	2.514	-2.157
Deal end	-27.943	4.152	-6.730
Deal revised	0.920	4.747	0.194
Private equity	2.268	1.577	1.438
Expected duration	0.001	0.008	0.067
Price premium	0.153	0.026	5.937

The adjusted R^2 for Table 5 is 49%. The adjusted R^2 for Table 5A is 19% and for Table 5B is 32%. Again the variables have the expected sign except for the duration variable but some are no longer statistically significant. The major impact of substituting expectations for actuals is to reduce the precision of the coefficients.

Savvy Small Time Investor Portfolio Experience. Passive investment is the hallmark of the small investor experience. Too small to be able to influence merger terms, passive arbitrageurs must be judicious in their investment selections and rely on their superior ability to predict offer outcomes in order to gain high arbitrage spreads. Can small investors avoid the naïve passive investment trap of low risk, low reward merger arbitrage strategies by using historical information found in this study to achieve solid results through savvy selections for their portfolios? A hypothetical portfolio was created using the knowledge provided by the historical study analysis in order to determine whether small time investors can be savvy rather than naïve. With any luck, this knowledge should produce superior ability to predict offer outcomes.

Thirty six cash mergers that were announced subsequent to the study period were screened for possible inclusion in the savvy small investor portfolio. The strategy of the savvy

small investor consists of exclusively investing in cash deals. Cash deals have the lowest fixed transactions costs which can overwhelm returns for a small investor.   Moreover, cash deals must meet various criteria. First, the deals must have a positive arbitrage spread on the next business day after the deal is announced. Deals with negative returns on that day tend to produce negative returns overall as upward price revisions are quite uncommon. Second, the target companies must have a market capitalization of approximately $100 million or more. Bid ask spreads are wider on stocks that trade infrequently, increasing trading costs. Small companies with market capitalizations below $100 million would typically have illiquid stocks. Trades would be less frequent, widening the bid ask spread. Third, a definitive merger agreement had to be in place. As was noted previously, during the study period leveraged buyout deals had a much higher probability of termination due to failure to obtain adequate financing. However, deals that took companies private also had higher arbitrage returns.   Since the 2012-13 period was not a credit crunch period, deals in which a private equity firm was the acquirer were included in the portfolio for a small time savvy investor. With a bit of luck, the savvy investor can ride out the storm of a deal termination.

Table 6 lists thirty two companies of the thirty six that were considered which met these three criteria. It was assumed that a small time investor would invest $1,000 for each deal. The Table also shows the closing date of the deal and the amount the investor received on the closing date. Given the dates of the announcement and the dates the deal closed, the investor would begin to invest in merger arbitrage deals in June 2012 and be fully closed out of merger arbitrage deal investments at the end of June 2013. In order to maintain the portfolio, the investor would have an average monthly investment of $12,557 for the period June 2012 to June 2013 and would need a maximum of $20,008 to sustain the portfolio during the height of deal activity.

Table 6 Savvy Small Investor Portfolio	Deal Closes	Return at Close
PeetTea/J.Benckiser	10/26/2012	$1,006
Union Drilling/Sidwinder Drill	11/7/2012	$1,005
Mediaware/Thomas Bravo	11/9/2012	$1,006
Dollar Thrifty/Hertz	11/20/2012	$1,005
Ramtron Int'l/Cypress Semi	11/21/2012	$1,006
Ceradyne/3M	11/28/2012	$1,001
Medicis/Valeant Partners	12/11/2012	$1,008
Fushi Copperweld/Abax	**12/28/2012**	**$1,102**
PresidentLife/Athena Life	12/28/2012	$1,010
Yucheng Tech/Sihitech	**12/28/2012**	**$1,063**
Sunrise Senior Living /Healthcare	1/9/2013	$1,017
LML Payment/Digital River	1/11/2013	$1,015
K-Swiss/E-Land	4/30/2013	$1,008
Seabright/Enstar	2/7/2013	$1,017
Retalix/NCR Corp	2/7/2013	$1,014
3SBio/Decade Sunshine	**5/30/2013**	**$1,080**
PSS World Medical/McKesson	2/22/2013	$1,015
Nexen/CNOOC	**2/25/2013**	**$1,062**
Feihe/Diamond Infant Formula	6/28/2013	$1,029

BCD Semiconductor/Diodes	**3/5/2013**	**$1,080**
Hot Topic/Sycamore Partners	6/12/2013	$1,009
Palomar Medical/Cynosure	6/24/2013	$1,036
Complete Genomics/BGI Shenzhen	3/18/2013	$1,005
Sealy/Tempurpedic	3/18/2013	$1,043
Cascade/Toyota	3/28/2013	$1,000
Shang Pharma./Shang Pharma. Holdings	**3/28/2013**	**$1,050**
Bluegreen/BFC Financial	**4/3/2013**	**$1,116**
FirstCity Financial/Varde Partners	5/17/2013	$1,031
Kayak/Priceline	5/21/2013	$1,008
Focus Media/Giovanna Parent	**5/23/2013**	**$1,078**
First California/PacWest Bank	**5/31/2013**	**$1,053**
Zhongpin/CEO Xianfu	**6/27/2013**	**$1,080**

Total Return = $33,109

As shown in the table, deals that are shown in bold lettering were extremely successful. On a $1,000 investment, at least $50 was returned to the investor. The total return was $1,109 and brokerage fees amounted to $254.40 for a total return net of fees of $854.60. The overall annualized average return net of transaction costs on the average holding of $12,557 was 7.05%. Of the ten most lucrative deals in the portfolio, five of the deals involved taking the target company private. By comparison, the alternative merger arbitrage investment portfolio available through the Proshares ETF did very poorly, producing a negative return. Of course, an investment in the S&P 500 index during the same period would have yielded the highest return. The desire for a small time investor to acquire a diversified portfolio through merger arbitrage investments strikes a prudent balance between risk and reward.

Conclusion

Passivity and know-how are not mutually exclusive factors to employ as investment strategies for the small time investor when engaging in merger arbitrage so as to diversify an investment portfolio. Since small time investors have no choice but to be passive, the ability to gain knowledge is crucial. In this study, know-how was provided by carefully examining historical data for the simplest type of merger arbitrage investments—all-cash deals agreed to by both companies. Information from historical deals suggested valuable criteria to use to screen for deals with relatively high returns and high success. One of the most successful risk arbitrageurs on Wall Street, John Paulson, said great advice that he received from a 40 year veteran of the business was that "risk arbitrage was not about making money, it was about not losing money. In effect, the true skill in risk arbitrage is about avoiding losses. And to avoid losses, one must understand, evaluate and manage risk."

The twelve year examination of historical data was a key determinant in helping select criteria that would allow a small time investor to understand, evaluate and manage risk and thereby avoid losses. While returns are definitely shrinking, the study findings suggest that there is still room for both hedge funds and small time investors to be successful risk arbitrageurs and portfolio diversifiers. Cash deals offered by acquirers taking the target company private must be evaluated carefully, but have yielded reasonable returns for those bold enough to manage the risk.

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