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Seeking the cues in macro markets

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Trading anxiety

Using Investopedia's proprietary dataset to trade risk

In this paper, we use Investopedia's Anxiety Index (IAI), generated from the searches that lead users to Investopedia.com, to create a hypothetical trading model. Our hypothesis is that knowing what investors are searching for and reading is likely to be a leading indicator of price action. We created a basket of risky assets (stock and equity volatility futures), filtering by IAI, and backtested the results. Since 2012, our active IAI trading rule basket has risk-adjusted returns of 1.26 and annualized returns 15.6%. It considerably outperformed a similar "long only" basket (risk-adjusted return of 0.83) and a VIX filtered basket (risk-adjusted returns of 0.95).

Introduction

Investopedia is the largest financial education website with over 21 million unique visitors a month and 70 million page views. Investopedia's Anxiety Index (IAI), collates searches for terms, which indicate investor concern such as "bankruptcy," "default" and "short selling" (see Investopedia: The Investopedia Anxiety Index, September 12, 2016). The volume of search terms are then aggregated into an index.
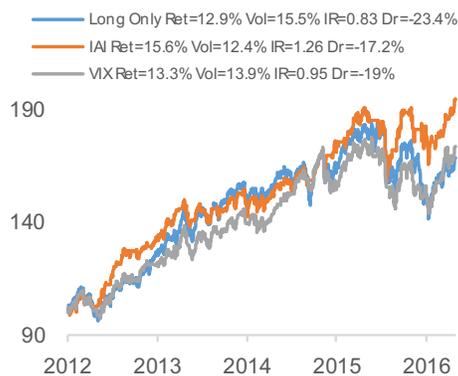
In Figure 1, we plot IAI alongside VIX, another metric which is often referred to as the market's "fear gauge." At least on a stylistic basis, it appears as though these variables are linked. In this paper, we shall show how we can use this relationship to create historically profitable trading rules.

Figure 1: IAI vs VIX
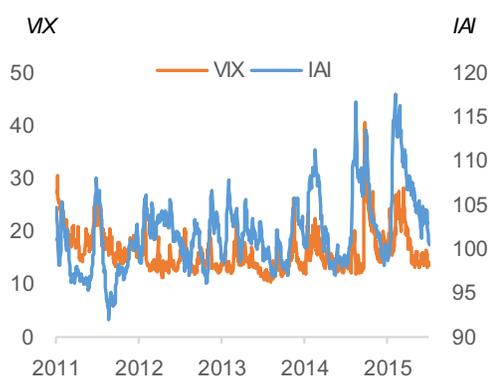
Source: Cuemacro, Investopedia, Bloomberg

Figure 2: IAI based trading strategy

Long Only Ret=12.9% Vol=15.5% IR=0.83 Dr=-23.4%
IAI Ret=15.6% Vol=12.4% IR=1.26 Dr=-17.2%
VIX Ret=13.3% Vol=13.9% IR=0.95 Dr=-19%

Source: Cuemacro, Investopedia, Bloomberg

Indeed, in Figure 2, we plot the returns for our trading strategy which uses IAI as a filter, with risk-adjusted returns of 1.26 and annualized returns of 15.6% since 2012; our strategy considerably outperforms both a long-only basket and VIX-filtered basket.

Digging down into the statistics

We have already seen that, at least stylistically, there seems to be some correlation between VIX and IAI. VIX roughly represents the implied volatility on S&P500 options. Hence, higher values indicate more costly options. As we might expect, VIX spikes at times of investor concern, as investors are more willing to pay for options to hedge their underlying risk. During these periods of investor concern, "risky trades" such as long equities and short volatility, tend to underperform, as investors switch from seeking yield to preserving capital. We might also be wary of turning points more broadly. For example, at very low values of volatility, there can be a mean reversion back to higher volatility and investor concern.

