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An examination of G10 carry trade during non-crisis and crisis period (2007-2009)

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AN EXAMINATION OF G10 CARRY TRADE DURING NON-CRISIS AND CRISIS PERIOD (2007-2009)

A Thesis

by

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ABSTRACT

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Carry trading is a form of currency trading in which an investor buys assets in a higher interest yielding currency by borrowing in a low interest yielding currency without hedging for exchange risk. I seek to compare and contrast the performance of carry trade strategy before and after the financial crisis (2007-2009). I also compare and contrast how the carry trade strategy and covered interest rate arbitrage fare in different periods. Carry traders do not hedge their position using forward rates whereas covered interest rate arbitrageurs do hedge their position using forward rates. A comparison of the two trading strategies in periods of non-crisis and crisis can help review if forward rates are effective measures reflective of investors' expectation in periods of non-crisis as opposed to period of crisis.

DEDICATION

The completion of my master's studies would not have been possible without the love, support and patience of my family. My aunt, Dr. Rosemarie Agyepong Andoh-Baidoo my uncle Dr. Francis Andoh-Baidoo, , my father, Mr. John Kwesi Danso, my mother, Mrs. Augustina Duodu Danso, my siblings and cousins all of whom provided inspiration, support and counsel. My thanks goes to Mr. Kwame Sam, Dr. Cynthia Kwartin Sarpong, Elsie Temah-Boahene for their support. For all those I failed to mention by name, I apologize and my sincere gratitude goes to you as well.

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CHAPTER I

INTRODUCTION

The concepts of trading and risk have led many investors and individuals alike to expect high rewards when investing in high-risk projects. However, some take advantage of arbitrage and trade with little to no risk involved. Carry trading is a form of currency trading in which an investor buys assets in a higher interest yielding currency by borrowing in a low interest yielding currency without hedging for exchange risk. The purpose is to generate profits and it has proven successful for hedge funds, banks, speculators and non-financial professionals alike. For example, around $1 trillion may have been invested in the yen in early 2007 (The Economist 1, 2007). In Austria, around 12 percent of households have their housing loan in foreign currencies, notably in Swiss francs and Japanese yen (Beer et. al, 2008).

As evident from the popular use of carry trade strategy, it should yield profits hence its continued use. However, when markets are in momentum, most people do not invest rationally. This same behavior in carry trading may lead to either the appreciation or depreciation of a currency if investors have heavily taken positions in such currencies. For example, when there were different future expectations of interest rates in Japan, these expectations led to the unwinding of the yen-dollar carry trade by several investors and subsequent appreciation of the yen (McKinnon, 2010 and Pilling, 2008). Carry trading goes beyond just speculators, investors or currency traders looking to make profit from a “flaw” in the exchange markets. This can

signal to bank regulators or even policy makers' expectations in the term structure of such countries. In a June 2014 Bloomberg report, Wong and Xie report that the European Central Bank cut its deposit rate to minus 0.1% (Wong and Xie, 2014). Thus, the deposit rates slashed below zero and the re-emergence of carry trade using Euro recently signal to the European Central Bank (ECB) that investors expect interest rates to be low for a while. This should be of concern to the ECB and countries heavily used in carry trade because the eventual unwinding of such currencies when rates are increased can be brutal. Carry trade thus has policy and governmental considerations in regards to stabilizing currencies.

The motivation for this research stems from financial and economic theory, in that future spot exchange rate and forward exchange rate should be equal in the future and interest rate should compensate for this convergence to occur. However, there is the forward premium puzzle where the forward premium (when the forward rate exceeds the spot rate) forecasts subsequent exchange rates negatively or where there is an inverse relation between the spot exchange rate changes and premium of forward rates over the spot rates (Burnside, et al., 2007; Burnside, et al., 2011; Xanthopoulos, 2011). Yet, this forward premium anomaly, while justifying profits made through speculation from carry trading, serves as a violation of the Uncovered Interest Rate Parity (UIP) theory. From UIP, carry trades should not lead to excess profits as UIP predicts that high yield currencies should depreciate in relation to low yield currencies (Burnside, et al., 2011). Fama (1984) offers a time-varying risk premium as one of the most possible reasons for the UIP puzzle and carry trade performance.

In this paper, I seek to compare and contrast the performance of carry trade strategy for non-crisis versus the financial crisis period (2007-2009). If carry trade profitability is driven by time-varying risk premium as suggested by Fama (1984), then the carry trade profitability is

expected to differ significantly between the two periods of non-crisis versus crisis. Since the higher interest rates (in excess of the "parity" interest rate) might reflect the imbedded premium for the higher country risk or any other inherent risks, the profitability accrued to carry traders should be quite unstable in the period of the financial crisis as compared to the period of non-crisis.

In addition, I also compare and contrast how the carry trade strategy and covered interest rate arbitrage fare in different periods. The covered interest rate arbitrage strategy is constructed in the same fashion as the carry trade trading strategy; however, while carry traders do not hedge their position using forward rates, covered interest rate arbitrageurs do hedge their position using forward rates. In this way, the only difference in calculating the profit to both alternative trading strategies is the choice of the exchange rate used when closing out the position; forward rates are used in covered interest rate arbitrage while future spot rates are used in carry trade. The comparison of the two trading strategies in periods of non-crisis and crisis can help review if forward rates are effective measures reflective of investors' expectation in periods of non-crisis as opposed to period of crisis.

Background on Carry Trade and Covered Interest Arbitrage

As explained in chapter I, the difference between carry trade and covered interest arbitrage is that carry trade does not use any hedging strategies and relies on floating rates to make profits whereas covered interest arbitrage uses the forward rate for hedging. As literature exposed the inconsistency in interest rate parity via the "forward premium puzzle" (examples Bilson (1981), Fama (1984)), this strategy has only grown in popularity. These seminal papers showed a flaw in interest parity and opened it up more to further discussion and testing.

In a Bloomberg report, James Ramage quotes Anjun Zhou, head of multiasset research at Mellon Capital Management Corp. who also manages more than $30 billion as saying, "Essentially, carry has returned in the pursuit of yield" (Ramage, 2014). In 2014, global stable interest rates and low interest rates in Europe have encouraged investors to revive carry trade strategies in looking for higher yielding investments (Ramage 2014). For example, investors borrow from low interest currencies like the Euro or dollar and invest in countries with high interest rates such as India or Turkey (Ramage 2014). However, investors worry how long this reliably profitable strategy will last because of expected increases in low interest rates, geopolitical tensions, and dwindling growth among the global economy (Ramage, 2014). In the report, the profitability of carry trade is evident as Anjun Zhou, head of multi asset research at Mellon Capital Management Corp., reports that the developed carry trade positions held by Mellon Capital have been doing well especially in positions where bearish euro and Swiss franc positions are used to fund bullish Australian and New Zealand dollar positions (Ramage 2014).

