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INVESTMENT MANAGEMENT

Managers' Drawdown Similarities and Robust Returns of Fund-of-Hedge Funds

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Dr. Claus Huber, CEFA, CFA, FRM

Performance persistence for hedge funds has been investigated, for example, by Brown et al. (2001) and Gregoriou et al (2008). The idea is that one hedge fund that performs strongly in one year also generates high returns in the next year. Generally, their conclusions are that there is little to no performance persistence. Our approach differs from the studies mentioned above in the sense that we do not look at returns but at the drawdown behaviour of hedge funds and its persistence. We show that our approach to drawdown modelling can add value to robust portfolio construction. Again we use the dbSelect database, which provides daily index levels for live and defunct CTAs from January 2004 to December 2014. We calculate 52 weekly returns for each manager for each year and model drawdown behaviour with 0/1 coding as described in our paper "Return and Drawdown Similarities of Hedge Funds", April 2015.

In order to identify similarities between managers of the dbSelect universe, we apply the Self-Organising Maps [SOM], which Teuvo Kohonen developed in the 1980s [Kohonen (1984)], to the managers' drawdown behaviour as described in Table 1. The SOM project similar objects on a map, where similar objects are being placed closely together. Figure 1 shows a SOM with 5x5 units.

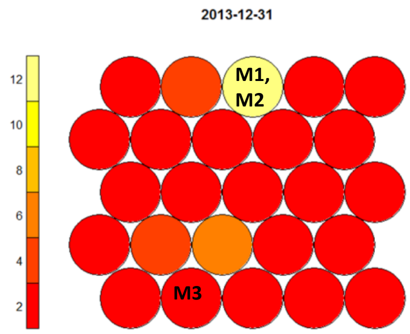

Figure 1: SOM with 25 units

In Figure 1 managers 1 and 2 appear on the same unit [the same circle] and manager 3 appears on a unit far away from the one of managers 1 and 2. The SOM can be used to identify similarities in drawdown behaviour: managers with similar drawdown behaviour appear on near-by units. For a robust portfolio, we seek managers with different drawdown behaviours. Those managers are located in different areas on the SOM. Hence we seek managers loading on distant units.

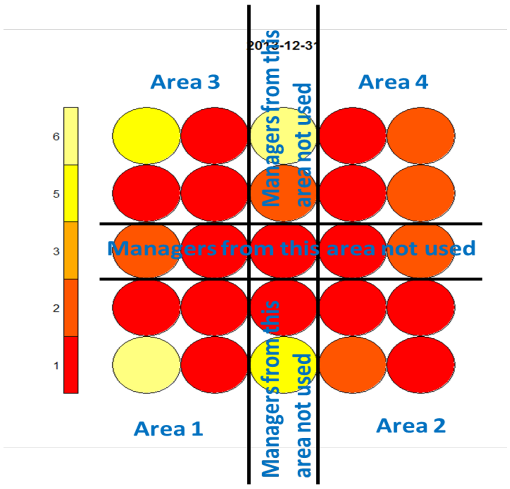

Figure 1: Dividing the SOM to select managers with dissimilar drawdown behaviour

We conduct a simulation experiment to investigate whether the drawdown analysis helps to build robust portfolios. To this end, we divide the 5x5 SOM into 4 disjunct areas as illustrated in Figure 2. If there is persistence in drawdown behaviour, portfolios with managers evenly spread over the SOM should exhibit less severe drawdowns than those with managers selected from one area of the SOM only.

In our simulation, we distinguish 2 areas for picking managers:

• Concentrated [Conc]: 8 managers are selected only from one of the 4 areas [for example, only from area 2].

• Evenly Distributed [Even]: 2 managers are selected evenly from each of the 4 areas [together 8 managers].

2004 is the first year of our sample. 52 weekly returns of 2004 were used to create a 5x5 SOM according to Figure 2. For the concentrated portfolio, we randomly select 2 managers from each of the 4 areas. Managers from the space between the 4 areas are not considered for inclusion in the portfolio. Each portfolio comprises 8 managers. All selected managers are equal weighted. We calculate performance of this portfolio for the following year 2005. We repeat this 9,999 times for 2004 and hence obtain 10,000 Conc portfolios as well as 10,000 Even portfolios, for which we measure out-of-sample performance for the following year. For 2005, we create another SOM with the 52 weekly returns of 2005 and use 2006 to measure out-of-sample performance in the same way as described above. In aggregate, we create one 5x5 SOM for every year from 2004 to 2013 [together 10 SOM], run 10,000 simulations for each year from 2004 to 2013 and measure out-of-sample performance for the years 2005 to 2014 [together 10 x 10,000 = 100,000 simulations for each Conc and Even]. Figure 3 shows the means of the 100 worst weekly drawdowns for both Conc and Even. Details of the simulation setup are given in the appendix.

