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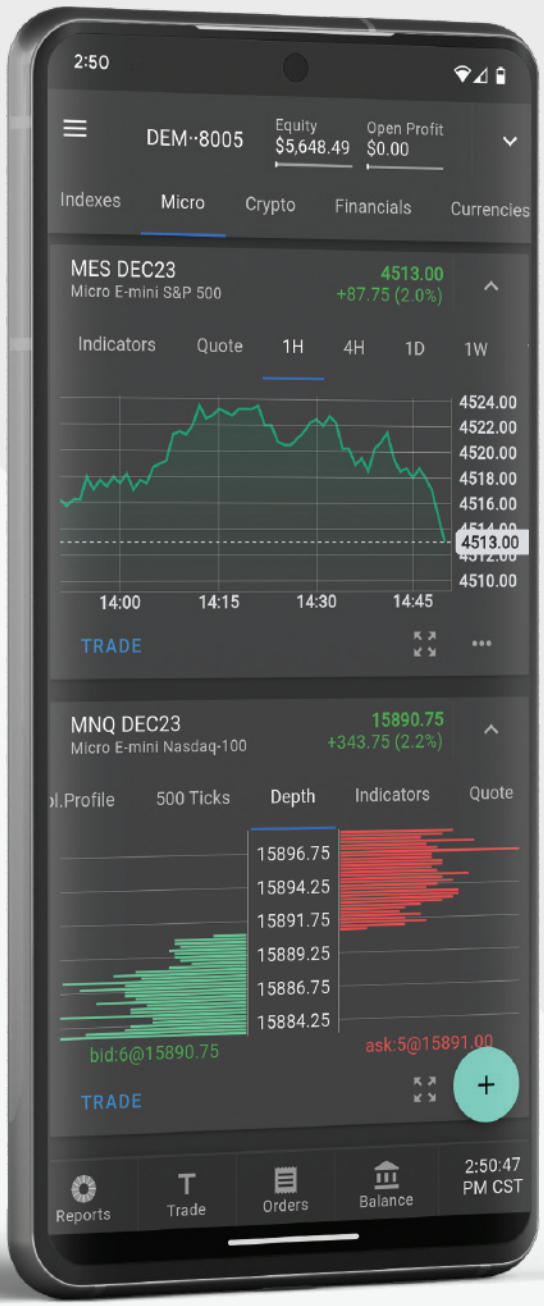

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Playing Decreasing Volatility

The Power Of Volatility Contraction Patterns In Breakout Trading Strategies

You can filter trades to improve signal quality. Here, we focus on situations where volatility has decreased in the market to be traded. Here's how to code, test, and implement this concept.

by Andrea Unger

At Unger Academy, we use price patterns in our trading systems primarily as filters within the core strategy rather than as direct signals to open and close trades. Instead of managing trades based on market price patterns, as is commonly done, we use price action primarily as an operational filter.

In this article, we'll leverage a volatility contraction pattern to enhance a trend-following strategy that opens new positions when a certain price level is broken through. Our approach is to filter trades and focus exclusively on situations where volatility has decreased in the market. In the following sections, we'll discuss the reasons for this and try to understand the possible impact of this filtering approach on different instruments.

WHAT IS THE DEFINITION OF A VOLATILITY CONTRACTION?

If we use a daily bar to represent the prices that the market has reached in this session, we can obtain a figure like that shown in Figure 1.

The "body" represents the difference between the opening and closing prices of a market, while

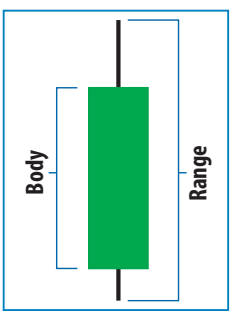

FIGURE 1: DAILY BAR. Comparing the ranges of successive bars can help identify potential trends in volatility.

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the "range" measures the distance between the high and the low of the session. Since the width of the range can serve as a gauge of price volatility, comparing the ranges of successive bars, one can identify potential trends in volatility.

The volatility contraction pattern we will evaluate can be defined in PowerLanguage as follows:

```
(highS(1)-lowS(1))< (highS(2)-lowS(2)) and (highS(2)-
lowS(2)) < (highS(3)-lowS(3))
```

Following this pattern, the range of the last completed session (highS(1)-lowS(1)) must be less than that of the previous one (highS(2)-lowS(2)), which in turn must be less than the previous one (highS(3)-lowS(3)).

