

Carrying On?

(An examination of the historic success of the currency carry trade strategy throughout the era of floating exchange rates)

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I. Introduction

Since the advent of floating exchange rates in the early 1970s, the currency “carry trade” has been a popular technique for currency traders. By owning (or “going long”) a higher interest rate currency, and funding the purchase (or “going short”) with a lower interest rate currency, there’s an interest rate difference that can be pocketed *if the exchange rate remains the same*. In the real world however, exchange rates rarely remain the same, so the “carry trader” is speculating that while the trade is open, the lower interest rate currency won’t rise significantly, and thus wipe out any gain (or more) from the interest rate difference. Because currency moves tend to be significantly more volatile than interest rate changes, this risk can be high.

As a result, the “carry trade” is sometimes perceived as a gamble with a skewed potential pay-off. Most of the time, the profits are expected to be small and steady (the interest rate differential). Periodically, the result may be a substantial loss (due to currency volatility). Cynical observers may view carry trade activity with skepticism: the carry trader may be doing all right now, but he or she will get their “come-uppance” in due course.

In this article, we put this idea to the test. Using the available data from over 30 years of floating exchange rates among developed nations’ currencies, we can examine whether, and in what conditions, the carry trade’s historical profits have been overwhelmed by occasional big losses.

Many carry traders understand the volatility inherent in currency markets, but believe that they are knowledgeable and flexible enough to close out these trades on average at a profit. To use an analogy, they know they’re playing with fire, but are confident they can grab the fire extinguisher before they get burned. Others may be tempted to place carry trades without understanding or anticipating the potential currency moves. All they see is a profitable interest rate “pick-up,” as long as currency rates don’t change. They may not realize their trade is inherently “flammable” until the fire flares up in their faces.

As we’ve noted, the typical pattern in a carry trade is a period of steady profits while the exchange rate remains stable (or even moves in favor of the trade), ending if and when the currency moves against the trade (often rapidly and dramatically). The longer the pattern of steady profit is established in a currency relationship, the more it likely will attract the more gullible traders who think this is a “fireproof” opportunity. One of the best-known examples is the carry trade in Asian currencies, such as the Thai baht, in the mid-1990s. With annualized interest rates around 10% higher than those in the United States, and with a seemingly stable currency relationship against the U.S. dollar, many traders were tempted. This became an excellent case study of a trade that worked very well...right up until it didn’t! The Asian currency crisis of 1997-8, and the resulting collapse of the baht and other regional currencies, provided financial scars and scares that chased many carry traders out of the market.

Despite the periodic notoriety of the carry trade technique, it has remained a pervasive part of the currency market. In the 2005 Brandes Institute research study of currencies and hedging, we examined the long-term results of the carry trade. While acknowledging that most carry traders are more focused on 30-day or even 30-hour horizons, we looked for evidence as to whether the carry trade technique had been effective over the 30-plus years of floating exchange rates. In other words, when all the profits from the interest rate differential are added up, and reduced by the losses due to appreciation of the lower interest rate currencies, is there anything left over?

The answer was a resounding yes¹.

¹ We note that we were examining only the “developed” currencies of countries currently in the MSCI World Index, and thus ignoring emerging market currencies, such as Thailand, referenced in an earlier example, which typically have higher interest rates.

In this article, we update these statistics through the middle of 2006, and explore the topic in more detail. Specifically, if there is evidence that the carry trade concept has been systematically profitable over extended periods, we explore what market anomalies might permit this “inefficiency” to continue.

II. Background and Assumptions

The price of currency forward rates reflects three elements over and above the current (spot) rate of a currency – the current interest rate differential between two currencies, the time horizon of the forward contract, and the liquidity of the currencies. In developed markets – the focus of this article – liquidity is not typically an issue. Forward currency rates are thus based primarily on the two remaining elements – interest rate differentials and time horizon – and contain an implicit assumption for the expected exchange rate change over the time horizon of the forward contract.

