GH Traders, LLC
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research note

Hedge Ratio using the ATR

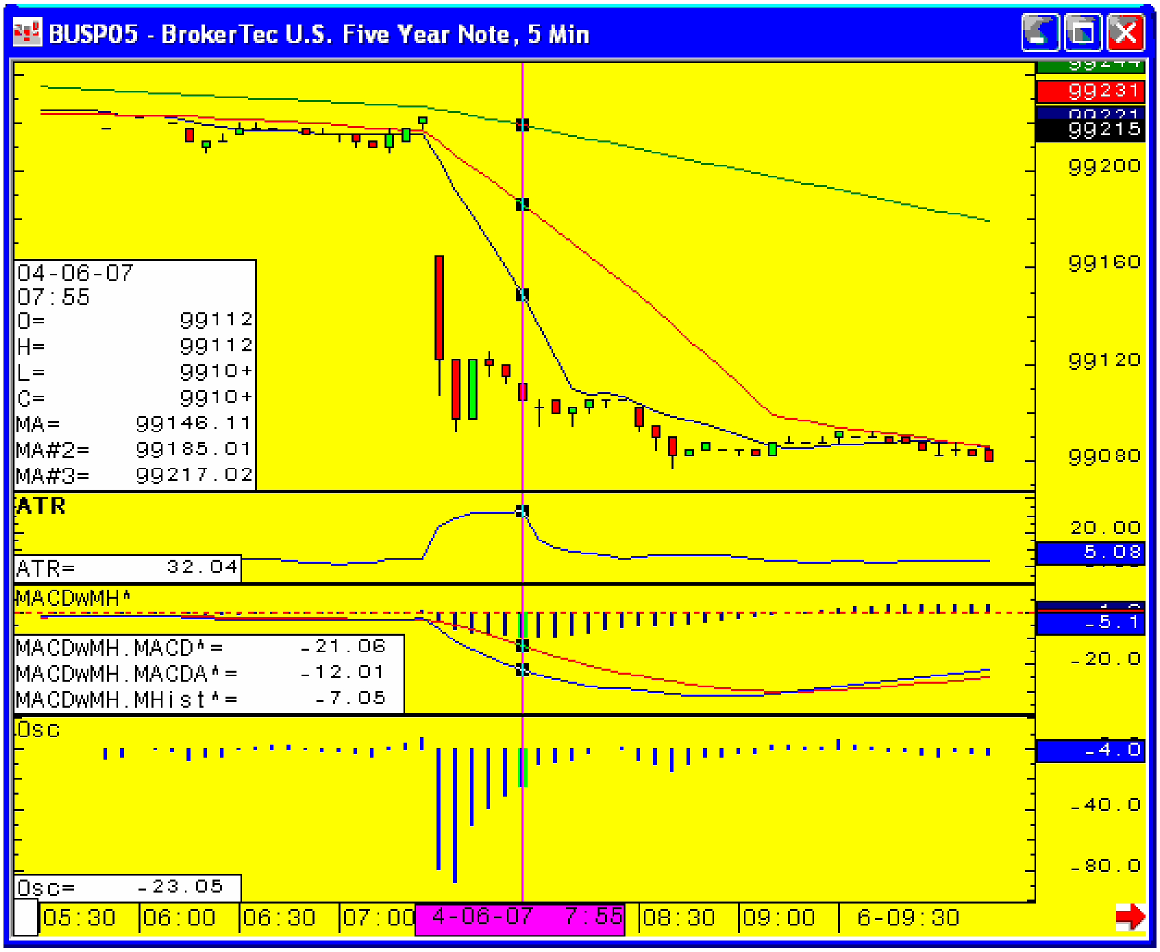
A look at a way to hedge between two markets that have nothing in common.

There are many ways to hedge between two similar type markets. Also within a market, like the Eurodollars or the cash treasury's. You can view the most basic hedge ratios used between fixed income markets on a daily basis in my morning email. But, what do you do when the two markets have nothing in common, like the 5yr note and the emini sp? One solution is to use the Average True Range (ATR) which is a volatility indicator.

Take note that we are talking about *apples and oranges* here; two markets that have nothing to do with each other. So, it's very risky putting on a trade like this. However, I've been asked so many times about this type of hedge ratio that I thought I'd write this research note in response to those inquiries.

Let's take a look at two markets, the 5yr cash & the emini SP, as an example. Let's also look at two ways to use this method. Many traders want to trade this type of strategy during an economic release, like, unemployment or durable goods etc. So I'll give two examples. One, trading this strategy during an economic release and two, simply trading the strategy during 'normal' times.

1. First, let's look at trading the strategy during an economic release, say, unemployment. The following is a tutorial on how you'd create the hedge ratio for a trade.
2. Go to the charts. Look at the last 12 unemp releases and write down the ATR for first 30 min after the release on a 5 min chart. A chart example follows.



