

## FUND OF HEDGE FUNDS – DO THEY REALLY ADD VALUE?

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Man Investments

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Hedge funds have attracted significant capital inflows in the last few years, mainly due to their primary performance characteristics: absolute returns and low correlation to traditional asset classes. The aim of this paper is to guide the reader through the return characteristics of the various hedge fund styles. As part of the analysis, an intuitive framework for examining hedge fund returns is developed, which separates alpha from traditional and alternative betas. Finally, the paper explores how the dynamic strategies applied by hedge fund managers help them to mitigate risk during difficult market environments and to take advantage of the recovery periods after crises.

### Hedge fund style characteristics

For the purpose of this analysis, hedge funds are categorised into five broad styles and their performance is proxied with the following indices:

- HFRI Equity Hedge (Total) Index (HFRI EH) for equity long-short strategies;
- HFRI Relative Value (Total) Index (HFRI RV) for relative value strategies;
- HFRI Event-Driven (Total) Index (HFRI ED) for event driven strategies;
- HFRI Macro (Total) Index for global macro strategies; and
- Stark 300 Trader Index (Stark MF) for managed futures strategies.

Most of our analysis is based on the time period between January 1994 and May 2008.

Table 1 shows the risk-return characteristics of the five hedge fund styles. It has been said that hedge funds have equity-like returns for bond-like volatility. From the table below, it is observed that this is not overstated for 4 out of five styles, managed futures being more volatile with a lower average return. However as can be seen in Table 1, hedge fund returns, with the exception of managed futures, are not normally distributed: relative value and event driven styles in particular are negatively skewed.

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**Table 1: Risk-return characteristics of hedge fund styles (January 1994 – May 2008)**

	HFRI EH	HFRI RV	HFRI ED	HFRI Macro	Stark MF
Return annualised	13.48%	9.41%	12.53%	10.19%	7.30%
Volatility annualised	8.66%	3.18%	6.24%	6.94%	9.39%
Downside deviation (Libor) ann.	4.77%	2.07%	3.88%	4.00%	5.83%
Maximum drawdown	10.30%	6.55%	10.78%	10.70%	9.70%
Sharpe (Libor) ann.	1.01	1.50	1.23	0.81	0.33
Sortino (Libor) ann.	1.83	2.27	1.98	1.40	0.54
Skewness	0.24	-2.23	-1.15	0.08	0.27
Excess kurtosis	1.99	14.32	4.87	1.07	0.03

Data sources: Bloomberg and RMF Investment Management.

Return annualised is the geometric average return annualised. Volatility annualised is the annualised standard deviation. Downside deviation is the sum of squared differences between Libor 3mth USD and the hedge fund return when the hedge fund monthly return is below the risk free rate. Maximum drawdown is the maximum loss in a consecutive period. The Sharpe ratio is computed as the excess return of the hedge fund index over Libor 3mth USD divided by its standard deviation. The Sortino ratio is similar to the Sharpe ratio but the standard deviation is replaced by the downside deviation w.r.t Libor 3mth USD as the divisor.

Although unattractive from a Sharpe ratio (or risk-adjusted) perspective, managed futures are uncorrelated with other hedge fund styles (see Table 2), which makes them very appealing in a portfolio context. In particular, they tend to diversify away part of the long equity risk exposure induced in equity hedged and event driven styles. Furthermore, the near to normal distribution of their returns means they offer an excellent complement to negatively skewed styles such as relative value and event driven.

**Table 2: Correlations across hedge fund styles (January 1994 – May 2008)**

	HFRI RV	HFRI ED	HFRI Macro	Stark MF
HFRI EH	0.64	0.83	0.61	0.00
HFRI RV		0.75	0.41	-0.08
HFRI ED			0.58	-0.02
HFRI Macro				0.48