Wong and Xie (2014) in a Bloomberg report quote Eric Busay, a money manager at California Public Employees' Retirement System, the largest United States public Pension with $294 billion in assets as saying, "The ECB has signaled risk is on again". This risk is what investors ride in hopes to make profit in the foreign exchange market. The yen carry trade in 2007 was put at around $80-$160 billion by Hiroshi Watanabe, Japan's deputy finance minister for international affairs (Economist 2, 2007). The total size as gauged by economists at Goldman Sachs in Tokyo puts the size of the carry trade to twice or five times that of the size of money market transactions since most business happens over the counter (Economist 2, 2007). A UBS AG index that tracks carry trade returns reports a 3.7% jump in 2014, which is higher than what one could obtain from stocks or bonds (Wong, 2014). Some of the most profitable currencies

traded against the US dollar according to data compiled by Bloomberg up to April 2014 include the Brazilian real (8% profit), Turkey lira and Colombian peso (5.9%) while others such as South Africa's rand, India's rupee are among some of the currencies mostly used in this strategy (Wong, 2014). Reduced volatility will only make investors more willing to pursue risks and with currency volatility at its lowest levels since 2007 spurring actions to exploit interest rate differentials (Wong, 2014). Paresh Updadhyaya, a director of currency strategy at Pioneer Investment Management Inc. that manages $236 billion in assets in a phone interview said, "Volatility is back to pre-Lehman levels – it's made investors more comfortable taking risks" (Wong, 2014).

As evident from the cited examples, carry trade is very popular and is widely used by hedge funds and investment companies as a strategy to make profit. Such carry trades are sold in indexes and Exchange Traded Funds (ETFs). Examples of carry trade include Deutsche Bank AG index, Deutsche Bank's Balanced Currency Harvest carry-trade, Societe Generale Index (SGI) FX-G10 Carry trade, Barclays Capital Intelligent Carry Index and last but not the least, CBN Carry Trade Index. The Deustche Bank carry index from the Deustche Bank currency returns index (DBCR) index is one of the popular carry trade indexes. I replicate their investment strategy and as such I will talk about how they construct the DBCR index.

The Deustche Bank Currency Returns Index (DBCR)[1] comprises DB Currency Carry Index, DB Currency Momentum Index and DB Currency Valuation Index. The index invests one-third of the overall amount equally in DB Currency Carry Index, DB Currency Momentum Index and DB Currency Valuation Index. It uses the G10 currencies in the index. The index is

[1] This was accessed on the Deutsche Bank website via this link.
http://www.cbs.db.com/new/docs/dbCurrencyReturns_March2009.pdf

rebalanced each month on the third Wednesday of March, June, September and December. Each currency is ranked by its 3m Libor rate a week before the quarterly date. The three currencies with the highest 3m Libor rate are allocated 1/3 in the long position and the 3 currencies with the lowest 3m Libor rate are allocated 1/3 in the short position. Then forwards are transacted in each currency for the next roll date.

The remaining of the paper is organized as follows. Section II reviews the existing literature. Section III describes the data. Section IV explains the methodology. Section V summarizes the results. Section VI concludes the paper.

CHAPTER II

LITERATURE REVIEW AND HYPOTHESIS

In looking at extant literature on this topic, I divide the literature review into three topics. Firstly, I review literature on interest rate parity and how it affects carry trade; secondly I review literature on carry trade; finally, I review literature on covered interest arbitrage.

Interest Rate Parity

Bilson (1981) and Fama (1984) come to the conclusion that forward rates have minimal control in forecasting future rates. Bilson (1981) states that it is easy to construct a model in which market expectations are rational and as such the best unbiased forecasting by the forward price may not be a component of rational expectations or efficient market. He also states that transactions costs, information costs, and risk aversion, as well as forecast errors could be causes of the forward premium puzzle. He uses "speculative efficiency" to refer to the state of excluding rational expectation or market efficiency state where he states the supply of speculative funds is infinitely elastic at the forward price that is equal to the expected future spot price. He applies methodology used in testing futures markets but points out that this is not easy to do as thevariance of the change in the exchange rate is very large relative to the variance of the forward premium. He suggests using higher frequency data to increase strengths but this may create overlapping forecasts inducing serial correlation in the residuals. He uses OLS and GLS estimations to test the models. In the OLS tests he finds that episodes do exist in times of

extreme stress in which the forward rate is not an unbiased forecast of the future spot rate. In the GLS model, he finds results that do not support the speculative efficiency hypothesis even for moderate values of the forward premium. He concludes that with respect of speculative efficiency, predictable profits can be made; predictable profits were realized in a simulated foreign exchange portfolio. With regards to his conclusion he raises concern that profits may be eliminated by transactions costs and may provide an adequate compensation for risk, thus it is not possible to make inferences about the efficiency of the foreign exchange market on the basis of that sole conclusion.

Fama (1984) tests a model for joint measurement of variation in the premium and expected future spot rate components of forward rates based on the conditional hypothesis that the forward market is efficient. He finds that most of the variation in the forward rates is due to premiums and also that there is a negative relationship between expected future spot rate and the premiums components of forward rates. In discussing the economics of premiums, Fama (1984) explains that the variables that determine the difference between expected real returns on nominal bonds also explain the premium in the forward rate and thus the lock between the premium in the forward rate and the interest rates on the nominal bonds of two countries is the direct consequence of the interest rate parity. He uses OLS and SUR estimates to test the model. He also finds that irrationality in forecasting exchange rates is not cured by continued experience with flexible exchange rates. He concludes that any forward rate can be interpreted as the sum of a premium and an expected future rate.

However, some studies (Domowitz and Hakkio, 1985; Cumby, 1988; and Froot and Frankel, 1989) reject this explanation. Domowitz and Hakkio (1985) test the alternative hypothesis which explains UIP using risk premium without sacrificing the notion of market efficiency. They

present an empirical model of the risk premium as a function of the conditional variance of market forecast errors. They posit that contrary to many rational expectations models of exchange rate, the exchange rate does not incorporate expectations of the future evident from the relation between the time decisions are made and the resolution of uncertainty since all decisions are made after the resolution of uncertainty and thus there is no speculative component money in the demand function they use. They assume forecast errors to follow the ARCH process introduced by Engle (1982) using maximum likelihood techniques to obtain efficient estimates. They find evidence against the unbiasedness hypothesis for a majority of the currencies and little support for the conditional variance of the exchange rate forecast error being an important sole determinant of the risk premium. Froot and Frankel (1989), in a survey, find that for the period 1981-85, variation in the forward dollar discount of the four most actively traded currencies (deutschmark, swiss franc, yen, british pound) reflects changes in expected depreciation rather than risk premia and that forward discount bias is primarily attributable to irrationality.

Froot and Thaler (1990) test for forward discount bias in the short-term and seek to find whether, UIP failure can be explained by a time-varying risk premium or expectational errors. Explanations for empirical results not supporting UIP include the peso problem (Farhi and Gabaix, 2008) and the risk premium (Cavaglia et al., 1994 and Fama, 1984). Cavaglia et al. (1994) through a survey conducted by Business International Corporation (BIC) covering 10 currencies relative to the dollar and eight currencies relative to the deutschmark find the forward bias to be attributed to both the failure of rational expectations and the existence of a time-varying risk premium. Froot and Thaler (1990) state that with regards to exchange rate premium, three approaches have been advanced: (1) the “statistical” models of risk, (2) measuring expected rates directly avoiding inferences from realized expectations, and (3) looking beyond relative

assets and examining various specifications of the fundamental determinants of required returns. In regards to expectational errors, they find contrary results to generally accepted financial theory where an increase in the interest differential should lead to an equivalent increase in expected depreciation. The authors find print estimates to suggest a 1% increase in interest differential to be followed by a 1% appreciation in the value of the dollar. The authors then explain another misleading inference from regressions which has popularly become known as the Peso problem also explained in (Farhi and Gabaix, 2008).

