Three Essays on Hedge Fund Flows, Regulation, and Economic Geography

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THREE ESSAYS ON HEDGE FUND FLOWS, REGULATION, AND ECONOMIC GEOGRAPHY

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ABSTRACT

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Chapter I studies the effect of tax policies (Tax Information Exchange Agreements (TIEAS)) on hedge fund flows and indirectly on hedge fund manager and investor behavior in six tax haven countries. I find that structural changes in both hedge fund dollar flows and net flows occurred in the tax haven countries as a result of TIEAS. I also find that both hedge fund dollar flows and net flows of the countries that signed TIEAS and the countries that did not sign TIEAS increased after their structural break points.

Chapter II investigates whether a causal relationship exists between hedge fund flows and performance. Six major offshore tax haven countries (from Chapter I) and the U.S. are included in the study. Applying unit root and cointegration models coupled with a bivariate vector autocorrelation model, I find that hedge fund return leads hedge fund flows in the U.S., Bahamas, and Bermuda. This suggests that hedge fund investors in these countries make their investment decisions based on the aggregated performance of hedge funds. However, data from the U.S. indicates a moderate feedback relationship. Results from impulse response analysis show that while an increase in hedge fund returns leads to an increase in flows in all tax haven countries, U.S. hedge fund flows decrease with increasing performance.

Chapter III traces the geographic location of U.S. hedge funds and funds of funds and estimates the determinants of U.S. hedge fund and fund of funds mangers' location choices. A

nested logit model developed by McFadden (1974) is used in the analysis. I find that fund type, lock up period, number of employees, management fees, and performance fees are significant determinants of hedge funds and funds of funds managers' location choices. High water mark is not a significant determinant of fund managers' location choices. In addition, hurdle rate is a significant determinant when fund managers are choosing between whether to register in tax haven or non-tax haven.

DEDICATION

This dissertation is dedicated to my family. Thank you for your unconditional love and support.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

TAX POLICY AND HEDGE FUND FLOWS

1.1 Introduction

The hedge fund industry has grown tremendously for the past several decades. Hedge funds can be classified into two broad categories on the basis of domicile: onshore hedge funds and offshore hedge funds. Offshore hedge funds have contributed more to the rapid growth rate than onshore hedge funds, due to tax benefits, lower transparency and a looser regulatory environment (Liang et al 2007). Aragon et al. (2011) state that onshore hedge funds are subject to strict marketing prohibitions, accredited investor requirements, a limited number of investors, and tax disadvantages. However, most hedge fund studies do not differentiate between onshore and offshore hedge funds. They almost always use an aggregated sample (Getmansky, 2012 and Liang, 1999). A few recent studies (Agarwal et al 2010, Brown et al 1999, and Kudrle, 2009) have begun to depart from the practice of aggregation by dividing the sample into onshore and offshore funds. Furthermore, while hedge fund studies have proliferated, there is little research focusing on hedge fund behavior as it relates to taxation issues.

I find that TIEAS affected the structural stability of hedge fund flows. Specifically, they caused structural changes in both hedge fund dollar flows and net flows in the six tax haven countries. This also suggests that tax policy does affect hedge fund manager and investor behavior. In addition, I use the month of signature as the theoretical structural break point for the countries that signed TIEAS with U.S. and Nov 2001 (structural break point of Cayman Islands) as the theoretical structural break point for the countries that did not sign TIEAS with U.S., because it is the earliest signature date in this study and structural change in capital flow are expected from this date on. I find that the actual structural break points are about 20 months after the theoretical structural break point for hedge fund dollar flow in all six countries while the actual structural break points are about 20 months before the theoretical structural break point for hedge fund net flow in all six countries.

In this study, I examine the effect that tax policy can have on hedge fund flows and (indirectly) on fund manager and investor behavior in six major tax haven countries, namely the Bahamas, British Virgin Islands, Cayman Islands, Guernsey, Bermuda, and Luxembourg. The first four countries were among the first major tax havens that signed Tax Information Agreements (TIEAS) with U.S. The latter two countries did not sign TIEAS with U.S. during my sample period (Jan 1998- Dec 2004). I hypothesize that TIEAS caused structural changes in hedge fund flows of these six countries. I also hypothesize that hedge fund flows in the countries that signed TIEAS decreased after their structural break points while hedge fund flows in the countries that did not sign TIEAS increased after their structural break points.

Comparing hedge fund dollar flow and net flow before and after the structural break points, I find that both hedge fund dollar flow and net flow increased after their structural break points in all six countries. This suggest that even though TIEAS cause structural changes to hedge fund flows, the disclosure of tax information disadvantage is not enough to offset the advantages of investing in these tax havens.

This study is one of the first studies to empirically analyze the effect of tax policy on hedge fund flows and indirectly on hedge fund manager and investor behavior. The results have significant implications. First, tax policy does affect hedge fund flows (and implicitly manager and investor behavior), thus suggesting that studies on hedge fund flows should control for tax policies and agreements. Second, the results show structural breaks in hedge fund flows 2000 and 2003. Time series studies on hedge flows should utilize methodology that take into account of structural breaks (i.e. many studies use sample period 1998 – 2010 without testing for potential structural changes). Finally, since tax policy affects hedge fund flows, and manager and investor behavior and tax legislation varies from country to country, simply separating hedge funds samples into onshore and offshore is not enough; disaggregating hedge fund samples into the individual country level might be necessary.

1.2 Hedge Fund Overview, Related Literature and Hypotheses

Hedge funds represent a distinct investment class, as they differ from traditional investment vehicles in terms of both legal structure and investment strategies. Compared to mutual fund managers, hedge fund managers are much less restricted in their investment activities. For example, hedge fund managers can use leverage, sell (short) or buy (long) securities they do not own, or take highly concentrated positions in single stocks or industries.

Onshore hedge funds differ significantly from offshore funds. Onshore funds achieve their freedom from registration and regulation under the Investment Company Act of 1940 by satisfying the exemption qualifications of either Section 3(c)(1) or Section 3(c)(7) of the Act. A 3(c)(1) fund must have less than 100 accredited investors. A 3(c)(7) fund can have an unlimited number of only qualified purchasers. However, the Securities Exchange Act of 1934 requires hedge funds with more than 499 investors to report on a quarterly basis. Hence, in order to avoid quarterly reporting, a 3(c)(7) fund, must have less than 499 investors. In general, onshore hedge fund investors are mostly accredited or qualified investors defined by Rule 501 of regulation D under the Securities Act of 1933. In contrast, offshore hedge funds are generally not concerned with the exemption requirements because they are typically corporations registered in tax havens such as the Bahamas, the British Virgin Islands (BVI), Cayman Islands (CI), Bermuda, or Luxembourg, where tax liabilities to non-U.S. investors are minimal.

According to McCrary (2002), most onshore hedge funds are structured as limited partnerships to pass through taxable income to fund investors. A partnership structure exposes tax-exempt investors to unrelated business taxable income (UBTI) that is generated from leveraged strategies (LePree, 2008). In contrast, this income can be converted into dividends, and UBTI can be avoided under a corporate structure. Most offshore hedge funds are structured as corporations, which are more attractive to U.S. tax-exempt investors, such as endowments and pension funds, and non-U.S. investors. According to the Barclay Hedge Fund Database, only 25.68% of the hedge funds are domiciled in the U.S., 53.38% domiciled in the Caribbean, 18.23% domiciled in Europe, and 2.71% domiciled in the rest of the world.

Onshore hedge funds are generally held by a limited number of accredited or qualified taxable U.S. individual investors, whereas offshore hedge funds are held by an unlimited number of tax-exempt institutional investors such as endowments and pension funds, and non-U.S. investors. Furthermore, Cumming and Dai (2010) study hedge funds regulations across 29 countries and find that compare to offshore hedge fund managers, onshore hedge fund managers are restricted to only one of a possible seven distinct marketing channels (private placements). Therefore, onshore hedge funds are subject to more restrictions on the number of investor accounts, investor type, and marketing channels compare to offshore hedge fund managers. In a survey by WSJ.com, some economists warned against heavy regulation on hedge funds: "… we would push them offshore if we tried to regulate with a heavy hand. Better have them onshore with light regulation." (Wall Street Journal, Eastern Edition, Oct. 13, 2006, pg. C.3)

Despite the increased research in hedge funds as an asset class, there is little research focus on the influence of tax policies on the mobility of capital flows. Kudrle (2009) suggests that many current and past tax haven initiatives use reputation as a foundation for making changes to existing tax legislation. Examples include The Financial Action Task Force (FATF), which uses factors such as money laundering, transparency, insufficient cooperation, and recently the financing of terror organizations to push for tax reforms. Other organizations such as the Organization for Economic Cooperation and Development (OECD), have persistently used reputation, as well as other tools to drive changes in tax cooperation among countries. One such recent tool is the Tax Information Exchange Agreements (TIEAS). The European Union has issued various directives in this area, notably the Savings Tax Directive (STD), which came into effect on January 7, 2005. As a result of the European Union STD, all EU member countries and certain non-member states are required to either withhold taxes or exchange information on certain investment income (Schwarz, 2009). There are a number of reasons why countries may not want to sign STDs or TIEAS. Schwarz (2009) argues that countries that have a highly profitable financial sector are reluctant to sign on to such agreements. Non-participation also avoids, or minimizes spillover effects into the labor market.

In this study, I focus on the impact that Tax Information Exchange Agreements (TIEAS) may have on the hedge fund flows. TIEAS is a model agreement on exchange of information on tax matters, developed by the Organization for Economic Co-operation and Development (OECD) global forum working group on effective exchange of information. The purpose of this Agreement is to promote international co-operation in tax matters through exchange of information (www.oecd.org). Of the countries that signed TIEAS with the U.S., I focus on the following ones: the Bahamas (Jan 25, 2002), British Virgin Islands (April 03, 2002), Cayman Islands (Nov 27, 2001), and the Isle of Guernsey (Sep 19, 2002) since over 70% of the offshore hedge funds are domiciled in these countries. I will compare these countries with Bermuda and Luxembourg, the two major offshore hedge fund countries that did not sign TIEAS with U.S. The information on all the recent bilateral agreements can be found in Appendix.

For the countries that signed TIEAS with U.S., I expect the hedge fund flows to decrease after signing the agreement. On the other hand, for the countries that did not sign TIEAS with U.S., I expect hedge fund flows to increase. A decrease in flows may affect liquidity as investors seek to move their assets elsewhere through the redemption process. Clarke et al (2007) suggest that sustained redemptions often require fund managers to sell their less liquid assets, which may depress asset values.

The month of signature is the theoretical structural break point for the countries that signed TIEAS with U.S. For the countries that did not sign TIEAS with U.S., Nov 2001 (structural break point of Cayman Islands) should be the theoretical structural break point because it is the earliest signature date in this study and structural change in capital flow are expected from this date on. The earliest date is chosen because it signifies to investors that other countries may also sign agreements but at a later date. This is similar to a signaling effect where the signature of one agreement signals that agreements may be signed by other jurisdictions.

[INSERT TABLE 1.1 HERE]

Hypothesis 1: TIEAS caused structural changes in tax haven countries' hedge fund dollar flows.

Hypothesis 2: TIEAS caused structural changes in tax haven countries' hedge fund net flows.

Hypothesis 3: Hedge fund dollar flows in the tax haven countries that signed TIEAS decreased after their structural break points; hedge fund dollar flows in the tax haven countries that did not sign TIEAS increased after their structural break points.

Hypothesis 4: Hedge fund net flows in the tax haven countries that signed TIEAS decreased after their structural break points; hedge fund net flows in the tax haven countries that did not sign TIEAS increased after their structural break points.

1.3 Data and Descriptive Statistics

Previous researches have used one or more of the three hedge fund databases, namely HFR, TASS, and ZCM/MAR. In this study, I obtain monthly data on individual hedge funds and fund-of-funds (FOFs) from the Barclay Hedge Fund Database. Both hedge funds and FOFs are included for the purpose of the study. I also include both active and inactive funds to minimize survivorship bias. The survivorship bias has been widely studied for both mutual fund and hedge fund industry. For mutual funds, the survivorship bias can overstate fund performance by about 0.5-1.4% per year if the data only contains survived funds. (i.e., Brown, Goetzmann, Ibbotson, and Ross (1992), Brown and Goetzmann (1995), and Malkiel (1995)) For hedge funds, the average survivorship bias is over 2% per year. (i.e., Fung and Hsieh (1998) and Brown, Goetzmann, and Ibbotson (1999), and Liang (2000)) Therefore, it is necessary to include both active and inactive funds in this study.

The sample period extends from January 1998 to December 2004. I focused on this period for several reasons: First, offshore hedge funds are relatively younger compared to onshore hedge funds (Brown et al, 1999). In fact, there were only a few offshore hedge funds in operation before our sample period. Second, the tax haven countries signed TIEAS agreements with the U.S. around late 2001 to late 2002. Third, in December 2004 the SEC passed a rule that removed the private adviser exemption by requiring hedge fund advisers to register under the Investment Advisers Act. However, since this rule excludes any fund with a lockup period of more than two years, hedge fund advisers can circumvent the registration by imposing a two-year lockup period on investors. As a result, many investors might increase their holdings in offshore hedge funds which do not have such a prolonged lockup period. Since fund flows might be influenced by this new registration rule, I exclude sample period past December 2004 to capture the before and after effect that the TIEAS has on hedge fund flows. The summary statistics of the six tax haven countries studied in this study are shown in Table 1.1 and Table 1.2.

[INSERT TABLE 1.2 HERE]

Computation of Dollar Flows

Using the methodology proposed by Agarwal et al (2009), monthly dollar flows for country *i* during month *m* are computed as:

$$DF_{i,m} = AUM_{i,m} - AUM_{i,m-1}(1+R_{i,m}) \qquad (1)$$

where DF is equal to Dollar flow for country *i* in month *m*, $AUM_{i,m}$ is assets under management for country *i* during month *m*, and $R_{i,m}$ represents average hedge fund return for country *i* during month *m*.

Computation of Net Flows

Following the similar approach as in Chevalier and Elison (1997) and Sirri and Tufano (1998), monthly net fund flows ($NF_{i,m}$) of each country *i* during month *m* are computed by scaling monthly dollar flows by beginning-of-month AUM in order to capture the change in size due to net capital flows

$$NF_{i,m} = DF_{i,m}/AUM_{i,m-1} \quad (2)$$

Hedge fund dollar flow and net flow from the six tax haven countries are graphed in Figure 1.1 – Figure 1.6.

[INSERT FIGURE 1.1 – FIGURE 1.6 HERE]

1.4 Methodology

In this study, I focus on the hedge fund flows of six countries that are considered tax havens for the purposes of taxation on investment-type income: (1) the Bahamas, (2) British Virgin Islands, (3) Cayman Islands, (4) Guernsey, (5) Bermuda, and (6) Luxembourg. We analyze the time period January 1998 to December 2004, which corresponds to the time period in which the TIEAS agreements were signed. The first four countries signed TIEAS with the U.S. and the last two countries did not sign TIEAS with U.S. during the specified sample period.

To investigate Hypotheses 1 and 2, I specify the following two sets of regression models to investigate if a capital flow structure change occurred at the Structural Break Point (SBP):

Time Period 01/1998 to SBP_i: $DF_{i,m} = \gamma_1 + \gamma_2 DF_{i,m-1} + u_{1m}$ (R.1.A)

Time Period SBP_{i+1} to 12/2004: $DF_{i,m} = \delta_1 + \delta_2 DF_{i,m-1} + u_{2m}$ (R.1.B)

Time Period 01/1998 to 12/2004: $DF_{i,m} = \alpha_1 + \alpha_2 DF_{i,m-1} + u_m$ (R.1.C)

Time Period 01/1998 to SBP_i: $NF_{i,m} = \kappa_1 + \kappa_2 NF_{i,m-1} + u_{1m}$ (R.2.A)

Time Period SBP_{i+1} to 12/2004: $NF_{i,m} = \mu_1 + \mu_2 NF_{i,m-1} + u_{2m}$ (R.2.B)

Time Period 01/1998 to 12/2004: $NF_{i,m} = \beta_1 + \beta_2 NF_{i,m-1} + u_m$ (R.2.C)

$DF_{i,m}$ represents dollar flow as calculated in (1) and $NF_{i,m}$ represents net dollar flow as calculated in (2). The *u*'s represent the error terms. SBP_i represents the Structural Break Point for country *i*.

Regressions (R.1.A), (R.1.B), (R.2.A), and (R.2.B) assume that the regressions in the two time periods are different; that is the intercept and the slope coefficients are different. The pooled regression (R.1.C) and (R.2.C) assume that there is no difference between the two time periods. In other words, they assume that the intercept and the slope coefficient remain the same over the entire time period; that is, there is no structural change. If there is no structural change, then $\gamma_1 = \delta_1 = \alpha_1$, $\gamma_2 = \delta_2 = \alpha_2$, $\kappa_1 = \mu_1 = \beta_1$, and $\kappa_2 = \mu_2 = \beta_2$.

The Chow (1960) test can be used to test for structural changes in time-series data (Bleaney, 1990). The intuition of the Chow (1960) test is to determine whether a single regression line (i.e. (R.1.C)) or two separate regression lines (i.e. (R.1.A) (R.1.B)) fit the data better. The steps of the Chow (1960) test are:

1) Run separate regressions on two time periods: before and after the structural break. Collect the sum of squared residuals (SSR) for both periods, $SSR_{1,SBPi}$ and $SSR_{SBPi+1,T}$, where SBP_i is the Structural Break Point for country *i*, T is the total number of observations or dates.
2) Run the regression on the entire time period, collect $SSR_{1,T}$.
3) Here, Chow (1960) test compares $SSR_{1,T}$ with $SSR_{1,SBPi}$ and $SSR_{SBPi+1,T}$. The test statistic is computed as:

$$F = \frac{(SSR_{1,T} - (SSR_{1,SBPi} + SSR_{SBPi+1,T}))/k}{(SSR_{1,SBPi} + SSR_{SBPi+1,T})/(T-2k)} \tag{3}$$

   where k is the number of parameters estimated in each equation (in this case, k = 2).
4) Find the critical values in the F-test tables (df = T-2k) and see whether the null hypothesis of no structural break can be rejected.

The Chow (1960) test can be used to test for structural changes when the structural break point is known. In this case, however, the theoretical structural break point might not be the actual structural break point. First of all, investors might get wind of the TIEAS before the actual signing date and withdraw their investment. Second, hedge fund managers imposed prolonged lockup period on investors; therefore investors might not be able to withdraw funds as fast as they want. Therefore, the actual structural break point is unknown in this case.

Quandt (1960) considers a linear regression model

$$y_t \quad = \beta_1 x_t' + \varepsilon_t \ , \ t = 1,\ldots,\tau$$

$$= \beta_2 x_t' + \varepsilon_t \ , \ t = \tau+1,\ldots,T \tag{4}$$

where β_1 , β_2, and x_t are kx1.There is a single breakpoint, τ. Assume the x's are stationary and weakly exogenous and the ε's are serially uncorrelated and homoskedastic.

No structural change null hypothesis

H_0: $\beta_1 = \beta_2$

In the case where τ is unknown, Quandt (1960) showed that the likelihood ratio statistic is:

$$QLR_T = \max_{\tau \varepsilon \{\tau_{\min},\ldots,\tau_{\max}\}} F_T(\tau) \tag{5}$$

The Quandt-Andrews Breakpoint Test can be used to test for one or more unknown structural breakpoints for a specified equation. In the Quandt-Andrews test, a single Chow (1960) test is performed at every observation between two observations or dates, τ_1 and τ_2. The k test statistics from these Chow (1960) tests are summarized into one test statistic for a test against the null hypothesis of no breakpoints between τ_1 and τ_2. Building on Quandt (1960), Andrews (1993) and Andrews and Ploberger (1994) develop three test statistics: the Supremum or Maximum statistics, the Exp statistics and the Ave statistics.

The Maximum statistic is the maximum of the individual Chow F-statistics:

$$MaxF_T = \max_{\{\tau 1 \le \tau \le \tau 2\}} F_T(\tau) \quad (6)$$

The exp statistics is optimal against distant alternatives:

$$ExpF_T = \ln\left(\frac{1}{k}\sum_{\tau=\tau 1}^{\tau 2} \exp(\frac{1}{2}F_T(\tau)\right) \quad (7)$$

The Ave statistic is the average of the individual F-statistics and is optimal against every local alternative:

$$AveF_T = \frac{1}{k}\sum_{\tau=\tau 1}^{\tau 2} F_T(\tau) \quad (8)$$

Hansen (1997) provided approximate asymptotic p-values of these test statistics. The distribution of these statistics becomes degenerate as τ_1 approaches the beginning the sample time period and τ_2 approaches the end of the sample period. Andrews (1993) recommends setting a trimming parameter which equals 15%. As a result, first and last 7.5% of the observations are excluded.

1.5 Results

The results from the Quandt-Andrews Breakpoint Test are shown in Table 1.3. The structural break point is significant only if two or three of the test statistics are significant.

[INSERT TABLE 1.3 HERE]

The Quandt-Andrews Breakpoint Test result for hedge fund dollar flows shows that significant structural changes occurred in five out of the six countries tested, namely the British Virgin Islands, Cayman Islands, Guernsey, Bermuda, and Luxembourg. All three test statistics (MaxF, ExpF, AveF) are significant for these five countries. Therefore, hypothesis 1 is accepted. Structural changes in hedge fund dollar flows occurred as a result of TIEAS.

The Quandt-Andrews Breakpoint Test result for hedge fund net flows shows that significant structural changes occurred in three out of the six countries tested, namely Cayman Islands, Guernsey, and Luxembourg. All three test statistics (MaxF, ExpF, AveF) are significant for these countries. Therefore, hypothesis 2 is accepted. Structural changes in hedge fund net flows occurred as a result of TIEAS.

Examining Table 1.3, we can see that structural breaks in the tax haven countries' hedge fund dollar flows occurred in 2003, which is after their theoretical structural break points (Month of their TIEAS signature). As we mentioned earlier, offshore hedge funds are relatively younger compare to onshore hedge funds and fewer offshore hedge funds exist before 1998. Therefore, offshore hedge funds in our sample period tend to have more new investors. The average lockup period is two years for new investors. This limits capital outflow from hedge funds. Our result confirms this. Recall that in Table 1.1 we can see that the structural break in six tax haven countries' hedge fund dollar flows occurred about 20 months after their theoretical structural break points.

On the other hand, structural break in the tax haven countries' hedge fund net flows occurred mostly in 2000 or early 2001(except for Luxembourg), which is before their theoretical structural break points. From equation (2), we know that the net flow captures the change in size due to net capital flow. In this case, net flow is better at capturing investors' reaction in response to TIEAS. Since investors are acknowledged of TIEAS before the actual signing date, the structural break point in six tax haven countries' hedge fund net flows should occur before their theoretical structural break points. My results show that the structural break in the tax haven countries' hedge fund net flows occurred about 20 months before their TIEAS signature date (with the exception of Luxembourg).

In Table 1.4, I compare the mean and standard deviation of hedge fund dollar flow and net flow for before and after the structural break.