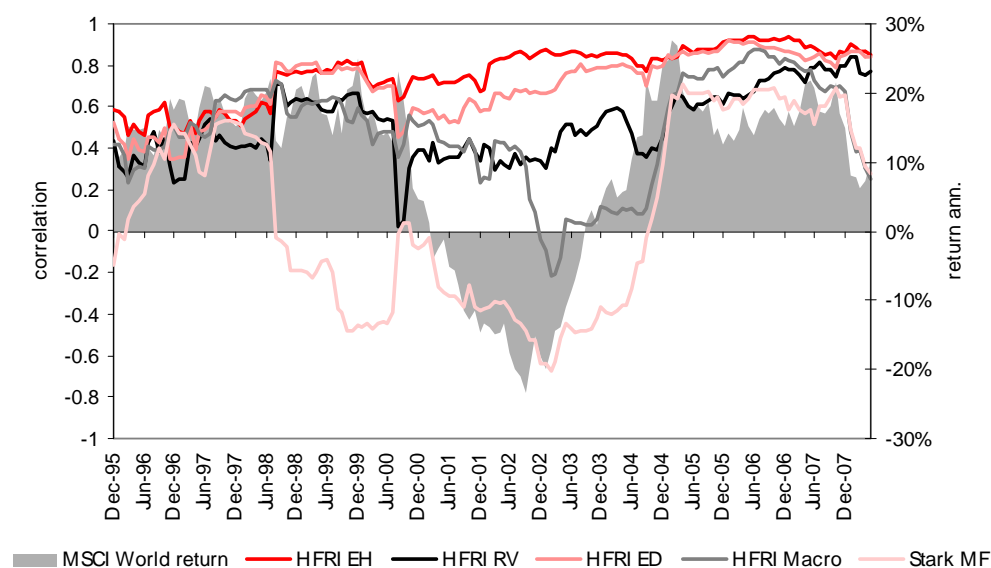
Data sources: Bloomberg and RMF Investment Management.

Hedge funds implement dynamic trading strategies that imply non-linear relationships with traditional investments. In Figure 1, we present the 24 months-rolling correlation of hedge fund styles to MSCI World Index, a proxy for international equities. In a recent paper, Bacmann, Jeanneret, and Scholz (2008) show how alternative investment strategies implemented by hedge funds drive the dynamics of their correlations to traditional investments. Managed futures and global macro styles present the most dynamic correlations whereas equity hedged and event driven styles show the least time-varying ones. Furthermore, all hedge fund styles are able to adjust their risk exposures (beta) with respect to equity market conditions.

For instance, during a bear equity market phase, a long-term trend following manager (managed futures) will take a short position in equity market futures, benefiting from the fall in equity market

prices. During a bull equity market phase, the trend follower will reverse its position and be long the market. Along the same line, an equity long-short manager (equity hedged) will reduce its beta to equity during bearish stock market conditions and increase it during bullish periods, although less aggressively than managed futures and global macro managers.

**Figure 1: 24 months-rolling correlations to MSCI World (January 1994 to May 2008)**

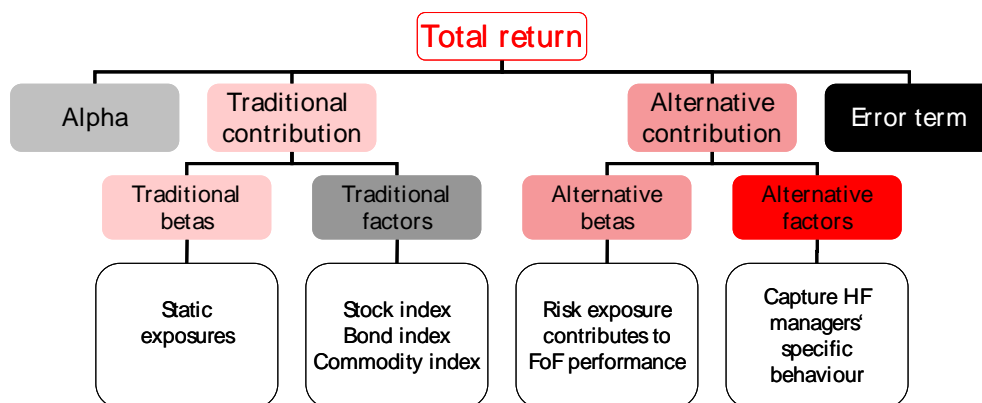


Data sources: Bloomberg and RMF Investment Management.

