



PROJECT MUSE®

Do Hedge Funds Disrupt Emerging Markets?

William Fung, David A. Hsieh, Konstantinos Tsatsaronis

Brookings-Wharton Papers on Financial Services, 2000, pp. 377-401
(Article)

Published by Brookings Institution Press

DOI: <https://doi.org/10.1353/pfs.2000.0009>



➔ *For additional information about this article*

<https://muse.jhu.edu/article/26619>

Do Hedge Funds Disrupt Emerging Markets?

WILLIAM FUNG, DAVID A. HSIEH, and
KONSTANTINOS TSATSARONIS

BY THEIR VERY nature, hedge funds employ opportunistic trading strategies on a leveraged basis.¹ A small bet by large hedge funds may amount to a sizable transaction that can affect a market, especially one that has limited liquidity; it is natural to find their footprints in most major market events.² On one level, the presence of hedge funds is no more disruptive than that of any other group of large speculators. Speculation is part and parcel of an open capital market, and the presence of hedge funds is, for that reason, to be expected. However, highly leveraged trading strategies practiced by many market participants, if left unchecked, can lead to a convergence of bets. This, in turn, can leave markets vulnerable to disruption when confidence erodes and participants head for the exit.

This paper represents the views of the authors and not those of the Bank for International Settlements or other institutions with which the authors are affiliated. We thank Stephen Brown, Franklin Edwards, William Goetzmann, Bryan MacDonald, Anthony Richards, Anthony Santomero, and participants at the Brookings-Wharton third annual conference on financial services for their helpful comments and suggestions.

1. For a description of the operation of hedge funds and hedge fund trading strategies, see Fung and Hsieh (1999) and Eichengreen, Mathieson, Chadha, Jansen, Kodres, and Sharma (1998).

2. A well-known case in point is the “attack” on the British pound by George Soros’s funds, discussed in Fung and Hsieh (2000).

This paper examines the Asian currency crisis of 1997—in particular, the role in the crisis of the “carry trade,” a highly leveraged strategy popular among banks and domestic corporations during the two years preceding the crisis. The unwinding of this popular strategy in light of concerns about the viability of the exchange rate pegs gave rise to “one-way bets” adopted by speculators such as hedge funds. Although it is tempting to extrapolate from the speculative activities of hedge funds at the peak of a crisis, it would be erroneous, on that evidence alone, to attribute the market’s disruption solely to hedge funds that came in at the end of a trade. As is often the case, the proverbial straw that broke the camel’s back is no more responsible than any of the other straws.

During the ten years (1986–97) preceding the Asian currency crisis, the Thai central bank successfully pegged the baht to the U.S. dollar (see figure 1). On July 2, 1997, however, the central bank was forced to allow the baht to float, an action that put pressure on other Asian currencies, eventually bringing down the Malaysian ringgit, the Indonesian rupiah, the Philippine peso, and the Korean won. The Hong Kong dollar, however, withstood the speculative attack. By the end of 1997, these currencies had lost between 44 and 56 percent of their value against the U.S. dollar (see figure 2). The devaluation bankrupted many Asian corporations and banks that had borrowed in foreign currencies, leading to a significant contraction in these nation’s economies.

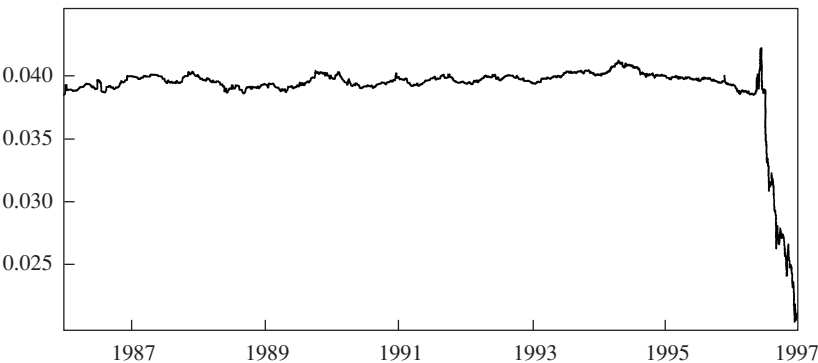
At the height of the episode, some Asian government officials accused speculators and hedge funds of attacking the currencies and causing their downfall. A public debate ensued, and the International Monetary Fund (IMF) responded by examining the role of hedge funds in the Asian currency crisis. The resulting study by Eichengreen and his coauthors considers three potential causes of market disruptions: (1) a trader holding a single large position, (2) positive feedback trading (that is, the strategy of adding positions as the market moves in favor of existing positions), and (3) “herding” by traders mimicking other traders.³ Through interviews with market participants, Eichengreen and his coauthors conclude that hedge funds did not play a central role in causing the Asian currency crisis. This study provides quantitative support for their conclusions.

Another 1998 study of the Asian currency crisis estimates the exposure of ten currency hedge funds by using monthly returns and that of

3. Eichengreen, Mathieson, Chadha, Jansen, Kodres, and Sharma (1998).

Figure 1. U.S. Dollars per Baht Exchange Rate 1987–97

U.S. dollars per baht

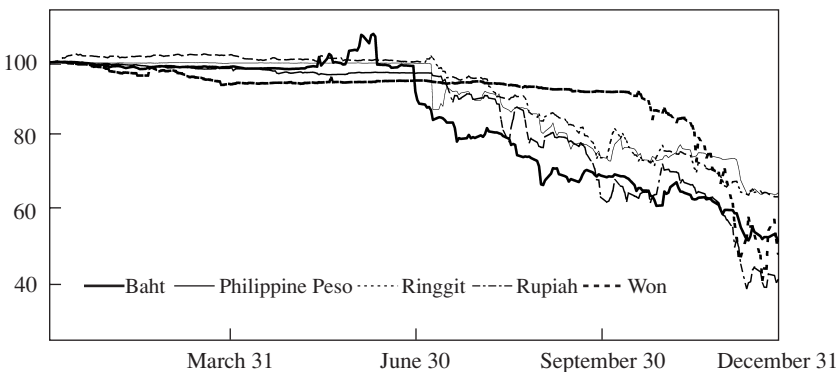


Source: Datastream.

two hedge funds by using weekly returns.⁴ Its authors conclude that neither the net positions nor the profits of major funds were unusual during the crisis. Our own study uses an alternative source of data: positions for *all* large hedge funds that had publicly available monthly returns during 1997 and assets under management in excess of \$1 billion at the end of 1997.

Figure 2. Asian Exchange Rates 1997

Index (12/31/97 = 100)



Source: Datastream.

4. Brown, Goetzmann, and Park (2000), applying methods proposed by Sharpe (1992).

In addition, we estimate positions for twelve of the twenty-seven funds that had publicly available daily and weekly returns. Our estimation procedure allows for a large set of market risk factors.

To complement the analysis of Eichengreen and his coauthors, we compare the role of the carry trade during the 1992 European rate mechanism (ERM) crisis to its role in the 1997 Asian currency crisis. We supplement their analysis of this highly leveraged trading strategy by examining the performance of hedge funds that specialize in emerging markets, as well as U.S. mutual funds with focused investments in these markets. Our results corroborate their findings that the withdrawal of capital from these investment funds had a much smaller impact on the Asian currencies than the unwinding of the carry trade by other financial institutions.

We begin by analyzing the 1992 ERM crisis and the 1997 Thai baht devaluation. This is followed by an analysis of the hedge fund exposures during the crisis period using first monthly performance data and then weekly and daily performance data. We analyze these exposure estimates in other countries in the region, followed by an empirical analysis of emerging-market hedge funds and mutual funds and a discussion of the question of potential market disruption.

Market Events

The high-profile ERM crisis of 1992, in which “hedge funds are most frequently cited as having played an important role,” sparked much of the ensuing public interest in these funds.⁵ Although it is tempting to hypothesize similar hedge fund involvement during the Asian currency crisis, in our view a lesser known, but more important, similarity links the two. In both cases, a simple and seemingly harmless leveraged trading strategy—the carry trade—contributed to the disruption of currency markets.

The carry trade involves borrowing from a low-interest-rate currency and lending to a high-interest-rate currency, without hedging exchange rate movements. Betting that the high-interest-rate currency will not depreciate by more than the interest rate differential, the trader captures the differential if the exchange rate moves within a narrow range. The carry trade can also be executed in the forward currency market, taking a long position in the higher-yielding currency and a short position in the lower-yielding cur-

5. Eichengreen, Mathieson, Chadha, Jansen, Kodres, and Sharma (1998), p. 15.

rency. Covered interest rate parity ensures a positive carry so long as the spot exchange rate movements are limited.⁶

Events leading up to the 1992 ERM crisis have been characterized as a convergence play—a “growing perception by international investors that the member countries of the EMS [European Monetary System] were on a continuous convergence path towards European Monetary Union (EMU), under which interest rate differentials in favor of the high-yielding ERM currencies would increasingly overestimate the actual risk of exchange rate depreciation.”⁷ Estimates put the amounts at issue as high as \$300 billion. Concerns that some of the high-inflation countries would have to realign their currencies caused capital movements that overwhelmed European central banks; Italy and the United Kingdom went so far as to pull out of the ERM altogether.

George Soros, manager of the Quantum Fund, was widely reported to have held a \$10 billion short position on the British pound (often referred to in the foreign exchange market as the sterling) and to have made \$1 billion for his fund as a result of the pound's September devaluation.⁸ Quantum's daily net asset values (NAVs) increased dramatically during the month, when the pound and lira dropped out of the ERM (see figure 3). As might be expected, other hedge funds were active during the crisis and had estimated positions of \$1.7 billion. Altogether, “large” hedge funds are estimated to have held short sterling positions totaling \$11.7 billion, a position more than twice that of the U.K. current account deficit in third quarter 1992 (\$5.4 billion), equal to its financial account deficit during the same quarter (\$11.4 billion), and in excess of 25 percent of the government's official reserves in 1992 (\$40 billion).⁹

Even in the broader context of the entire ERM, an \$11.7 billion position was sizable. As of August 1992, the official reserves of the eight countries involved in the ERM crisis (France, Germany, Italy, Ireland, Portugal, Spain, Sweden, and the United Kingdom) totaled \$268 billion.¹⁰ By the end of September, the official reserves of the six countries that remained in

6. See Fung, Hsieh, and Leitner (1993) for an outline and empirical analysis of this positive carry strategy.

7. Goldstein, Folkerts-Landau, Garber, Rojas-Suárez, and Spencer (1993), quoted in Fung and Hsieh (2000), from which this summary is derived.

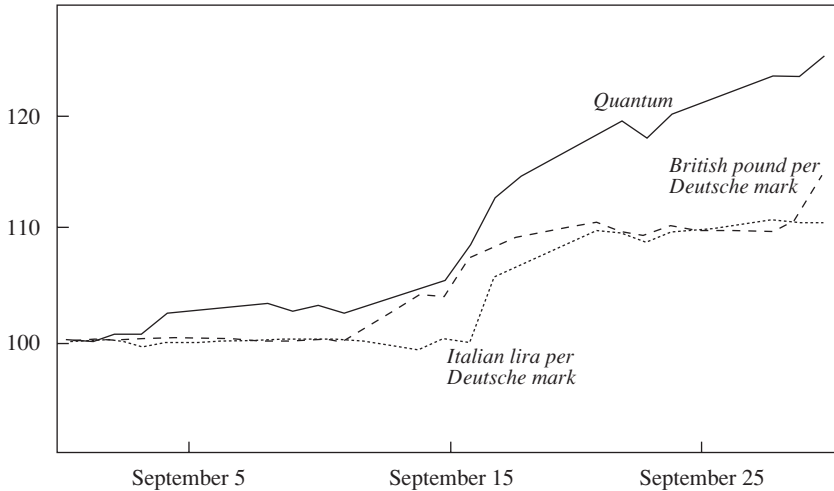
8. See Thomas Jaffe and Dyan Machan, “How the Market Overwhelmed the Central Banks,” *Forbes*, November 9, 1992, pp. 40–42.