If we regress daily changes of VIX and IAI, the T statistic is 2.7, which suggests, at least on a contemporaneous basis, that there is statistically significant relationship between the two indicatorsgiven the strong relationship between these indicators, it suggests that if we are using VIX as an indicator, we might be able to replace it with IAI.

Before we apply our trading rule, we normalise both IAI and VIX so they are comparable quantities in terms of scale. In Figure 3, we plot our normalised IAI and VIX scores. Even after this transformation, both quantities appear to be heavily correlated.

Figure 3: IAI and VIX Scores after normalisation
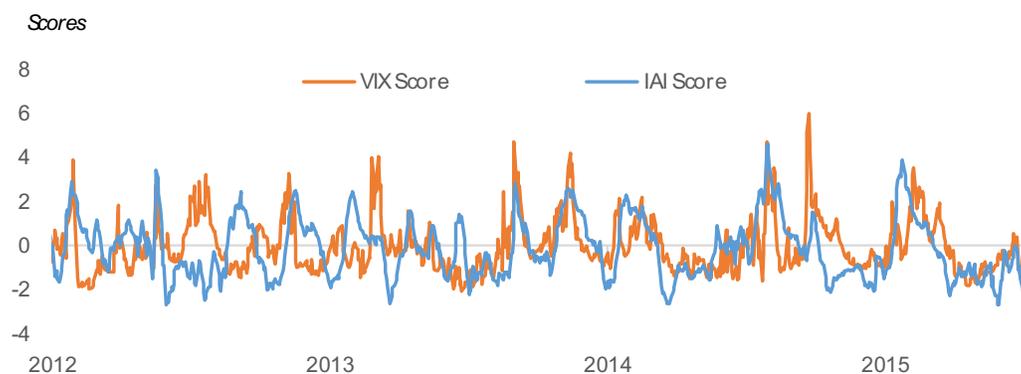
Source: Cuemacro, Investopedia, Bloomberg

Creating a trading strategy

In our previous analysis, we have seen that both VIX and IAI are strongly correlated, and there seems to be a strong contemporaneous relationship between the two indicators. We have also suggested that intuitively, trying to avoid trading at extreme points in sentiment might be warranted. In this section we test this idea, by looking at a number of stock futures: S&P500, Nikkei, FTSE100 and DAX, alongside VIX futures. We have also included transaction costs (but not roll costs). While we are using futures contracts, it is of course possible to replicate such a portfolio using ETFs. Given that VIX futures have much higher volatility than any of the other assets, we have reduced leverage there to 1/3. For simplicity, we assume constant leverage on every contract. Note, for VIX futures, we have also flipped the signal, so all our trades will be

short/flat, as opposed to long/flat, given the negative correlation between volatility and risk sentiment.

In practice, investors will use variable leverage, adjusting leverage depending on a volatility target. This also makes it easier to mix assets in a portfolio, which have vastly different volatilities. Otherwise, you will have more exposure to the higher volatility asset by default if notionals are the same. Risk parity funds tend to use this type of approach to do their allocations. As a result they tend to employ higher leverage on bond exposure than equities exposure. For example, if a volatility target was 10% and the volatility of the underlying asset was 5%, we would need a leverage of 2 to meet the volatility target. Increasing leverage essentially involves borrowing against our collateral.

Our data sample is from 2012 to the end May 2016, which is the entire period for which we have daily IAI data available (monthly data goes back to 2008). It can often be the case that with more unusual datasets, the data history available tends to be shorter. We shall use as our benchmark a long only strategy. Our trading rules are relatively straightforward, which we outline below:

- Long only: stay long only
- IAI filter: stay long, unless IAI score is at an extreme (high/low) in which case we go flat
- VIX filter: stay long, unless VIX score is at an extreme (high/low) in which case we go flat

In Figure 4, we present the risk adjusted returns (ie. returns / volatility) for all three trading strategies, while in Figure 5, we present the drawdowns, which we define as the maximum peak-to-trough losses in our sample. Our first observation is that our IAI filter outperforms long only for every asset, both on a risk adjusted basis and on a drawdowns basis. It also outperforms the VIX filter on a risk adjusted basis for all assets other than Nikkei. On a drawdown basis, it is more difficult to pick a clear winner from the VIX filter and IAI filter.