[INSERT TABLE 1.4 HERE]

As mentioned earlier, I expect the hedge fund flows from the four tax haven countries that signed TIEAS with U.S. to decrease after signing the agreement and that the hedge fund flows of the two tax haven countries that did not sign TIEAS would increase. However, Table 1.4 shows that the average hedge fund dollar flows and standard deviation in all six tax haven countries increased after their structural break points. Furthermore, the average hedge fund net flows, which is better at capturing investors' behavior than dollar flows, also increased in all six tax haven countries after their structural break points. Therefore, both hypothesis 3 and hypothesis 4 are rejected. In addition, there is no significant performance increase in any of the countries tested that might lead to increased investment incentives in hedge fund industry. The rejection of hypothesis 3 and hypothesis 4 suggests that first of all, even though TIEAS causes structural breaks in the tax haven countries' hedge fund flows, it is not enough to offset the other attracting prospective of investing in these offshore havens. Part of the explanation may also be that not all investors are affected by the agreements. For example, tax exempted investors such as pension funds or endowment funds will keep on investing in these countries regardless of TIEAS because this agreement has a minimal effect on them. This finding confirms that of Agarwal and Naik (2005), in which a shift in hedge fund investor type is noted. They point out that the typical hedge fund investors were high net worth U.S. individuals who invest in onshore funds in the early 1990s while institutional investors who prefer offshore funds are typical hedge fund investors nowadays. This shift of investor type largely account for the fast growth of offshore hedge funds.

1.6 Conclusions

Many studies point out that offshore hedge funds have been growing a lot faster than onshore hedge funds due to their tax and regulatory advantages. However, few of them test this empirically. Furthermore, it is hard to differentiate the impact of tax and regulatory policies. In this study, I empirically analysis the effect of tax policy (TIEAS) may have on hedge fund flows.

The results show that TIEAS cause structural changes in both hedge fund dollar flow and net flow of the tax haven countries (the Bahamas, British Virgin Islands, Cayman Islands, Guernsey, Bermuda, and Luxembourg) studied. The structural break in the tax haven countries' hedge fund dollar flows occurred about 20 months after their theoretical structural break points (Month of their TIEAS signature). This is largely due to the two year lockup period restrictions for new investors.

On the other hand, hedge fund net flow, which captures the change in size due to net capital flow, is better at capturing investors' reaction in response to TIEAS. The results show that the structural break in the tax haven countries' hedge fund net flows occurred about 20 months before their TIEAS signature date. This is because investors' acknowledgement of the TIEAS before the actual signing date and act on the information.

I also examine whether hedge fund flow of the countries that signed TIEAS decrease while countries that did not sign TIEAS increase. The results show that even though TIEAS causes structural changes in tax haven countries' hedge fund dollar flow and net flow, it is not enough to offset the other benefit of investing in these countries because both dollar flow and net flow of these countries increased after their structural break points.

In sum, first of all, this study shows that tax policy does significantly affect hedge fund flows and investor behavior. Studies on hedge fund flows should therefore control for the effect of tax legislation accordingly during their modeling process. Second, my results show that structural breaks in hedge fund flows occurred in five out of the six tax haven countries studied. Time series studies that include these time periods should use methodologies that take structural breaks into consideration. For example, when conducting unit root test, one could use the Zivot and Andrew (1992) test or other tests that consider structural breaks instead of the Augmented Dickey-Fuller tests or PP tests. Finally, since tax and regulatory policies affect hedge fund characteristics and investor/manager behavior, hedge funds from different domiciles under different tax and regulatory rules should not be analyzed together as an aggregated sample, which many studies do.

Table 1.1: Descriptive Statistics of Funds from Different Domiciles

Note: In the following table, US = the United States, BAH = Bahamas, BVI = British Virgin Islands, CI = Cayman Islands, GUE = Guernsey, BER = Bermuda, LUX = Luxembourg, SBP = Structural Break Point.

Domicile	Active Funds	Inactive funds	Total funds	Date of Signature	Theoretical SBP	Total TIEAS Signed
BAH	36	103	139	25-Jan-2002	Jan-2002	27
BVI	260	394	654	3-Apr-2002	Apr-2002	19
CI	1152	1547	2699	27-Nov-2001	Nov-2001	26
GUE	85	73	158	19-Sep-2002	Sep-2002	18
BER	172	234	406	N/A	Nov-2001	25
LUX	87	74	161	N/A	Nov-2001	0

Table 1.2: Descriptive Statistics of Funds Characteristics

Note: In the following tables, US = the United States, BAH = Bahamas, BVI = British Virgin Islands, CI = Cayman Islands, GUE = Guernsey, BER = Bermuda, LUX = Luxembourg, AUM = Assets Under Management, ADF = Annual Dollar Flow, ANF = Annual Net Flow.

Panel A: Fund Asset Under Management (in millions of dollars)

AUM	BAH	BVI	CI	GUE	BER	LUX
1998	24200	131000	2040000	13700	69900	37300
1999	27600	133000	2420000	12600	91600	47600
2000	37300	183000	4270000	16000	134000	48300
2001	51900	240000	7090000	20000	188000	38700
2002	53100	264000	10200000	28500	222000	45400
2003	57500	371000	15900000	59400	290000	55800
2004	86100	611000	31100000	109000	491000	106000

Panel B: Fund Annual Dollar Flow (in millions of dollars)

ADF	BAH	BVI	CI	GUE	BER	LUX
1998	8274	19125	72103	1706	12229	11981
1999	3099	9525	32862	-1484	20392	9665
2000	9456	32941	183396	3365	42084	708
2001	14459	35230	279323	3838	52523	-9475
2002	1094	2608	306039	8474	33986	6951
2003	3807	62294	562696	30441	65883	10037
2004	28213	127531	1508063	48565	199854	49831

Panel C: Fund Annual Net Flow

ANF	BAH	BVI	CI	GUE	BER	LUX
1998	0.566	0.134	0.164	0.109	2.275	0.360
1999	0.073	0.334	0.345	0.008	1.240	0.042
2000	0.545	0.315	0.563	0.097	0.535	0.020
2001	0.373	0.185	0.547	0.015	0.402	0.222
2002	0.612	0.296	0.931	0.101	0.388	0.790
2003	0.305	2.070	0.708	0.899	0.537	0.311
2004	1.276	1.349	0.925	0.627	1.265	0.583

Table 1.3: Quandt-Andrews Breakpoint Test Results

Note: In the following tables, US = the United States, BAH = Bahamas, BVI = British Virgin Islands, CI = Cayman Islands, GUE = Guernsey, BER = Bermuda, LUX = Luxembourg, SBP = Structural Break Point. ***, **, * denotes significance of 1%, 5%, and 10% respectively. P-value is calculated using Hansen's (1997) method.

Panel A: Quandt-Andrews Breakpoint Test Results for Fund Dollar Flow

DF	MaxF-stats	P-value	ExpF-stats	P-value	AveF-stats	P-value	SBP
BAH	6.261	0.3783	1.3683	0.3561	1.8420	0.4348	2003M11
BVI	12.980**	0.0274	4.8240**	0.0098	7.1547**	0.0080	2003M10
CI	13.059**	0.0265	4.3146**	0.0161	5.7438**	0.0216	2003M06
GUE	38.379***	0.0000	15.6761***	0.0000	12.5530***	0.0004	2003M03
BER	12.608**	0.0321	4.8285**	0.0097	7.5067**	0.0063	2003M10
LUX	31.980***	0.0000	12.0329***	0.0000	8.1731***	0.0041	2003M11

Panel B: Quandt-Andrews Breakpoint Test Results for Fund Net Flow

NF	MaxF-stats	P-value	ExpF-stats	P-value	AveF-stats	P-value	SBP
BAH	2.991	0.8896	0.5463	0.8261	0.9603	0.7999	2000M03
BVI	8.192	0.1910	2.1894	0.1467	3.5840	0.1117	2000M04
CI	9.957*	0.0963	2.7560*	0.0800	3.9493*	0.0839	2000M03
GUE	14.478**	0.0143	5.1248**	0.0073	7.8606**	0.0050	2001M01
BER	2.287	0.3095	1.2268	0.4144	2.2866	0.3095	2000M11
LUX	13.755**	0.0196	3.9284**	0.0237	5.0503**	0.0361	2003M11

Table 1.4: Mean and Standard Deviation of Hedge Fund Flows before and after Structural Break Point

Note: In the following tables, US = the United States, BAH = Bahamas, BVI = British Virgin Islands, CI = Cayman Islands, GUE = Guernsey, BER = Bermuda, LUX = Luxembourg, SBP = Structural Break Point, DF = Dollar Flow, NF = Net Flow. ***, **, * denotes significance of 1%, 5%, and 10% respectively.

Panel A: Average Monthly Dollar Flow before and after Structural Break Point

DF	**SBP**	**Ave DF before SBP** (in millions of dollars)	**Ave DF after SBP** (in millions of dollars)		**Std. Dev. before SBP** (in millions of dollars)	**Std. Dev. after SBP** (in millions of dollars)	
BAH	2003M11	-11.7	125	↑	153	171	↑
BVI	2003M10**	29.6	1020	↑	762	858	↑
CI	2003M06**	848	6880	↑	2260	8030	↑
GUE	2003M03***	2.77	257	↑	64.6	234	↑
BER	2003M10**	76.6	733	↑	414	888	↑
LUX	2003M11***	-44.7	364	↑	184	419	↑

Panel B: Average Monthly Net Flow before and after Structural Break Point

NF	**SBP**	**Ave NF before SBP**	**Ave NF after SBP**		**Std. Dev. before SBP**	**Std. Dev. after SBP**	
BAH	2000M03	-0.0135	0.0064	↑	0.0554	0.0390	↓
BVI	2000M04	-0.0186	0.0132	↑	0.0573	0.0352	↓
CI	2000M03*	-0.0041	0.0288	↑	0.0442	0.0390	↓
GUE	2001M01**	-0.0206	0.0328	↑	0.0351	0.0555	↑
BER	2000M11	-0.0039	0.0153	↑	0.0491	0.0256	↓
LUX	2003M11**	-0.0098	0.0502	↑	0.0476	0.0601	↑