9. Fung and Hsieh (2000).

10. Goldstein, Folkerts-Landau, Garber, Rojas-Suárez, and Spencer (1993).

Figure 3. Quantum Net-Asset-Values, September 1982

Index (8/31/92 = 100)



Source: Datastream, private sources.

the ERM had fallen by \$17.8 billion, while their central banks had spent \$82.6 billion in defending their currencies. The United Kingdom issued private debt of Euro Currency Unit (ECU) 10 billion and Sweden issued ECU 11 billion (a total of \$29.4 billion in intervention) to bolster their reserve positions. The German Bundesbank is estimated to have spent another DM 92 billion, or \$53.2 billion, to support the ERM currencies.¹¹ By September 1992 central bank interventions in the ERM totaled roughly \$100 billion. The hedge fund positions amounted to 4.4 percent of the official reserves of the ERM central banks and 11.7 percent of the amount the banks spent to support their currencies. On the basis of these amounts, it is reasonable to conclude that the estimated \$11.7 billion short sterling position generated a material impact on the exchange rate and on the external value of the British pound. Cast against the backdrop of \$300 billion of convergence bets that had to be unwound, this short position could easily have disrupted the currency market.

Hedge funds, however, never figured prominently in the buildup of the convergence bets, in part because relatively fewer hedge funds were trad-

11. Goldstein, Folkerts-Landau, Garber, Rojas-Suárez, and Spencer (1993).

ing globally outside of traditional equity markets during the late 1980s and early 1990s. Indeed, hedge fund strategies remain predominantly equity oriented, and U.S. markets still rank high on the list of preferred habitats.¹² The more important reason for the modest role of hedge funds in the convergence buildup was the limited supply of leverage from the banking community. During that period, the practice of extending lines of credit to offshore entities on a nonrecourse basis against collateral was not widely accepted by most banks, and foreign exchange trading was primarily an interbank activity. Although banks may act on behalf of corporate clients and traditional investment funds with well-established creditworthiness, only a handful of funds acted on behalf of highly leveraged speculative funds, many of which were—and remain—incorporated offshore. Therefore, although the speculative hedge funds may have nudged sterling over the ERM band, it was more likely the unwinding of sizable carry positions by proprietary trading books in commercial and investment banks that pushed the higher-yielding currencies toward their respective ERM limits.

The events surrounding the ERM crisis bear a striking resemblance to those surrounding the demise of the baht in 1997. Adams and his coauthors trace the increasingly aggressive flow of the carry trade down the credit spectrum in Asia during the 1990s—from sovereign credit, to top-tier domestic commercial banks, to lower-tier commercial banks and finance companies, and finally to corporates. They attribute the behavior of domestic banks and corporate entities to “a firm belief in the official stances on exchange rates”:

Activity in local money markets—particularly in Indonesia and Thailand—[is] estimated to have reached a feverish pitch by mid-1996, with a commensurate deterioration in quality. . . . By mid-1996 the international commercial and investment banks had built up substantial exposures in the region. Commercial and investment bank treasuries were long regional currencies from the carry trade, while their proprietary trading desks had substantial investments in, and their underwriting desks [had] inventories of, Asia fixed-income instruments. The hedge funds played a very limited role in the fixed-income carry trade in the region over much of the period, focusing instead on more traditional long equity investments.¹³

12. Hedge funds were noticeably absent from the financial news during the Mexican peso devaluation of 1994. Although the peso suffered a 34.6 percent devaluation on December 22, the Quantum Fund's NAV barely changed.

13. Adams, Mathieson, Schinasi, and Chadha (1998), p. 41.

Adams and his coauthors do not provide a direct estimate of the size of the Asian carry trade, but we can infer its magnitude from capital flows (see table 1). Net private capital inflows for the five affected Asian countries (Indonesia, Malaysia, the Philippines, South Korea, and Thailand) jumped from an average of \$30.4 billion between 1990 and 1994 to \$62.9 billion in 1995 and \$72.9 billion in 1996. Most of the \$75 billion of unusual inflows during 1995 and 1996 were probably carry trades.¹⁴

Another notable similarity is the lack of hedge fund involvement during the buildup of the very one-sided market in Europe during 1992 and in Asia during 1995–96. In fact, the first episode of notable pressure on the baht stemmed largely from international commercial and investment banks unwinding their carry trades around July 1996.¹⁵ It was not until the peak of the baht crisis in June 1997 that significant hedge fund activities were observed by market participants. This suggests that speculative hedge funds did not participate in the buildup phase of the carry trade in Asia. Of the \$26 billion forward position in short U.S. dollar/long baht carried by the Thai central bank, market participants attributed \$7 billion to global or macro hedge funds absorbing the other side of the transaction.

Monthly Analysis of Large Hedge Funds

Fung and Hsieh identify twenty-seven hedge funds and commodity funds with assets under management exceeding \$1 billion and combined assets of \$55.5 billion at the end of 1997.¹⁶ They use principal-component decomposition to group these funds into four categories: global or macro funds (twelve), trend-following funds (three), emerging-market funds (one), and market-neutral funds (eleven).

14. The figure of \$75 billion is the sum of 1995 inflows (less the 1990–94 average) and 1996 inflows (less the 1990–94 average).

15. Adams, Mathieson, Schinasi, and Chadha (1998), p. 44.

16. Fung and Hsieh (2000), using the Tass, Republic, Barron's listing of the MAR (formerly Managed Accounts Research) Hedge and CTA (Commodity Trading Advisor) databases, and information published on the Internet by Micropal and Nelson. At the end of 1997, Tass had 875 hedge funds with assets of \$94 billion and 299 commodity funds with assets of \$18 billion. Our sample of twenty-seven large hedge funds and commodity funds controls 49.5 percent of the assets in this industry. The remainder of the funds are, by inference, very small. Only the large funds have access to lines of credit to allow them to trade in the over-the-counter markets. The smaller funds would exert very little impact.

Table 1. Net Capital Flows to Asian Emerging Markets, 1990–97

Billions of U.S. dollars

<i>Indicator</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>
<i>Asia emerging markets</i>								
Net private capital inflows	19.1	35.8	21.7	57.6	66.2	95.8	110.4	13.9
Hedge fund inflows ^a	n.a.	n.a.	n.a.	n.a.	0.5	1.8	–0.3	–0.5
U.S. mutual fund inflows ^b	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1.9	–3.7
Changes in reserve assets	47.4	45.9	6.9	43.0	78.3	47.7	61.4	10.7
<i>Five affected countries^c</i>								
Net private capital inflows	24.9	29.0	30.3	32.6	35.1	62.9	72.9	–11.0
Net for direct investment	6.2	7.2	8.6	8.6	7.4	9.5	12.0	9.6
Net portfolio investment	1.3	3.3	6.3	17.9	10.6	14.4	20.3	11.8
Other (bank)	17.4	18.5	15.4	6.1	17.1	39.0	40.6	–32.3
Net external borrowing from official creditors	0.3 25.6	4.4	2.0	0.8	0.7	1.0		4.6
Errors and omissions	0.3	0.9	2.7	1.8	–4.7	–8.1	–8.5	–19.5

Sources: Adams, Mathieson, Schinasi, and Chadha (1998), Hedge Fund Research, and Lipper.

n.a. Not available.

a. Based on Hedge Fund Research's emerging-market (Asia) hedge funds.

b. Based on Lipper's Pacific ex-Japan mutual funds.

c. Korea, Indonesia, Malaysia, the Philippines, and Thailand.

Most global or macro hedge funds had sizable gains in July 1997, when the baht devalued 23 percent (see table 2). During the month of July, the Quantum Fund, for example, gained 11.4 percent. With assets of \$5 billion in June 1997, the fund would have needed a \$3 billion short position in the baht in order to generate an 11 percent return. Stanley Druckenmiller, who headed Quantum's daily operations, confirmed the existence of short positions in the baht and ringgit.¹⁷ Although he did not disclose the size of the fund's position, the financial press assumed that the short position was large.

It would be naive, however, to think that a sizable fund such as Quantum had no other position in its portfolio. To arrive at reasonable estimates of exposure, one needs to adjust for the effect on performance of these other positions. The U.S. equity market in particular had large gains during the second half of 1997, and the monthly returns of large hedge funds were more correlated with the U.S. equity market, as measured by the Standard & Poor's (S&P) 500 index, than with Asian currencies.

17. Greg Ip and Darren McDermott, "Soros Says Funds Didn't Cause Malaysia Crisis," *Wall Street Journal*, September 5, 1997, p. C1.

Table 2. Returns of Large Hedge/Commodity Trading Advisor Funds, July–December 1997

Percentage change

<i>Fund</i>	<i>July</i>	<i>August</i>	<i>September</i>	<i>October</i>	<i>November</i>	<i>December</i>
<i>Market</i>						
Baht	−23.0	−7.3	−6.2	−13.0	1.9	−19.6
Ringgit	−4.5	−10.6	−11.4	−5.0	−3.0	−10.2
Rupiah	−7.5	−12.8	−10.8	−10.2	−1.2	−50.7
Won	−0.2	−1.4	−1.4	−5.5	−21.4	−44.5
S&P 500 index	8.0	−5.6	5.4	−3.3	4.6	1.7
Emerging-market stocks ^a	1.6	10.8	0.5	15.2	5.7	0.4
Emerging-market Asian stocks ^a	−0.6	−18.1	−8.6	−20.5	−11.7	−7.2
Thai stocks ^a	31.0	29.0	13.5	22.6	14.7	10.2
Malaysian stocks ^a	4.9	19.8	0.7	17.0	21.6	18.4
Indonesian stocks ^a	2.8	32.7	17.0	5.5	21.3	1.2
Korean stocks ^a	3.3	2.9	9.1	27.9	5.8	4.9
<i>Global or macro funds</i>						
1	2.4	−0.1	1.7	−0.3	0.3	1.7
2	11.4	2.8	9.4	10.4	5.1	7.2
3	6.9	0.1	4.9	0.8	0.5	1.5
4	10.1	1.9	1.5	3.8	1.8	5.9
5	6.5	2.0	3.7	5.8	0.4	n.a.
6	11.4	7.4	4.6	10.6	2.5	3.9
7	10.3	6.7	2.0	11.8	0.9	4.4
8	13.6	8.2	3.9	15.7	5.1	12.0
9	9.2	5.9	0.4	15.1	5.8	7.4
10	7.3	−3.4	3.0	−7.4	4.2	2.0
11	21.7	12.1	0.3	1.5	1.5	10.5
12	9.6	0.8	8.5	1.2	1.2	7.1
<i>Trend-following funds</i>						
1	6.2	8.0	5.0	2.3	1.7	4.8
2	6.8	−10.2	6.5	−0.6	9.8	1.5
3	15.8	3.7	2.2	2.0	2.5	2.9
<i>Emerging-market funds</i>						
1	3.3	7.6	3.3	13.6	2.3	2.4
<i>Market-neutral funds</i>						
1	1.5	1.1	1.3	1.0	1.2	1.0
2	8.7	2.8	1.8	1.0	1.5	7.5
3	0.5	−0.1	1.9	1.1	1.2	0.0
4	1.7	2.8	0.3	0.8	8.9	2.4
5	1.2	0.9	0.3	0.3	0.3	−0.2
6	1.0	0.7	3.5	0.3	0.8	2.4
7	2.2	1.3	4.1	0.9	2.3	3.6
8	0.4	4.1	1.5	0.7	3.4	1.4
9	2.8	1.9	n.a.	n.a.	n.a.	n.a.
10	4.3	2.4	0.8	3.2	3.7	2.4
11	16.5	7.4	15.6	6.0	1.3	n.a.