The carry trade seeks to exploit discrepancies between spot rates and these implicit forward rates, as it involves borrowing in a currency with a lower interest rate and investing the proceeds in a currency with a higher interest rate. This strategy is based on the assumption that currencies with higher interest rates do not decline to the extent assumed in currency forward contracts.² As noted earlier, the gains tend to be small and frequent, the losses significant but infrequent. This characteristic often is described as “picking up nickels in front of a steamroller.”

This article is based on data collected from the Brandes Institute’s previous research on currencies, *Currencies and Hedging: the Long-term Perspective*, appropriately updated. This data encompasses the modern era of free-floating currencies, which effectively commenced in 1973. While the data for this paper is based in U.S. dollars, the conclusions are valid for any currency-base, as the profits from a carry trade are based on the relative movements of two currencies, not on the actual return of the base currency, whether dollars, yen, euro, or any other. For extensive data based in 23 local currencies, please refer to the previous Brandes Institute paper, *Currencies and Hedging: the Long-term Perspective*.

III. Carry Trade Simulations

The approach used in this article is based on ranking currencies each quarter based on the relative level of their 3-month interest rates. Thus, at the start of the measurement period (January 1, 1973), we place the currency with the lowest 3-month interest rate into “Rank 1,” the next lowest into “Rank 2” and so on, until all currencies are ranked. We then measure the total return of the following quarter, comprising the interest rate earned, and the exchange rate move against the base or measurement currency. In this study, we have used the U.S. dollar as the base currency. Note that the choice of measurement currency does not impact the difference between currency returns (which is the focus of the study), although it clearly has an impact on the absolute returns in each currency.

² As noted in previous research, including:

Kritzman, Mark. “Do Currencies Still Trend?” Peter L. Bernstein, Inc. 2006

McBrady, Matthew. “Carry Traders, Dealers, and the Forward Discount Anomaly.” February 25, 2005.

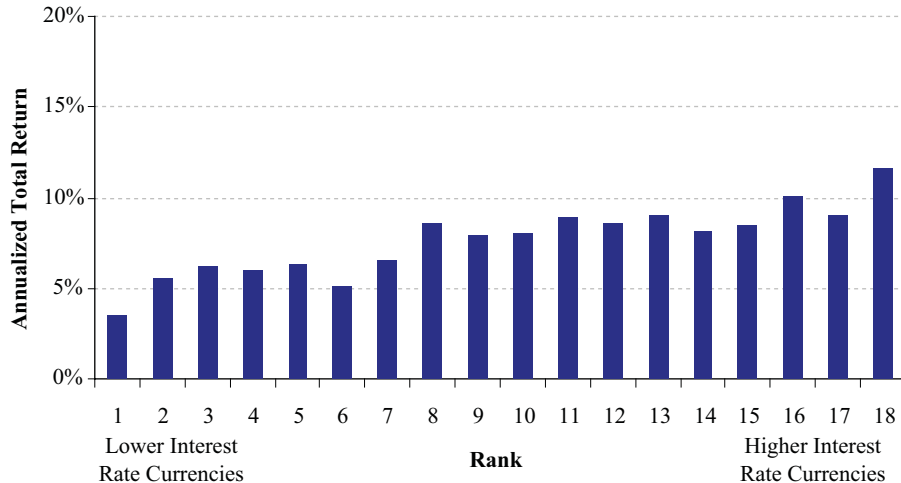
Currencies are re-ranked at the start of each successive quarter. Note that if relative interest rate levels have changed by then, the ranking order of actual currencies may be different. By repeating this process for every quarter in the full period studied, and then measuring the cumulative result of “Rank 1,” “Rank 2,” etc., we have the results of a strategy simulation that can show us what happens if we always invested in the lowest rank country (lowest relative interest rates), the highest rank, or some combination in between.