Figure 1.1: Bahamas Monthly Hedge Fund Dollar Flow and Net Flow

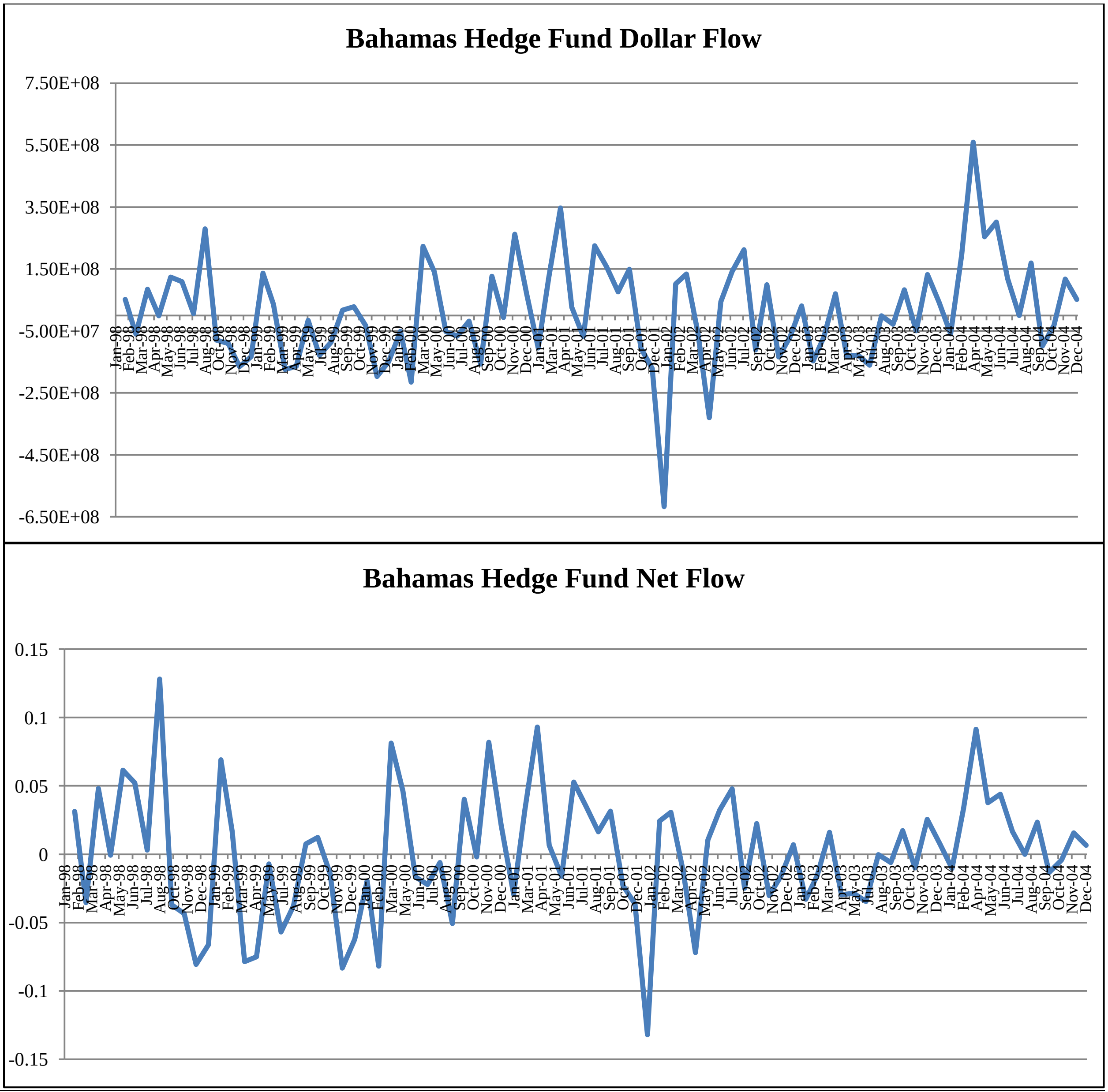


Figure 1.2: British Virgin Islands Monthly Hedge Fund Dollar Flow and Net Flow

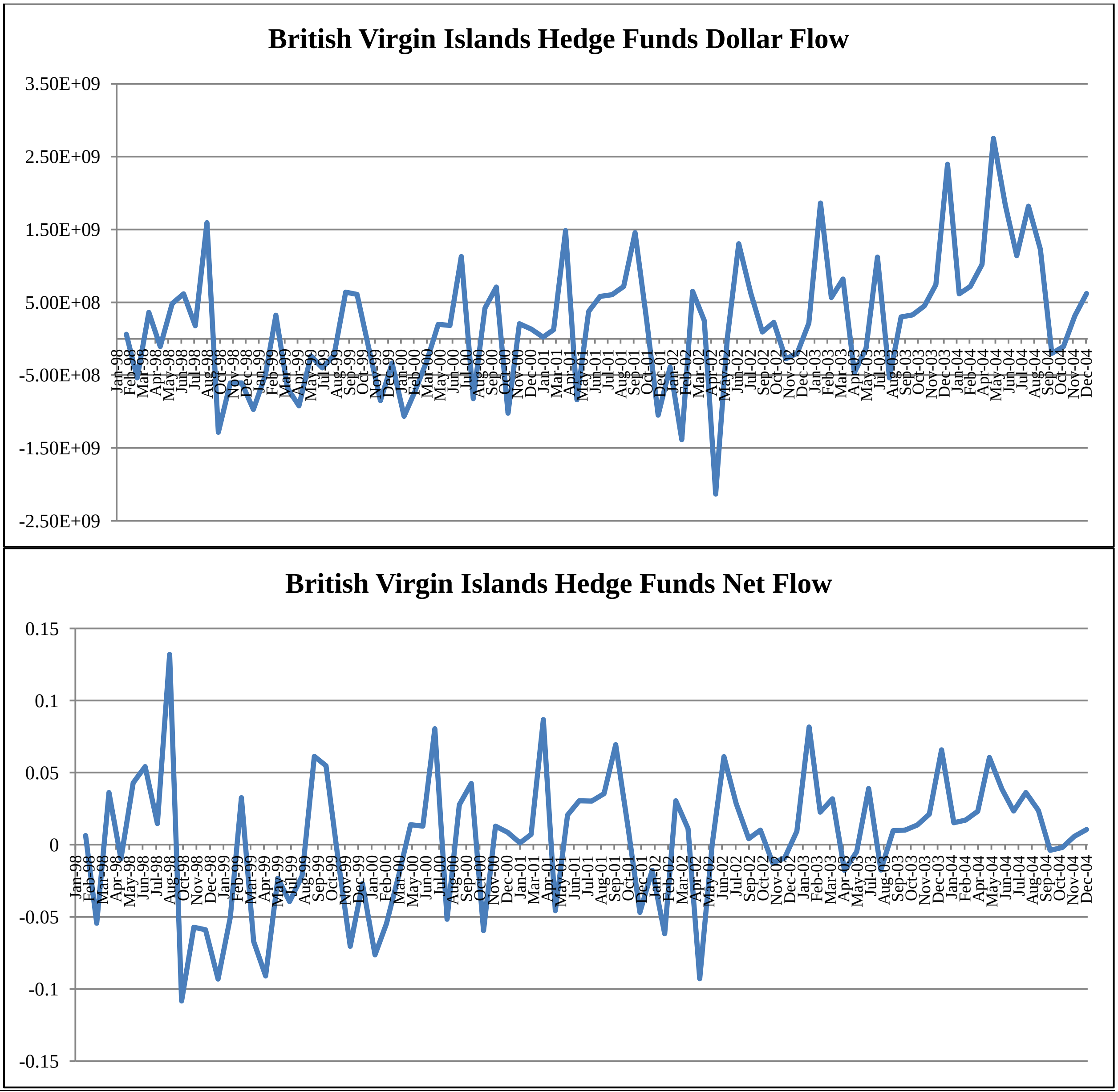


Figure 1.3: Cayman Islands Monthly Hedge Fund Dollar Flow and Net Flow

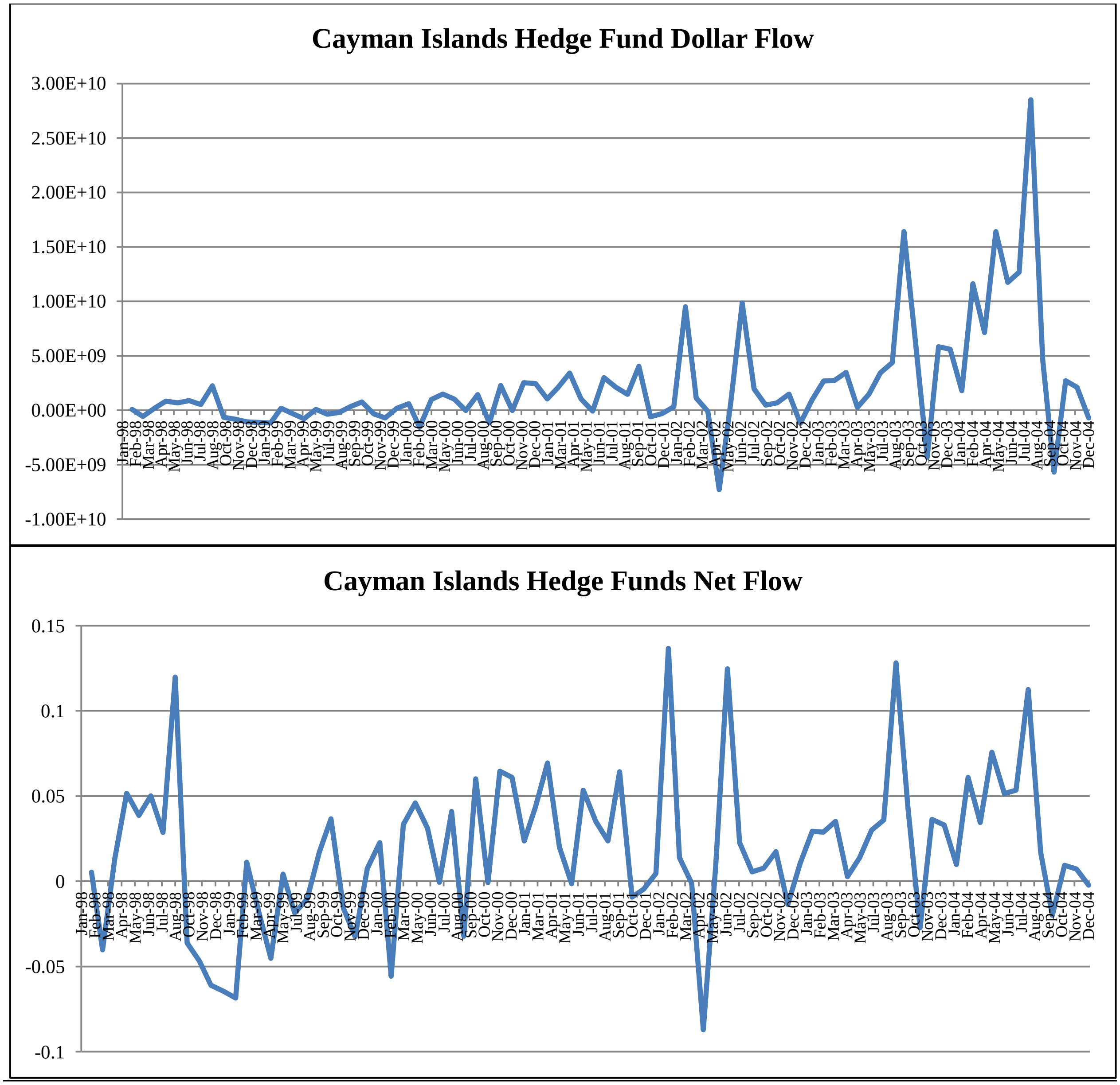


Figure 1.4: Guernsey Monthly Hedge Fund Dollar Flow and Net Flow

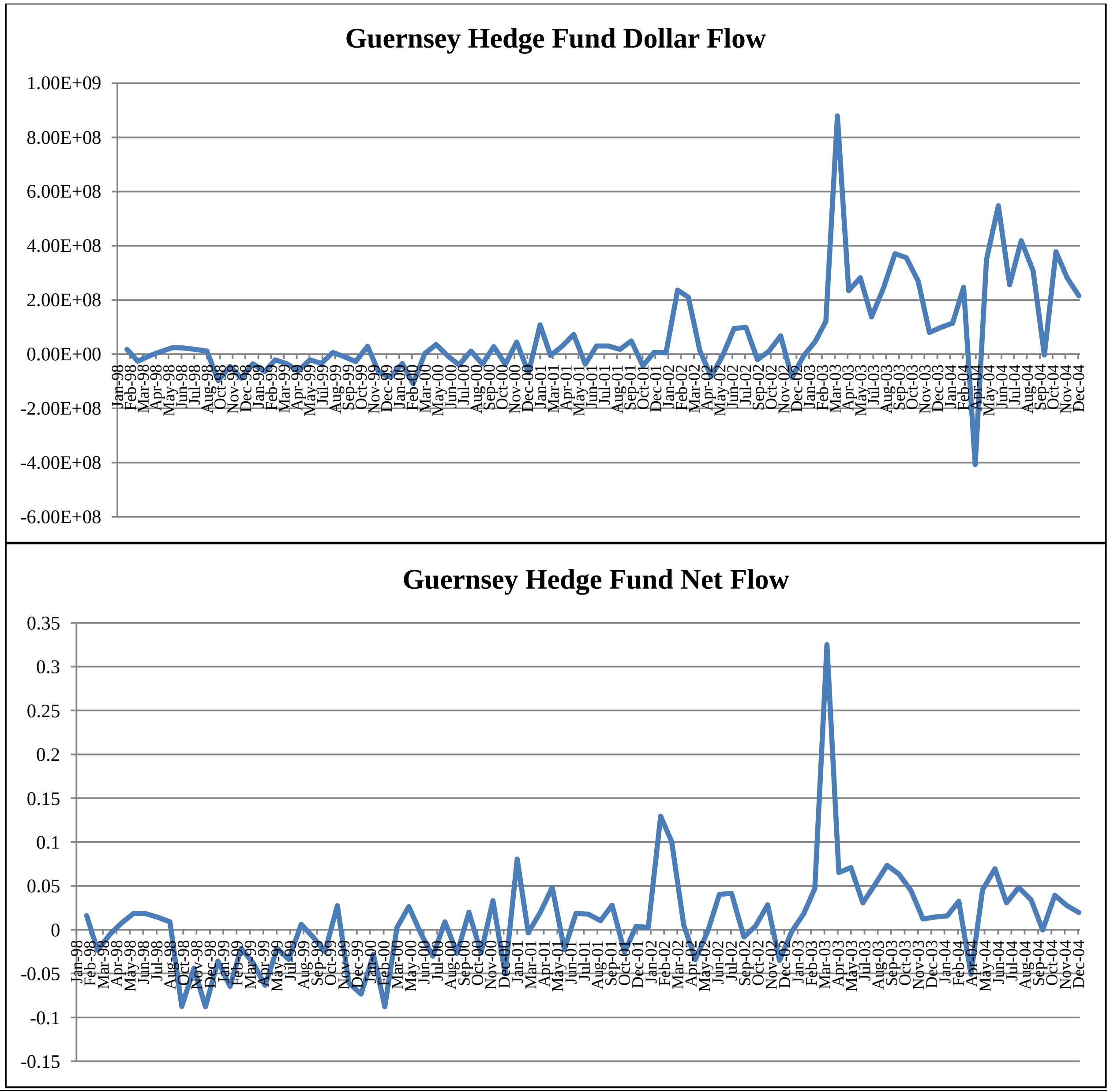


Figure 1.5: Bermuda Monthly Hedge Fund Dollar Flow and Net Flow

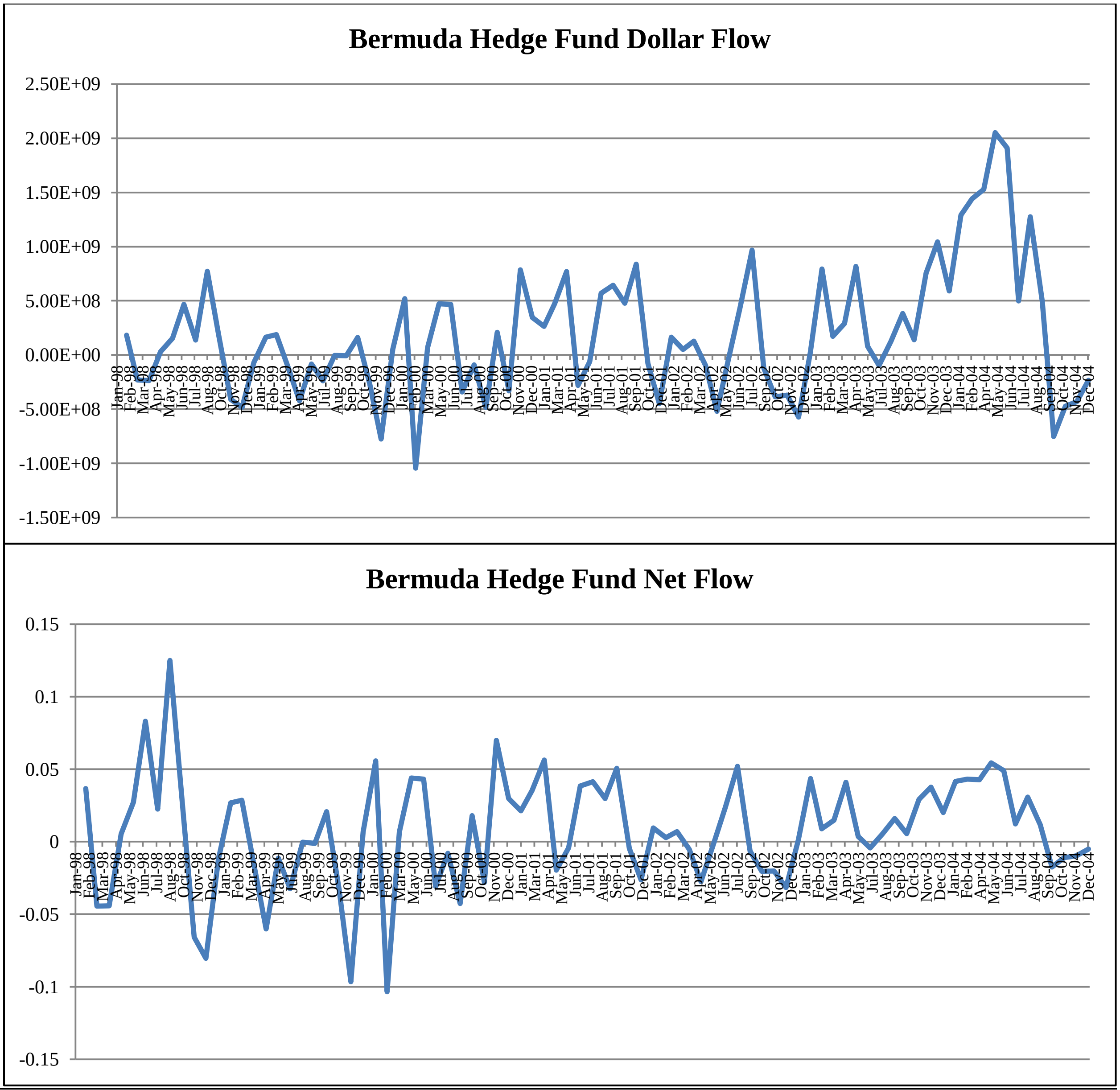
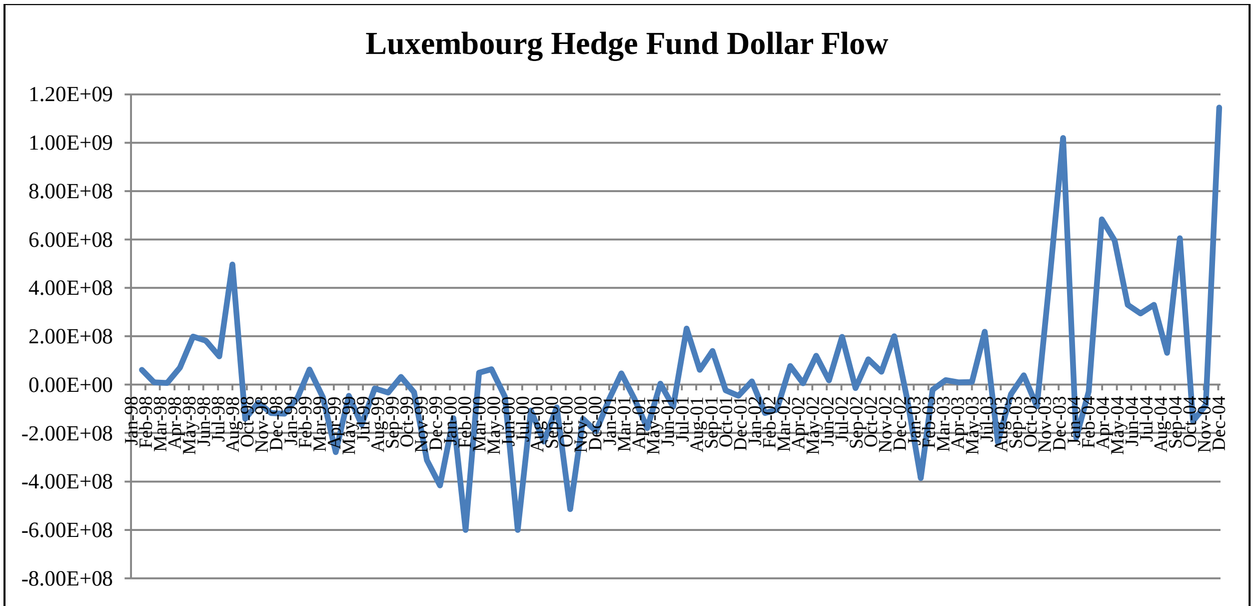
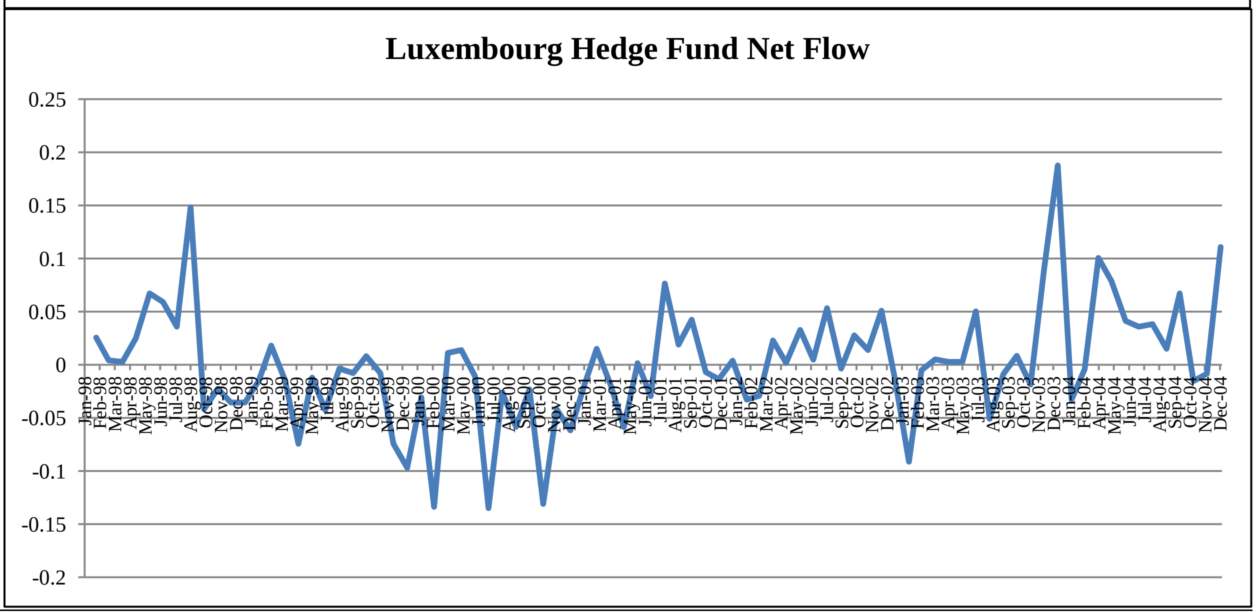


Figure 1.6: Luxembourg Monthly Hedge Fund Dollar Flow and Net Flow





CHAPTER II

HEDGE FUND FLOWS AND PERFORMANCE: A BIVARIATE CAUSALITY APPROACH

2.1 Introduction

The flow-performance relationship of individual fund has been widely studied for both mutual fund and hedge fund industry. However, there is little research that deals with hedge fund flows and performance causality issues at the macro level. Prior hedge fund studies regarding flows and performance have been focusing on investigating the correlation relation. However, the results are mixed, and correlation does not imply causation in any meaningful sense, that is, the existence of correlation between hedge fund return and flows does not prove causality or the direction of influence.

In this study, I investigate whether a causal relationship exists between aggregated hedge fund flows and performance using data from the Barclay Hedge Fund Database. I focus on hedge funds in six major tax haven countries and the U.S. because together they make up about 80% of the world’s hedge funds. In addition, differences in hedge fund tax policy and regulation among these countries lead to differences in fund manager and investor behavior, hence affect fund’s investment strategy, organizational design, performance, and flows. Therefore, even though previous research shows a significant correlation between hedge fund flows and performance, the direction of the influence should be different for hedge fund from different countries. Therefore, in this study the hedge fund flows and performance relation is tested at the individual country level. In addition, many studies have shown that hedge fund investors chase past performance, study the flows and performance relation for individual countries allows us to capture how hedge fund investors of a country respond to aggregated fund performance.

I follow the approach of Granger and Huang (2000) to investigate the bivariate causality relation between hedge fund flows and performance in seven countries. I use the Zivot and Andrews (1992) model to test for unit root in hedge fund flows and return of the seven countries. The test reveals that the series are a mixture of $I(0)$ and $I(1)$.

Cointegration vectors aim to determine $I(0)$ relations that hold between variables which are individually non-stationary. Specifically, variables are cointegrated when a long-run linear relationship is obtained from a set of variables that share the same non-stationary properties. Asteriou and Hall (2007) state that cointegrating relationships might exist in cases where a mix of $I(0)$ and $I(1)$ variables are present in the model. Therefore, I employ the Gregory and Hansen (1996) model to test for cointegration between hedge fund flows and performance for each country. The cointegration test yield highly significant results for all countries.

Once the cointegration property is established, a bivariate VAR model can be used to test for Granger causality between hedge fund flows and performance. I find that hedge fund returns lead flows in U.S., British Virgin Islands, and Bermuda. However, the moderate feedback interaction in the case of the U.S. suggests that U.S. hedge fund flows also lead return. Next, I use impulse response (IR) functions to examine the short run dynamic relation of hedge fund flows and performance in the seven countries. The IR results show that an increase in hedge fund return leads to an increase in hedge fund flows in all six tax haven countries. On the contrary, increase in hedge fund return lead to decrease in hedge fund flows in the U.S. This indicates U.S. investors' lack of confidence in persistence of good performance.

The rest of the study is organized as follows: Section 2.2 discuss related studies. Section 2.3 provides descriptive data statistics. Section 2.4 presents unit root tests of hedge fund flows and performance. Section 2.5 examines the cointegration relation between hedge fund flows and performance. Section 2.6 employs a bivariate VAR model to investigate the causality relation between hedge fund flows and performance. Section 2.7 examines the impulse response functions. Section 2.8 offers concluding remarks.

2.2 Related Literature

Fund performance has been widely studied for mutual fund, private equity fund, and hedge fund. Brown, Harlow and Starks (1996), Chevalier and Ellison (1997) and Sirri and Tufano (1998) provide empirical performance analysis studies for mutual funds; Kaplan and Schoar (2005) investigate the performance of private equity funds. Ackermann, McEnally and Ravenscraft (1999), Agarwal and Naik (2000a,b, 2004), Edwards and Caglayan (2001), Fung and Hsieh (1999, 2000, 2001), and Liang (1999, 2000, 2001) conducted several original empirical studies of hedge fund performance using different hedge fund databases.

The flow-performance relation in the mutual fund industry has been widely studied. Chen et al. (2004), Chevalier and Ellison (1997), Goetzmann and Peles (1997), Gruber (1996), Sirri and Tufano (1998) and Zheng (1999) examine the determinants of money flows in mutual funds, and document a positive and convex relationship. For private equity funds, the flow-performance relation differs substantially from the one found for mutual funds. Kaplan and Schoar (2005) examine the relationship between past performance and capital flows into subsequent funds and report a concave relationship.

In the hedge fund industry, the flow-performance relation of individual hedge funds has also been investigated. Some recent papers include Goetzmann, Ingersoll and Ross (2003), Aragon and Qian (2010), Teo (2012), Fung, Hsieh, Naik, and Ramadorai (2008), and Ding, Getmansky, Liang and Wermers (2009). However, the results of these studies are mixed.

Similar to the documented convex flow-performance relation in mutual funds, Agarwal, Daniel and Naik (2009) also find a convex flow-performance relation for individual hedge funds. However, Goetzmann, Ingersoll and Ross (2003) and Getmansky (2012) find a concave flow-performance relation while Baquero and Verbeek (2005) report a linear flow-performance relation. Ding, Getmansky, Liang and Wermers (2009) reconcile previous studies and analyze the impact of share restrictions of individual hedge funds on the fund flow-performance relation. They find that hedge funds exhibit a convex flow-performance relation in the absence of share restrictions but exhibit a concave relation in the presence of restrictions, which suggest that the different results in flow-performance relation from previous studies can be largely explained by restrictions on flows. Ding, Getmansky, Liang and Wermers (2009)'s results also imply that study of hedge fund flows at the macro level in the presence/absence of restrictions may provide insight hedge fund investors' activities. Therefore, in this study, I investigate whether causality relations exist between aggregated hedge fund flows and performance focusing on hedge funds in six major tax haven countries and the U.S. Due to different tax and regulatory environment, behavior of hedge fund managers and investors from different domicile are different. Hence, the relation between hedge fund flow and performance, which is largely dictated by manager and investor activities, should be different in different countries.

Hypothesis 1: A causal relationship exists between hedge fund flows and performance in some of the countries tested, but this might not be the case for other countries.

Hypothesis 2: The direction of the causal relationship between hedge fund flows and performance are not the same for all seven countries. (i.e., hedge fund performance might lead that of flows in some countries while vice versa in other countries)

2.3 Data and Descriptive Statistics

In this study, I obtain monthly data on individual hedge funds and fund-of-funds (FOFs) from the Barclay Hedge Fund Database. Both hedge funds and FOFs are included for the purpose of the study. In addition, both active and inactive funds are included to minimize survivorship bias. The sample period extends from January 1994 to December 2008. I excluded data after December 2008 because there have been many arguments in the press and academic studies about whether hedge fund is the leading causes of the 2008 financial crisis. These accusations can have significant impact on investors' activities. For example, many hedge fund investors might turn away from hedge fund investment and choose other investment vehicles instead. In this study, I focus on the performance and fund flows of six tax haven countries: the Bahamas, British Virgin Islands, Cayman Islands, Guernsey, Bermuda, and Luxembourg and compare the results with the U.S. I choose these countries because they make up about 80% of world's hedge funds.

Computation of Net Flows

The aggregated monthly asset under management ($AUM_{i,m}$) is computed by aggregating AUM of all the hedge funds and FOFs of country *i* during month *m* obtained from Barclay Hedge Fund Database Barclay Hedge Fund Database. Monthly dollar flows for country *i* during month *m* is computed using the methodology proposed by Agarwal et al. (2009):

$$DF_{i,m} = AUM_{i,m} - AUM_{i,m-1}(1+R_{i,m}) \quad (1)$$

where $DF_{i,m}$ denotes the Dollar flow for country *i* during month *m*, $R_{i,m}$ represents average hedge fund return for country *i* during month *m*.

Following the similar approach as in Chevalier and Elison (1997) and Sirri and Tufano (1998), monthly net fund flows ($NF_{i,m}$) of each country *i* are computed by scaling monthly dollar flows by beginning-of-month AUM in order to capture the change in size due to net capital flows:

$$NF_{i,m} = DF_{i,m}/AUM_{i,m-1} \qquad (2)$$

As shown in study 1, net flow is better at capturing hedge fund manager and investor behavior than dollar flow. In this study, I use net flow as the measure of hedge fund flow in the seven countries tested. The monthly hedge fund AUM, return and flow are shown in figure 2.1 – 2.7.

[INSERT FIGURE 2.1 – 2.7 HERE]

2.4 Unit Root Test

Prior to time series analysis, it is necessary to investigate the stationary properties of the variables. If the means and variance of a variable change over time, this variable is said to be a non-stationary or unit root variable. A stationary series fluctuates around a constant long run mean and has a finite variance that does not depend on time. A non-stationary series has no tendency to return to a long run deterministic path, and the variances of the series are time dependent. Estimation of a non-stationary series often lead to spurious regression, and the economic interpretation might not be meaningful. Nelson and Plosser (1982) argue that almost all macroeconomic time series have a unit root. Therefore, a unit root test is necessary before empirical time series studies. The commonly used methods to test for the presence of unit roots are the Augmented Dickey-Fuller (ADF) tests (Dickey and Fuller, 1979 and1981).

$$\Delta y_t = \alpha + \beta t + (\rho - 1) y_{t-1} + \sum_{i=1}^{k-1} \theta_i \Delta y_{t-i} + a_t \qquad (3)$$

where Δ is the first difference operator, y_t is the time series being tested (in this case, y_t is hedge fund flow or return), t is the time trend variable, and k is the number of lags which are added to the model to ensure the residuals are white noise. Schwarz Bayesian Criterion (SBC) and Akaike Information Criterion (AIC) are used to determine the optimal lag length. ADF test the null hypothesis of $\rho = 1$ against the alternative hypothesis of $\rho < 1$. Fail to reject the null hypothesis implies that the time series is not stationary.

Many literatures have criticized the potential confusion of structural breaks in the series as evidence of non-stationarity when using ADF to test for unit root. Specifically, ADF may falsely fail to reject the unit root hypothesis if the series has a structural break. For example, when a series is found to be $I(1)$, it is possible that the series is actually stationary around the structural break, $I(0)$, but is falsely classified as $I(1)$. Perron (1989) shows that failure to allow for an existing structural break leads to a bias that reduces the ability to reject a false unit root null hypothesis. To circumvent this problem, Perron (1989) modifies the ADF unit root test by including dummy variables that account for one known (exogenous) structural break. However, Christiano (1992) criticizes Perron (1989)'s assumption of known break date as 'data mining'. Several studies (i.e. Zivot and Andrews (1992), Perron and Vogelsang (1992), Perron (1997), and Lumsdaine and Papell (1997)) have shown that determining the break date endogenously from the data can improve the results by reducing the bias of non-rejection in unit root test.

In this study, I follow the Zivot and Andrews (1992) approach to test for unit root in hedge fund flow and return from January 1994 to December 2008 in the U.S. and the six tax haven countries:

$$\Delta y_t = \alpha + \beta t + (\rho - 1) y_{t-1} + \gamma DU_t(\lambda) + \sum_{i=1}^{k-1} \theta_i \Delta y_{t-i} + a_t \quad (4)$$

where $DU_t(\lambda)$ = 1for $t > T\lambda$, otherwise $DU_t(\lambda) = 0$; $\lambda = T_B/T$ represents the location where the structural break lies; T is the sample size; T_B is the date when the structural break occurred. (The rest of the variables are the same as defined in equation (3))

The Zivot and Andrews (1992) Test uses a different dummy variable for each possible break date and endogenously determines structural break date utilizing the full sample. The break date is chosen when the *t*-statistic from the ADF unit root test is most negative. As a result, a break date is chosen when the evidence is least favorable for the null hypothesis that the series has a unit root with structural break.

Results from Zivot and Andrew (1992) test for the six tax haven countries and the U.S and the results are reported in Table 2.1.

[INSERT 2.1 HERE]

Table 2.1 reveals that the unit root null hypotheses in hedge fund return can be rejected for all countries. In addition, the unit root null hypotheses in hedge fund flow are rejected in all countries except for Cayman Islands. In general, lack of unit root property in most of the series tested during the sample periods suggest that the series are stationary, and further econometric models can be readily applied.