Sources: Datastream and TASS Asset Management.

n.a. Not applicable due to fund closure.

a. ING/Barings emerging-market indexes.

To demonstrate this point quantitatively, we run regressions of the returns of twenty-seven funds against the rates of change of the baht and the S&P 500 index, jointly, for the last six months of 1997. The S&P 500 index is statistically significant and positive in seventeen of the regressions, while the baht is statistically significant and negative (indicative of short positions) in only four. Furthermore, in the seventeen regressions in which the S&P is significant, the average \bar{R}^2 is 65 percent, an indication that the S&P 500 index was a strong determinant of fund returns in the second half of 1997—much more so than the baht. Monthly returns of large hedge funds give no indication of large short positions in the baht.

Daily and Weekly Analysis of Twelve Large Hedge Funds

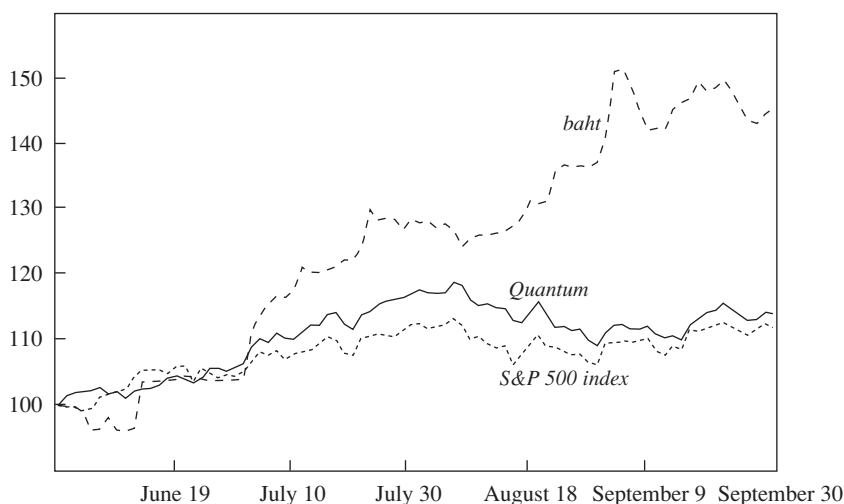
Hedge funds change their positions frequently; monthly returns, therefore, may not allow for accurate position estimates. Of the twenty-seven large funds, we collected daily and weekly returns for twelve (ten global or macro funds and two trend-following funds) from publicly available sources.¹⁸ These high-frequency returns provide a greater number of observations, which allow us to check our findings based on monthly returns. The performance of the Quantum Fund between May 30 and September 30, 1997, for example, was much more closely correlated with the S&P 500 index than with the performance of the baht (see figure 4).¹⁹ This point is even more apparent in figure 5: Quantum was long the U.S. stock market throughout 1997. Given the fund's underlying exposure to the U.S. stock market—roughly 100 percent of its capital—the 8 percent rise in the S&P 500 index in July explains the lion's share of Quantum's concomitant 11.4 percent gain.

18. A comment on our methodology is in order here. Our estimates of hedge fund positions are based on a limited number of observations, which is unsatisfactory from a statistical perspective. However, if a limited number of observations during stressful market conditions cannot bias us into concluding significant involvement of hedge funds, it is unlikely that using a larger number of observations, which ultimately must take us further away from the events, would lead us to conclude otherwise.

19. Regressing Quantum's daily return on the returns of the S&P 500 index and baht from July 2, 1997 (when the baht first devalued 7 percent) to the end of July, we find that the S&P was highly significant, but not the baht. The same was true for the ringgit, rupiah, and won.

Figure 4. Quantum Fund Performance, June–September 1997

Index (5/30/97 = 100)



Sources: Datastream, private source.

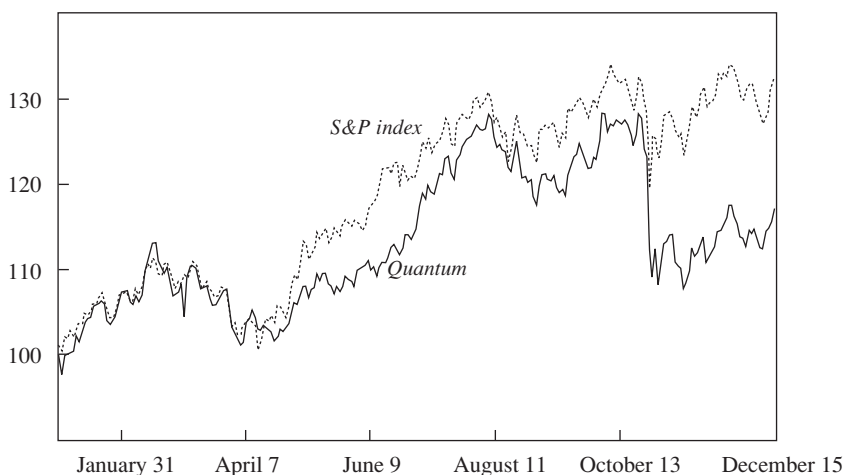
A few words on the estimation procedure are in order. The higher-frequency returns allow us to estimate positions in a more precise manner using multivariate regression.²⁰ We begin with a large number of asset markets in which global or macro funds and trend-following funds trade: U.S. stocks, European stocks, Japanese stocks, Asian stocks, U.S. bonds, European bonds, Japanese bonds, three major currencies (the Deutsche mark, British pound, and Japanese yen, all against the U.S. dollar), and four Asian currencies (the Thai baht, Malaysian ringgit, Indonesian rupiah, and Korean won). Using a stepwise approach, we regress the returns of each fund against these markets and sequentially omit markets that do not have a statistically significant regression coefficient. In addition, we vary the sampling interval for these regressions, allowing for discrete changes in position.

Using this procedure, we obtain position estimates for each fund over the second half of 1997. For the purposes of our inquiry, we aggre-

20. The procedure is similar to that used in Sharpe (1992) and Brown, Goetzmann, and Park (2000).

Figure 5. Quantum Fund Performance vs S&P Index, 1997

Index (12/31/96 = 100)



Sources: Datastream, private source.

gate the positions in each of the Asian currencies across all funds (see figure 6).

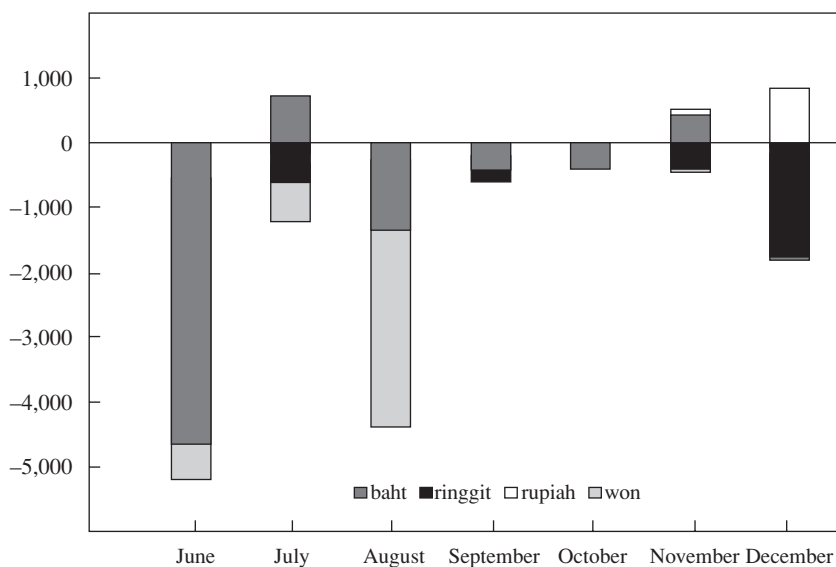
The twelve large hedge funds had an estimated net short position in the baht just shy of \$5 billion at the end of June 1997. It dropped below \$3 billion on July 8 and to less than \$2 billion by July 30. For the remainder of 1997, the group as a whole held both long and short positions in the baht several times, never exceeding \$2 billion in either direction. The July decline in the short position suggests that the twelve hedge funds as a whole did not use positive feedback trading strategies. Our estimates indicate that hedge fund involvement during the July 1997 baht episode was smaller than the \$7 billion reported by Eichengreen and his coauthors.

Malaysia, Indonesia, South Korea, and Hong Kong

The devaluation of the baht triggered a series of currency crises in the region. Once again, rumors of hedge fund activities figured prominently in the popular press, including a public debate between George Soros and Malaysian Prime Minister Matahir bin Mohamad. The conclusions of Eichengreen and his coauthors, however, refute the headlines:

Figure 6. Asian Currency Positions of Twelve Large Hedge Funds, May–December 1997

Millions of U.S. dollars



Source: Authors' calculations.

The hedge funds have been singled out as having played an important role in the onset of the Southeast Asian currency crises. It would appear, however, that they were only one among the groups of investors in the broader dynamic that unfolded and do not appear to have played a critical role—either as leaders or by cornering markets. While several hedge funds together took positions against the baht, the majority of these positions appear to have been taken when other major investor groups had already begun to get out of the speculative attack on the baht.²¹

In what follows, we report our empirical estimates of hedge funds' exposures to the ringgit, the rupiah, and the won, repeating the process

21. Eichengreen, Mathieson, Chadha, Jansen, Kodres, and Sharma (1998), p. 49. The authors continue (p. 49): "The Thai baht is the only currency on which the hedge funds appear to have collectively taken a short position. The one other simultaneous buildup of hedge fund positions appears to have been on the Indonesian rupiah. These positions, were, however, taken after its initial depreciation and were long position, reflecting the view that the rupiah had overshot and the expectation that it would appreciate. . . . It appears that only a few of the hedge funds took modest positions for short periods, at different points in time, on the Malaysian ringgit."

we performed on the baht, first using monthly returns and then weekly as well as daily returns. We do not analyze the Philippine peso, which is regarded as too illiquid for large speculative bets.

We regress the monthly returns of each of the twenty-seven large hedge funds on the S&P 500 index and the ringgit for the second half of 1997. The S&P 500 index is statistically significant in fifteen large hedge funds, while the ringgit is significant and negative (indicative of short positions) in only three large hedge funds. In one case, the ringgit is significant and positive, indicating a long position. In the regressions with the S&P and the rupiah, the results are eighteen and three, respectively. In the regressions with the S&P and the won, the results are eighteen and zero, and in three cases the funds are long the won. These results accord with other findings that there is no strong evidence that large hedge funds were heavily shorting Asian currencies during the second half of 1997.²²

We also perform aggregate position estimates using weekly and daily data for twelve large hedge funds; the findings are illustrated in figure 6. The twelve large funds had both long and short positions in the ringgit from July to December 1997. However, the position did not exceed \$2 billion in either direction. The funds were on average long \$100 million in the rupiah; during one period (in August 1997) they were short \$3 billion in the won. These positions are broadly in line with the qualitative results of Eichengreen and his coauthors.

