

Hedge Funds and the Asian Currency Crisis of 1997

By: Stephen J. Brown, William N. Goetzmann and James M. Park | Journal of Portfolio Management Summer 2000
 (Please note that this is a review of a working paper version. The version in the Journal of Portfolio Management may differ.)
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Introduction

If you are currently considering whether to invest in an Asian long-short equity hedge fund, you are probably wondering about the risks in Asia. The Asian currency crisis of 1997 is still fresh in the memories of investors but, curiously, there is still not a clear consensus on the causes of the crisis. Broadly speaking, some argue that the economic fundamentals were weak in Asia, e.g. poor lending controls and excessive short-term USD borrowing. Others argue that the economic fundamentals were solid. Instead, speculative attacks on Asian currencies led to an erosion of economic fundamentals and therefore became self-fulfilling.

No one argues that speculative attacks are impossible. George Soros famously made £ 1 billion in a less than a month by betting that the United Kingdom would drop out of the ERM in 1992. Even if Soros did not cause the devaluation of the UK pound, he may have hastened it. (The MIT economist Paul Krugman has suggested the term «Soroi» for global macro hedge funds that have sufficient assets and access to leverage to successfully attack an over-valued currency.) The central question here is whether hedge funds contributed to the Asian currency crisis. Some have conjectured that Soroi fingerprints are all over the sudden decline in the value of Asian currencies in fall 1997. If the Soroi are able to cause a collapse of a currency in a country with solid economic fundamentals, they would be a risk for their Asian long-short equity hedge fund cousins.

Brown, Goetzmann and Park (hereafter BGP) offer evidence that the Soroi were not involved in the collapse of Asian currencies in 1997. As BGP state: «We test the hypothesis that the dramatic negative returns to these currencies versus the dollar were correlated to large positions,

short or long, taken by the (top eleven global hedge) funds. The answer is No.» However, before breathing a sigh of relief, Asian long-short equity investors might want to evaluate their methods and the strength of the evidence.

Method and Estimation Problems

Briefly stated, BGP use a two-stage regression method to estimate whether Soroi currency holdings affect the value of the currency. A first regression estimates the size of the currency holdings and a second regression estimates the impact on the value of the currency. Roughly speaking, BGP want to know if the Soroi dramatically increased their short positions in Asian currencies just before they fell in price. Their task is complicated because Soroi currency positions are not available. BGP do have monthly data on returns and assets under management for the eleven largest Soroi from September 1993 to October 1997. They first report results for one currency, the Malaysian ringgit, since the Malaysian Prime Minister Mohamad Mahathir has widely claimed that hedge funds were responsible for the fall in the value of the ringgit from July 1997 to September 1997.

In the following brief explanation of the BGP estimation procedure, I alter their notation for the sake of clarity. In equation 1, for each Soroi they estimate the ringgit holdings each month by regressing the Soroi monthly return on the monthly return of the ringgit (expressed as ringgit/dollar) for the four prior months. Equation 1 is the hedge fund version of the Sharpe style regression, so b is an estimate of the portfolio weight of the ringgit in each Soroi portfolio.

$$(1) R_{HF} = a + b \cdot R_{MR} + e$$

R_{HF} is the Soroi monthly return; R_{MR} is the ringgit/dollar monthly return

A separate time series regression is estimated for each Soroi for every month

For each month's estimate of b , the regression uses the four prior months

To understand equation 1, consider a Soroi that invests all of its assets long in the ringgit with no leverage. The estimates

in equation 1 will be $a=0$ and $b=1$. More realistically, consider a Soroi that employs leverage and shorts the ringgit. With an equity of USD 100 million as margin and a short position of USD 1 billion in ringgits, the estimates in equation 1 will be $a=0$ and $b=-10$. Equation 1 is estimated for each Soroi fund for every month, using the four prior months. (The estimate of the January 1994 portfolio weight is based on the four observations from September 1993 to December 1993. The estimate for February 1994 is based on observations from October 1993 to January 1994. And so on.)

BGP emphasize that the standard error of the estimate of b in equation 1 is quite large for three reasons. First, the exclusion of other Soroi investments in equation 1 means that those terms are included in the error term. Second, with only four observations the standard error is quite high. Third, the absolute value of b is upwardly biased if the Soroi invests in the same direction in other currencies that are positively correlated with the ringgit. (If the ringgit return is down then the Soroi return is positive for two reasons: for being short the ringgit and for being short other Asian currencies. And vice versa.)

Because BGP need a time series of monthly b estimates for their second regression, they have no alternative to equation 1. BGP mitigate the problem of the high standard errors by estimating the second equation once for all eleven Soroi combined. Since b is an estimate of the portfolio weight of the ringgit in each Soroi portfolio (for each month), BGP multiply the estimated b for each fund-month times the fund's equity each month to get an estimate of the fund's dollar exposure to the ringgit. (Using the example above, if $b=-10$ and the fund equity is USD 100 million, then the fund's estimated dollar exposure to the ringgit is USD 1 billion.) BGP then estimate equation 2 using the average of the eleven Soroi's dollar exposure to the ringgit, which I label $\$E_{11HF_s}$.

(An aside. Instead of mitigating the high standard errors of b by using an average $\$E_{11HF_s}$, BGP might have created a portfolio of the eleven Soroi and run a single version of equation 1. The precision of $\$E_{11HF_s}$ would be higher since it is based on one estimate instead of eleven and because information about the changes of the equity for each Soroi (during the four months used in the regression) would be included in the estimate of $\$E_{11HF_s}$. The BGP estimates of b assume that the equity of each Soroi was unchanged during the four months.)

