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Lessons from the Sub-Prime Crisis

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Citation

Teo, Melvyn. 2007 November. Lessons from the Sub-Prime Crisis. *Hedge Fund Insights: Statistical Digest of the BNP Paribas Hedge Fund Centre at SMU*, 1-5.

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Lessons from the Sub-Prime Crisis

MELVYN TEO¹

Abstract

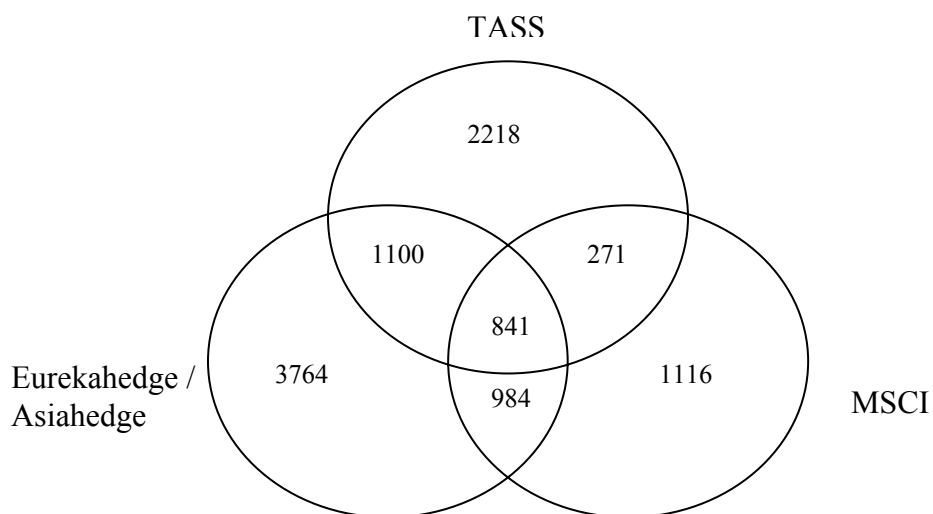
We show that there is significant variation in performance across hedge funds during the subprime crisis. Hedge funds that (i) invested in Asia, (ii) had equity exposure, (iii) adopted directional strategies, or (iv) allowed for frequent redemptions, underperformed other funds. Moreover, leveraged funds did not fare significantly worse than their non-leveraged counterparts. Our results suggest that credit market illiquidity was not directly responsible for the bloodshed amongst hedge funds. Rather, funds were hurt by an increase in global risk aversion and by fire sales conducted in anticipation of redemptions.

August 2007 was a tumultuous month for the hedge fund industry. Reports are rife in the media about hedge fund who were caught on the wrong side of the subprime mortgage trade. Several seemingly good quantitative hedge funds (e.g., Renaissance Technologies, AQR, and Goldman Sachs Asset Management) posted extremely dismal returns. Many funds were reported to have cut risk exposure in order to cater to the expected deluge of redemptions that typically follow poor performance. Industry watchers argue that credit market illiquidity, fire sales in anticipation of redemptions, and an increase in global risk aversion conspired to hurt hedge funds in August.

In this issue of the statistical digest, we perform a post-mortem on the subprime induced crisis. We characterize the distribution of fund performance in August 2007, examine which hedge funds were most affected by or insulated from the crisis, and discriminate between the various likely explanations for the negative spike in fund performance. Our analysis is based on a large sample of funds culled from four global hedge fund databases: TASS, MSCI, EurekaHedge, and AsiaHedge. The following Venn diagram breaks down the funds by database. The presence of many funds unique to a specific database underscores the importance of collecting fund data from several sources so as to better proxy the entire fund population.