The analysis of hedge fund activities in Hong Kong requires a different approach. The Hong Kong Monetary Authority (HKMA) was able to peg the Hong Kong dollar to the U.S. dollar throughout the crisis. Consequently, it is not possible to infer hedge fund positions in the Hong Kong dollar from the co-movements of hedge fund returns and the Hong Kong dollar. Instead, we focus on the Hong Kong equity market.

To understand the link between the currency peg and the equity market in Hong Kong, one needs to note that the Hang Seng index (the common proxy for the Hong Kong equity market) has a significant component in real estate. This makes the Hang Seng index very sensitive to interest rate movements. The most significant tool available to the HKMA to “defend” the currency peg is a rise in the short-term interest rate, which creates a subtle link between monetary policy and the equity market. This point is

22. Brown, Goetzmann, and Park (2000).

echoed by Adams and his coauthors in a companion IMF study to the Eichengreen paper:

A popular account of the turmoil in Hong Kong SAR's [special administrative region] financial markets was that a number of large investors, and in particular the macro hedge funds, took small positions against the Hong Kong dollar—"attacking it a little"—but aware of the HKMA's commitment to the peg, predicted a sharp increase in interest rates, and took much larger short positions in interest rate sensitive instruments, and in particular the equity market.²³

Adams and his coauthors find no evidence of "a concerted strategy by any group of investors to simultaneously short the Hong Kong dollar and equity markets," thus refuting this popular account. Nonetheless, the mere fact that such allegations arose points to the multifaceted nature of speculative trading in modern capital markets and to how easy it is to misinterpret events if one only considers a part of the total picture.²⁴

Given the inability to estimate hedge fund positions in the Hong Kong dollar from performance data, we turn to the issue of hedge fund positions in the Hong Kong equity market. Between October 3 and October 28, 1997, the Hang Seng index dropped 40.1 percent (from 15,128 to 9,060), the steepest decline in the Hong Kong market's history. However, the position estimates from the daily and weekly data for twelve large hedge funds during that period reveal only one fund with a short position in Asian stocks. It was short \$4.8 billion from October 1 to October 16 and then \$3.5 billion from October 17 to October 24. This particular hedge fund is known to take positions in global equity markets on a relative value or long/short basis. We find long exposures during this period in other equity markets, such as the United States, as well as short equity positions, such as Japan.

Our finding is consistent with the accounts of Adams and his coauthors, who conclude that short positions in equity index futures contracts "appear to have been taken as a hedge against other long positions." With respect to direct short sales of equities, they find that "during the period of turmoil, short-selling transactions contributed to less than 3 percent of total market turnover."

Both our study and that of Adams and his coauthors find no evidence that large hedge funds were pressuring the Hong Kong market. Why, then,

23. Adams, Mathieson, Schinasi, and Chadha (1998), p. 51.

24. "Asian Currencies: Speculate and Be Damned," *Euromoney*, September 15, 1997, p. 99.

were there persistent rumors to that effect? An alternative interpretation could be that other speculators selectively extracted information from the portfolio activities of large hedge funds and used it to aid their own activities.

This view is consistent with the notion that large speculative bets were not required to drive down the Hong Kong equity market because of traders' inability to take on short positions in equities directly. The repo market for Hong Kong equities lacks both depth and liquidity compared to the same market for U.S. equities. As a result, the majority of the speculative short positions were established via the stock index futures market. At the peak of the turmoil, the basis between the index futures and the cash index reached historical extremes. This implies the possibility of large arbitrage profits if arbitrageurs could go long the index futures market and short baskets of equities. However, this trade was not available with an incomplete repo market for equities. As a result, the large discount in the index futures relative to cash equities led to a "negative" interest rate. The extent to which this prompted the HKMA to intervene in the index futures market remains an interesting, but unexamined, question. What is clear is that for the HKMA to take no action would have been tantamount to running an economy with two interest rates: a large positive rate set by the HKMA and a negative implied interest rate based on the actions of speculators.

Emerging-Market Specialty Funds

We also analyze the positions of hedge funds that specialize in emerging markets, particularly Asian emerging markets during the second half of 1997. These hedge funds are primarily engaged in long and short positions in Asian equities and bonds. Although these funds are much smaller than those analyzed above, their concentrated activities may result in position sizes that are comparable to those of the large, more diversified hedge funds with more diversified activities.

For this purpose, we use two monthly return performance indexes calculated by Hedge Fund Research: hedge funds that invest in diversified emerging markets (diversified hedge funds) and those that invest in Asian emerging markets (Asian hedge funds). To contrast these funds' performance, we also include comparable U.S. mutual funds, using two monthly

Table 3. Number and Assets of Specialty Funds, 1996 and 1997

<i>Fund</i>	<i>1996</i>		<i>1997</i>	
	<i>Number of funds</i>	<i>Assets under management (billions of U.S. dollars)</i>	<i>Number of funds</i>	<i>Assets under management (billions of U.S. dollars)</i>
<i>HFRI hedge fund indexes</i>				
Emerging-market	105	8.2	110	12.0
Emerging-market Asia	38	2.3	31	1.8
<i>Lipper U.S. mutual funds</i>				
Emerging-market	116	15.6	151	19.6
Pacific ex-Japan	76	9.8	82	4.3

Sources: Hedge Fund Research and Lipper.

return indexes compiled by Lipper: U.S. mutual funds that invest in diversified emerging markets (diversified mutual funds) and those that invest in Asian Pacific markets excluding Japan (Pacific ex-Japan mutual funds). The number of funds and their assets under management at the end of 1996 and 1997 are summarized in table 3.

Diversified Emerging-Market Mutual Funds and Hedge Funds

Diversified emerging-market mutual funds and hedge funds show a strong correlation with the ING/Barings emerging-market index (see table 4). During the second half of 1997, diversified mutual funds had a correlation of 0.97 with the U.S. dollar returns of the index, and the average beta was 1.02; extending the sample further back in time leads to essentially the same conclusion. The evidence suggests that this group of mutual funds did not hedge against currency fluctuations. To corroborate this result, we find that diversified mutual funds had no correlation with any of the four Asian currencies—the baht, ringgit, rupiah, and won—beyond the correlation with the ING/Barings emerging-market index.

Over the same period, diversified hedge funds had a correlation of 0.71 with the U.S. dollar returns of the ING/Barings emerging-market index, with an average beta of 0.42. Several factors might explain the lower beta:

—*Currency hedging.* We find no correlation with the four Asian currencies beyond the correlation with the ING/Barings index.

—*Country bets (or tilts) away from the ING/Barings index.* Had there been country bets, we would expect to find that at least one of the individ-

Table 4. Return of Emerging-Market Funds, July–December 1997

Percent

<i>Fund</i>	<i>July</i>	<i>August</i>	<i>September</i>	<i>October</i>	<i>November</i>	<i>December</i>
<i>Market fund</i>						
Baht	−0.23	−7.3	−6.2	−13.0	1.9	−19.6
Ringgit	−4.5	−10.6	−11.4	−5.0	−3.0	−10.2
Rupiah	−7.5	−12.8	−10.8	−10.2	−1.2	−50.7
Won	−0.2	−1.4	−1.4	−5.5	−21.4	−44.5
Emerging-market stocks ^a	1.9	−10.0	0.2	−17.1	−2.2	2.4
Emerging-market Asian stocks ^a	−0.6	−18.1	−8.6	−20.5	−11.7	−7.2
Brady bonds ^b	4.7	−1.0	3.3	−10.6	5.2	3.2
<i>Hedge Fund Research</i>						
<i>hedge fund indexes</i>						
Emerging-market	4.6	−2.1	0.6	−8.0	−3.9	1.3
Emerging-market Asia	2.6	−2.8	−4.4	−7.0	−2.7	−1.9
<i>U.S. mutual funds</i>						
Emerging-market	2.9	−11.0	3.6	−16.7	−4.6	0.9
Pacific ex-Japan	2.3	−15.3	−1.3	−25.2	−3.5	−2.6

Sources: Datastream, Hedge Fund Research, and Lipper.

a. ING/Barings emerging-market indexes.

b. J. P. Morgan Brady bond index.

ual Asian equity market indexes would increase the explanatory power of the regression beyond the overall ING/Barings rating. This is not the case.

—*Investments in Asian bonds rather than Asian equities.* We find no correlation with the J. P. Morgan Brady bond index or the J. P. Morgan emerging-market local bond index beyond the correlation with the ING/Barings index.

—*Long/short positions in equity.* There is no direct way to test this. In light of a less than fully developed repo market for equities, outright short positions in emerging-market equities are often difficult to establish. Consequently, most specialist Asian hedge fund managers retain a long bias (a beta between 0 and 1) in the markets.

—*Market timing.* Market timing refers to a shift between equities and cash. Market timing can be detected as a nonlinear relationship between the market timer's returns and equities. A scatter plot of diversified hedge fund returns against the ING/Barings Index, however, reveals no evidence of a nonlinear relationship between them.

In our view, long/short positions constitute the most plausible explanation of the behavior of diversified hedge fund returns.

U.S.-Based Emerging-Market Asian Mutual Funds and Hedge Funds

During the second half of 1997, Pacific ex-Japan mutual funds had a correlation of 0.98 with the U.S. dollar return of the Morgan Stanley Asia Pacific ex-Japan index, with an average beta of 1.08. This indicates that Asian mutual funds did not hedge currency fluctuations. To corroborate this result, we find that Asian market mutual funds had no correlation with any of the four Asian currencies—the baht, ringgit, rupiah, and won—beyond the correlation with the Morgan Stanley index.

Over the same period, Asian hedge funds had a correlation of 0.91 with the ING/Barings Asian emerging-market index, with an average beta of 0.35. There was no correlation with the four Asian currencies beyond the correlation with the ING/Barings index, nor was there any obvious evidence of country bets or tilts. There also was no correlation with Brady bonds or with Asian local bonds and no evidence of market-timing activities. Thus the low value of beta is consistent with long/short positions in Asian equities.

We find no corroborating evidence of Asian hedge funds and U.S.-based mutual funds carrying significant short positions in Asian currencies. In addition, Post and Millar find no panic among U.S. emerging-market funds; to the contrary, these funds made positive net purchases in Asian equities.²⁵

Market Disruption

Eichengreen and his coauthors examine three causes of market disruptions in their analysis of the Asian currency crisis. In what follows, we test their conclusions in light of our findings.

Did Hedge Funds Have a Large Position in Asian Currencies?

The aggregate short positions of twelve large hedge funds in the baht, ringgit, rupiah, and won never exceeded \$6 billion during July 1997. Relative to the funds' assets under management (\$30 billion in June 1997), these positions were small: the funds clearly were not betting everything on Asian currencies.

25. Post and Millar (1998). We have not been able to investigate rumors that European fund managers withdrew significant amounts of capital from the region's equity markets.

These positions also were small relative to the size of official reserves. In the fall of 1997, Thailand had sufficient foreign exchange reserves to neutralize a \$5 billion bet against the baht. Thai official reserves were consistently above \$36 billion from January 1996 through April 1997, declining to \$32.3 billion in May 1997 and to \$31.4 billion in June 1997. In June 1997, the total official reserves of Indonesia, Malaysia, the Philippines, South Korea, and Thailand were in excess of \$122 billion.