Froot and Thaler (1990) explain the "peso problem" as arising in 1955-1976 when the peso was fixed at a constant rate against the dollar. However the peso sold at a discount in the forward market based on investor expectation. The depreciation expected by investors did not occur. Other literature in conjunction with Froot and Thaler (1990) such as Hodrick (1987), Engel (1996), Baillie and Bollerslev (2000) and Flood and Rose (2002) have rejected the UIP condition based on econometric regressions used in modeling. Baillie and Bollerslev (2000) provide evidence that anomaly may be viewed as a statistical artifact from having small sample sizes and persistent autocorrelation in the forward premium. Froot and Thaler (1990) thus come to the conclusion that no positive evidence exists that the forward discount's bias is due to risk as opposed to expectational errors.

Carry Trade

Since the "forward premium puzzle" has shown that empirically interest parity does not hold, exploiting this anomaly should theoretically yield profits. I examine literature that covers the topic of carry trade and its profitability.

Bilson (1981) showed that buying the currency whose interest rate was relatively high would provide expected profits without bearing much risk. This and many other literature have shown that this anomaly when exploited leads to profit by taking some risk. One of the hardest problems as shown in most empirical research is finding and agreeing to a methodology that best models and explains how profits are made. Hodrick (1987) in a survey conducted, concludes "we do not yet have a model of expected returns that fits the data" in FX markets. Engel (1996) also concludes that the strong negative relation between forward premium and future exchange are not explained by models of rate models of equilibrium risk premia for any level of risk aversion. Yet, in such findings, it points to the ability to profit from carry trade strategy and hence its popularity. Galati and Melvin (2004) assert that carry trade is the strategy most widely used by practitioners.

Even with the problem of modeling, empirical research has shown the profitability of carry trade. James and Secmen (2009) show that carry trading has been successful in returning profits for three decades and thus is a robust trading strategy. This is consistent with findings of Burnside et al. (2006) where they show that Sharpe ratio from carry trading is positive and statistically different from zero. Burnside et al. (2011) find in explaining profitability of carry trades, traditional risk factors fails. Baillie and Chang (2011) posit that carry trade breaks down when markets become more turbulent and a reversion to UIP is more likely to be observed during such periods of volatility. They use logistic smooth transition regression framework in the econometric model for examining the role of carry trade and momentum trading strategies and their implications for the magnitude of forward premium anomaly and find that speed of adjustment to UIP depends on relative size of carry profits especially US-Yen carry trades against UK and the EMU currency and carry trades could explain deviation in UIP.

Covered Interest Arbitrage

Frenkel and Levich (1975) explore the topic of covered interest arbitrage and the possibility of unexploited profits in an efficient market. They estimate transaction cost from studying triangular arbitrage and use it in testing for efficiency in market. They conclude that the empirical data are consistent with the interest parity theory in the sense that covered interest arbitrage does not seem to entail unexploited opportunities for profit. Frenkel and Levich (1979) follow up Frenkel and Levich (1975) and test for effect of transaction costs on the efficacy of covered interest arbitrage during three periods: the tranquil peg (1962-67); the turbulent peg (1968-69); and the managed float (1973-75). They use this classification rather than the legal and institutional arrangements of the exchange rate regime (e.g., pegged or flexible ex-change rate systems). They find first that cost of executing transactions associated with covered interest arbitrage has risen dramatically during the managed float period as compared with the previous periods and account for deviations from parity during the tranquil peg and the managed float periods. They thus conclude from the data that after allowing for transaction costs and ensuring that the arbitraged assets are comparable covered interest arbitrage does not seem to entail unexploited opportunities for profit.

Different categories of literature cover various topics of carry trade. There are those that try to solve the puzzle of UIP, others which seek to find why carry trade is profitable and others that focus on some topic of carry trade. However, it is undeniable that carry trade is profitable even if it is carried out in the short term. The review of literature leads to the questions of how profitable carry trade is as compared to covered interest arbitrage; if any or both of these

strategies provide profit in the recent financial crisis. These questions lead to the subsequent hypotheses that:

1) Carry trade differs significantly in the crisis versus non-crisis periods
2) Covered interest arbitrage also differs significantly in the crisis versus non-crisis periods

I address these questions by using data from a different period than authors in my reviewed literature. This data is within a time frame with different laws, economic conditions as well as examining them within a different frame of portfolio construction discussed in section.

CHAPTER III

DATA

I obtain data on spot exchange rates, forward rates and Libor rates for the G10 countries (Euro (EUR), Japanese yen (JPY), Great Britain pound (GBP), Australian dollar (AUD), Canadian dollar (CAD), Swiss franc (CHF), New Zealand dollar (NZD), Norwegian krone (NOK) and Swedish krona (SEK)) from Datastream. I download spot exchange rates and three-month forward rates relative to the US dollar of these countries' currencies. The sample period is from 2000 to 2013. These are in indirect quotes (quoted in foreign currency per dollar). I obtain Libor rates also from Datastream for the ten countries. In cases where Libor was not available, I used T-bill rates or similar short-term government financial instruments to proxy as interest rates.

CHAPTER IV

METHODOLOGY

In examining the profitability to carry trade strategy, I construct the portfolio for carry trading following Deustche Bank Currency Returns (DBCR) carry-trade index. This is a trading strategy to compare performance of carry trading with covered interest rate arbitrage. At the beginning of each month, I rank the 10 currencies based upon their Libor rates and go long on the top 5 currencies and short on the bottom 5 currencies. The position is closed out at the end of month. I assume no transaction costs, no taxation and that risk-level reflects in investors own actions and ability to carry risk accordingly. I use no traditional portfolio optimization methods and I take the position of an investor in the United States.

For the sake of scaling, I assume investing $200 in each of the top 5 currencies (in terms of their Libor rates). The total investment of $1000 in the long position is obtained by going short of $200 in each of the bottom 5 currencies (in terms of their Libor rates). In this way, the portfolio requires no upfront investment since the short position is used to fund the long position. The portfolio profit is thus presented in dollar terms. For the easiness of comparison, I also calculate the returns to the long position (assuming $1000 initial investment) separately from the returns to the short position (also assuming $1000 initial investment) and then average the returns on the long and short positions.

In addition to the carry trade profit, I calculate the covered interest rate arbitrage trading strategy. The covered interest rate arbitrage strategy is constructed in the exact same fashion as

the carry trade trading strategy; however, while carry traders do not hedge their position using forward rates, covered interest rate arbitrageurs do hedge their position using forward rates. In this way, the only difference in calculating the profit to the two alternative trading strategies is the choice of the exchange rate used when closing out the position; forward rates are used in covered interest rate arbitrage while future spot rates are used in carry trade.