This approach allows us to measure a simulated carry trade strategy. For example, carry traders offered the choice of the currencies of the developed nations in the MSCI World Index could place their assets each quarter in the highest-ranking currency, funding this from the lowest-ranking currency. At the end of each quarter, they book the profit or loss, and then repeat the process with the new rankings.

Forward pricing of currencies is set so that the currency price three months out (the forward rate) is the current (spot) rate adjusted by the difference between the 3-month interest rates of the two currencies. This means that a higher interest rate currency is implicitly priced in the market to depreciate by that interest rate differential.

If the currency markets were efficient in this context, traders should be indifferent to whether their returns come from the interest rate difference or from currency moves. If we measure the results across the currency “ranks,” there should be no evidence that one rank persistently does better than another on a total return basis.

**Exhibit 1: Annualized Total Returns, Carry Trade
Jan. 1973 — June 2006**

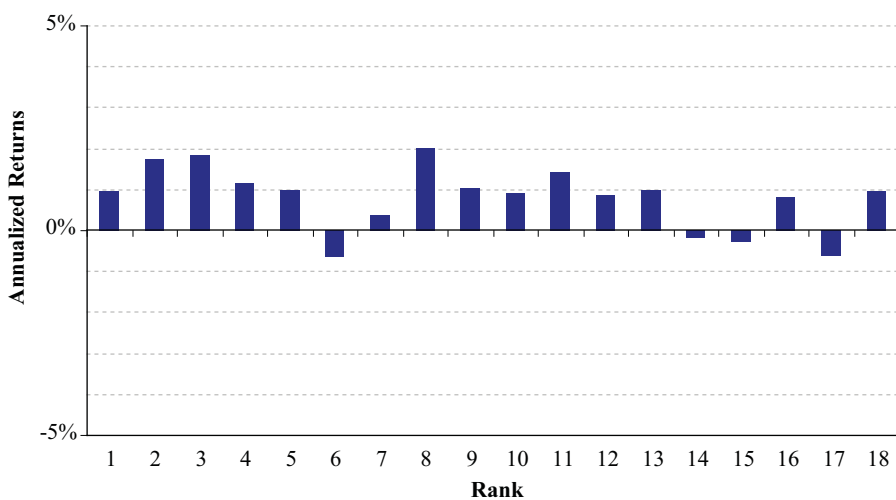


Source: Brandes Institute, based on data from FactSet, Global Financial Data, U.S. Economic Research Service, and the International Monetary Fund, 6/30/06. Past performance is no guarantee of future results.

Let's start by looking at the full floating rate period for the MSCI World (developed market) currencies with data available since 1973³. Despite the efficiency theory, there's clear visual evidence of a pattern that the total returns rise almost linearly with rank. See Exhibit 1.

In order to produce a chart with no evidence of systematic outperformance across ranks, we need to strip out the interest rate element of returns from the prior Exhibit. In Exhibit 2, we see that the currency-only changes appear randomly distributed across ranks once the interest rate component of returns is removed. This poses a contradiction. On the one hand, spot and forward currency prices implicitly assume that higher interest-rate currencies will systematically depreciate over time. On the other hand, Exhibit 2 presents evidence that they have not done so.