Substantial sales of the baht and other Asian currencies took place in the fall of 1997, however, and in amounts far larger than hedge fund positions. The sales of Asian currencies can be inferred from the net private capital flows of the five affected Asian countries (see table 1). Bank lending to Asian markets fell \$32.3 billion in 1997, an amount five times larger than the positions of large hedge funds in the Asian currencies. This was offset by positive inflows in direct investments and portfolio investment, resulting in net capital outflows of \$11 billion. The capital outflows could have been even larger, because "errors and omissions" (which typically result from unrecorded capital flows) jumped to an outflow of \$19.5 billion in 1997, more than \$10 billion higher than during the previous two years.

The sales of Asian currencies can also be inferred from the reserve losses of the five affected Asian countries, reported to be \$36 billion in 1997.²⁶ Actual intervention probably was much larger than this amount, since the loss of reserves did not reflect forward transactions of Asian central banks.²⁷

The \$6 billion short Asian currency position in large hedge funds coincided with a much larger capital outflow. Although the hedge fund position may well have broken the camel's back, the evidence shows that actions by other participants in the market preceded the sales of Asian currencies by large hedge funds.

Did Hedge Funds Use Positive Feedback Trading Strategies in Asian Currencies?

Figure 6 provides the aggregate positions of the twelve large funds in four Asian currencies. There is no evidence of positive feedback trading. Had such trading occurred, we would have observed increasingly larger

26. Adams, Mathieson, Schinasi, and Chadha (1998).

27. See Adams, Mathieson, Schinasi, and Chadha (1998).

short positions as the Asian currencies continued their decline from July through December 1997.

Did Hedge Funds' Short Positions Cause Other Investors to Flee the Asian Carry Trade?

The buildup to both the 1992 ERM crisis and the 1997 Asian currency crisis involved substantial amounts of carry trades, which allowed domestic corporations and banks to borrow in foreign currencies at low interest rates. As long as the domestic currency did not depreciate, the foreign currency loans represented an inexpensive source of funding.

By fixing the exchange rate, however, the central banks were indirectly paying a risk premium to foreign investors to support domestic funding needs. In instances in which these foreign “lenders” were themselves highly leveraged institutions (such as proprietary desks associated with investment banks and, more rarely, leveraged domestic corporations), the resultant equilibrium was tenuous at best. This carry trade amounted to financing long-term foreign currency needs of the domestic economy through leveraged short-term speculation. Consideration of the merit and economic rationale of running what was essentially a mismatched asset-liability position is best deferred to another occasion, but it is clear that periodic funding crises will emerge whenever adverse fundamental economic factors coincide with a category of funds’ rollover dates. Speculative foreign “lenders” can be myopic, and when they smell trouble they flee the local market. When this occurs, the presence of a lender of last resort, irrespective of the economic motivation, should be considered a solution, not a problem.

In July 1997, foreign lenders decided to unwind their carry trades in Thailand. They sold baht and bought dollars in the spot market, putting tremendous pressure on the Thai currency. The Thai central bank had two options: it could supply the dollars in the spot market to facilitate the unwinding (thus draining its official reserves), or it could postpone this by arranging forward dollar sales (thus conserving reserves) with commercial banks.

Commercial banks that performed forward transactions with the Thai central bank were buying dollars and selling baht. They typically would sell dollars and buy baht in the spot market, rolling the position until the expiration of the forward contract, an action that supplied much-needed dollars to

unwind the carry trades. Thus the forward transactions of the Thai central bank were, in effect, a short-term financing operation to borrow dollars.

Commercial banks that engaged in the forward transaction with the Thai central bank now had two problems: they had to manage the currency risk of that position, and their long dollar/short baht forward trade had a negative carry, since they were long a lower-yield currency and short a higher-yield currency. It was therefore natural for these commercial banks to look for counterparties to absorb the offsetting transaction. Presumably, this is how large hedge funds came to accumulate a \$5 billion forward position against the baht over a short period.

Clearly, the Thai central bank was betting that the pressure on the baht in the spot market would subside and that it could close out the forward transactions at a profit. Since the central bank was long baht/short dollar, it was long the carry trade and stood to benefit from the interest differential. By being on the other side of this trade, speculators (including some large hedge funds) had a negative carry position. They paid the interest differential for the privilege of making a profit in the event of a large devaluation. Given that the interest differential was small, this amounted to a low-cost bet against the baht.

In the end, both sides were speculating. The Thai central bank was betting that the foreign currency loans could be rolled over, while speculators were betting the contrary. The central bank was wrong.

Did hedge funds play a role in the crisis? Of course they did. Did hedge funds *cause* the crisis by causing investors to flee the Asian carry trade? No. Hedge funds were only able to accumulate their forward positions because the central banks were engaging in forward interventions; they entered the market *after* the carry trade started to unwind, not before. Thailand was funding long-term domestic investments with short-term foreign currency loans. It was unable to roll over these short-term debts. This type of liquidity crisis happens to individuals, corporations, and entire countries. In fact, Long-Term Capital Management (LTCM) was also engaged in various forms of carry trades, albeit in different markets. LTCM's troubles in October 1998 also could be characterized as a liquidity problem, because counterparties refused to roll over its carry positions. Just as the 1992 ERM crisis replayed itself in a different form in 1997, history continued to repeat itself in 1998. The commonality appears to be highly leveraged carry trades that ultimately exceeded the market's capacity to absorb adverse economic events.

Concluding Remarks

It is beyond doubt that excessive speculation—in the form of the baht carry trade and the subsequent stampede for the exits—along with the forward intervention of the Thai central bank led to the Asian currency crisis of 1997. However, no single group of speculators brought about the crisis.

Could more regulation have prevented the crisis? Regulators already oversee the main supplier of leverage to hedge funds—namely, banks—and the Bank for International Settlements has issued guidelines on conducting business with highly leveraged institutions.²⁸ However, it is far from clear how regulations can effectively be enforced against offshore hedge funds and how onshore hedge funds can be singled out among leveraged traders. In addition, there is little empirical justification for doing so. By contrast, collecting and disclosing aggregate market positions of large participants (banks and hedge funds alike) in potentially disruptive trades—a task appropriately conducted by an impartial regulatory body—would allow market participants to observe the large buildup of positions on one side of the market. The possibility of a market disruption caused by participants stampeding to the exits might deter speculators from adding more positions. The collection and disclosure of such information would be a useful first step to designing an early warning system.

Finally, there are valuable insights to be gained by monitoring the trading strategies of hedge funds. The ability of hedge funds to take quick advantage of developing trends may provide regulators with early warnings about the next likely trouble spot in the world financial markets. At the peak of the Asian markets rally in 1996, for example, there were scattered reports that hedge funds were executing a variation of the baht carry trade. Apparently, confidence in the so-called Asian economic miracle was so widespread that out-of-the-money puts on the baht were inexpensive, and speculators could secure these protective puts and still maintain a positive carry by being long the baht. The implied volatility of these protective puts is indicative of the market's assessment of devaluation risk.²⁹ Therefore, by observing these risk parameters, one can get a sense of the complacency of the market.³⁰

28. Basel Committee on Banking Supervision (1999a, 1999b).

29. Fung, Hsieh, and Leitner (1993).

30. There were rumors of a similar put in the Russian treasury bill market just before the 1998 Russian default.

We see no value, however, in tracking dynamic trading positions. Hedge funds are secretive organizations. More than likely they would disguise their positions to outsiders—counterparties and regulators alike—by using a variety of instruments to achieve the same underlying bet. As we have argued here, it is the convergence of speculative bets (or strategies) that poses the danger for markets; the instrument of choice to achieve the exposure is secondary. We have developed a methodology for estimating the essence of the bet by observing hedge fund returns. This approach is not obtrusive and does not involve complex disclosure issues. However, to achieve the desired result, a complementary monitoring effort must be put in place, involving commercial and investment banks. Regulators should obtain from the banking communities their exposures to key risk factors in terms of gross positions unadjusted for the banks' own risk management aggregates. Risk factors can be defined at aggregate levels, such as specific bond spreads or option volatility of credit spreads. No counterparty information is necessary at this stage. Precautionary actions are called for only when bets among hedge funds coincide with exposures to the same risk factors among banks. This process avoids the difficulty of trying to obtain potentially useless information from hedge funds on their positions. At a sufficiently aggregate level, it is difficult to extract uncomfortable details of counterparty information from banks without affecting the objective of establishing an early warning system.

Valuable policy insights can be gleaned from the monitoring of hedge fund strategies; such observations can provide an opportunity to detect potentially dangerous risks being adopted by the market as a whole in advance of a market disruption. The direct regulation of hedge funds, by contrast, might encourage these funds to conceal their activities, making early detection of one-way bets even harder to achieve.

Comments and Discussion

Comment by Bryan J. MacDonald: I would like to make a few points regarding this paper. I will not discuss the methodology, but I do think that there are several challenges in analyzing hedge funds in general. There certainly is a lack of data and of transparency, and both data and transparency are needed to allow someone to take a good look at the position of hedge funds.

Hedge funds are private funds, and they have limited disclosure. There is a tremendous amount of discussion in the hedge fund business about the issue of limited disclosure. Everyone is saying that these funds should be more transparent, but there are significant risks in transparency. We do not require mutual funds, which are highly regulated entities, to disclose their positions on anything more than a quarterly basis in financial statements.

In fact, the information that would be disclosed could be tremendously disadvantageous to the shareholders. If you knew, as someone on the other side of the transaction, that a particular fund had a large position in a particular market, you could use that to your advantage. I hesitate to use the word manipulation, but I will say that a tremendous amount of business is being done on the short side. Short squeezes are rampant in the marketplace. Information on what short positions are can be used. The street can be swept. Large traditional funds become very, very good at using information on other peoples' positions to their advantage. I am not an advocate of asking for more disclosure, unless it is to creditors who are going to extend you the margin and the credit to leverage your portfolio to invest in many different asset classes.

The bigger problem is the definition of a hedge fund. There is a tremendous amount of misunderstanding about the hedge fund industry, so I am

going to explain the hedge fund industry a bit more. The paper focuses only on the largest funds, which are the smallest number of funds. There are several thousand, and those funds are growing by the day. We continue to see huge growth in the hedge fund industry. Many people want to use the term hedge fund to explain a wide variety of strategies and approaches to investing in the world markets. There is a tendency to oversimplify.

What are hedge funds? Are we talking about large, leveraged, speculative pools of capital? If so, proprietary trading desks should be considered hedge funds. They are in many cases the predecessors to the hedge funds. The people who run hedge funds today, especially the large leveraged ones, typically are working for one of the large investment banks, and they have left the sell side to go to the buy side. That is the theater in which these funds get started.

Are we talking about specialized managers who invest long and short? That is probably a better use of the term hedge fund, in that it covers a lot of ground and encompasses many strategies. Are we talking about private partnerships that get paid incentive fees? Yes, private partnerships are paid incentive fees, but do private equity funds, real estate funds, and oil and gas partnerships? A variety of other vehicles are paid incentive fees. What about private investment funds that hedge their risks? The concept of hedge fund is dangerous, because many of these funds do not and cannot fully hedge the risk. The only perfect hedge that I have ever seen is long and short on the same security, and that can cost money.

What is the objective of a hedge fund? Is it absolute return? Some people would say that the objective is simply to get the biggest return possible in any market environment. They never want to be down; they want to always be up and always make money. Is the objective better risk-adjusted returns? That is probably a more reasonable expectation. These practitioners are simply trying to change the relationships between risk and return in the market. They are trying to reduce risks and improve return by using a variety of tools. It is yet to be fully determined whether they are successful or not.