2.5 Cointegration Test

Regression models with a series that contain a unit root could lead to spurious regression. To circumvent this problem, researchers often transform the data by differencing the variables prior to their inclusion in the regression model. However, this differencing process can potentially cause loss of important long-run information. On the other hand, if a long-run relationship exists among the set of variables that share similar non-stationary properties, i.e., if the non-stationary variables are cointegrated, regression models with such variables can proceed without generating spurious results. Hence, cointegration allows capturing the economic equilibrium relationships between non-stationary variables within a stationary model. Cointegration test involves searching of a linear combination of non-stationary variables such that the combination is stationary. The variables are said to be cointegrated if such a stationary linear combination is found. Therefore, the non-stationary variables are associated by an equilibrium relationship. In this case, the application of traditional econometric models to non-stationary variables could produce important results. Therefore, cointegration test can be viewed as a direct test of the economic theory. Furthermore, cointegration approaches allow estimating long run parameters by estimating short run disequilibrium relationships.

Lutkepohl (2004) suggests that at times, it is convenient to consider systems with both $I(1)$ and $I(0)$ variables. Thus, the concept of cointegration can be extended to any linear combination that is $I(0)$, even though this is not in the spirit of the original definition because a cointegration relation can exist for a linear combination of $I(0)$ variables. The original definition of cointegration from Engle and Granger (1987) refers to variables that are integrated of the same order. Enders (2004) argues that it is possible to find equilibrium relationships among groups of variables that are integrated of different orders. Therefore, even in the presence of a set of variables which contains both $I(1)$ and $I(0)$ variables, cointegration analysis is applicable and the presence of a long run linear combination denotes the existence of cointegrated variables. Hence, it is possible to find long run equilibrium relationships among a set of $I(0)$ and $I(1)$ variables if their linear combination reveals a cointegrating relationship. Therefore, even though the variables in this study are a mixture of $I(0)$ and $I(1)$, it is useful to investigate the cointegration relation between hedge fund flow and return in each country.

If it is certain that the underlying series are all $I(1)$, the conventional Johansen cointegration technique can be safely used. However, the presence of structural breaks introduces uncertainty as to the true order of integration of the variables. To investigate the stationary assumption of several $I(1)$ variables, the majority of academic researchers rely on the model proposed by Engle and Granger (1987). Just as the ADF model fails to consider problems associated with structural breaks, the Engle-Granger model experiences the same problem. Gregory and Hansen (1996) follow a similar approach as in Zivot and Andrews (1992) and modify the Engle and Granger model to consider the structure break through residual-based cointegration technique. The steps of running Gregory and Hansen (1996) Test are:

1) Estimate the following multiple regression:

$$y_{1t} = \alpha + \beta t + \gamma DU(\lambda) + \theta_1 y_{2t} + e_t \quad (5)$$

where y_{1t} and y_{2t} are of I(1) and y_{2t} is a variable or a set of variables, $DU_t(\lambda)$ has the same definition as that in (4).

2) Test whether e_t in (5) is of I(0) or I(1) using the ADF and Phillips-Perron technique. If e_t is found to be consistent with I(0), then cointegration exist between y_{1t} and y_{2t}

The cointegration results based on Gregory and Hansen (1996) are shown in Table 2.2.

[INSERT TABLE 2.2 HERE]

Table 2.2 shows that the null hypothesis of no cointegration between hedge fund returns and flows can be rejected for all six tax haven countries the U.S.

2.6 Bivariate VAR and Granger Causality Test

After the statistical property of e_t is established from the previous section, bivariate VAR model can be used to test the Granger causality.

If cointegration does not exist, the following formulation is used in testing hypotheses 1 and 2:

$$\begin{aligned}\Delta y_{1t} &= \alpha_0 + \sum_{i=1}^{k-1}\alpha_{1i}\Delta y_{1t-i} + \sum_{i=1}^{k-1}\alpha_{2i}\Delta y_{2t-i} + \varepsilon_{1t} \\ \Delta y_{2t} &= \beta_0 + \sum_{i=1}^{k-1}\beta_{1i}\Delta y_{1t-i} + \sum_{i=1}^{k-1}\beta_{2i}\Delta y_{2t-i} + \varepsilon_{2t}\end{aligned} \tag{6}$$

where y_{1t} is the net flow rate of hedge fund, y_{2t} is the return of hedge fund. Reject H_0: $\alpha_{21}=\alpha_{22}=\ldots=\alpha_{2k}=0$ implies that flow rate Granger causes return. Similarly, Reject H_0: $\beta_{11}=\beta_{12}=\ldots=\beta_{1k}=0$ implies that return Granger causes flow rate.

If cointegration does exist between y_{1t} and y_{2t}, an error correction term is required in testing causality. In this case, the vector error correction model (VECM) is:

$$\begin{aligned}\Delta y_{1t} &= \alpha_0 + \delta_1(y_{1t-1} - \gamma y_{2t-1}) + \sum_{i=1}^{k-1}\alpha_{1i}\Delta y_{1t-i} + \sum_{i=1}^{k-1}\alpha_{2i}\Delta y_{2t-i} + \varepsilon_{1t} \\ \Delta y_{2t} &= \beta_0 + \delta_2(y_{1t-1} - \gamma y_{2t-1}) + \sum_{i=1}^{k-1}\beta_{1i}\Delta y_{1t-i} + \sum_{i=1}^{k-1}\beta_{2i}\Delta y_{2t-i} + \varepsilon_{2t}\end{aligned} \tag{7}$$

where δ_1 and δ_2 stand for speeds of adjustment. Reject H_0: $\alpha_{21}=\alpha_{22}=\ldots=\alpha_{2k}=0$ and $\delta_1=0$ implies that flow rate Granger causes return. Similarly, Reject H_0: $\beta_{11}=\beta_{12}=\ldots=\beta_{1k}=0$ and $\delta_2=0$ implies that return Granger causes flow rate.

Since the null hypothesis of no cointegration between hedge fund flow and return are rejected for all seven countries in the previous section, equation (7) is suited here to explore the causal relations between hedge fund flow and return. The optimum value for *k* is assumed to be12 since there are 12 months in a year.

The results for the vector error correction model of the seven countries are reported in Table 2.3, and the results for Granger causality are reported in Table 2.4.

[INSERT TABLE 2.3 HERE]

[INSERT TABLE 2.4 HERE]

The results show that hedge fund return Granger causes hedge fund flows, or in other words that a change in the hedge fund return leads that of hedge fund flows in the U.S., British Virgin Island, and Bermuda. This suggests that hedge fund investors in these three countries make their investment decisions based on passed aggregated return of the hedge funds. However, causality is not established in the Hedge fund flows and performance relation of the other four countries. This shows that although hedge fund flows and performance are significantly cointegrated in all seven countries, causality relation between hedge fund flows and performance only exists in some in some countries. Therefore, hypothesis 1 is accepted.

Granger causality results for U.S. hedge fund flows and performance also shows a feedback relation. More specifically, changes in hedge fund flow also lead that of hedge fund return. This indicates that the direction of influence between hedge fund flows and performance are not the same for all the countries. Hence, hypothesis 2 is accepted.

2.7 Impulse Response Functions

To examine the short run dynamic relation between hedge fund flow and performance of these seven countries, I take advantage of the impulse response (IR) functions. Overall, several distinctive patterns can be identified from the IR analysis of the hedge fund flow and performance of the seven countries. The IR (10 periods) from shocks of each variable is shown in Table 2.5.

[INSERT TABLE 2.5 HERE]

Results from the IR analysis are in conformity with that of the Granger causality test. As shown in Panel B of Table 2.5, one-unit shocks from the hedge fund returns have very discernible positive responses on their corresponding hedge fund flows in all of the six offshore countries. This indicates that an increase in hedge fund return will lead to an increase in hedge fund flow in the offshore countries. Investors in these offshore countries as a group may tend to increase their investment after positive return of a hedge fund. However, the response from hedge fund flows in the U.S. are opposite of those in the offshore countries. That is, an increase in hedge fund return lead to a decrease of hedge fund flows. It seems like U.S. investors have lower confidence in persistently good performance of hedge funds as investors withdraw funds after positive returns.

In addition, there is a feedback interaction between hedge fund performance and flow in the U.S. The sign of the relations between hedge fund flow and return depends on the strength of each one. In this case, the response of flow to return is stronger than that of return to flow. Hence, we would observe a decrease of hedge fund flow after an increase in the hedge fund return in the U.S.

2.8 Conclusions

Prior hedge fund studies regarding flows and performance have primarily focused on correlations. However, correlation does not imply causation in any meaningful sense, nor does it give information on the direction of the influence. Furthermore, most hedge fund literature focuses on the characteristics of individual hedge funds, and little is known at the macro level about hedge fund flow and performance.

In this study, I apply the Zivot and Andrews (1992) unit root test and Gregory and Hansen (1996) cointegration model that considers a structural break coupled with bivariate VAR models to investigate the causal relationship between hedge fund flows and performance in six tax haven countries and the U.S. Built on the results of the causality test, the IR analysis lends its further support to the influence of hedge fund return and hedge fund flows.

The Granger causality results indicate that changes in the hedge fund return lead that of hedge fund flows in the U.S., British Virgin Islands, and Bermuda. This suggests that hedge fund investors make investment decisions based on aggregated hedge fund performance in the above three countries. That is to say, the investors in these three countries chase past aggregate performance. However, the result in the U.S. also shows a significant feedback relation, i.e., U.S. hedge fund flows also lead hedge fund return.

IR analysis results show that increase in hedge fund return lead to increase in hedge fund flows in all tax haven countries. This implies hedge fund investors of these tax haven countries are confident in the good performance persistency. On the other hand, increase in hedge fund returns leads to decrease in hedge fund flows in the U.S. The results from the U.S. suggest that while some investors of U.S. hedge funds increase their investment after positive returns, other investors of U.S. hedge funds are more cautious because they tend to withdraw funds after positive return. This may imply that U.S. hedge fund investors have lower confidence in performance persistence of hedge funds.

Even though, the flow-performance relationship has been widely studied for hedge funds, this study is one of the first to examine the causal relationship between hedge fund flows and performance. Furthermore, this study is one of the first to acknowledge the difference in the flow-performance relationship of hedge funds in different countries. The results suggest that empirical studies on hedge fund should divide their samples geographically instead of using the aggregated sample of all the hedge funds in the world.

Table 2.1: Zivot and Andrew Unit Root Test Results

Note: In the following table, US = the United States, BAH = Bahamas, BVI = British Virgin Islands, CI = Cayman Islands, GUE = Guernsey, BER = Bermuda, LUX = Luxembourg. R = monthly return of the country, F = monthly net fund flow of the country. T_B = the date when the structural break occurred.

	t-stats	**T_B**	**DU1 p-value**
US R	-10.14	2006M09	0.0824
US F	-6.68	2004M01	0.0674
BAH R	-10.11	2006M09	0.0803
BAH F	-10.99	1998M09	0.0554
BVI R	-10.14	2006M09	0.0826
BVI F	-14.09	2000M04	0.0011
CI R	-10.14	2006M09	0.0821
CI F	-13.79	1996M06	0.1455
GUE R	-10.05	2006M09	0.0889
GUE F	-12.92	1997M05	0.0008
BER R	-10.14	2006M09	0.0823
BER F	-11.78	2004M09	0.0094
LUX R	-10.11	2006M09	0.0769
LUX F	-9.06	1996M05	0.0000

Table 2.2: Gregory and Hansen Conintegration Test Results

Note: In the following table, US = the United States, BAH = Bahamas, BVI = British Virgin Islands, CI = Cayman Islands, GUE = Guernsey, BER = Bermuda, LUX = Luxembourg. R = monthly return of the country, F = monthly net fund flow of the country. ADF = Augmented Dickey and Fuller, PP = Phillips-Perron, T_B = the date when the structural break occurred. The critical values are taken from Table 1 of Gregory and Hansen (1996). *,**,*** denotes significance of 1%, 5%, and 10% respectively.

	t(ADF)	T_B (ADF)	Za (PP)	Za- T_B (PP)	Zt (PP)	Zt- T_B (PP)
US R on F	-8.48*	2006M05	-103.03*	2006M05	-8.50*	2006M05
US F on R	-6.51*	1996M02	-106.53*	2000M06	-8.92*	2000M06
BAH R on F	-3.99	2002M11	-181.36*	2003M03	-13.44*	2003M03
BAH F on R	-9.44*	2000M04	-182.09*	1997M10	-13.64*	1997M10
BVI R on F	-13.21*	1996M11	-179.12*	1996M09	-13.37*	1996M09
BVI F on R	-14.55*	2002M11	-193.16*	2002M11	-14.59*	2002M11
CI R on F	-6.91*	2000M03	-91.43*	2000M04	-7.94*	2000M04
CI F on R	-9.91*	1996M11	-137.35*	1996M09	-10.37*	2000M04
GUE R on F	-7.28*	2000M05	-136.18*	2000M04	-10.27*	1997M12
GUE F on R	-4.82	1997M05	-164.36*	1997M08	-12.53*	1997M06
BER R on F	-6.28*	1999M11	-172.32*	1999M10	-12.92*	1999M10
BER F on R	-7.42*	2000M02	-114.18*	1996M02	-9.09*	1996M02
LUX R on F	-9.37*	1996M11	-132.71*	2005M04	-10.01*	2005M04
LUX F on R	-13.99*	1996M05	-189.26*	1996M04	-14.09*	1996M04

Table 2.3: Vector Error Correction Model (VECM)

Note: In the following tables, US = the United States, BAH = Bahamas, BVI = British Virgin Islands, CI = Cayman Islands, GUE = Guernsey, BER = Bermuda, LUX = Luxembourg.

Panel A: Estimation Results of VECM for Hedge Fund Flow

EC	US	BAH	BVI	CI	GUE	BER	LUX
Adjustment	-0.841	-0.544	-0.920	-1.039	-0.828	-0.615	-0.317
t-stats	-6.349	-8.461	-7.067	-7.746	-7.373	-7.467	-4.569
R Square	0.606	0.468	0.519	0.505	0.468	0.444	0.504
Adj. R Square	0.595	0.453	0.505	0.490	0.452	0.427	0.489
F-stats	52.37	29.95	36.67	34.62	29.88	27.11	34.54
Log Likelihood	244.8	263.4	301.4	33.73	195.3	345.7	182.7
Akaike AIC	-2.714	-2.925	-3.357	-0.315	-2.152	-3.861	-2.008
Schwarz SC	-2.606	-2.817	-3.249	-0.207	-2.044	-3.753	-1.900

Panel B: Estimation Results of VECM for Hedge Fund Return

EC	US	BAH	BVI	CI	GUE	BER	LUX
Adjustment	-10.60	22.04	37.88	4.14	12.96	43.99	14.79
t-stats	-1.20	-4.98	-3.26	-1.54	2.35	-4.79	-4.95
R Square	0.18	0.28	0.23	0.19	0.20	0.27	0.28
Adj. R Square	0.16	0.26	0.21	0.16	0.17	0.25	0.26
F-stats	7.54	13.22	10.37	7.73	8.33	12.71	13.18
Log Likelihood	-494.8	-481.6	-488.9	-494.2	-490.1	-484.1	-479.5
Akaike AIC	5.69	5.54	5.62	5.68	5.64	5.57	5.52
Schwarz SC	5.80	5.65	5.73	5.79	5.75	5.68	5.63

Table 2.4: Bivariate Granger Causality Results

Note: In the following table, US = the United States, BAH = Bahamas, BVI = British Virgin Islands, CI = Cayman Islands, GUE = Guernsey, BER = Bermuda, LUX = Luxembourg. R = monthly return of the country, F = monthly net fund flow of the country. -/--> implies does not Granger cause. ***,**,* denotes significance of 1%, 5%, and 10% respectively.

Null Hypothesis:	N	F-Statistic	Prob.
US F -/--> US R	167	1.6075*	0.0957
US R -/--> US F	167	2.9557***	0.0011
BAH F -/--> BAH R	167	0.4658	0.9317
BAH R -/--> BAH F	167	2.7493***	0.0022
BVI F -/--> BVI R	167	0.4936	0.9158
BVI R -/--> BVI F	167	0.3840	0.9675
CI F -/--> CI R	167	0.2375	0.9961
CI R -/--> CI F	167	0.5157	0.902
GUE F -/--> GUE R	167	0.4794	0.9242
GUE R -/--> GUE F	167	1.1145	0.3529
BER F -/--> BER R	167	1.3818	0.1811
BER R -/--> BER F	167	1.7765**	0.0574
LUX F -/--> LUX R	167	0.6597	0.7874
LUX R -/--> LUX F	167	0.6237	0.8194

Table 2.5: Estimation Result of Impulse Response Function

Note: In the following tables, US = the United States, BAH = Bahamas, BVI = British Virgin Islands, CI = Cayman Islands, GUE = Guernsey, BER = Bermuda, LUX = Luxembourg. *,**,*** denotes significance of 1%, 5%, and 10% respectively.

Panel A: Response of Hedge Fund Return from One Unit Shock in Hedge Fund Flow

Period	US	BAH	BVI	CI	GUE	BER	LUX
1	0	0	0	0	0	0	0
2	-0.0060	0.0005	-0.0017	0.0006	0.0007	0.0003	0.0016
3	-0.0012	0.0017	-0.0005	-0.0028	0.0006	-0.0006	0.0049
4	-0.0005	0.0070	0.0006	-0.0003	0.0036	0.0027	0.0052
5	-0.0024	0.0047	-0.0006	-0.0006	0.0025	0.0022	0.0055
6	-0.0015	0.0043	-0.0001	-0.0010	0.0025	0.0013	0.0058
7	-0.0013	0.0052	0.0001	-0.0008	0.0027	0.0020	0.0058
8	-0.0016	0.0046	-0.0002	-0.0008	0.0026	0.0020	0.0059
9	-0.0015	0.0045	-0.0001	-0.0008	0.0026	0.0017	0.0059
10	-0.0015	0.0048	-0.0001	-0.0008	0.0026	0.0018	0.0059

Panel B: Response of Hedge Fund Flow from One Unit Shock in Hedge Fund Return

Period	US	BAH	BVI	CI	GUE	BER	LUX
1	0	0	0	0	0	0	0
2	-5.3591	7.2870	3.4778	1.0638	6.3054	20.4427	3.9049
3	-5.2689	11.0088	17.0840	2.1308	8.2193	24.9184	7.1494
4	-7.5264	16.0171	27.0754	2.9056	9.3342	31.8528	11.6754
5	-7.3442	13.4353	18.2299	2.2704	8.7573	30.6080	10.2642
6	-7.3738	13.0577	22.4325	2.3430	8.8099	29.3716	11.7872
7	-7.8466	13.6458	23.6879	2.4240	8.8026	30.3302	11.6114
8	-7.7720	13.1132	21.3041	2.3693	8.7747	30.2400	11.7350
9	-7.7783	13.1098	22.6741	2.3761	8.7805	29.7836	11.8300
10	-7.8490	13.3548	22.6580	2.3870	8.7857	30.0316	11.8049