### Understanding hedge fund returns

In attributing hedge fund returns, it is widely accepted that returns can be decomposed into three elements: the contribution of traditional risk factors, the contribution of alternative risk factors, and alpha. The contribution of traditional risk factors captures the part of hedge fund returns stemming from exposures to risk factors common to traditional asset classes (stock indices, interest rates, etc.). The contribution of alternative risk factors captures the hedge fund strategy specific portion of returns by replicating the dynamic strategies of hedge funds on, for instance, equities, fixed income, currencies, and commodities. Finally, alpha is the proxy for hedge fund managers' skills in implementing, operating, and managing their strategies. Figure 2 shows a schematic representation of the model.

**Figure 2: Factor decomposition framework**



“Traditional” risk factors are defined as the sources of risk commonly identified and recognised in the traditional investment universe, such as equity related factors (MSCI World Total Return Index), size spread (small vs. large caps) and the value spread factor (value vs. growth stocks). In order to incorporate hedge fund return characteristics into the analysis, “alternative” factors are included aiming to replicate particular segments of hedge fund strategies. For example, a contrarian spread factor that buys last month worst performers and sells short last month winners is used. This alternative equity risk factor is a proxy for the payoff of an equity market neutral strategy based on short-term mean reversion in stock returns.

Managed futures offer another good example of the usefulness of alternative risk factors in explaining hedge fund returns. As mentioned in section 1, one of their strategies consists in taking long positions when markets move up and short positions when markets move down. Traditional risk factors would not be of any help in explaining the returns. The relationship between trend following strategy returns and underlying market returns is non-linear and exhibits a clear option-like shape. Alternative risk factors based on naïve trend following strategies replicate the payoff function of managed futures. They incorporate the option-like feature and thus add explanatory power in a linear factor decomposition model.

Table 3 shows the results of the application of the above framework to HFRI FoF Composite and HFRI FoF Market Defensive during two time periods<sup>1</sup>. The set of risk factors enables one to capture the differences in risk exposures between the fund indices. As expected, HFRI FoF Composite is more exposed to traditional risk factors. HFRI FoF Market Defensive on the other hand has a higher allocation to short sellers and managed futures. Therefore it has a higher exposure to alternative trend following factors and less exposure to traditional equity markets. Consequently, the added value of alternative risk factors in explaining hedge fund returns is more pronounced for HFRI FoF Market Defensive, especially in the second sub-period.

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**Table 3: Factor decomposition of HFRI FoF indices**

Risk factors (T=traditional, A=Alternative)			Jan 1994 - Dec 1999		May 2000 - May 2008	
			HFRI FoF Composite	HFRI FoF Market Defensive	HFRI FoF Composite	HFRI FoF Market Defensive
Alpha annualised			-0.47%	0.71%	2.11%	1.39%
Equity risk	MSCI World Total Return	T	0.196	0.072	0.184	0.118
	MSCI World cumulative 12M	T	0.032	0.022	0.009	0.003
	Size spread (SMB)	T	0.161	0.049	0.102	0.081
	Value spread (HML)	T	0.076	0.111	-0.034	0.036
	Momentum spread (UMD)	A	0.085	0.052	0.049	0.070
	Contrarian spread	A	-0.109	-0.071	-0.007	0.001
	Trend following equities	A	0.131	0.166	0.088	0.120
Fixed income risk	Change in long-term interest rates	T	-1.231	-0.266	-0.943	-1.071
	Trend following interest rates	A	-0.017	0.160	0.029	0.120
	Change in high yield spreads	A	-2.190	-2.275	-0.708	0.025
Other risks	Trend following currencies	A	0.128	0.151	0.040	0.183
	Trend following commodities	A	-0.017	-0.004	0.053	0.177
Adj. R square	Full set of risk factors		0.66	0.43	0.69	0.62
	Set of traditional risk factors		0.51	0.15	0.55	0.07
Level of significance			1%	5%		

Data sources: Bloomberg and RMF Investment Management.