Once I obtain the carry trade profit and the covered interest rate profit, I compare the performances of the two trading strategies during non-crisis period and the crisis period (2007-2009) the t-test and the Wilcoxon non-parametric test. In the multivariate framework, I employ the following OLS regression:

$$PROFIT_t = \alpha + \beta_1 CRISIS_t + \beta_2 SP500_t + \beta_3 INFLATION_t + \beta_2 RISKPREMIUM_t + e_t$$

In the above model, PROFIT is the profitability accrued to the carry trade strategy or the covered interest rate arbitrage trading strategy, alternatively. CRISIS is the dummy variable for the years 2007-2009 of the financial crisis. SP500 is the return on the S&P500 index which captures the overall market performance. INFLATION is the inflation rate in the United States. RISKPREMIUM is the difference in the percentage changes between the Corporate AAA Bond Yield Index and Corporate BBB Bond Yield Index, which captures the risk premium in the overall market as posited by Roll and Ross (1984).

CHAPTER V

RESULTS

Table 1 provides a panel data on means and standard deviations from 2000 to 2013 each for spot exchange rates, forward rates and Libor rates. Table 2 provides details to how frequently each currency is shorted or longed and the percentage of how many times a currency is shorted or longed. From this table, Swiss Francs and Japanese Yen are all used in shorting (100%) as New Zealand and Australian dollars are all also used in the long position (100%). This is evident given that Switzerland and Japan have offered the lowest rates, while New Zealand and Australia have offered some of the highest interest rates.

Table 3 provides the summary statistics of the profits to the carry trade strategy and to the covered interest arbitrage strategy. The average ending $ values of the long and short positions of the carry trade strategy are $748.837 and $840.877 (per every $1000 portfolio value), respectively, leading to a loss for the overall strategy of $92.039. Similarly, the average ending $ values of the long and short positions of the covered interest arbitrage strategy are $646.204 and $746.271, respectively, leading to a loss for the overall strategy of $100.067. It seems to suggest that the two trading strategies are not profitable overall. However, the high standard deviations suggest that the average statistics might be misleading. There is also a statistically significant difference in the profitability between the two strategies.

Table 4 reports the mean profits to the carry trade strategy and to the covered interest arbitrage strategy by year. Interestingly, the results show that these two trading strategies yield significant profits prior to the year 2008 while yielding significant loss afterward. Thus, there is some evidence that the financial crisis has impacted the profitability of these two trading strategies.

In Table 5, I compare and contrast the profitability of the carry trade strategy and of the covered interest arbitrage strategy by year in the non-crisis period and the crisis period. The crisis period is 2007-2009 and the non-crisis period from 2000-2006 and 2010 to 2013.The average (median) $ net profit to the carry trade strategy in the non-crisis period is -$151.552 ($84.577) while the average (median) $ net profit in the crisis period is $111.297 ($88.559). Similarly, the average (median) $ net profit to the covered interest arbitrage strategy in the non-crisis period is -$41.013 ($222.134) while the average (median) $ net profit in the crisis period is $301.834 ($259.577). The difference between the profitability of the non-crisis and the crisis periods is significant at the 5% level, suggesting that the profitability might be higher in the crisis period. Notice how big the magnitude of the losses generated from the portfolios after the year 2009 which might drag down the average profitability in the non-crisis period.

In Table 6, I report the results from the cross-sectional analyses of the profitability of the two alternative trading strategies. Consistent with the univariate analyses in Tables 4 and 5, the coefficient on the CRISIS is positive and significant at the 1% level in models 1 through 4, suggesting that the profits accrued to the two trading strategies are higher in the crisis period. The higher profits might represent a risk premium for the higher risks in the crisis period. The other control variables INFLATION and RISK PREMIUM are positive and significant,

suggesting that the profitability from the strategies are compensations for inflation risk and higher risks.

In Table 7, I perform the cross-sectional analyses of the profitability of the two alternative trading strategies separately for the non-crisis period and the crisis period. The impacts of INFLATION on the profitability are similar in the non-crisis period and the crisis period. The impacts of RISK PREMIUM, on the other hand, are only significant in the non-crisis period for the covered interest arbitrage strategy while only significant in the crisis period for the carry trade strategy.

CHAPTER VI

CONCLUSION

In this paper, I attempt to compare and contrast the performance of carry trade strategy and covered interest arbitrage strategy during the financial crisis (2007-2009) and periods not affected by the financial crisis. If carry trade profitability is driven by time-varying risk premium as suggested by Fama (1984), then the profitability of the trading strategies is expected to differ significantly between the two periods of non-crisis versus crisis. Since the higher interest rates (in excess of the "parity" interest rate) might reflect the imbedded premium for the higher country risk or any other inherent risks, the profitability accrued to carry traders should be quite unstable in the period of the financial crisis as compared to the period of non-crisis.

I document that both trading strategies yield higher profits in periods of the financial crisis. It is possible that the higher profits might represent a risk premium for the higher risks in the crisis period.

This research contributes to the existing body of literature by providing a new dimension of factoring crisis period (2007-2009) and non-crisis period and comparing carry trade to covered interest arbitrage trading strategies. It could also have managerial and macroeconomic implications. This research could be expanded in the future to contribute in the area of how both carry and covered trade are affected by bearish expectations. McKinnon (2010) states that the

credit crunch of 2008 led to unexpected unwinding of the US dollar carry trade. It could also be expanded to see how costs (transaction, taxation) affect profitability as Frenkel and Levich (1975) find covered interest arbitrage does not seem to entail unexploited opportunities for profit when they include costs.

REFERENCES

Baillie, R.T., & Bollerslev, T., (2000). The forward premium anomaly is not as bad as you think. Journal of International Money and Finance *19* (4), 471-488.

Baillie, R.T., & Chang, S. S., (2011). Carry trades, momentum trading and the forward premium anomaly. Journal of Financial Markets *14*, 441-464.

Beer, C., Ongena, S., & Peter, M. (2008). Borrowing in Foreign Currency: Austrian Households as Carry Traders. *Swiss National Bank Working Papers*, (19), 1-50.

Bilson, J.F.O., 1981. The ‘‘Speculative Efficiency’’ hypothesis. J. Bus., 54(3), 435–451.

Burnside, C., Eichenbaum, M., & Rebelo S., (2007). The Returns to Currency Speculation in Emerging Markets. *American Economic Review, American Economic Association*, 97(2), 333-338.

Burnside, C., Eichenbaum, M., Kleshcelski, I. & Rebelo, S., (2006). The returns to currency speculation. *NBER Working Paper No. 12489*.

Burnside, C., Han, B., Hirshleifer, D., & Wang, T. (2011). Investor Overconfidence and the forward Premium Puzzle. *Review Of Economic Studies*, *78*(2), 523-558.

Cavaglia, S., Verschoor, W.F.C., Wolff, C.C.P., (1994). On the biasedness of forward foreign exchange rates: Irrationality or risk premia?. *Journal of Business* 67, 321–343.

Cumby, Robert E., (1988). Is it risk? : Explaining deviations from uncovered interest parity, *Journal of Monetary Economics*, , *22* (2), 279-299.