**Exhibit 2: Annualized Currency-only Changes, Carry Trade
Jan. 1973 — June 2006**



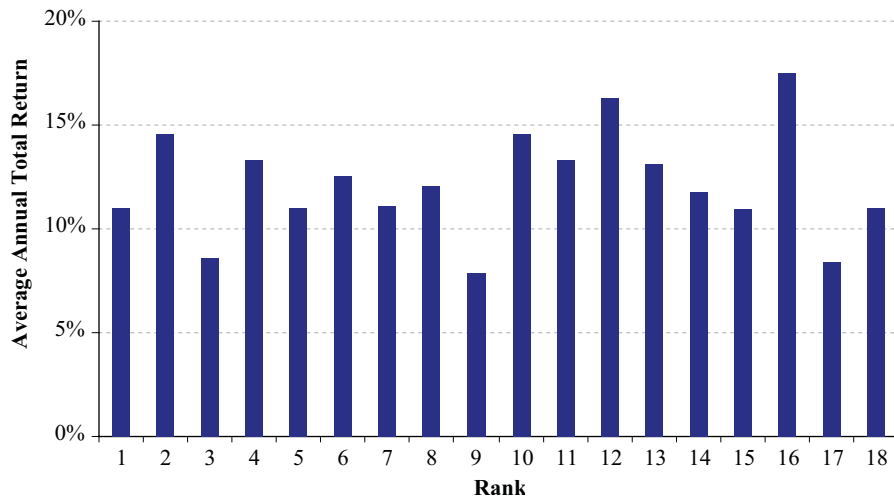
Source: Brandes Institute, based on data from FactSet, Global Financial Data, U.S. Economic Research Service, and the International Monetary Fund, 6/30/06. Past performance is no guarantee of future results.

Was this always the case?

Dissecting the data into decade-long segments (or, in the case of the 1970s and 2000s, partial decades), we find a clearly different pattern in the early days of floating exchange rates. In the 1970s, the currency markets *did* behave as “efficient market” theorists would predict. Subsequently (ironically just as efficient market theory was gaining wider acceptance), the pattern changed from random total return ranks (see Exhibit 3) to random currency-only change ranks (1980s and subsequently), consistent with the pattern in Exhibit 2.

³ Five countries of the present 23 MSCI World Index constituents – Hong Kong, Finland, Greece, New Zealand, and Portugal – do not have full series data available. For the full period we show only ranks 1 through 18, although there is data available through rank 21 from 1984 onward.

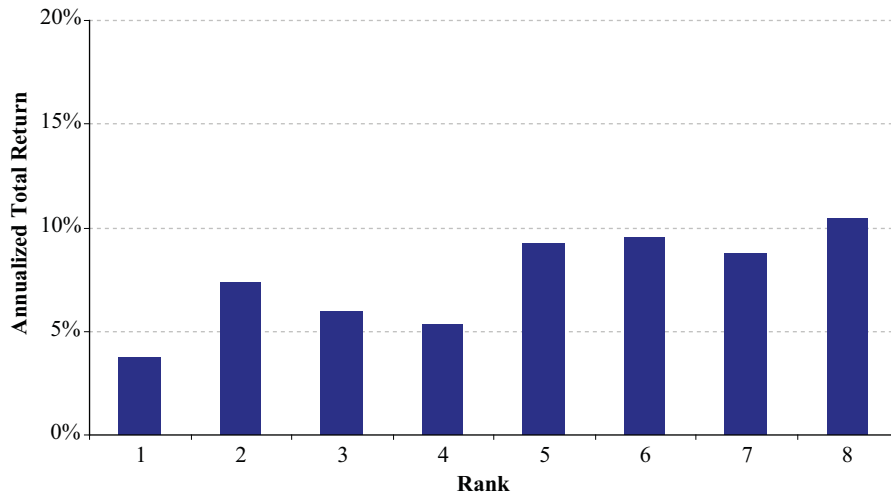
Exhibit 3: Annualized Total Returns, Carry Trade 1973 — 1979



Source: Brandes Institute, based on data from FactSet, Global Financial Data, U.S. Economic Research Service, and the International Monetary Fund, 6/30/06. Past performance is no guarantee of future results.