3.
    a. Note the ATR spike on the unemployment release. The 5 yr normally moves about 5 to 6 ATRs. On unemployment it averaged 32 ATRs over 6 bars.
    b. You interpret the ATR as follows (on CQG)
        i. 32.04 = 32 boxes (or 8 tics). The 5yr moves in 1/4 tics.
        ii. Look to the right and you'll see the ATR at 5.08. That's the ATR after everything calmed down and what we normally see with the 5yr. That means it moves 5 boxes on average over the course of a 5 minute bar.
        iii. I set my ATR for the 5 min chart at smooth, and 6. That way you can view the economic release ATR easier. (6bars * 5 minutes = 30 minutes. That's why I wrote, *look at the first 30 minutes that follow the release*).

4. I'd write down the ATR, for the unemployment release above, as 32. Then, I'd do the same thing for all of the prior releases until I had 1-year's worth of data.
5. Average out the 12 releases
    a. Take that average and plug it into the following formula below

        i. (Minimum tic fluctuation * ATR) * Number of Contracts = Total Risk
        ii. ($78.13*32)*1 = **$2500**
        iii. We'll bring that $2500 number into our hedge ratio equation later.

6. Now, you need to find the ATR for the emini S&Ps.

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    a.
        i. The chart above shows the ATR, where I marked it with the vertical line, at 154.17. This converts to 15.5 boxes in the S&Ps.
    b. I'd write down the ATR for the release above as 15.5. Then I'd do the same thing for all of the prior releases until I had 1-year's worth of data.
    c. Average out the 12 releases
    d. Take the average and plug it into the following formula (I'll enter 15.5 as the average, because I didn't go back and collect all 12-months of data.)
        i. (Minimum tic fluctuation * ATR) * Number of Contracts = Total Risk
        ii. ($12.50*15.5)*1 = **$193.75 (round to $193)**

iii. We'll bring that number above, $193 into our hedge ratio equation later.

7. Now let's put it all together and get our hedge ratio
    a. Risk
        i. 5yr risk / Emini S&P risk = hedge ratio
        ii. $2500 / $193 = **12.95 (round to 13)**
8. Conclusion
    a. **Hedge ratio for 5 yr / emini S&P is 1:13** *for this particular trade*.
    b. If you would have followed this trade on the unemp release in the charts above, you would have lost a lot of money being long the spread, that is, long one 5yr cash and short 13 emini's.
    c. If you were short the spread, great.
    d. This is a very dangerous trade. However, there are things you could do with it. Think about it. Look at the charts. There are times when this trade is viable. Let's move on.

9. What about during normal trading times?
    a. You'd do the same thing as above. Example follows.
    b. 5yr chart

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   i. The chart shows the ATR at 5.083 which is simply 5 boxes

ii. Take the average and plug it into the following formula (like we in the first example at the beginning of this paper)
iii. (Minimum tic fluctuation * ATR) * Number of Contracts = Total Risk
iv. ($78.13*5)*1 = **$390**
v. We'll bring that $390 number into our hedge ratio equation later.

d. The emini S&P

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e.
i. The ATR is 120.83 or 12 boxes (simply move the decimal one digit to the right; 120.83 = 12.083, then, round to 12)

f. Take the average and plug it into the following formula
i. (Minimum tic fluctuation * ATR) * Number of Contracts = Total Risk
ii. ($12.50*12)*1 = **$150**
iii. We'll bring that $150 number into our hedge ratio equation later.

g. Now let's put it all together and get our hedge ratio
i. Risk
1. 5yr risk / Emini S&P risk = hedge ratio
2. $390 / $150 = **2.6 (round to 3)**

h. Conclusion

i. **Hedge ratio for 5 yr / emini S&P is 1:3** *for this particular trade*.
ii. Note, the bigger size you trade, the more precise you'd have to be with the hedge ratio. For instance, if you are doing 3 ~ 5yrs, you'd do 8 eminis (2.6*3 = 7.8). Or if you did 2 ~ 5yrs, you'd do 5 eminis (2.6*2 = 5.2). That's called TAILS. Tails will kill your PnL the bigger you trade if you are not precise.

Quite a bit of difference from the unemployment trade and the 'normal' time trade. 1:13 and 1:3. Those ratios tell me the trade is risky, period.

However, many traders may see something within this formula. Also, this trade could be put into a spreadsheet with live price data using the CQG excel link. Therefore you wouldn't have to do the calculations by hand.

Conclusion
The following is the formula I used to get the hedge ratio

1. Define the following for each contract you are trading
   a. (Minimum tic fluctuation * ATR) * Number of Contracts = Total Risk
2. Define spread ratio
   a. Commodity / Commodity = hedge ratio

Thank you,
Jim Goulding

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