Domowitz, I., & Hakkio, C.S., (1985). Conditional Variance and the Risk Premium in the Foreign Exchange Market, *Journal of International Economics*, 19, 47-66.

Engel, C., (1996). The forward discount anomaly and the risk premium: a survey of recent evidence. *Journal of Empirical Finance* 3 (2), 123-192.

Fama, Eugene F. (1984). "Forward and Spot Exchange Rates." *Joumal of Monetary Economics*, 14, 319-338.

Farhi, E. & Gabaix, X., (2008). Rare disasters and exchange rates. Working paper, Harvard University and NYU Stern.

Flood, R.P., Rose, A.K., (2002). Uncovered interest parity in crisis: the interest rate defense in the 1990s. *IMF Staff Papers.*

Frenkel, J. A., & Levich, R. M. (1981). Covered interest arbitrage in the 1970's. *Economics Letters*, *8*(3), 267-274.

Frenkel, J. A., & Levich, R. M. (1977). Transaction costs and interest arbitrage: Tranquil versus turbulent periods. *The Journal of Political Economy*, 1209-1226.

Froot, K. A. & Frankel, J. A. (1989), Forward Discount Bias: Is It an Exchange Risk Premium?, *Quarterly Journal of Economics*, 104, 139–161.

Froot, K.A. and Thaler, R.H., (1990). Anomalies: foreign exchange. Journal of Economic Perspectives, 4(3), 179–192.

Galati, G., & Melvin, M. (2004). Why has FX trading surged? Explaining the 2004 triennial survey. *BIS Quarterly Review*, *4*, 67-74

Hodrick, R. (1987). The Empirical Evidence on the Efficiency of Forward and Futures Foreign Exchange Markets (New York: Harwood Academic).

James, J., Kasikov, K., & Secmen, A. (2009). Uncovered interest parity and the FX carry trade. *Quantitative Finance*, *9*(2), 123-127.

McKinnon, R., Lee, B., & Wang, Y. (2010). The Global Credit Crisis and China's Exchange Rate. *Singapore Economic Review*, *55*(2), 253-272.

Pilling, D., (2008). Beware the unwinding of the yen carry trade. Financial Times, October 3, 2008

Ramage, J., (2014). Currency 'Carry' Trade make comeback--For Now: Stable Foreign-Exchange Prices Encourage Strategy, but Waters Not Always So Placid. WSJ. June 30

2014.

Roll, R., & Ross, S. A. (1984). The arbitrage pricing theory approach to strategic portfolio planning. *Financial analysts journal*, 14-26

The Economist (a). "What Keeps Bankers Awake at Night? Financial stability," Economist. February 1, 2007, 382, 73–74.

The Economist b. "The yen and the carry trade: Out with a whimper" Economist, April 26, 2007

Wong, A., (2014). Carry Trades Restore Profits as Volatility Plummets: Currencies. Bloomberg April 9, 2014.

Wong, A., and Xie, Y., 2014. Currency Carry Trades Rise in ECB's Negative-Rate World. Bloomberg. Jun 10, 2014.

Xanthopoulos, A. (2011). An Interpretation of Carry Trade Profitability. Working Paper.

Table 1 – Summary Statistics of Spot Exchange Rates, Forward Rates and Libor Rates by Year and by Country

Panel A: Mean and standard deviation of spot Rates by years

Year	GBP	CAD	AUD	NZD	Norway	CHF	SEK	JPY	EUR
2000	1.496884	0.670507	0.570943	0.449	0.11213	0.587667	0.108097	0.926982	0.910171
	(0.055)	(0.012)	(0.030)	(0.034)	(0.004)	(0.018)	(0.006)	(0.017)	(0.041)
2001	1.440166	0.645887	0.517807	0.420737	0.111325	0.593322	0.096935	0.82368	0.895438
	(0.024)	(0.011)	(0.017)	(0.012)	(0.002)	(0.019)	(0.004)	(0.023)	(0.026)
2002	1.503116	0.637093	0.543896	0.464718	0.126209	0.645222	0.103288	0.800332	0.945833
	(0.063)	(0.009)	(0.018)	(0.029)	(0.010)	(0.038)	(0.006)	(0.035)	(0.054)
2003	1.63547	0.716383	0.652285	0.582632	0.141459	0.744479	0.1242	0.864241	1.132312
	(0.054)	(0.038)	(0.048)	(0.031)	(0.005)	(0.023)	(0.006)	(0.034)	(0.051)
2004	1.832489	0.770226	0.736567	0.66442	0.148694	0.806189	0.136399	0.925378	1.244023
	(0.042)	(0.034)	(0.031)	(0.030)	(0.006)	(0.030)	(0.006)	(0.023)	(0.043)
2005	1.819135	0.826027	0.76223	0.704272	0.155252	0.803701	0.134142	0.90942	1.244138
	(0.063)	(0.021)	(0.016)	(0.016)	(0.004)	(0.033)	(0.008)	(0.040)	(0.051)
2006	1.842995	0.881943	0.753421	0.649508	0.156173	0.798698	0.135857	0.859841	1.256097
	(0.070)	(0.015)	(0.017)	(0.027)	(0.005)	(0.021)	(0.005)	(0.015)	(0.038)
2007	2.001548	0.935457	0.8387	0.736459	0.171161	0.83419	0.148187	0.85008	1.370698
	(0.039)	(0.064)	(0.041)	(0.032)	(0.009)	(0.027)	(0.005)	(0.027)	(0.053)
2008	1.852381	0.943149	0.852728	0.713381	0.179575	0.926627	0.15336	0.970268	1.470822
	(0.180)	(0.072)	(0.113)	(0.088)	(0.020)	(0.049)	(0.016)	(0.054)	(0.103)
2009	1.56562	0.880789	0.792343	0.63609	0.159974	0.923711	0.13165	1.069867	1.394166
	(0.094)	(0.059)	(0.095)	(0.078)	(0.012)	(0.045)	(0.010)	(0.041)	(0.073)
2010	1.545579	0.971093	0.919799	0.721976	0.165664	0.96197	0.139152	1.142271	1.326492
	(0.047)	(0.018)	(0.048)	(0.027)	(0.006)	(0.050)	(0.007)	(0.053)	(0.060)
2011	1.603715	1.011735	1.032294	0.791765	0.178584	1.132179	0.154188	1.255941	1.392174
	(0.031)	(0.026)	(0.033)	(0.034)	(0.006)	(0.072)	(0.005)	(0.039)	(0.046)
2012	1.58494	1.000603	1.035602	0.810154	0.171983	1.066954	0.147755	1.253379	1.285579
	(0.024)	(0.015)	(0.023)	(0.021)	(0.004)	(0.026)	(0.004)	(0.032)	(0.033)
2013	1.564257	0.971333	0.968537	0.820479	0.170326	1.079294	0.153563	1.026315	1.327896
	(0.043)	(0.019)	(0.056)	(0.022)	(0.006)	(0.023)	(0.002)	(0.042)	(0.027)