Is the objective to be market neutral? I wish someone could explain to me why being market neutral is a good thing. Markets typically go up 75 percent of the time and go down 25 percent of the time. To be neutral to those movements is not something that I, as a long-term investor, necessarily want. I can understand if I am trying to extract return without market risk. Typically, I am trading one risk for another. I am trading the risk

of exposure to the market in return for counterparty risk in terms of the derivatives that I am using to hedge my portfolio or other risks, such as liquidity risks. I am not so sure that market neutrality is easily achievable or even a valid objective.

Is the objective to protect capital in down markets? Yes. The mathematics work. If you do not lose money, it is easier to have higher compound returns over time. That is a valid objective. Are we talking about speculation or investment? Some funds are speculators, and they play an important role in the marketplace. But not all funds in the hedge fund world are speculators.

What types of hedge funds are there? There are multiple-strategy macro-funds. The vast majority of the funds examined in the paper could be termed macro-funds. They are investing in a variety of disciplines from equities and currencies. They can go anywhere in the world. They can trade things like tax liens. You cannot believe the types of deals that come across my desk.

We have many arbitrage strategies: convertible arbitrage, fixed-income arbitrage, market-neutral strategies, and long and short equities in the developed markets, which are the vast majority in terms of numbers. Sector funds, technology funds, banking funds, and specialized funds run by specialized people with specialized experience use their experience to exploit inefficiencies in the market. Many distressed securities funds are done as locked-up vehicles. They are long term, but there are a number of distressed securities hedge funds. Emerging-market funds, both debt and equity, have been lumped into the hedge fund world. There is an important reason why they are in hedge funds and why emerging-market investments will be viewed as a hedge fund-type function for at least the foreseeable future.

And last but not least, there is a whole community of commodity traders. The biggest are functioning just like large hedge funds. The only difference is that, in addition to trading the financial markets, they may trade agricultural commodities and metals. And many times, they gained their experience in the commodity trading market.

There is an overlap between the Commodity Futures Trading Commission and the Securities and Exchange Commission in their jurisdiction over futures. This ought to be rationalized at some level because we are really dealing with two communities in two worlds that are growing together over time.

All too often, people view hedge funds as a ticking time bomb. The vast majority of hedge funds are very responsible investors. And they are our best and brightest. The best and brightest people in the financial markets in the world are going into the hedge fund business, not just in the United States, but all over the world. Europe is the largest area of growth today. People are leaving large European financial institutions, which was unheard of ten years ago. Massive changes are occurring. These people are starting investment boutiques, and this is going to occur on a global scale.

Why are the best and brightest migrating to this format? What motivates the hedge fund? The first is economics. It is possible to make a lot of money running a hedge fund, and there are cultural benefits as well. You go into most hedge funds, and the workers do not dress up in suits any longer. They work near their homes.

Technology has freed hedge fund managers to run these operations from anywhere they want. Funds no longer need to have a bevy of eighty analysts. They can get the information on the Internet. It is possible to pull tremendous amounts of information from the Internet and to harness computer horsepower to cull through the information.

Entrepreneurial activities are the driving force in hedge funds, which is why the United States has been such a leader in the business. It is important not to underestimate the role of entrepreneurship in developing these creative enterprises. At some point, the best and brightest people get tired of sitting in meetings and spending their time dealing with organizations. They are not necessarily good organizational beasts. In order to succeed in large corporations, you have to understand organizational dynamics and be good at it.

Global consolidation of financial institutions is displacing some of the best and the brightest. One of the biggest risks that we have in these large mergers is the displacement of intellectual capital. One of the greatest challenges in merging globally is retaining the best and brightest. Typically, the first people to leave are the ones who can, and you are left behind with people who are not necessarily your best performers. Ego drives a lot of this, too. You have to have an ego to run one of these funds.

I would like to run through what the hedge fund business looks like, because I think that it is important in the context of the paper's analysis. I used one source, and these are probably understated numbers. An estimated \$205 billion is in hedge funds globally, and the number is probably closer to \$300 billion today. Not everyone reports to this source. There

are about 2,000 to 3,000 hedge fund firms. Each firm tends to have three funds: an onshore fund, an offshore fund, and a qualifier purchaser or QIB-type structure, a 337 vehicle.

The distribution of assets is more fascinating. There are twenty firms with more than \$1 billion in assets in this particular data set. There are only fourteen firms with between \$500 million and \$1 billion in assets. Thousands of people are not counted in the top group. Buyers are migrating to the largest funds, giving them the most creditworthiness and access to the greatest amounts of leverage. As a result, these large funds are taking particularly large bets that can influence and affect markets.

The top twenty-five managers control almost 25 percent of the assets in the entire industry. And 40 percent is controlled by the top 100 firms. In addition to the number of firms in the distribution, the control of assets indicates that a lot of new participants may not be growing. It is hard to break into that club. It is very hard.

The growth of assets is huge, running at about a 20 to 25 percent growth rate over time. Even after last year, when hedge funds had significant net outflows as a result of disappointing performance in 1997 and 1998, we still saw an increase in assets, with an estimated 17 percent growth rate year over year between 1998 and 1999.

Now let me address the subject of emerging markets. What sources of capital do emerging markets have available to them? When they need money, where do they go? They can go to governments and get foreign aid. They can go to central banks. They can go to multilateral organizations like the International Monetary Fund, the World Bank, and the development banks like the International Finance Corporation that have been long-time investors in private investments, well before the private sector.

They can go to foreign financial institutions, commercial banks, investment banks, and insurance companies. Or they can go to the private market, meaning institutional investors. Both pension funds and endowment funds have been big investors here, as have private investors, high-net-worth individuals, and very wealthy families. And they can go to domestic financial institutions and domestic financial markets. We could help the emerging markets to develop their own domestic financial markets by giving them incentives. Do not underestimate the power of the 401-K in driving our bull market forward; 3 percent of U.S. salaries go into 401-Ks like clockwork, and very few individuals look at their 401-K statement more than quarterly.

Liquidity is being fueled into the markets. If we could help other countries create that kind of engine over time, that would be a positive force, and it would help them not to rely so much on foreign capital for growth.

Hedge funds have an important role to play in emerging markets. They are the risk-based capital portion of the liquid markets. These people are paid to take risks. They are compensated for it, and they play an important role. Without something like the hedge fund, there would be times when no capital would be available, and the volatility would be worse.

The natural evolution is that the investment banks make money for a period of time, and then they do not. They decide that they no longer want to perform that function, and the people leave, and they start a hedge fund. They bring in other investors, who then reenter the markets, recapitalize, and reliquify those markets, and the next cycle begins. They play a very, very important role. When somebody asks whether hedge funds disrupt markets, I answer that perhaps they do. Do they affect markets? Absolutely. There are two sides to the coin. Some things are good, and some things are bad.

They are successors to the proprietary trading desk. They are pioneers. I have a difficult time accepting the concept that they are late into trades, which is presented in the paper. Hedge funds often are the first to trade, not the last. There are times when they have to reverse, and perhaps that occurred in the currency crisis. Hedge funds provide liquidity, and they fill capital voids.

Now let me address the dangers. Hedge funds are tactical in nature. They are not strategic investors. They are not compensated to stay in for a long time, because their base of investors demands much shorter results. They are focused on the short term. They are leveraged, and leverage has risks.

I am amazed at how many asset allocation models do not factor in liquidity. Liquidity is assumed to be a free good in our world. It is great that the academic world focuses on ways of quantifying liquidity. Every time we have a liquidity disruption, people seem surprised.

Hedge funds are driven by incentives, and their base of capital is unstable. Most hedge funds have quarterly redemptions, annual redemptions, or monthly redemptions. The investors would like daily redemptions. Managers would like a 999-year lock-up.

So the challenges facing the emerging markets are an excessive dependence on foreign capital; a lack of a developed fiscal monetary infrastruc-

ture, good banking systems, regulatory infrastructures, and so forth; and a need to manage change. The reality is that effecting change through a market-driven economy is a messy process. It is not simple and neat and tidy. It takes time, and investors need to understand that it is a long-term process.

Hedge funds are unable to attract additional investors. Traditional investors are not going to invest in the emerging markets until the risk-reward relationship changes. Since 1992 the average annual rate of return for emerging-market debt has been about 12 percent with a standard deviation of 17 percent. Equities have performed even worse, realizing a 4 percent return with a 23 percent standard deviation. Standard & Poor's (S&P) has had a much more positive relationship between risk and return. High-yield bonds have constituted a wonderfully efficient use of capital. Until this relationship changes, it is hard for any traditional investor to say that hedge funds are a good trade. Once those relationships start to normalize, it will be possible to say that these markets have emerged. Until that happens, they are not going to be seen as an extension of normal debt and equity investing. So the hedge funds are the only ones with the tools to manage that relationship. Until that changes, the hedge funds will continue to attract capital.

The correlations of emerging-market bonds are very high with their stock markets and reasonably high with the S&P. Since 1992 the S&P has been a big driver of world liquidity and wealth creation. It does not surprise me that those correlations exist.

The one that is quite telling is the correlation of emerging-market bonds to the U.S. Treasury market. It would seem to make sense that investing in emerging-market debt would help to diversify a U.S. fixed-income portfolio quite effectively. If you can manage the risk-return relationship, you may have a good investment.

Should hedge funds be subject to greater regulation? I am not a big fan of regulation; I have always been a fan of deregulation. But if we are going to subject funds to regulation, we should first define the objectives. Are we trying to protect the system against risk, or are we trying to protect the consumer? The only people who can invest in hedge funds are sophisticated investors, people with money that they are able to lose and, in some cases, with the experience to be in these investments. Buyer beware has always been a better driver than regulation overall.

We should deal with the source of the problem, not the results. The issue here is leverage and its impact on liquidity. Leverage in illiquid mar-

kets or nascent markets can be highly dangerous. That is true not just in the currency markets, but also in small cap stocks and in convertible markets. It is true wherever the volume of trading is low relative to the amount of capital poured into the area.

We should look to the industry for greater regulation. This industry should take note of what the mutual funds have done. We need to have a body of hedge funds saying that they are going to regulate themselves. That should happen in the next ten years.

We also should educate investors more and more about the true risk associated with certain strategies. What surprised people with regard to Long-Term Capital Management (LTCM) was the amount of leverage, and therefore the amount of risk that was being taken, not the type of trades. We need to make sure that investors understand the risks to letting managers do anything they want.

Finally, I wish to address the capital requirements of high-level transactions. If we want to regulate hedge funds, let us start with the people who lend the money. A regulatory structure is in place with banks, and the capital requirements for highly leveraged transactions were changed back in the early 1990s. Hedge funds are highly leveraged portfolios, and we ought to look at ways of applying similar requirements to them. We need close monitoring of borrowing by sophisticated creditors, meaning banks. Banks have the responsibility to ask for information in return for credit.

The bailout of LTCM could be viewed not as a bailout but as the Federal Reserve doing its job. The greatest disasters in the last five years have occurred in fixed-income and credit-related instruments. In 1994 it was in mortgage backs. Last year, it was in a variety of credit spread issues from high-yield debt to distressed securities to emerging-market debt. The establishment of global standards for banks will address all of these problems, and that perhaps is a better way to regulate an industry requiring a great deal of credit to function.

Do I think that hedge funds disrupt markets? Perhaps. But other, bigger, speculative positions of participants also may have a great impact. Hedge funds play a very important role and should continue to play a very important role in the future.