Alpha and risk exposures are estimated with multiple OLS regressions. MSCI World Total Return is a proxy for international equities. MSCI World cumulative 12M is the cumulative performance of the MSCI World Total Return Index computed on a rolling basis over the last 12 months. The size spread factor is a portfolio long small caps and short large caps. The value spread factor is a portfolio long value stocks and short growth stocks. The momentum spread factor captures mid-term continuation in stock returns through a portfolio of stocks which is long last 12-month winners and short last 12-month losers. The contrarian spread factor captures short-term mean reversion in stock returns through a portfolio which is long last month losers and short last month winners. The trend following factors are proprietary factors replicating the payoff profile of basic trend following strategies on different asset classes (equities, interest rates, currencies, and commodities). The change in long-term interest rates is measured by the monthly change in US Govt 10-year yield. The change in high yield spreads is a proxy for credit risk. It is measured by the monthly change in the spread between the yield of the Credit Suisse High Yield Index and the the US Govt 10-year yield.

Overall, alternative risk factors greatly improve the explanatory power of the model. Their significance and the fact that it increases during the second sub-period clearly outlines the growing importance of the dynamic aspect of hedge funds. The varying risk exposures across both time periods show that hedge fund managers allocate dynamically to the various sources of risk.

### Hedge fund behaviour in crisis periods

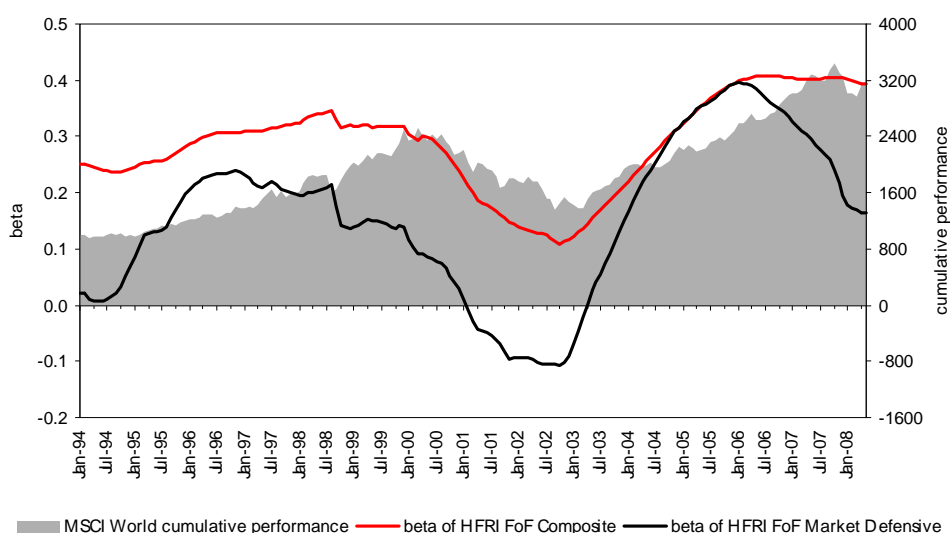
During normal market environments, equity related hedge fund styles have a positive market exposure in order to generate positive returns. However, this exposure is likely to contribute to

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negative performance during transition phases and crises. It is therefore essential that managers adjust their market exposures in time to mitigate losses or even benefit from such environments.

To illustrate this point, Figure 3 highlights the dynamic beta of HFRI FoF Composite and HFRI FoF Market Defensive versus MSCI World Total Return Index<sup>ii</sup>. The betas of both HFRI indices decrease strongly in the bear market from 2000 until 2002 and increase again in the following bull market indicating that the underlying managers adjust their market exposure according to the environment and control their downside risk. Beta of the less equity biased HFRI FoF Market Defensive is more dynamic and decreases earlier in crises. In the recent credit crunch (June 2007 to May 2008), managers have again decreased their betas.