How strong is its filtering action?

To answer this question, we can use a simple code that calculates the percentage of occurrences in the markets from different sectors, from 2010 to today:

```
var: countVolC(0), countsession(0),
dateInDateTimeFormat(0), datereadable("");

dateInDateTimeFormat = ELDateToDateTime(date);
datereadable = FormatDate("dd-MM-yyyy", dateInDate-
TimeFormat);

if (highS(1)-lowS(1))< (highS(2)-lowS(2)) and (highS(2)-
lowS(2)) < (highS(3)-lowS(3)) then begin
        countVolC = countVolC+1;
end;

countsession=countsession+1;
print(File("C:\test.txt"),datereadable,"    ",countVolC,"
",countsession);
```

Essentially, we count all the times the market has displayed three consecutive bars of decreasing ranges and compare them to the total number of sessions. We then calculate the frequency of these events (as a percentage) for the different markets. (See Figure 2.)

From the results of the table, we can see that the frequency of this pattern remains relatively consistent in the different markets, accounting for about 15–20% of the trading sessions. So, if we consider using this pattern as a filter in a breakout strategy, we can expect a significant decrease in the total number of trades. It is essential to beware of the potential risk that the results lose statistical relevance.

Nonetheless, we're optimistic about the efficacy of this filter, as a volatility contraction typically precedes notable price moves, especially breakouts at the levels monitored by the strategy.

	countSession	countVolC	% occur
@ES	3409	520	15%
@NQ	3409	576	17%
@EC	3410	616	18%
@CL	3407	632	19%
@RB	3407	588	17%
@GC	3406	598	18%

FIGURE 2: PATTERN FREQUENCY. How often does the volatility contraction pattern occur in the markets tested? The frequency of the pattern appears relatively consistent across the six markets tested (15–20% of the trading sessions). This frequency suggests the pattern could be useful as a filter and would decrease the total number of trades taken.

A first test with multiple instruments

For an initial test, we will look at the same set of futures contracts. We will apply the simple strategy described below to each instrument, using data from 2010 to the present and a 15-minute chart timeframe.

The strategy opens long or short positions on the breakout of the previous session's high or low. No additional filters are applied. The strategy closes the position at the end of the trading session or when a stop-loss of $2,000 is reached.

```
input: stoploss(2000);
var:  MP(0), oktrade(false), slb(false);

slb=sessionlastbar;
MP=marketposition;

if slb[1] then begin
        oktrade = true;
end;

if oktrade then begin
        buy next bar HighS(1) stop;
        sellshort next bar LowS(1) stop;
end;

if MP<>MP[1] and MP<>0 then oktrade=false;
setexitonclose;
if stoploss>0 then setstoploss(stoploss);
```

The results for the system are shown in Figure 3.

As expected, it is noticeable that the two instruments

	Avg trade	Num trade	Net profit	Max DD
@ES	$ -10,16	3137	$ -31.887	$ 78.075
@NQ	$ 1,57	3150	$ 4.930	$ 67.190
@EC	$ -7,67	3090	$ -23.700	$ 51.187
@CL	$ 21,49	3087	$ 66.350	$ 42.820
@RB	$ 41,69	3140	$ 130.897	$ 35.813
@GC	$ 13,84	2968	$ 41.090	$ 71.280

FIGURE 3: A TEST WITH MULTIPLE INSTRUMENTS. The same simple strategy is applied to each instrument, using data from 2010 to the present and a 15-minute chart timeframe.

	Avg trade	Num trade	Net profit	Max DD	
@CL	$ 21,49	3087	$ 66.350	$ 42.820	
@CL	$ 76,57	636	$ 48.700	$ 26.750	filtered
@RB	$ 41,69	3140	$ 130.897	$ 35.813	
@RB	$ 81,99	584	$ 47.884	$ 26.380	filtered

FIGURE 4: WITH FILTER VS. WITHOUT FILTER. Here you can compare the results from the system with and without the filter. Although the net profit decreased, the average trade is more sustainable for live trading.