Figure 2.1: U.S. Monthly Hedge Fund AUM, Return and Flow

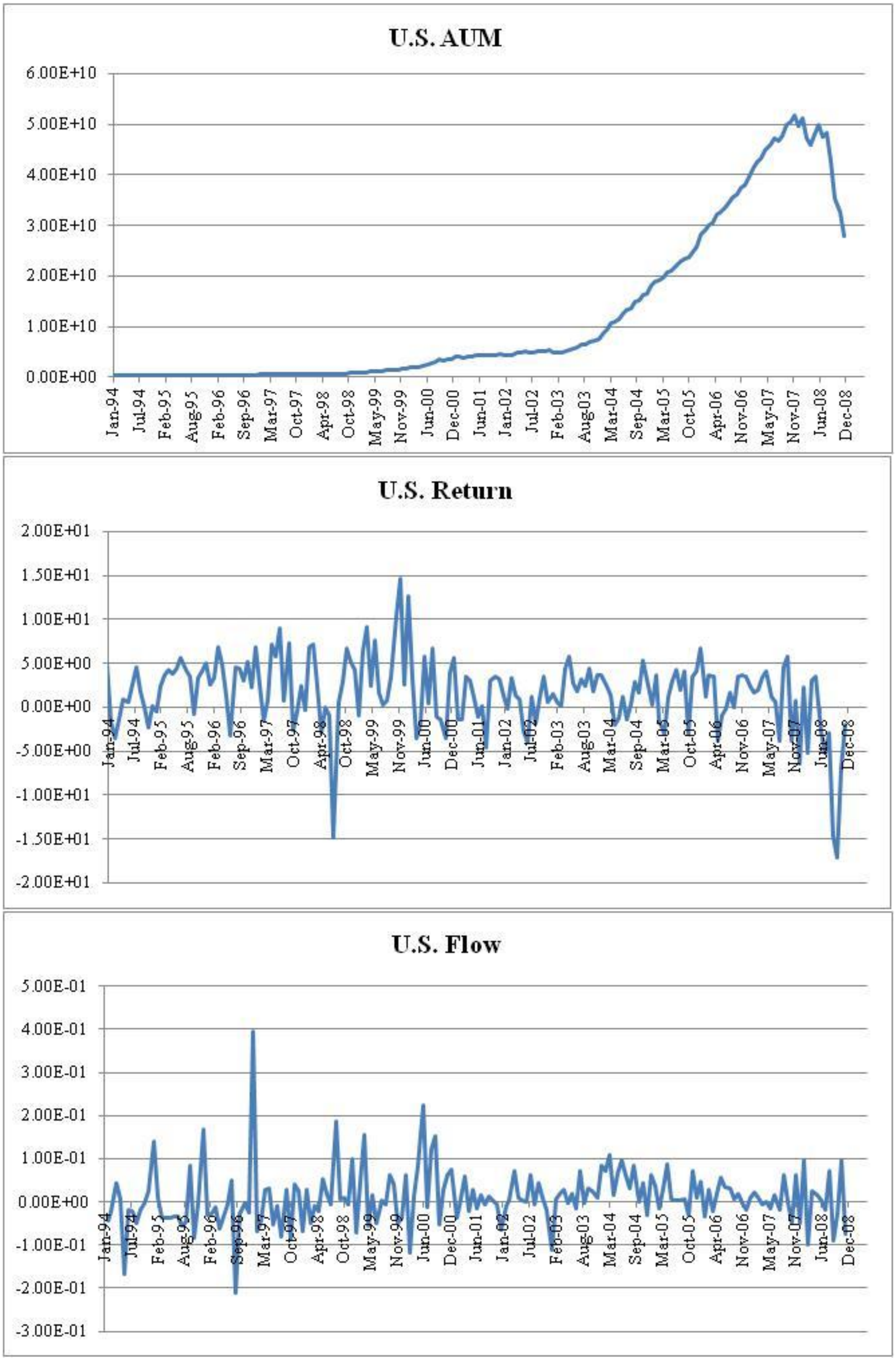


Figure 2.2: Bahamas (BAH) Monthly Hedge Fund AUM, Return and Flow

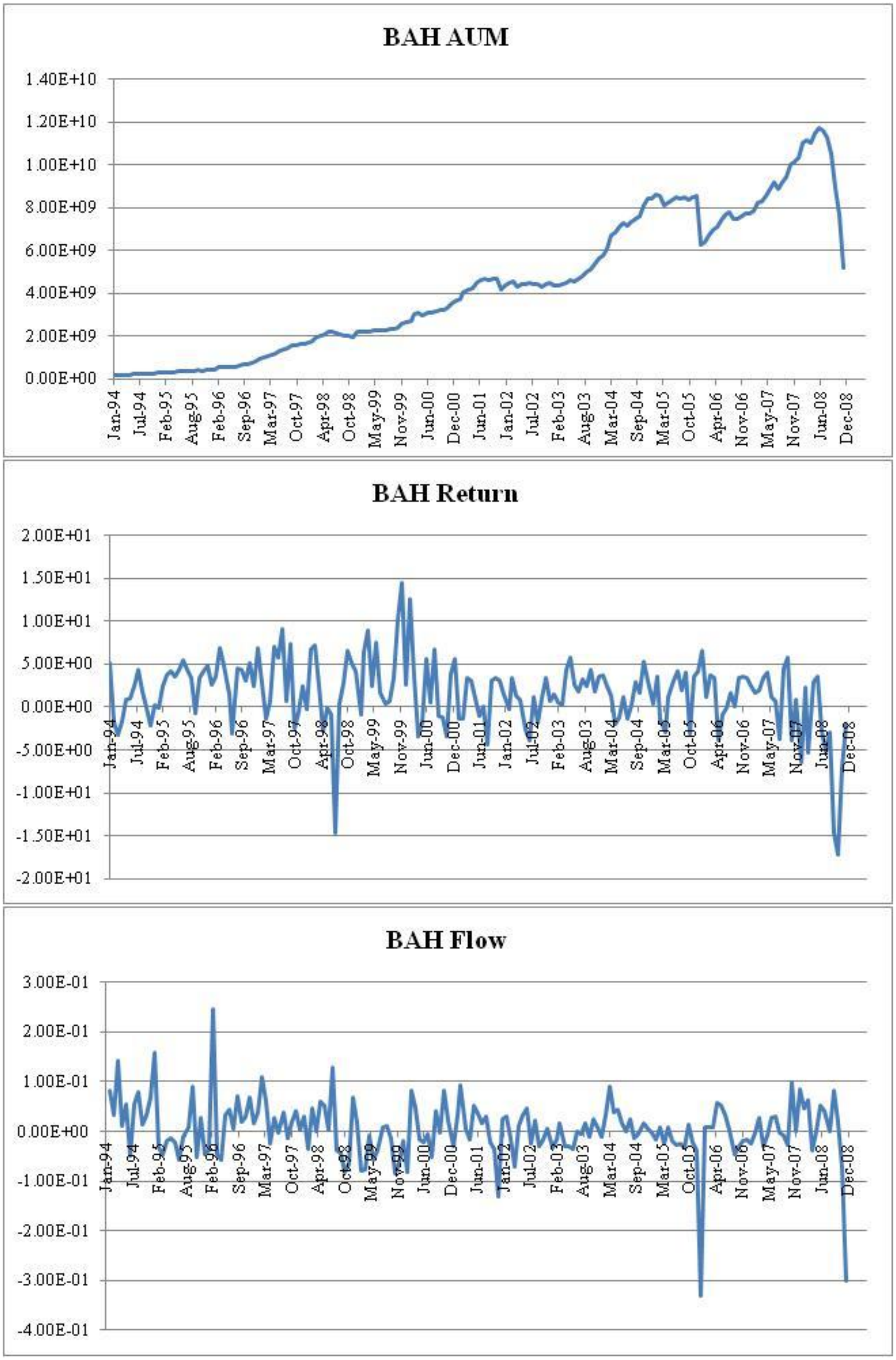


Figure 2.3: British Virgin Islands (BVI) Monthly Hedge Fund AUM, Return and Flow

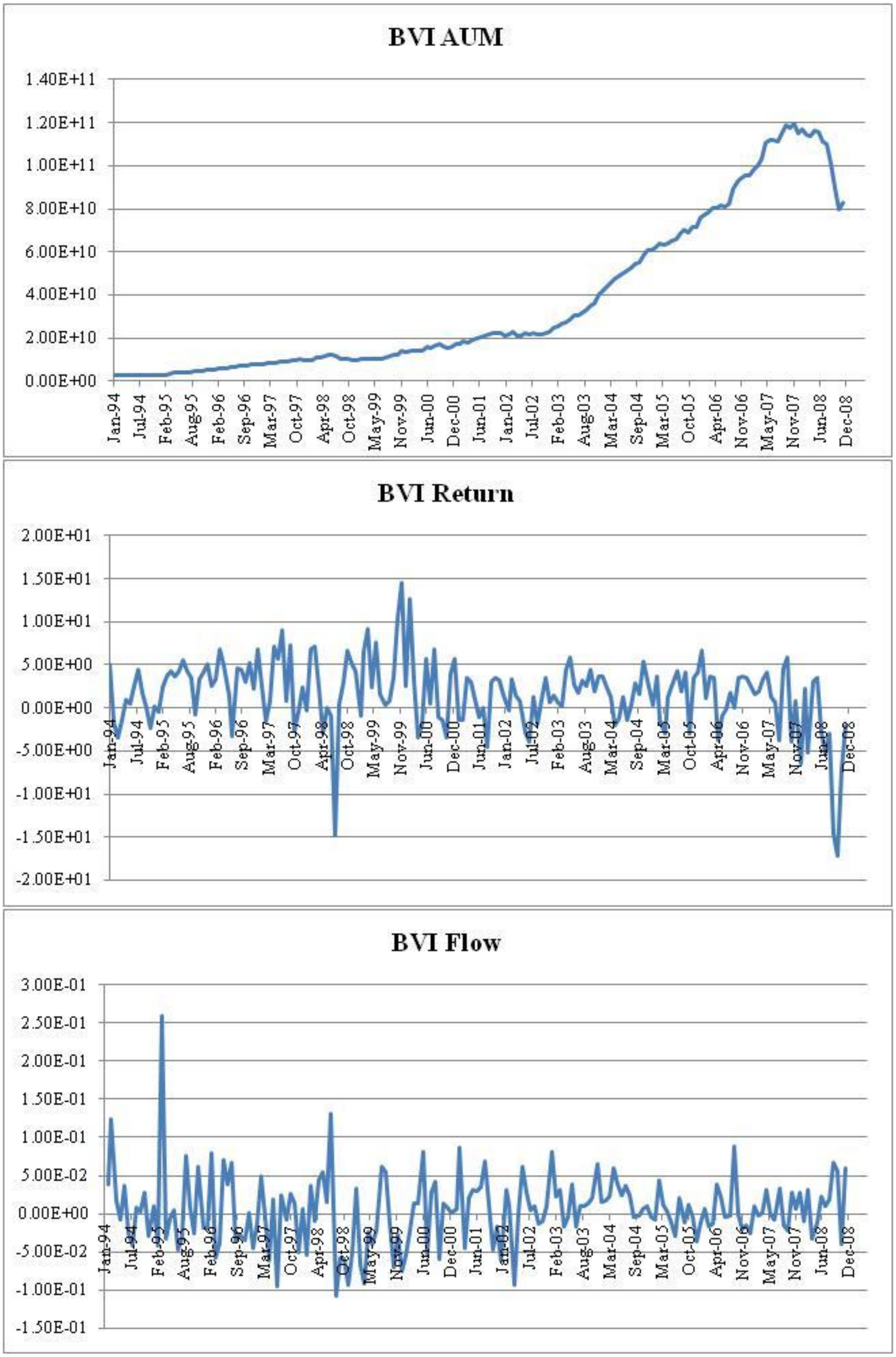


Figure 2.4: Cayman Islands (CI) Monthly Hedge Fund AUM, Return and Flow

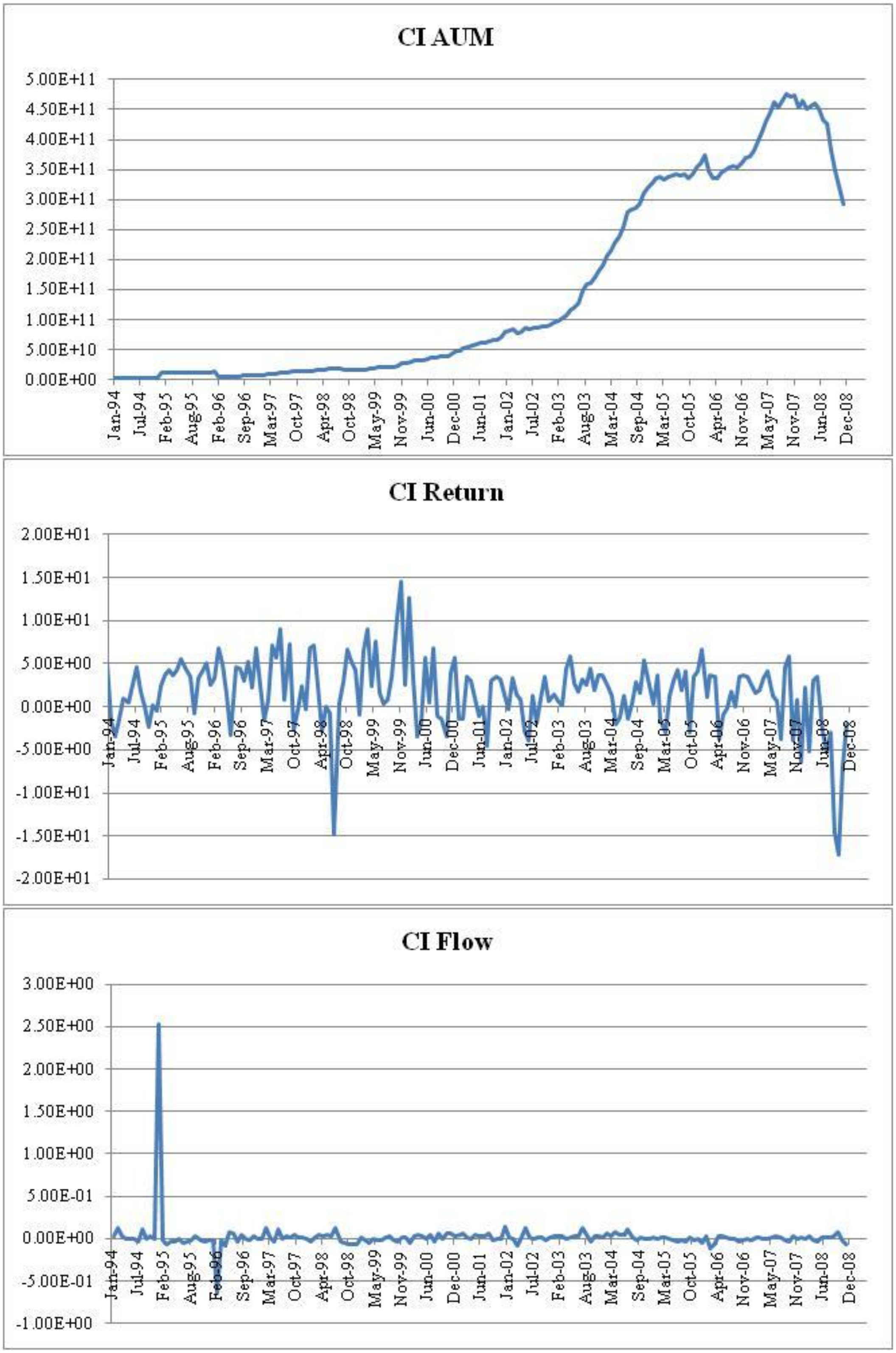


Figure 2.5: Guernsey (GUE) Monthly Hedge Fund AUM, Return and Flow

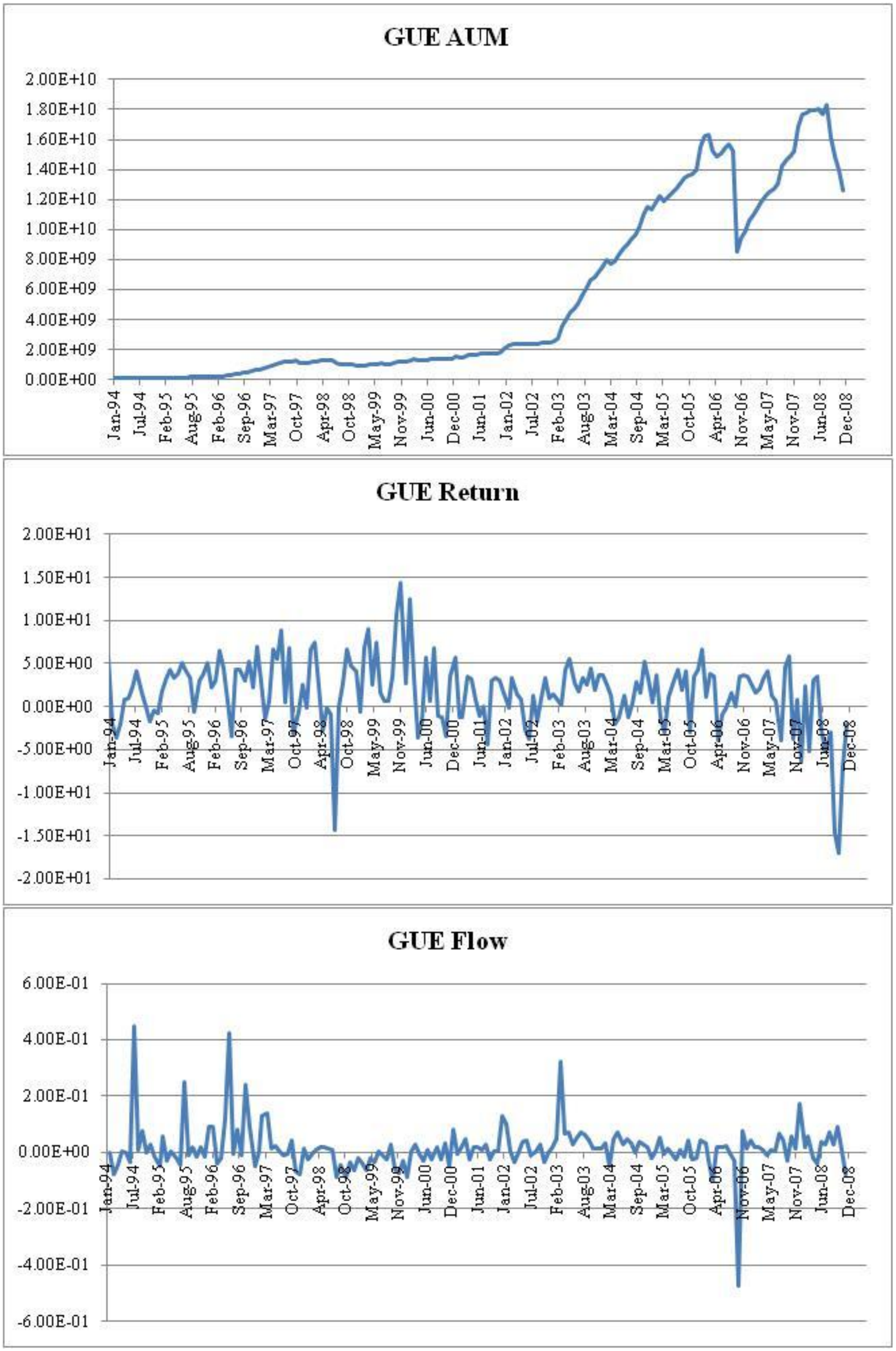


Figure 2.6: Bermuda (BER) Monthly Hedge Fund AUM, Return and Flow

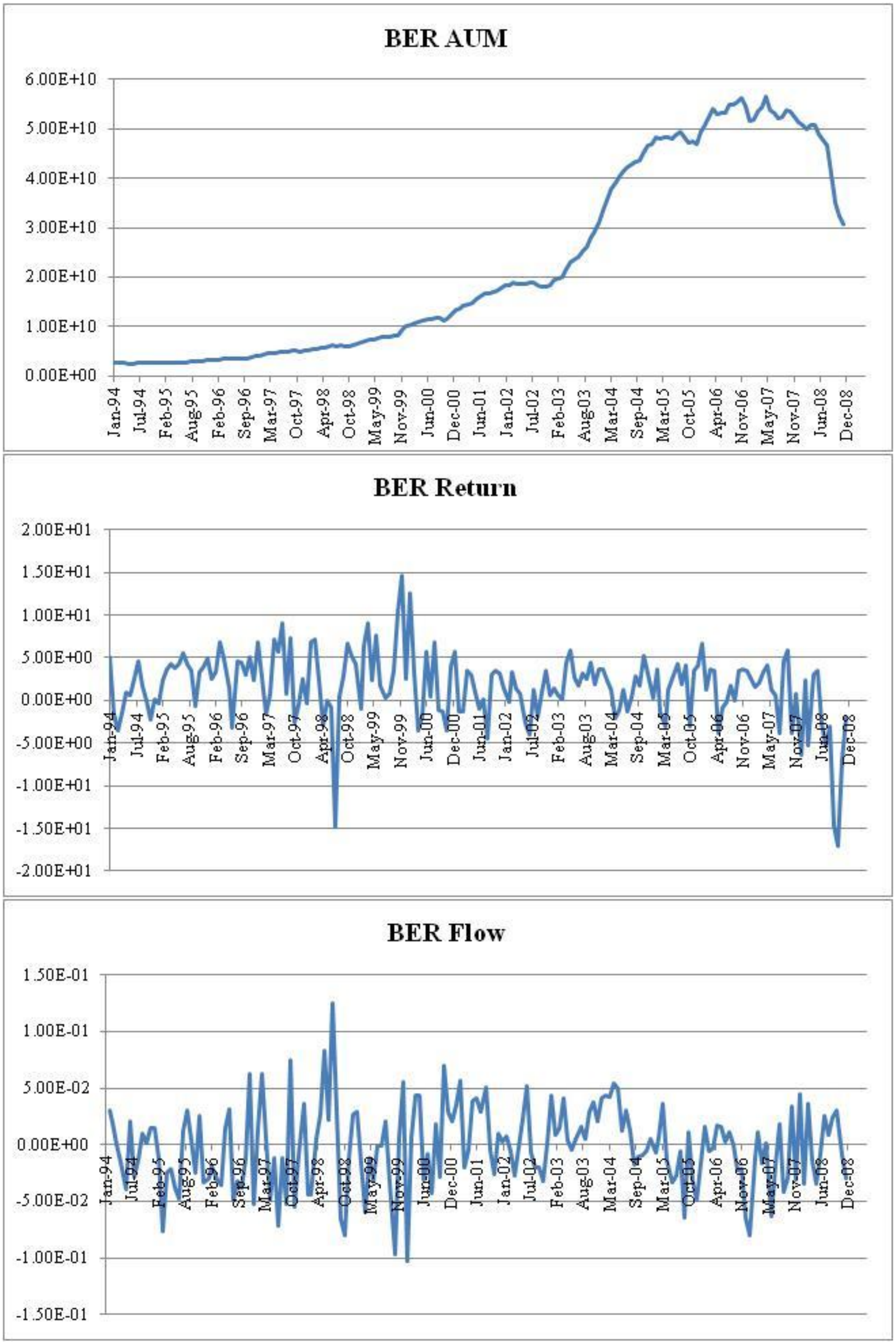
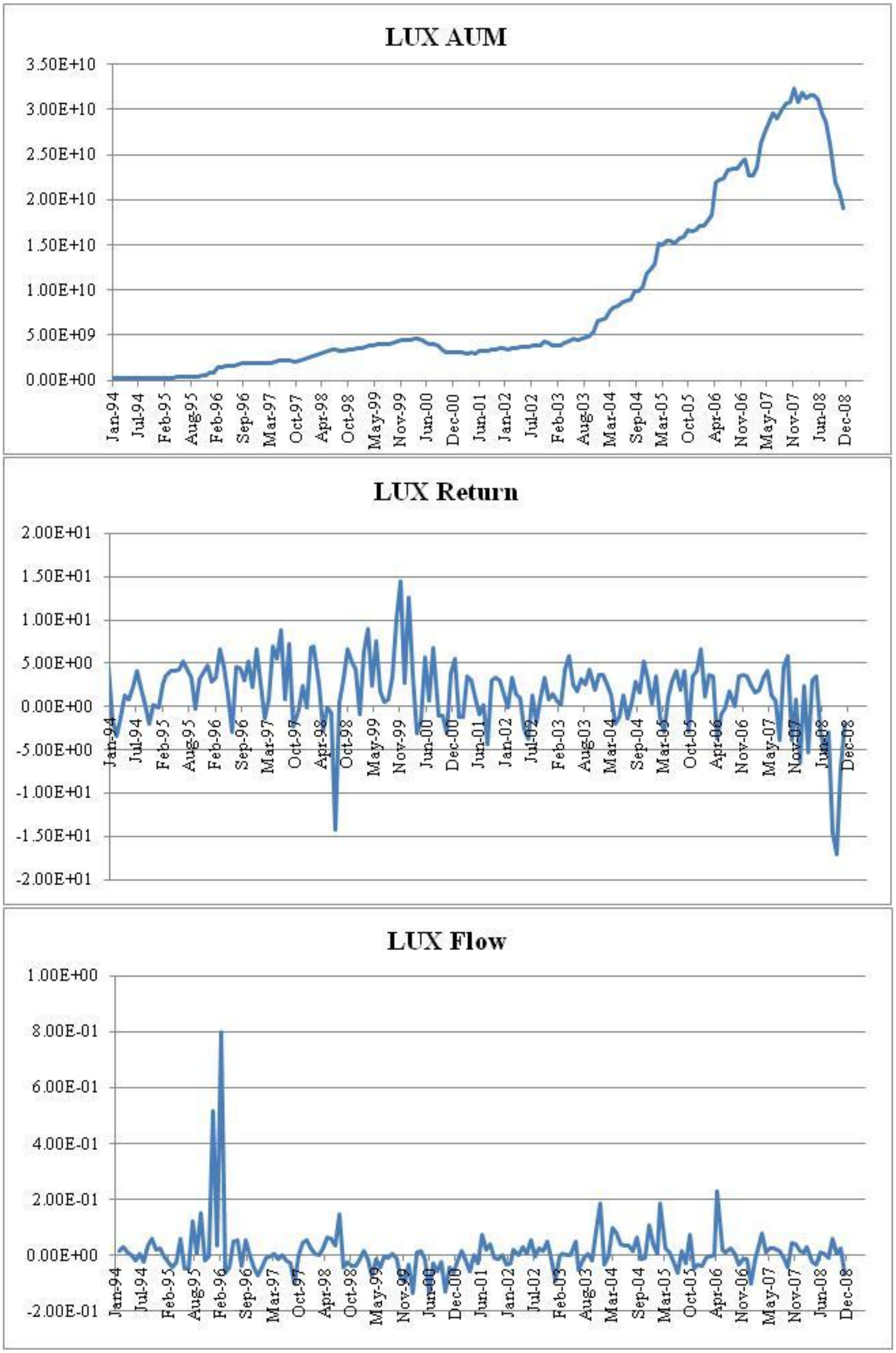


Figure 2.7: Luxembourg (LUX) Monthly Hedge Fund AUM, Return and Flow



CHAPTER III

DETERMINANTS OF U.S. HEDGE FUND MANAGERS' LOCATION CHOICES

3.1 Introduction

The hedge fund industry has grown tremendously since it was founded 60 years ago. Getmansky (2012) reports the number of hedge funds has risen by more than 25% per year for the last two decades. In addition, the total assets under management of the hedge fund industry have doubled in the past five years. Ding et al (2009) also report that inflows of hedge fund industry totaled $100 billion during the second quarter of 2009 according to Hedge Fund Research. As a result of the significant growth, there is an increased interest in hedge fund research.