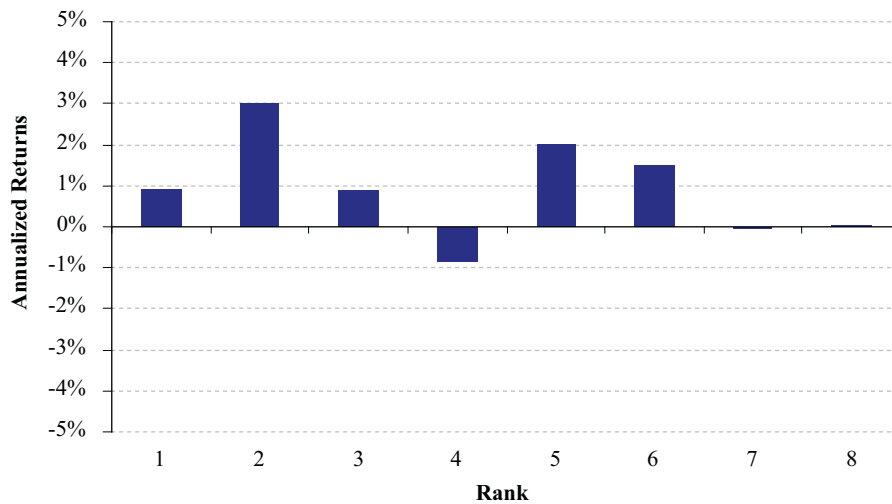
As well as examining all the developed country currencies, we focused in particular on the “Big 8,” representing the most liquid and most commonly traded currencies. This was done for two reasons. First, these represent the most likely currencies to be used in any practical carry trade strategy. Second, the list of MSCI World currencies includes 16 European countries, of which 12 now use the euro as their currency. There is, therefore, a degree of redundancy in using the full list of currencies. The differences in currency patterns may be clearer when using just the “Big 8”: the United States, Canada, the United Kingdom, France, Germany, Switzerland, Japan, and Australia. The patterns that we observed in the full list also are visible for the Big 8. Exhibit 4 shows a similar rank order for total returns, and Exhibit 5 shows a more random pattern when currency-only changes are ranked.

**Exhibit 4: Annualized Total Returns, Carry Trade, Big 8 Countries
Jan. 1973 — June 2006**



Source: Brandes Institute, based on data from FactSet, Global Financial Data, U.S. Economic Research Service, and the International Monetary Fund, 6/30/06. Past performance is no guarantee of future results.

**Exhibit 5: Annualized Currency-only Changes, Carry Trade, Big 8 Countries
Jan. 1973 — June 2006**



Source: Brandes Institute, based on data from FactSet, Global Financial Data, U.S. Economic Research Service, and the International Monetary Fund, 6/30/06. Past performance is no guarantee of future results.

IV. Testing Practical Carry Trade Strategies

In testing specific strategies, we have used the “Big 8” data for the reasons outlined in the previous section. We tested two variations of the carry trade:

Aggressive: own the highest-ranking currency (Rank 8) and fund from the lowest-ranking one (Rank 1)

Conservative: own all four of the highest-ranking currencies (average of Ranks 5-8) and fund from all four of the lowest-ranking ones (Ranks 1-4)

Exhibit 6: Annualized Returns, Carry Trade Strategies

	Aggressive	Conservative
FULL PERIOD, Jan. 1973-June 2006	5.2%	3.4%
1970s (1973-1979)	-1.0%	-1.3%
1980s	6.8%	4.3%
1990s	5.8%	3.8%
2000s (2000 - June 2006)	9.2%	6.8%

Source: Brandes Institute, based on data from FactSet, Global Financial Data, U.S. Economic Research Service, and the International Monetary Fund, 6/30/06. Past performance is no guarantee of future results.

The conclusion is that the carry trade has been significantly profitable over the full period studied for both strategies. After starting out unprofitably in the 1970s, the carry trade appears to be “gaining profitability,” with the current decade posting the best results of the period.

Consistent with the pattern in Exhibit 4, the results in Exhibit 6 show that the aggressive carry trade outperformed the conservative trade in all periods studied, even in the 1970s when neither of the approaches worked. The annualized returns over the longer periods are material, even if reduced by any costs of funding. (The underlying assumption is that the trader receives interest at the 3-month risk free rate, and also can borrow at that rate. This may not be a realistic cost assumption in the real world.)

These results raise two more questions:

- Even with the success of the carry trade strategy over longer periods, how badly have these strategies suffered in the short term? (If traders are sufficiently “burned” by bad short-term experiences, they may never persist to reap the longer-term rewards.)
- Was there something different about the 1970s that, if it recurs, may re-establish a currency market pattern that is not profitable for currency traders?