**Figure 3: Dynamic beta of FoF indices to MSCI World ( January 1994 to May 2008)**

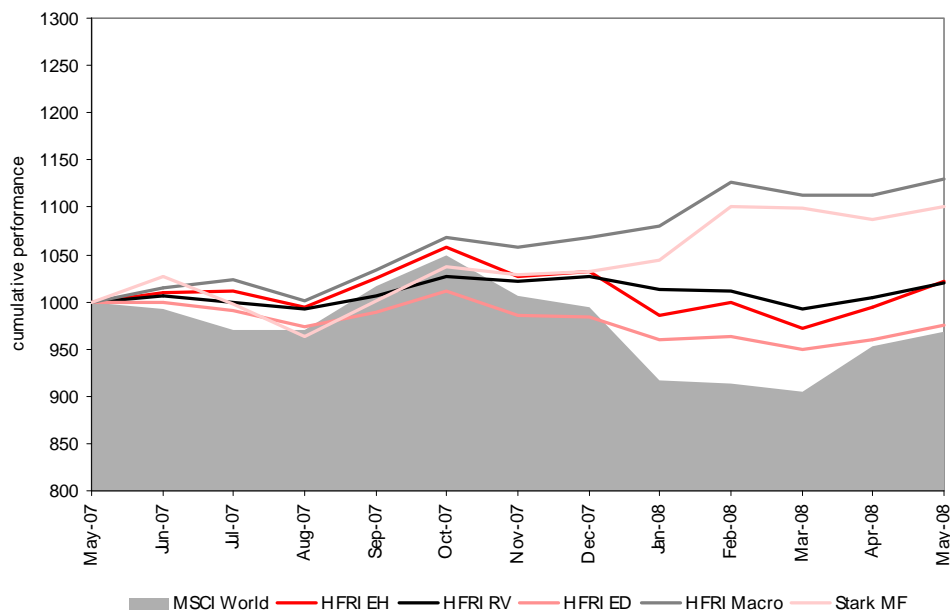


Data sources: Bloomberg and RMF Investment Management.

Dynamic betas to MSCI World are estimated using a Kalman Smoother technique, an efficient recursive filter which is able to capture dynamic exposures.

It is therefore not surprising that hedge fund styles weather the market turmoil of this crisis rather well (Figure 4). Global macro and managed futures generate a strong positive performance, as expected by their investment philosophy. Event driven, on the other hand, suffers more because of its exposures to both equities and credit. However, event driven managers still outperform international equities over the period. The current market situation is an illustrative example of the need for a diversified hedge fund portfolio across the five styles.

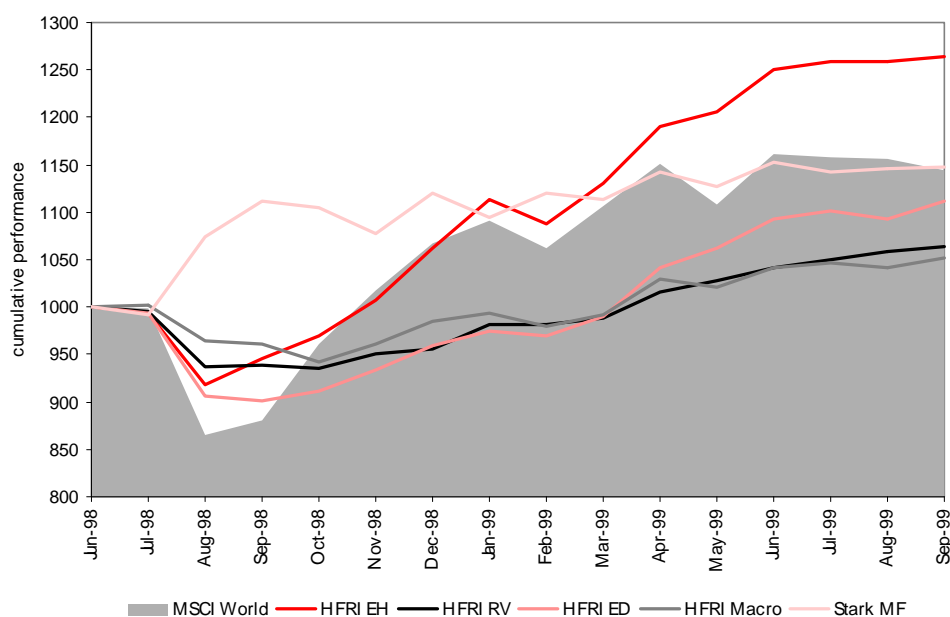
**Figure 4: Hedge funds in the credit crunch (May 2007 to May 2008)**



Data sources: Bloomberg and RMF Investment Management

Above observations are confirmed when we look at a second example, the Russian/LTCM crisis in the third quarter of 1998 (Figure 5). Again, managed futures outperform during the crisis. Equity hedged suffers less than international equities and is able to profit from the following equity market uptrend.