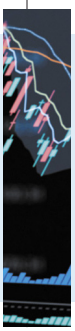
from the energy sector, crude oil (@CL) and RBOB gasoline (@RB), perform best when traded with this breakout approach. We focus on these instruments and introduce the volatility contraction filter by modifying the script with the parts highlighted below:

```
var: MP(0), oktrade(false), slb(false), VolC(false);

if slb[1] then begin
        VolC = (highS(1)-lowS(1))< (highS(2)-lowS(2)) and
(highS(2)-lowS(2)) < (highS(3)-lowS(3));
        oktrade = true;
end;

if oktrade and VolC then begin
        buy next bar HighS(1) stop;
        sellshort next bar LowS(1) stop;
end;
```

The results with and without the filter are reported in the table in Figure 4.



We'll leverage a volatility contraction pattern to enhance a trend-following strategy that opens new positions when a certain price level is broken through.

	Avg trade	Num trade	Net profit	Max DD
@RB	$ 139,90	434	$ 60.706	$ 16.760

FIGURE 5: ADDING A TIME-BASED CONDITION TO ENTRIES. When Sunday and Monday are excluded from trading, there is an improvement to the overall metrics profile for the strategy, though not every individual metric is an improvement.

The filtering action of the pattern is precisely what we expected. Even though the net profit has decreased, the average trade is now closer to what might be called sustainable in live trading, where commission costs and slippage must also be considered.

For further illustration, we continue developing a specific strategy for the @RB futures contract.

LET'S CREATE A SIMPLE STRATEGY

We return to the code used in the previous section and see if adding a time-based filter to the entries can improve its performance.

We will then add two inputs, myday1 and myday2, to exclude trading during two sessions in the week. The @RB trading session starts at 6:00 PM (exchange time) and ends at 5:00 pm the following day, from Sunday to Friday. Based on the available historical data, it was found that the strategy's performance can be improved if myday1 = 0 and myday2 = 1, that is, if Sunday and Monday are excluded.

We will incorporate this new time-based condition into our code, highlighting the parts below:

```
Input: myday1(0), myday2(1);

if oktrade and VolC and (dayofweek(d)<>myday1 and
dayofweek(d)<>myday2) then begin
        buy next bar HighS(1) stop;
        sellshort next bar LowS(1) stop;
end;
```

This gives us the new results shown in Figure 5.

We find that the system's net profit has increased significantly, even though we only trade on four of the five available days per week. The maximum drawdown has decreased, and the average trade has increased to $140. The total number of trades has decreased, which may reduce the statistical significance of the results. However, we also trade fewer sessions, so 30–35 trades per year is a reasonable number. Therefore, we decide to keep the chosen time filter.

	Avg trade	Num trade	Net profit	Max DD
@RB	$ 206,00	415	$ 85.512	$ 29.623

FIGURE 6: CAN OVERNIGHT TRADING IMPROVE RESULTS? So far, trading has been intraday with all open positions closed at the end of the session. If trades are given more time to develop, will that improve the strategy? Results show that changing the strategy from intraday to multiday had a significant impact on the system.

	Avg trade	Num trade	Net profit	Max DD
@RB	$ 237,54	421	$ 100.006	$ 30.567

FIGURE 7: INTRODUCING A TAKE-PROFIT. Is adding a take-profit beneficial? Here you see the results from the system after introducing a take-profit of $4,000. Improvements are seen in the net profit and the average trade.

	Avg trade	Num trade	Net profit	Max DD
@ES	$ 93,92	530	$ 49.775	$ 15.112
@NQ	$ 62,15	579	$ 35.985	$ 38.675
@EC	$ 39,04	596	$ 23.268	$ 23.312

FIGURE 8: RESULTS WITH VOLATILITY CONTRACTION FILTER. In tests on energy futures, filtering trades by allowing trades only after a volatility contraction improved the system overall.

CAN WE FURTHER IMPROVE THE STRATEGY BY TRADING OVERNIGHT?