Hedge funds can be classified into two broad categories on the basis of domicile: onshore and offshore. Offshore hedge funds are typically corporations registered in tax havens such as the Bahamas, the British Virgin Islands, or Cayman Islands, where tax liabilities of non-U.S. citizens are minimal. Much of the current literature (i.e. Liang et al 2007) has noted that offshore hedge funds in tax havens have been growing much faster than onshore hedge funds due to tax benefits and a looser regulatory environment for the offshore hedge funds. Yet very little is known about the factors influencing hedge fund managers' location choice process for fund registration.

Academic research on hedge funds has mostly focused on the issues of performance and incentives. Documenting reasons for hedge fund managerial behavior is a relatively new area of research primarily due to the difficulty in obtaining data as well as the various restrictions that are placed on hedge fund investors. But there are several reasons for the need to investigate the location of hedge funds and understanding hedge fund managers' behavior in the location choice process. Economic geography has been widely studied in areas such as mutual funds. However, there are very few studies regarding economic geography in the hedge fund industry. A more comprehensive understanding of the hedge funds and funds of funds managers' location decision process can potentially benefit hedge fund managers, investors and policy makers. For example, profit maximizing hedge fund managers and investors can choose their optimum locations according to their own investment preferences (i.e. higher/lower management fee). Policy makers can take into consideration the factors affecting location choices when regulating hedge funds in order to keep domestic hedge funds onshore and attract foreign hedge fund registration.

In this study, I take advantage of a nested logit model developed by McFadden (1974) to trace the location of U.S. hedge funds and funds of funds and estimate the determinants of U.S. hedge fund and fund of funds mangers' location choices using data on hedge funds and funds of funds listed in the Barclay Hedge Fund Database from January 1994 to February 2010. Controlling type of fund, fund flexibility, fund managerial structure, and manager compensation, estimated results from nested logit model show that fund type, lock up period, number of employees, management fees, and performance fees are significant determinants of hedge funds and funds of funds managers' location choice process. In addition, hurdle rate is a significant determinant when fund managers are choosing between whether to register in tax haven or non-tax haven. High-water mark is not a significant determinant of fund managers' location choices, even though many studies have shown that hedge funds with high-water mark provision outperform those without (i.e. Liang (2009), Agarwal et al. (2009)). There is little research focusing on hedge fund managerial behavior as it relates to location choice issues. This study contributes to the existing literature by providing insight into the factors affecting hedge funds and funds of funds managers' location choices for fund registration.

3.2 Literature Review and Hypotheses

The importance of economic geography has been widely documented. (i.e., Krugman (1991), Audretsch and Feldman (1996), Loughran and Schultz (2005), and Becker (2007)). However, very little is known regarding the factors that influence hedge fund and fund of funds managers' location choices. In this study, I estimate the location determinants of hedge funds and funds of funds with a nested logit model. According to Greene (2003), a nested logit model is similar to a multinomial logit model. However, a multinomial logit model assumes that choices between any two alternatives are independent of the other alternatives (IIA) while a nested logit model relaxes the IIA and assumes that the choices are independent within a group or nest of alternatives. In the nested logit model, the decision process follows a hierarchical structure: the hedge funds and funds of funds managers choose a nest and a specific alternative within this nest. In nested logit models, even though the decision trees are often interpreted as the highest level decisions are made first, followed by decisions at lower levels, no such sequential ordering is necessarily implied. The structure of a nested model is shown in Figure 3.1.

[INSERT FIGURE 3.1 HERE]

Assuming that hedge fund managers aim to maximize profit, the issue of where to locate is simply which location leads to maximum fund returns. The probability that a hedge fund locates in a particular geographic region depends on how the characteristics of that region affect a hedge fund's return relative to the characteristics of other regions. Therefore, in order to find out the determinants of fund managers' location choices, I will first find the factors that influence fund return and then investigate whether these factors affect fund managers' location choices for registration. These factors are (pre)determined at the time of the registration and do not change too frequently afterwards. In addition, these factors are different for different geographical region. For example, when a manager decides whether to set up a hedge fund versus a fund of funds before or at the time of registration, it cannot change afterwards. Factors such as assets under management or fund flows also affect fund return. However, these factors change from time to time. In addition, managers cannot assess these factors before or at the time of registration. Therefore, factors that cannot be assessed before or at the time of fund registration do not affect fund manager's registering location choice and are not included in the analysis.

Many attractive hedge funds are closed for new investment due to the membership limitation of hedge funds. In addition, the lack of transparency in hedge funds has always been a major problem for hedge fund investors. Moreover, many hedge funds require a minimum investment of $1,000,000. The high minimum investment requirements make diversification in hedge funds very difficult. Funds of funds (or funds of hedge funds) are hedge funds themselves whose portfolio consists of a number of hedge funds. Managers of funds of funds select hedge fund managers and invest in several hedge funds to diversify the risks. Therefore, funds of funds provide investors with access to certain closed funds, opportunity to diversification and a certain degree of due diligence.

Regardless of benefit to investors provided by funds of funds, research has shown that the gain of funds of funds does not compensate for the high fees imposed on investors. Brown et al. (2004) contend that investors have to pay “fees on fees” on funds of funds. For this reason, individual hedge funds dominate funds of funds with regard to returns net of fees. Liang (2004) confirms the results of Brown et al. (2004) by reporting that hedge funds outperform funds of funds from 1994 to 2001. Hence, the difference in return between hedge funds and funds of funds should lead to difference registration location choices by the fund managers.

Hypothesis 1: Managers of hedge funds and funds of funds choose different geographical regions for fund registration.

A lock up period is the minimum period in which the investment cannot be withdrawn, and thus represents the investors’ minimum commitment time to the capital. Capital withdrawal restrictions such as lockup period grant fund managers greater flexibility so that they can pursue different investment strategies. According to De Long et al. (1990), managers with greater flexibility can invest in arbitrage that might take time to become profitable due to noise trader risk. Liang (1999) reports a positive relationship between lockup period and average fund return. Therefore, since the average lockup period varies in different geographical regions, it should play an important role in the decision-making process of hedge funds and funds of funds managers’ location choice process.

Hypothesis 2: Managers of hedge funds and funds of funds that prefer different lockup periods would choose different geographical regions for fund registration.

Koh et al (2003) and Liang (1999) find a positive relationship between fund size and performance. In the hedge fund literature, fund size refers to total assets under management of the testing period. Since fund size does not remain constant during the entire sample period and most of the times managers of larger funds tend to have more employees. Many studies use number of employees as a proxy for firm size (i.e. Cabral and Mata (2000), Foss and Pederson (2002), and Hoque and James (2000)). In this study, I use number of employees of a fund manager as a proxy for fund size. Hence the number of employees should impact geographic region for fund registration.

Hypothesis 3: Managers of hedge funds and funds of funds that have different number of employees would choose different geographical regions for fund registration.

In the hedge fund industry, fund managers are compensated through management fees and performance fees. Performance fees are frequently subject to high-water mark and hurdle rate provisions. High-water mark is a provision to ensure performance fees are only paid when the net asset value exceeds its previous maximum. Hurdle rate is the minimum amount a fund needs to earn before charging performance fees. A significant difference of hedge funds from other investment vehicles is that the compensation contract is set at the fund's inception date and seldom changes during the life time of the fund. In general, Agarwal et al. (2009) state that managerial incentives are associated with superior performance. Ackermann et al. (1999), Agarwal et al. (2009) and Edwards and Caglayan (2001) find a significantly positive relationship between fund performance fee and return. Liang (1999) reports that most hedge funds impose high-water mark provisions and that funds with high-water mark provisions significantly outperform funds without. Agarwal et al. (2009) also find that inclusion of high-water mark in the incentive contracts is associated with superior performance. Therefore, hedge fund and fund of funds managers with different compensation (management fee, performance fee, high-water mark, and hurdle rate) preferences should choose different geographical location for fund registration.

Hypothesis 4: Hedge funds and funds of funds managers that prefer different management fees would choose different geographical regions for fund registration.

Hypothesis 5: Hedge funds and funds of funds managers that prefer different performance fees would choose different geographical regions for fund registration.

Hypothesis 6: Hedge funds and funds of funds managers that prefer a high-water mark would choose different geographical regions for fund registration.

Hypothesis 7: Hedge funds and funds of funds managers that prefer a hurdle rate would choose different geographical regions for fund registration.

3.3 Data and Descriptive Statistics

In this study, I obtain data on individual hedge funds and funds of funds from the Barclay Hedge Fund Database. Both active and inactive funds are included to minimize survivorship bias. The difference between headquarters and registered locations is: headquarters stand for where managers' main office and most staffs are located while registered locations stand for the location where the fund has been legally organized or officially established. According to Barclay Hedge Fund Database, there is a total of 4,455 hedge funds and funds of funds with headquarters in the United Sates during the sample period of January 1994 – February 2010. I excluded data after February 2010 because the Dodd-Frank Wall Street Reform and Consumer Protection Act was signed into federal law in July 2010. This act eliminates registration exemption of onshore hedge fund managers. Hence, more onshore hedge fund managers might have the incentives to register offshore in order to circumvent registration. This will affect this study of onshore hedge fund managers' location choice process. Out of these 4,455 funds, 4,239 (95.15%) hedge funds and funds of funds are registered in U.S., Europe, British Virgin Islands and Cayman Islands. The rest 4.85% of the funds dispersedly registered in the rest of the world and are excluded from the sample due to their size insignificance (number of funds in these countries are less than the number of variables included in the nested logit models) that might bias the analysis. Hence, the final sample contains 4,239 hedge funds and funds of funds managed by U.S. managers and registered in the U.S., Europe, British Virgin Islands, and Cayman Islands during the sample period of January 1994 to February 2010.

In order to test hypothesis 1-7 introduced in the previous section, the explanatory variables are defined below.

Measure of Type of Fund

Fund_Type: dummy variable that takes the value of one for hedge fund and two for fund of funds. (to test hypothesis 1)

Measure of Fund Flexibility

Lockup_Period: period (days) in which the investment cannot be withdrawn. (to test hypothesis 2)

Measure of Fund Managerial Structure

Number_Employees: number of employees of the fund manager. (to test hypothesis 3)

Measure of Manager Compensation

Management_Fee: the percentage fee charged by the fund for ongoing portfolio management. (to test hypothesis 4)

Performance_Fee: the percentage fee for return performance above a predetermined benchmark. (to test hypothesis 5)

Highwater_Mark: a provision to ensure performance fees apply to the highest net asset value, take the value of one for no high-water mark and two otherwise. (to test hypothesis 6)

Hurdle_Rate: Minimum amount a fund needs to earn before charging performance fees, take the value of one for no hurdle rate and two otherwise. (to test hypothesis 7)

The descriptive statistics of the geographical regions included in this study are shown in Table 3.1 – 3.4.

[INSERT TABLE 3.1 – 3.4 HERE]

3.4 Methodology

In a discrete choice model, decision-makers choose among a set of finite, exhaustive and mutually exclusive alternatives. The most widely used discrete choice model is the multinomial logit model developed by McFadden (1973). A multinomial logit model is based on principles of utility maximization and has the property that the relative probabilities that each alternatives are independent of the presence or characteristics of all other alternatives (Koppelman and Wen (1998)). This property is defined as the independence of irrelevant alternatives (IIA). IIA implies that adding or deleting an alternative does not affect the odds among the remaining alternatives. This IIA property is a major limitation of the multinomial logit model because it implies equal competition between any pairs of alternatives. Due to this limitation, multinomial logit model has been widely criticized despite its simple mathematical form and ease of estimation and interpretation. McFadden (1978) derived generalized extreme value models that allow for a variety of assumptions concerning the structure of the error distributions of alternatives. In generalized extreme value models, it is assumed that the error terms are distributed according to a generalized extreme value distribution. Generalized extreme value models generalize the univariate extreme value distribution from the multinomial logit models. When all the correlations in a generalized extreme value model equal zero, the generalized extreme value model becomes the product of independent extreme value distributions and the generalized extreme value model becomes a multinomial logit model. The most widely used generalized extreme value model is the nested logit model, which is also the most widely known relaxation of the multinomial logit model.

Borsch-Supan (1987) notes that a nested logit model represents important deviations from the IIA property but retain most of the computational advantages of the multinomial logit model. According to Train (2007), the nested logit model is appropriate when a decision maker's alternatives set can be partitioned into subsets (nests) so that IIA holds within each nest and that IIA generally does not hold for alternatives from different nests. In other words, the ratio of probabilities of any two alternatives from the same nest is independent of the attributes of all other alternatives in the nest; the ratio of probabilities of any two alternatives from different nests can depend on the attributes of other alternatives from the two nests. Therefore, Nested logit models are often used when the choice set has two or more levels, and when there are groups of alternatives that are more similar to each other with respect to unobserved characteristics than they are to other alternatives. In other words, nested logit models are appropriate when there is correlation for excluded reasons between the alternatives in each group but no correlation between alternatives in different groups. The available location choices that a hedge fund manager face can be partitioned into two subsets: tax haven and non-tax haven in the first level. Locations in each subset are correlated within the group but uncorrelated with locations from other groups. Therefore, a nested logit model is suitable to estimate the determinants of U.S. hedge fund managers' decision choices for fund registration.

I estimate a normalized nested logit model that is consistent with a random utility model setup. When setting up a new hedge fund, each fund manager i faces a finite set L of locations l.

Since fund managers aim to maximize profit, they will choose the location that lead to the highest utility, which is

$$U_{il} > U_{ik} \quad \forall\, k \neq l \text{ and } k = 1, 2, \dots L \qquad (1)$$

Each utility function includes a deterministic (observable) part and a random (unobservable) part:

$$U_{il} = V_{il} + \varepsilon_{il} \qquad (2)$$

where ε_{il} follows general extreme value distribution and each ε_{il} is correlated within each nest *B* but maintains independence across nests. It has a cumulative joint distribution function described as:

$$F(\varepsilon_{il}) = \exp\left(-\sum_{k=1}^{K}\left(\sum_{l\in B_k} e^{-\varepsilon_{il}/\sigma_k}\right)^{\sigma_k}\right) \qquad (3)$$

Equation (3) shows that the choices are partitioned into *K* nests of B_k. The parameter σ_k is the log-sum coefficient measuring the degree of independence in unobserved utility among the alternatives *l* in nest B_k. σ_k is also known as a dissimilarity parameter. A high σ_k means higher degree of independence and low correlation. In other words, alternatives in the same nest are less similar for unobserved reasons. The statistic 1- σ_k is commonly used as a measure of correlation. If σ_k =1, it implies that alternatives in nest B_k are completely independent. Furthermore, if σ_k =1 for all nests, the nested logit model reduces to the multinomial model. In this case, it is unnecessary to use the nesting structure because decision makers perceive all alternatives in *L* as perfect substitutes. Hence, it is always necessary to check the estimated log-sum when estimating nested logit models.

Now I decompose the observed portion of utility in equation (2) into two parts:

1) Marginal utility: W_{ik}, which depends only on variables that describe nest B_k and is constant for all alternatives within the nest B_k. These variables differ over nests but not over alternatives within nest B_k.

2) Conditional utility: Y_{il}, which depends on variables that describe alternative *l* and varies over alternatives within a nest.

Therefore, equation (2) can be rewritten as:

$$U_{il} = W_{ik} + Y_{il} + \varepsilon_{il} \qquad where\ \ l \in B_k \tag{4}$$

Let P_{il} = probability of fund manager *i* choose location *l* to register, $P_{i|Bk}$ = marginal probability of fund manager *i* choose a location in nest B_k, and $P_{il|Bk}$ = conditional probability of fund manager *i* choose location *l* in nest B_k. Then,

$$P_{il} = P_{iB_k} \times P_{il|B_k} \tag{5}$$

In other words, P_{il} is the probability that fund manager *i* choose nest B_k (tax haven or non-tax haven) in the first level and location *l* (specific country) in the second level.

Let $W_{ik} = w_{ik}$ and $Y_{il} = x_{il}\beta$; w_{ik} is the matrix of characteristics specific to nest *k* in the first level; $x_{il}\beta$ is the matrix of characteristics specific to the location *l* in nest *k* in the second level.

$$P_{i|B_k} = \frac{e^{w_{ik}r + \sigma_k IV_{ik}}}{\sum_{\tau=1}^{K} e^{w_{i\tau}r + \sigma_\tau IV_{i\tau}}} \tag{6}$$

$$P_{il|B_k} = \frac{e^{x_{il}\beta/\sigma_k}}{\sum_{l\in B_k} e^{x_{il}\beta/\sigma_k}} \tag{7}$$

$$P_{il} = \frac{e^{w_{ik}r + \sigma_k IV_{ik}}}{\sum_{\tau=1}^{K} e^{w_{i\tau}r + \sigma_\tau IV_{i\tau}}} \times \frac{e^{x_{il}\beta/\sigma_k}}{\sum_{l\in B_k} e^{x_{il}\beta/\sigma_k}} \tag{8}$$

where

$$IV_{ik} = ln \sum_{l\in B_k} e^{x_{il}\beta/\sigma_k} \tag{9}$$

$IV_{ik,}$ which is calculated as the log of the denominator of the second level, is the inclusive value and links the two levels of the nested logit model by bringing information from the conditional probability (second level) to marginal probability (first level) (Ben-Akiva and Lerman (1985)).

Following the approach of Gomes and Phillips (2007), two nested logit models are used to trace the location of U.S. hedge funds and funds of funds and estimate the determinants of fund managers' location choices. Both of nested logit models include two decision levels. The first level alternatives are not tax haven and tax haven. The second level alternatives are United States, Europe, British Virgin Islands, and Cayman Islands. I use not tax haven as the base alternative at the first decision level, and United States as the base alternative at the second decision level. The nested logit models are estimated using full-information maximum likelihood.

The Dependent variable is the location choice of hedge funds and funds of funds managers for both nested logit models. It takes the value of one for region chosen by the hedge funds or fund of funds managers, and zero for all other alternatives.

In the first nested logit model, the explanatory variables for first-level decision alternatives are Fund_Type, Lockup_Period and Number_Employees; the explanatory variables for the second-level decision alternatives are Management_Fee, Performance_Fee, Highwater_Mark and Hurdle_Rate. The structure of this model is shown in Figure 3.2.

[INSERT FIGURE 3.2 HERE]

This model assumes that type of fund, fund flexibility, and fund structure influence fund managers' choice in the first level and that manager compensation influence fund managers' choice in the second level. That is to say, in this model, the individual specific variables are Fund_Type, Lockup_Period, and Number_Employees; alternative-specific variables are

Management_Fee, Performance_Fee, Highwater_Mark and Hurdle_Rate.

In the second nested logit model, the explanatory variables for first-level decision alternatives are Management_Fee, Performance_Fee, Highwater_Mark and Hurdle_Rate; the explanatory variables for the second-level decision alternatives are Fund_Type, Lockup_Period and Number_Employees. The structure of this model is shown in Figure 3.3.

[INSERT FIGURE 3.3 HERE]

In the second model, I assume that manager compensation influence fund managers' choice in the first level while type of fund, fund flexibility, and fund structure influence fund managers' choice in the second level. In other words, the individual specific variables in this model are Management_Fee, Performance_Fee, Highwater_Mark and Hurdle_Rate; the alternative-specific variables in this model are Fund_Type, Lockup_Period, and Number_Employees.

3.5 Results

The results for the nested logit models 1 and 2 are reported in Table 3.5 and Table 3.6 respectively.

[INSERT TABLE 3.5 & 3.6 HERE]

As stated in the previous section, the log-sum coefficient reflects the degree of independence among the unobservable portions of utility for alternatives in the nest. If log-sum coefficient equals 1 for all nests, the nested logit model collapse to a multinomial logit model. Table 3.5 and 3.6 depict that for both nested logit models, the LR test indicates the null hypothesis that all of the log-sum coefficients are 1 is rejected. Therefore, it is appropriate to use a nested logit model instead of a multinomial logit model in both cases.

Type of funds is a significant determinant of hedge fund and fund of funds managers' location choices. As shown in Panel A of Table 3.5, managers of funds of funds are more likely to register in tax havens. Furthermore, Panel B of Table 3.6 shows that managers of funds of funds are more likely to register in the British Virgin Islands compared to the Cayman Islands in tax havens; and Europe is preferred by fund of funds managers than the U.S. in non-tax havens. Therefore, hypothesis 1 is accepted, managers of hedge funds and funds of funds choose different geographical regions for fund registration.

Lockup period is a significant determinant of hedge fund and fund of funds managers' location choices. Panel A of Table 3.5 shows that managers that prefer shorter lock up period are more likely to register in tax havens. Furthermore, Panel B of Table 3.6 shows that managers that prefer shorter lock up periods prefer to register in the U.S. compared to Europe in non-tax haven countries. Managers that prefer shorter lock up periods are also more likely to register in the Cayman Islands rather than the British Virgin Islands when choosing tax havens. Hence, hypothesis 2 is accepted, fund managers that prefer different lock up periods would choose different geographical regions for fund registration.

Number of employees is also a significant determinant of hedge fund and fund of funds managers' location choices. Panel A of Table 3.5 depicts that fund managers with more employees are more likely to register in tax havens. Furthermore, Panel B of Table 3.6 shows fund managers with more employees prefer to register in the U.S. compared to Europe in non-tax haven countries. Fund managers with more employees are also more likely to register in the British Virgin Islands rather than the Cayman Islands when choosing tax havens. Hence, hypothesis 3 is accepted, as fund managers with different number of employees would choose different geographical regions for fund registration. Since number of employees is a proxy for fund size, it follows that fund size is a significant determinant of hedge fund and fund of funds managers' location choices. In addition, managers of larger funds prefer to register in tax havens than non-tax havens, in the British Virgin Islands than in the Cayman Islands, and in the U.S. than in Europe.

Management fee is a significant determinant of hedge fund and fund of funds managers' location choices. Panel A of Table 3.6 shows that fund managers who prefer higher management fees are more likely to register their funds in tax havens. Panel B of Table 3.5 depicts that managers who prefer higher management fees would prefer to register their funds in Europe than the U.S. in non-tax havens, and managers who prefer higher management fees are more likely to register in the British Virgin Islands than in the Cayman Islands. Therefore, hypothesis 4 is accepted, as fund managers that prefer different management fees would choose different geographical regions for fund registration. This result is consistent with the accepting of hypothesis 3, which states that fund size is a significant determinant of hedge fund and fund of funds managers' location choices. Moreover, larger funds tend to register in tax havens as fund managers of larger funds will receive more management fee. Hence, hedge fund and fund of funds managers who prefer higher management fees will also prefer to register in tax havens.

Performance fee is also a significant determinant of fund managers' location choices. Panel A of Table 3.6 shows that fund managers who prefer higher performance fees are more likely to register their funds in tax havens. Panel B of Table 3.5 shows that fund managers who prefer higher performance fees would prefer to register their funds in the United States rather than register in Europe. Thus, hypothesis 5 is accepted, fund managers that prefer different performance fees would choose different geographical regions for fund registration.

High-water mark is not a significant determinant of hedge fund and fund of funds managers' location choices, hence hypothesis 6 is rejected.