**Figure 5: Recovery of hedge funds after Russian/LTCM crisis (June 1998 to September 1999)**



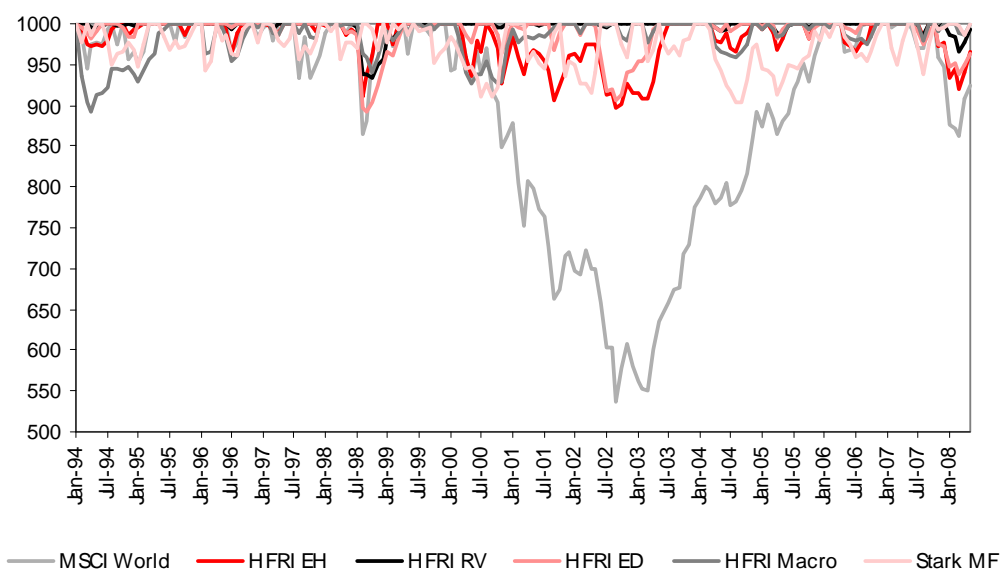
Data sources: Bloomberg and RMF Investment Management



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Finally, hedge fund strategies have an improved control of downside risk through fast reaction to changing market conditions. Figure 6 illustrates the drawdown phases of hedge fund styles vs. those of MSCI World. Hedge fund drawdowns are less severe and much shorter than those of equity markets. The chart clearly outlines the short recovery periods characterising hedge funds.

**Figure 6: Drawdown of hedge fund styles vs. MSCI World (January 1994 to May 2008)**



Data sources: Bloomberg and RMF Investment management. The chart represents the cumulative performance when the index is in a drawdown, otherwise the value is capped at 1000.

### Conclusion

Hedge funds are categorised into five styles with respect to their investment philosophy. All five styles have different risk-return characteristics stemming from the different trading strategies they implement. Their correlation pattern outlines the need for a diversified hedge fund portfolio across the five styles. It is observed that the trading strategies of hedge funds cannot be captured with traditional risk factors and introduce the concept of alternative risk factors. These factors are based on dynamic strategies, improve the explanatory power of factor models, and offer more insight into the behaviour of hedge funds. Finally, the behaviour of hedge funds in difficult market environments is analysed. Hedge funds can mitigate their downside risk through their speed of adjustment to changing market conditions and take advantage of the recovery phases that follow crises. These characteristics make them an ideal complement to traditional portfolios.



**REFERENCES**

Bacmann, J.-F., P. Jeanneret, 2005. *"Funds of funds are still providing alpha"*. Hedgequest, Spring 2005.

Bacmann J.F., P. Jeanneret, S. Scholz, 2008. *"What correlation does not tell you about hedge funds: a factor approach to hedge fund correlations"*. Forthcoming in Journal of Derivatives and Hedge Funds, August 2008.

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**ENDNOTES**

<sup>i</sup> Bacmann and Jeanneret (2005) find that the analysis period from January 1994 to present includes a structural breakpoint and therefore identify two distinct time periods from January 1994 to December 1999 and from May 2000 to present for analysis.

<sup>ii</sup> Exposures are computed with Kalman smoother, an efficient recursive filter which is able to capture dynamic exposures