Comment by Franklin R. Edwards and Mustafa O. Caglayan: Fung, Hsieh, and Tsatsaronis address the controversial issue of whether specu-

lation by hedge funds caused or exacerbated the Asian currency crisis during the last half of 1997, when most Asian currencies lost between 44 and 56 percent of their value against the U.S. dollar. The sharp devaluation of these currencies resulted in the bankruptcies of many Asian corporations and banks and was a major factor in the subsequent economic contraction in Asian economies.

After the fact, hedge funds came under attack as a major cause of the collapse of the Asian currencies. The prime minister of Malaysia, Mahathir Mohammad, for example, accused them of being the modern equivalent of “highwaymen” in breaking the Asian currencies.¹ He argued that, by accumulating huge short speculative positions, hedge funds made it impossible for the Thai central bank to maintain the baht at a fixed rate versus the U.S. dollar. Further, he contended that when the value of the baht plummeted on July 2, 1997, this precipitated the sharp devaluations of the Malaysian ringgit, the Indonesian rupiah, and the Korean won. Prime Minister Mohammad is not alone in this view. Prominent economists, such as Joseph Stiglitz, have also singled out volatile international capital flows as a major cause of the economic instability that rocked the economies of many East Asian countries in 1997.²

The policy issue that underlies this controversy, of course, is whether trading by hedge funds and other international speculators should be curbed, perhaps by regulatory restrictions on hedge funds or by explicit capital controls. At the very minimum, critics contend, hedge funds should have to report their portfolio positions and trading activities either publicly or to specified regulators, who, knowing these positions, could presumably act to head off the kind of market turmoil experienced by Asian countries in 1997.

The controversy about the role of speculators and in particular hedge funds in the Asian currency crisis is difficult to resolve empirically because of the difficulty of directly observing the position of hedge funds. Hedge funds are largely unregulated and therefore do not have to disclose their portfolio positions publicly. Hedge funds consider position information to be proprietary and are reluctant to disclose it for fear of losing their competitive advantage. Indeed, even highly regulated financial institutions, such as mutual funds,

1. Mahathir Mohammad, “Highwaymen of the Global Economy,” *Wall Street Journal*, September 23, 1997, p. C1.

2. Joseph Stiglitz, “Boats, Planes, and Capital Flows,” *Financial Times*, March 25, 1998, p. 32.

are required to report their portfolio positions only semi-annually, so that information in the kind of detail necessary to evaluate even their role in the collapse of the Asian currencies is typically not available.

Fung, Hsieh, and Tsatsaronis attempt to overcome this data deficiency by inferring from data on hedge fund returns during the Asian currency crisis the speculative positions the funds must have held in Asian currencies. In particular, they use data on the monthly returns of twenty-seven large hedge funds and data on the weekly returns of ten of these twenty-seven hedge funds to infer the positions that these funds must have had in Asian currencies during the last six months of 1997. They then compare those inferred positions with the total capital flows for the Asian countries (from balance-of-payments accounts) to determine if the hedge funds' positions were large enough, in their opinion, to have caused the collapse of the Asian currencies.

The authors conclude that hedge funds were not the main culprits in the 1997 Asian crisis and that their speculative bets against the Asian currencies were small. Nevertheless, they identify excessive speculation as a factor and believe that all financial institutions, including hedge funds, should be required to report their positions on a timely basis to an impartial regulating body that could use this information to assess the market's exposure and signal impending trouble. Thus Fung, Hsieh, and Tsatsaronis envision regulators as standing ready to impose additional constraints on financial institutions should they believe that either a currency crisis is fomenting or some other financial crisis is, in their view, impending.

Some of these conclusions and policy recommendations go well beyond the empirical work in this paper and, in our opinion, are highly controversial. What do Fung, Hsieh, and Tsatsaronis mean by excessive speculation? How do they determine that speculation is excessive? How would a regulator use the information they believe should be reported, and in what circumstances would a regulator act? The authors do not address any of these questions. We believe their paper would be improved either by omitting any discussion of these policy issues or by discussing the pros and cons of adopting such policies.

There are several problems with the methodology that Fung, Hsieh, and Tsatsaronis use to infer the portfolio positions of hedge funds from their return data. First, reported hedge fund returns are the returns on a hedge fund's entire portfolio. Thus to isolate the impact of changes in Asian currency values on a particular hedge fund's returns, as Fung, Hsieh, and

Tsatsaronis attempt to do, it may be important to account for other factors that may affect a hedge fund's returns. In particular, if the fund is holding other assets (or positions) that also change in value when the Asian currencies change in value, it is not possible to estimate the impact of the change in these currency values on the hedge fund's returns without controlling for the effects of changes in the other asset values on returns. But since information on hedge funds' portfolios is not available, it is not possible to do this directly. Fung, Hsieh, and Tsatsaronis attempt to address this problem by including returns on the S&P 500 index as an explanatory variable in their estimating equations, but this simple procedure is unlikely to capture the complexity of the returns-generating process for hedge funds. In our empirical work, we show that estimates of the relationship between hedge fund returns and Asian currency values are quite sensitive to the returns-generating factors included in the estimating equation.

Second, Fung, Hsieh, and Tsatsaronis examine only twenty-seven hedge funds and estimate separate equations for each of these funds over the six-month period from July 1, 1997, through December 31, 1997. This procedure leaves them with very few degrees of freedom, so that they are not able to include other explanatory factors in their estimating equations.

To demonstrate the instability of estimates of the relationship between hedge fund returns and changes in Asian currency values depending on which explanatory factors are included in the estimating equations, we estimate new pooled, time-series, cross-section returns equations for the July–December 1997 period using monthly returns for 827 hedge funds (including Commodity Trading Advisors). The hedge funds in our sample employed four different trading strategies: global macro, global, market neutral, and currency funds. Monthly returns equations are estimated using two models: one using only the four Asian currencies used by Fung, Hsieh, and Tsatsaronis as the explanatory variables and one employing a six-factor return model and regressing six-factor return residuals on the same four Asian currencies.³ The estimates for the first model, using time-series, cross-section, pooled regressions for the last six months of 1997, are reported in table 1. Estimates are shown for each of the four investment styles of hedge funds as well as for all hedge funds taken together.

3. For a discussion of our multifactor returns models, see Edwards and Caglayan (2000). See also Fama and French (1995, 1996) for a discussion of multifactor returns models.

Table 1. Hedge Fund Returns and Asian Currency Changes: Model 1, Time-Series, Cross-Section, Pooled Regressions of Hedge Fund Returns on Four Asian Currencies

$$R_t = b_0 + b_1*(\text{Thailand Cur}) + b_2*(\text{Malaysia Cur}) + b_3*(\text{Indonesia Cur}) + b_4*(\text{Korea Cur})$$

Period, 1997:07–1997:12

<i>Explanatory variables</i>	<i>All hedge funds</i>	<i>Global macro funds</i>	<i>Global funds</i>	<i>Market-neutral funds</i>	<i>Currency CTAs</i>
Constant term	-2.343*	-2.782*	-4.289*	0.744*	1.509*
CUR-THAILAND	0.191*	0.255*	0.254*	0.037*	0.189*
CUR-MALAYSIA	0.516*	0.613*	0.779*	0.067	0.074
CUR-INDONESIA	-0.245*	-0.356*	-0.299*	-0.024	-0.418*
CUR-KOREA	-0.018*	0.009	-0.036*	-0.023*	0.067*
Total panel observations	4,948	423	2,673	1,372	458
Adjusted R^2	0.061	0.103	0.101	0.016	0.167
Number of funds	827	73	448	224	82
Total money under management (millions of U.S. dollars)	76,754.7	22,246.8	31,662.5	16,919.8	5,925.6

* Significant at the 1 percent level.

Estimates for the second model are derived as follows. First, we estimate the following pooled, time-series, cross-section, six-factor regression model to account for the effect of other factors on hedge fund returns:

$$R_i = a + b * (S \& P500 - R_f) + h * (HML) + s * (SMB) + w * (WML) + g * (TERM) + k * (DEF) + e_i \quad (1)$$

where R_i is monthly hedge fund returns; R_f is the thirty-day Treasury bill rate; HML is monthly returns on a portfolio of high book-to-market stocks minus the monthly returns on a portfolio of low book-to-market stocks; SMB is the monthly returns on a portfolio of small stocks minus the monthly returns on a portfolio of large stocks; WML is the monthly returns on a stock portfolio of past year's winners minus the monthly returns on a portfolio of past year's losers; TERM is the monthly returns on long-term government bond portfolio minus the monthly returns on thirty-day Treasury bills, measured at the end of the previous month; DEF is monthly returns on a portfolio of long-term corporate bonds minus the monthly returns on long-term government bonds; and e_i is the usual error term (or residual return). This equation is estimated separately for each of the four hedge fund styles as well as for all hedge funds for the nine-year period 1990:01 through 1998:08. All hedge funds in existence for at least twelve months during this period are included in the sample. The estimates for this equation are reported in table 2.

Second, we regress the monthly residuals of equation 1 for the six months from July through December 1997 on the four Asian currency variables used in model 1, once again for each style of hedge fund and for all hedge funds together, using time-series, cross-section, pooled data:

$$e_i = a + \beta_1^* (\text{Thailand Cur}) + \beta_2^* (\text{Malaysia Cur}) + \beta_3^* (\text{Indonesia Cur}) + \beta_4^* (\text{Korea Cur}) + \varepsilon_i \quad (2)$$

where currency variables are expressed in units per U.S. dollar. This procedure controls for other factors that may affect hedge fund returns other than changes in the values of Asian currencies, isolating the relationship between hedge fund returns and the Asian currencies. The estimates for this equation are reported in table 3.

The results in table 1 show a significant relationship between the Asian currencies and returns for all hedge funds. In particular, the coefficients for all four currencies are significant at the 1 percent level. However, only two

Table 2. Six-Factor, Time-Series, Cross-Section, Pooled Regressions of Hedge Fund Returns

$$R_i = a + b^*(S\&P500 - R_f) + h^*(HML) + s^*(SMB) + w^*(WML) + g^*(TERM) + k^*(DEF) + e_i$$

Period: 1990:01–1998:08

<i>Explanatory variables^a</i>	<i>All hedge funds</i>	<i>Global macro funds</i>	<i>Global funds</i>	<i>Market- neutral funds</i>	<i>Currency CTAs</i>
Constant term	0.799*	0.747*	0.708*	0.941*	0.978*
S&P500 – R_f	0.298*	0.282*	0.525*	0.062*	–0.125*
HML	–0.033**	0.159*	–0.070*	0.035	–0.142*
SMB	–0.269*	–0.134*	–0.501*	–0.064*	0.181*
WML	0.047*	0.147*	0.007	0.023	0.241*
TERM	0.157*	0.088	0.070*	0.156*	0.483*
DEF	0.694*	–0.076	0.639*	0.573*	1.441*
Total panel observations	51,930	5,690	26,025	11,885	8,330
Adjusted R^2	0.071	0.051	0.161	0.028	0.018

*Significant at the 1 percent level.