(A second aside. BGP understand that by combining the eleven Soroi in the estimate of $\$E_{11HF_s}$, they are testing whether the eleven Soroi together caused the ringgit to collapse, not each Soroi individually. The former conjecture could be rejected even if the latter conjecture were true, since the ringgit exposures of some Soroi may be long while others are short. BGP present the time series of the estimated individual exposures to the ringgit for each of the eleven Soroi. The exposures vary significantly over time, but in all cases the exposures are low in fall 1997.)

Now BGP have estimated a time series of $\$E_{11HF_s}$ from January 1994 to October 1997 for the combined eleven Soroi in their sample. Remember that BGP wish to test whether Soroi dollar exposure to the ringgit caused the crash in the ringgit in fall 1997. They argue that, if this were true, then the correlation between $\$E_{11HF_s}$ and the return on the ringgit/dollar rate would be positive. (The logic is straightforward. Sometime after the Soroi increase their shorts of the ringgit, its value falls. Note that even if poor economic fundamentals caused the ringgit to crash, the Soroi might nevertheless trigger the crash and still profit.) BGP test this conjecture with equation 2. A significantly positive estimate of d is evidence consistent with the conjecture that the Soroi caused the ringgit to crash. A zero estimate of d is evidence that the Soroi were not the cause.

$$(2) R_{MR} = c + d * \$E_{11HF_s} + u$$

R_{MR} is the ringgit/dollar monthly return

$\$E_{11HF_s}$ is the monthly combined Soroi dollar exposure to the ringgit

One time series regression is estimated for January 1994 to September 1997

BGP also carefully discuss estimation problems in equation 2. They point out that d is upwardly biased if there is a positive correlation between the current month R_{MR} and the estimate of $\$E_{11HF_s}$ based on the prior four months. While they are not explicit, this positive correlation could be the result of investors other than the Soroi attacking the currency at the same time. Another estimation problem arises because the estimate of the current month ringgit exposure, $\$E_{11HF_s}$, is based on returns for the prior four month. If the Soroi can trigger a currency collapse in less than 1 or 2 months after taking short positions, then equation 2 will have little power to detect it. As discussed below, BGP offer additional evidence using weekly data.



George Soros

Results

BGP report the estimate of equation 2 for the ringgit. The result is encouraging for investors fearful of economic instability triggered by Soroi in Asia. The estimate of d is 0.000 with a t-stat of 0.453 for the period January 1994 to September 1997. If the estimation problems discussed above have not harmed the power of the test, then this evidence supports the view that Soroi currency positions do not influence the value of the ringgit. (BGP run equation 2 using a R_{MR} lagged one month and get the same results.)

To consider the evidence during the fall of 1997 specifically, BGP chart the estimated combined Soroi exposure to the ringgit, $\$E_{11HF_s}$, for each month from January 1994 to September 1997. The chart also shows the value of the ringgit each month. (Keep in mind that $\$E_{11HF_s}$ is a trailing four-month estimate of the current month exposure.) Starting in November 1996, $\$E_{11HF_s}$ was increasingly net long, peaking at over USD 100 billion but going back to zero by February 1997. The ringgit value remained stable during the period. Starting in March 1997, $\$E_{11HF_s}$ was increasingly net short, peaking at about USD -100 billion in June 1997. Again the ringgit value remained stable for the period. The ringgit crashed from July 1997 to September 1997. During this period the Soroi appear to be unwinding, rather than holding or increasing their short position. This is striking evidence against the conjecture that the Soroi caused the Asia currency crisis, since the Soroi appear to be buying ringgit as its value fell. Rather than concluding that the Soroi cushioned the collapse of the ringgit, BGP more cautiously suggest that the Soroi lacked the power to affect the value of the ringgit one way or the other.

BGP repeat the same chart, but estimate $\$E_{11HF_s}$ as exposure to an Asian currency basket rather than just the ringgit. Again the chart also shows the value of the Asian currency basket for each month. These estimates allow for the

possibility that the Soroi are invested in other Asia currencies than the ringgit. The results are very similar to the ringgit chart. There is a striking brief increase in $\$E_{11HF_s}$ to a long position of USD 1500 billion during December 1995 followed by a sudden swing to a short position of USD 300 billion during the next three months. Again no movement in the value of the Asian currency basket value is visible during the period. And after May 1997, $\$E_{11HF_s}$ is only slightly short and unchanged while the Asian currency basket value fell.

Using weekly returns for two unnamed funds, BGP estimate $\$E_{11HF_s}$ for each fund, using the Asian currency basket. The weekly estimates of equation 1 will have lower standard errors than the monthly estimates because the number of observations is 4 times higher and because returns for other currencies can be added (UK, Germany, Japan and Mexico). Nevertheless, the results are unchanged. For both funds, estimated exposures to Asian currencies are occasionally quite high, but the exposures during fall 1997 are modest.

Conclusion

It's the old «good news and bad news» story for the Soroi. BGP are encouraged that their results suggest that developing country currency markets are sufficiently deep to be unaffected by even the largest positions taken by the Soroi. One might imagine that the Soroi are delighted by evidence contrary to the accusations that they destabilized Asian currency markets. But the bad news is that the same evidence suggests that the Soroi were unable to profit during a period of extraordinary opportunity. In fact, funds managed by George Soros were either flat or down from June 1997 to September 1997. The Asian long-short equity fund investors need not worry, but perhaps the Asian currency fund investors should.