Panel B: Mean and standard deviation of forward rates by years

Year	GBP	CAD	AUD	NZD	NOKK	CHF	SEK	JPY	EUR
2000	0.668021	1.488541	1.755659	2.241389	8.93988	1.689784	9.222694	106.1022	1.095334
	(0.024)	(0.026)	(0.094)	(0.173)	(0.341)	(0.053)	(0.507)	(2.014)	(0.050)
2001	0.696645	1.549562	1.939183	2.390359	9.067638	1.684336	10.34681	120.3508	1.119223
	(0.012)	(0.028)	(0.063)	(0.070)	(0.193)	(0.056)	(0.440)	(3.537)	(0.034)
2002	0.670141	1.573521	1.854169	2.1809	8.081736	1.553685	9.778161	124.6054	1.064849
	(0.028)	(0.023)	(0.060)	(0.134)	(0.661)	(0.093)	(0.566)	(5.413)	(0.061)
2003	0.615901	1.407014	1.554613	1.739208	7.127956	1.341629	8.117563	116.1789	0.887461
	(0.019)	(0.077)	(0.112)	(0.092)	(0.238)	(0.040)	(0.416)	(4.147)	(0.040)
2004	0.550069	1.30319	1.373023	1.5247	6.744544	1.238837	7.356417	108.7804	0.805826
	(0.013)	(0.055)	(0.058)	(0.070)	(0.281)	(0.045)	(0.297)	(2.713)	(0.028)
2005	0.551871	1.209052	1.318929	1.432606	6.421486	1.237844	7.444631	110.223	0.802277
	(0.018)	(0.031)	(0.026)	(0.033)	(0.161)	(0.049)	(0.410)	(4.777)	(0.031)
2006	0.542793	1.131254	1.330337	1.551062	6.377983	1.241763	7.324554	115.9283	0.792645
	(0.021)	(0.019)	(0.031)	(0.065)	(0.220)	(0.033)	(0.293)	(2.040)	(0.024)
2007	0.500516	1.071882	1.198846	1.370844	5.85218	1.191735	6.732157	117.4697	0.728654
	(0.009)	(0.073)	(0.057)	(0.059)	(0.301)	(0.036)	(0.228)	(3.619)	(0.027)
2008	0.548341	1.06741	1.208801	1.443384	5.691339	1.080914	6.620916	103.9448	0.68555
	(0.059)	(0.089)	(0.179)	(0.197)	(0.720)	(0.058)	(0.744)	(5.302)	(0.050)
2009	0.641243	1.140391	1.288335	1.606207	6.311006	1.084159	7.64845	94.52138	0.719585
	(0.040)	(0.078)	(0.157)	(0.204)	(0.474)	(0.053)	(0.619)	(3.553)	(0.038)
2010	0.647926	1.030947	1.100928	1.3965	6.072393	1.041188	7.209412	88.7627	0.755509
	(0.020)	(0.019)	(0.058)	(0.051)	(0.231)	(0.054)	(0.342)	(4.028)	(0.034)
2011	0.624407	0.991417	0.97996	1.273355	5.63402	0.885533	6.522541	80.74915	0.719937
	(0.012)	(0.025)	(0.031)	(0.054)	(0.186)	(0.054)	(0.229)	(2.495)	(0.024)
2012	0.63136	1.001487	0.974324	1.242567	5.839761	0.936681	6.795796	80.80034	0.777753
	(0.010)	(0.015)	(0.022)	(0.032)	(0.154)	(0.023)	(0.181)	(2.066)	(0.020)
2013	0.640133	1.032257	1.042834	1.227746	5.900019	0.926194	6.528133	98.57554	0.753059
	(0.018)	(0.020)	(0.059)	(0.033)	(0.194)	(0.020)	(0.105)	(3.919)	(0.015)

Panel C: Mean and standard deviation of Libor rates by years

Year	UK	CAN	AUS	NZ	NOR	SWI	SWE	JAP	EUR
2000	6.107828	5.719412	6.202429	7.039152	7.185975	3.256787	4.038252	0.161585	4.712284
	(0.104)	(0.188)	(0.222)	(0.188)	(0.565)	(0.379)	(0.090)	(0.157)	(0.475)
2001	4.972337	4.007471	4.863003	5.703218	7.530955	2.991379	4.035388	0.090881	4.373448
	(0.595)	(1.037)	(0.491)	(0.444)	(0.299)	(0.554)	(0.217)	(0.018)	(0.564)
2002	3.993985	2.608927	4.707832	6.002088	7.18307	1.200192	4.174575	0.08612	3.402292
	(0.081)	(0.339)	(0.260)	(0.401)	(0.334)	(0.436)	(0.228)	(0.007)	(0.155)
2003	3.669004	2.950881	4.858209	5.451057	4.21521	0.338123	3.13991	0.085545	2.385679
	(0.179)	(0.232)	(0.243)	(0.295)	(1.307)	(0.191)	(0.386)	(0.005)	(0.256)
2004	4.575382	2.286603	5.432388	6.279794	2.047843	0.45897	2.211364	0.088946	2.152939
	(0.318)	(0.238)	(0.063)	(0.420)	(0.107)	(0.213)	(0.203)	(0.006)	(0.047)
2005	4.698692	2.716654	5.593502	7.092508	2.265051	0.761539	1.788169	0.30662	2.234131
	(0.148)	(0.290)	(0.094)	(0.246)	(0.219)	(0.053)	(0.201)	(0.159)	(0.115)
2006	4.801423	4.117462	5.924507	7.486923	3.182242	1.421154	2.463983	0.727922	3.15974
	(0.258)	(0.257)	(0.289)	(0.171)	(0.412)	(0.296)	(0.377)	(0.109)	(0.392)
2007	5.954176	4.519272	6.633046	8.376063	5.119731	2.41092	3.797433	0.848006	4.406444
	(0.402)	(0.238)	(0.352)	(0.344)	(0.665)	(0.278)	(0.485)	(0.025)	(0.399)
2008	5.491221	3.18542	7.197555	7.59267	6.447325	2.472328	4.674885	0.585631	4.728295
	(0.854)	(0.659)	(0.936)	(1.337)	(0.697)	(0.645)	(0.692)	(0.079)	(0.545)
2009	1.196935	0.441648	3.724406	3.235067	2.520481	0.297893	0.951073	0.384226	1.22591
	(0.592)	(0.271)	(0.323)	(0.305)	(0.669)	(0.099)	(0.513)	(0.047)	(0.555)
2010	0.692146	0.765824	4.659229	3.55451	2.561743	0.25	0.865498	0.33191	0.803651
	(0.070)	(0.328)	(0.301)	(0.134)	(0.167)	(0.000)	(0.478)	(0.003)	(0.148)
2011	0.889615	1.173462	4.863533	2.971369	2.94664	0.146154	2.429462	0.32791	1.387191
	(0.110)	(0.027)	(0.094)	(0.251)	(0.223)	(0.123)	(0.194)	(0.006)	(0.186)
2012	0.838333	1.16387	4.092352	2.62246	2.292148	0	1.997835	0.239475	0.574401
	(0.237)	(0.036)	(0.480)	(0.127)	(0.289)	(0.000)	(0.388)	(0.026)	(0.343)
2013	0.492904	1.135577	3.142853	2.862338	1.793426	0	1.064731		0.220717
	(0.014)	(0.027)	(0.086)	(0.178)	(0.094)	(0.000)	(0.085)		(0.020)