Figure 4: Risk Adjusted Returns
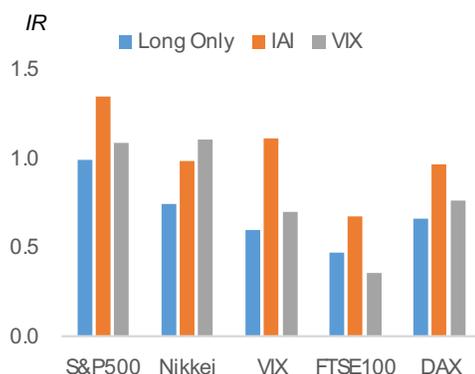
Source: Cuemacro, Investopedia, Bloomberg
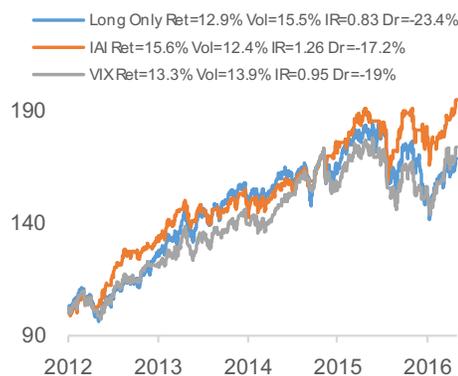
Figure 5: Drawdowns

Source: Cuemacro, Investopedia, Bloomberg

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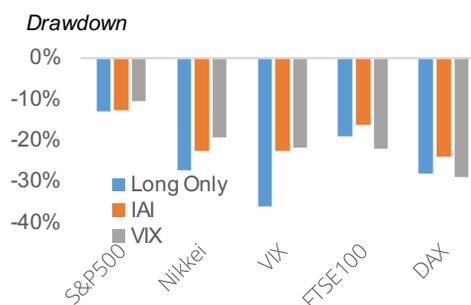
Applying trading filters to a basket

We have seen that applying the IAI filter outperforms both the VIX filter and a long only strategy. What about examining the results when we create a portfolio of our stock and equity volatility futures? After all, in practice, investors trade portfolios of assets, rather than individual assets. In our analysis here, we have assumed equal, notional-based weighting in portfolio (other than on VIX futures, as discussed above). As before, we apply the same trading rules (long only, IAI filter and VIX filter), which were mentioned above.
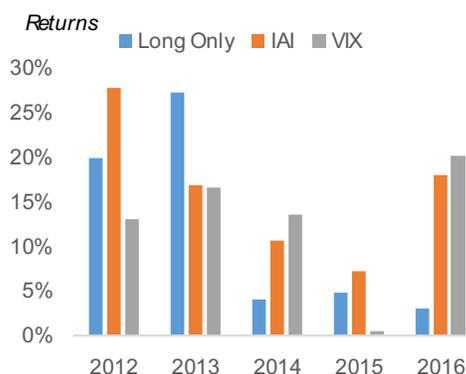
In Figure 6, we plot the cumulative returns for all three strategies. In Figure 7, we plot the annualised returns on a year-over-year basis. Our first observation is that on a basket basis, the IAI filter is the top performer with risk adjusted returns of 1.26 versus 0.95 for the VIX filter and 0.83 for the long only strategy. The drawdowns for IAI are also the smallest, while also having the best returns (15.6% versus 13.3% for VIX and 12.9% for long only). On a year-over-year basis, we see that the IAI strategy has outperformed long only in every year other than 2013.