On the first of these topics, we can give an approximation of the “good experience to bad experience” ratio by looking at how frequently the strategy delivered double-digit gains or losses on a rolling period⁴ basis.

Exhibit 7: Double-Digit Return Experience, Carry Trade Strategies

Up-down ratio	Aggressive	Conservative
Rolling horizon		
One year	52-21	29-7
Three years	47-4	12-0
Five years	31-0	0-0

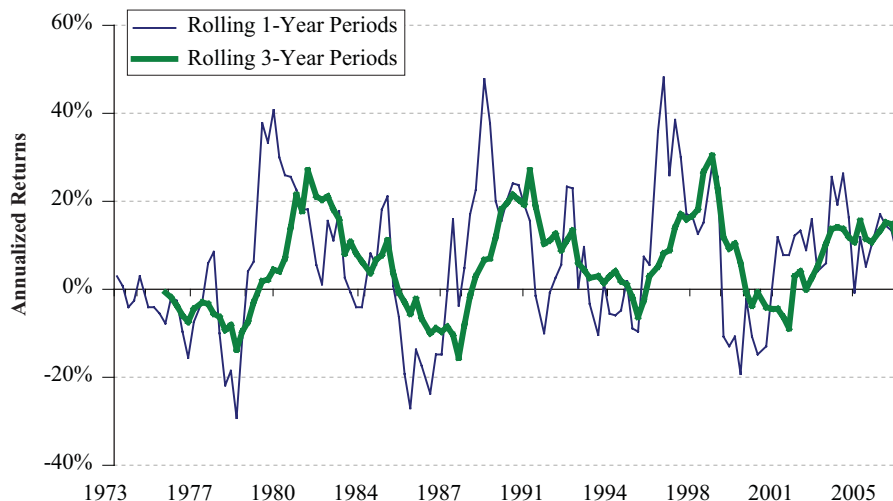
Note: Ratio measures the number of rolling periods that exceeded +10% vs. those that were below -10%.

Source: Brandes Institute, based on data from FactSet, Global Financial Data, U.S. Economic Research Service, and the International Monetary Fund, 6/30/06. Past performance is no guarantee of future results.

Clearly, the shorter the time horizon, and the more aggressive the strategy, the more likely the trader is to suffer a “double-digit hit.” See Exhibit 7. Nevertheless, even for the 1-year horizon, the 52-21 ratio for the aggressive strategy remains well in positive territory. The 1-year aggressive strategy ratio for performance after 1980 improves to 50-15.

The difference in returns for the aggressive strategy between the 1- and 3-year time horizons also can be seen in Exhibits 8 and 9, which show that there were intermittent periods of sustained losses for the strategies even if, over time, these were outweighed by the gains.

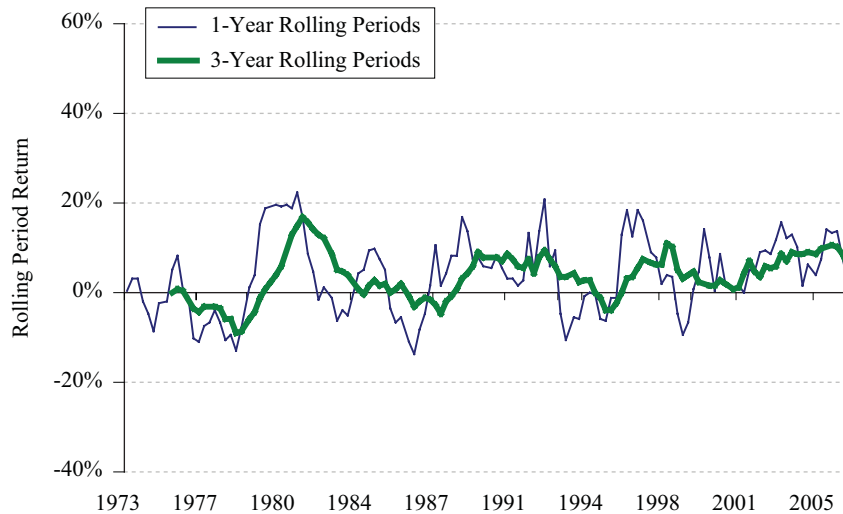
Exhibit 8: Annualized Returns, Carry Trade, Aggressive Strategy Rolling 1- and 3-year Periods, Jan. 1973- June 2006