The table is contains panel data on summary statistics of Spot Exchange Rates, Forward Rates and Libor Rates by Year and by Country. Panel A is mean and standard deviation of spot rates by years; Panel B contains the mean and standard deviation of forward Rates by years; and, mean and standard deviation of Libor rates by years

Table 2. Distribution of Currencies in Short and Long Positions

Currencies	*Number of months shorted*	*% of the currency being shorted*	*Number of months being longed*	*% of the currency being longed*
Great Britain Pound	48	30.19	111	69.81
Norwegian Krone	38	23.9	121	76.1
Australian Dollars	0	0	159	100
Canadian Dollars	115	72.33	44	27.67
Japanese Yen	159	100	0	0
Swedish Krona	95	59.75	64	40.25
Euro	124	77.99	35	22.01
New Zealand Dollars	0	0	159	100
Swiss Francs	159	100	0	0

This table contains information on the distribution of currencies in short and long positions monthly. In some unique cases (New Zealand dollars, Australian dollars) currencies are not shorted but longed and in a unique case as well, currencies (Japanese yen and Swiss francs) are not longed but shorted. %). This is evident given that Switzerland and Japan have offered the lowest rates, while New Zealand and Australia have offered some of the highest interest rates.

Table 3 - Summary Statistics of Carry Trade Profits and Covered Interest Profits

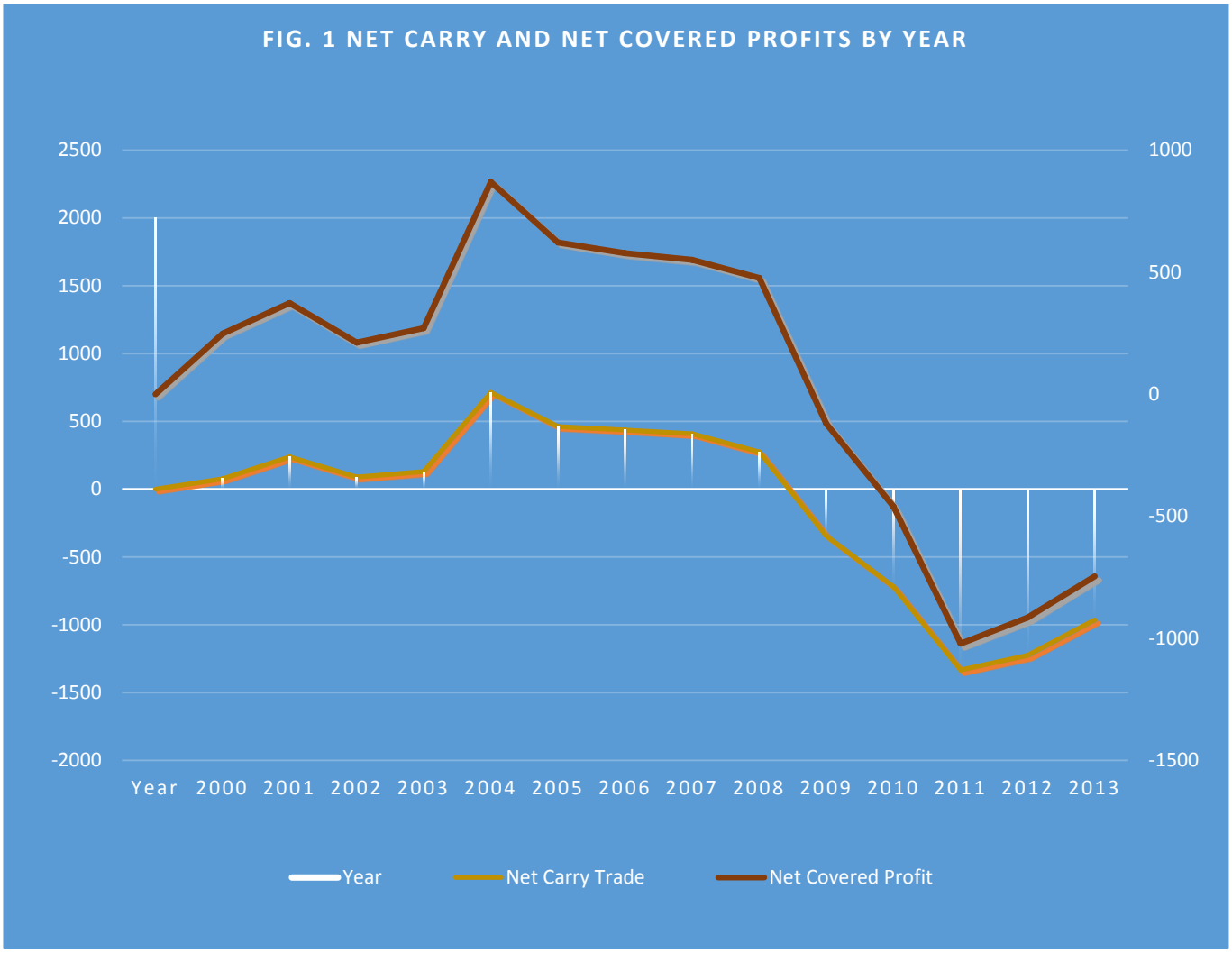
Variables	*Mean*	*Median*	*Standard deviation*	*t-stat*	*Minimum*	*Maximum*
Ending uncovered long position	$748.837	$647.801	$325.050	29.050***	$158.597	$1,579.890
Ending uncovered short position	$840.877	$624.453	$443.829	23.890***	$278.616	$1,806.890
Net carry trade profit	-$92.039	$84.577	$683.839	-1.700*	-$1,410.980	$1,113.610
Net carry trade profit %	-9.204%	8.458%	68.384%	-1.700*	-141.098%	111.361%
Ending covered long position	$646.204	$475.219	$385.588	21.13***	$135.676	$1,488.630
Ending covered short position	$746.271	$643.971	$326.180	28.85***	$146.390	$1,583.060
Net covered profit	-$100.067	-$223.636	$629.977	2.00**	-$1,112.030	$1,292.470
Net covered profit %	-10.007%	22.364%	62.998%	2.00**	-111.203%	129.247%
$ profit difference between carry trade and covered arbitrage	-$192.106	-$167.411	$66.799	-36.26***	-$360.799	-$107.090
% profit difference between carry trade and covered arbitrage	-19.211%	-16.741%	6.680%	-36.26***	-36.080%	-10.709%

This table provides summary statistics of carry trade profits and covered interest profits for the variables Ending uncovered long position; Ending uncovered short position; Net carry trade profit; Net carry trade profit %; Ending covered long position; Ending covered short position; Net covered profit; Net covered profit %; $ profit difference between carry trade and covered arbitrage; % profit difference between carry trade and covered arbitrage. All the variables are statistically significant