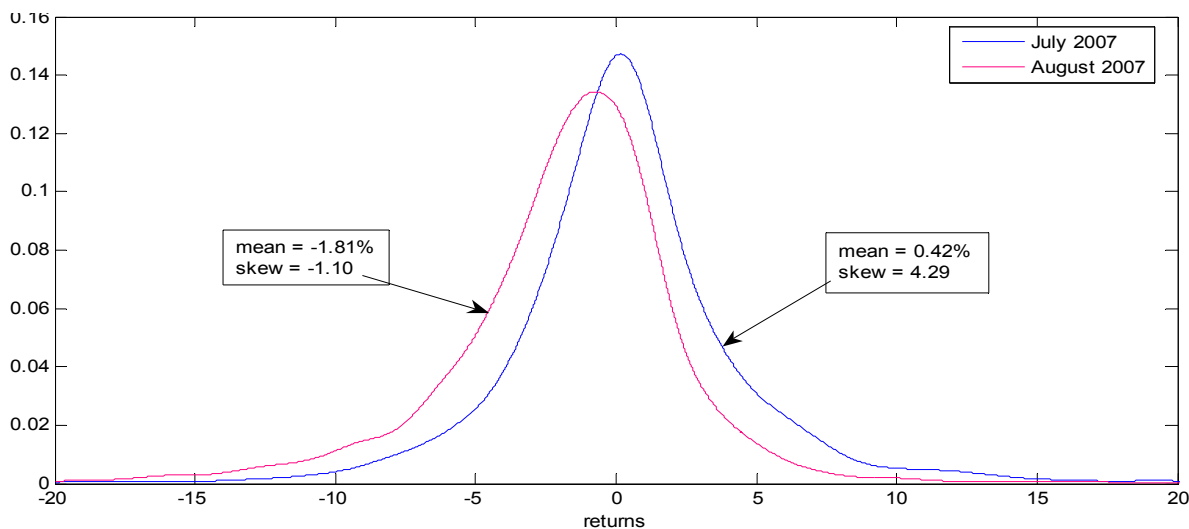
¹ Melvyn Teo is Assistant Professor of Finance and Director, BNP Paribas Hedge Fund Centre at the Singapore Management University. E-mail: melvynteo@smu.edu.sg. Phone: +65-6828-0735. Chuin-Hao Lim provided excellent research assistance. The views expressed here are my own and do not represent those of BNP Paribas or the Singapore Management University.

Figure 1: Breakdown of fund sample by database



To measure the impact of the crisis on fund performance, we compare the distribution of fund returns for July 2007 and August 2007. Figure 2 plots the kernel density functions for the fund distributions for July and August. In addition to a 2.23 percent reduction in fund average return in August relative to July, we find that the distribution of fund returns skews to the left as a result of the crisis. This suggests that most of the funds had poor returns during August. Specifically, in July, most of the funds had returns greater than that of the modal fund, i.e., 17 basis points. In contrast, in August, most of the funds had returns worse than that of the modal fund, i.e., -71 basis points.

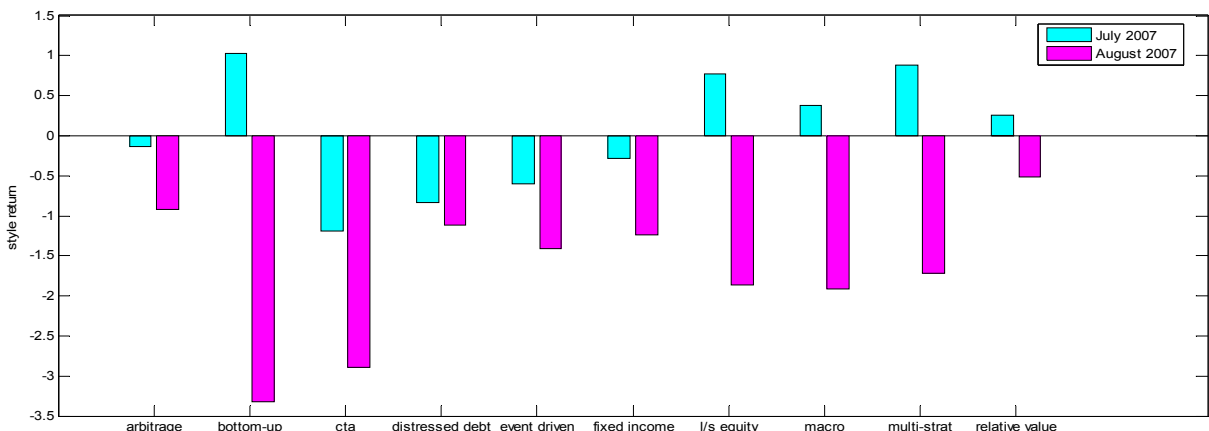
Figure 2: Distribution of hedge fund performance in July and August 2007



The 2.23 percent reduction in average fund monthly return seems small. However, as shown below in Figure 3, there is substantial variation in performance across investment styles. Hedge funds engaged in directional strategies like bottom-up, CTA, macro, and equity long/short

were most affected by the events in August while funds engaged in non-directional strategies like arbitrage and relative value emerged relatively unscathed. It is interesting to note that strategies with high equity exposure (bottom-up and long/short equity) suffered more than strategies with high credit market exposure (distressed debt and fixed income).