Source: Brandes Institute, based on data from FactSet, Global Financial Data, U.S. Economic Research Service, and the International Monetary Fund, 6/30/06. Past performance is no guarantee of future results.

⁴ Rolling periods represent a series of overlapping, smaller time periods within a single, longer-term time period. A hypothetical example is the 20-year time period from 12/31/82 through 12/31/02. This long-term period consists of 16 smaller 5-year “rolling” segments. The first segment is the 5-year period from 12/31/82 to 12/31/87. The next rolling segment is the 5-year period from 12/31/83 to 12/31/88, and so on.

**Exhibit 9: Annualized Returns, Carry Trade, Conservative Strategy
Rolling 1- and 3-year Periods, Jan. 1973- June 2006**



Source: Brandes Institute, based on data from FactSet, Global Financial Data, U.S. Economic Research Service, and the International Monetary Fund, 6/30/06. Past performance is no guarantee of future results.

Even though these short periods of losses appear modest compared to the longer-term gains, the magnitude of the losses could well be enough to discourage traders with limited resources. The aggressive strategy suffered two periods of over 40% cumulative losses, in 1974-8, and in 1985-6, with a 25% loss in the 1992-5 period and 30% in 1998-2000. For the conservative strategy, losses in approximately the first three time periods were 25%, 17%, and 17%, respectively, while it came out unscathed overall in 1998-2000.

Now that we have an order of magnitude of the loss experience, we will turn to the other question: why were the 1970s different?

The short answer is that we don't know! While we acknowledge that we are not economic historians, to avoid the question entirely leaves the reader vulnerable to the possibility that either the 1970s, or the period since, were just a random "blip" in financial market experience.

We would thus point out two characteristics that we believe differentiate the 1970s (for space reasons, we restrict ourselves here to observations on currency markets, as opposed to fashion, sport, music, and politics!).

First, the currency markets were entering a free float era for the first time in history. As such, it may have taken the currency markets some time to reach a basis for equilibrium, starting from exchange rates that were set in a fixed-rate system. This was clearly a one-off, 1970s effect. It is not so clear why it should have had an impact on how the carry trade worked (or didn't).

We believe the second 1970s characteristic was more impactful: the '70s was an era of high inflation rates world-wide. In particular for the Big 8 countries, the gap between the inflation rates of the Rank 8 and Rank 1 countries typically was much greater than it is now, or for much of the period since 1980. Why should that matter? A high inflation differential tended to motivate a government to keep interest rates high in an attempt to control the economy, and defend the currency. However, when these efforts were unsuccessful (as was the case for much of

that decade), currency depreciation typically followed. This would explain the pattern we observe for that decade: high interest rate currencies (*e.g.* Rank 8) showed a consistent pattern of weakness, at least offsetting their interest-rate advantage.

If worldwide inflation has been a partial explanation of these currency characteristics, then carry traders likely would do well to monitor future inflation developments. This possible explanation also has interesting behavioral implications that we explore in the next section of this article.

V. Why Have Carry Trade Strategies Worked?

The daily volume of global currency markets exceeds \$1.5 trillion. Currency traders can find a wealth of data and software programs available to help manage this data. In such a liquid and scrutinized market, why would the interest rate premium persist, enabling participants to potentially capitalize on the carry trade?