Figure 6: Basket Returns

Long Only Ret=12.9% Vol=15.5% IR=0.83 Dr=-23.4%
IAI Ret=15.6% Vol=12.4% IR=1.26 Dr=-17.2%
VIX Ret=13.3% Vol=13.9% IR=0.95 Dr=-19%

Source: Cuemacro, Investopedia, Bloomberg

Figure 7: YoY Basket Returns

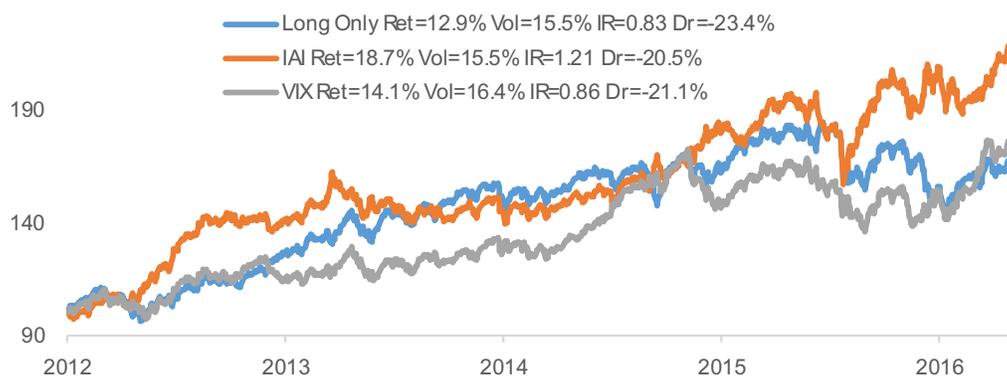*Returns*

Long Only   IAI   VIX

Source: Cuemacro, Investopedia, Bloomberg

Long/short rules

So far we have only investigated trading rules which do not short risky assets, given that most investors have long-only mandates. However, what if we apply short positions when the IAI is at an extreme (rather than going flat) and also do the same for VIX? In Figure 8, we present the returns for long only, long/short IAI and long/short VIX filtered baskets. We again see that our IAI

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basket outperforms both long only and VIX filtered, in terms of risk adjusted returns (and also has the smallest drawdowns).

Figure 8: Long/short rules

Legend:
- Long Only Ret=12.9% Vol=15.5% IR=0.83 Dr=-23.4%
- IAI Ret=18.7% Vol=15.5% IR=1.21 Dr=-20.5%
- VIX Ret=14.1% Vol=16.4% IR=0.86 Dr=-21.1%

Source: Cuemacro, Investopedia, Bloomberg

Over Brexit

Our analysis has covered the period between 2012-2016 ending in May. We have a few weeks of out-of-sample data following that, which also covers the recent Brexit vote. How did our various strategies perform over the Brexit vote? We see that the long only strategy performed best, followed by IAI and then VIX. While the VIX signal took us out earlier than the IAI signal before Brexit, it failed to get back into the trade as quickly as IAI signal.

Figure 9: Over Brexit

Legend: Long Only, IAI, VIX

Source: Cuemacro, Investopedia, Bloomberg

Conclusion

We have discussed Investopedia's Anxiety Index, which is a measure of searches conducted on Investopedia's website for topics related to investor concern. We have shown how it has a statistically significant relationship with VIX, which is the most common measure for investor "fear". Hence, this would suggest that we can use it as a replacement for the VIX, when it comes to measuring the market's "fear".

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Later, we showed how we can use the IAI to create a filter for trading baskets of risky assets, which in our case was a number of different equity index and equity volatility futures.

Our IAI filter trading rule had better risk adjusted returns than a long only (or VIX filtered) basket. Our final IAI filtered basket has risk adjusted returns of 1.26 since 2012, compared with 0.95 for a VIX filtered basket and 0.83 for a long only basket. This suggests that using Investopedia's Anxiety Index can add considerable value compared to using the VIX alone as a filter for trading risky assets.

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