We are trading intraday and closing all open positions at the end of the session at the latest. What would happen if we gave the trades more time to develop? To answer this question, we introduce a new input, MaxDays, a new variable, DaysInTrade (which increases by 1 with each session) and replace the exit command setexitonclose with the last five lines in the following code set:

```
input: MaxDays(0);
var: DaysInTrade(0);

if slb[1] then begin
        VolC = (highS(1)-lowS(1))< (highS(2)-lowS(2)) and
(highS(2)-lowS(2)) < (highS(3)-lowS(3));
        oktrade = true;
        DaysInTrade=DaysInTrade+1;
end;

if MP<>MP[1] and MP<>0 then DaysInTrade=0;
if MP<>0 and DaysInTrade>=MaxDays and MaxDays>0
then begin
if Time>=1630 and Time<1700 then sell next bar market;
    end;
```

By optimizing MaxDays using data available from 2010 to the present, it proves beneficial to run trades up to a maximum of three sessions. We then set MaxDays=3 and observe the new results (see Figure 6).

Changing the strategy from intraday to multiday has had a significant impact on the system. The Max DD (maximum drawdown) has indeed decreased, but the net profit has increased by over 40%, and the average trade has increased by almost 50%, which is already a good level for the instrument we trade.

Can we increase it even more? The strategy is straightforward and already provides us with excellent metrics. Adding specific conditions could improve it, but also increase the risk of overfitting.

Therefore we decide not to introduce more entry rules but only to see if adding a take profit could be beneficial.

In Figure 7 you can see the results after introducing a take-profit of $4,000.

The Max DD (maximum drawdown) has remained more or less the same, but we have increased both the net profit and the average trade. Therefore, we are satisfied with this choice.

FINAL CONSIDERATIONS

We have shown how, for the primary energy futures, allowing trades only after a volatility contraction has had a significant impact on the metrics of a trend-following breakout system. This approach significantly improved the average trade and reduced the max drawdown.

This led us to develop a comprehensive strategy for @RB futures. In the future, it may be worthwhile to revisit the assets that we initially set aside due to their poor performance with the original strategy to determine the impact of this pattern on them.

When you compare these filtered results (Figure 8) with those of the unfiltered strategy, you notice a significant improvement in the metrics stands out. This underscores the efficacy of using a volatility contraction filter on breakout entries.

Andrea Unger is a full-time professional trader, president of The Unger Academy, and author of The Unger Method. *He is a four-time World Trading Champion (2008, 2009, 2010, and 2012), an honorary member of SIAT (Italian*

Allowing trades only after a volatility contraction has had a significant impact on the metrics of a trend-following breakout system.

Society of Technical Analysis, a branch of IFTA), and speaks throughout Europe, America, Australia, and Asia. He may be reached at Andrea@UngerAcademy.com. The Unger Academy provides services to traders, including individuals, to help them improve their approach to trading (more information can be found at https://autc.pro/tasc).

FURTHER READING

Unger, Andrea [2021]. *The Successful Trader's Guide To Money Management: Proven Strategies, Applications, And Management Techniques*, Wiley Trading.

_____ [2021]. *The Unger Method: The Winning Strategy Of The 4-Time World Trading Champion*, The Boss Books.

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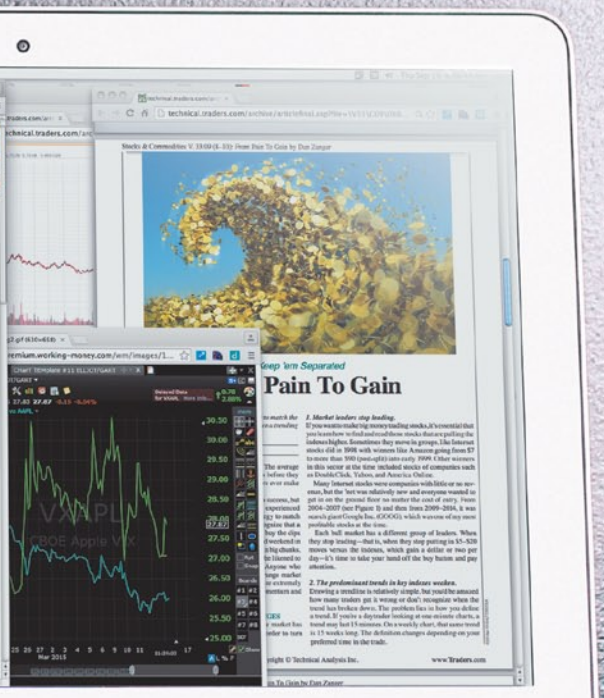

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