Figure 3: Variation in performance across investment styles in July and August 2007



To gain further insight into the cross-sectional variation in fund returns in August, we compare the performance of funds investing in Asia, U.S., and Europe. The variation in fund returns across investment regions shown in Figure 4 is broadly consistent with the flight to quality or global increase in risk aversion story. We find that even though the crisis originated from problems in the U.S. mortgage markets, funds investing in Asia suffered the most significant losses, while funds investing in the U.S. suffered the smallest losses. The average fund return was -2.58 percent for Asia focused funds, -1.84 percent for Europe focused funds, and -1.26 percent for U.S. focused funds.

Figure 4: Distribution of hedge fund returns in August 2007, stratified by investment region

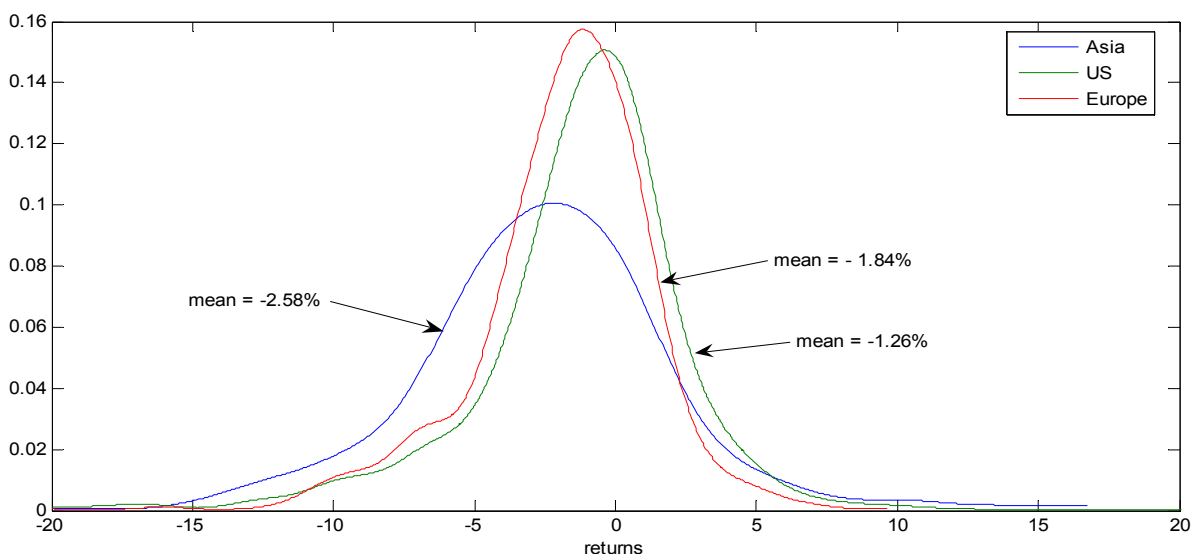
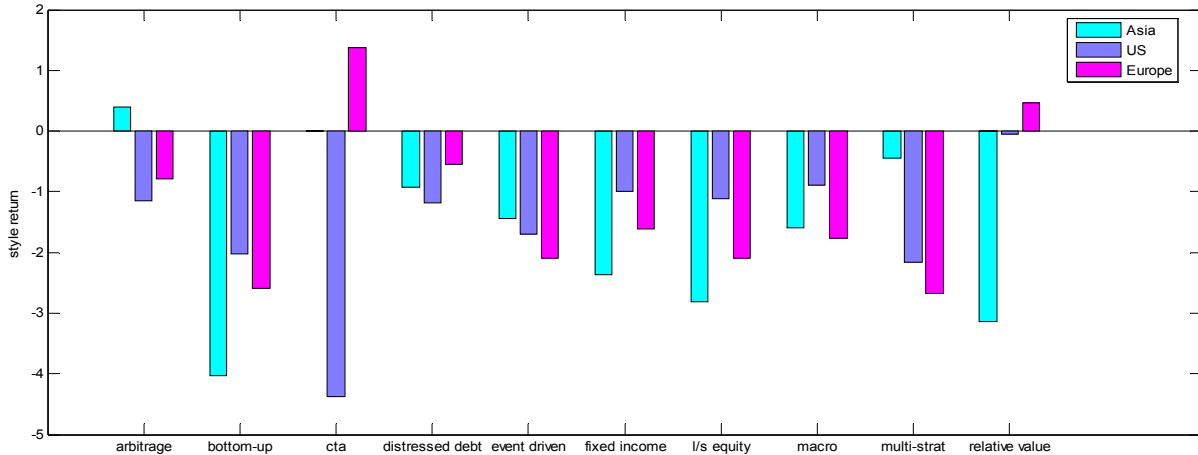


Figure 5 further breaks down fund performance by investment region and investment style. We observe that the underperformance of Asia focused funds is not uniform across investment styles. It tends to be concentrated in bottom-up, long/short equity, fixed income, and relative value funds. Long/short equity and bottom-up funds dominate the Asia-focused sample, hence underperformance in these styles will naturally show up in the fund distribution of Figure 4.