**Significant at the 10 percent level.

a. R_f , hedge fund returns; R_f , thirty-day Treasury bill rate; HML, returns on a portfolio of high book-to-market stocks minus portfolio of low book-to-market stocks; SMB, returns on a portfolio of small stocks minus portfolio of large stocks; WML, returns on a portfolio of past year's winners minus portfolio of last year's losers; TERM, long-term government bond returns minus thirty-day Treasury bill rate measured at the end of the previous month; DEF, long-term corporate bond returns minus the long-term government bond returns.

of the coefficients (Thailand and Malaysia) are positive, indicating the presence of a net short hedge fund position in those currencies. The negative coefficients for Indonesia and Korea indicate that hedge funds were net long in those currencies and therefore lost money when the currencies devalued. These results, therefore, present a mixed picture of the effects of hedge fund trading on the currencies: they may have destabilized the currencies of Thailand and Malaysia but may have stabilized those of Indonesia and Korea.

After controlling for other factors, however, these results change significantly. Table 3 shows that for all hedge funds there is a significantly positive coefficient only for Indonesia and a significantly negative coefficient only for Korea. Further, the coefficients are quite different for different styles of hedge funds. For example, for the Malaysian currency, global macro and currency funds have significantly positive coefficients, while market-neutral funds have significantly negative coefficients.

Without laboring our results any further, two things seem clear. First, the estimated relationship between the Asian currencies and hedge fund returns are highly sensitive to what other returns factors are included in the

Table 3. Hedge Fund Returns and Asian Currency Changes: Model 2, Time-Series, Cross-Section, Pooled Regressions of Six-Factor Return Residuals on Four Asian Currencies

(1) $R_i = a + b^*(SP\ 500 - R_f) + h^*(HML) + s^*(SMB) + w^*(WML) + g^*(TERM) + k^*(DEF) + e_i$

Period: 1990:01–1998:08

(2) $e_i = a + \beta_1^*(Thailand\ Cur) + \beta_2^*(Malaysia\ Cur) + \beta_3^*(Indonesia\ Cur) + \beta_4^*(Korea\ Cur)$

Period: 1997:07–1997:12

<i>Explanatory variables</i>	<i>All hedge funds</i>	<i>Global macro funds</i>	<i>Global funds</i>	<i>Market-neutral funds</i>	<i>Currency CTAs</i>
Constant term	−0.981*	−2.999*	−1.338*	0.758*	−0.116
CUR-THAILAND	0.017	0.109*	−0.012	−0.031*	0.168*
CUR-MALAYSIA	0.033	0.393*	−0.082	−0.124*	0.401*
CUR-INDONESIA	0.065*	−0.160	0.228*	0.097*	−0.548*
CUR-KOREA	−0.029*	−0.006	−0.045*	−0.030*	0.046*
Total panel observations	4,948	423	2,673	1,372	458
Adjusted R^2	0.008	0.027	0.019	0.013	0.111
Number of funds	827	73	448	224	82
Total money under management (millions of U.S. dollars)	76,754.7	22,246.8	31,662.5	16,919.8	5,925.6

* Significant at the 1 percent level.

estimating equations and, second, the estimated relationships are very different for different styles of hedge funds. Thus attempting to infer the Asian currency positions of hedge funds from a very small sample of selected hedge funds, as Fung, Hsieh, and Tsatsaronis do, seems highly risky and may lead to erroneous policy implications.

Even presuming that it can be unambiguously inferred from hedge fund returns that hedge funds had net short positions in the Asian currencies, it is a leap of faith to conclude that hedge funds “caused” the collapse of the Asian currencies. The Asian currency crisis was first and foremost the result of problems in the real economy: excess capacity and increasing costs that led to a sharp fall in profitability. The Asian currencies were pegged principally to the dollar, despite the fact that a substantial proportion of their external trade was with countries in the Asian region. These currency pegs became unsustainable for real economic reasons: the sharp fall in the growth of exports from the region—caused in part by an appreciation in the real exchange rate of the Asian countries relative to that of other Asian countries and to Japan, the weak Japanese economy, increasing competition in export markets from China and Mexico, and excess capacity in many exporting industries. By 1996 the current account deficit in the five most affected Asian countries had reached \$55 billion.⁴

It was the crisis in the real economies of the Asian countries that precipitated the flight of capital by investors, causing asset prices to fall and financial institutions to fail. The financial effects of the capital outflows were particularly severe for the Asian countries because both the governments and most of the banks in these countries had borrowed heavily in short-term dollars to invest in longer-term domestic currency loans, creating currency and interest rate risks that they could not support. In summary, the economic policies and the financial structures of the Asian countries were fundamentally incompatible with the policy of pegging their currencies to the U.S. dollar.

To the extent that hedge funds and other financial institutions bet on the depreciation of the Asian currencies, these institutions were the messengers rather than the cause of the Asian currency crisis. They merely exposed the weaknesses in the Asian economies. In today’s world of nearly uninhibited international capital flows, it is far-fetched to think

4. Brealey (1999).

that speculators will not bet against countries that fix their exchange rates but then pursue economic policies that are unsustainable under fixed-rate regimes. Thus it is not as clear to us as it is to Fung, Hsieh, and Tsatsaronis that excessive speculation led to the Asian currency crisis of 1997. Indeed, we might even argue that the substantial capital outflows from Asian countries in 1997 have forced these countries to make the policy and structural changes that they eventually would have had to make in any case. It is not obvious that putting off these changes to a later time would have enhanced international financial stability.

General Discussion: Bryan MacDonald opened a general discussion of hedge funds by asserting that as hedge funds get larger, they tend to migrate to global markets for currencies, fixed-income instruments, and other credit instruments because the markets in which they traditionally operated have become less liquid. Franklin Edwards agreed with the paper's conclusion that the problems surrounding the Asian financial crisis were due not to hedge fund activity, but instead to excessive lending by foreign banks in foreign currency or, conversely, to excessive borrowing by banks and corporations in the region. Edwards added that the pegged, but adjustable, exchange rate regimes being used by the affected countries also encouraged unwise lending and borrowing. Indeed, Edwards asked why some countries, knowing this to be the case, persist in maintaining fixed exchange rates.

Litan answered that the conventional answer to that question is that pegging exchange rates is generally justified as a means to control domestic inflation. However, as all nations should have learned from the Asian crisis, potentially very large costs also are associated with maintaining fixed exchanges.

Daniel Tarullo asked MacDonald whether the disclosure concern addressed in his presentation refers to a type of disclosure that is close to real time and reveals a particular trade or whether it refers to a significantly lagging disclosure that reveals a fund's overall trading strategy. MacDonald responded by asserting that a one-time snapshot of a fund's positions may not reveal much and that a stream of complex data is probably necessary to produce full disclosure. However, he cautioned that such data may be difficult to analyze within a reasonable time period.

More broadly, MacDonald argued that too much disclosure may not necessarily be in the best interest of investors. Information is power in the capital markets. Disclosure of sizably leveraged positions to other market participants, such as banks with similar positions, can be dangerous. For instance, it is not necessarily advantageous to shareholders of these funds for the public to know that their fund is short 4 million shares of a stock traded at 10,000 shares a day, because such information can be extracted and manipulated in the marketplace.

David Hsieh explained that the kind of disclosure suggested in his paper is not a full public disclosure of the positions held by an individual fund, but rather some measure of aggregate exposure of all institutions to a particular kind of trade. He acknowledged, however, that the question of to whom the hedge funds should report is a difficult and sensitive one to answer.

Robert Litan questioned whether Hsieh's suggested disclosures would be effective in markets that are as dynamic as those in which hedge funds participate and where the amounts at risk change frequently on a daily basis. In addition, he noted that there most likely would be a huge lag in whatever disclosures the investors get. Litan argued that the real problem posed by hedge funds lies in excessive leverage by a few (such as LTCM) and that the best approach to handling excessive leverage is through effective regulation of banks that provide credit to the funds. Franklin Edwards agreed.

Calomiris also argued that the key variables triggering the economic downfalls in the 1980s and 1990s in Chile, Mexico, Russia, and Brazil and the problem with LTCM were not the hedge funds, but rather weaknesses in domestic financial systems and improper incentives for foreign banks to lend excessively in foreign currencies. Accordingly, in his view, establishing effective market discipline—perhaps through a subordinated debt requirement for large banks—is key to preventing financial crises in the future. Indeed, with a subordinated debt requirement, banks should have greater solutions to obtain more adequate disclosure from hedge funds. Alternatively, in the absence of such a requirement, it might be appropriate to prohibit banks from lending at all to hedge funds unless those funds provide banks with sufficiently transparent information that can be evaluated. Still another alternative would be for banks to establish hedge fund operations themselves, but to operate them as separately capitalized subsidiaries.

One participant observed that some banks are beginning to put credit ratings on hedge funds, not only because they finance the funds themselves, but also because many foreign banks have actually extended credit using the hedge fund investments as collateral. Credit ratings help managers at all these lending institutions to establish an appropriate level of capital.

References

- Adams, Charles, Donald J. Mathieson, Garry Schinasi, and Bankim Chadha. 1998. *International Capital Markets: Developments, Prospects, and Key Policy Issues*. World Economic and Financial Surveys. Washington: International Monetary Fund.
- Basel Committee on Bank Supervision. 1999a. *Banks' Interactions with Highly Leveraged Institutions*. Publication 45. Basel: Bank for International Settlements.
- . 1999b. *Sound Practices for Banks' Interactions with Highly Leveraged Institutions*. Publication 46. Basel: Bank for International Settlements.
- Brealey, Richard. 1999. "The Asian Crisis: Lessons for Crisis Management and Prevention." *Journal of Applied Corporate Finance* 12 (Fall): 111–24.
- Brown, Stephen, William Goetzmann, and James Park. 2000. "Hedge Funds and the Asian Currency Crisis of 1997." *Journal of Portfolio Management* (forthcoming).
- Edwards, Franklin R., and Mustafa O. Caglayan. 2000. "An Analysis of Hedge Fund Performance: Excess Returns, Common Risk Factors, and Manager Skill." Columbia Business School, Columbia University, New York.
- Eichengreen, Barry, Donald Mathieson, Bankim Chadha, Anne Jansen, Laura Kodres, and Sunil Sharma. 1998. *Hedge Fund and Financial Market Dynamics*. Occasional Paper 166. Washington: International Monetary Fund (May 15).
- Fama, Eugene F., and Kenneth R. French. 1995. "Size and Book-to-Market Factors in Earnings and Returns." *Journal of Finance* 50 (March): 131–55.
- . 1996. "Multifactor Explanations of Asset Pricing Anomalies." *Journal of Finance* 51 (March): 55–84.
- Fung, William, and David A. Hsieh. 2000. "Measuring the Market Impact of Hedge Funds." *Journal of Empirical Finance* (forthcoming).
- . 1999. "A Primer on Hedge Funds." *Journal of Empirical Finance* 6 (September): 309–31.
- Fung, William, David A. Hsieh, and James Leitner. 1993. "Exploiting the Interest Differential in Currency Trading." In *Strategic Currency Investing: Trading and Hedging in the Foreign Exchange Market*, edited by Andrew W. Gitlin, ch. 15, 260–86. Chicago: Probus Publishing.
- Goldstein, Morris, David Folkerts-Landau, Peter Garber, Liliana Rojas-Suárez, and Michael Spencer. 1993. *International Capital Markets: Part I. Exchange Rate Management and International Capital Flows*. World Economic and Financial Surveys. Washington: International Monetary Fund.
- Post, Mitchell A., and Kimberlee Millar. 1998. "U.S. Emerging Market Equity Funds and the 1997 Crisis in Asian Financial Markets." *Perspective* 41 (June). Washington: Investment Company Institute.
- Sharpe, William F. 1992. "Asset Allocation: Management Style and Performance Measurement." *Journal of Portfolio Management* 18 (Winter): 7–19.