Hurdle rate is significant as an individual-specific variable, but insignificant as an alternative-specific variable. In other words, hurdle rate is a significant determinant of fund managers' location choices in the first level, but not in the second level. Panel A of Table 3.6 depicts that fund managers who do not like hurdle rate are more likely to register their funds in tax havens. Hypothesis 7 is partially accepted because hurdle rate is a significant determinant of fund managers' location choices only when the manager is choosing between tax havens and non-tax haven.

3.6 Conclusions

In this study, nested logit estimation techniques are used to investigate the U.S. hedge fund and fund of funds managers' location choices. The sample includes 95.15% of the hedge funds and funds of funds with head offices in the U.S. and registered in the U.S., Europe, British Virgin Islands, and Cayman Islands from January 1994 to February 2010. There is little research concerning hedge fund managerial behavior as it relates to location choice issues. Therefore, this study contributes to the existing literature by providing insight into the factors affecting hedge fund and fund of funds managers' location choices for fund registration.

Controlling for type of fund, fund flexibility, fund managerial structure and manager compensation, I examine U.S. hedge fund and fund of funds managers' location decision-making process. Results from the nested logit models show that fund type, lock up period, number of employees, management fees, and performance fees are significant determinants of hedge fund and fund of funds managers' location choices. On the other hand, high-water mark is not a significant determinant of fund managers' location choices. Nested logit model estimates also show that hurdle rate is a significant determinant when fund managers are choosing between whether to register in tax haven or non-tax haven.

In sum, this study investigates the role of fund type, lock up period, number of employees, management fee, performance fee, high-water mark, and hurdle rate in hedge funds and funds of funds managers' location decision-making process. However, the choices of locations might also be driven by the unobservable regulatory characteristics of the host countries. Therefore, a possible extension to this study would be to incorporate regulation or policy related characteristics in the analysis.

Table 3.1: Descriptive Statistics of U.S. Hedge Funds and Funds of Funds Registered in the United States

Note: The variables are defined as follows: Fund_Type: dummy variable that takes the value of one for hedge fund and two for fund of funds. Fund_Lockup_Period: period (days) in which the investment cannot be withdrawn. Manager_Number_Employees: number of employees of the fund manager. Fund_Management_Fee: the percentage fee charged to the fund for ongoing portfolio management. Fund_Performance_Fee: the percentage fee for return performance above a predetermined benchmark. Fund_Highwater_Mark: a provision to ensure performance fees apply to the highest net asset value, take the value of one for no high water mark and two otherwise. Fund_Hurdle_Rate: Minimum amount a fund needs to earn before charging performance fees, take the value of one for no hurdle rate and two otherwise.

	N	Min	Max	Mean	Std. Deviation
Fund_Type	2573	1	2	1.230	0.421
Lockup_Period (days)	2573	0	1825	212.550	233.490
Number_Employees	2573	1	4700	41.370	285.494
Management_Fee (%)	2573	0	5	1.349	0.473
Performance_Fee (%)	2573	0	65	16.399	7.016
Highwater_Mark	2573	1	2	1.850	0.357
Hurdle_Rate	2573	1	2	1.160	0.365

Table 3.2: Descriptive Statistics of U.S. Hedge Funds and Funds of Funds Registered in Europe

Note: The variables are defined as follows: Fund_Type: dummy variable that takes the value of one for hedge fund and two for fund of funds. Fund_Lockup_Period: period (days) in which the investment cannot be withdrawn. Manager_Number_Employees: number of employees of the fund manager. Fund_Management_Fee: the percentage fee charged to the fund for ongoing portfolio management. Fund_Performance_Fee: the percentage fee for return performance above a predetermined benchmark. Fund_Highwater_Mark: a provision to ensure performance fees apply to the highest net asset value, take the value of one for no high water mark and two otherwise. Fund_Hurdle_Rate: Minimum amount a fund needs to earn before charging performance fees, take the value of one for no hurdle rate and two otherwise.

	N	Min	Max	Mean	Std. Deviation
Fund_Type	68	1	2	1.630	0.486
Lockup_Period (days)	68	0	365	29.490	97.690
Number_Employees	68	1	4700	138.600	565.558
Management_Fee (%)	68	0	5.5	1.287	1.007
Performance_Fee (%)	68	0	33.33	11.189	9.196
Highwater_Mark	68	1	2	1.630	0.486
Hurdle_Rate	68	1	2	1.340	0.477

Table 3.3: Descriptive Statistics of U.S. Hedge Funds and Funds of Funds Registered in British Virgin Islands

Note: The variables are defined as follows: Fund_Type: dummy variable that takes the value of one for hedge fund and two for fund of funds. Fund_Lockup_Period: period (days) in which the investment cannot be withdrawn. Manager_Number_Employees: number of employees of the fund manager. Fund_Management_Fee: the percentage fee charged to the fund for ongoing portfolio management. Fund_Performance_Fee: the percentage fee for return performance above a predetermined benchmark. Fund_Highwater_Mark: a provision to ensure performance fees apply to the highest net asset value, take the value of one for no high water mark and two otherwise. Fund_Hurdle_Rate: Minimum amount a fund needs to earn before charging performance fees, take the value of one for no hurdle rate and two otherwise.

	N	Min	Max	Mean	Std. Deviation
Fund_Type	382	1	2	1.340	0.475
Lockup_Period (days)	382	0	1825	111.350	255.653
Number_Employees	382	1	350	40.030	58.665
Management_Fee (%)	382	0	3	1.409	0.508
Performance_Fee (%)	382	0	65	15.190	8.066
Highwater_Mark	382	1	2	1.810	0.394
Hurdle_Rate	382	1	2	1.060	0.233

Table 3.4: Descriptive Statistics U.S. Hedge Funds and Funds of Funds Registered in Cayman Islands

Note: The variables are defined as follows: Fund_Type: dummy variable that takes the value of one for hedge fund and two for fund of funds. Fund_Lockup_Period: period (days) in which the investment cannot be withdrawn. Manager_Number_Employees: number of employees of the fund manager. Fund_Management_Fee: the percentage fee charged to the fund for ongoing portfolio management. Fund_Performance_Fee: the percentage fee for return performance above a predetermined benchmark. Fund_Highwater_Mark: a provision to ensure performance fees apply to the highest net asset value, take the value of one for no high water mark and two otherwise. Fund_Hurdle_Rate: Minimum amount a fund needs to earn before charging performance fees, take the value of one for no hurdle rate and two otherwise.

	N	Min	Max	Mean	Std. Deviation
Fund_Type	1216	1	2	1.280	0.451
Lockup_Period (days)	1216	0	1825	171.600	233.840
Number_Employees	1216	1	4700	100.180	505.824
Management_Fee (%)	1216	0	3	1.436	0.442
Performance_Fee (%)	1216	0	30	16.389	6.404
Highwater_Mark	1216	1	2	1.870	0.340
Hurdle_Rate	1216	1	2	1.140	0.352

Table 3.5: Empirical Results from Nested Logit Model 1

Note: The variables are defined as follows: Fund_Type: dummy variable that takes the value of one for hedge fund and two for fund of funds. Fund_Lockup_Period: period (days) in which the investment cannot be withdrawn. Manager_Number_Employees: number of employees of the fund manager. Fund_Management_Fee: the percentage fee charged to the fund for ongoing portfolio management. Fund_Performance_Fee: the percentage fee for return performance above a predetermined benchmark. Fund_Highwater_Mark: a provision to ensure performance fees apply to the highest net asset value, take the value of one for no high water mark and two otherwise. Fund_Hurdle_Rate: Minimum amount a fund needs to earn before charging performance fees, take the value of one for no hurdle rate and two otherwise. N = number of observations at each level, K = number of times alternative is chosen.

	Coefficient	Std. Err.	Sig.
Panel A: First-Level Decision			
Not_Tax_Haven (N=8,478)			
Fund_Type	(base)		
Lockup_Period	(base)		
Number_Employees	(base)		
Tax_Haven (N=8,478)			
Fund_Type	0.669	0.113	0.000
Lockup_Period	-0.001	0.000	0.000
Number_Employees	0.0003	0.000	0.000
Panel B: Second-Level Decision			
United States (N=4,239 K=2,573)			
Management_Fee	(base)		
Performance_Fee	(base)		
Highwater_Mark	(base)		
Hurdle_Rate	(base)		
Europe (N=4,239 K=68)			
Management_Fee	10.29	2.680	0.000
Performance_Fee	-0.493	0.167	0.003
Highwater_Mark	-231.0	252.8	0.361
Hurdle_Rate	-6.672	13.79	0.628
British Virgin Islands (N=4,239 K=382)			
Management_Fee	1.183	1.413	0.403
Performance_Fee	-0.0318	0.1376	0.817
Highwater_Mark	-17.63	20.13	0.381
Hurdle_Rate	-26.05	33.29	0.434
Cayman Islands (N=4,239 K=1,216)			
Management_Fee	0.763	0.397	0.054
Performance_Fee	0.001	0.036	0.968
Highwater_Mark	-8.967	9.573	0.349
Hurdle_Rate	5.401	7.169	0.451
LR test for IIA (tau=1): chi2(2)=92.92 Prob > chi2=0.000			

Table 3.6: Empirical Results from Nested Logit Model 2

Note: The variables are defined as follows: Fund_Type: dummy variable that takes the value of one for hedge fund and two for fund of funds. Fund_Lockup_Period: period (days) in which the investment cannot be withdrawn. Manager_Number_Employees: number of employees of the fund manager. Fund_Management_Fee: the percentage fee charged to the fund for ongoing portfolio management. Fund_Performance_Fee: the percentage fee for return performance above a predetermined benchmark. Fund_Highwater_Mark: a provision to ensure performance fees apply to the highest net asset value, take the value of one for no high water mark and two otherwise. Fund_Hurdle_Rate: Minimum amount a fund needs to earn before charging performance fees, take the value of one for no hurdle rate and two otherwise. N = number of observations at each level, K = number of times alternative is chosen.

	Coef.	Std. Err.	Sig.
Panel A: First-Level Decision			
Not_Tax_Haven (N=8,478)			
Management_Fee	(base)		
Performance_Fee	(base)		
Highwater_Mark	(base)		
Hurdle_Rate	(base)		
Tax_Haven (N=8,478)			
Management_Fee	0.398	0.069	0.000
Performance_Fee	0.026	0.007	0.001
Highwater_Mark	0.161	0.108	0.133
Hurdle_Rate	-0.423	0.098	0.000
Panel B: Second-Level Decision			
United States (N=4,239 K=2,573)			
Fund_Type	(base)		
Lockup_Period	(base)		
Number_Employees	(base)		
Europe (N=4,239 K=68)			
Fund_Type	17.56	3.96	0.000
Lockup_Period	0.068	0.014	0.000
Number_Employees	-0.001	0.001	0.123
British Virgin Islands (N=4,239 K=382)			
Fund_Type	3.516	0.489	0.000
Lockup_Period	0.005	0.001	0.000
Number_Employees	0.029	0.004	0.000
Cayman Islands (N=4,239 K=1,216)			
Fund_Type	0.368	0.104	0.000
Lockup_Period	-0.001	0.0002	0.000
Number_Employees	-0.0003	0.0001	0.011
LR test for IIA (tau=1): chi2(2)=184.3 Prob > chi2=0.000			

Figure 3.1: Structure of the Nested Logit Model

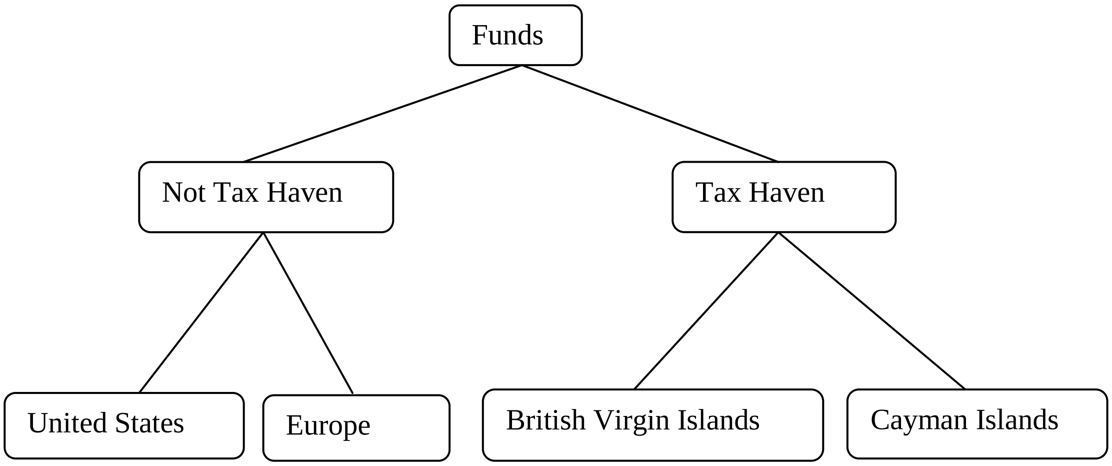


Figure 3.2: Structure of the Nested Logit Model 1

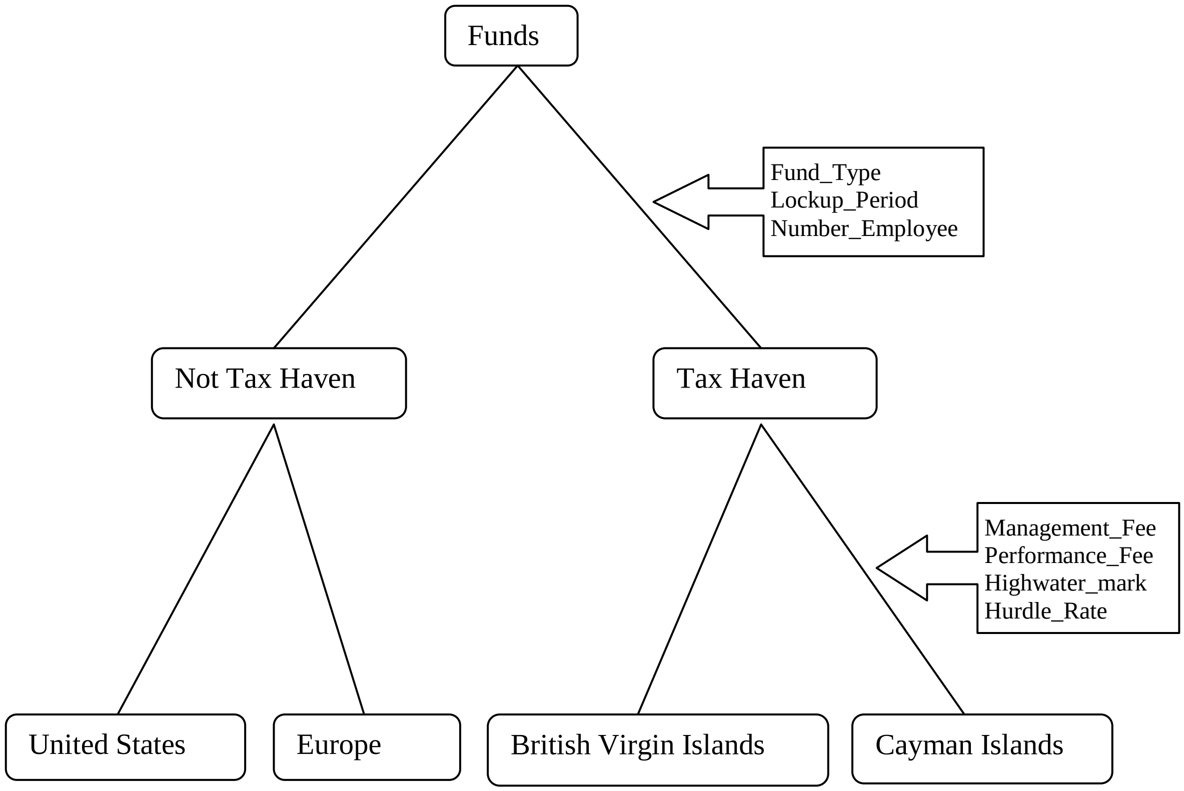
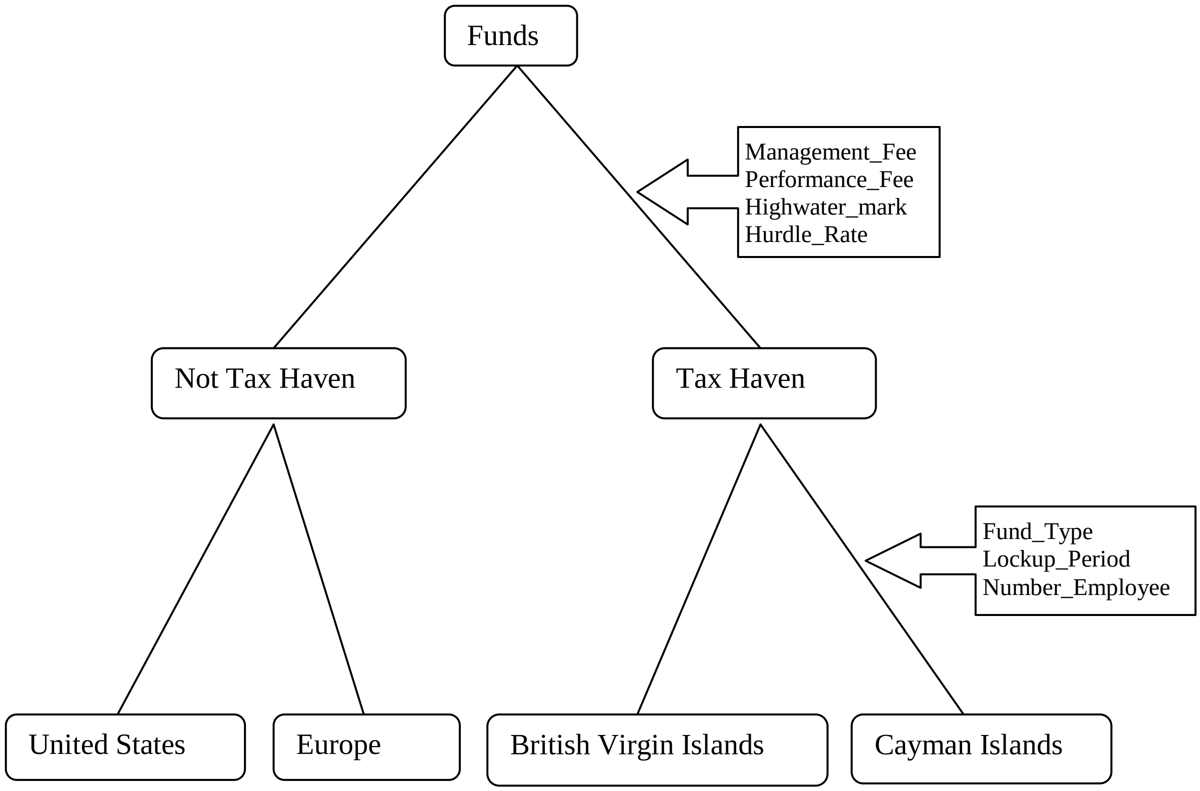


Figure 3.3: Structure of the Nested Logit Model 2



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APPENDIX

APPENDIX

Tax Information Exchange Agreements (TIEAS)

Recent bilateral agreements (by date of signature)

Denmark - Guatemala (15 May 2012)

Greenland - Guatemala (15 May 2012)

Finland - Guatemala (15 May 2012)

Iceland - Guatemala (15 May 2012)

Faroe Islands - Guatemala (15 May 2012)

Norway - Guatemala (15 May 2012)

Sweden - Guatemala (15 May 2012)

Denmark - Uruguay (14 December 2011)

Faroe Islands - Uruguay (14 December 2011)

Greenland - Uruguay (14 December 2011)

Iceland - Uruguay (14 December 2011)

Norway - Uruguay (14 December 2011)

Sweden - Uruguay (14 December 2011)

Iceland - Mauritius (1 December 2011)

Denmark - Mauritius (1 December 2011)

Faroe Islands - Mauritius (1 December 2011)

Finland - Mauritius (1 December 2011)

Greenland - Mauritius (1 December 2011)

Norway - Mauritius (1 December 2011)

Czech Republic - San Marino (25 November 2011)

Greenland - Barbados (3 November 2011)

Denmark - Barbados (3 November 2011)

Faroe Islands - Barbados (3 November 2011)

Faroe Islands - Bahrain (14 October 2011)

Denmark - Bahrain (14 October 2011)

Finland - Bahrain (14 October 2011)

Greenland - Bahrain (14 October 2011)

Iceland - Bahrain (14 October 2011)

Norway - Bahrain (14 October 2011)

Sweden - Bahrain (14 October 2011)

The BAHAMAS - South Africa (14 September 2011)

BERMUDA - South Africa (6 September 2011)

BERMUDA - Argentina (22 August 2011)

Czech Republic - BERMUDA (15 August 2011)

Australia - Liberia (11 August 2011)

Aruba - The BAHAMAS (8 August 2011)

The BAHAMAS - GUERNSEY (8 August 2011)

Czech Republic - Isle of Man (18 July 2011)

Australia - Macao (12 July 2011)

Czech Republic - Jersey (12 July 2011)

Australia - Costa Rica (1 July 2011)

Sweden - Costa Rica (29 June 2011)

Norway - Costa Rica (29 June 2011)

Denmark - Costa Rica (29 June 2011)

Finland - Costa Rica (29 June 2011)

Iceland - Costa Rica (29 June 2011)

Faroe Islands - Costa Rica (29 June 2011)

Greenland - Costa Rica (29 June 2011)

Slovenia - Isle of Man (27 June 2011)

BERMUDA - Indonesia (22 June 2011)

Isle of Man - Indonesia (22 June 2011)

Japan - Isle of Man (21 June 2011)

Australia - Liechtenstein (21 June 2011)

Czech Republic - BRITISH VIRGIN ISLANDS (13 June 2011)

Ireland - Vanuatu (31 May 2011)

Grenada - Vanautu (31 May 2011)

San Marino - Vanuatu (19 May 2011)

Denmark - Macau (29 April 2011)

Faroe Islands - Macau (29 April 2011)

Finland - Macau (29 April 2011)

Greenland - Macau (29 April 2011)

Iceland - Macau (29 April 2011)

Norway - Macau (29 April 2011)

Sweden - Macau (29 April 2011)

Greenland - The Seychelles (30 March 2011)

Faroe Islands - The Seychelles (30 March 2011)

Iceland - The Seychelles (30 March 2011)

Finland - The Seychelles (30 March 2011)

Denmark - The Seychelles (30 March 2011)

Norway - The Seychelles (30 March 2011)

Sweden - The Seychelles (30 March 2011)

Ghana - Liberia (24 February 2011)

India - The BAHAMAS (11 February 2011)

Japan - The BAHAMAS (27 January 2011)

Sweden - Liechtenstein (29 December 2010)

Denmark - Liechtenstein (29 December 2010)

Faroe Islands - Liechtenstein (29 December 2010)

Greenland - Liechtenstein (29 December 2010)

Iceland - Liechtenstein (29 December 2010)

Finland - Liechtenstein (29 December 2010)

Norway - Liechtenstein (29 December 2010)

Argentina - People's Republic of China (13 December 2010)

Australia - Mauritius (8 December 2010)