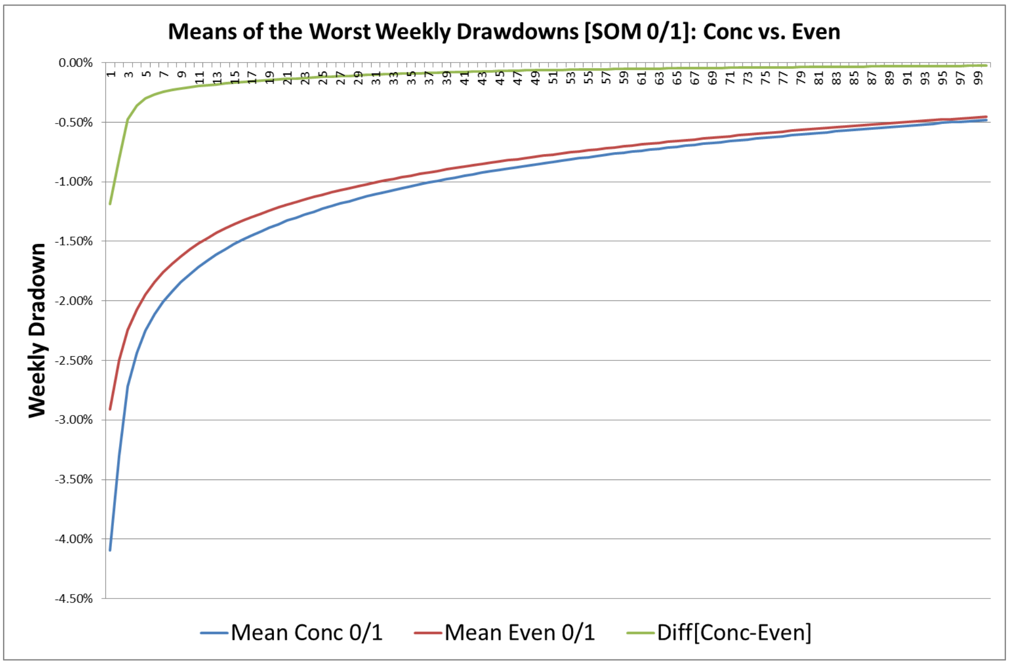

Figure 2: Results of the simulations: means of the worst weekly drawdowns

Figure 3 shows that the worst weekly drawdowns of Conc are consistently below [i.e., are more negative] than those of Even. This means that when there are drawdowns, they tend to be more severe for the concentrated portfolios than for the evenly distributed portfolios. Hence the drawdown analysis with SOMs does add value in the context of the construction of robust portfolios.

In our simulation experiment, we have assumed no skill in selecting the managers and hence picked them randomly, apart from their belonging to the different areas of the SOM. Integrating the drawdown analysis via SOM in an investment process to select CTA managers can make portfolios more robust and enhance their risk/return behaviour.

References

Brown, S. J., Goetzmann, W. N., Park, J. (2001): Careers and survival: Competition and risk in the hedge fund and CTA industry, Journal of Finance, 56, 1869–1886.

Gregoriou, G. N., Hübner, G. and Kooli, M. (2010): Performance and persistence of Commodity Trading Advisors: Further evidence, Journal of Futures Markets, 30, 725–752.

Kohonen T. (1984): Self-Organization and Associative Memory, Springer, Berlin.

Appendix

The simulated drawdowns in Figure 2 are determined as follows:

1. For simulation run i, sort all [10 years x 52 weeks =] 520 weekly returns in ascending order → rank 1 = worst drawdown.
2. We have one worst drawdown for each of the 10,000 simulation runs.
3. Calculate the mean of all worst drawdowns across the 10,000 simulations. This gives the value of -4.1% for the first value for Conc in Figure 2 [blue line].
4. Repeat this for the 2nd worst, 3rd worst, etc. drawdowns.