Table 4 - Net Carry Trade and Covered Profits by Year

Year	*N*	*$ Net Carry Trade Profit*	*% Net Carry Trade Profit*	*$ Net Covered Profit*	*% Covered Profit*	*$ Profit Difference*	*% Profit Difference*
2000	10	$76.500	7.650%	$247.970	24.797%	-$171.475	-17.148%
2001	12	$238.370	23.837%	$372.600	37.260%	-$134.224	-13.422%
2002	12	$88.140	8.814%	$210.980	21.098%	-$122.835	-12.283%
2003	12	$128.480	12.848%	$270.380	27.038%	-$141.901	-14.190%
2004	12	$713.150	71.315%	$869.910	86.991%	-$156.755	-15.676%
2005	12	$460.610	46.061%	$621.840	62.184%	-$161.233	-16.123%
2006	12	$436.310	43.631%	$577.560	57.756%	-$141.253	-14.125%
2007	12	$406.790	40.679%	$550.420	55.042%	-$143.629	-14.363%
2008	12	$272.820	27.282%	$475.570	47.557%	-$202.750	-20.275%
2009	12	-$345.720	-34.572%	- $120.490	-12.049%	-$225.234	-22.523%
2010	12	-$719.610	-71.961%	-$460.690	-46.069%	-$258.920	-25.892%
2011	12	-$1,334.160	-133.416%	-$1,022.240	-102.224%	-$311.915	-31.192%
2012	12	-$1,226.920	-122.692%	-$915.460	-91.546%	-$311.459	-31.146%
2013	5	-$963.690	-96.369%	-$746.730	-74.673%	-$216.964	-21.696%

This table provides net carry trade and covered profits by year. Net covered profit and net carry trade profit both return positive profits until 2009 when profits turn negative. Profit differentials are negative for all years.



A graphical representation of table 4 showing mean returns of both carry trade and covered interest arbitrage by year

Table 5 - Net Carry Trade and Covered Profits in Non-Crisis Periods vs. in Crisis Period

	Non-Crisis Period (N=123)		***Crisis Period (N=136)***		***Difference***			
Variables	Mean	Median	Mean	Median	Mean	Median	t-stat	Wilcoxon-stat
$ Net Carry Trade Profit	-$151.552	$84.577	$111.297	$88.559	$262.849	$3.982	2.44**	1.052
% Net Carry Trade Profit	-15.155%	8.458%	11.130%	8.856%	26.285%	0.398%	2.44**	1.052
$ Net Covered Profit	$41.013	$222.134	$301.834	$259.577	$260.822	$37.442	2.57***	1.311
% Covered Profit	4.101%	22.213%	30.183%	25.958%	26.082%	3.744%	2.57***	1.311
$ Profit Difference	-$192.565	-$160.990	-$190.538	-$190.918	$2.028	-$29.928	0.2	-0.982
% Profit Difference	-19.257%	-16.099%	-19.054%	-19.092%	0.203%	-2.993%	0.2	-0.982

The test statistic is statistically significant for all variables except the $profit difference and %profit difference. The N for all periods is 259 and non-crisis period has N=123 and crisis has N=136

Table 6 - Cross-Sectional Analyses Carry Trade Profit and Covered Interest Arbitrage Profit - Whole Sample

Indep. Variables	***Model 1*** $ Net Carry Trade Profit	***Model 2*** % Net Carry Trade Profit	***Model 3*** $ Net Covered Profit	***Model 4*** % Covered Profit	***Model 5*** $ Profit Difference	***Model 6*** % Profit Difference
CRISIS	0.167	0.167	0.179	0.179	0.022	0.022
	(2.600**)	(2.600**)	(2.715***)	(2.715***)	(0.368)	(0.368)
S&P500 RETURN	-0.043	-0.043	-0.047	-0.047	0.006	0.006
	(-0.509)	(-0.509)	(-0.561)	(-0.561)	(0.059)	(0.059)
INFLATION	0.167	0.167	0.163	0.163	0.171	0.171
	(2.286**)	(2.286**)	(2.212**)	(2.212**)	(2.504**)	(2.504**)
RISK PREMIUM	0.174	0.174	0.173	0.173	0.152	0.152
	(2.207**)	(2.207**)	(2.179**)	(2.179**)	(1.774*)	(1.774*)
Constant	-207.299	-0.207	-8.683	-0.009	-198.616	-0.199
	(-2.828***)	(-2.828***)	(-0.129)	(-0.129)	(-27.331***)	(-27.331***)
F	4.438***	4.438***	4.535***	4.535***	2.042**	2.042**
R-squared	0.071	0.071	0.075	0.075	0.033	0.033
Observations	159	159	159	159	159	159

This table provides a cross-sectional analyses of carry trade profit and covered interest arbitrage profit for the whole sample. This is from the econometric model $PROFIT_t = \alpha + \beta_1 CRISIS_t + \beta_2 SP500_t + \beta_3 INFLATION_t + \beta_2 RISKPREMIUM_t + e_t$.

Table 7 - Cross-Sectional Analyses Carry Trade Profit and Covered Interest Arbitrage Profit - Non-Crisis vs. Crisis Periods

	Non-Crisis Period			***Crisis Period***		
Independent Variables	% Net Carry Trade Profit	% Covered Profit	% Profit Difference	% Net Carry Trade Profit	% Covered Profit	% Profit Difference
S&P500 RETURN	-0.033	-0.068	-0.031	-0.096	-0.049	0.274
	(-0.320)	(-0.427)	(-0.304)	(-0.581)	(-0.424)	(1.693)
INFLATION	0.069	0.588	0.073	0.546	0.022	0.719
	(0.830)	(2.951 ***)	(0.877)	(2.705 **)	(0.283)	(4.101 ***)
RISK PREMIUM	0.124	0.554	0.119	0.524	0.155	0.579
	(1.468)	(2.727 **)	(1.443)	(2.537 **)	(1.474)	(3.094 ***)
Constant	-0.175	0.025	0.017	0.224	-0.192	-0.199
	(-2.218 **)	(0.268)	(0.241)	(2.455 **)	(-24.909 ***)	(-25.688 ***)
F	2.107**	5.346***	2.062**	4.867***	1.750*	6.444***
R-squared	0.026	0.235	0.025	0.218	0.035	0.326
Observations	123	36	123	36	123	36

This table provides cross-sectional analyses of carry trade profit and covered interest arbitrage profit for the crisis and non-crisis period. This is from the econometric model $PROFIT_t = \alpha + \beta_1 CRISIS_t + \beta_2 SP500_t + \beta_3 INFLATION_t + \beta_2 RISKPREMIUM_t + e_t$.

BIOGRAPHICAL SKETCH

Charles Kwame Armah Danso earned the degree of Master of Business Administration from the University of Texas-Pan American (UTPA) in 2014. He graduated with honors with a Bachelor's in Business Administration (BBA) in Finance from the University of Texas-Pan American in May, 2013. He has worked as a research and teaching assistant while pursuing his Master's and Bachelor's degree in Business Administration. He has won first place in two College of Business Administration research contests at both the undergraduate and Master's level. He attended and presented at the Undergraduate Research Conference at UTPA in 2012 and at the Western Economic Association International Meeting (WEAI), San Francisco, in 2012.

Charles Kwame Armah Danso has been admitted to the PhD program in Florida Atlantic University for Fall 2014. He can be contacted by phone at (956) 500 2736 or by e-mail at ckadanso@gmail.com or cdanso2014@fau.edu.