We review three possible explanations:

1. When “risk-adjusted,” the carry trade returns are less attractive.

Using the industry convention for risk (standard deviation of returns), we note that for the Big 8 countries, the standard deviation of quarterly returns for Rank 1 over the 1973-2006 period is 6.5%, higher than that of Rank 8 (5.3%). Intuitively, this can be explained by the higher proportion of the less-volatile interest-rate component within total returns of the higher-ranking currencies. So we can reject this explanation, since the higher standard deviation for Rank 1 does not support this premise.

2. Tax preferences make interest income less desirable than currency gains.

Taking in net foreign interest income could trigger withholding or income taxes for traders, while any capital gains/losses in currency trades may attract a lower tax rate. Hence the “market” might demand an interest rate premium when finding its efficient equilibrium. However, it may be possible to structure carry trades without incurring income-related taxes in most domiciles, by using forward, rather than spot contracts. It’s also possible that many carry traders are operating on a gross of tax basis (as tax-exempt institutions, or from offshore locations). As the tax implications are outside the expertise and scope of this article, we merely note that while the tax impact may erode some of the carry trade advantage, we think it unlikely that it would erode it materially.

3. Behavioral factors may be behind the historical profitability of the carry trade.

We hypothesize that currency market participants implicitly interpret a higher interest rate currency to have a higher risk of depreciation. Note that the interest-rate differential is already built into forward currency prices, so that traders must factor that depreciation into their calculations. Our data and analysis suggest that market participants are collectively, and persistently, acting as though they expect even more severe depreciation than an “efficient market” would suggest. The actual outcome (Exhibit 5) shows that this expected depreciation of high interest rate currencies has not occurred.

In essence, they appear to be avoiding the high interest countries in the apparent belief that those countries with low interest rates are potentially safer, or more “comfortable” to own. This overpayment for “comfort” is a behavioral anomaly with which value investors are well familiar, as it underpins the rationale for historical out-performance by value relative to glamour stocks (see Brandes Institute research: *Value vs. Glamour*). We would note in that context, we do not agree with the industry convention for risk (standard deviation, see explanation #1 above). We would argue that participants are taking risk when they overpay for “comfort,” whether it be in owning glamour stocks, or low interest-rate currencies.

In summary, we prefer the behavioral hypothesis to the other two (“risk” or taxes). We also wonder whether an additional element is that the market cannot, or is slow to, “unlearn” what once may have had merit. In the formative period of floating currencies, concerns surrounding monetary stability may have commanded more attention. While developed countries may have more stable inflation rates today, the “blowups” of the 1970s still may be influencing market perceptions.

VI. Conclusions

- The carry trade is a market anomaly that appears to contradict efficient market theory. Our hypothesis is that behavioral anomalies occur in the currency markets, as they do in other financial markets, and the carry trade is one such anomaly that has been exploitable for over 25 years.
- Since the inception of floating exchange rates in the early 1970s, a conservative carry trade strategy applied to the “Big 8” currencies might have realized a return of over 3% annualized, as of June 30, 2006.
- While most carry traders focus on the short term, we examined the results over longer periods, and found that the probability of a positive result increased as the time horizon lengthened. For example, using a conservative strategy and measuring over a rolling 3-year horizon, not only were the overall results profitable, but there was never a 3-year period that had a cumulative loss that exceeded 10%.
- For more aggressive strategies, especially over shorter time horizons, periodic losses could have been significant. There were “strings” of adverse results that accumulated a net loss of 40%.

The final question is whether this pattern of results will continue. Just because a strategy appears to have been profitable for such an extended period does not imply or guarantee that these results will persist. We leave it to our readers to examine our hypothesis on why we believe the carry trade has been successful, and then come to their own views on its future potential.

MSCI World Index: The Morgan Stanley Capital International World Index is an unmanaged index consisting of equities from developed markets around the world, including the United States. This index is often used as a benchmark for global equity portfolios and includes dividends and distributions net of corresponding withholding taxes but does not reflect fees, brokerage commissions, or other expenses of investing.

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