BERMUDA - People's Republic of China (3 December 2010)

United States - Panama (30 November 2010)

Australia - Montserrat (23 November 2010)

Aruba - St. Kitts and Nevis (23 November 2010)

France - Belize (22 November 2010)

Finland - Montserrat (22 November 2010)

Norway - Montserrat (22 November 2010)

Denmark - Montserrat (22 November 2010)

Greenland - Montserrat (22 November 2010)

Iceland - Montserrat (22 November 2010)

Sweden - Montserrat (22 November 2010)

Faroes Islands - Montserrat (22 November 2010)

Mexico - Cook Islands (22 November 2010)

Ireland - Belize (18 November 2010)

Denmark - Liberia (10 November 2010)

Sweden - Liberia (10 November 2010)

Norway - Liberia (10 November 2010)

Faroes Islands - Liberia (10 November 2010)

Greenland - Liberia (10 November 2010)

Iceland - Liberia (10 November 2010)

Finland - Liberia (10 November 2010)

United Kingdom - Aruba (5 November 2010)

United Kingdom - Liberia (1 November 2010)

Canada - San Marino (27 October 2010)

Portugal - Belize (22 October 2010)

Greenland - Vanuatu (13 October 2010)

Sweden - Vanuatu (13 October 2010)

Norway - Vanuatu (13 October 2010)

Iceland - Vanuatu (13 October 2010)

Finland - Vanuatu (13 October 2010)

Faroes Islands - Vanuatu (13 October 2010)

Denmark - Vanuatu (13 October 2010)

India - BERMUDA (7 October 2010)

Germany - BRITISH VIRGIN ISLANDS (5 October 2010)

Portugal - BRITISH VIRGIN ISLANDS (5 October 2010)

Portugal - Dominica (5 October 2010)

Ireland - Marshall Islands (4 October 2010)

GUERNSEY - San Marino (29 September 2010)

Norway - Marshall Islands (28 September 2010)

Iceland - Marshall Islands (28 September 2010)

Greenland - Marshall Islands (28 September 2010)

Finland - Marshall Islands (28 September 2010)

Faroes Islands - Marshall Islands (28 September 2010)

Sweden - Marshall Islands (28 September 2010)

Denmark - Marshall Islands (28 September 2010)

Germany - Dominica (21 September 2010)

Finland - Belize (15 September 2010)

Norway - Belize (15 September 2010)

Iceland - Belize (15 September 2010)

Denmark - Belize (15 September 2010)

Greenland - Belize (15 September 2010)

Faroes Islands - Belize (15 September 2010)

Sweden - Belize (15 September 2010)

France - Cook Islands (15 September 2010)

Portugal - Antigua & Barbuda (13 September 2010)

United Kingdom - Netherlands Antilles (10 September 2010)

Spain - San Marino (6 September 2010)

Antigua and Barbuda - Aruba (1 September 2010)

Mexico - CAYMAN ISLANDS (28 August 2010)

New Zealand - Samoa (24 August 2010)

New Zealand - Marshall Islands (4 August 2010)

New Zealand - Vanuatu (4 August 2010)

Portugal - St. Kitts and Nevis (29 July 2010)

Germany - Monaco (27 July 2010)

Portugal - St. Lucia (14 July 2010)

Portugal - Jersey (9 July 2010)

Portugal - Isle of Man (9 July 2010)

Portugal - GUERNSEY (9 July 2010)

Canada - Dominica (29 June 2010)

Canada - CAYMAN ISLANDS (24 June 2010)

Sweden - Monaco (23 June 2010)

Iceland - Monaco (23 June 2010)

Norway - Monaco (23 June 2010)

Finland - Monaco (23 June 2010)

Denmark - Monaco (23 June 2010)

Greenland - Monaco (23 June 2010)

Faroes - Monaco (23 June 2010)

Canada - Saint-Lucia (18 June 2010)

Canada - The BAHAMAS (17 June 2010)

Canada - BERMUDA (14 June 2010)

Canada - St. Kitts and Nevis (14 June 2010)

Germany - Saint Lucia (7 June 2010)

Germany - Turks and Caicos Islands (4 June 2010)

Germany - CAYMAN ISLANDS (27 May 2010)

Netherlands - Liberia (27 May 2010)

Norway - Antigua and Barbuda (19 May 2010)

Norway - Dominica (19 May 2010)

Norway - Grenada (19 May 2010)

Norway - Saint Lucia (19 May 2010)

Groenland - Antigua and Barbuda (19 May 2010)

Groenland - Dominica (19 May 2010)

Groenland - Grenada (19 May 2010)

Groenland - Saint Lucia (19 May 2010)

Sweden - Grenada (19 May 2010)

Sweden - Dominica (19 May 2010)

Sweden - Saint Lucia (19 May 2010)

Sweden - Antigua and Barbuda (19 May 2010)

Iceland - Grenada (19 May 2010)

Iceland - Dominica (19 May 2010)

Iceland - Saint Lucia (19 May 2010)

Iceland - Antigua and Barbuda (19 May 2010)

Finland - Antigua and Barbuda (19 May 2010)

Finland - Dominica (19 May 2010)

Finland - Grenada (19 May 2010)

Finland - Saint Lucia (19 May 2010)

Faroes Islands - Grenada (19 May 2010)

Faroes Islands - Saint Lucia (19 May 2010)

Faroes Islands - Dominica (19 May 2010)

Faroes Islands - Antigua and Barbuda (19 May 2010)

Denmark - Grenada (19 May 2010)

Denmark - Dominica (19 May 2010)

Portugal - CAYMAN ISLANDS (13 May 2010)

Australia - Marshall Islands (12 May 2010)

Aruba - Saint-Lucia (10 May 2010)

Portugal - BERMUDA (10 May 2010)

Netherlands - Gibraltar (23 April 2010)

Australia - Vanuatu (21 April 2010)

Aruba - CAYMAN ISLANDS (20 April 2010)

France - St. Vincent and the Grenadines (13 April 2010)

Germany - BAHAMAS (9 April 2010)

Australia - Monaco (1 April 2010)

France - St. Kitts and Nevis (1 April 2010)

France - Saint Lucia (1 April 2010)

Australia - Dominica (31 March 2010)

Australia - Belize (31 March 2010)

United Kingdom - Grenada (31 March 2010)

United Kingdom - Dominica (31 March 2010)

France - Grenada (31 March 2010)

Australia - Turks and the Caicos (30 March 2010)

Australia - Grenada (30 March 2010)

Australia - Saint Lucia (30 March 2010)

Australia - CAYMAN ISLANDS (30 March 2010)

Australia - BAHAMAS (30 March 2010)

Germany - St. Vincent and the Grenadines (29 March 2010)

France - Antigua and Barbuda (26 March 2010)

United Kingdom - Belize (25 March 2010)

Finland - St. Vincent and the Grenadines (24 March 2010)

Iceland - St. Vincent and the Grenadines (24 March 2010)

Sweden - St. Vincent and the Grenadines (24 March 2010)

Faroes - St. Vincent and the Grenadines (24 March 2010)

Norway - St. Vincent and the Grenadines (24 March 2010)

Greenland - St. Vincent and the Grenadines (24 March 2010)

Iceland - St Kitts and Nevis (24 March 2010)

Sweden - St Kitts and Nevis (24 March 2010)

Faroes - St Kitts and Nevis (24 March 2010)

Norway - St Kitts and Nevis (24 March 2010)

Greenland - St Kitts and Nevis (24 March 2010)

Finland - St Kitts and Nevis (24 March 2010)

Australia - Anguilla (20 March 2010)

Germany - Anguilla (19 March 2010)

Australia - St Vincent and the Grenadines (18 March 2010)

Belgium - Grenada (18 March 2010)

New Zealand - Dominica (16 March 2010)

New Zealand - St. Vincent and the Grenadines (16 March 2010)

Spain - BAHAMAS (11 March 2010)

Finland - BAHAMAS (10 March 2010)

Iceland - BAHAMAS (10 March 2010)

Norway - BAHAMAS (10 March 2010)

Sweden - BAHAMAS (10 March 2010)

Greenland - BAHAMAS (10 March 2010)

The Faroe Islands (10 March 2010)

Denmark - BAHAMAS (10 March 2010)

Australia - Saint Kitts and Nevis (5 March 2010)

Australia - San Marino (4 March 2010)

Belgium - Dominica (26 February 2010)

Sweden - Andorra (24 February 2010)

Iceland - Andorra (24 February 2010)

Greenland - Andorra (24 February 2010)

Norway - Andorra (24 February 2010)

Faroes Islands - Andorra (24 February 2010)

Finland - Andorra (24 February 2010)

Denmark - Andorra (24 February 2010)

Mexico - The BAHAMAS (23 February 2010)

Netherlands - Grenada (18 February 2010)

United Kingdom - San Marino (16 February 2010)

Belgium - Montserrat (16 February 2010)

Netherlands - Belize (4 February 2010)

Japan - BERMUDA (1 February 2010)

France - Uruguay (28 January 2010)

Netherlands - San Marino (27 January 2010)

United Kingdom - St Kitts & Nevis (18 January 2010)

United Kingdom - Saint Lucia (18 January 2010)

United Kingdom - St. Vincent and the Grenadines (18 January 2010)

United Kingdom - Antigua & Barbuda (18 January 2010)

Spain - Andorra (14 January 2010)

Finland - San Marino (12 January 2010)

Norway - San Marino (12 January 2010)

Sweden - San Marino (12 January 2010)

Iceland - San Marino (12 January 2010)

Denmark - San Marino (12 January 2010)

Netherlands - Monaco (11 January 2010)

France - Vanuatu (31 December 2009)

Belgium - Belize (29 December 2009)

Ireland - Saint Lucia (22 December 2009)

Belgium - Saint-Kitts and Nevis (18 December 2009)

Belgium - Gibraltar (16 December 2009)

Australia - Samoa (16 December 2009)

Australia - Aruba (16 December 2009)

Demark - Cook Islands (16 December 2009)

Denmark - Samoa (16 December 2009)

Faroes Islands - Cook Islands (16 December 2009)

Faroes Islands - Samoa (16 December 2009)

Faroes Islands - Turks & Caicos (16 December 2009)

Finland - Cook Islands (16 December 2009)

Finland - Samoa (16 December 2009)

Finland - Turks & Caicos (16 December 2009)

Greenland - Cook Islands (16 December 2009)

Greenland - Samoa (16 December 2009)

Greenland - Turks & Caicos (16 December 2009)

Iceland - Cook Islands (16 December 2009)

Iceland - Gibraltar (16 December 2009)

Iceland - Samoa (16 December 2009)

Iceland - Turks & Caicos (16 December 2009)

Norway - Cook Islands (16 December 2009)

Norway - Gibraltar (16 December 2009)

Norway - Samoa (16 December 2009)

Norway - Turks & Caicos (16 December 2009)

Sweden - Cook Islands (16 December 2009)

Sweden - Gibraltar (16 December 2009)

Sweden - Samoa (16 December 2009)

Sweden - Turks & Caicos (16 December 2009)

Ireland - Antigua & Barbuda (15 December 2009)

Ireland - St Vincent & Grenadines (15 December 2009)

Faroes Islands - Anguilla (14 December 2009)

Finland - Anguilla (14 December 2009)

Greenland - Anguilla (14 December 2009)

Iceland - Anguilla (14 December 2009)

Norway - Anguilla (14 December 2009)

Sweden - Anguilla (14 December 2009)

New Zealand - Turks & Caicos (11 December 2009)

New Zealand - Anguilla (11 December 2009)

Liechtenstein - St Kitts & Nevis (11 December 2009)

Denmark - Saint Lucia (10 December 2009)

Netherlands - Monserrat (8 December 2009)

Ireland - Cook ISlands (8 December 2009)

Ireland - Samoa (8 December 2009)

Argentina - San Marino (7 December 2009)

Belgium - St Lucia (7 December 2009)

Belgium - St Vincent & the Grenadines (7 December 2009)

Belgium - Antigua & Barbuda (7 December 2009)

BAHAMAS - France (7 December 2009)

Ireland - BRITISH VIRGIN ISLANDS (7 December 2009)

BAHAMAS - Belgium (7 December 2009)

BAHAMAS - Netherlands (4 December 2009)

BAHAMAS - Argentina (3 December 2009)

St. Lucia - The Netherlands (2 December 2009)

BAHAMAS - China (1 December 2009)

Portugal - Andorra (30 November 2009)

New Zealand - Saint Kitts and Nevis (24 November 2009)

Liechtenstein - Antigua & Barbuda (24 November 2009)

Argentina - Costa Rica (23 November 2009)

New Zealand - BAHAMAS (18 November 2009)

Belgium - Liechtenstein (10 November 2009)

Netherlands - Liechtenstein (10 November 2009)

Andorra - Netherlands (6 November 2009)

Antigua and Barbuda - Netherlands Antilles (29 October 2009)

St. Lucia - Netherlands Antilles (29 October 2009)

Netherlands Antilles - CAYMAN ISLANDS (29 October 2009)

United Kingdom - BAHAMAS (29 October 2009)

Australia - Cook Islands (27 October 2009)

Argentina - Andorra (26 October 2009)

Netherlands - Cook Islands (23 October 2009)

Belgium - Andorra (23 October 2009)

Aruba - BERMUDA (20 October 2009)

Faroe Islands - Gibraltar (20 October 2009)

Finland - Gibraltar (20 October 2009)

Greenland - Gibraltar (20 October 2009)

Mexico - BERMUDA (15 October 2009)

Portugal - Gibraltar (14 October 2009)

Ireland - Liechtenstein (13 October 2009)

Argentina - Monaco (13 October 2009)

France - BERMUDA (8 October 2009)

Australia - GUERNSEY (7 October 2009)

France - CAYMAN ISLANDS (5 October 2009)

Liechtenstein - St Vincent & the Grenadines (2 October 2009)

The BAHAMAS (28 Sept 2009)

The BAHAMAS - San Marino (24 September 2009)

France - Turks and Caicos (24 September 2009)

France - San Marino (22 September 2009)

France - Liechtenstein (22 September 2009)

France - Gibraltar (22 September 2009)

France - Andorra (22 September 2009)

Greenland - San Marino (22 September 2009)

Monaco - Liechtenstein (21 September 2009)

Monaco - Andorra (18 Septembre 2009)

Monaco - BAHAMAS (18 September 2009)

Andorra - San Marino (21 September 2009)

Andorra - Liechtenstein (18 September 2009)

Austria - Gibraltar (17 September 2009)

Austria - Andorra (17 September 2009)

Austria - Monaco (17 September 2009)

Austria - St Vincent & the Grendines (14 September 2009)

Netherlands - Samoa (14 September 2009)

Netherlands - BRITISH VIRGIN ISLANDS (11 September 2009)

Aruba - BRITISH VIRGIN ISLANDS (11 September 2009)

Netherlands Antilles - BRITISH VIRGIN ISLANDS (11 September 2009)

Netherlands Antilles - St Kitts & Nevis (11 September 2009)

Aruba - St Kitts & Nevis (11 September 2009)

Denmark - Aruba (10 September 2009)

The Faroe Islands - Aruba (10 September 2009)

Finland - Aruba (10 September 2009)

Greenland - Aruba (10 September 2009)

Iceland - Aruba (10 September 2009)

Norway - Aruba (10 September 2009)

Sweden - Aruba (10 September 2009)

Denmark - Netherlands Antilles (10 September 2009)

The Faroe Islands - Netherlands Antilles (10 September 2009)

Finland - Netherlands Antilles (10 September 2009)

Greenland - Netherlands Antilles (10 September 2009)

Iceland - Netherlands Antilles (10 September 2009)

Sweden - Netherlands Antilles (10 September 2009)

The Faroe Islands - San Marino (10 September 2009)

United States - Monaco (8 September 2009)

Denmark – Turks & Caicos Islands (7 September 2009)

Monaco - Samoa (7 September 2009)

Netherlands - Antigua & Barbuda (2 September 2009)

Denmark - Antigua (2 September 2009)

Denmark - Gibraltar (2 September 2009)

Denmark - Anguilla (2 September 2009)

Germany - Liechtenstein (2 September 2009)

Netherlands - St Vincent & the Grenadines (1 September 2009)

Denmark - St Vincent & Grenadines (1 September 2009)

Denmark - St Kitts & Nevis (1 September 2009)

Netherlands – St Kitts & Nevis (1 September 2009)

Mexico - Netherlands Antilles (1 September 2009)

San Marino - Samoa (1 September 2009)

Aruba - St. Vincent and the Grenadines (1 September 2009)

Canada - Netherlands Antilles (29 August 2009)

United Kingdom/Gibraltar (27 August 2009)

Australia/Gibraltar (25 August 2009)

New Zealand - BRITISH VIRGIN ISLANDS (14 August 2009)

New Zealand - CAYMAN ISLANDS (14 August 2009)

New Zealand - Gibraltar (13 August 2009)

Germany - Gibraltar (13 August 2009)

Liechtenstein - UK (11 August 2009)

Monaco - San Marino (29 July 2009)

BERMUDA - Ireland (28 July 2009)

New Zealand - Isle of Man (27 July 2009)

New Zealand - Jersey (27 July 2009)

United Kingdom - Turks & Caicos (23 July 2009)

Netherlands - Turks & Caicos (22 July 2009)

Netherlands - Anguilla (22 July 2009)

Ireland - Turks & Caicos (22 July 2009)

Ireland - Anguilla (22 July 2009)

New Zealand - GUERNSEY (21 July 2009)

UK - Anguilla (20 July 2009)

Belgium - Monaco (15 July 2009)

New Zealand - Cook Islands (9 July 2009)

The Netherlands - The CAYMAN ISLANDS (8 July 2009)

Germany - BERMUDA (3 July 2009)

Ireland - Gibraltar (24 June 2009)

Ireland - CAYMAN ISLANDS (23 June 2009)

France - BRITISH VIRGIN ISLANDS (17 June 09)

Australia - Jersey (10 June 2009)

The Netherlands - BERMUDA (8 June 2009)

Denmark - BRITISH VIRGIN ISLANDS (19 May 2009)

Faroes - BRITISH VIRGIN ISLANDS (19 May 2009)

Finland - BRITISH VIRGIN ISLANDS (19 May 2009)

Greenland - BRITISH VIRGIN ISLANDS (19 May 2009)

Iceland - BRITISH VIRGIN ISLANDS (19 May 2009)

Norway - BRITISH VIRGIN ISLANDS (19 May 2009)

Sweden - BRITISH VIRGIN ISLANDS (19 May 2009)

New Zealand - BERMUDA (17 April 2009)

Denmark - BERMUDADenmark - CAYMAN ISLANDS (16 April 2009)

Faroes - BERMUDAFaroes - CAYMAN ISLANDS (16 April 2009)

Finland - BERMUDAFinland - CAYMAN ISLANDS (16 April 2009)

Greenland - BERMUDAGreenland - CAYMAN ISLANDS (16 April 2009)

Iceland - BERMUDAIceland - CAYMAN ISLANDS (16 April 2009)

Norway - BERMUDANorway - CAYMAN ISLANDS (16 April 2009)

Sweden - BERMUDASweden - CAYMAN ISLANDS (16 April 2009)

Denmark - CAYMAN ISLANDS (1 April 2009)

Faroes - CAYMAN ISLANDS (1 April 2009)

Finland - CAYMAN ISLANDS (1 April 2009)

Greenland - CAYMAN ISLANDS (1 April 2009)

Iceland - CAYMAN ISLANDS (1 April 2009)

Norway - CAYMAN ISLANDS (1 April 2009)

Sweden - CAYMAN ISLANDS (1 April 2009)

USA - Gibraltar (31 March 2009)

France - Isle of Man (26 March 2009)

Ireland - Jersey (26 March 2009)

Ireland - GUERNSEY (26 March 2009)

Germany - GUERNSEY (26 March 2009)

France - GUERNSEY (24 March 2009)

France - Jersey (23 March 2009)

The United Kingdom - Jersey (10 March 2009)

Germany - Isle of Man (02 March 2009)

Australia - Isle of Man (29 January 2009)

The United Kingdom - GUERNSEY (20 January 2009)

The United States - Liechtenstein (8 December 2008)

Portugal - Andorra (30 November 2008)

Spain - Aruba (24 November 2008)

The United Kingdom - BRITISH VIRGIN ISLANDS (29 October 2008)

Denmark - GUERNSEY (28 October 2008)

Denmark - Jersey (28 October 2008)

Faroes - GUERNSEY (28 October 2008)

Faroes - Jersey (28 October 2008)

Finland - GUERNSEY (28 October 2008)

Finland - Jersey (28 October 2008)

Greenland - GUERNSEY (28 October 2008)

Greenland - Jersey (28 October 2008)

Iceland - GUERNSEY (28 October 2008)

Iceland - Jersey (28 October 2008)

Norway - GUERNSEY (28 October 2008)

Norway - Jersey (28 October 2008)

Sweden - GUERNSEY (28 October 2008)

Sweden - Jersey (28 October 2008)

Australia - BRITISH VIRGIN ISLANDS (27 October 2008)

Isle of Man - United Kindom (29 September 2008)

Jersey - Germany (4 July 2008)

Netherlands Antilles - Spain (10 June 2008)

GUERNSEY - Netherlands (25 April 2008)

Isle of Man - Ireland (24 April 2008)

BERMUDA - United Kingdom (4 December 2007)

Denmark - Isle of Man (30 October 2007)

Faroes - Isle of Man (30 October 2007)

Finland - Isle of Man (30 October 2007)

Greenland - Isle of Man (30 October 2007)

Iceland - Isle of Man (30 October 2007)

Isle of Man - Norway (30 October 2007)

Isle of Man - Sweden (30 October 2007)

Jersey - Netherlands (20 June 2007)

Netherlands Antilles - New Zealand (01 March 2007)

Australia - Netherlands Antilles (01 March 2007)

Antigua & Barbuda - Australia (30 January 2007)

Australia - BERMUDA (10 November 2005)

Isle of Man - Kingdom of The Netherlands (12 October 2005)

Aruba - United States (21 November 2003)

Jersey - United States (04 November 2002)

Isle of Man - United States (02 October 2002)

GUERNSEY - United States (19 September 2002)

Netherlands Antilles - United States (17 April 2002)

BRITISH VIRGIN ISLANDS - United States (03 April 2002)

BAHAMAS - United States (25 January 2002)

CAYMAN ISLANDS - United States (27 November 2001)

Antigua And Barbuda - United States (06 December 2000)

BIOGRAPHICAL SKETCH

Weifang Yang received a Bachelor's Degree in Chemistry from California State University – San Bernardino in 2008. Subsequently, in Fall 2008 Ms. Yang started doctoral studies at University of Texas – Pan American. She received a Ph.D. in Business Administration with an emphasis in Finance at the University of Texas – Pan American in May 2013.

Ms. Yang worked with professors from both Accounting and Finance Department while completing her doctoral studies. She has published articles in peer-reviewed journals such as Review of Accounting and Finance, Journal of Business and Accounting, and International Business and Economics Research Journal. In addition, her work has also been presented at a number of conferences.

Ms. Yang was hired as an Assistant Professor of Finance at Shandong University in China upon graduation. She can be reached at totallyweifang@gmail.com or at 51A Weihai Villas, Weihai, Shandong, China 264200.