Figure 5: Variation in performance across investment styles and regions in August 2007



To further discriminate between the likely causes of hedge fund underperformance in August 2007, we estimate cross-sectional regressions on August 2007 fund returns. We seek to explain the variation in performance with various fund characteristics including fees, assets under management, minimum investments, age, leverage, redemption period, and the presence of a local headquarters. If funds that use leverage and who had longer redemption periods posted lower returns, then one may conclude that a liquidity crunch was responsible for much of the bloodshed in the industry. Conversely, if leveraged funds did not fare any worse than non-leveraged funds, and funds holding illiquid securities (as proxied by funds with a longer redemption period) outperformed other more liquid funds, then it is unlikely that the root cause of the underperformance is illiquidity.

Table 1 reports the coefficient estimates from the aforementioned cross-sectional regression. We find evidence inconsistent with the illiquidity hypothesis. Leveraged funds do not perform significantly worse than funds who eschew leverage. Indeed, the coefficient estimates on the redemption period variable suggests that funds holding illiquid securities outperform other funds. The overperformance appears economically relevant. Funds with semi-annual redemptions outperform funds with monthly redemptions by about 50 basis points in August. One view is that the higher redemption periods of these funds allow them to avoid the redemption-induced fire sales that hurt other funds. A related view is that funds investing in illiquid securities would have lower mark to market losses as liquid securities are the ones that are liquidated and therefore funds holding these securities end up reporting losses not the funds with illiquid securities. It is noteworthy that in line with previous studies on local information advantage and hedge funds (see, for example, Teo (2007)), funds with a local presence outperform funds without a local presence by 0.76 percent in August.

Table 1

Cross-sectional regression on hedge fund returns in August 2007

Cross-sectional regressions on hedge fund returns in August 2007. The independent variables are hedge fund characteristics including management fee in percentage, performance fee in percentage, redemption period in business days, minimum investment in US\$m, assets under management in US\$m, age in years, an indicator variable that equals one if a fund has a local headquarters, and an indicator variable that equals one if a fund uses leverage. The regressions for the "all funds" sample include investment style dummies. The t-statistics from heteroscedasticity consistent White (1980) standard errors are in parentheses. Coefficient estimates that are statistically significant at the 1% level are in bold. The regression sample includes 4102 hedge funds with sufficient return and characteristics information, of which 1957 are long/short equity funds.

	All funds		Long/Short Equity funds	
	univariate	multivariate	univariate	multivariate
Management fee (%)	-0.216 (-2.10)	-0.210 (-2.07)	-0.413 (-3.01)	-0.22 (-2.13)
Performance fee (%)	0.014 (0.72)	0.018 (0.92)	-0.005 (-0.19)	0.006 (0.22)
Redemption period (business days)	0.005 (3.69)	0.004 (3.04)	0.007 (4.06)	0.005 (3.05)
Minimum investment (US\$m)	0.010 (0.22)	-0.008 (-0.17)	-0.001 (-0.02)	-0.028 (-0.43)
Assets under management (US\$m)	0.000 (0.34)	0.000 (0.64)	0.000 (0.45)	0.000 (0.47)
Age (years)	0.016 (1.12)	0.001 (0.07)	0.117 (6.80)	0.094 (5.48)
Local headquarters	0.762 (5.35)	0.720 (5.02)	1.379 (7.44)	1.298 (6.98)
Leverage	-0.145 (-1.03)	-0.062 (-0.44)	0.155 (0.82)	0.266 (1.44)

To summarize, the analysis thus far has shown that credit market illiquidity by itself is unlikely to explain the dismal performance of the hedge fund industry in August. On average, funds that were exposed to the credit markets performed better than funds that were exposed to the equity markets. Funds that had exposure to illiquid securities outperformed funds that had exposure to more liquid securities. Rather, it was a capital flight to quality, i.e., away from more risky Asian stocks and towards developed country stocks, that created problems for funds. These problems were aggravated when funds with short redemption periods had to conduct fire sales in anticipation of month-end redemptions. In a sense, our broad conclusion dovetails with that of Amenc (2007) who argues that hedge funds are the victims and not the source of the sub-prime crisis.

References

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